



Agenda

Transportation, Infrastructure, and Planning Subcommittee

Wednesday, May 17, 2023

10:00 AM

City Council Chambers

OPTIONS TO ACCESS THIS MEETING

Virtual Request to speak at a meeting:

- **Register online** by visiting the City Council Meetings page on phoenix.gov **at least 2 hours prior to the start of this meeting.** Then, click on this link at the time of the meeting and join the Webex to speak:

<https://phoenixcitycouncil.webex.com/phoenixcitycouncil/onstage/g.php?MTID=ef42f242e6102bbe4b1d7a136b1600d7c>

- **Register via telephone** at 602-262-6001 **at least 2 hours prior to the start of this meeting.** noting the item number. Then, use the Call-in phone number and Meeting ID listed below at the time of the meeting to call-in and speak.

In-Person Requests to speak at a meeting:

- Register in person at a kiosk located at the City Council Chambers, 200 W. Jefferson St., Phoenix, Arizona, 85003. Arrive **1 hour prior to the start of this meeting.** Depending on seating availability, residents will attend and speak from the Upper Chambers, Lower Chambers or City Hall location.

- Individuals should arrive early, 1 hour prior to the start of the meeting to submit an in-person request to speak before the item is called. After the item is called, requests to speak for that item will not be accepted.

At the time of the meeting:

- **Watch** the meeting live streamed on phoenix.gov or Phoenix Channel 11 on Cox Cable, or using the Webex link provided above.

- **Call-in** to listen to the meeting. Dial 602-666-0783 and Enter Meeting ID 2557 831 0448# (for English) or 2556 088 5913# (for Spanish). Press # again when prompted for attendee ID.

- **Watch** the meeting in-person from the Upper Chambers, Lower Chambers or City Hall depending on seating availability.

Para nuestros residentes de habla hispana:

- **Para registrarse para hablar en español**, llame al 602-262-6001 **al menos 2 horas antes del inicio de esta reunión** e indique el número del tema. El día de la reunión, llame al 602-666-0783 e ingrese el número de identificación de la reunión 2556 088 5913#. El intérprete le indicará cuando sea su turno de hablar.

- **Para solamente escuchar la reunión en español**, llame a este mismo número el día de la reunión (602-666-0783; ingrese el número de identificación de la reunión 2556 088 5913#). Se proporciona interpretación simultánea para nuestros residentes durante todas las reuniones.

- **Para asistir a la reunión en persona**, vaya a las Cámaras del Concejo Municipal de Phoenix ubicadas en 200 W. Jefferson Street, Phoenix, AZ 85003. Llegue 1 hora antes del comienzo de la reunión. Si desea hablar, regístrese electrónicamente en uno de los quioscos, antes de que comience el tema. Una vez que se comience a discutir el tema, no se aceptarán nuevas solicitudes para hablar. Dependiendo de cuantos asientos haya disponibles, usted podría ser sentado en la parte superior de las cámaras, en el piso de abajo de las cámaras, o en el edificio municipal.

CALL TO ORDER

000 CALL TO THE PUBLIC

MINUTES OF MEETINGS

1 Minutes of the Transportation, Infrastructure and Planning Subcommittee Meeting

Page 11

This item transmits the minutes of the Transportation, Infrastructure and Planning Subcommittee Meeting on April 19, 2023 for review, correction or approval by the Subcommittee.

THIS ITEM IS FOR POSSIBLE ACTION.

Responsible Department

This item is submitted by Deputy City Manager Mario Paniagua and the City Manager's Office.

CONSENT ACTION (ITEMS 2-8)

2 Alternative Transportation Programs Contract Extension

Page 17

Request the Transportation, Infrastructure and Planning Subcommittee recommend City Council approval to amend the Alternative Transportation Services Contract 148268 with MV Transportation, extending Group I services for the current five-year contract term by an additional year.

THIS ITEM IS FOR CONSENT ACTION.

Responsible Department

This item is submitted by Deputy City Manager Mario Paniagua and the

Public Transit Department.

**3 Proposed Amendment to the 2018 International Building Code
Section 310.4.1 - Care Facilities Within a Dwelling**

Page 19

This report provides the Transportation, Infrastructure and Planning Subcommittee with a summary of the proposed changes to the 2018 International Building Code (IBC) Section 310.4.1 - Care facilities within a dwelling. This proposed change will align with the Arizona Revised Statutes (A.R.S.), title 9, chapter 7, article 1, section 9-807.

THIS ITEM IS FOR CONSENT ACTION.

Responsible Department

This item is submitted by Deputy City Manager Alan Stephenson and the Planning and Development Department.

4 Biomass Power Production Partnership with Salt River Project

Page 21

This report provides information to the Transportation, Infrastructure, and Planning Subcommittee on the agreement with Salt River Project for Biomass Power Production.

THIS ITEM IS FOR CONSENT ACTION.

Responsible Department

This item is submitted by Deputy City Manager Ginger Spencer and the Water Services Department.

**5 Renewable Liquefied Natural Gas Contract - IFB PTD 23-001 - Request
for Award**

Page 23

Request to authorize the Transportation, Infrastructure and Planning

Subcommittee to recommend City Council approval to enter into a contract with Sapphire Gas Solutions to provide renewable liquefied natural gas to the Public Transit Department for use in the operation of the transit fleet during the next five years.

THIS ITEM IS FOR CONSENT ACTION

Responsible Department

This item is submitted by Deputy City Manager Mario Paniagua and the Public Transit Department.

6 U.S. Department of Transportation Safe Streets and Roads for All Grant Opportunity for Federal Fiscal Year 2023 - Bipartisan Infrastructure Law Funding

Page 25

This report requests the Transportation, Infrastructure, and Planning Subcommittee recommend City Council approval to apply for, accept and, if awarded, enter into an agreement for disbursement of federal funding from the U.S. Department of Transportation (USDOT) through the Federal Fiscal Year (FFY) 2023 Safe Streets and Roads for All (SS4A) grant opportunity. The total grant funds applied for will not exceed \$25 million, and the City's local match would not exceed \$6.25 million.

THIS ITEM IS FOR CONSENT ACTION.

Responsible Department

This item is submitted by Deputy City Manager Alan Stephenson and the Street Transportation Department.

7 Amend City Code - Section 36-158, Schedule I, Local Speed Limits at 25 Locations

Page 27

This report provides the Transportation, Infrastructure, and Planning Subcommittee with information about proposed record keeping and local speed limit changes at 25 locations and requests the Subcommittee recommend City Council adoption of recommended changes to Phoenix

City Code, section 36-158, Schedule I, Local Speed Limits.

THIS ITEM IS FOR CONSENT ACTION.

Responsible Department

This item is submitted by Deputy City Manager Alan Stephenson and the Street Transportation Department.

8 Amend City Code to Establish the Shared Micromobility Program

Page 70

This report requests the Transportation, Infrastructure and Planning (TIP) Subcommittee recommend City Council amend Phoenix City Code chapters 4, 23, 24, 31, 36 and 39 to establish a Shared Micromobility Program; enact related regulations; and allow for the permanent use of electric scooters on public streets citywide.

THIS ITEM IS FOR CONSENT ACTION.

INFORMATION ONLY (ITEMS 9-12)

9 Metro, Regional Public Transportation Authority and Maricopa Association of Governments Meetings

Page 73

This report provides the Transportation, Infrastructure and Planning Subcommittee with copies of past and/or upcoming meeting agendas/summaries for METRO light rail, Valley Metro/Regional Public Transportation Authority and the Maricopa Association of Governments.

THIS ITEM IS FOR INFORMATION ONLY.

Responsible Department

This item is submitted by Deputy City Manager Mario Paniagua and the Public Transit Department.

10 Citizens Transportation Commission Meetings

Page 75

This report provides the Transportation, Infrastructure and Planning

Subcommittee with copies of past and/or upcoming meeting agendas/summaries for the Citizens Transportation Commission.

THIS ITEM IS FOR INFORMATION ONLY.

Responsible Department

This item is submitted by Deputy City Manager Mario Paniagua and the Public Transit and Street Transportation departments.

11 Freeway Program Update

Page 76

This report provides the Transportation, Infrastructure and Planning Subcommittee updates on the Arizona Department of Transportation (ADOT) freeway program within the City of Phoenix.

THIS ITEM IS FOR INFORMATION ONLY.

Responsible Department

This item is submitted by Deputy City Manager Alan Stephenson and the City Manager's Office.

12 October 2023 Proposed Bus Service Changes and Public Outreach

Page 81

This report provides the Transportation, Infrastructure and Planning Subcommittee with information on the proposed October 2023 bus services changes and related public outreach efforts.

THIS ITEM IS FOR INFORMATION ONLY.

Responsible Department

This item is submitted by Deputy City Manager Mario Paniagua and the Public Transit Department.

INFORMATION AND DISCUSSION (ITEM 13)

13 Building Automation Systems Update

Page 95

This report provides information to the Transportation, Infrastructure and

Planning (TIP) Subcommittee about Building Automation Systems (BAS) and their usage within the operations of City of Phoenix facilities.

THIS ITEM IS FOR INFORMATION AND DISCUSSION.

Responsible Department

This item is submitted by Deputy City Manager Mario Paniagua and the Public Works Department.

DISCUSSION AND POSSIBLE ACTION (ITEMS 14-16)

14 Active Transportation Plan

Page 97

This report requests the Transportation, Infrastructure, and Planning Subcommittee recommend City Council approval of the Street Transportation Department's Active Transportation Plan (ATP).

THIS ITEM IS FOR DISCUSSION AND POSSIBLE ACTION.

Responsible Department

This item is submitted by Deputy City Manager Alan Stephenson and the Street Transportation Department.

15 Street Planning and Design Guidelines Manual Update

Page 401

This report requests the Transportation, Infrastructure and Planning Subcommittee recommend City Council approval of the Street Planning and Design Guidelines Manual.

THIS ITEM IS FOR DISCUSSION AND POSSIBLE ACTION.

Responsible Department

This item is submitted by Deputy City Manager Alan Stephenson, the Street Transportation Department and the City Engineer.

**16 Phoenix Bus Rapid Transit Program Planning Support Services
Contract Amendment**

Page 545

This report requests the Transportation, Infrastructure and Planning Subcommittee recommend City Council approval to execute an amendment to the Phoenix Bus Rapid Transit (BRT) Planning Support Services Contract 149143 with HDR Engineering Inc. to provide continued project management, community and business engagement and outreach, transit planning, and engineering oversight for the approved BRT corridor of 35th Avenue/Van Buren Street. The additional expenditures included in this amendment will not exceed \$5.5 million through the remainder of the contract.

THIS ITEM IS FOR DISCUSSION AND POSSIBLE ACTION.

Responsible Department

This item is submitted by Deputy City Manager Mario Paniagua and the Public Transit Department.

000 CALL TO THE PUBLIC

FUTURE AGENDA ITEMS

ADJOURN

For further information or reasonable accommodations, please call the City Council Meeting Request line at 602-262-6001. 7-1-1 Friendly.

Persons paid to lobby on behalf of persons or organizations other than themselves must register with the City Clerk prior to lobbying or within five business days thereafter, and must register annually to continue lobbying. If you have any questions about registration or whether or not you must register, please contact the City Clerk's Office at 602-534-0490.

Members:

Councilwoman Debra Stark, Chair
Councilwoman Betty Guardado
Councilwoman Ann O'Brien
Councilwoman Laura Pastor



City of Phoenix

Transportation, Infrastructure, and Planning Subcommittee

Report

Agenda Date: 5/17/2023, Item No. 1

Minutes of the Transportation, Infrastructure and Planning Subcommittee Meeting

This item transmits the minutes of the Transportation, Infrastructure and Planning Subcommittee Meeting on April 19, 2023 for review, correction or approval by the Subcommittee.

THIS ITEM IS FOR POSSIBLE ACTION.

The minutes are included for review as **Attachment A**.

Responsible Department

This item is submitted by Deputy City Manager Mario Paniagua and the City Manager's Office.

Attachment A

Phoenix City Council Transportation, Infrastructure, and Planning (TIP) Subcommittee Summary Minutes Wednesday, April. 19, 2023

City Council Chambers
200 W. Jefferson St.
Phoenix, Ariz.

Subcommittee Members Present

Councilwoman Debra Stark, Chair
Councilwoman Laura Pastor
Councilwoman Betty Guardado

Subcommittee Members Absent

Councilwoman Ann O'Brien

CALL TO ORDER

Chairwoman Stark called the Transportation, Infrastructure, and Planning Subcommittee to order at 10:05 a.m. with Councilwoman Laura Pastor and Councilwoman Betty Guardado present.

CALL TO THE PUBLIC

None.

MINUTES OF MEETINGS

1. Minutes of the Transportation, Infrastructure, and Planning Subcommittee Meeting

Councilwoman Pastor motioned to approve the minutes of the Feb. 15, 2023, Transportation, Infrastructure, and Planning Subcommittee meeting. Chairwoman Stark seconded the motion, which passed unanimously, 3-0.

CONSENT ACTION (ITEMS 2-4)

Items 2-4 were for consent action. No presentations were planned, but City staff was available to answer questions.

Chairwoman Stark remarked that item 4 was a recommendation for the City Council to name the new transit center at Metrocenter in honor of former District 1 Councilwoman and Mayor Thelda Williams.

Councilwoman Pastor stated that former Councilwoman Williams deserves this honor and motioned to approve consent items. Chairwoman Stark seconded the motion, which passed unanimously, 3-0.

2. Fiscal Year 2023-24 Assessment for Water Industry Research and Partnerships

Consent only. No Councilmember requested additional information.

3. Fiscal Year 2023 Assessments for the Arizona Municipal Water Users Association

Consent only. No Councilmember requested additional information.

4. Naming of the Metrocenter Transit Center for Thelda Williams

Consent only. No Councilmember requested additional information.

5.* Biomass Power Production Partnership with Salt River Project

Item 5 was withdrawn.

INFORMATION ONLY (ITEMS 6-10)

6. Street Transportation Department Capital Improvement Program for Fiscal Years 2022-23 Through 2027-28

Information only. No Councilmember requested additional information.

7. Freeway Program Update

Information only. No Councilmember requested additional information.

8. Citizens Transportation Commission Meetings

Information only. No Councilmember requested additional information.

Public Comment

Rocky Kujala expressed concerns about the impact of the City's Bus Rapid Transit program on businesses and property owners along the 35th Ave and Van Buren corridor.

9. Metro, Regional Public Transportation Authority, and Maricopa Association of Governments Meetings

Information only. No Councilmember requested additional information.

10. Water, Wastewater, and Stormwater Proposed Rate Increase Outreach Plan

Information only. No Councilmember requested additional information.

Public Comment

Cynthia Graber expressed concerns about the City's proposed Water, Wastewater, and Stormwater increases.

INFORMATION AND DISCUSSION (ITEMS 11-13)

11. Maricopa County Regional Flood Control Update

City Engineer Eric Froberg introduced Maricopa County Flood Control Director Michael Fulton to provide an update on item 11.

Mr. Froberg noted that the City had recently moved its flood control management group from the Public Works Department to the City Engineer's Office.

Mr. Fulton discussed a flood control partnership between the City of Phoenix, Maricopa County Flood Control, and regional municipalities, highlighting the partnership's history and funding sources. He added the Maricopa County Flood Control is funded by secondary property taxes of \$0.1592/\$1,000 of assessed valuation.

Chairwoman Stark expressed support for item 11.

12. Public Works Apprenticeship Programs Update

Deputy City Manager Mario Paniagua introduced Assistant Public Works Director Melissa Sweinhagen, Assistant Public Works Director Chris Ewell, Assistant Public Works Director Felipe Moreno, and Deputy Human Resources Director Megan Avalos to discuss item 12.

Ms. Avalos provided an overview of the Human Resources role in helping advance the City's apprenticeship programs, namely the Electrician, Solid Waste Equipment Operator (SWEO), Building Equipment Operator (BEO), Fleet Technician, Street Maintenance Worker, and other apprenticeship classifications across the City.

Mr. Ewell discussed the City's Electrician and Building Equipment Operator apprenticeship, noting the Electrician apprenticeship is a four-year intensive daytime and on-the-job training classroom instructions through the Phoenix Electrical JATC Apprenticeship Center.

Mr. Moreno gave an overview of the SWEO program. He stated it is the country's first heavy equipment apprenticeship program and is currently training ten apprentices.

Ms. Sweinhagen discussed the City's Fleet Technician apprenticeship program, noting it is a two-year Fleet Apprentice training that offers on-the-job training that would result in apprentices becoming Equipment Service Worker II at the end of the program.

Councilwoman Guardado thanked staff for developing the training opportunities.

13. Street Maintenance Worker Apprenticeship Program Update

Street Transportation Director Kini Knudson introduced Street Transportation Deputy Director Jesse Duarte and LiUNA! Local 777 representative Michael Ruelas to present item 13.

Ms. Avalos discussed Human Resources coordination with other departments and LiUNA! Local 777 to expand and grow the City's apprenticeship programs.

Mr. Duarte provided an overview of the City's Maintenance Worker Apprenticeship Program, recruitment strategies, and community outreach.

LiUNA! Local 777 representative Michael Ruelas discussed LiUNA's collaboration with the City to ensure apprentices succeed in their respective programs.

Councilwoman Stark acknowledged the Street Maintenance Worker Apprentices in attendance.

Councilwoman Guardado expressed for the City's apprenticeship programs.

Councilwoman Pastor asked what the City needs to bring additional apprentices through the Street Maintenance Worker Apprenticeship program.

Mr. Duarte replied the City is reevaluating the last three apprenticeship classes and removing some requirements to enter the program.

Councilwoman Pastor stated expediting the process and getting the next apprentice class into vacant positions is critical.

Mr. Knudson responded staff would work together to bring additional applicants through the apprenticeship program.

DISCUSSION AND POSSIBLE ACTION (ITEM 14)

14. Proposed Revisions to Phoenix City Code Chapter 32

Mr. Paniagua introduced Deputy City Manager Alan Stephenson and Planning and Development Director Joshua Bednarek to present item 14.

Mr. Stephenson gave an overview of a new municipal separate storm sewer system (MS4) requirement update related to federal and state regulations.

Mr. Bednarek discussed community and stakeholder outreach staff has conducted over the last few months, including public stakeholder meetings, advisory board approval discussions, and upcoming follow-up sessions with other stakeholders.

Councilwoman Guardado motioned to approve item 14. Councilwoman Pastor seconded the motion, which passed unanimously, 3-0.

CALL TO THE PUBLIC

Carmen Terrell stated some recruitment incentives should be in place to sustain the City's apprenticeship programs.

FUTURE AGENDA ITEMS

ADJOURNMENT

Chairwoman Stark adjourned the meeting at 11:17 a.m.

Respectfully submitted,

Yusuf Dirow, Management Fellow

DRAFT



Alternative Transportation Programs Contract Extension

Request the Transportation, Infrastructure and Planning Subcommittee recommend City Council approval to amend the Alternative Transportation Services Contract 148268 with MV Transportation, extending Group I services for the current five-year contract term by an additional year.

THIS ITEM IS FOR CONSENT ACTION.

Summary

In addition to fixed route (bus and light rail) and paratransit services (Dial-a-Ride), the City of Phoenix provides Alternative Transportation Programs for Phoenix senior citizens and residents with disabilities through its multiple taxi service subsidy programs, some of which have been in place since 1983. The Alternative Transportation Programs allow flexibility for seniors and individuals who have obtained paratransit certification per the Americans with Disabilities Act (ADA) to plan taxi-based trips based on their needs. The alternative transportation programs include:

- ADA Cab: A supplement to Dial-a-Ride service, allowing individuals to schedule additional trips at their convenience and to locations of their choice.
- Senior Cab: Provides individuals age 65 and older flexible transportation at their convenience and to locations of their choice.
- Employment and Employment Training: Supports travel to and from jobs or employment training programs for residents with disabilities.
- Repetitive Medical Trips: Supports travel to and from repetitive medical appointments, such as dialysis treatment.

Procurement Information

The Public Transit Department (PTD) issued a Request for Proposals in February 2023, which received no contractor proposals. In response, the Public Transit Department has negotiated a price with the incumbent contractor, MV Transportation, to extend Group I services for the current contract by one year. PTD has begun working to seamlessly transition Phoenix's users of the Alternative Transportation Programs to Valley Metro's Ride Choice program, which offers similar services, during the one-year extension.

Contract Term

Upon approval, Contract 148268 will be extended through June 30, 2024.

Financial Impact

MV's negotiated management fees for the one-year extension are \$299,454. In addition to the management fee, there are pass-through transportation costs funded by federal grants that are tracked and reimbursed separately based on passenger trips provided. Those costs are estimated not to exceed \$1.1 million, for a total contract amendment value of \$1.4 million. Funding is available in PTD's operating budget and via existing federal grant funding.

Responsible Department

This item is submitted by Deputy City Manager Mario Paniagua and the Public Transit Department.



Proposed Amendment to the 2018 International Building Code Section 310.4.1 - Care Facilities Within a Dwelling

This report provides the Transportation, Infrastructure and Planning Subcommittee with a summary of the proposed changes to the 2018 International Building Code (IBC) Section 310.4.1 - Care facilities within a dwelling. This proposed change will align with the Arizona Revised Statutes (A.R.S.), title 9, chapter 7, article 1, section 9-807.

THIS ITEM IS FOR CONSENT ACTION.

Summary

The Phoenix Building Construction Code provides minimum health and safety standards for construction of buildings in Phoenix. This proposed amendment will amend the 2018 IBC Section 310.4.1 - Care facilities within a dwelling. The proposed amendment will align with the A.R.S., title 9, chapter 7, article 1, section 9-807.

Concurrence/Previous Council Action

The Development Advisory Board (DAB) Technical Subcommittee recommended approval of this amendment on Feb. 21, 2023. The DAB recommended approval of this amendment on March 16, 2023, and ratified the results on March 29, 2023.

Responsible Department

This item is submitted by Deputy City Manager Alan Stephenson and the Planning and Development Department.

ATTACHMENT A



City of Phoenix

PLANNING & DEVELOPMENT DEPARTMENT

BUILDING CONSTRUCTION CODE CHANGE PROPOSAL

Proposed Amendment to 2018 International Building Code (IBC) Section 310.4.1

Submitted by: 2018 International Building Code Administrative Committee

310.4.1 Care facilities within a dwelling. Care facilities for five or fewer persons receiving care that are within a single-family dwelling are permitted to comply with the *International Residential Code*. ~~provided an automatic sprinkler system is installed in accordance with Section 903.3.1.3 or Section P2904 of the International Residential Code.~~

Reasons:

Arizona Revised Statutes (ARS), Title 9, Chapter 7, Article 1, Section 9-807 states the following:

A municipality shall not adopt a code or ordinance or part of a uniform code or ordinance that prohibits a person or entity from choosing to install or equip or not install or equip fire sprinklers in a single family detached residence or any residential building that contains not more than two dwelling units. A municipality shall not impose any fine, penalty or other requirement on any person or entity for choosing to install or equip or not install or equip fire sprinklers in such a residence. This section does not apply to any code or ordinance that requires fire sprinklers in a residence and that was adopted before December 31, 2009.

The last IBC the City adopted prior to December 31, 2009, was the 2006 IBC which did not have this sprinkler provision as shown above in Section 310.4.1.

Cost Impact: Reduced cost impact - Since fire sprinklers are not required.

Approved in previous 2012 Code Adoption process: ☒ YES ☐ NO

ACTION TAKEN:

2018 Code Committee

☐ Approved as submitted ☐ Modified and approved ☐ Denied ☐ No action taken

Date:

Development Advisory Board (DAB) Administrative Subcommittee

Date: 2/14/2023

☒ Approved as submitted ☐ Modified and approved ☐ Denied ☐ No action taken

Development Advisory Board (DAB)

Date: 3/16/2023

☒ Approved as submitted ☐ Modified and approved ☐ Denied ☐ No action taken

Transportation, Infrastructure and Planning Subcommittee

Date: 5/17/2023

☐ Approved as submitted ☐ Modified and approved ☐ Denied ☐ No action taken

City Council Action

Date:

☐ Approved as submitted ☐ Modified and approved ☐ Denied ☐ No action taken

For "Approved in previous Code Adoption process": Choose Yes or No - double click on box choose checked.

For "Action Taken": Double click on box and choose checked or not checked.

(Font Ariel, 11 point, left justified)



Biomass Power Production Partnership with Salt River Project

This report provides information to the Transportation, Infrastructure, and Planning Subcommittee on the agreement with Salt River Project for Biomass Power Production.

THIS ITEM IS FOR CONSENT ACTION.

Summary

Arizona forests are at a high risk of catastrophic fires and will continue to be devastated each year without proactive forest restoration efforts. These fires could significantly impact the watersheds that feed the Salt River Project's (SRP) reservoir system and provide water to Phoenix. Wildfires degrade water quality, increase water treatment costs, and impact water system resiliency by filling reservoirs with debris and sediment. Phoenix has a history of partnering with SRP and other City partners in developing and executing strategic forest thinning projects to better protect the health of the forests and the watershed system.

The challenge to reforestation efforts is finding marketable industry options for the enormous amount of low-value, small ponderosa pine trees found in Arizona's forests. Bioenergy is one of the few options available to dispose of these trees and supports the industry to ensure thinning projects move forward to continue protecting watersheds. Bioenergy is a renewable energy resource that generates electricity through a wood-burning boiler. Currently, SRP is contracted to receive power from a biomass plant located in Snowflake, Arizona, owned and operated by Novo BioPower, that uses small trees from forest thinning, other non-marketable woody material such as branches that are left over from thinning operations and sawmill residues.

The new agreement between Phoenix, SRP, and other valley cities supports SRP's continuance of the biomass power purchase agreement with Novo BioPower to work on forest thinning projects in areas at risk of devastating wildfires. This agreement will assist to restore critical watersheds that provide water to the Valley by investing in forest thinning projects and biomass power.

Through the agreement, SRP will purchase power and associated environmental

attributes from Novo BioPower's use of forest thinning sourced within SRP Watersheds. SRP will retire in Phoenix's name renewable energy certificates ("RECs"), Water Benefits, Acres Treated Benefits, and Carbon Benefits associated with the clean energy generation and forest thinning efforts. In addition to the many environmental benefits specific to watershed protection and biomass investment, the City is working with SRP on a 20MW solar development project that will produce annual renewable energy credits.

The Water Services Department is seeking approval for two agreements with SRP for the biomass power and solar power respectively for a total investment of \$1.3M per year for a 10-year term.

Responsible Department

This item is submitted by Deputy City Manager Ginger Spencer and the Water Services Department.



Renewable Liquefied Natural Gas Contract - IFB PTD 23-001 - Request for Award

Request to authorize the Transportation, Infrastructure and Planning Subcommittee to recommend City Council approval to enter into a contract with Sapphire Gas Solutions to provide renewable liquefied natural gas to the Public Transit Department for use in the operation of the transit fleet during the next five years.

THIS ITEM IS FOR CONSENT ACTION

Summary

Renewable Liquefied Natural Gas (RLNG) is a fuel product generated from the decomposition of organic waste streams, or "biomass". RLNG captures the naturally occurring gas from society's waste streams for use as a carbon-neutral and reliable energy source. Typical sources of biomass production are landfills, livestock operations and dairy farms, wastewater treatment, and other industrial sources.

In furthering its efforts to reduce the City's carbon footprint and implement tactics outlined in the City's Climate Action Plan, the Public Transit Department (PTD) will transition to using RLNG to power its compressed natural gas heavy-duty buses which currently comprise approximately 2/3 of the bus fleet. The City's Climate Action plan calls for identifying sources of renewable energy, and to utilize renewable natural gas sources as a substitute for fossil natural gas. This contract will supply RLNG to PTD's three transit operating facilities (North Transit Facility, South Transit Facility, and West Transit Facility) for the next five years. During this time, the PTD will also begin Phase 1 of its Zero Emission Heavy-Duty Bus Fleet Transition plan as approved by City Council in December 2022, which includes acquiring and testing, on a long-term basis, newer-technology zero emission buses.

Procurement Information

An Invitation for Bid procurement was processed in accordance with City of Phoenix Administrative Regulation 3.10.

Two vendors submitted bids deemed to be responsive to posted specifications and responsible to provide the required goods and services. Following an evaluation based on price, the procurement officer recommends award to the following vendor:

Selected Bidder

Sapphire Gas Solutions: \$59,262,584 million.

Contract Term

The contract will begin on or about July 1, 2023, for an initial two-year period, with one two-year option to extend, followed by an additional one-year option to extend (both options to be exercised at the City's sole discretion), totaling up to five years.

Financial Impact

The total cost of the contract, including taxes, will not exceed \$59.8 million. Funding is available in the Public Transit Department's operating budget.

Responsible Department

This item is submitted by Deputy City Manager Mario Paniagua and the Public Transit Department.



U.S. Department of Transportation Safe Streets and Roads for All Grant Opportunity for Federal Fiscal Year 2023 - Bipartisan Infrastructure Law Funding

This report requests the Transportation, Infrastructure, and Planning Subcommittee recommend City Council approval to apply for, accept and, if awarded, enter into an agreement for disbursement of federal funding from the U.S. Department of Transportation (USDOT) through the Federal Fiscal Year (FFY) 2023 Safe Streets and Roads for All (SS4A) grant opportunity. The total grant funds applied for will not exceed \$25 million, and the City's local match would not exceed \$6.25 million.

THIS ITEM IS FOR CONSENT ACTION.

Summary

The SS4A is a new funding program under the Bipartisan Infrastructure Law, which was signed into law on Nov. 15, 2021. The USDOT issued a Notice of Funding Opportunity (NOFO) on March 30, 2023, for the SS4A program for the second year of the program offering over a billion dollars in FFY 2023. The intent of the program is to offer a competitive discretionary grant opportunity to support planning, infrastructure, and behavioral and operational initiatives to prevent death and serious injuries involving all roadway users, including pedestrians, bicyclists, public transportation users, personal conveyance, micromobility users, motorists and commercial vehicle operators.

On Sept. 7, 2022, City Council approved the Street Transportation Department's (Streets) Vision Zero Road Safety Action Plan (RSAP). The RSAP is one of the key SS4A grant requirements to apply for funding designated under the implementation grants category. Last year, the department was successful in obtaining \$460,000 in SS4A funding in supplemental action funds to enhance and build upon the existing planning efforts approved through the RSAP. If awarded this year, the funding will be used for implementation of projects and strategies in the RSAP.

Streets evaluated prior year successful implementation awards and consequently changed the focus of this second round submittal to be more in line with the first round of awarded implementation grants. The focus on this second round submittal will be a more comprehensive corridor approach utilizing key strategies identified in the RSAP

to target safety improvements along one of the City's busiest and high-injury-prone corridors: Indian School Road, west of 39th Avenue. Staff is evaluating all of the grant criteria to ensure a competitive final grant submittal is achieved with a focus on these grant priorities as defined in the SS4A NOFO:

- Promoting safety to prevent death and serious injuries on public roadways.
- Employing low cost, high impact strategies that can improve safety over a wide geographic area.
- Ensuring equitable investment in the safety needs of under-served communities, which includes under-served urban communities.
- Incorporating evidence-based projects and strategies and adopting innovative technologies.
- Demonstrating engagement with a variety of public and private stakeholders.
- Aligning with USDOT's mission and strategic goals such as safety, climate change and sustainability, equity and Justice 40, workforce development, job quality and wealth creation.

The City intends to submit an implementation grant application with a total project cost up to \$31.25 million, which includes final design, environmental, and construction costs related to the implementation of projects that will deliver countermeasure solutions to improve roadway safety along Indian School Road corridor west of 39th Avenue.

The SS4A grant submittal deadline is July 10, 2023.

Financial Impact

The estimated total cost for the project is approximately \$31.25 million. The maximum federal participation rate is 80 percent with a minimum local match of 20 percent of the total project cost. If awarded, the federal match would not exceed \$25 million, and the City's costs would be approximately \$6.25 million for the local match.

Funding for the local match is available in the Streets' Capital Improvement Program budget. Potential grant funding received is available through the Federal Bipartisan Infrastructure Law from USDOT through the FFY 2023 SS4A grant opportunity.

Responsible Department

This item is submitted by Deputy City Manager Alan Stephenson and the Street Transportation Department.



Amend City Code - Section 36-158, Schedule I, Local Speed Limits at 25 Locations

This report provides the Transportation, Infrastructure, and Planning Subcommittee with information about proposed record keeping and local speed limit changes at 25 locations and requests the Subcommittee recommend City Council adoption of recommended changes to Phoenix City Code, section 36-158, Schedule I, Local Speed Limits.

THIS ITEM IS FOR CONSENT ACTION.

Summary

Speed limits are established under Arizona Revised Statutes, section 28-703, which requires an "engineering study and traffic investigation." The Phoenix City Code and Charter require that all local speed limits on City streets be approved by City Council in the form of an amendment to Phoenix City Code, as shown in **Attachment A**.

The Street Transportation Department (Streets) conducted a comprehensive review of the speed limit ordinance and is recommending record keeping and local speed limit changes at 25 locations, as summarized in **Attachment B**. Thirteen changes are for record keeping purposes, where speed limits posted on City streets do not match the speed limits included in the current ordinance or where street segments included in the current ordinance are not maintained by the City. The twelve other changes are related to road and traffic conditions. As with all recommended speed limit changes, they are based on traffic investigations conducted with the engineering judgment of Streets staff.

Responsible Department

This item is submitted by Deputy City Manager Alan Stephenson and the Street Transportation Department.

ATTACHMENT A

ARTICLE XII. PENALTY AND SCHEDULES

36-158 Schedule I—Local speed limits.

It is hereby determined upon the basis of an engineering and traffic investigation that the speed limit permitted by state law on the following streets or intersections is greater or less than is reasonable under existing conditions, and it is hereby declared that the maximum speed limits shall be as hereinafter set forth on those streets, parts of streets or intersections herein designated at the times specified when signs are erected giving notice thereof.

The City Traffic Engineer may declare a maximum speed limit that is determined pursuant to this section to be effective at all times or at such times as indicated on the speed limit signs. The City Traffic Engineer may establish lower speed limits for different times of day, different types of vehicles, varying weather conditions, special events, work zones for construction, maintenance or other activity in the roadway and other factors bearing on safe speeds. The lower limits are effective when posted on appropriate fixed, variable or portable signs.

Table A. Prima Facie Speed Limit 30 Miles Per Hour at All Times.	
Acoma Drive	51st Avenue to 43rd Avenue
Acoma Drive	Black Canyon Freeway to 23rd Avenue
Acoma Drive	36th Street to 40th Street
Acoma Drive	Tatum Boulevard to 64th Street
Arroyo Norte Drive	Northbound I-17 Frontage Road to 3900 West
Beardsley Road	32nd Street to 34th Street
Butler Drive	39th Avenue to 27th Avenue
Butler Drive	Black Canyon Freeway to 19th Avenue
Campbell Avenue	71st Avenue to 51st Avenue
Campbell Avenue	113th Avenue to 107th Avenue
Campbell Avenue	35th Avenue to 15th Avenue

Table A. Prima Facie Speed Limit 30 Miles Per Hour at All Times.	
Campbell Avenue	12th Street to 16th Street
Campbell Avenue	20th Street to 44th Street
Canterbury Drive	Thunderbird Road to Tam-O-Shanter Drive
Cashman Drive	Pinnacle Peak Road to 44th Street
Central Avenue	Lincoln Street to Madison Street
Central Avenue	Grovers Avenue to Union Hills Drive
Chauncey Lane	68th Street to Scottsdale Road
Cholla Street	24th Street to 56th Street
Clarendon Avenue	55th Avenue to Maryvale Parkway
Colter Street	16th Street to SR-51
Copperhead Trail	North Valley Parkway to Gambit Trail
Copperhead Trail	West of 14th Lane Traffic Circle to Gambit Trail
Coral Gables Drive	Thunderbird Road to 7th Street
DEEM HILLS PARKWAY	51ST AVENUE TO STETSON VALLEY PARKWAY
Deer Valley Drive	1,200 feet west of 35th Avenue to 35th Avenue
Desert Willow Parkway	East Dixileta Drive to Dynamite Boulevard
Desert Willow Parkway West	30200 North Cave Creek Road to 31000 North Cave Creek Road
Dove Valley Road	52nd Place to 56th Street
Dunlap Avenue	7th Street to 12th Street
Durango Street	67th Avenue to 63rd Avenue

Table A. Prima Facie Speed Limit 30 Miles Per Hour at All Times.	
Elwood Street	40th Street to 48th Street
Encanto Boulevard	93rd Avenue to 91st Avenue
Encanto Boulevard	75th Avenue to 73rd Avenue
Encanto Boulevard	71st Avenue to 51st Avenue
Encanto Boulevard	49th Avenue to 31st Avenue
Encanto Boulevard	Grand Avenue to 19th Avenue
Freemont Road	Rough Rider Road to Cashman Drive
Galvin Parkway	100 Feet +/- North of East Papago Park to Traffic Circle at Botanical Garden Entrance
Grand Ave	7th Avenue to 15th Avenue
Greenway Road	20th Street to Cave Creek Road
Grovers Avenue	51st Avenue to 27th Avenue
Grovers Avenue	Central Avenue to Cave Creek Road
Hatcher Road	Central Avenue to 12th Street
Highland Avenue	Campbell Avenue to 107th Avenue
Highland Avenue	16th Street to 24th Street
Illini Street	30th Street to Riverpoint Parkway
INSPIRATION MOUNTAIN PARKWAY	STETSON VALLEY PARKWAY TO STETSON VALLEY PARKWAY
Jefferson Street	27th Avenue to 23rd Avenue
Jefferson Street	7th Avenue to 4th Avenue

Table A. Prima Facie Speed Limit 30 Miles Per Hour at All Times.	
Jesse Owens Parkway	Central Avenue to 7th Street
Jones Avenue	103rd Avenue to 99th Avenue
Kelton Lane	29th Avenue to 28th Avenue
Knox Road	Warpaint Drive to 36th Street
Lakewood Parkway West	3300 East to 3600 East to 17000 South to 15800 South
Lakewood Parkway East	3600 East to 3800 East to 17000 South to 15800 South
Lindner Drive (West Section)	45th Avenue to Augusta North
Lindner Drive (East Section)	45th Avenue to Grovers Avenue
Lockwood Drive	Freemont Road to Cashman Drive
Marriott Drive	Pathfinder Drive to Deer Valley Drive
Maryland Avenue	43rd Avenue to Black Canyon Freeway
MARYLAND AVENUE	CENTRAL AVENUE TO 16TH STREET
Maryvale Parkway	51st Avenue to Indian School Road
Missouri Avenue	43rd Avenue to 27th Avenue
Missouri Avenue	Black Canyon Freeway to 19th Avenue
Mohave Street	7th Avenue to 7th Street
Morningside Drive	Black Canyon Freeway to 21st Avenue
Morten Avenue	16th Street to 1900 East
Mountain View Road	23rd Avenue to 15th Avenue
Mountain View Road	12th Street to 17th Street

Table A. Prima Facie Speed Limit 30 Miles Per Hour at All Times.	
Mountain View Road	32nd Street to 36th Street
Northern Avenue	26th Street to 32nd Street
North Valley Parkway	Carefree Highway to 33rd Lane
Oak Street	16th Street to 24th Street
Oak Street	32nd Street to 44th Street
Oak Street	48th Street to 52nd Street
Oak Street (Eastbound)	56th Street to 64th Street
Olympic Drive	Central Avenue to Jesse Owens Parkway
Orangewood Avenue	43rd Avenue to 19th Avenue
Osborn Road	83rd Avenue to 75th Avenue
Osborn Road	73rd Avenue to Grand Avenue
Osborn Road	Black Canyon Freeway to 19th Avenue
Osborn Road	40th Street to 56th Street
Paradise Lane	7th Street to 16th Street
Paradise Lane	Tatum Boulevard to 56th Street
Paradise Lane	47th Avenue to 43rd Avenue
Pathfinder Drive	44th Street to Marriott Drive
Piedmont Road	48th Street to 51st Street
Pinnacle Vista Drive	Pyramid Peak Parkway to Inspiration Mountain Parkway
Pinnacle Vista Drive	52nd Street to 56th Street

Table A. Prima Facie Speed Limit 30 Miles Per Hour at All Times.	
POINTE GOLF CLUB DRIVE	THUNDERBIRD ROAD TO SHARON DRIVE
Quail Track Drive	North Valley Parkway to Copperhead Trail
Ranger Drive	Tatum Boulevard to 55th Street
Riverpoint Parkway	Wood Street to Illini Street
Roeser Road	7th Avenue to Central Avenue
Roeser Road	40th Street to 48th Street
Roosevelt Street	51st Avenue to 43rd Avenue
ROOSEVELT STREET	57TH AVENUE TO 43RD AVENUE
Roosevelt Street	39th Avenue to 35th Avenue
Roosevelt Street	33rd Avenue to 27th Avenue
Roosevelt Street	19th Avenue to 7th Avenue
Roosevelt Street	Central Avenue to 16th Street
Rose Garden Lane	29th Avenue to 19th Avenue
Rough Rider Road	Black Mountain Boulevard to 40th Street
Sells Drive	79th Drive to 71st Drive
Sky Crossing Way	Deer Valley Road to Black Mountain Boulevard
SR-51 (East Access Road)	500 Feet North of Camelback Road to Colter Street
Stanford Drive	40th Street to 44th Street
Stetson Hills Loop	43rd Avenue to 39th Drive
Sweetwater Avenue	51st Avenue to Black Canyon Freeway

Table A. Prima Facie Speed Limit 30 Miles Per Hour at All Times.	
Sweetwater Avenue	32nd Street to 42nd Street
Sweetwater Avenue	Paradise Valley Parkway East to Scottsdale Road
Thunderbird Road	28th Street to 32nd Street
Trailblazer Drive	44th Street to Tatum Boulevard
University Drive	24th Street to Magnolia Street (2700 East)
Utopia Road	23rd Avenue to 19th Avenue
Van Buren Street	7th Street to 16th Street
Via Del Deserto	33rd Lane to Via Puzzola
Via Puzzola	Carefree Highway to Cloud Road
Via Tramonto	Carefree Highway to Via Vista
Via Vista	27th Avenue to Via Tramonto
Vineyard Road	47th Avenue to 43rd Avenue
Virginia Avenue	35th Avenue to 27th Avenue
Virginia Avenue	Central Avenue to 7th Street
Warpaint Drive	Knox Road to Coconino Street
Washington Street	7th Avenue to 4th Avenue
Wier Avenue	39th Avenue to 35th Avenue
Winchcomb Drive	26th Avenue to Acoma Drive (2300 West)
Wood Street	Riverpoint Parkway to University Drive
1st Avenue	Grant Street to Roosevelt Street

Table A. Prima Facie Speed Limit 30 Miles Per Hour at All Times.	
3rd Avenue	Thomas Road to Osborn Road
3rd Street	Monroe Street to Indian School Road
4th Street	5th Street crossover to Roosevelt Street
5th Street	Van Buren Street to 5th Street Crossover
5th Street Crossover	5th Street to Fillmore Street
7th Avenue	Jackson Street to Van Buren Street
7th Avenue	Coral Gables Drive to Greenway Parkway
7th Street	Jefferson Street to Van Buren Street
11th Avenue	Greenway Parkway to Bell Road
11th Street	Washington Street to Moreland Street
12th Street	Vineyard Road to Southern Avenue
12th Street	Moreland Street to Thomas Road
12th Street	Osborn Road to Indian School Road
12th Street	Bell Road to Agua Fria Freeway
15th Avenue	Bethany Home Road to Northern Avenue
15th Avenue	Hatcher Road to Shangri-La Road
15th Avenue	Bell Road to Grovers Avenue
15th Avenue	Union Hills Drive to Utopia Road
16th Street	Grovers Avenue to Beardsley Road
18th Street	Camelback Road to 500 Feet North of Camelback Road

Table A. Prima Facie Speed Limit 30 Miles Per Hour at All Times.	
19TH AVENUE	OLNEY AVENUE TO DOBBINS ROAD
20th Street	Dobbins Road to Baseline Road
20th Street	Roeser Road to Broadway Road
20th Street	Jefferson Street to Roosevelt Street
20th Street	McDowell Road to Cambridge Avenue
20th Street	Greenfield Road to Highland Avenue
20th Street	Missouri Avenue to Bethany Home Road
21st Avenue	Bell Road to Union Hills Drive
23rd Avenue	Indian School Road to Bethany Home Road
23RD AVENUE	INDIAN SCHOOL ROAD TO GLENDALE AVENUE
23rd Avenue	Orangewood Avenue to Dunlap Avenue
23rd Avenue	Acoma Drive to Greenway Road
23rd Avenue	Union Hills Drive to Utopia Road
24th Street	Shea Boulevard to Sweetwater Avenue
26th Avenue	Thunderbird Road to Acoma Drive
26th Street	SR-51 to Shea Boulevard
27th Avenue	Rose Garden Lane to Deer Valley Drive
27th Drive	Carefree Highway to Via Vista
28th Street	Cholla Street to Thunderbird Road
28th Street	Oak Street to Camelback Road

Table A. Prima Facie Speed Limit 30 Miles Per Hour at All Times.	
28th Avenue	29th Avenue to Kelton Lane
29th Avenue	Union Hills Drive to Kristal Way
29th Avenue	Beardsley Road to Rose Garden Lane
31st Avenue	Van Buren Street to Encanto Boulevard
31st Avenue	Thomas Road to Grand Avenue
31st Avenue	Indian School Road to Camelback Road
31st Avenue	Missouri Avenue to Orangewood Avenue
31st Avenue	Northern Avenue to Dunlap Avenue
31st Avenue	Cheryl Drive to Thunderbird Road
31st Avenue	Bell Road to Kristal Way
31st Avenue	Yorkshire Drive to Beardsley Road
32nd Street	750 Feet South of Beautiful Lane to Baseline Road
32nd Street	Deer Valley Road to Sky Crossing Way
32nd Street	Puget Avenue to Mountain View Road
33rd Lane	North Valley Parkway to Via Del Deserto
36th Street	Ranch Circle North to Suncrest Court
36th Street	Roeser Road to Broadway Road
36th Street	McDowell Road to Camelback Road
36th Street	Mountain View Road to Shea Boulevard
36th Street	Cactus Road to Greenway Road

Table A. Prima Facie Speed Limit 30 Miles Per Hour at All Times.	
39th Avenue	Van Buren Street to Osborn Road
39th Avenue	Missouri Avenue to Camino Acequia
39th Avenue	Peoria Avenue to Cactus Road
39th Avenue	Bell Road to Yorkshire Drive
40th Street	University Drive to 0.25 Miles North of University Drive
40th Street	Mountain View Road to Shea Boulevard
44th Street	Frye Road to Chandler Boulevard
44th Street	Ray Road to Warner-Elliott Loop
44th Street	Paradise Village Parkway North to Bell Road
44th Street	Deer Valley Drive to Cashman Drive
45th Avenue	Bell Road to Union Hills Drive
46th Street	Paradise Village Parkway North to Thunderbird Road
47th Avenue	Baseline Road to Vineyard Road
47th Avenue	Thomas Road to Camelback Road
47th Avenue	Thunderbird Road to Greenway Road
47th Avenue	Acoma Drive to Bell Road
48th Street	Pecos Park Entrance to Frye Road
48th Street	Elwood Street to University Drive
48th Street	Van Buren Street to McDowell Road
48th Street	Cholla Street to Paradise Village Parkway South

Table A. Prima Facie Speed Limit 30 Miles Per Hour at All Times.	
50th Street	Frye Road to Chandler Boulevard
51st Street	Elliot Road to Piedmont Road
52nd Place	Rancho Paloma Drive to Dove Valley Road
52nd Street	Thomas Road to Osborn Road
52nd Street	Cholla Street to Cactus Road
52nd Street	Thunderbird Road to Bell Road
52nd Street	Jomax Road to Pinnacle Vista Drive
53rd Avenue	Maryvale Parkway to Indian School Road
55th Avenue	McDowell Road to Camelback Road
55th Avenue	Pinnacle Peak Road to Alameda Road
56th Street	Mountain View Road to Shea Boulevard
59th Avenue	South Mountain Avenue to Baseline Road
60th Street	Desert Cove Avenue to Cholla Street Alignment
60th Street	Cactus Road to Bell Road
63rd Avenue	Lower Buckeye Road to Pima Street
63rd Avenue	Thomas Road to Osborn Road
63rd Avenue	Indian School Road to Camelback Road
70th Street	Princess Drive to Mayo Boulevard
71st Avenue	Van Buren Street to Roosevelt Street
71st Avenue	McDowell Road to Indian School Road

Table A. Prima Facie Speed Limit 30 Miles Per Hour at All Times.	
71st Avenue	Campbell Avenue to Camelback Road
71st Drive	Indian School Road to Sells Drive
79th Drive	Osborn Road to Sells Drive
80th Lane	Thomas Road to Osborn Road
93rd Avenue	Encanto Boulevard to Thomas Road
103rd Avenue	Broadway Road to Country Place Boulevard
103rd Avenue	Indian School Road to Campbell Avenue
111th Avenue	Campbell Avenue to Camelback Road

Table A1. Prima Facie Speed Limit 30 Miles Per Hour from 7:00 a.m. to 4:00 p.m. on School Days.

Cactus road	Wb 350 ft +/- east of 37th Avenue and eb 350 ft +/- west of 37th Avenue
Ray Road	400 Feet North of Thunderhill Drive to 100 Feet South of Mountain Sky Avenue
19th Avenue	450 Feet North of Orangewood Avenue to 450 Feet South of Orangewood Avenue

Table B. Prima Facie Speed Limit 35 Miles Per Hour at All Times.

Adams Street	27th Avenue to Washington Street
Anthem Way	46th Drive to Black Canyon Freeway
Ball Park Boulevard	Camelback Road to Grand Canal
Beardsley Road	20th Street to Cave Creek Road
Bethany Home Road	16th Street to 18th Street

Table B. Prima Facie Speed Limit 35 Miles Per Hour at All Times.

Black Mountain Boulevard	Sr101 To Mayo Boulevard
Black Mountain Boulevard	Rancho Paloma Drive to Carefree Highway
Buckeye Road	31st Avenue to 27th Street
Camelback Road	27th Avenue to 28th Street
Central Avenue	Briarwood Terrace to Chandler Boulevard
Central Avenue	Mineral Road to Thunderbird Trail
Central Avenue (Southbound)	Thunderbird Trail to Dobbins Road
Central Avenue	Vineyard Road to Pioneer Street
Central Avenue	Watkins Street to Lincoln Street
Central Avenue	Roosevelt Street to Mountain View Road
Central Avenue	Happy Valley Road to 2,050 Feet +/- North of Happy Valley Road
Chandler Boulevard	Shaughnessey Road To 19th Avenue
Chandler Boulevard (Westbound)	19th Avenue to 15th Avenue
Chandler Boulevard	Pecos Road to Shaughnessey Road
Cheryl Drive	35th Avenue to Metro Parkway West
Circle Mountain Road	New River Road to Barko Lane
Cotton Center Boulevard	40th Street to 48th Street
Desert Foothills Parkway	Chandler Boulevard to 5th Avenue
Desert Willow Parkway East	31000 North Cave Creek Road (East Side) to 5000 East Dixileta Drive

Table B. Prima Facie Speed Limit 35 Miles Per Hour at All Times.

Dobbins Road	Central Avenue to 19th Street
Dove Valley Road	North Valley Parkway to 16th Avenue
Dunlap Avenue	7th Avenue to 7th Street
Encanto Boulevard	83rd Avenue to 75th Avenue
Frye Road	3rd Street to Desert Foothills Parkway
Galvin Parkway	North of Traffic Circle at Botanical Garden Entry to McDowell Road
Grand Avenue	18th Avenue to 15th Avenue
Grant Street	Black Canyon Freeway to Lincoln Street
Grant Street	16th Street to Sky Harbor Circle
Greenway Road	Cave Creek Road to Greenway Parkway
Guadalupe Road	48th Street to Interstate 10
Hatcher Road	19th Avenue to Central Avenue
Holmes Boulevard	Bell Road to Grovers Avenue
Indian School Road	27th Avenue to 20th Street
Indian School Road	45th Street to 48th Street
Jefferson Street	23rd Avenue to 7th Avenue
Jefferson Street	7th Street to Washington Street
Jefferson Street	7th Street to 265 Feet +/- East of 26th Street (except frontage road which is 25 mph)
Jomax Road	Cave Creek Road to Tatum Boulevard
Jomax Road	Tatum Boulevard to 52nd Street

Table B. Prima Facie Speed Limit 35 Miles Per Hour at All Times.

Knox Road	36th Street to 48th Street
Lafayette Boulevard	44th Street to 64th Street
Liberty Lane	17th Avenue to Central Avenue
Liberty Lane	Desert Foothills Parkway to 13th Way
Lincoln Street	Grant Street to 7th Street
Lone Mountain Road	40th Street to Cave Creek Road
Lower Buckeye Road	300 Feet West to 300 Feet East of 99th Avenue
Lower Buckeye Road	22nd Avenue to 19th Avenue
Maryland Avenue	19th Avenue to 16th Street
MARYLAND AVENUE	19TH AVENUE TO CENTRAL AVENUE
Maryvale Parkway	Indian School Road to 51st Avenue
MAYO BOULEVARD	BLACK MOUNTAIN BOULEVARD TO 40TH STREET
McDowell Road	27th Avenue to 32nd Street
Metro Parkway	Entire Street Surrounding Metro Center
Missouri Avenue	19th Avenue to 24th Street
Mohave Street	7th Street to Sky Harbor Circle
Mohave Street	22nd Street to 24th Street
Mountain View Road	Central Avenue to 12th Street
Norterra Parkway	Happy Valley Road to Jomax Road
Oak Street	24th Street to 32nd Street

Table B. Prima Facie Speed Limit 35 Miles Per Hour at All Times.

Oak Street	52nd Street to 56th Street
Osborn Road	19th Avenue to 36th Street
Paloma Parkway	Bronco Butte Trail to Dove Valley Road
Paradise Village Parkway	Entire Street Surrounding Paradise Village
Peoria Avenue	19th Avenue to 7th Avenue
Pinnacle Peak Road	19th Avenue to 7th Street
Pocono Way	800 feet north of Hackamore Drive to 33rd Avenue
Pointe Golf Club Drive	Thunderbird Road to Sharon Drive
Princess Drive	68th Street to Scottsdale Road
Pyramid Peak Parkway (Northbound)	1,900 Feet +/- north of Brookhart Way to City Limits
Ranch Circle North	Ray Road (3600 East) to Ray Road (4300 East)
Ranch Circle South	Ray Road to Mountain Parkway
Rancho Paloma Drive	Black Mountain Boulevard to 56th Street
Roeser Road	Central Avenue to 40th Street
Roosevelt Street	16th Street to 32nd Street
Rose Garden Lane	19th Avenue to 7th Avenue
Shea Boulevard	24th Street to 32nd Street
Sky Harbor Circle	22nd Street to Grant Street, Mohave Street to Grant Street, and Mohave Street to 22nd Street
Southern Avenue	7th Avenue to 7th Street

Table B. Prima Facie Speed Limit 35 Miles Per Hour at All Times.

STETSON VALLEY PARKWAY	DEEM HILLS PARKWAY TO STRAIGHT ARROW LANE
Sweetwater Avenue	Cave Creek Road to 32nd Street
Tatum Boulevard	40th Street to Cave Creek Road
Thistle Landing Drive	48th Street to 50th Street
Thomas Road	27th Avenue to 32nd Street
Thunderbird Road	32nd Street to 38th Place
Tombstone Trail	Norterra Parkway to 21st Avenue
University Drive	16th Street to 24th Street
Utopia Road	Black Canyon Freeway to 23rd Avenue
Utopia Road	Cave Creek Road to 32nd Street
Van Buren Street	35th Avenue to 7th Avenue
Van Buren Street	16th Street to 44th Street
Washington Street	Adams Street to 7th Avenue
Washington Street	7th Street to 24th Street (except frontage road which is 25 mph)
Williams Drive	Black Canyon Freeway to 19th Avenue
Yorkshire Drive	43rd Avenue to Black Canyon Freeway
1st Avenue Crossover	Grant Street to Hadley Street
3rd Avenue	Osborn Road to Indian School Road
3rd Street	Frye Road to Chandler Boulevard
5th Avenue	Desert Foothills Parkway to Chandler Boulevard

Table B. Prima Facie Speed Limit 35 Miles Per Hour at All Times.

5th Street Crossover	Fillmore Street to 4th Street
7th Avenue	Dobbins Road to Baseline Road
7th Avenue	Magnolia Street to Jackson Street
7th Avenue	Van Buren Street to Missouri Avenue
7th Avenue	Dunlap Avenue to Hatcher Road
7th Avenue	Greenway Parkway to Bell Road
7th Street	Mineral Road to Baseline Road
7th Street	Lincoln Street to Jefferson Street
7th Street	Van Buren Street to Missouri Avenue
7th Street	Butler Drive to Cinnabar Avenue
12th Street	Indian School Road to Mountain View Road
15th Avenue	Southern Avenue to Broadway Road
15th Avenue	0.25 miles south of Magnolia Street to Bethany Home Road
16th Street	Dobbins Road to Baseline Road
16th Street	Maricopa Freeway to Bethany Home Road
16th Street	Bell Road to Grovers Avenue
17th Avenue	Pecos Road to Chandler Boulevard
17th Avenue	Buckeye Road to Grant Street
19th Avenue	Buckeye Road to the Grand Canal
19th Avenue	Glendale Avenue to Northern Avenue (Except where noted in subsection A.1 of this section)

Table B. Prima Facie Speed Limit 35 Miles Per Hour at All Times.

20th Street	Highland Avenue to Missouri Avenue
21st Avenue	Jomax Road to Tombstone Trail
23rd Avenue	Bethany Home Road to Glendale Avenue
23rd Avenue	Mountain View Road to Cactus Road
23rd Avenue	Utopia Road to Deer Valley Drive
23rd Avenue	Pinnacle Peak Road to Happy Valley Road
24th Street	South Mountain Avenue to Baseline Road
24th Street	Buckeye Road to Indian School Road
25th Avenue	Dunlap Avenue to Peoria Avenue
27th Avenue	South Mountain Avenue to Baseline Road
27th Avenue	Lower Buckeye Road to Van Buren Street
27th Avenue	Northern Avenue to Dunlap Avenue
27th Avenue	Grovers Avenue to Union Hills Drive
27th Avenue	Yorkshire Drive to Rose Garden Lane
27th Drive	North Valley Parkway to Carefree Highway
28th Drive	Peoria Avenue to Cactus Road
29th Avenue	Dunlap Avenue to Metro Parkway
29th Avenue	Greenway Road to Bell Road
32nd Street	Air Lane to Van Buren Street
32nd Street	Chandler Boulevard to Pecos Road

Table B. Prima Facie Speed Limit 35 Miles Per Hour at All Times.

33rd Avenue	Pocono Way to Pinnacle Vista Drive
35th Avenue	South Mountain Avenue to Baseline Road
35th Avenue	Van Buren Street to Encanto Boulevard
35th Avenue	Happy Valley Road to 800 feet north of Hackamore Drive
36th Street	Shea Boulevard to Cactus Road
39th Drive	Pinnacle Peak Road to Happy Valley Road
40th Street	0.39 miles South of Air Lane to Washington Street
40th Street	McDowell Road to Missouri Avenue
40th Street (Southbound)	Shea Boulevard to Mercer Lane
40th Street	Potter Drive to Deer Valley Drive
40th Street	Tatum Boulevard to Lone Mountain Road
43rd Avenue	Olney Avenue to Dobbins Road
43rd Avenue	Elwood Street Alignment to Lower Buckeye Road
43rd Avenue	Anthem Way to 1,930 Feet North of Anthem Way
44th Street	Campbell Avenue to Calle Feliz
44th Place	Cotton Center Boulevard to Broadway Road
48th Street	Frye Road to Chandler Boulevard
48th Street	Washington Street to Van Buren Street
48th Street	Piedmont Road to Guadalupe Road
50th Street	Chandler Boulevard to Ray Road

Table B. Prima Facie Speed Limit 35 Miles Per Hour at All Times.

51st Street	500 Feet South of Elliot Road to Warner-Elliot Loop
52nd Street	McDowell Road to Thomas Road
52nd Street	Cactus Road to Thunderbird Road
55th Avenue	Alameda Road to Happy Valley Road
56th Street	South City Limit to Van Buren Street
56th Street	Oak Street to Camelback Road
56th Street	Bell Road to Central Arizona Project Canal
56th Street	Lone Mountain Road to Rancho Paloma Drive
64th Street	Oak Street to McDowell Road (Southbound Only)
64th Street	255 Feet North of Hillcrest Boulevard to Chaparral Road
68th Street	Princess Drive to Mayo Boulevard
71st Avenue	Baseline Road to Vineyard Road
79TH AVENUE	MCDOWELL ROAD TO THOMAS ROAD
107th Avenue	Camelback Road to Missouri Avenue

Table B1. Prima Facie Speed Limit 35 Miles Per Hour from 7:00 a.m. to 4:00 p.m. on School Days.

Dunlap Avenue	For Westbound, 650 Feet +/- West of 29th Avenue to 625 +/- West of 35th Avenue
Dunlap Avenue	For Eastbound, 545 Feet +/- West of 35th Avenue to 30th Avenue

Table B2. Prima Facie Speed Limit 35 Miles Per Hour from 7:00 a.m. to 5:00 p.m. on School Days.

Greenway Parkway	400 Feet West of 7th Avenue to 250 Feet East of 5th Avenue
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Table C. Prima Facie Speed Limit 40 Miles Per Hour at All Times.

Air Lane	24th Street to 32nd Street
Baseline Road	43rd Avenue to 35th Avenue
Baseline Road	7th Avenue to 7th Street
Beardsley Road (Eastbound Frontage)	37th Avenue to 27th Avenue
Beardsley Road	Cave Creek Road to 32nd Street
Bell Road	19th Avenue to 12th Street
Bell Road	0.25 miles West of Cave Creek Road to 1,500 Feet East of 40th Street
Bethany Home Road	43rd Avenue to 16th Street
Black Mountain Boulevard	Mayo Boulevard to Pinnacle Peak Road
BROADWAY ROAD	51ST AVENUE TO 32ND STREET
Broadway Road	19th Avenue to 32nd Street
Buckeye Road	39th Avenue to 31st Avenue
Cactus Road	39th Avenue to 350 ft West of 37th Avenue
Cactus Road	350 ft East of 37th Avenue to 19th Avenue
Cactus Road	Cave Creek Road to 60th Street
Camelback Road	43rd Avenue to 27th Avenue
Camelback Road	28th Street to 64th Street

Table C. Prima Facie Speed Limit 40 Miles Per Hour at All Times.

Carefree Highway	700 feet West of North Valley Parkway to Via Puzzola
Cave Creek Road	Dunlap Avenue to Peoria Avenue
Cave Creek Road	Marco Polo Road to Rose Garden Lane
Central Avenue (Northbound)	Thunderbird Trail to Dobbins Road
Central Avenue	Dobbins Road to Vineyard Road
Central Avenue	Pioneer Street to Watkins Street
Chandler Boulevard	Marketplace Way to 34th Street
Deer Valley Drive	600 Feet West of 27th Avenue to 0.25 Miles East of 19th Avenue
Deer Valley Drive	600 Feet West of 16th Street to 56th Street
Desert Foothills Parkway	Pecos Road to Chandler Boulevard
Desert Peak Parkway	Lieber Place to Cave Creek Road
Dobbins Road	From West City Limit to 1,320 Feet +/- East
Dobbins Road	23rd Avenue to Central Avenue
Dunlap Avenue	43rd Avenue to 7th Avenue (Except where noted in Table B1 of this section)
Durango Street	35th Avenue to Black Canyon Freeway
Elliot Road	2,085 Feet +/- West of 59th Avenue to 51st Avenue
Elliot Road	46th Street to 51st Street
Elwood Street	7th Street to 16th Street
Galvin Parkway	Van Buren Street to 100 Feet +/- North of East Papago Park (Zoo Entrance)

Table C. Prima Facie Speed Limit 40 Miles Per Hour at All Times.

Gavilan Peak Parkway	800 Feet +/- West of 33rd Lane to Cloud Road
Glendale Avenue	43rd Avenue to 21st Street
Greenway Parkway	500 Feet West of 7th Avenue to 3rd Avenue (Except where noted in Table B2 of this section)
Greenway Parkway	Cave Creek Road to Greenway Road
Greenway Road	51st Avenue to 19th Avenue
Greenway Road	Greenway Parkway to 300 Feet East of 30th Street
Greenway Road	52nd Street to 500 Feet East of 60th Street
Indian School Road	67th Avenue to 27th Avenue
Indian School Road	20th Street to 45th Street
Indian School Road	48th Street to 60th Street
Jomax Road	Black Canyon Freeway to Norterra Parkway
Liberty Lane	13th Way to 24th Street
Lincoln Drive	21st Street to 800 Feet East of Ocotillo Road
Lower Buckeye Road	103rd Avenue to 300 Feet +/- West of 99th Avenue
LOWER BUCKEYE ROAD	107TH AVENUE TO 300 FEET +/- WEST OF 99TH AVENUE
Lower Buckeye Road	300 Feet +/- East of 99th Avenue to 95th Avenue
LOWER BUCKEYE ROAD	79TH AVENUE TO 67TH AVENUE
Lower Buckeye Road	27th Avenue to 22nd Avenue
Maricopa Freeway Frontage Roads	23rd Avenue to 16th Street

Table C. Prima Facie Speed Limit 40 Miles Per Hour at All Times.

Mayo Boulevard	Black Mountain Boulevard to 40th Street
McDowell Road	43rd Avenue to 27th Avenue
McDowell Road	32nd Street to 52nd Street
Mountain Parkway	Chandler Boulevard to Ray Road
Norterra Parkway	Jomax Road to North Valley Parkway
Northern Avenue	43rd Avenue to SR-51
North Valley Parkway	Jomax Road to 30th Avenue
North Valley Parkway	800 Feet +/- West of 33rd Lane to 33rd Lane
Peoria Avenue	43rd Avenue to 19th Avenue
Priest Drive	Salt River Drive to Van Buren Street
Pyramid Peak Parkway (Southbound)	67th Avenue to City Limits
Pyramid Peak Parkway (Northbound)	67th Avenue to 1,900 Feet +/- North of Brookhart Way
Ray Road	Chandler Boulevard to Interstate 10 (Except where noted in Table A1 of this section)
Rose Garden Lane	Cave Creek Road to 32nd Street
Shea Boulevard	32nd Street to 450 Feet East of 40th Street
Southern Avenue	39th Avenue to 31st Avenue
Southern Avenue	19th Avenue to 7th Avenue
Southern Avenue	7th Street to 24th Street
STETSON VALLEY PARKWAY	RANGE MULE DRIVE TO DEEM HILLS PARKWAY

Table C. Prima Facie Speed Limit 40 Miles Per Hour at All Times.

Thomas Road	800 Feet West of 59th Avenue to Grand Avenue
Thomas Road	32nd Street to 56th Street
Thunderbird Road	31st Avenue to Coral Gables Drive
Thunderbird Road	38th Place to Scottsdale Road
Union Hills Drive	27th Avenue to 19th Avenue
Union Hills Drive	7th Street to 20th Street
University Drive	Wood Street to 48th Street
Van Buren Street	67th Avenue to 200 Feet West of 63rd Avenue
Van Buren Street	39th Avenue to 35th Avenue
Van Buren Street	44th Street to 56th Street
Warner-Elliot Loop	4600 East Elliot Road to 578 Feet East of Wakial Loop
Washington Street	24th Street to 34th Street
7th Avenue	Baseline Road to Magnolia Street
7th Avenue	Missouri Avenue to Dunlap Avenue
7th Avenue	Bell Road to Union Hills Drive
7th Avenue	Rose Garden Lane to Deer Valley Drive
7th Street	Baseline Road to Lincoln Street
7th Street	Missouri Avenue to Butler Drive
7th Street	Cinnabar Avenue to 400 Feet North of Peoria Avenue
7TH STREET	CINNABAR AVENUE TO CLINTON STREET

Table C. Prima Facie Speed Limit 40 Miles Per Hour at All Times.

7th Street	Thunderbird Road to 600 Feet North of Bell Road
16th Street	Baseline Road to the Maricopa Freeway
16th Street	Bethany Home Road to Northern Avenue
19th Avenue	Southern Avenue to Buckeye Road
19th Avenue	Grand Canal to Glendale Avenue
19th Avenue	Northern Avenue to Evans Drive
24th Street	Pecos Road to Chandler Boulevard
24th Street	Baseline Road to Buckeye Road
24th Street	Indian School Road to Montebello Avenue
27th Avenue	Baseline Road to 500 Feet +/- North
27th Avenue	Van Buren Street to Northern Avenue
32nd Street	Baseline Road to Wood Street
32nd Street	Van Buren Street to the Arizona Canal
32nd Street	Mountain View Road to Bell Road
32nd Street	Beardsley Road to Rose Garden Lane
35th Avenue	Dobbins Road to South Mountain Avenue
35th Avenue	Baseline Road to Broadway Road
35th Avenue	Lower Buckeye Road to Van Buren Street
35th Avenue	Encanto Boulevard to Bell Road
35th Avenue	Union Hills Drive to Beardsley Road

Table C. Prima Facie Speed Limit 40 Miles Per Hour at All Times.

40th Street	Pecos Road to Chandler Boulevard
40th Street	800 Feet South of Roeser Road to University Drive
40th Street	Washington Street to McDowell Road
40th Street (Northbound)	Shea Boulevard to Mercer Lane
40th Street	Mercer Lane to Union Hills Drive
40th Street	Mayo Boulevard to Pinnacle Peak Road
43rd Avenue	Buckeye Road to Glendale Avenue
43rd Avenue	Thunderbird Road to Beardsley Road
43rd Avenue	Pinnacle Peak Road to Happy Valley Road
44th Street	Washington Street to Campbell Avenue
44th Street	Calle Feliz to McDonald Drive
48th Street	Chandler Boulevard to Piedmont Road
51ST AVENUE	ESTRELLA DRIVE TO OLNEY AVENUE
51st Avenue	Dobbins Road to Baseline Road
51st Avenue	0.5 Miles South of Lower Buckeye Road to Lower Buckeye Road
51st Avenue	Roosevelt Street to Camelback Road
51st Avenue	250 Feet South of Cactus Road to Union Hills Drive
51st Avenue	Pinnacle Peak Road to Happy Valley Road
51ST AVENUE	PINNACLE PEAK ROAD TO RANGE MULE DRIVE
52nd Street	Van Buren Street to McDowell Road

Table C. Prima Facie Speed Limit 40 Miles Per Hour at All Times.

55TH AVENUE	HAPPY VALLEY ROAD TO DEEM HILLS PARKWAY
56th Street	Shea Boulevard to Bell Road
56th Street	Central Arizona Project Canal to Pinnacle Peak Road
59th Avenue	Dobbins Road to South Mountain Avenue
59th Avenue	Roosevelt Street to Camelback Road
64th Street	Cactus Road to Bell Road
67th Avenue	400 Feet +/- South of Elwood Street to Camelback Road
67th Avenue	Happy Valley Road to Pyramid Peak Parkway
75th Avenue	Baseline Road to Vineyard Road
75th Avenue	0.25 Miles South of Thomas Road to Devonshire Avenue
83rd Avenue	Van Buren Street to Papago Freeway
91st Avenue	McDowell Road to Indian School Road
99th Avenue	0.5 Miles South of Lower Buckeye Road to Durango Street
107th Avenue	Indian School Road to Camelback Road

Table D. Prima Facie Speed Limit 45 Miles Per Hour at All Times.

Baseline Road	55th Avenue to 43rd Avenue
Baseline Road	35th Avenue to 7th Avenue
Baseline Road	7th Street to 48th Street
Beardsley Road (Frontage Roads)	27th Avenue to 20th Street
Beardsley Road Frontage Road	27th Avenue to 51st Avenue

Table D. Prima Facie Speed Limit 45 Miles Per Hour at All Times.

(Westbound)	
Beardsley Road Frontage Road (Eastbound)	51st Avenue to 37th Avenue
Bell Road	51st Avenue to 19th Avenue
Bell Road	12th Street to 0.25 Miles West of Cave Creek Road
Bell Road	1,500 Feet East of 40th Street to Scottsdale Road
Broadway Road	107th Avenue to 99th Avenue
BROADWAY ROAD	107TH AVENUE TO 91ST AVENUE
Broadway Road	27th Avenue to 19th Avenue
Broadway Road	32nd Street to 48th Street
Buckeye Road	71st Avenue to 39th Avenue
Cactus Road	51st Avenue to 39th Avenue
Camelback Road	113th Avenue to 99th Avenue
Carefree Highway	Via Puzzola to 0.5 Miles East of Via Tramonto / Paloma Parkway
Cave Creek Road	Peoria Avenue to Marco Polo Road
Cave Creek Road	Rose Garden Lane to Pinnacle Peak Road
Cave Creek Road (Southbound)	Pinnacle Peak To 660 Feet +/- North of Quiet Hollow Lane
Cave Creek Road	Peak View Road to Westland Road
Chandler Boulevard (Eastbound)	19th Avenue to 15th Avenue
Chandler Boulevard	15th Avenue to Marketplace Way

Table D. Prima Facie Speed Limit 45 Miles Per Hour at All Times.

Chandler Boulevard	34th Street to Interstate 10
Deer Valley Drive	35th Avenue to 600 Feet West of 27th Avenue
Deer Valley Drive	0.25 Miles East of 19th Avenue to 600 Feet West of 16th Street
Dixileta Drive	Tatum Boulevard to 52nd Street
Dobbins Road	1,320 Feet +/- East of City Limit to 200 Feet +/- West of 56th Glen
Dobbins Road	43rd Avenue to 0.25 Miles West of 35th Avenue
Dobbins Road	650 Feet West of 35th Avenue to 33rd Avenue
Dobbins Road	30th Lane to 23rd Avenue
Dove Valley Road	16th Avenue to Sonoran Desert Drive
Dynamite Boulevard	Cave Creek Road to 40th Street
Greenway Parkway	17th Drive to 500 Feet West of 7th Avenue
Greenway Parkway	3rd Avenue to Cave Creek Road
Greenway Road	19th Avenue to 17th Drive
Greenway Road	300 Feet East of 30th Street to 52nd Street
Greenway Road	500 Feet East of 60th Street to Scottsdale Road
Happy Valley Road	67th Avenue to 29th Avenue
Happy Valley Road	800 Feet West of 23rd Avenue to 7th Street
Indian School Road	99th Avenue to 67th Avenue
Jomax Road	Norterra Parkway to 19th Avenue

Table D. Prima Facie Speed Limit 45 Miles Per Hour at All Times.

Lincoln Drive	800 Feet East of Ocotillo Road to 32nd Street
Lone Mountain Road	56th Street to 63rd Street
Lower Buckeye Road	95th Avenue to 83rd Avenue
Lower Buckeye Road	79th Avenue to 75th Avenue
LOWER BUCKEYE ROAD	95TH AVENUE TO 79TH AVENUE
Lower Buckeye Road	67th Avenue to 27th Avenue
Mayo Boulevard	Tatum Boulevard to Scottsdale Road
McDowell Road	83rd Avenue to 43rd Avenue
McDowell Road	52nd Street to 1,350 Feet East of 52nd Street
McDowell Road	1,575 Feet West of Galvin Parkway to 64th Street
New River Road	1.0 Mile Southwest of Black Canyon Freeway to Black Canyon Freeway
Pinnacle Peak Road	55th Avenue to 19th Avenue
Pinnacle Peak Road	Cave Creek Road to Tatum Boulevard
Shea Boulevard	450 Feet East of 40th Street to 64th Street
Sonoran Desert Drive	Dove Valley Road to Cave Creek Road
Southern Avenue	59th Avenue to 51st Avenue
Southern Avenue	31st Avenue to 19th Avenue
Southern Avenue	24th Street to 48th Street
Tatum Boulevard	Mockingbird Lane to Pinnacle Peak Road
Tatum Boulevard	Prickly Pear Trail to Cave Creek Road

Table D. Prima Facie Speed Limit 45 Miles Per Hour at All Times.

Thomas Road	99th Avenue to 800 Feet West of 59th Avenue
Thunderbird Road	51st Avenue to 31st Avenue
Thunderbird Road	Coral Gables Drive to Cave Creek Road
Union Hills Drive	51st Avenue to 27th Avenue
Union Hills Drive	19th Avenue to 7th Street
Union Hills Drive	20th Street to Tatum Boulevard
Van Buren Street	83rd Avenue to 67th Avenue
Van Buren Street	200 Feet West of 63rd Avenue to 39th Avenue
Van Buren Street	56th Street to 508 Feet East of Project Drive
Washington Street	34th Street to 56th Street
7th Avenue	Union Hills Drive to Rose Garden Lane
7th Street	400 Feet North of Peoria Avenue to Thunderbird Road
7TH STREET	CLINTON STREET TO THUNDERBIRD ROAD
7th Street	600 Feet North of Bell Road to Happy Valley Road
19th Avenue	Dobbins Road to Southern Avenue
19th Avenue	Evans Drive to Jomax Road
24th Street	Baseline Road to Roeser Road
24th Street	Montebello Avenue to Lincoln Drive
27th Avenue	Southern Avenue to Broadway Road
29th Avenue	Pinnacle Peak Road to Happy Valley Road

Table D. Prima Facie Speed Limit 45 Miles Per Hour at All Times.

32nd Street	Arizona Canal to Lincoln Drive
32nd Street	Bell Road to Beardsley Road
35th Avenue	200 Feet South of Elliot Road to Dobbins Road
35th Avenue	Baseline Road to 500 Feet +/- North
35th Avenue	Broadway Road to Lower Buckeye Road
35th Avenue	Bell Road to Union Hills Drive
35th Avenue	Beardsley Road to Pinnacle Peak Road
40th Street	Baseline Road to 800 Feet South of Roeser Road
43rd Avenue	South Mountain Avenue to Southern Avenue
43rd Avenue	Lower Buckeye Road to Buckeye Road
43rd Avenue	Glendale Avenue to Thunderbird Road
48th Street	Baseline Road to Southern Avenue
51st Avenue	Baseline Road to Roosevelt Street
51st Avenue	Union Hills Drive to Beardsley Road
59th Avenue	Elliot Road to Dobbins Road
59TH AVENUE	BROADWAY ROAD TO DURANGO STREET ALIGNMENT
59th Avenue	Buckeye Road to Roosevelt Street
75th Avenue	Broadway Road to Van Buren Street
75th Avenue	Roosevelt Street 0.25 miles South of Thomas Road
75TH AVENUE	BROADWAY ROAD TO 0.25 MILES SOUTH OF THOMAS ROAD

Table D. Prima Facie Speed Limit 45 Miles Per Hour at All Times.

75th Avenue	Devonshire Avenue to Camelback Road
83rd Avenue	Broadway Road to Buckeye Road
83rd Avenue	Papago Freeway to Camelback Road
91st Avenue	Elwood Street to Buckeye Road
91st Avenue	Indian School Road to Camelback Road
99TH AVENUE	MOBILE LANE TO RIVERSIDE AVENUE
99th Avenue	Durango Street to Buckeye Road
99TH AVENUE	THOMAS ROAD TO CAMELBACK ROAD

Table E. Prima Facie Speed Limit 50 Miles Per Hour at All Times.

Broadway Road	99th Avenue to 91st Avenue
Buckeye Road	75th Avenue to 71st Avenue
Carefree Highway	0.5 Miles East of Via Tramonto / Paloma Parkway to 7th Avenue
Cave Creek Road (Northbound)	Pinnacle Peak Road to 660 Feet +/- North of Quiet Hollow Lane
Cave Creek Road	660 Feet +/- North of Quiet Hollow Lane to Peak View Road
El Mirage Road	0.25 Miles South of Camelback Road to 0.50 Miles North of Camelback Road
Lower Buckeye Road	107th Avenue to 103rd Avenue
Lower Buckeye Road	83rd Avenue to 79th Avenue
Lower Buckeye Road	75th Avenue to 71st Avenue
McDowell Road	1,350 Feet East of 52nd Street to 1,575 Feet West of Galvin Parkway

Table E. Prima Facie Speed Limit 50 Miles Per Hour at All Times.

New River Road	Cloud Road to 1.0 Mile Southwest of Black Canyon Freeway
Pinnacle Peak Road	Tatum Boulevard to Scottsdale Road
Tatum Boulevard	Pinnacle Peak Road to Prickly Pear Trail
51st Avenue	Estrella Drive to Olney Avenue
59th Avenue	Broadway Road to Durango Street Alignment
75th Avenue	Van Buren Street to Roosevelt Street
91st Avenue	1.56 Miles South of Broadway Road to 0.5 Miles South of Broadway Road
99th Avenue	Indian School Road to Camelback Road
99th Avenue	0.25 Miles North of Broadway Road to 0.5 Miles South of Lower Buckeye Road

Table F. Prima Facie Speed Limit 55 Miles Per Hour at All Times.

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G. Parks.

1. North Mountain Park.

a. Prima Facie Speed Limit 25 Miles Per Hour at All Times.

North Mountain Park Drive	Entire Length
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2. Papago Park.

a. Prima Facie Speed Limit 25 Miles Per Hour at All Times.

All roadways except Galvin Parkway.

3. Pecos Park.

- a. Prima Facie Speed Limit 25 Miles Per Hour at All Times.

All roadways within park boundary.

4. South Mountain Park.

- a. Prima Facie Speed Limit 25 Miles Per Hour at All Times.

All roadways within park boundary.

5. Piestewa Peak Park.

- a. Prima Facie Speed Limit 30 Miles Per Hour at All Times.

Piestewa Peak Road	Piestewa Peak Park Boundary to End of Road Within Piestewa Peak Park
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H. Sky Harbor Airport.

- 1. Prima Facie Speed Limit 15 Miles Per Hour at All Times.

Sky Harbor Boulevard (North and South Roadway)	Between Terminal Curb and Sky Harbor Boulevard Median on All Terminals 2 and 3 and on Level 1 of Terminal 4
Sky Harbor Boulevard (North and South Roadway)	All Ticketing/Check-in Lanes on Level 2 of Terminal 4

- 2. Prima Facie Speed Limit 20 Miles Per Hour at All Times.

Sky Harbor Boulevard (South Roadway)	4,400 Feet East of 24th Street to 6,300 Feet East of 24th Street
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- 3. Prima Facie Speed Limit 25 Miles Per Hour at All Times.

Sky Harbor Boulevard (North and South Roadway)	All Ramps, Entries and Exits for All Ticketing/Check-in and Baggage Claim Lanes at Terminals 3 and 4
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- 4. Prima Facie Speed Limit 30 Miles Per Hour at All Times.

Sky Harbor Boulevard (South Roadway)	3,000 Feet East of 24th Street to 4,400 Feet East of 24th Street
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- 5. Prima Facie Speed Limit 35 Miles Per Hour at All Times.

Sky Harbor Boulevard (North and South Roadway)	Between 24th Street and SR 143, Except as Provided in the Prior Subsections
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ATTACHMENT B

SUMMARY OF CHANGES IN CITY OF PHOENIX SPEED LIMITS AMENDING SECTION 36-158, SCHEDULE I - LOCAL SPEED LIMITS

Prima Facie Speed Limit **30 mph** at all times

<i>Street Changed</i>	<i>Segment Changed</i>	<i>Reason for Change</i>	<i>Council District</i>
Deem Hills Parkway	51st Avenue to Stetson Valley Parkway	Recommend reduction from 35 mph to 30 mph.	1
Inspiration Mountain Parkway	Stetson Valley Parkway to Stetson Valley Parkway	Record keeping. Update ordinance to show currently posted speed limit.	1
Maryland Avenue	Central Avenue to 16th Street	Recommend reduction from 35 mph to 30 mph.	6
Pointe Golf Club Drive	Thunderbird Road to Sharon Drive	Recommend reduction from 35 mph to 30 mph.	3
Roosevelt Street	57th Avenue to 51st Avenue	Recommend increase from 25 mph to 30 mph in conjunction with roadway improvements.	7
19th Avenue	Olney Avenue to Dobbins Road	Recommend reduction from 35 mph to 30 mph.	8
23rd Avenue	Bethany Home Road to Glendale Avenue	Recommend reduction from 35 mph to 30 mph.	5

Prima Facie Speed Limit **35 mph** at all times

<i>Street Changed</i>	<i>Segment Changed</i>	<i>Reason for Change</i>	<i>Council District</i>
Mayo Boulevard	Black Mountain Boulevard to 40th Street	Recommend reduction from 40 mph to 35 mph.	2
Stetson Valley Parkway	Deem Hills Parkway to Straight Arrow Lane	Record keeping. Update ordinance to show currently posted speed limit.	1

79th Avenue	McDowell Road to Encanto Boulevard	Recommend increase from 25 mph to 35 mph to coincide with development and existing posted speed limit north of segment.	7
79th Avenue	Encanto Boulevard to Thomas Road	Record keeping. Update ordinance to show currently posted speed limit.	7

Prima Facie Speed Limit 40 mph at all times

<i>Street Changed</i>	<i>Segment Changed</i>	<i>Reason for Change</i>	<i>Council District</i>
Broadway Road	51st Avenue to 19th Avenue	Record keeping. Update ordinance to show currently posted speed limit.	7, 8
Lower Buckeye Road	107th Avenue to 103rd Avenue	Record keeping. Update ordinance to show currently posted speed limit.	7
Lower Buckeye Road	79th Avenue to 67th Avenue	Record keeping. Update ordinance to show currently posted speed limit from 79th Avenue to 71st Avenue. 71st Avenue to 67th Avenue annexed from Maricopa County and added to ordinance.	7
Stetson Valley Parkway	Range Mule Drive to Deem Hills Parkway	Record keeping. Update ordinance to show currently posted speed limit.	1
7th Street	400' North of Peoria Avenue to Clinton Street	Recommend reduction from 45 mph to 40 mph.	3
51st Avenue	Estrella Drive to Olney Avenue	Recommend reduction from 50 mph to 40 mph.	8
51st Avenue	Happy Valley Road to Range Mule Drive	Record keeping. Update ordinance to show currently posted speed limit.	1
55th Avenue	Happy Valley Road to Deem Hills Parkway	Record keeping. Update ordinance to show currently posted speed limit.	1

Prima Facie Speed Limit **45 mph** at all times

<i>Street Changed</i>	<i>Segment Changed</i>	<i>Reason for Change</i>	<i>Council District</i>
Broadway Road	99th Avenue to 91st Avenue	Recommend reduction from 50 mph to 45 mph with development.	7
Lower Buckeye Road	83rd Avenue to 79th Avenue	Record keeping. Update ordinance to show currently posted speed limit.	7
59th Avenue	Broadway Road to Durango Street Alignment	Record keeping. Update ordinance to show currently posted speed limit.	7
75th Avenue	Van Buren Street to Roosevelt Street	Record keeping. Update ordinance to show currently posted speed limit.	7
99th Avenue	Mobile Lane to Riverside Avenue	Record keeping. Update ordinance to show currently posted speed limit.	7
99th Avenue	Thomas Road to Camelback Road	Recommend reduction from 50 mph to 45 mph with development.	5

Note: All speed limit changes were recommended based on a traffic study and approved by a Traffic Engineer.



Amend City Code to Establish the Shared Micromobility Program

This report requests the Transportation, Infrastructure and Planning (TIP) Subcommittee recommend City Council amend Phoenix City Code chapters 4, 23, 24, 31, 36 and 39 to establish a Shared Micromobility Program; enact related regulations; and allow for the permanent use of electric scooters on public streets citywide.

THIS ITEM IS FOR CONSENT ACTION.

Summary

On June 26, 2019, City Council approved Ordinance G-6602 establishing a Downtown Shared Electric Scooter (e-scooter) Pilot Program (Pilot Program) and amending Phoenix City Code to incorporate a definition for an electric standup scooter and legalizing e-scooter operation on public streets with revocable dockless electric standup scooter share permits. Additionally, the ordinance authorized the City of Phoenix Police Department or peace officer to issue civil traffic citations for, among other things, speed limit violations, yielding the right of way, parking violations, and riding on the sidewalk. The ordinance had a one-year sunset provision.

The ordinance was extended four times to extend the Pilot Program and sunset provision to allow staff time to research, develop and implement a new permanent program. The ordinance is now set to expire on June 30, 2023.

On Dec. 14, 2022, City Council approved the Shared Micromobility Program (Micromobility Program) to replace the Pilot Program, and the program launched on Jan. 20, 2023. Phoenix City Code needs to be amended to reflect the updated definitions, terms and provisions of the new Micromobility Program. The amendment also needs to allow for the permanent use of e-scooters on public streets citywide.

Shared Micromobility Program

The Micromobility Program built upon the Pilot Program by expanding the program boundaries and the types of vehicles available. The Micromobility Program vendors were also selected using a competitive procurement process and operate under City contracts rather than a revocable permit that was used during the Pilot Program.

If approved, this request will amend Phoenix City Code to align with the new Micromobility Program by adding a definition of micromobility and removing references to the revocable dockless electric standup scooter share permits. The ordinance will also update the term “standup electric scooters” to “electric scooters, e-scooters” to allow for additional vehicle types to be used in the Micromobility Program and by residents who own electric scooters.

Additionally, the sunset provision that currently allows e-scooters to operate on public streets in the City will become permanent. To support the safe use of e-scooters, the amendment will also clarify that e-scooters should be operated at a speed that is reasonable and prudent under the existing conditions. It also adds a section on disposition of abandoned e-scooters that mirrors the electric bicycle regulations, required equipment, and applicability of traffic laws and bicycle laws.

The Street Transportation Department will provide an update to the Transportation, Infrastructure and Planning Subcommittee at its September 2023 meeting on the first six months of operation of the Micromobility Program.

Electric Bicycles

Currently, Phoenix City Code uses the term “motorized electric bicycle” when referring to electric bicycles. The amendment will remove the word motorized and update the term to “electric bicycle,” which is used in the Arizona Revised Statutes.

Financial Impact

There is no financial impact related to amending the Phoenix City Code.

Concurrence/Previous Council Action

The Transportation, Infrastructure and Planning Subcommittee:

- Was provided with information on the proposed Comprehensive Micromobility Program on Oct. 20, 2021; and
- Recommended approval to issue a solicitation for the program on April 20, 2022, by a vote of 4-0.

The Economic Development and Equity Subcommittee:

- Was provided an update on the Shared Micromobility Shared Revenue Contract Solicitation on Dec.13, 2022.

The City Council approved:

- The Pilot Program (Ordinance G-6602) on June 26, 2019;
- A Pilot Program extension and a sunset provision extension (Ordinance G-6676) on

Feb. 19, 2020;

- A sunset provision extension (Ordinance G-6772) on Dec. 2, 2020;
- A Pilot Program extension and a sunset provision extension (Ordinance G-6823) on March 17, 2021;
- A Pilot Program extension, a sunset provision extension, and the allowance of electric bicycles on public streets citywide (Ordinance G-6967) on March 2, 2022;
- The issuance of a Request for Proposals to operate a Comprehensive Micromobility Program in Phoenix on May 11, 2022; and
- The award of the Revenue Contract Solicitation to two micromobility vendors to operate shared micromobility services in Phoenix (Ordinance S-49256) on Jan. 14, 2022.

Responsible Department

This item is submitted by Deputy City Manager Alan Stephenson and the Street Transportation Department.



Metro, Regional Public Transportation Authority and Maricopa Association of Governments Meetings

This report provides the Transportation, Infrastructure and Planning Subcommittee with copies of past and/or upcoming meeting agendas/summaries for METRO light rail, Valley Metro/Regional Public Transportation Authority and the Maricopa Association of Governments.

THIS ITEM IS FOR INFORMATION ONLY.

Summary

Within Maricopa County, there are several agencies with different charges relating to public transit and transportation planning.

Valley Metro/Regional Public Transportation Authority (RPTA): In 1993, the RPTA Board adopted the name Valley Metro as the identity for the regional transit system in metropolitan Phoenix. Under the Valley Metro brand, local governments fund the transit system which the public sees on Valley streets today. Valley Metro Board member agencies include Avondale, Buckeye, Chandler, El Mirage, Gilbert, Glendale, Goodyear, Maricopa County, Mesa, Peoria, Phoenix Queen Creek, Scottsdale, Surprise and Tempe.

METRO: METRO is the brand name for Valley Metro Rail Inc., a nonprofit, public corporation charged with the design, construction and operation of the light rail system. The cities that participate financially in the light rail system each have a representative on the METRO Board of Directors. Cities on the board include Chandler, Glendale, Mesa, Phoenix and Tempe. METRO is structured on a "pay to play basis," with voting power allocated based on investment in the system.

The Maricopa Association of Governments (MAG): MAG is a council of governments that serve as the regional agency for the metropolitan Phoenix area. When MAG was formed in 1967, elected officials recognized the need for long-range planning and policy development on a regional scale. Issues such as transportation, air quality and human services affect residents beyond the borders of individual jurisdictions. MAG is the designated Metropolitan Planning Organization (MPO) for transportation planning

in the Maricopa County region.

The goal of staff is to provide the Transportation, Infrastructure and Planning Subcommittee with agendas for future meetings of these bodies. At times, meeting dates do not coincide and agendas are not available until close to the meeting date. However, prior to reach each Board of Directors meeting, most agenda items are reviewed by staff committees which include City of Phoenix members.

Meeting agendas and/or additional information for previous and upcoming METRO, RPTA and MAG meetings will be distributed to Transportation, Infrastructure and Planning Subcommittee members at the meeting.

These materials can also be found via the pages below:

MAG - <https://www.azmag.gov/About-Us/Calendar>

Valley Metro - <https://www.valleymetro.org/news-events>

Responsible Department

This item is submitted by Deputy City Manager Mario Paniagua and the Public Transit Department.



Citizens Transportation Commission Meetings

This report provides the Transportation, Infrastructure and Planning Subcommittee with copies of past and/or upcoming meeting agendas/summaries for the Citizens Transportation Commission.

THIS ITEM IS FOR INFORMATION ONLY.

Summary

The Citizens Transportation Commission advances transparency, public input, and government accountability by reviewing appropriations provided by the Phoenix Transportation 2050 plan (T2050), as approved by the voters on Aug. 25, 2015.

The Commission reviews T2050 appropriations and program recommendations of the Public Transit Department and the Street Transportation Department; annually review the revenues and expenditures of T2050 funds, as well as funding from other sources; conducts public meetings; and formulates and presents recommendations to the Phoenix City Council related to revenues, expenditures, projections, programs and major projects as called for by T2050.

Meeting agendas and/or additional information for previous and upcoming Citizens Transportation Commission meetings will be distributed to Transportation, Infrastructure and Planning Subcommittee members at each Subcommittee meeting.

Meeting minutes can be found through a search via the City of Phoenix Public Records Search page below:

<https://www.phoenix.gov/cityclerk/services/public-records-search>.

Responsible Department

This item is submitted by Deputy City Manager Mario Paniagua and the Public Transit and Street Transportation departments.



Freeway Program Update

This report provides the Transportation, Infrastructure and Planning Subcommittee updates on the Arizona Department of Transportation (ADOT) freeway program within the City of Phoenix.

THIS ITEM IS FOR INFORMATION ONLY.

Summary

The Maricopa Association of Governments (MAG) Regional Transportation Plan reflects numerous freeway construction projects and studies underway within the City of Phoenix. These projects are funded from the voter approved Proposition 400 half-cent sales tax as well as from state and federal revenue sources. City of Phoenix staff are embedded with ADOT on these major construction projects to ensure coordination of all construction activities with City departments. This report is an overview of the current major freeway projects. A monthly report will be provided to the Transportation, Infrastructure and Planning Subcommittee reflecting project changes as well as new projects.

Interstate 10 (I-10) - Broadway Curve Reconstruction Update

The I-10 Broadway Curve project is planned to improve a segment of I-10 between the I-10/Interstate 17 (I-17) Split Traffic Interchange and the South Mountain Freeway/Congressman Ed Pastor Freeway Loop 202 near Pecos Road. The project encompasses one of the most heavily traveled segments of freeway in the Valley. Traffic volumes within this 11-mile section of I-10 exceed 250,000 vehicles per day and include vital connections to I-17, State Route (SR) 143, US-60 and Loop 202.

The proposed improvements include:

- Adding general purpose and High Occupancy Vehicle (HOV) lanes;
 - Adding a collector-distributor (CD) road system to reduce the number of lane changes on the freeway;
 - Improving connections between I-10 and the SR 143 and Broadway Road to improve HOV lane connections;
 - Improving connections of I-10 and US-60 (Superstition Freeway);
 - Constructing new bridges to accommodate new interchange facilities and additional
-

lanes;

- Building retaining and sound walls; and
- Constructing pedestrian bridge crossings to improve pedestrian access across the freeway.

Construction began in late 2021 and is scheduled for completion in 2024.

Update:

Westbound US 60 to westbound I-10 ramp is expected to open to traffic in the next couple of months. Once traffic is switched over, construction crews will remove the existing ramp to begin building the collector distributor roads in this area.

I-17 Frontage Road Drainage Improvement

This ADOT project will replace the existing pump stations at the I-17 traffic interchanges at Greenway Road, Thunderbird Road, Cactus Road and Peoria Avenue with a gravity storm drain system that will discharge the storm water into the Arizona Canal Diversion Channel (ACDC). The purpose of the project is to improve the drainage facilities that remove storm runoff from the cross streets, helping to reduce the potential for flooding at the I-17 overpasses.

The project includes the installation of 30- to 90-inch diameter reinforced concrete pipe along the I-17 frontage road, two detention basins at the I-17 and Thunderbird Road traffic interchange, pavement replacement on the frontage road, signing, striping, improvements to ADA features within the project area, and removal of the four existing pump stations.

Update:

Construction began in January 2020 and substantial completion is expected June 2023.

Loop 101 - I-17 to 75th Avenue Widening

The scope of this project is to add one general purpose lane in each direction to Loop 101/Agua Fria Freeway from I-17 to 75th Avenue. The project includes bridge widening of existing structures to accommodate the new general-purpose lanes. The project work includes diamond grind surface treatment, new concrete pavement, retaining walls, lighting, ADA improvements, drainage improvements, FMS improvements, and signing and striping.

I-10 Deck Park (Hance Park) Tunnel Repair

The Deck Park Tunnel is an underpass that carries the I-10 freeway beneath downtown Phoenix between 3rd Avenue and 3rd Street. The tunnel consists of a series of 19 side-by-side bridge structures. Construction of the facility began in 1983 and opened to traffic on Aug. 10, 1990. The tunnel carries approximately 230,000 vehicle trips per day and provides a critical link for regional connectivity and mobility.

Leaks in the ceiling structure of the Deck Park Tunnel have occurred in the past and continue to appear. The water infiltration caused by the leaks can lead to deterioration of the tunnel infrastructure and impacts the ventilation and electrical systems, which could force closure of the tunnel to traffic. There is also concern that any damage could produce a need for repairs that would require excavation of Margaret T. Hance Park, which is undergoing a major, \$100 million revitalization expected to begin in March 2020.

ADOT, MAG and the City of Phoenix initiated an I-10 Deck Park Tunnel Waterproofing Study in May 2019 because of concern with the integrity of the tunnel.

The study recommended that all joints that have not been repaired in the last five years be replaced, which comprises 15 of the 19 total joints. ADOT intends on working closely with the City of Phoenix to coordinate construction activities of the joint work with the Hance Park revitalization project to minimize cost and public disturbance.

Construction began in March 2020.

Grand - 35 Study

ADOT and the Federal Highway Administration (FHWA), in coordination with the BNSF Railway, City of Phoenix and MAG, are initiating a Draft Environmental Assessment (EA) and initial DCR for the US-60 (Grand Avenue), 35th Avenue and Indian School Road intersection.

The study proposes that improvements need to be made to the US-60 corridor functionality, arterial street network multimodal opportunities (e.g., expansion of bicycle lane network), and BNSF Railway corridor capacity. These improvements would reduce traffic congestion, improve pedestrian and vehicular safety, and enhance multimodal transportation options.

ADOT anticipates releasing the draft environmental assessment document in mid-2023 and finalizing the study in 2023.

If a Build Alternative for interchange improvement is selected, the following tentative schedule has been identified:

- Design and Right of Way Acquisition - beginning in 2024
- Construction - beginning in 2025

I-10: Papago Tunnel to the I-10/I-17 System Interchange Corridor Study

This study is led by MAG and in partnership with ADOT and the City because of the regional significance of the freeway corridor and its influence over downtown Phoenix and Sky Harbor area. This study will determine strategies to mitigate, and address existing, and expected operational issues. The project team is looking at traffic demand and operations. The next steps include outreach to the public.

State Route (SR) 303: 43rd and 51st Avenues Traffic Interchanges

Phoenix, MAG, and ADOT have agreed to accelerate design and construction of the new Traffic Interchanges (TIs) at 51st and 43rd Avenues to accommodate the schedule of the new Taiwan Semiconductor Manufacturing Company (TSMC) facility. Construction of the new TIs will be completed in summer 2023.

Update:

Construction of the new TIs at 51st and 43rd avenues:

- **Projected completion date is on target for completion August 2023.**
- **57 percent construction has been completed.**
- **Traffic switch onto new 43rd Avenue is projected early May.**
- **51st Avenue will be ready for deck pours at the end of May.**

State Route 303 (SR 303): 51st Avenue - I-17 and SR303 Lake Pleasant Parkway - 51st Avenue

AZTEC Engineering Group, Inc. has been selected as prime for Final design. Notice to proceed with final design will be late Spring of 2023. The design is expected to be completed within two years. There is no construction funding currently programmed.

The Office of Arts and Culture will add this project to the five-year Art Plan - potential art locations at ramps/bridges, system interchange, and possibly at 67th Avenue if funding allows for this addition.

I-10/Loop 101 System Interchange

ADOT has initiated a study to evaluate improvements to the Loop 101 (Agua Fria Freeway) and Interstate 10 system TI in the West Valley.

The purpose of this study is to evaluate alternatives to the TI that will enhance regional travel by improving safety, reducing congestion and improving connectivity.

This study will evaluate the following improvements:

- A new Direct High-Occupancy Vehicle ramp within the existing TI that will accommodate travel to/from the north along Loop 101 and to/from the east along I-10.
- A possible new connection between southbound Loop 101 and 91st Avenue. This connection would be separate from the Loop 101/I-10 system TI ramps and may connect to the existing I-10/91st Avenue TI ramps.
- Evaluation of several other traffic interchange locations and connecting arterial roadways for possible improvement within the project area.

On Feb. 23, 2023, a second public meeting was held at Sheely Farms Elementary School to present recommended alternatives. Alternatives include a direct HOV lane and the proposed 91st Avenue connector ramp. Comments and questions can be submitted through March 9, 2023.

I-17 Pavement Improvement Project

ADOT has started a pavement improvement project on I-17 between Dunlap Avenue and Deer Valley Road. The purpose of the project is to extend the life of the pavement and to improve safety and the driving experience on the existing roadway. The project includes removing the existing asphalt pavement and using a diamond grinding treatment to provide a smooth and quiet roadway surface. The project requires weekend closures and overnight lane restrictions on the I-17 that will impact travel in the area.

Construction will take approximately 12 months and should be completed in late 2023.

Responsible Department

This item is submitted by Deputy City Manager Alan Stephenson and the City Manager's Office.



October 2023 Proposed Bus Service Changes and Public Outreach

This report provides the Transportation, Infrastructure and Planning Subcommittee with information on the proposed October 2023 bus services changes and related public outreach efforts.

THIS ITEM IS FOR INFORMATION ONLY.

Summary

The Public Transit Department (PTD) is proposing to extend the reach of frequent local bus service within the city with the proposed October 2023 local bus service changes. An entire route, or even segment of a route, is considered part of the frequent service network when its weekday service frequency is 15 minutes or better from at least 6 a.m. to 6 p.m.

In Phoenix, local bus service has a minimum base frequency of every 30 minutes daily, Monday through Sunday, although many routes have increased frequency based on levels of ridership throughout the day. These proposed service changes focus on weekday local bus service, during peak hours (from 6 a.m. to 9 a.m. and 3 p.m. to 7 p.m.), or midday hours (from 9 a.m. - 3 p.m.). Weekday local bus service runs from approximately 4 a.m. to 11 p.m.

As of April 2023, eight of 43 local/circulator routes operating in Phoenix are part of the frequent service network, which covers 34 percent of Phoenix residents in its service area. With the implementation of the proposed October 2023 service changes, the frequent service network would increase to 11 routes covering 47 percent of Phoenix residents within its service area.

Overall, the proposed October 2023 service changes are estimated to expand the frequent service network by covering 217,000 more residents as well as 133,000 more jobs within its service area.

Following is a brief description of the proposed service changes, followed by details of current service and the proposed changes.

Brief description of proposed changes:

- Route 0 (Central Avenue): From 6 a.m. to 7 p.m. weekdays, modify frequency from 20 to 30 minutes.
- Route 3 (Van Buren Street): From 6 a.m. to 7 p.m. weekdays, modify frequency to 15 minutes between 35th Avenue and 32nd Street, and extend 15 minute frequency to 44th Street.
- Route 7 (7th Street): From 6 a.m. to 7 p.m. weekdays, modify frequency to 15 minutes between Dunlap Avenue and Baseline Road, and to 30 minutes north of Dunlap Avenue and south of Baseline Road.
- Route 16 (16th Street): From 6 a.m. to 7 p.m. weekdays, increase weekday frequency to 15 minutes between Baseline Road and Northern Avenue.
- Route 19 (19th Avenue): From 6 a.m. to 7 p.m. weekdays, increase frequency to 15 minutes for the entire route.
- Route 27 (27th Avenue): During weekday peak hours, increase frequency to 15 minutes between Bell and Lower Buckeye roads.
- Route 35 (35th Avenue): From 6 a.m. to 7 p.m. weekdays, increase frequency to 15 minutes between Lower Buckeye Road and the Metrocenter Transit Center.
- Route 70 (24th Street/Glendale Avenue): From 6 a.m. to 7 p.m. weekdays, increase frequency to 15 minutes between Baseline Road and 43rd Avenue.
- DASH Circulator: Extend route to Roosevelt Road and Third Street, and add weekend service between Roosevelt Road and Jefferson Street.

Current Route Description

- Route 0: The 8.6-mile route runs on Central Avenue between Van Buren Street (to the south) and Sunnyslope Transit Center (to the north) in central Phoenix. The route overlaps with light rail on Central Avenue from Van Buren Street to Camelback Road. This route operates at a 20 minute frequency on weekdays and every 30 minutes on the weekend.
- Route 3: The 24-mile route runs on Van Buren Street in the cities of Phoenix, Avondale and Tolleson, with the Phoenix portion operating between 83rd Avenue and the Phoenix Zoo. During weekdays, the frequency intervals increase between 35th Avenue and 32nd Street. Currently, the schedule in this area of the route is every 10 minutes during morning peak hours; every 15 minutes from 9 a.m. to 2 p.m.; every 10 minutes from 2 p.m. to 6 p.m., and then every 15 minutes until 7 p.m.
- Route 7: The 25-mile route runs primarily on 7th Street between Dobbins Road up to 19th Avenue and Deer Valley Road. During weekday peak hours, the route operates on a 20 minute interval north of Van Buren Street and a 10 minute interval south of Van Buren Street.
- Route 16: The 23.5-mile local route runs on 16th and 32nd streets between

Dobbins Road and Paradise Valley Community College. During weekday peak hours the route operates every 15 minutes between Baseline Road and Northern Avenue.

- Route 19: The 25.5-mile local route runs primarily on 19th Avenue from the 27th Ave/Baseline Park and Ride, to 23rd Avenue and Happy Valley Road. During weekdays, the frequency intervals vary throughout the between Jefferson Street and Union Hills Drive segment of the route. This section of the has 12 minute frequency during peak hours and every 15 minutes during the midday.
- Route 27: The 22-mile local route runs on 27th Avenue between Lower Buckeye Road and Rose Garden Lane/Deer Valley Road. The route operates every 30 minutes, seven days a week.
- Route 35: The 28-mile local route runs primarily on 35th Avenue between the 27th Ave/Baseline Park and Ride, to 23rd Avenue and Happy Valley Road, with a deviation to the Metrocenter Transit Center. During weekday peak hours, the route operates every 15 minutes between Lower Buckeye Road and the Metrocenter Transit Center.
- Route 70: The 31-mile local route runs on 24th Street and Glendale Avenue, between the 24th Street and Baseline Park and Ride to Luke Air Force Base in Glendale. During weekday peak hours, the route operates every 15 minutes between the 24th/Baseline Park and Ride and the Glendale Park and Ride at 99th Avenue.
- DASH Circulator: The 1.5-mile Downtown Phoenix Circulator runs on Jefferson and Washington Streets between the State Capitol and Third Avenue. The weekday-only circulator runs every 12 minutes from 6 a.m. to 6:30 p.m.

Proposed Changes

Map illustration of proposed service changes by route are included in **Attachment A**.

- Route 0: Modify weekday frequency from every 20 minutes to every 30 minutes. Recent passenger load analysis revealed that frequency can be reduced while not causing overcrowding on the route. The route also overlaps with light rail service between Van Buren Street and Camelback Road.
- Route 3: Modify weekday peak hour frequency from every 10 minutes to every 15 minutes between 35th Avenue and 32nd Street, while also extending the frequency eastward to 44th Street, expanding the route's contribution to the frequent service network.
- Route 7: Modify weekday frequency from 6 a.m. to 7 p.m. to every 15 minutes between Dunlap Avenue and Baseline Road. Segments north of Dunlap Avenue and south of Baseline Road would run at a 30 minute frequency. If implemented, frequency changes for the route would decrease south of Van Buren Street from 10 to 15 minutes; increase between Van Buren Street and Dunlap Avenue from 20 to

15 minutes; and decrease from 20 to 30 minutes north of Dunlap Avenue. The Dunlap Avenue to Baseline Road segment would become part of the frequent service network.

- Route 16: Increase midday frequency from 6 a.m. to 7 p.m. to every 15 minutes between Baseline Road and Northern Avenue. The frequency improvement would match the route's current peak-hour service frequency of every 15 minutes on the same segment, making the segment part of the frequent service network.
- Route 19: Modify weekday frequency from 6 a.m. to 7 p.m. to every 15 minutes between Jefferson Street and Union Hills Drive. If implemented, frequency changes for the route would increase from 30 to 15 minutes south of Jefferson Street and north of Union Hills Drive, and frequency would decrease between Jefferson Street and Union Hills Drive from every 12-15 minutes to every 15 minutes. The entirety of Route 19 would become part of the frequent service network.
- Route 27: Increase weekday frequency to every 15 minutes during peak hours between Bell and Lower Buckeye roads; the segment of the route north of Bell Road would maintain 30 minute frequency.
- Route 35: Increase weekday midday frequency to every 15 minutes between Lower Buckeye Road and the Metrocenter Transit Center. The frequency improvement would match the route's current peak-hour service frequency of every 15 minutes on the same segment, making the segment part of the frequent service network.
- Route 70: Increase weekday midday frequency to every 15 minutes between the 24th Street and Baseline Park and Ride and the intersection of 43rd and Glendale avenues. The frequency improvement would match the route's current peak-hour service frequency of every 15 minutes on the same segment, making the segment part of the frequent service network.
- DASH: Following extensive outreach and community engagement conducted during the department's Neighborhood Transit Study (NTS), the PTD proposes to expand the DASH circulator's reach in the downtown area. The proposed expansion includes extending the route east to 1st Avenue and Jefferson Streets, where it would connect with the Fry's grocery store and multiple light rail connections within walking distance. Also, expand the route north to Roosevelt Street via 3rd and 5th streets to provide a transit connection to Roosevelt Row. In addition, PTD proposes to modify the service frequency, days, and hours to the following: implement frequency to every 15 minutes; extend hours to 11 p.m. between Roosevelt Row and Downtown Phoenix; and add service on weekends on the same segment.

Staff will return to the City Council with a recommendation on the proposed changes after completion of the public outreach process in June. If approved, the service changes will take effect Oct. 23, 2023.

Service Equity Analysis

Per FTA regulations, a Title VI Service Equity Analysis on each proposed service change will be conducted to analyze if the proposed change causes a disparate impact on minority populations or yields a disproportionate burden towards low-income populations. Details of the analysis for the proposed October 2023 proposed service change will be included when staff returns to request Council's recommendation to approve the proposed changes.

Public Outreach

The Public Transit Department uses the locally adopted public outreach process to solicit public feedback on proposed service changes.

The public input process takes place from May 8 to June 9. During that time, Phoenix and Valley Metro staff will undertake the public input process and conduct in-person and virtual outreach utilizing posters and A-Frame signs placed at key areas along each route to notify the public of the proposed changes, and direct passengers to visit Valley Metro's website to submit comments. The proposed service changes will also be advertised via social media, interactive webinars, and a public hearing, which is scheduled from 5 to 6 p.m. on Wednesday, May 24 at Valley Metro's offices, Conference Room 10A.

Responsible Department

This item is submitted by Deputy City Manager Mario Paniagua and the Public Transit Department.

ATTACHMENT A- October 2023 Proposed Service Change Maps

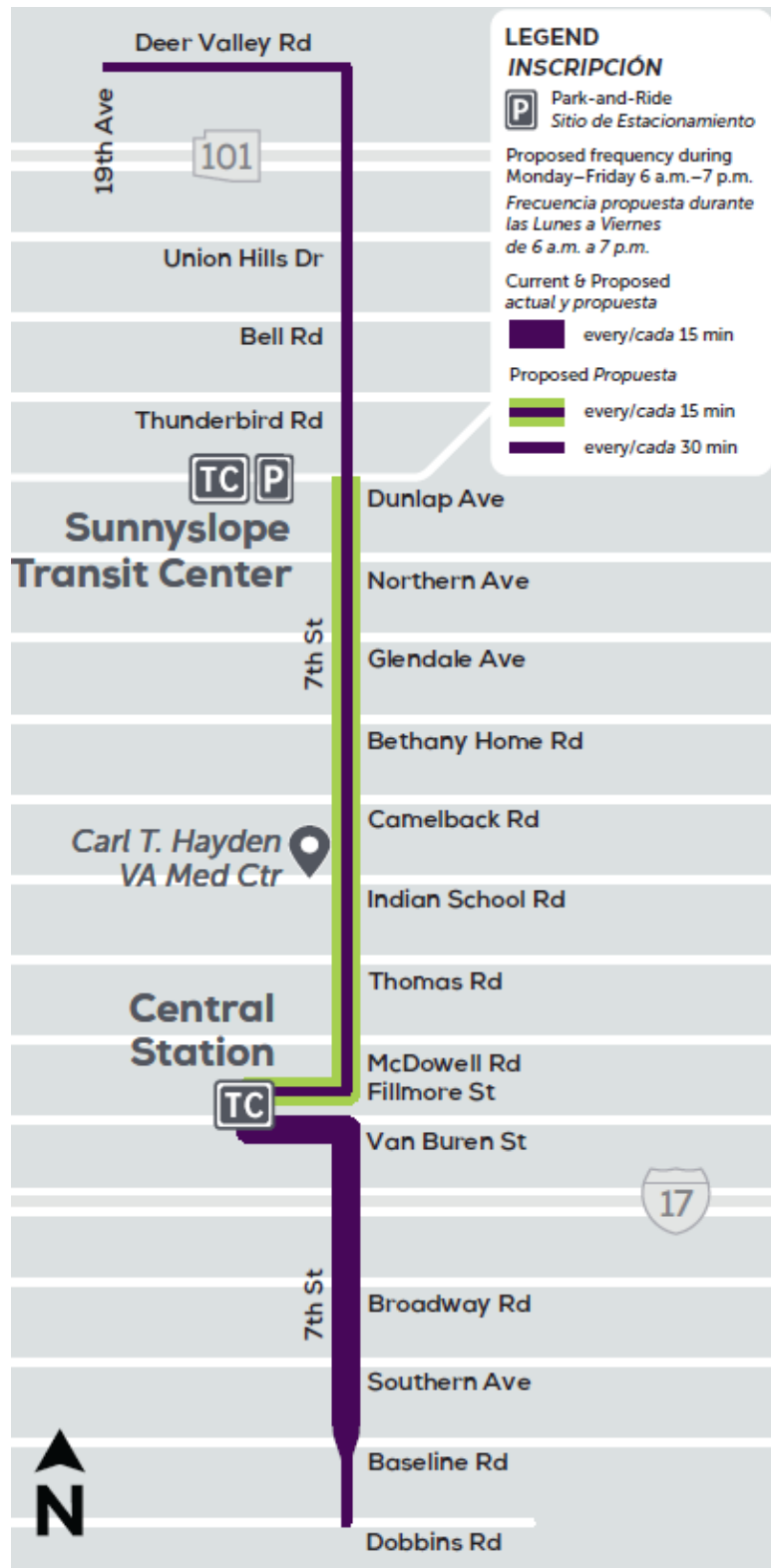
Route 0— (Central Ave)



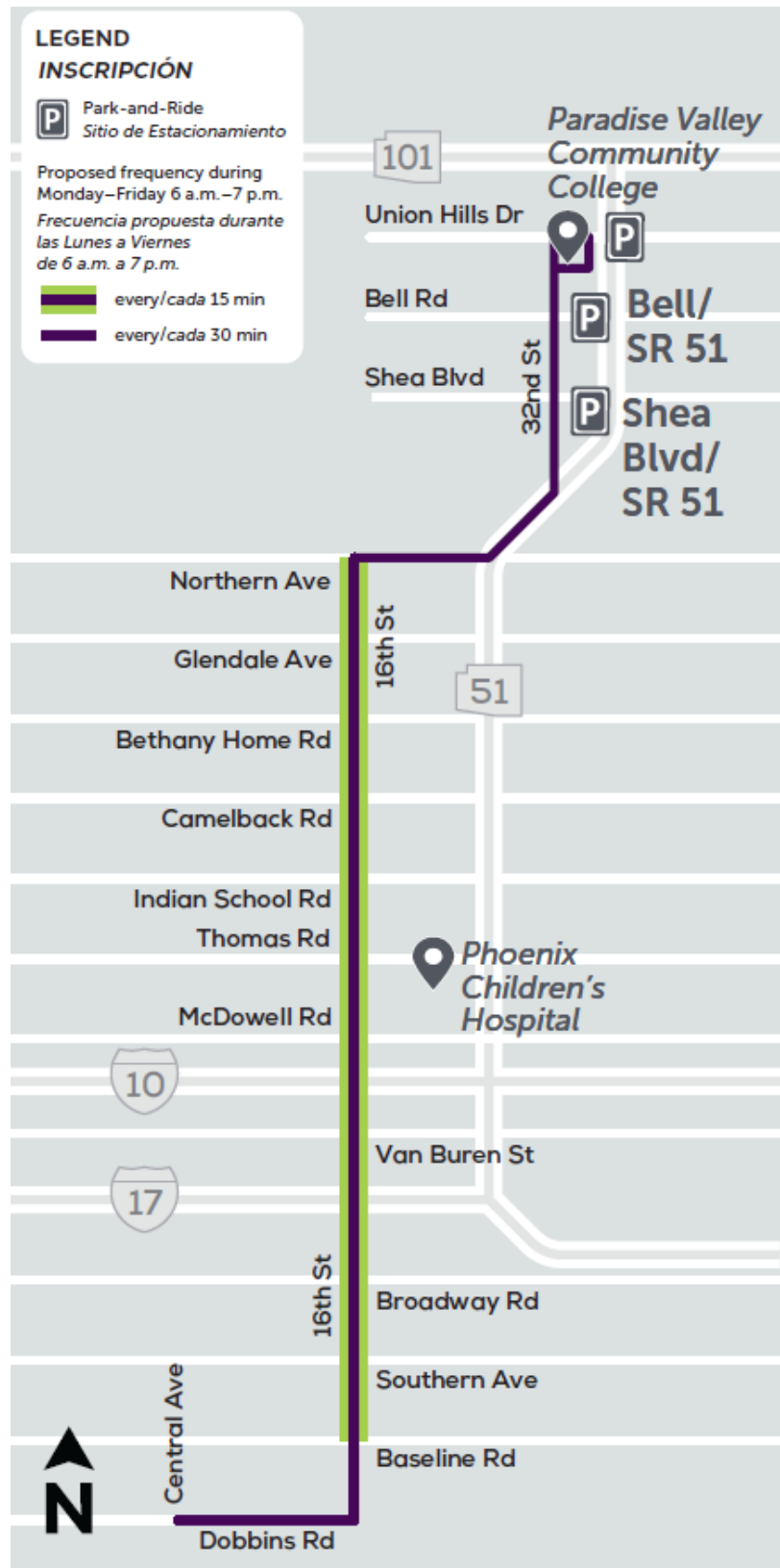
Route 3— (Van Buren St)



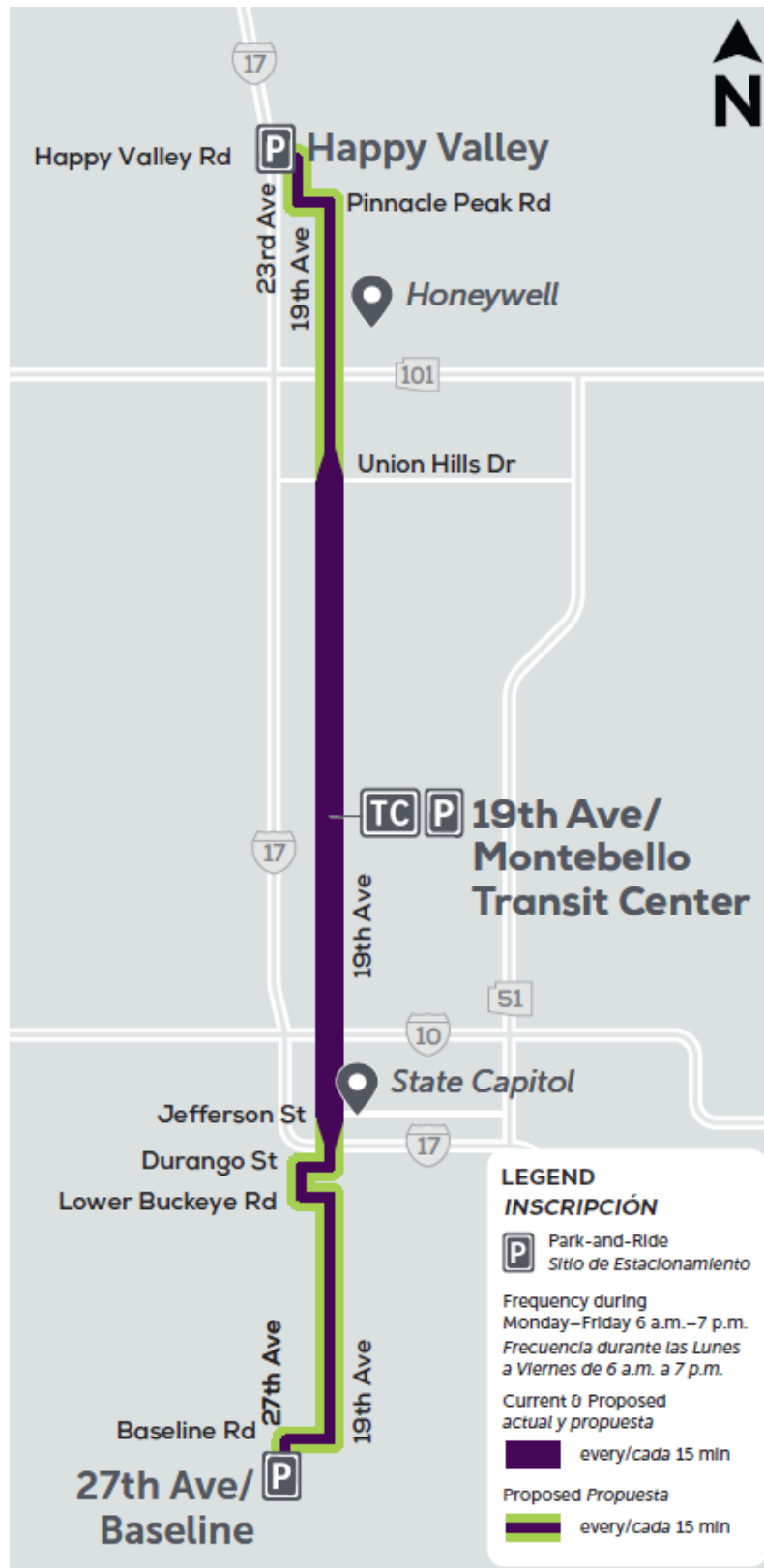
Route 7— (7th St)



Route 16— (16th St)



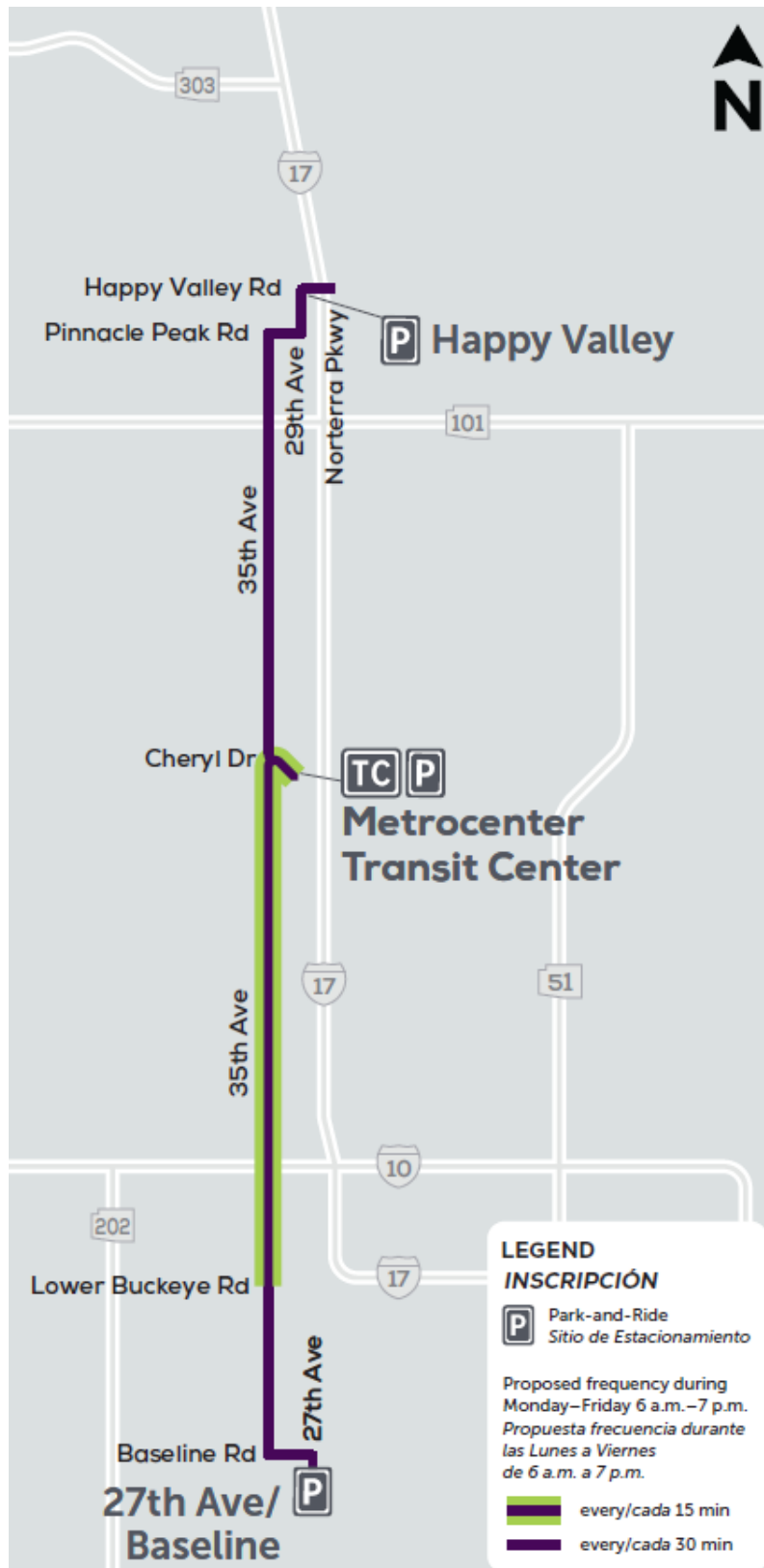
Route 19— (19th Ave)



Route 27 — (27th Ave)



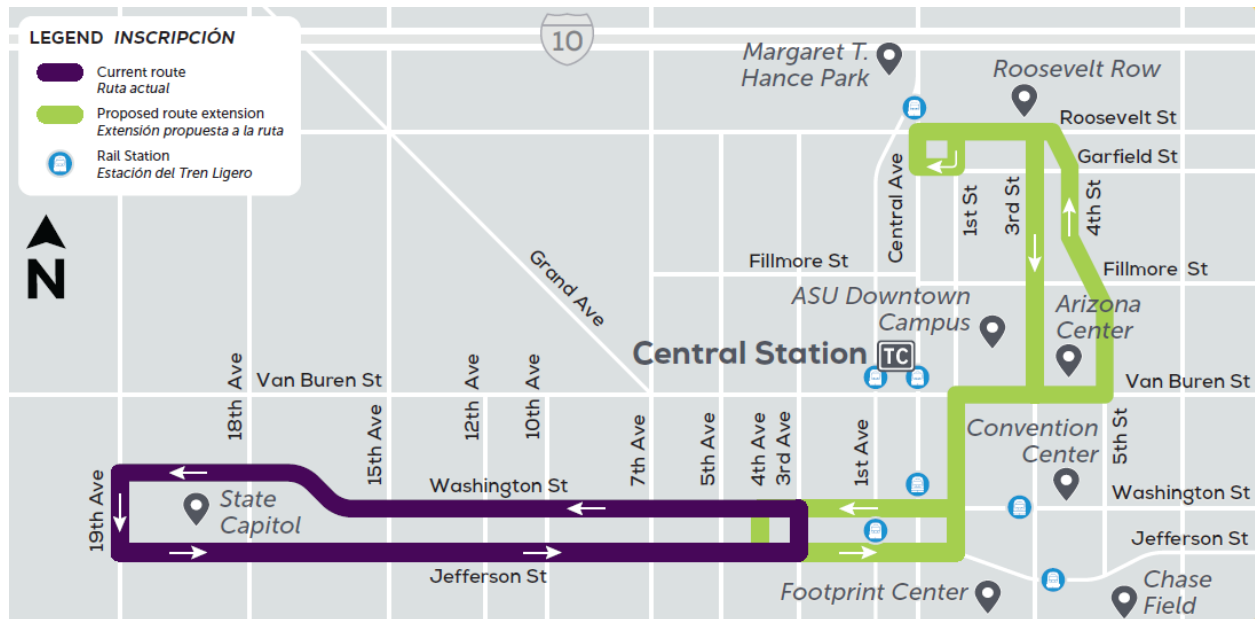
Route 35— (35th Ave)



Route 70— (24th St/Glendale Ave)



DASH Circulator





Building Automation Systems Update

This report provides information to the Transportation, Infrastructure and Planning (TIP) Subcommittee about Building Automation Systems (BAS) and their usage within the operations of City of Phoenix facilities.

THIS ITEM IS FOR INFORMATION AND DISCUSSION.

Summary

Building automation systems are networks of computer controlled electronic devices designed to monitor and optimize various building operations, such as lighting, heating, ventilation, air conditioning, security, and fire safety. The integration to these building systems is intended to reduce energy consumption, provide safer buildings, and give staff the ability to monitor multiple processes through a single graphical interface.

Building automation system structure utilizes software and databases installed on servers and operator workstations that communicate with hardware devices distributed throughout facilities. The hardware devices create a network of information that is received and then processed to send control signals back to control devices in a repeating loop that creates ongoing efficiency.

Building automation systems offer numerous benefits for energy management in commercial buildings. Some of these benefits include:

1. **Energy Savings:** Building automation systems are designed to optimize the performance of building systems to minimize energy consumption. They achieve this by monitoring and adjusting the building's systems based on occupancy, weather conditions, and other factors. BAS can save up to 30% on energy costs by optimizing the building's systems.
2. **Improved Comfort:** Building automation systems can improve the comfort of occupants by maintaining optimal temperature, lighting, and air quality. They achieve this by adjusting the building's systems to suit the needs of the occupants.

3. **Improved Indoor Air Quality:** Building automation systems can improve indoor air quality by monitoring and adjusting the building's heating, ventilation and cooling systems to maintain the appropriate temperature, humidity, and ventilation rates. This can reduce the risk of health problems related to poor indoor air quality. The system can also be used to maintain Occupational Safety and Health Administration regulatory requirements for indoor air quality.

4. **Predictive Maintenance:** Building automation systems can also enable predictive maintenance by monitoring the performance of building systems and predicting when maintenance is required. This can help to prevent costly breakdowns and prolong the life of building systems.

By optimizing the performance of building systems, BAS can help building owners and managers reduce energy consumption and costs while creating a comfortable and healthy environment for occupants. As technology advances, building automation systems will continue to become more advanced, offering even greater benefits for energy management in commercial buildings.

The City of Phoenix currently has approximately 70 facilities and campuses utilizing various manufacturers of building automation with an age span of 0 to over 20 years of service. The lifespan of building automation systems ranges from 7-15 years and is dependent on supporting technologies such as chip/component manufacturing and operating systems that provide the operator interface. As stated above, BAS technologies are critical tools to manage the energy consumption, manage building systems operations, and provide the ideal indoor temperatures for building occupants. Enterprise departments are more likely to have identified funding for the upgrade and replacement of BAS hardware and software and the Public Works Department is utilizing funding available to upgrade and replace these systems in non-enterprise departments.

Responsible Department

This item is submitted by Deputy City Manager Mario Paniagua and the Public Works Department.



Active Transportation Plan

This report requests the Transportation, Infrastructure, and Planning Subcommittee recommend City Council approval of the Street Transportation Department's Active Transportation Plan (ATP).

THIS ITEM IS FOR DISCUSSION AND POSSIBLE ACTION.

Summary

The Street Transportation Department (Streets) is requesting City Council approval of the ATP (**Attachment A**). Active transportation is defined as walking, biking, or rolling, including using wheelchairs, scooters, mobility devices, or micromobility vehicles. The ATP updates the City's Comprehensive Bicycle Master Plan originally approved by City Council in 2014. The ATP is guided by four overarching principles based on community input to create an active transportation network that is:

- 1) Safe;
- 2) Connected;
- 3) Enjoyable; and
- 4) Equitable.

The ATP is a policy-level plan that includes recommendations in three areas: network development, policy updates and design guidance. The recommendations in the ATP will help further the implementation of existing plans and policies including Complete Streets, the Vision Zero Road Safety Action Plan and the Climate Action Plan.

ATP Background

In 2014, City Council approved the City's Comprehensive Bicycle Master Plan. The plan recommended infrastructure and policy changes to reach the vision of a well-connected infrastructure network that would make bicycling a preferred option for daily transportation within 20 years. The vision included receiving a Platinum Level Bicycle Friendly Community designation from the League of American Bicyclists.

The Bicycle Master Plan guided the development of several signature active transportation projects in Phoenix, including the 3rd and 5th Avenue Improvements, the 3rd Street Promenade, Oak Street and the Grand Canalscape. Subsequently, the

Transportation 2050 (T2050) Plan, approved by voters in 2015, established a commitment to add 1,080 new bike lane miles in the City of Phoenix by 2050. This ambitious goal requires building bike lanes beyond the recommendations in the Comprehensive Bicycle Master Plan.

In 2018, Streets applied for, and received, funds from the Maricopa Association of Governments (MAG) to update its Comprehensive Bicycle Master Plan to help guide implementation of an expanded bike lane network. In June 2019, City Council approved an intergovernmental agreement to allow the City to work with MAG to collaborate on the development of an ATP that would include walking and the use of micromobility and mobility devices.

ATP Development and Community Engagement

The ATP planning process included engagement of an interdepartmental advisory team, extensive analysis of existing City plans and policies, and two rounds of community engagement. The interdepartmental advisory team (Active Transportation Advisory Team) brought together staff from seven City departments, with dedicated working groups for each of the plan elements. The planning team reviewed 11 existing City plans and policies to ensure alignment with the ATP and to identify opportunities for further implementation of active transportation goals.

Two rounds of community outreach were conducted for the ATP. The first round of community outreach took place in the winter of 2021 through an online survey, poster polls at two community events, and interviews with community leaders from historically marginalized neighborhoods and active transportation advocacy organizations. The feedback gathered during this round of outreach guided the creation of the planning principles and the recommendations within each assessment area. A second round of public outreach, focused on review of the draft plan, was conducted from December 2022 through January 2023 through a virtual public meeting and a community survey. The community feedback during the meeting and the survey answers informed updates to the final version of the ATP.

ATP Elements

The ATP has three elements that correspond to the three assessment areas: network development, policy updates and design guidance. Each element is designed to work as part of the overall plan, or as a standalone document.

Rather than providing a map of recommended bicycle or active transportation projects, the ATP recommends a community-focused program for developing the active transportation network in Phoenix. Streets will work in each of Phoenix's urban villages to conduct in-depth community outreach and recommend a network of bike lanes that

can be quickly implemented. Staff will work with two urban villages per year to create plans and then work to install the bike lanes within two years after finishing the plans, as funding is available. The process will also identify potential larger projects that will require longer planning timelines and additional funding. The urban villages will be prioritized based on equity and the individual village workload. The program is anticipated to take approximately ten years to complete.

The policy section recommends updates to City policies and procedures to ensure alignment and consistency and to support the four principles of the plan: Safe, Connected, Enjoyable and Equitable. It supports the further implementation of Complete Streets, the Climate Action Plan and the Vision Zero Road Safety Action Plan. The recommendations are grouped into short-term, medium-term and long-term priorities based on public input and feasibility.

The design guidance section will be a reference manual for staff and consultants on how to design streets for active transportation. It reflects the current best practices for active transportation with a special focus on Phoenix's unique challenges. The design guidance section will be shared internally and made available on Phoenix's website as a standalone document for use by consultants and developers.

Accountability

The ATP continues previously established commitments to build bike lanes and multi-use paths along canals and to pursue a Platinum Level Bicycle Friendly Community designation. Tracking metrics for each of the three plan elements are identified and will be reported in annual Active Transportation Program updates to the Citizens Transportation Commission, and the Transportation, Infrastructure, and Planning Subcommittee.

Financial Impact

The \$2 million per year Bicycle Master Plan funding from the Highway Users Revenue Fund will be used for implementation of the ATP.

Concurrence/Previous Council Action

The City Council approved:

- An intergovernmental agreement with MAG (Ordinance S-45828) on June 19, 2019.
- An exception to Phoenix City Code to include indemnification and assumption of liability provisions for the intergovernmental agreement previously authorized (Ordinance S-46354) on Feb. 5, 2020.

Responsible Department

This item is submitted by Deputy City Manager Alan Stephenson and the Street Transportation Department.



City of Phoenix

ACTIVE TRANSPORTATION PLAN

APRIL 2023

ACKNOWLEDGMENTS

City Council

Mayor Kate Gallego

Councilmember Ann O'Brien, District 1

Councilmember Jim Waring, District 2

Councilmember Debra Stark, District 3

Councilmember Laura Pastor, District 4

Councilmember Betty Guardado, District 5

Councilmember Kevin Robinson, District 6

Vice Mayor Yassamin Ansari, District 7

Councilmember Kesha Hodge Washington, District 8

Previous Council Members

Councilmember Sal DiCiccio, District 6

Councilmember Carlos Garcia, District 8

Active Transportation Advisory Committee

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Krista Flynt

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Sharifa Rowe

Stephanie Luz Cordel

Special thanks to the Maricopa Association of Governments for providing funding for this project through the Active Transportation Design Assistance Program.

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Program Element

Policy Recommendations Element

Bicycle & Pedestrian Design Guidance Element

APPENDIX A

Public Outreach Summary



City of Phoenix

THE CITY OF PHOENIX ACTIVE TRANSPORTATION PLAN Executive Summary

Guiding Principles

The plan includes guiding principles that are based on what Phoenixians said were important during outreach. These principles guided recommendations developed in the plan, and they will guide how Phoenix builds its active transportation network.



Equitable



Safe



Connected



Enjoyable

What is active transportation?



When we walk, bike, and roll around Phoenix, we are using active transportation.

By designing our streets to be inclusive of active travel, and improve safety and connectivity for active transportation infrastructure, Phoenix can give people choices on how they move around the community.



Public Input Major Takeaways

RESIDENTS WOULD LIKE TO SEE MORE:



bike infrastructure, specifically bike lanes that are protected or separated from vehicle travel lanes.



streets with sidewalks, specifically detached sidewalks with shade



midblock crossings

COMMUNITY PRIORITIES



Neighborhood bicycle routes should be a higher priority than regional routes.



The City should prioritize Comfortable and safe Bicycle facilities over lower-cost facilities.



Prevent injury-causing collisions.



Everyone should have a comfortable and safe option for using the street.

What are the Plan's Primary Recommendations?

Community Active Transportation Network Program

Community feedback indicated that short, local connections within people's neighborhoods were a high priority. The Community Active Transportation Network Program will work with community members to recommend biking and walking connections. The program will focus on bike lanes and street crossings to help people get to local destinations. The program will gather community input through community task forces, surveys, meetings, and attending community events.

A cornerstone of the Network Development Program is neighborhood engagement. Local connections to parks, schools, transit, community centers, and other neighborhood destinations will be identified and prioritized by neighborhood residents themselves. This community-driven approach will allow the Network Development Program to account for

diverse needs and priorities across the city of Phoenix, and will help lead to projects that can make an impact on residents' daily lives.

The Network Program will individually assess two of Phoenix's 15 Urban Villages, every year. Priority projects will be implemented the following two years after the assessment is completed.



Village Assessment Process

STEP 1

Analyze Existing Conditions

STEP 2

Identify Destinations and Gaps

STEP 3

Identify Network

STEP 4

Prioritize Projects

STEP 5

Implement Projects

Implementation Schedule

	2023	2024	2025	2026	2027	2028	2029	2030	2031
Network Assessment	Village 1 Village 2	Village 3 Village 4	Village 5 Village 6	Village 7 Village 8	Village 9 Village 10	Village 11 Village 12	Village 13 Village 14 Village 15		
Project Implementation		Villages 1 and 2	Villages 1 through 4	Villages 3 through 6	Villages 5 through 8	Villages 7 through 10	Villages 9 through 12	Villages 11 through 15	Villages 13 through 15

Policy Recommendations

The policy recommendations direct staff to update internal policies and programs to better support active transportation. Under each objective, there are specific recommendations to advance existing plans and to support the guiding principles of the plan. The recommendations are prioritized as short-term, medium-term, and long-term to create a feasible work plan. The policy recommendations represent a continued shift towards a more multimodal future in Phoenix where active transportation plays an important role alongside other ways of travel.



Policy Objectives



Objective 1: Advance Complete Streets Policy Implementation



Objective 2: Support the Goals of the Climate Action Plan



Objective 3: Support the Vision Zero Road Safety Action Plan



Objective 4: Share Opportunities for Integrating Active Transportation Policies and Guidance into the General Plan



Objective 5: Build Safe Active Transportation Networks



Objective 6: Build Connected Active Transportation Networks



Objective 7: Build Enjoyable Active Transportation Networks



Objective 8: Build Equitable Active Transportation Networks

Design Guidance

Phoenix's new design guidance for active transportation is based on best practices and focuses on safety and comfort of people walking and biking. The guidance provides an overview of how we should be designing our active transportation facilities and includes important design considerations that will raise the standard for bike and pedestrian design in Phoenix. The new design guidance is an exciting step forward for the City and will be an important guide as each new facility is design and built.

In particular, the Bikeway Facility Selection Matrix is an important milestone for bikeway design in Phoenix. Contextual factors, such as posted speeds and volumes, will help determine levels of bikeway separation for enhanced user comfort and safety.



Planning Process

The two-year process to create this plan involved a thorough assessment of internal barriers to implementing active transportation, numerous meetings with the Active Transportation Advisory Team (ATAT), and community engagement through interviews with community leaders, surveys, tabling events, advocacy group interviews, and a virtual public meeting introducing the draft plan. A final community survey on the draft plan helped identify final revisions.

Accountability

The City will continue tracking and reporting on bicycle infrastructure progress, including on-street and canal path facilities. Additionally, after each urban village priority projects are selected, they will be included as an addendum to the plan for implementation accountability. Finally, the City will apply for Bicycle Friendly Community Status each two years to benchmark progress towards Platinum status.

What was the process for creating the Plan?



City of Phoenix

City of Phoenix Streets Department

Active Transportation Program

Email: bikesh@phoenix.gov

01

BACKGROUND

BACKGROUND

Purpose & Need

The City of Phoenix Active Transportation Plan (ATP) establishes a framework to guide decision-making—through policies, programs, and infrastructure—to make walking, biking, and rolling* more safe and enjoyable in Phoenix. This plan is a policy-level plan that highlights collaborative opportunities to advance active transportation through partnerships with other city initiatives, and also provides a neighborhood-centered approach to building active transportation priorities at the neighborhood scale.

This plan's recommendations are organized into three main assessment areas of 1) Policy Framework, 2) Network Development guidance, and 3) Design Guidance. An overview of all three of these areas is contained within this document, which is guided by an overarching set of principles—**to create an active transportation network in Phoenix that is safe, connected, enjoyable, and equitable.**

Each year, the City installs new bikeways, crossings, and pedestrian infrastructure in coordination with capital projects and the ongoing resurfacing program. This plan aims to accelerate active transportation progress by prioritizing neighborhood-scale and neighborhood-identified improvements and provides design guidance to create the next generation of bicycle and pedestrian infrastructure in Phoenix.

While the city aims to continue improving city-wide networks, a major focus of this plan is helping to create linkages and connections to everyday destinations within neighborhoods and urban villages with facilities that are designed to be safe and enjoyable for everyone. Many of these local destinations - including grocery stores, restaurants, schools, and parks - are set up for travel through walking and biking as short trips within neighborhoods. This plan focuses on helping

residents access and connect to these important local destinations.

Safe and connected active transportation networks should meet the needs of all Phoenixians. This plan provides an assessment framework that helps to prioritize highest need areas and the neighborhood-



Source: Maricopa Association of Governments

Three Plan Assessment Areas:



POLICY FRAMEWORK:

Review policies and internal practices that influence active transportation design.



NETWORK DEVELOPMENT:

Develop a network framework that is not map-based.



DESIGN GUIDANCE:

Create updated design guidance for how to design bicycle and pedestrian facilities.

* Rolling refers to those using wheelchairs, scooters, and other mobility devices, whether powered or unpowered.

specific approach speaks to Phoenix’s large geographic demographic diversity, allowing residents to identify projects and needs that are most impactful to their neighborhoods.

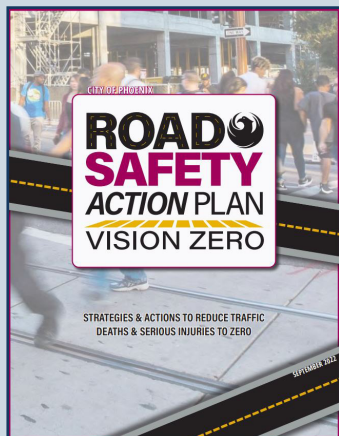
Advancing Existing Plans

Phoenix is the 5th largest city and the fastest growing large city in the United States at this time. Many previous and existing planning efforts have contributed to and guided this growth to support Phoenix transitioning into a world class city. These plans, and this active transportation plan, build upon and support the cultural shift of designing roadways to be inclusive

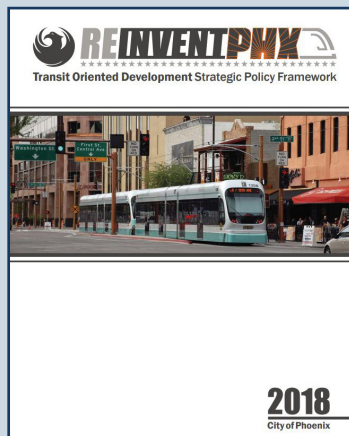
and safe for a variety of ways of travel and directly impact the lives, experiences, and quality of life of Phoenix’s residents. This ATP is an opportunity to build upon other planning efforts, like those highlighted below, to make biking and walking key components of the City’s transportation network as it continues to grow and evolve in the future.

Existing Plans Supported by This Plan

Existing plans and policies across Phoenix that this plan supports are: Road Safety Action Plan: Moving to Vision Zero (2022); City of Phoenix Complete Streets Policy; City of Phoenix Climate Action Plan (2021); the Maricopa Association of Governments Active Transportation Plan (2020); and the City of Phoenix Transit Oriented Development (TOD) Strategic Policy Framework (2018).



The Phoenix Road Safety Action Plan: Moving to Vision Zero (2022) adopted by City Council in September 2022 with the goal of reducing traffic fatalities and serious injuries to zero in Phoenix by 2050.



The City of Phoenix Transit Oriented Development (TOD) Strategic Policy Framework (2018) prioritizes higher density land use around high capacity transit and provides opportunities for active transportation connections.



The City of Phoenix Complete Streets Policy provides support and direction around designing Phoenix’s streets to accommodate many different forms of travel, and to prioritize safe and comfortable facilities for people walking and biking.

Advancing Active Transportation

While the City of Phoenix first began planning for bikes when the Council adopted a proposed bike system in 1987, bikeway implementation and momentum for safe and comfortable facilities only recently began with the adoption of the City's first bicycle master plan in 2014. Since then, the City has made significant progress in expanding the bicycle network. To date, the City has implemented 183 miles of buffered bike lanes, 8 miles of protected bike lanes, and 974 miles of traditional bike lanes. In recent years, as national best practices have evolved, the City has begun planning and

implementing bicycle facilities that are considered more comfortable for all ages and abilities. This includes bike boulevards, which are low stress routes along neighborhood streets, as well as protected bike lanes, which are on-street bicycle facilities that are physically separated from motor vehicle traffic by a vertical element or barrier, such as a curb, flexible delineators, or vehicle parking aisle.

The Evolution of Protected Bikeways in Phoenix:



2017

The City installed its **first protected bike lane** along 15th Avenue between Van Buren and Jefferson streets.



2019

The City installed its **first parking-protected bike lanes** along 39th Avenue from Encanto Boulevard to Edgemont Avenue and Earll Drive from Sixth to Third Avenues.



2021

The City installed its **first two-way protected bike lane** along 3rd Avenue between Roosevelt Street and McDowell Road.



2022

The City installed **protected bike lanes** on Fillmore Street from Central Avenue to 7th Street, and 3rd Street from Roosevelt Street to Indian School Road.

Another exciting milestone is the current design of a bike boulevard that includes significant traffic calming and traffic diverters along Fillmore Street from 7th to 16th Streets. This corridor will reflect current best practices in bike boulevard design and has been envisioned for over a decade.

Phoenix has made significant progress and the work by various departments, advocates, and community input have helped make each of these projects a reality for our community. The next 10 years will bring more opportunities to create safe and enjoyable roadways that provide space for different forms of travel.

Streets for All

The way we think about and design our streets in Phoenix and across the country is changing. We have made large strides as a community, and have invested significant resources, in building a transportation network that provides choices for how to travel, including not just driving, but walking, rolling, biking, transit, and other emerging types of mobility options. The extension of our light rail system, continued advancement of Bus Rapid Transit and the building of canal trails are all testaments to this commitment.

Walking, biking, and rolling are critical pieces of this network. These modes are not just about providing a variety of options, but are about including and accommodating people of all ages and abilities (see

the Design Guidance Element for more information on designing for different users). They provide safe connections for children to walk or bike to school and connect people to work, transit, and places they want or need to go. In many cases, walking, biking, and rolling are also primary ways of moving around Phoenix. Many residents use walking and biking to access transit and other modes of transportation, and an increasing number of people are reducing household vehicle ownership for a variety of different reasons.

Building our active transportation network serves these purposes, among many others, and helps to guide how and where safe critical infrastructure investments can and should be made within our community.

Active Transportation accounts for a variety of different ways of travel, including walking, rolling, biking, and many emerging types of mobility options. But it's not just about being inclusive of multiple types of travel modes, it's about ensuring the accommodation of people with different abilities, including people with a disability and children. This means creating facilities that are comfortable for people of all abilities and confidence levels.

** Rolling refers to those using wheelchairs, scooters, and other mobility devices, whether powered or unpowered.*



3rd Avenue Protected Bike Lanes with the use of a buffer strip and vertical posts to separate bicyclists from traffic.
Source: Maricopa Association of Governments



02

BENEFITS OF ACTIVE TRANSPORTATION

BENEFITS OF WALKING & BIKING

Economic Benefits

Active transportation can benefit the bottom line of households, businesses, and cities. The economic benefits of walking and biking include lower transportation costs for individuals and families, savings to cities from less wear and tear on streets, greater neighborhood and community vibrancy, boosts in retail sales, and more young job seekers being attracted and retained.¹

Vehicle ownership and maintenance are expensive.

On average, households in Phoenix spend \$10,900 a year (\$908 per month) on vehicle ownership costs². These costs are especially burdensome for lower-earning households. National research from 2019 shows that lower-earning American households proportionately spend roughly twice as much of their income as the average-earning household on transportation. In 2016, the lowest earning 20 percent of the population spent almost 30 percent of their income on transportation costs³. Having more transportation choices, including biking, walking, and transit, presents important opportunities for individuals and families to be more financially stable and self-reliant.

Research suggests that active transportation also has the potential to contribute to the general economic vitality of the community, and in more specific ways as shown in the graphics at right.

DRIVING 4 MILES/DAY COSTS



IN FUEL AND VEHICLE WEAR AND TEAR
AAA, 2019

while...

WALKING AND BICYCLING COSTS



Your driving Costs: How Much are you really Paying to Drive? (2019). <https://exchange.aaa.com/wp-content/uploads/2019/09/AAA-Your-Driving-Costs-2019.pdf>

Increased **EMPLOYMENT AND SALES** for businesses facing **STREETS WITH IMPROVED WALKING & BIKING INFRASTRUCTURE^{4,5}**



Proximity to **BICYCLE INFRASTRUCTURE** is associated with **INCREASING RESIDENTIAL PROPERTY VALUES⁶**

1. Railyards Blog. <https://railyards.com/blog/7-benefits-of-bike-friendly-communities>

2. The Housing and Transportation (H+T®) Affordability Index. <https://htaindex.cnt.org/map/>

3. ITDP (Institute for Transportation & Development Policy). The High Cost of Transportation in the United States. 2019. <https://www.itdp.org/2019/05/23/high-cost-transportation-united-states/>

4. Garrett-Peltier, H. (2011). Pedestrian and Bicycle Infrastructure: A National Study of Employment Impacts. University of Massachusetts, Amherst, Political Economy Research Institute.

5. Liu, J. H., & Shi, W. (2020). Understanding Economic and Business Impacts of Street Improvements for Bicycle and Mobility— A Multicity Multiapproach Exploration (NITC-RR-1031). National Institute for Transportation and Communities, Portland State University.

6. Liu, J. H., & Shi, W. (2017). Impact of Bike Facilities on Residential Property Prices. Transportation Research Record: Journal of the Transportation Research Board, 2661, pp 50–58. <https://doi.org/10.3141/2662-06>

Safety Benefits

Dedicated infrastructure for walking and biking, combined with measures to reduce vehicle speeds, helps prevent crashes and saves lives. Many bicycle and pedestrian-involved crashes are preventable.

While education and other efforts are important, the design of safe infrastructure that is designed for slower vehicle speeds and separation between motorists, bicyclists, and pedestrians is the most effective way to reduce crashes and crash severity.

Speed management is important in preventing both crash instances and crash severity. Research shows that driver behavior, especially speed, is largely driven by roadway design, more so than posted speed limits or enforcement, and that streets designed for slower speeds result in fewer crashes.⁶

“Communities designed to be walkable can improve safety not only for people who walk but for all community members.”

– Vivek H. Murthy, Surgeon General, 2015



Bicycling infrastructure

(specifically separated and protected bike lanes) significantly reduce fatalities and improve road-safety outcomes for all road users, not just cyclists.⁷

A pedestrian hit by a vehicle traveling at **25 MPH**



has an **89%**
chance of survival

A pedestrian hit by a vehicle traveling at **35 MPH**



has a **68%**
chance of survival

A pedestrian hit by a vehicle traveling at **45 MPH⁸**



has a **35%**
chance of survival

6. Ewing, Reid and Dumbaugh, Eric. 2009. *The Built Environment and Traffic Safety*. *Journal of Planning Literature*. Volume 23 Number 4.

7. Marshall, W. and Ferencak, N. 2019 - *Why cities with high bicycling rates are safer for all road users*, *Journal of Transport & Health*

8. National Traffic Safety Board (2017) *Reducing Speeding-Related Crashes Involving Passenger Vehicles*. Available from: <https://www.nts.gov/safety/safety-studies/Documents/SS1701.pdf>

Health Benefits

Active transportation supports mental and physical well-being through reduced stress, reduced anxiety, and numerous health benefits associated with higher levels of activity.

The Centers for Disease Control and Prevention recommends that adults get 150 minutes of moderate-intensity physical activity every week (e.g., 30 minutes a day for five days) to reduce chances of chronic diseases, such as diabetes or cardiovascular disease. Most recent data shows that roughly 80 percent of American adults do not achieve this.⁹ Communities that make walking and bicycling safe and convenient ways to travel enable residents to incorporate physical activity into their daily routines.

Despite the inherent risks tied to bicycling in car-oriented cities, studies have shown that the health benefits of bicycling to an individual outweigh the risks 9 to 1, even when accounting for higher exposure to air pollution and risk of traffic collisions.¹⁰

Nationally, those who bike report¹¹:



A BETTER MOOD



HIGHER SELF-CONFIDENCE



HIGH TOLERANCE TO STRESS



HEALTHIER SLEEP PATTERNS



Those who are **PHYSICALLY ACTIVE** generally **LIVE LONGER** and have a **LOWER RISK FOR HEART DISEASE, STROKE, TYPE 2 DIABETES, DEPRESSION, AND SOME CANCERS.**

CDC, 2015



20 MINUTES WALKING OR BIKING
each day is associated with a

21% LOWER RISK OF HEART FAILURE FOR MEN

&

29% LOWER RISK FOR WOMEN

Rahman, 2014 and 2015

9. Centers for Disease Control and Prevention. <https://www.cdc.gov/physicalactivity/index.html>

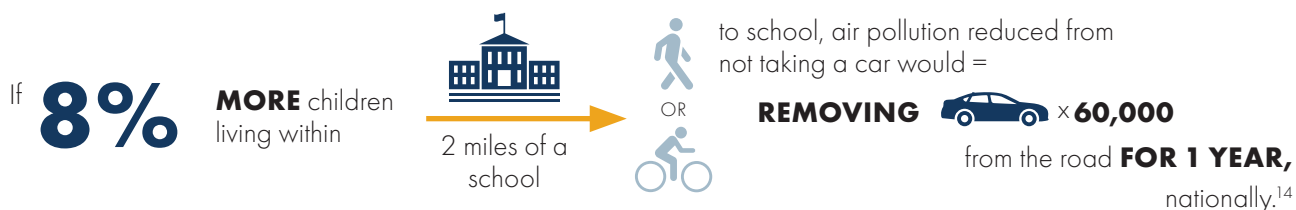
10. de Hartog, Jeroen Johan; Boogaard, Hanna; Nijland, Hans; Hoek, Gerard. 2010. Do the Health Benefits of Cycling Outweigh the Risks? *Environmental Health Perspectives*. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2920084/>

11. Boyd, H., Hillman, M., Nevill, A., Pearce, A. and Tuxworth, B. (1998). Health-related effects of regular cycling on a sample of previous non-exercisers, *Resume of main findings*

Environmental Benefits

By enabling people to make short trips on foot or bicycle instead of a car, active transportation can help communities address several environmental challenges. The most discussed, and perhaps most critical, environmental benefits of active transportation are reduced air pollution and emissions of greenhouse gases. Other environmental benefits include energy savings, less noise pollution, less water pollution, and even reduced pressure to develop agricultural and open space.

Replacing automobile trips with walking and bicycling trips can reduce particulate matter, nitrous oxide, sulfur oxide, volatile organic compounds and carbon dioxide that a typical motor vehicle emits.



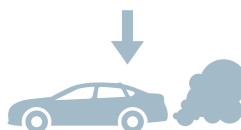
By **2050**, if 7% of American commute trips were



ANNUAL GLOBAL GREENHOUSE GAS EMISSIONS would be reduced by approximately



84%



Those who **BICYCLE EVERYDAY** had **84% LOWER CARBON DIOXIDE EMISSIONS** from all daily travel than non-bicyclists.¹³

Phoenix Climate Action Plan

In 2021, Phoenix adopted a climate action plan with the goal of reaching net-zero as a city by 2050 while also reducing 50% of emissions by 2030. Our active transportation network will be a key partnership opportunity in achieving these goals.

Key opportunities identified by the climate action plan that advance active transportation include:

- Creating a connected and comfortable bicycle network that is designed for all ages and abilities
- Expanding the network of multi-use pathways
- Linking active transportation connections with high capacity transit
- Creating walkable and bikeable neighborhood connections

Accessibility and Mobility Benefits

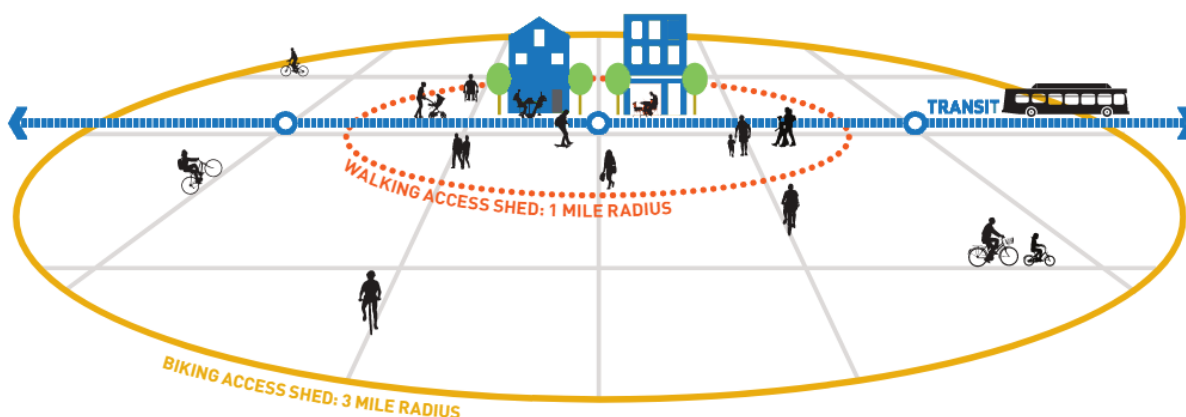
Active transportation provides more options for how people get around, regardless of their reason for travel. Improved infrastructure that provides comfortable and safe routes of travel can encourage more people to use active modes and increase connections to educational, economic, and recreational opportunities.

For those who are unable to drive or lack access to a vehicle, increasing the range of safe walking, biking, and rolling facilities creates large improvements in quality of life - accessing more destinations and opening the door to new possibilities. A robust active transportation network can capture a high percentage of 0-5 mile trips, helping to maximize transportation efficiency, and provide greater choice for residents and visitors.



Source: Maricopa Association of Governments

On average, **40% OF ALL TRIPS** we make are for a distance of **TWO MILES OR LESS**—a distance that can easily be covered by a **10 MINUTE BICYCLE RIDE** or a **30 MINUTE WALK**.¹⁵



12. European Cyclists' Federations. (2016). Cycle More Often 2 Cool Down the Planet! Quantifying CO2 savings of cycling. *ast Company* <https://medium.com/fast-company/as-we-discuss-big-solutions-to-climate-change-dont-forget-people-friendly-streets-18514fe56a43>

13. Brand, C. et al., 2021, The climate change mitigation effects of daily active travel in cities. *Transportation Research Part D: Transport and Environment*

14. Pedroso, M, 2008, Safe Routes to School Steps to a Greener Future: How walking and bicycling to school reduces carbon emissions and air pollutants. *Safe Routes to School National Partnership*

15. NHTS 2009, FHWA Office of Policy



Telegraph Rd.
E. Main St. →

03

COMMUNITY INPUT & PRINCIPLES

INPUT THEMES

Community outreach for the plan was conducted through an online survey, poster polls at neighborhood and community events, and interviews with local leaders and advocacy organizations. This input guided the overall plan goals. Here is a snapshot of what we heard. The full engagement summary can be found in **Appendix A**.

Online Survey

Who Participated?




665

Survey Participants

What we heard:

DAILY TRANSPORTATION

65%  for daily transportation

70% would like to  more often.

TRANSPORTATION BARRIERS

Most common **BARRIERS** to **WALKING**:



Most common **BARRIERS** to **BIKING**:



The highest percentage of respondents rate current conditions in Phoenix as **UNSAFE** for



58% of residents agree with "I would support lowering speed limits in exchange for making streets more comfortable for walking and biking" with 37% saying they strongly agree.

 **58%** agree

TRANSPORTATION DESIRES

Respondents would **LIKE TO SEE MORE**:



bike infrastructure, specifically bike lanes that are protected or separated from vehicle travel lanes.

streets with sidewalks, specifically detached sidewalks with shade



midblock crossings



PRIORITIES

GENERAL TRANSPORTATION:



preventing injury-causing collisions



everyone has a comfortable option for using the street

STREET-SPECIFIC



expanded bikeway network



shade



neighborhood routes over regional



comfortable over low-cost



safety over upgrading/adding paths



65% of respondents feel unable to find information and ways to provide input on local bicycle and pedestrian projects in their neighborhood.

Poster Polls

Who Participated?



79

Poster Poll
Participants

What we heard:

SPECIFIC PRIORITIES



NEIGHBORHOOD BICYCLE ROUTES should be a higher priority than regional routes



The City should prioritize **COMFORTABLE BICYCLE FACILITIES** over lower-cost facilities

GENERAL PRIORITIES



SAFETY



TRANSIT ACCESS



EQUITY

Draft Plan Feedback



PROTECTION AND SEPARATION between vehicles and cyclists / pedestrians is important



Heat and **LACK OF SHADE** are a deterrent to walking and biking



BETTER PROTECTION for cyclists and pedestrians **AT INTERSECTIONS**



More **FREQUENT ARTERIAL CROSSINGS**



More **ACCOUNTABILITY AND TRANSPARENCY** on project delivery

Interviews with Local Leaders and Advocacy Organizations

Who Participated?

4

Representatives from two education and advocacy organizations

7

Community leaders from the 6 marginalized zip codes identified in the equity map

What we heard:



BICYCLE ADVOCATES

- Need for increased awareness/education about city projects; better messaging when relating neighborhood projects to overall city goals.
- Concerns about traffic, speeding, and lack of infrastructure to make walking and biking safe.
- City should work to improve the culture with the streets department. In addition, there are concerns about internal politics, turnover, and a lack of strong advocates within the department.



COMMUNITY LEADERS IN HISTORICALLY MARGINALIZED AREAS

- Concerns about safety; lack of sidewalks in some residential communities (particularly West & South Phoenix), inconsistent bike paths, speeding, homeless encampments, violent crimes, drug use, and stray dogs.
- Need for more accountability and transparency from the city. In addition, they are not confident the city will show up for their communities; supportive of additional street infrastructure if it supported their current safety needs.

GUIDING PRINCIPLES

Developing an intentional active transportation network that is responsive to the community must be driven by key guiding principles. The future active transportation network in Phoenix should be one that is safe, connected, enjoyable, and equitable. These principles should guide future decision-making around facility selection and design and work together to create a better environment for people walking and biking in Phoenix.



Equitable

The City will develop active transportation networks that meet the needs of all Phoenixians and will prioritize improvements for areas with the highest need and vulnerable and disadvantaged populations. Your identity, ability, and/or where you live should not determine your ability to safely and enjoyably travel around Phoenix.



Safe

The City will develop active transportation networks that eliminate bicycle and pedestrian fatalities and serious injuries. People walking and biking in Phoenix should be able to travel to their destination without fear or the undue risk of being killed or seriously injured in traffic.



Connected

The City will develop active transportation networks that connect people to where they want and need to go. People in Phoenix should be able to walk and bike to destinations within their urban villages that allow them to meet their daily needs such as to school, work, parks and trails, attractions, healthcare, transit, and more.



Enjoyable

Travel along Phoenix's bikeways and pedestrian corridors should be an enjoyable experience. Routes that support people of all ages and abilities will include separation from motor vehicles, reduce exposure to high speed and high volume traffic, provide shade for heat resiliency, and encourage more people to walk and bike to nearby destinations.

04

REVIEW OF EXISTING PLANS

REVIEW OF EXISTING PLANS

The City of Phoenix's transportation system is guided by a number of different local and regional plans and initiatives. Many of these completed plans and initiatives directly or indirectly address active transportation as part of their implementation priorities, which highlights the important role active transportation plays in achieving a variety of different objectives. The policies, design guidelines, and network development program outlined in this plan were drafted with this in mind, and are an attempt to build upon and advance many of the active transportation objectives already outlined in other plans.

Citywide plans reviewed included the Phoenix General Plan (2015), the Phoenix Strategic Plan, City of Phoenix Complete Streets Policy, the Transportation 2050 Plan (T2050), and the Climate Action Plan (2021). Other

plans reviewed included the 2014 Comprehensive Bicycle Master Plan, Sustainability Transportation Goals, Shifting Gears Five Year Bicycle Program (2018), the Downtown Phoenix Comprehensive Transportation Study, Reinvent Phoenix, and the Mobility Improvements Program.

This section is a summary of some of the key themes that came out of the existing plan review, and includes some specific policies and goals related to active transportation from those plans. These themes provided the foundation for policy and design guidance recommendations.

Recommendation	Existing Plan	Summary
Theme 1: Improve Safety & Comfort for Pedestrians and Enhance the Pedestrian Experience		
Cores, centers and corridors will have pedestrian and bicycle connections to the surrounding community	Phoenix General Plan	There is an opportunity to better define pedestrian planning in Phoenix by building on policies and objectives in other city plans. The ATP should focus on pedestrian comfort and safety through policy development and design guideline updates. Factors influencing the pedestrian experience include safe crossings, lighting, visibility, shade, and separation from traffic, among others.
Plan, design, develop, and maintain green infrastructure, such as interconnected trail systems that increase shade canopy coverage and promote pedestrian mobility	Phoenix Strategic Plan	
Less traffic and more crosswalks are the future	Reinvent Phoenix	
Build more high comfort (safer, better-connected) networks	Maricopa Association of Governments (MAG) Active Transportation Plan	

Recommendation	Existing Plan	Summary
Theme 2: Prioritize Active Transportation Improvements Around First/Last Mile Transit Connectivity		
Create more walkable corridors to connect to station areas	Reinvent Phoenix	First/last mile connectivity to transit is an important intersect between public transit and active transportation; the provision of comfortable and safe bicycle and pedestrian facilities makes people more likely to walk or bike to transit. The provision of quality active transportation infrastructure around transit has the added benefit of increasing transit ridership.
Conduct additional project assessments for major street sidewalk improvements for ADA non-accessible bus stops	Mobility Improvement Programs	
A particular emphasis on improving connectivity and access to major transportation and transit corridors	Transportation 2050 Plan	
Encourage bike integration with the overall transit system	Phoenix Comprehensive Bicycle Master Plan	
Provide first-mile/last-mile connections that complement and even supplement transit during disruptions	Shared Mobility Program	
Theme 3: Improve Coordination Between Departments & Agencies on Active Transportation Implementation		
Phoenix street environment to be more inclusive of pedestrians, cyclists, and transit-users will require coordination with and support of many City departments and adjacent landowners	City of Phoenix Complete Streets Policy	Many plans, agencies, and departments reference active transportation as an objective, and while many positive references to active transportation in other plans exist, it's important to understand whether they are being implemented and what barriers to implementation might exist.
Street Transportation Department will lead implementation of Complete Streets for projects	Phoenix Strategic Plan	
Build off the agency partnerships that developed the plan to implement the TOD vision	Reinvent Phoenix	
Strengthen regional transportation planning coordination with state and regional governmental agencies and public service providers	Phoenix Comprehensive Bicycle Master Plan	
Theme 4: Understand and Assess Funding Sources		
The Planning and Development Department will provide guidance for privately funded projects to implement the Policy	City of Phoenix Complete Streets Policy	Understand what funding exists, how funding is being used and allocated, and understand public support and priorities in terms of funding.
T2050 dedicates nearly 14% of its total transportation funding towards improvements that expand bicycle and pedestrian connectivity	Transportation 2050 Plan	
The Street Transportation Department's Capital Improvement Program (CIP), the five-year program provides over \$750 million in improvements to street transportation infrastructure	Shifting Gears Five Year Bicycle Plan	
Seek State and Federal funding through the Maricopa Association of Governments (MAG) to assist with implementation of large and difficult projects	Phoenix Comprehensive Bicycle Master Plan	
Theme 5: Design Guidelines and Standards		

Recommendation	Existing Plan	Summary
Complete Streets principles will be included into the General Plan and other relevant plans, manuals, rules, regulations, ordinances and programs as determined by staff and the Complete Streets Advisory Board	City of Phoenix Complete Streets Policy	Developing Design Guidance that follow best practices allow for the implementation bicycle and pedestrian facilities that can attract users of all ages and abilities. This guidance can improve safety, functionality, and comfort for users. They are a tool for the Street Department for installation and can provide context sensitive designs that will help achieve mode shift goals and safety goals.
Potential improvement strategies should be “context sensitive” solutions.	Transportation 2050 Plan	
Update City of Phoenix guidelines addressing bicycle facility design and traffic control	Phoenix Comprehensive Bicycle Master Plan	
Building out a regional active transportation network for all ages and abilities	Maricopa Association of Governments (MAG) Active Transportation Plan	

Theme 6: Sustainability

Create a network of shared-use trails and pathways that are safe, convenient and connected within preserves and parks	Phoenix General Plan	Active transportation is one main component in creating a sustainable future. Vehicular transportation is one of the largest contributors to greenhouse gas (GHG) emissions and contributes to climate change. The ATP will be the key planning document to reduce dependency on driving. Additionally, the ATP will provide recommendations for landscaping that could have benefits to water and urban heat issues.
Reducing energy usage from street lights while improve visibility by replacing 100,000 street lights with new LEDs	Shifting Gears Five Year Bicycle Plan	
Allowing 90% of the population to be a 10-minute walk from transit through the expansion of routes and service frequency (and shaded bus stops)	Environmental Sustainability Goals – Transportation	
Increase the active transportation mode share to 30 percent by 2040	Maricopa Association of Governments (MAG) Active Transportation Plan	
Continue to implement the Tree & Shade Master Plan to establish 25% tree and shade canopy in streets and pedestrian areas by 2030 (medium term 2030-2035)	Climate Action Plan	
Increase bike lane mileage in the City of Phoenix and ensure the bicycle network is connected and comfortable for riders of all ages and abilities. (long term 2040-2050)	Climate Action Plan	
Create a network of multi-use paths along the existing canal network in Phoenix (long term 2040-2050)	Climate Action Plan	
Develop a series of corridors with a strong emphasis on active transportation and connections to high-capacity transit corridors (long term 2040-2050)	Climate Action Plan	

05

ACTION & ACCOUNTABILITY

ACTION & ACCOUNTABILITY

Translating Community Input into Action

The Active Transportation outreach approach was designed to capture community priorities, desired outcomes, and process approaches in order to draft plan recommendations aligned with community priorities. The initial round of community outreach focused on soliciting input that could form the basis of the plan guiding principles, priorities, and the general direction for recommendations.

The first round of outreach included an online survey, poster polls, and targeted outreach to neighborhood leaders and active transportation advocates. Each method of outreach was able to reach different populations; the poster polls at community events and targeted outreach to neighborhood leaders were a way to get feedback from residents that may not normally opt into online polls.

As City staff will be responsible for implementing the plan, stakeholder interviews with City staff were conducted to better understand challenges and feasibility as part of the initial outreach. The internal Active Transportation Advisory Team provided further information on opportunities and challenges from several departments, including:

- Streets & Transportation
- Parks & Recreation
- Office of Sustainability
- Planning & Development
- Public Transit
- Aviation
- Neighborhood Services
- Community & Economic Development

The internal staff outreach ensured recommendations were feasible by identifying what could be achieved within the twenty-year planning horizon while also highlighting opportunity areas with potential for rapid actions.

Input from outreach is reflected in the plan guiding principles, network development program, design guidance, and the policy recommendations, as follows.

Plan Guiding Principles

Across each outreach method, respondents were asked about their big picture priorities and guiding principles when it comes to transportation. The survey and poster polls focused on tradeoffs to ensure plan recommendations and prioritization were grounded in community priorities.

In the online survey, respondents most frequently identified safety as their top priority, followed by canals, equity, high comfort facilities, and gap closure. Poster poll participants had largely similar priorities. At the Laveen BBQ, respondents ranked safety first, followed by parks and community centers, transit access, canals, and equity. At First Friday in downtown, respondents selected transit access as their top priority followed by safety, access to population and employment centers, equity, and canals.

These priorities are captured in the plan guiding principles of safe, connected, enjoyable, and equitable active transportation networks. Though each group of respondents had different top priorities for where active transportation networks should connect to, the neighborhood-scale planning recommendations in the Community Active Transportation Network Program will allow different communities to identify the important destinations for their neighborhoods. Policy recommendations on canal paths are also included in the plan.

Policy Recommendations

Active transportation infrastructure is part of the city fabric, usually sharing the same streets as cars, and connecting to the same places. In the survey and through targeted outreach, the planning team asked about

overall transportation priorities to better understand how Phoenixians would like to see active transportation integrated into the city. Interconnected transportation and land use issues, along with the tradeoffs inherent to creating truly multimodal streets, were mentioned in targeted outreach and in survey comments.

While survey respondents overwhelmingly expressed interest in walking and biking more, features of the car-oriented built environment were consistently identified as the major barriers to active transportation in Phoenix. Unsafe driving and distances between places were most frequently identified as the top barriers to walking, while unsafe driving and bike lanes too close to traffic were the top barriers to biking. To meaningfully address these barriers, the policy recommendations include potential updates to policies and procedures that impact land use and street design.

Through the current General Plan, Complete Streets Policy, and Transit-Oriented Development planning the City of Phoenix already has strong policy support for multimodal street design and supportive land use. However, in conversations with internal City staff, a recurring theme was the need to translate high level policy recommendations into updates for existing procedures and practices.

The need to match high level policies with day-to-day practices was echoed in targeted outreach as well. Representatives of advocacy groups, who had been involved in campaigns to adopt these policies and plans, felt the recommendations had not always resulted in implementation. Neighborhood leaders representing historically marginalized communities doubted the city could follow through on delivering their stated vision, based on direct experience with previous planning processes.

Carrying overarching policy recommendations into implementation is particularly important for active transportation as it is both a desired outcome in city plans and a means to achieving other outcomes, such as reducing carbon emissions reductions and improving air quality. As a result, the policy recommendations include

specific recommendations for implementing existing plans through an active transportation lens. Recommendations for consideration in the upcoming General Plan update are also included to further link land use and transportation in Phoenix.

Overcoming Existing Active Transportation Barriers

While active transportation barriers exist, the new design guidance, policies, and network development approach, in conjunction with the work of other plans/initiatives, will continue to advance active transportation in Phoenix. Expanding active transportation culture will not happen overnight, it will happen incrementally.



Source: Maricopa Association of Governments

Community Active Transportation Network Program

During outreach, respondents were asked directly about tradeoffs in the planning and design process, specifically, whether they would prefer planning to focus on regional or local networks and whether they would prefer safer, more expensive infrastructure or more miles of lower-cost infrastructure. Across all outreach methods, respondents preferred to focus on connections to local destinations and higher-quality infrastructure, even if the increased cost resulted in less mileage overall. These preferences were particularly pronounced for poster poll participants.

Direct conversations with community leaders from historically marginalized neighborhoods helped the planning team to better understand needs and desires from communities that often do not get prioritized in citywide plans. Many community leaders expressed concerns about personal safety in addition to traffic safety. They mentioned the lack of sidewalks in some residential communities (particularly West & South Phoenix), inconsistent bike paths, speeding, homeless encampments, violent crimes, drug use in neighborhoods, and stray dogs.

The preference for local network connections tailored to neighborhood level concerns shaped the recommendations for network development. The Community Active Transportation Network Program is designed to provide an opportunity for the Street Transportation Department to work with communities at a scale that allows for careful consideration

THE PROGRAM WILL IDENTIFY AND IMPLEMENT:

- Neighborhood-scale bicycle facilities
- Safe crossings of major roadways
- Enhanced accessibility to transit
- Safe routes to schools, community centers, and activity centers
- Connections to trails and parks

of community destinations and connections. The program's focus on equity, safety, and tying together existing connections will allow for the identification of projects that are driven by neighborhoods themselves, beginning with urban villages that have the greatest need. It will be a way for the department to create stronger relationships with communities, share information, and be more transparent about decisions.

The program will assess two urban villages per year and will immediately implement the priority projects that can be quickly built in the next two years. The program will operate from 2023 through 2031, and funding for the network development program has been allocated by the City.

In addition to the priority projects that can be quickly implemented, the outreach is anticipated to identify maintenance issues and potential Capital Improvement Projects. The program will help guide available resources to high priority community projects, even outside of the quick-build projects envisioned for the

Community Active Transportation Network Program Schedule

	2023	2024	2025	2026	2027	2028	2029	2030	2031
Network Assessment	Village 1 Village 2	Village 3 Village 4	Village 5 Village 6	Village 7 Village 8	Village 9 Village 10	Village 11 Village 12	Village 13 Village 14 Village 15		
Project Implementation		Villages 1 and 2	Villages 1 through 4	Villages 3 through 6	Villages 5 through 8	Villages 7 through 10	Villages 9 through 12	Villages 11 through 15	Villages 13 through 15

Roadway Reallocation

Space reallocation projects involve reallocating street space through the use of roadway paint and modular infrastructure, such as flexposts. Roadway reallocation projects are less costly than roadway reconstruction projects, are able to react to community input, and can be installed quickly.



Source: Maricopa Association of Governments

program. When the program has worked with every urban village in Phoenix, the Street Transportation Department will work with Phoenix residents and City leadership to determine the next steps for further building out the network and how to best continue the work of the program.

Design Guidance

The design guidance provides information on safe and comfortable active transportation infrastructure. The guidance is intended to support the design and implementation of infrastructure types that respondents prioritized during the outreach process.

In the online survey, respondents were asked more specific questions about infrastructure types and tradeoffs around speed limits. They were also asked whether they supported lowering speed limits in some cases. Respondents consistently supported safe, enjoyable, and connected infrastructure designs even if they added congestion. The preference for separation from motor vehicles and slower speeds informed policy recommendations in addition to the design guidance.

When asked about whether they would like to see more of a given type of infrastructure in Phoenix, respondents were most enthusiastic about infrastructure types that provided greater separation and shade. A detached sidewalk with shade was the single most popular picture, with 94% of respondents agreeing to some degree they would like to see more in Phoenix, and 74% strongly agreeing. For bike infrastructure, designs with more separation (e.g. curb protected bike lanes) received the most enthusiastic support while designs with no separation (e.g. Bike Boulevard) received the least enthusiasm. In all cases, the majority of respondents at least slightly agreed they would be willing to accept increased rush hour congestion as a trade off.



Source: Maricopa Association of Governments

Implementation and Tracking

The plan has three assessment areas, with three distinct paths to implementation. Additionally, the plan builds on previous plans, policies, and initiatives. Implementation timelines for each of these areas are detailed below. Progress on metrics will be included in an annual update to the Citizens Transportation Commission along with bike mile tracking.

Ongoing Commitments

The Street Transportation Department will prioritize maintaining momentum on active transportation initiatives already underway. The department will continue to deliver on the following programs and project types:

- upgrade bike lanes identified through pavement projects where there is space on the street
- Maricopa Association of Governments Active Transportation Plan Regional Routes: The department will continue to seek funding from the Maricopa Association of Governments to build out routes in the regional Active Transportation Plan
- Complete Streets: The department will continue to review development projects and Capital Improvement Plan projects to recommend bike lanes, sidewalks, street crossings, and other Complete Streets design features
- Canalscape projects: The department will continue to seek funding to build out the canal path network
- Pavement projects and other striping projects: The department will continue to add bike lanes and

Ongoing Tracking Metrics

The Street Transportation Department will continue to report on active transportation metrics set by previous plans. Delivering on ongoing commitments and metrics is a key component of the Active Transportation Plan.

Existing plan or initiative	Goal	Evaluation Metrics
Transportation 2050	Add 1,080 bike lane miles from 2015 to 2050	<ul style="list-style-type: none"> Target of 30.9 new bike lane miles per year, reported annually to the Citizens Transportation Commission
Climate Action Plan	Multi-use paths along 90% of canals in Phoenix by 2050	<ul style="list-style-type: none"> New miles of paths included in the annual T2050 reports
2014 Comprehensive Bicycle Master Plan	Achieve Platinum level Bicycle Friendly Community Status	<ul style="list-style-type: none"> Apply for Bicycle Friendly Community Status every two years to benchmark progress Work continuously towards Platinum status (note- the previous timeline for achieving different levels of bicycle friendliness has been updated to emphasize more frequent applications rather than specific milestones as the Bicycle Friendly Community Status standards are regularly updated)

New Tracking Metrics

Plan Assessment Areas	Timeframe	Evaluation Metrics
Design Guidance	The design guidance will be used as a reference tool by internal staff and design teams as soon as it is finalized. The document is deliberately designed as a standalone piece in order for the PDF to be easily distributed and printed.	<ul style="list-style-type: none"> Design guidance internally distributed Design guidance posted on Street Transportation Department website Internal staff survey to check whether it is being used one year after adoption
Network Development	Staff will begin work on the Community Active Transportation Program as soon as the Active Transportation Plan is adopted. Outreach for the first two villages is anticipated to start in the fall of 2023.	<ul style="list-style-type: none"> Network planning conducted with two villages per year until all villages are completed. % of recommended quick-build projects within two years of finalizing Community Active Transportation Network recommendations
Policy Recommendations	Implementation priorities and timeframe are detailed in the Policy Recommendations chapter.	<ul style="list-style-type: none"> % of policy recommendations initiated within the recommended timeframe



Source: Maricopa Association of Governments



City of Phoenix



City of Phoenix

COMMUNITY ACTIVE TRANSPORTATION NETWORK PROGRAM ELEMENT

APRIL 2023



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COMMUNITY ACTIVE TRANSPORTATION NETWORK PROGRAM

INTRODUCTION

The City of Phoenix Active Transportation Plan establishes a framework for advancing walking and biking infrastructure, programs, and policies in the City. While this plan does not explicitly analyze the existing network or recommend specific projects, it does propose a framework for how the City can advance these efforts in accordance with the Plan's vision, goals, and priorities. The following document outlines a program that would implement this framework, including recommended analyses, planning areas and priorities, and processes for translating analysis results and public input into a comprehensive network.

Responding to Plan Goals

This framework responds to the plan's goals and addresses the following:

- **Safe Networks:** Phoenix's walking and biking networks should facilitate safe travel to destinations across the city. People traveling in Phoenix should not experience undue risk of serious injury or death. The City will develop transportation networks that reduce conflict points and eliminate serious injuries and fatalities.
- **Equitable Networks:** Safe and connected active transportation networks should meet the needs of all Phoenixians. This plan provides an opportunity to invest in Phoenix's highest need areas and help remove barriers to access for vulnerable and disadvantaged populations in the city.
- **Connected Networks:** A functional and effective network will connect people to where they want and need to go. Bicycle and pedestrian network will support access to school, work, parks and trails, attractions, healthcare, transit, and more. The City will create a complete and connected bicycle and pedestrian network that supports travel within neighborhoods and across the city.
- **Enjoyable Networks:** Travel along Phoenix's bikeways and pedestrian corridors should be an enjoyable experience. Routes that support people of all ages and abilities will include separation from motor vehicles, reduce exposure to high speed and high volume traffic, provide shade for heat resiliency, and encourage more people to walk and bike to nearby destinations.



Source: Maricopa Association of Governments

COMMUNITY ACTIVE TRANSPORTATION NETWORK PROGRAM

The City of Phoenix covers nearly 520 square miles and is home to more than one million people. Today, 4,863 miles of roadway and 183 miles of shared use paths support travel across the city. Each year, the City installs new bikeways, crossings, and pedestrian infrastructure in coordination with capital projects and the ongoing resurfacing program. While this provides a method to advance active transportation networks in the city—and will continue to do so in the future—it does not directly consider opportunities to develop a complete and connected network by closing network gaps, improving safety at intersections, and connecting people to where they want to go, particularly at the neighborhood scale, a priority identified in the project outreach.

Improving routes across the whole city will require significant investment both in terms of funding as well as staff time. Phoenix covers more than 500 square miles, with varying levels of both need and opportunity in different areas of the city. To support development of high-quality networks in an organized and efficient manner, Phoenix can focus planning and implementation efforts by Urban Village. Urban Villages in Phoenix provide a manageable scale for assessing network opportunities while still being large enough to result in tangible improvements for how people get around both within their neighborhood and

across the city. Focusing on assessment by Urban Village also creates an opportunity for an intentional neighborhood-focused engagement process where neighborhood residents can help identify and prioritize which local projects are most needed and most relevant to their daily lives.

The program will assess two villages per year, and then implement priority projects that can be quickly built in the next two years. All told, the program will run from 2023 through 2031. The schedule of assessments and project implementation are limited by the availability of funding for assessments each year, and the existing schedule/speed of roadway restriping. Funding for the transportation network program and the priority projects will be allocated from those earmarked for the Bicycle Master Plan.

The sections that follow outline the process, starting from selecting which Urban Villages to plan for first through analysis and project development. It includes the following steps:

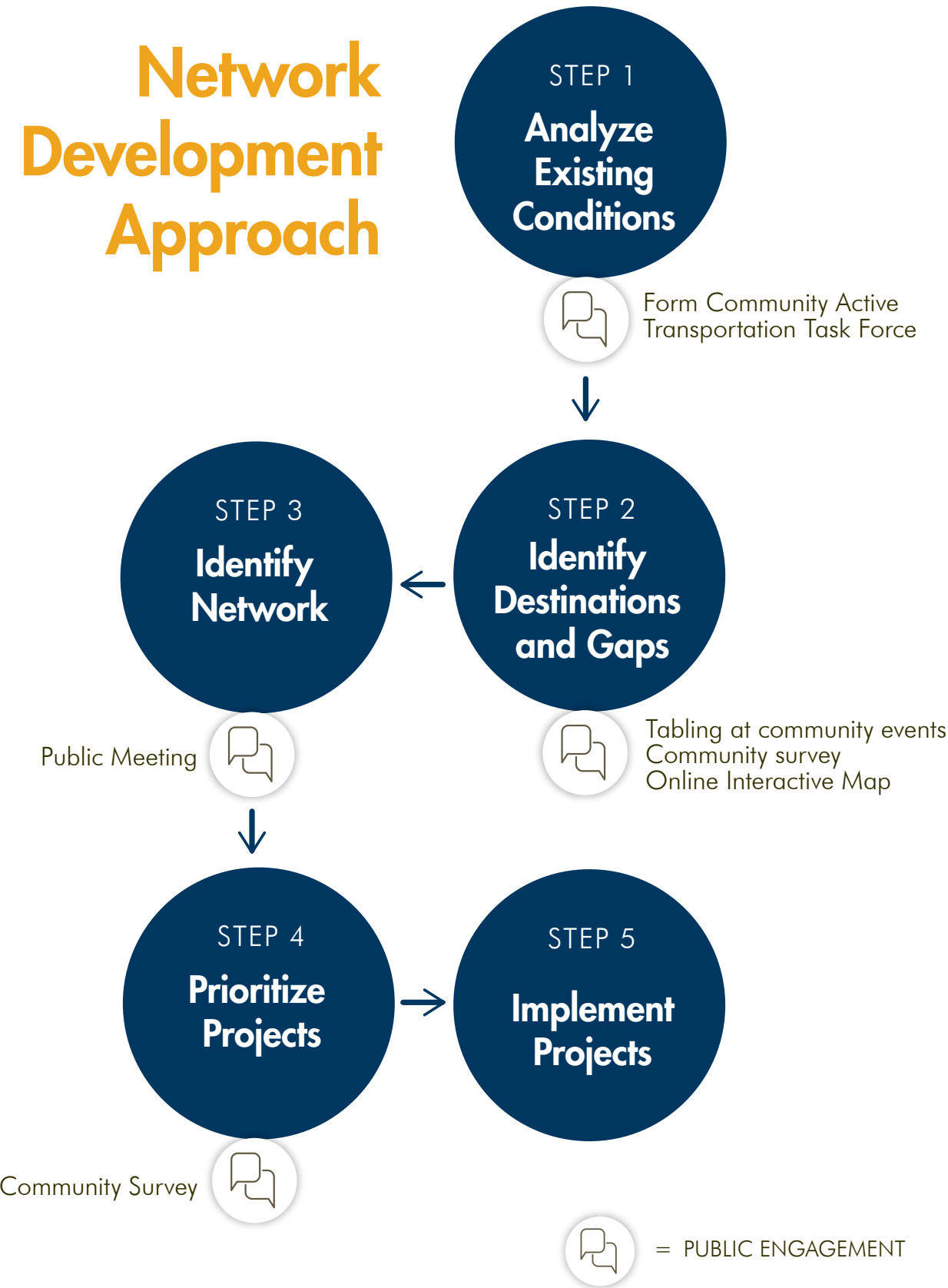
Pre-work: Prioritize Urban Villages

1. Analyze Existing Conditions
2. Identify Destinations
3. Identify Network
4. Prioritize Projects
5. Implement Projects

Community Active Transportation Network Program Schedule

	2023	2024	2025	2026	2027	2028	2029	2030	2031
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Project Implementation		Villages 1 and 2	Villages 1 through 4	Villages 3 through 6	Villages 5 through 8	Villages 7 through 10	Villages 9 through 12	Villages 11 through 15	Villages 13 through 15

Network Development Approach



Community engagement is a critical element of the process, and needs to be incorporated in order to achieve the neighborhood-driven project identification and prioritization outcomes being recommended by this plan. Respondents to the project survey and input at outreach events identified the desire and need for better neighborhood-focused connectivity that allows residents to walk, bike, and roll around their local neighborhoods more safely and enjoyably. This Urban Village assessment process is intended to address that feedback and allow the city to better understand and react to active transportation needs at the neighborhood scale. Each urban village in Phoenix has different contexts and the engagement process is a way to help drive neighborhood-identified projects that truly make an impact.



Source: City of Phoenix

The sections that follow identify recommended approaches for engagement to provide a more comprehensive understanding of local community priorities and conditions.

Pre-Work: Prioritize Urban Villages

Identification of priority Urban Villages (Figure 1) for network planning and implementation should consider the location of historically disadvantaged and vulnerable populations as well as existing infrastructure deficiencies. The results of the Equity Analysis (Figure 2) will inform identification of focus populations, while data capturing existing active transportation facility locations should be used to identify network deficiencies.

As the geographic coverage of Urban Villages varies, the City should combine smaller areas with comparable characteristics to facilitate network connections. For example, Encanto and Central City cover relatively small areas in comparison to other Villages and may be considered together.

Recommended Urban Village Assessment Prioritization Strategy:

Equity: Using the equity analysis, prioritize Urban Villages for assessment based on the percentage of the Village scoring as high need based on demographic and environmental justice factors.

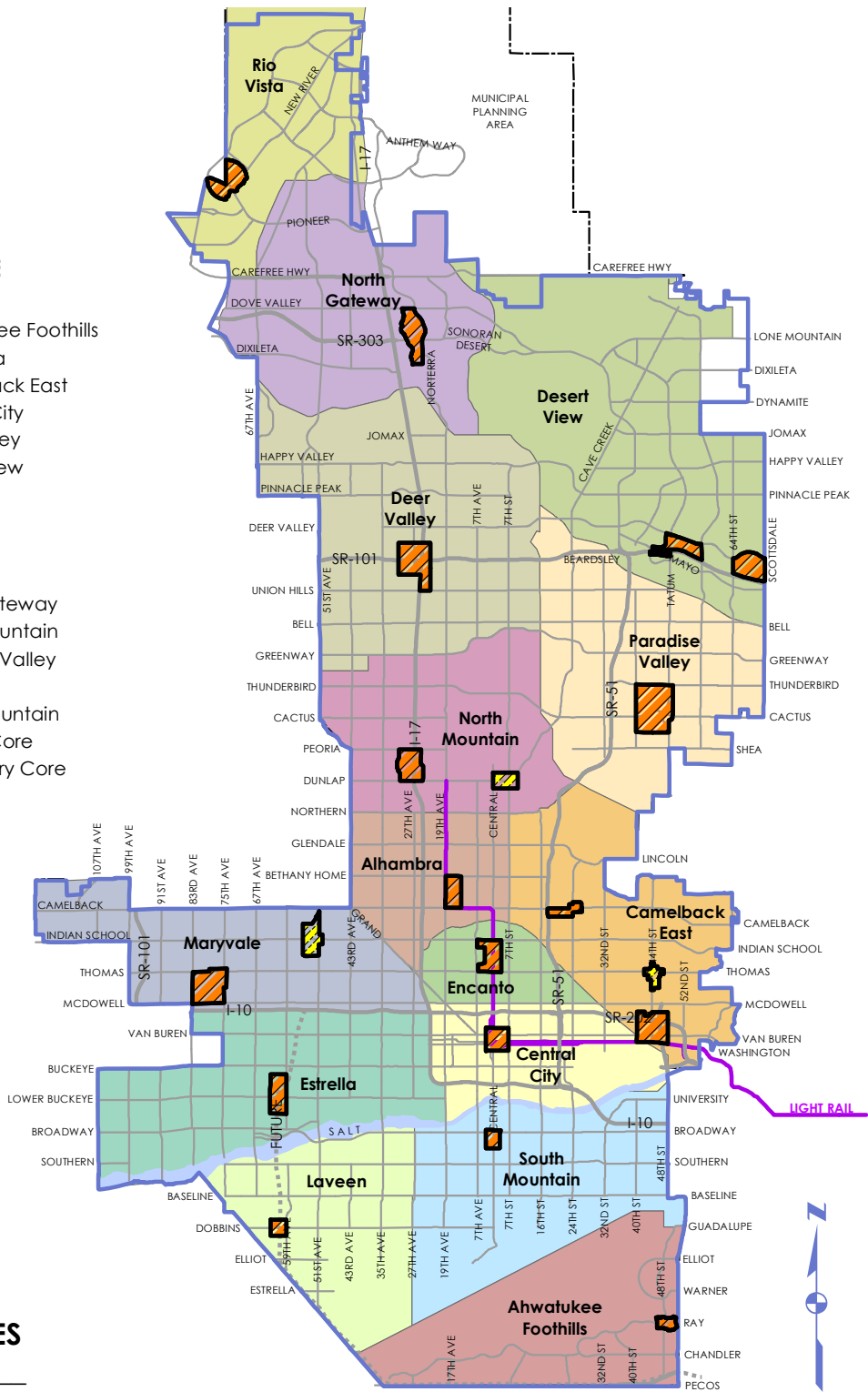
Equity: Rank Urban Villages based on existing facility presence. Evaluate the ratio of miles of bikeways to miles of roadway centerline, as well as ratio of miles of sidewalk to miles of centerline miles. The City will need to obtain sidewalk data to support this assessment.

Safety: Rank Urban Villages based on active transportation related serious injuries and fatalities. Coordinate with Maricopa County Public Health to obtain hospital data on pedestrian and bicycle serious injuries and fatalities. Identify Urban Villages with highest numbers of pedestrian and bicycle serious injuries and fatalities.

**URBAN
VILLAGE
& VILLAGE
CORES**

- Ahwatukee Foothills
- Alhambra
- Camelback East
- Central City
- Deer Valley
- Desert View
- Encanto
- Estrella
- Laveen
- Maryvale
- North Gateway
- North Mountain
- Paradise Valley
- Rio Vista
- South Mountain
- Primary Core
- Secondary Core

**URBAN
VILLAGES
FIGURE**



Equity Analysis Results

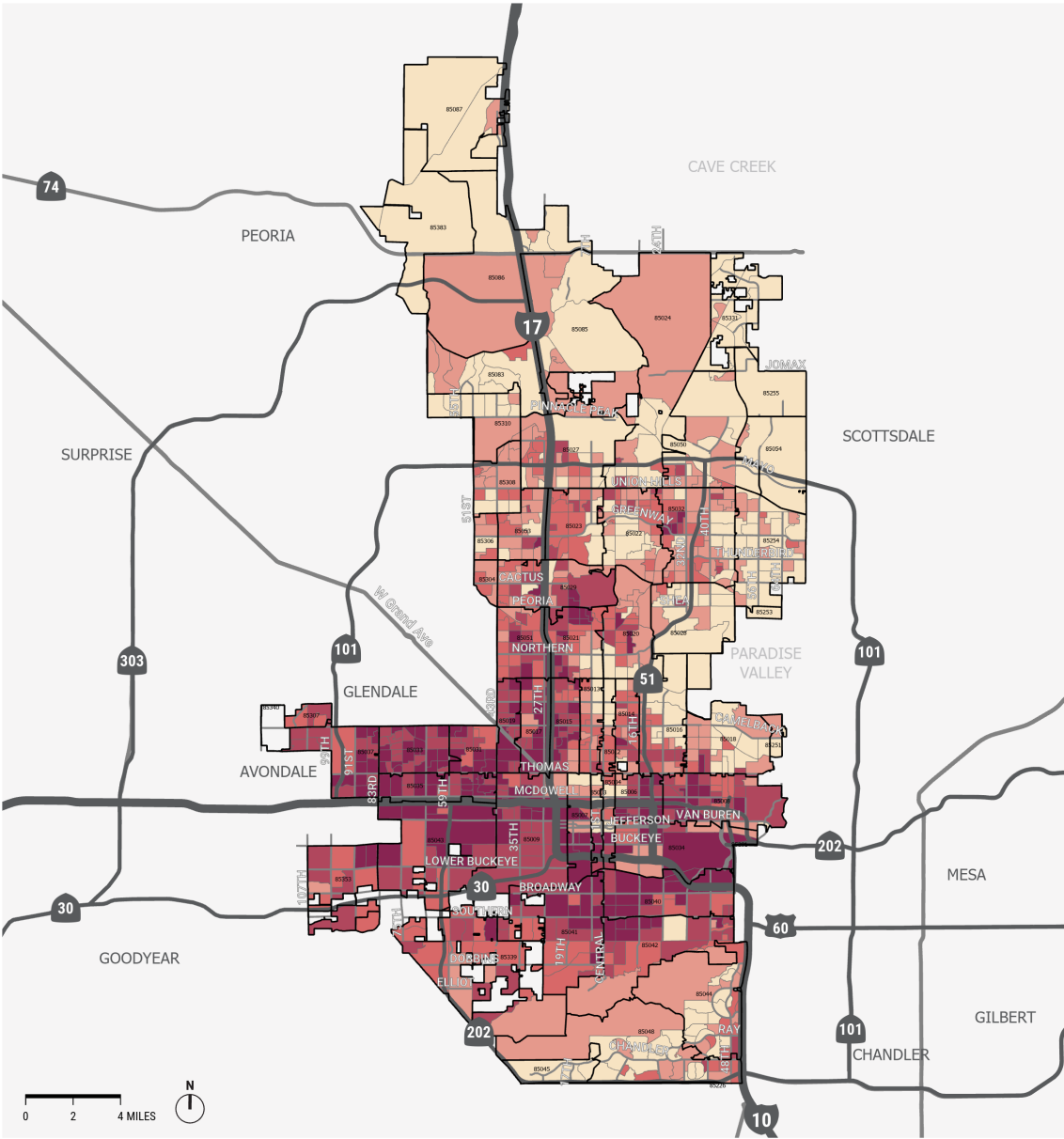
The equity analysis in Phoenix is shown on the next page and is broken down at the Census Block Group level. Generally, south and west Phoenix are shown as areas of highest need, with other pockets of need also shown along the I-17 corridor. Urban Villages with the highest need based on this analysis include South Mountain, Maryvale, Estrella, Alhambra, and North Mountain.

What is an Equity Analysis?

An equity analysis utilizes demographic and environmental metrics to help identify areas of the community with higher need. Generally, areas that also score high on the equity analysis area also areas that have been historically underserved and where infrastructure can be lacking behind other parts of the community. For the Phoenix ATP, The United States Environmental Protection Agencies Demographic and Environmental EJ Screen factors were used to help identify areas of need at the Census Block Group level in Phoenix. The results of this analysis are shown on the next page.



Source: Alta Planning + Design



EQUITY ANALYSIS

CITY OF PHOENIX
ACTIVE TRANSPORTATION PLAN



- Combined Level of
Environmental Exposure and
Demographic Need (by Census
Block Group)
- Low Exposure + Need
 - High Exposure + Need
 - Zip Code Boundaries

Step 1: Analyze Existing Conditions

For each Urban Village, analyze the existing network conditions. The results of this step will provide baseline information that will guide project identification in subsequent steps. This process begins with mapping existing bikeways, sidewalks, and supporting infrastructure. Table 1 identifies the recommended analyses, based on plan goals, that can support the planning process. For each analysis, the table includes the following information:

- **Analysis Name and Description**, including what the analysis will accomplish and the information it provides for the planning process;
- **Required Data**, which can guide the City's identification of new datasets that may be required;
- **Anticipated Baseline Measurements**, which identify the metrics that will result from the analysis;
- **Recommended Metric**, or an identified standard to use as a point of comparison or for goal setting and progress tracking; and
- **Resources**, which link to available documentation or informational resources to learn more.

For the Recommended Metric, or identified standard, it is important to note that in many cases, specific standards or absolute rules are not available. Instead, the City of Phoenix should both track progress based on improving the metric (e.g., reduction of crashes annually) as well as identify standards that are appropriate for various contexts in the City based on considerations like existing level of service, land use and roadway context, and coordination across departments. For example, safety metrics should correspond with the policies and actions identified in the City's Vision Zero Road Safety Action Plan and in coordination with the Action Plan's goals. FHWA's Guidebook for Developing Pedestrian and Bicycle Performance Measures can help further guide the City in this effort.

Community Engagement

COMMUNITY ACTIVE TRANSPORTATION TASK FORCE

A Community Task Force will guide decision-making and oversee the selection of neighborhood priorities. The Task Force will be neighborhood-focused and representatives will include residents, businesses, community-based organizations, and neighborhood leaders. It is imperative that the Task Force represent a cross-section of the urban village to better identify neighborhood-specific needs.

The role of the Task Force will be to review the survey to help establish neighborhood-specific needs and challenges, engage their neighbors as routes are developed, and help prioritize facilities for implementation.



Source: Maricopa Association of Governments

Plan Goal	Analysis Name	Analysis Description	Required Data	Anticipated Baseline Measurements	Recommended Performance Measure / Outcome	Resources
Safe Network	Crash Analysis	Identify crash trends, hotspots, and characteristics through an analysis of bicycle- and pedestrian-involved crashes. Consider both frequency of crashes as well as severity. Areas with high frequencies of crashes or severe/fatal crashes can guide further analysis to identify relevant countermeasures.	<ul style="list-style-type: none"> Bicycle- and pedestrian-involved crashes for the last 5 years 	<ul style="list-style-type: none"> Annual trends crashes numbers, separated by severity Proportion of crashes involving bicyclists and/or pedestrians compared to all collisions Relationship of crashes locations to existing active transportation facilities 	Annual reduction in crashes. Zero traffic deaths	
	Safety Review	Analyze crash data to determine patterns in crash locations. Consider roadway characteristics, such as speed or number of lanes, and evaluate available crash characteristics, such as contributing factors. Identify factors that are associated with high crash locations. This step may also utilize existing crash profiles, as available and applicable.	<ul style="list-style-type: none"> Bicycle- and pedestrian-involved crashes for the last 5 years; Roadway Characteristics 	Summary of crash location trends and associated roadway characteristics.	Develop corresponding countermeasures, review and revise design requirements as needed	FHWA Safe System Approach
Connected Network	Destination Density	Identify activity centers and other destinations that active transportation networks will connect. Destinations will include schools by type; transit stops and hubs; parks; trails; shopping centers; employment centers; attractions; and other destinations as determined by the City of Phoenix. The results of this exercise will inform identification of key routes that connect destinations within an Urban Village.	<ul style="list-style-type: none"> Schools by type; Transit stops and hubs; Parks and trails; Employment Centers; Attractions; Other destinations as determined by the City of Phoenix. 	N/A. This analysis visualizes data to serve as a reference layer for gap identification and route development.	Establish minimum network spacing standards and connectivity requirements based on land use context and associated destinations.	
	Crosswalk Spacing	Evaluate the distance between signalized, marked crosswalks along major roadways, including arterials and collectors. The results of this analysis will provide insight into locations where crossing improvements are needed to support safer, more comfortable travel.	<ul style="list-style-type: none"> Traffic Signals, Pedestrian Hybrid Beacons, RRFBs 	Percent of roadways with crossing opportunities less than 800 ft apart; between 800 ft and ¼ mile; between ¼ mile and ½ mile; between ½ mile and 1 mile; greater than 1 mile	No absolute rule exists for crosswalk spacing. Recommended standard should consider land use context, desire lines and building entrances, and potential out of direction travel required to access a crossing	FHWA STEP STUDIO: Tools for Selecting and implementing countermeasures for improving pedestrian crossing safety, NACTO

Plan Goal	Analysis Name	Analysis Description	Required Data	Anticipated Baseline Measurements	Recommended Performance Measure / Outcome	Resources
Enjoyable Network	Level of Traffic Stress	Evaluation of the relative stress level associated with a roadway, based on roadway characteristics as well as provision of bicycle or pedestrian infrastructure. Network should be evaluated using both a Bicycle Level of Traffic Stress and Pedestrian Level of Traffic Stress approach.	<ul style="list-style-type: none"> Roadway centerline, including number of lanes, posted speed limit. Alternatively, functional class could be used. Bicycle facilities, including location, type, and width Pedestrian facilities, including location, type, and width 	<ul style="list-style-type: none"> Percentage of roadways by LTS score Relationship of LTS score and existing bikeways Percentage of network within specified distance of destination types (e.g., schools) that are low stress 	Designated bikeways should meet requirements for LTS 2. This assessment should consider impact of roadway crossings.	<p>Mineta Transportation Institute Low-Stress Bicycling and Network Connectivity</p> <p>Oregon Department of Transportation Analysis Procedures Manual</p>
	Connectivity Islands	Using the results of the Level of Traffic Stress, symbolize data to identify areas of connected low-stress corridors. This analysis helps to identify barriers to enjoyable travel and provide an early assessment of out-of-direction travel.	<ul style="list-style-type: none"> Results of the Level of Traffic Stress Analysis 	N/A. This analysis visualizes Level of Traffic Stress data to facilitate identification of barriers to comfortable travel in the Urban Village.	N/A Use this analysis to support visualization of out of direction travel, network gaps, and barriers.	Mineta Transportation Institute Low-Stress Bicycling and Network Connectivity
	Heat Assessment	Conduct a heat assessment to understand heat exposure on the network for purposes of assessing project design features, particularly when the key network segments and linkages are shown to have high levels of heat exposure.	<ul style="list-style-type: none"> Tree Equity Score map and Heat Vulnerability Index Map 	Percentage of network experiencing high heat exposure.	Reduction in heat along network corridor; increased tree canopy/vegetation coverage	<p>Planning for Urban Heat Resilience, PAS Report 600;</p> <p>Pima Association of Governments Resiliency Planning Maps</p>

Step 2: Identify Destinations and Gaps

Following analysis of existing conditions, the results of each analysis should be considered together to identify key trends and gaps in the existing network. While the characteristics and context of each Urban Village may require unique considerations for identifying project opportunities, the following can be used as a preliminary guide.

Connections to Destinations:

Utilizing the results of the Destination Density mapping exercise and community input, explore where connections are missing in the existing network. Some questions to ask are:

- How does the existing network connect to elementary schools or transit stops? Does the current network support direct access?
- Are there gaps that result in travel along high stress routes? For larger scale destinations, such as shopping centers or city parks, evaluate how neighborhoods are able to safely and enjoyably connect to the location.

It is expected that local networks should be denser to support access to local destinations by the greatest number of residents, so assess the availability of low-stress connections in relationship to different destination types.

Further, evaluate existing crossing opportunities, particularly in relationship to destinations. Using the results of the Crosswalk Spacing Analysis, identify roadway segments with limited crossings. Dedicated crosswalks and bike crossings with signals can support low-stress routes, improve access to destinations, and encourage crossings at designated locations.



Source: Alta Planning + Design

Enjoyable Networks:

What is the relative comfort of existing connections? For example, although a bike lane may provide direct access to a local elementary school, it's location along a higher speed road identifies this as a high stress (LTS 3 or 4) connection. Scenarios such as this may still be considered a network gap and project opportunity.

Further, consider the impact of high stress roadway crossings and if these corridors result in difficult connections along an otherwise enjoyable route. High stress roadway crossings are candidates for intersection improvements in the next step.



Source: Maricopa Association of Governments

Safe Networks:

Are collision hotspots located along existing active transportation routes? Are key routes consistent with high crash locations, or do they have characteristics similar to those associated with high crash locations? Evaluate the relationship among analysis results in coordination with safety analysis results to identify both opportunities to advance safe and comfortable routes as well as opportunities to improve safety for all modes of travel through development of active transportation routes.

Community Engagement

During Step 2, the planning team will attend existing community events and conduct a survey to ask residents about destinations and gaps.

COMMUNITY SURVEY

An online and community survey will be conducted for residents and employees of the Urban Village. This survey will focus on identifying important community destinations, and establish an Urban Village-specific vision for network priorities.

Step 3: Identify Network

Within each Urban Village, identify new connections of improvements to existing facilities to improve connections to destinations, support enjoyable networks, and proactively develop safe networks. This process is informed by the results of the Existing Conditions analysis (Step 1) and the identification of Network Gaps (Step 2). This process should include the following:



Source: Alta Planning + Design

- **Fill Gaps in Existing Network:** For existing low-stress routes, fill any gaps in the network by identifying new low-stress bikeways and key intersection improvements. Low-stress bike routes should provide as direct of a route as possible while supporting enjoyable travel through increased separation from motor vehicles, traffic calmed routes, and complete and connected network links.
- **Develop Local Connections:** Create new connections that support access to schools, parks, transit stops, and other high priority destinations. For destinations along major roadways, such as transit stops or shopping centers, consider nearby crossing opportunities as well as sidewalk completeness to support direct access.
- **Develop Regional Connections:** Identify connections to nearby neighborhoods, Urban Villages, and regional destinations. Regional connections may be less dense than the local network and rely on high-quality facilities along larger corridors in some locations. Local networks should connect to the regional route to support a connected system.

For each corridor or intersection identified as a potential project, be sure to consider the associated facility selection and design guidance provided by this plan. Additionally, consider the heat assessment and opportunities for green infrastructure or shade features if the project is identified in an area of high heat exposure. If roadway characteristics require a more separated facility, but space does not allow for implementation, consider adjacent and parallel routes.

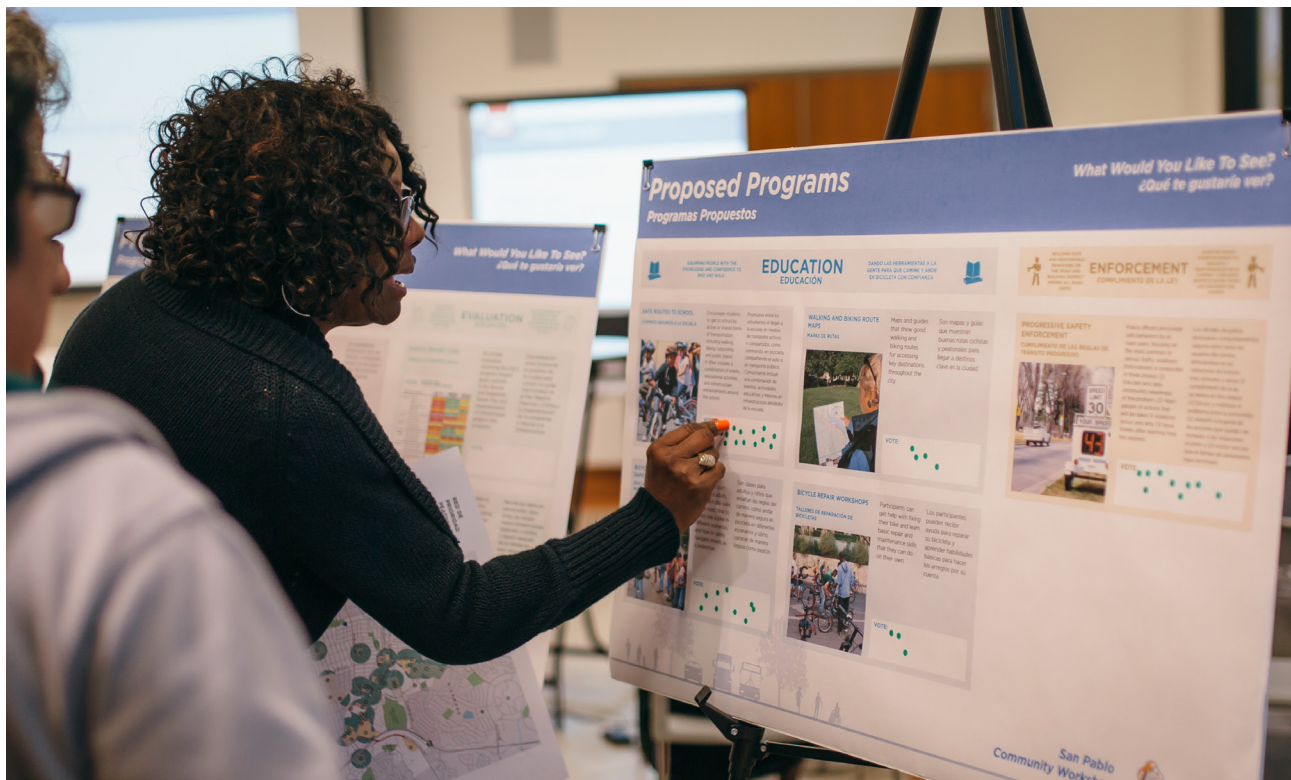
Step 4: Prioritize Projects

Within the planning process, prioritization helps us understand which projects should be implemented first. Specifically, the goal is to identify which projects are most needed and can provide the greatest community benefit. A successful process will have three key characteristics:

- **Aligned with local value and needs:** Prioritization should also be rooted in community values and needs, captured through a data-driven evaluation process. While infrastructure quality, economic conditions, and growth patterns may change over time, a prioritization process based on community values can help guide new project priorities that best reflect a shared community vision.
- **Practical and actionable:** By focusing on the necessary timeline and funding for projects, prioritization can identify a local network that can be quickly implemented.

Community Engagement

The Street Transportation Department will host a community meeting to get feedback on proposed projects and prioritization. A community survey with a map of proposed routes will also be used to gather community feedback.



Source: Alta Planning + Design



Source: Maricopa Association of Governments

Creating an Effective Prioritization Process

The planning team will work with the task force to identify a network of projects that can be quickly built within 1 to 2 years. More complex projects that require additional funding and outreach will be prioritized in collaboration with the task force. The following are examples of how the prioritization process may utilize project goals:

- **Connected Networks:** Do projects support connections to key neighborhood areas and/or regional destinations? This can be assessed overall or separately for unique location types (e.g., connections to schools, parks, transit, neighborhood centers, etc.)
- **Safe Networks:** Does a project address an identified or evaluated roadway safety concern identified by the neighborhood residents, the safety assessment, or another plan? Project will include countermeasures that respond to crash history of location or the characteristics of a location that are consistent with city crash profiles.
- **Enjoyable Networks:** Project improves an existing high stress corridor or improves crossing conditions along a low stress route.
- **Community Input:** Project is supported by the residents, workers, and patrons within the Urban Village. This should be assessed through a focused survey/outreach effort within each Urban Village as part of its respective prioritization process.
- **Equitable Networks:** Project is community-driven and provides a connection for those with the greatest need.

Step 5: Implement Projects

Using the priority projects developed in Step 4 and verified by the public, the Street Transportation Department will seek to implement projects that can be quickly implemented, such as installing bike lanes that do not require major street redesigns as a top priority. The goal will be to install these projects within one to two years.

The Street Transportation Department will create a map of the prioritized recommendations. The map will be appended to the Active Transportation Plan and considered part of the plan. It will also be shared on the Street Transportation Department's website.

For larger projects that are better suited for the Capital Improvement Plan, the Street Transportation Department will seek funding opportunities, including external grants. For projects identified by the community that do not fit within the Active Transportation Program, staff will refer the projects to the appropriate program teams. When the program has worked with every urban village in Phoenix, the Street Transportation Department will work with Phoenix residents and City leadership to determine the next steps for further building out the network and how to best continue the work of the program.



Source: Maricopa Association of Governments



City of Phoenix



City of Phoenix

POLICY RECOMMENDATIONS ELEMENT

APRIL 2023



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01

CONTEXT & COLLABORATION

INTRODUCTION

Policy recommendations are one of the three key focus areas of this planning process, the other two being a Community Active Transportation Network Program and Design Guidance. The Policy recommendations are intended to guide city actions towards continuing to build an equitable, safe, connected, and enjoyable active transportation network.

The policy recommendations found within this section are guided by a number of different

factors, including the city's physical and cultural context, common objectives found as part of the existing plan review of other city documents, and community outreach themes. The policy recommendations are a continuation of areas of success, but also represent a continued shift towards a more multimodal future in Phoenix where active transportation plays an important role alongside other ways of travel.

ISSUES INFLUENCING WALKING & BIKING IN PHOENIX

Physical and cultural context is one of the most important factors influencing the planning and design of active transportation facilities. For Phoenix, the two most significant factors contributing to this context are the city's historic development patterns and the warm summer climate. The city's development patterns have contributed to the reliance on a personal vehicle to travel, which is manifested in the way roadways are design and built for vehicular travel. This has led to safety concerns and issues, particularly for people walking and biking.

Additionally, despite an overall temperate climate that is conducive for walking and biking, the City's warm summer months present unique challenges for people walking and biking, particularly the dangers of heat exposure and heat related illness.

The following section is a summary of these factors, all of which directly inform the policy recommendations found later in this section.



Source: Maricopa Association of Governments

Development Patterns

Issue: Phoenix has seen rapid growth both in terms of land and population since the second half of the 20th Century. Much of that growth, however, has developed around the automobile characterized by single family homes, highways and high speed roadways, and a separation of land uses. Businesses and other community destinations are often located along these major roadways, and our community's design has influenced our reliance on a vehicle even for short trips.

Positive: This history of sprawling, low-density development has begun to change as the city aims to grow more sustainably by concentrating growth in Downtown, near high-capacity transit, and in transit oriented development areas. Greater access and shorter distances to destinations, creates more demand and opportunities for walking and biking.

Opportunity: Short trips are important to consider because they can be good candidates for replacing a motor vehicle trip with an active trip, such as by walking, biking, or rolling. While Phoenix has been adding density and creating more short trips by focusing growth near community destinations, many people in Phoenix already take many short car trips. Studies have shown that nearly 50% of all car trips in the United States are three miles or less¹⁸, a distance that could be supported by bicycling. In Phoenix, the grid system, particularly prevalent in central parts of the city, provides walkable connections between residential and commercial areas that can be leveraged.



Source: Alta Planning + Design

18. Curry, Melanie, et al. "Bikes and Scooters Could Replace a Lot of Car Trips in U.S. Cities." *Streetsblog California*, 17 Sept. 2019, <https://cal.streetsblog.org/2019/09/16/bikes-and-scooters-could-replace-a-lot-of-car-trips-in-u-s-cities/>. Accessed 5 July 2022.

Car Culture

Issue: For decades, Phoenix has excelled at building car-oriented places; internal policies and practices have been created with the primary goal of moving cars and limiting vehicle congestion during peak commuting hours. Decades of auto-oriented development has created barriers to walking and biking such as: limited street connections between neighborhoods, major roadways that are wide and have high speeds, destinations that are far apart, and highways that separate neighborhoods.

Positive: The City of Phoenix has made progress, especially over the last decade, in expanding the walking, bicycling, and the transit network as options for travel. For example, the City has implemented the following planning and policy initiatives that increase multimodal options: Comprehensive Bicycle Master Plan (2014), ReinventPHX (2015), the Walkable Urban Code (2015), City of Phoenix Complete Streets Policy (2017); the City of Phoenix Transit Oriented Development (TOD) Strategic Policy Framework (2018), the Key Corridors Master Plan (2020), and the Road Safety Action Plan: Moving to Vision Zero (2022). Transit options are improving through the continued expansion of the Valley Metro Light Rail and Bus Rapid Transit will soon provide Pheonicians with another high-capacity transit option. The City is also expanding and improving bicycle and pedestrian connections to and from transit.

Opportunity: This ATP is an opportunity to collaborate with and build upon the momentum from these various planning and policy initiatives to ensure biking and walking are a key component of the City's transportation network as it continues to grow and evolve in the future. The transportation system needs to work holistically across all modes, not just for motor vehicles.



Source: Maricopa Association of Governments

Safety

Issue: Decades of car-oriented development and streets designed to efficiently move motor vehicles through them, has led to an increasing number of traffic crashes resulting in fatalities and serious injuries on Phoenix streets. A disproportionate number of traffic fatalities and serious injuries in Phoenix involve people biking and walking. People traveling outside of motor vehicles are particularly vulnerable roadway users, particularly people biking and walking. More specifically, data across the country has shown that traffic fatalities and serious injuries are disproportionately impacting children, seniors, people with low and no income, unhoused residents, and people of color .

Streets designed for the movement of cars typically leads to cars traveling at high speeds. Speed is one of the most important factors in determining how severe a crash is, especially for people walking, biking or relying on transit. The faster a car is traveling, the less likely a person's chances are of surviving the crash. In addition to high speeds, car-oriented major roadways also typically have dangerous conditions for people walking and biking such as long crossing distances, incomplete sidewalks, a lack of bicycle facilities, and general lack of separation from motor vehicles.

Positive: To combat the growing number of people dying in traffic crashes, the City of Phoenix approved the Phoenix Vision Zero Road Safety Action Plan (2022), which establishes strategies and objectives to eliminate traffic fatalities and serious injuries in Phoenix. Vision Zero represents a cultural shift in Phoenix, and policies and practices directly support active transportation objectives.

Opportunity: With the momentum of various policy and planning initiatives, specifically the Complete Streets Policy (2017), Complete Streets Design Guidelines (2018), the Phoenix Vision Zero Road Safety Action Plan (2022), and this updated active transportation plan, the City has set the plans, policies, and design standards in place to proactively create streets safe for all roadway users.



Source: Maricopa Association of Governments

Climate

Issue: Temperatures in Phoenix have been rising over the past few decades and are expected to continue rising. Phoenix averages over 100 days per year where temperatures are over 100 degrees Fahrenheit. Heat can be a major barrier (as identified through public input in the previous section) to walking and biking in Phoenix. Heat is also experienced inequitably, with historically marginalized areas of Phoenix having less shade and being hotter than wealthier areas of the community.

Positive: Phoenix has been taking steps to lower temperatures that are magnified by the urban heat island effect, which makes already hot temperatures hotter due to surfaces that retain and absorb heat such as pavement. In 2020, the City began Cool Pavement Pilot Program, which has successfully lowered surface temperatures on the city's streets through a coating applied over the existing asphalt. In addition to cool pavement, the City has also developed a Cool Corridors Program in 2020 that aims to "create a network of cool corridors," primarily through planting trees, "across its communities to encourage movement from residential homes to various areas across the city that is safe and environmentally-conscious."¹⁹

Opportunity: The City has the opportunity to build upon the Cool Pavement and Cool Corridors program by providing facilities that are safe and enjoyable to walk and bike. Bicycle and pedestrian infrastructure should be prioritized and implemented in coordination with the Cool Pavement and Cool Corridors Programs—along streets with trees, shade, and cool pavement—to reduce the barrier that heat provides to walking and biking in Phoenix.



Source: Maricopa Association of Governments

19. <https://www.phoenix.gov/streetssite/Pages/Cool-Corridors.aspx>



02

POLICY RECOMMENDATIONS

POLICY RECOMMENDATIONS FOR ACTIVE TRANSPORTATION

The Active Transportation Plan provides an opportunity for the City of Phoenix to support existing city policies, related plan recommendations, and ongoing programs and efforts that seek to improve the quality of life for all residents. The policy recommendations that follow identify specific opportunities to implement existing plans and policies, including the Road Safety Action Plan, Complete Streets Policy, and the Climate Action Plan, while advancing walking and biking in Phoenix.

The recommendations are focused on actions the Street Transportation Department can initiate, in collaboration with other City departments, agencies, and community groups. The prioritization takes into account community feedback, existing opportunities, and Street Transportation Department capacity. Throughout the 20 year planning horizon, the Street Transportation Department should seek new opportunities to update policies to support active transportation or adjust recommended priorities based on changing conditions and public input.



SECTION 1

Support Implementation Of Existing Plans



Objective 1: Advance Complete Streets Policy Implementation

City of Phoenix adopted a Complete Streets Policy in 2017, followed by Complete Streets Design Guidelines in 2018. The Street Transportation Department has been working to implement the Complete Streets priorities and designs by identifying appropriate streets and contexts for complete street transitions, updating procedures, and building additional active transportation infrastructure. Complete street designs have also been emphasized with new projects and development across the City.

Identifying appropriate contexts and designing streets for all modes remains a high priority for

Phoenicians. In the community survey, respondents were asked to rank priorities for overall transportation in Phoenix; “Giving everyone a comfortable option for using streets, whether they are driving, walking, biking, or taking transit” was the top priority for 29% of respondents, second only to “Preventing collisions that could injure people.” In survey comments and survey questions about specific types of infrastructure, respondents repeatedly showed support for street design that prioritizes comfortable and safe multimodal options above all.

Recommendation		Type of Change
Near term (2023 - 2026)		
1.1	Conduct a Complete Streets information and professional education campaign internally to improve awareness of active transportation best practices and Complete Streets design.	Continue ongoing work
1.2	Create internal guidance that documents existing policies and processes relevant to Complete Streets design elements for retrofits and new projects developed as part of the active transportation network	Prioritize resources
Medium term (2027 - 2032)		
1.3	Review and update project documentation and handoff process in the Capital Improvement Project process to incorporate Complete Streets goals and support Active Transportation.	Update existing procedures
1.4	Compile and report on information about Complete Streets compliance captured via the development process.	Prioritize resources
1.5	Create a policy and define a methodology for evaluating multi-modal impacts and mitigation of development in high-activity areas	Update existing policies
Long term (2032 - 2043)		
1.6	Update traffic impact analysis guidance and standards in the City of Phoenix Street Planning and Design Guidelines Manual to incorporate safe systems and complete streets tradeoffs in future updates to the manual	Update existing procedures
1.7	Review internal documentation of Complete Streets elements and collaborate internally to update policies and processes where appropriate to streamline implementation of Complete Streets design elements in support of Active Transportation.	Update existing policies
1.8	Establish a methodology for determining active transportation demand for Capital Improvement and development projects in order to ensure appropriate facilities are built.	Update existing policies



Objective 2: Support the Goals of the Climate Action Plan

The Climate Action Plan set a goal to shift how people get around Phoenix towards lower carbon modes of transportation, including active transportation. Building out the canal path network was one of the supporting goals for the plan as it increases opportunities for safe and comfortable biking and walking. The Street Transportation Department is committed to supporting the Climate Action Plan and the

following recommendations provide concrete steps for achieving the overarching goals.

Expanding and connecting canal paths was a recurring theme in the first round of public outreach. In the online survey respondents were asked to rank bicycle-specific improvements; “Canals – Adding and upgrading paths along existing canals” was the second most frequent top priority (19%), second only to safety.

Recommendation		Type of Change
Near term (2023 - 2026)		
2.1	Support electric vehicle adoption by continuing to manage the Micromobility Program and seek to expand the program boundaries and types of vehicles based on demand and future infrastructure expansion.	Continue ongoing work
2.2	Support electric vehicle adoption by revising Motorized Play Vehicle Ordinance to better regulate modern micromobility vehicles for safety and transportation options.	Update existing code
2.3	Collect data on existing shared use paths along canals, assess needs, and create a plan for building out 90% of the network by 2050.	Prioritize resources
2.4	Continue to build canal paths in line with the goal of paths along 90% of the canal network by 2050.	Continue ongoing work
Medium term (2027 - 2032)		
2.5	Support mode shift target by creating an anticipatory warrant process that provides an opportunity to install pedestrian and bicycle crossings proactively.	Update existing policies
2.6	Support mode shift target by integrating Benefits of Complete Streets Tool into CIP project evaluation to capture latent demand and mode shift potential as one of the evaluation criteria when assessing potential project impacts (i.e., Complete Streets Toolkit).	Update existing procedures
2.7	Initiate research into opportunities for safe and legal usage of micromobility along canal paths.	Outside agency would need to update existing policies
Long term (2033 - 2043)		
2.8	Support mode shift goals by seeking to collaborate with the Public Transit Department to identify last-mile sidewalk connections and crossings and seek funding for adding sidewalk.	Prioritize resources



Objective 3: Support the Vision Zero Road Safety Action Plan

The Road Safety Action Plan was adopted by Council in 2022 with strong support from Phoenixians. Safety was the top priority in the initial round of public outreach for this plan. It was the most frequently identified top priority for transportation overall and for improvements to the bicycle network. The following recommendations address how active transportation can support the implementation of the Road Safety Action Plan.

Recommendation		Type of Change
Near term (2023 - 2026)		
3.1	Integrate the High Injury Network and identified priority locations from the RSAP into the Community Active Transportation Network Program as part of the existing conditions analysis.	Update existing procedures
3.2	Integrate the High Injury Network and rebalancing recommendations from the RSAP into pavement project reviews for potential bike lanes.	Update existing procedures
3.3	Establish internal processes to integrate the Active Transportation Team in to the RSAP implementation process, specifically for the RSAP goals to review of mid-block crossings at priority arterial road locations, the development of checklist or toolkit to improve safety for pedestrians and bicyclists in project design, and the analysis of the transportation network to identify locations with risk-factors and countermeasures.	Prioritize resources
3.4	Advance school safety measures identified in the RSAP, including expanding education and awareness programs, developing Safe Routes to School Plans, and implementing school zone safety measures.	Prioritize resources
3.5	Develop and promote driver education programs, campaigns, and materials to increase awareness of safe driving behavior around people walking and biking.	Prioritize resources

SECTION 2

Informing Future Plans



Objective 4: Share Opportunities for Integrating Active Transportation Policies and Guidance into the General Plan

The City of Phoenix will be updating its General Plan in 2025, in accordance with state law requirements that an update be performed every ten years. The upcoming General Plan update presents a significant opportunity for the Planning and Development Department to make recommendations, set priorities, and identify the process for procedural changes on land use and transportation policy in the City of Phoenix. The following recommendations are general guidance the Street Transportation Department can provide as opportunities to better support Complete Streets implementation and integrate active transportation, safety, and design into the General Plan.

During targeted outreach and in survey comments, a recurring theme was the need to link land use and transportation. The community survey asked respondents to identify the single biggest barrier to walking in Phoenix; the most frequent response was “Distance between places” (24%). Creating neighborhoods with walkable destinations requires land use policies that support a mix of uses within a walkable distance. The General Plan update also impacts policies that directly impact street design, including regulations around requirements for providing parking, mitigating traffic impacts, and street cross-section design.

Recommendation		Type of Change
Near term (2023 - 2026)		
4.1	In the Connect People and Places Core Value, update the Bicycle Goal to Active Transportation goal to reflect updated program name.	Update existing policies
4.2	Include the Active Transportation Plans’ Network Development Program as a key bicycle implementation mechanism within the Active Transportation Goal section.	Update existing policies
4.3	Integrate the importance of protected bicycle infrastructure as a design consideration within the Active Transportation Goal section.	Update existing policies
4.4	Include the Active Transportation Plan as an implementation policy or plan within the General Plan’s Complete Streets Goal section.	Update existing policies
4.5	Integrate first and last mile connectivity through bicycle and pedestrian infrastructure as a design principle within the Transit Oriented Development Goal section.	Update existing policies
4.6	Include bicycle infrastructure and accessibility as a key design principle, in addition to pedestrian infrastructure, within the Cores, Centers, and Corridors Goal section.	Update existing policies

SECTION 3

Align Internal Standards And Practices With Active Transportation Plan Values



Objective 5: Build Safe Active Transportation Networks

Safety was identified as a plan value as it was a consistent theme throughout public outreach. The following recommendations support Phoenix's Vision Zero goal and offer specific recommendations for developing safe active transportation networks.

Recommendation		Type of Change
Near term (2023 - 2026)		
5.1	Use the FHWA Bikeway Facility Guide, which provides facility selection criteria based on roadway characteristics and user considerations, as a baseline for facility selection and design on all bikeway projects.	Update existing procedures
5.2	Pilot the use of NACTO City Speed Limit Guide as a baseline for consideration on targeted, high-priority active transportation corridors.	Pilot
Medium term (2027 - 2032)		
5.3	In future updates of the City's Street Planning and Design Guidelines, reference and integrate best practice facility designs and treatments for bicycle and pedestrian facilities include in the Plan's Design Guidance section as well as emergent best practices.	Update existing policies
5.4	Evaluate the potential use of stop bars in high priority bicycle and pedestrian intersections.	Update existing procedures



Objective 6: Build Connected Active Transportation Networks

Connectivity was identified as a plan value as a network is only as strong as its weakest link. Connecting existing and future facilities is essential for creating a viable active transportation network. Adding crossings for people walking and biking along major streets

can effectively shorten walking and biking distances, as it reduces the chance of people walking out of their way to cross safely. The following recommendations identify specific opportunities to reduce gaps in the network and create safe and comfortable connections for people walking and biking.

Recommendation		Type of Change
Near term (2023 - 2026)		
6.1	Initiate a feasibility study for a pilot protected intersection in Phoenix.	Continue ongoing work
6.2	Pilot implementation of intersection treatments that elevate visibility, shorten crossing distances, and provide greater protection to people walking and biking at high-priority biking and walking intersections.	Pilot
Medium term (2027 - 2032)		
6.3	Document location of all bike lanes that allow time of day parking. Prioritize locations to work with the community on potential alternative designs with the goal of eliminating bike lanes that allow parking.	Prioritize resources
6.4	Establish standard intersection design practices that raise the visibility of people biking on approaches and through intersections, as recommended in the Plan's Design Guidance section.	Update existing policies
6.5	Create and implement consistent wayfinding on high priority active transportation corridors throughout Phoenix	Prioritize Resources
Long term (2033 - 2040)		
6.6	Seek to collaborate with the Parks and Recreation Department and the Planning and Development Department to identify opportunities for coordinated development of an interconnected, low-stress Multi-Use Path network in Phoenix.	Prioritize resources



Objective 7: Build Enjoyable Active Transportation Networks

Enjoyability was identified as a plan value as people will not use infrastructure they do not enjoy. The need for comfortable and enjoyable networks was a recurring theme in the initial round of public outreach. The following

recommendations offer specific guidance on building infrastructure that will attract new users and allow every Phoenician interested in walking and biking to be able to do so comfortably.

Recommendation		Type of Change
Near term (2023 - 2026)		
7.1	Establish outreach guidelines for including traffic calming in Capital Improvement Projects, including speed humps and speed bumps.	Update existing procedures
7.2	Collect data that will enable evaluation of bicycle and pedestrian Level of Transportation Stress (LTS). Data should specifically include: length, location, and number of travel lanes; parking signs; landscaping strips; and sidewalk location and width. This assessment informs facilities selection and design by evaluating the relative comfort and safety of someone walking or biking along a corridor.	Prioritize resources
7.3	Conduct a pilot project of various roadway surface materials that act as heat reflectants to reduce the stress and impact of heat. Use the pilot to select preferred materials and use cases and create implementation guidelines.	Pilot
Medium term (2027 - 2032)		
7.4	Seek to collaborate across departments to streamline permit process for structural shade in the ROW, specifically awnings.	Update existing policies
7.5	Seek to collaborate across departments to review the existing traffic calming design standards for horizontal and vertical traffic calming for potential updates to ensure designs effectively calm traffic while supporting emergency operations.	Update existing policies



Objective 8: Build Equitable Active Transportation Networks

Equity was identified as a plan value as it is a high priority for the City and for the community. Throughout the outreach process, residents asked for an equitable approach to developing infrastructure and planning processes that take

different community needs into account. The following recommendations seek to address historic inequities and to ensure that all Phoenicians have a chance to participate in active transportation planning processes and benefit from infrastructure investments.

Recommendation		Type of Change
Near term (2023 - 2026)		
8.1	Create easy to share fliers and slides with information on how to contact the Street Transportation Department and how to report maintenance to share during future outreach opportunities.	Prioritize resources
8.2	Track and incorporate publicly-submitted requests during the urban village assessment and project prioritization process.	Prioritize resources
Medium term (2027 - 2032)		
8.3	In future updates to the Street Transportation Department's Public Engagement Plan consider opportunities to better include low-income, historically-marginalized, disabled, and limited English-speaking residents in the decision-making and implementation process.	Update procedures
8.4	In future updates to internal public outreach standard processes and materials consider opportunities to better reach historically marginalized communities and empower residents to be actively involved in the decision making and implementation process.	Update procedures
Long term (2033 - 2040)		
8.5	Update existing program structures to support implementation of small projects that proactively support safe and enjoyable active transportation such as sidewalk infill, shade, street crossings, Low Impact Development/Green Infrastructure, ramps, and other Complete Streets design elements.	Update procedures
8.6	Evaluate Street Transportation Department programs that support active transportation, such as the Neighborhood Traffic Calming Program, for opportunities to update project selection criteria and outreach processes to better prioritize projects that reflect diverse needs and experiences.	Update procedures



City of Phoenix



City of Phoenix

BICYCLE & PEDESTRIAN DESIGN GUIDANCE ELEMENT

APRIL 2023



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01

INTRODUCTION

CONTEXT

This toolbox presents high-level guidance for local planners, engineers, and advocates to improve the walkability and bikability of Phoenix and create more comfortable streets for pedestrians and bicyclists of all ages and abilities. Planners and project designers should refer to these guidelines in shaping future infrastructure projects; however, these guidelines are not intended to guide detailed design as they do not constitute standards.

Future roadway planning, engineering, design and construction will continue to strive for a balanced transportation system that includes a seamless, accessible bicycle and pedestrian network and encourages bicycle and pedestrian travel wherever possible.

The goal of a transportation system is to better meet the needs of people - whether in vehicles, bicyclists or pedestrians - and to provide access to goods, services, and activities.

Streets that include safe and inviting facilities for active modes provide users important transportation choices, whether it is to make trips entirely by walking or bicycling, or to access public transit. Often in urban or suburban areas, walking and bicycling are the fastest and most efficient ways to perform short trips.

Convenient, active travel provides many benefits, including reduced traffic congestion, financial savings for users, road and parking facility savings, improved economic development, and a more attractive and healthier environment through reduced greenhouse gases.

The design guidelines and recommendations in this document are intended for use on City of Phoenix roadways. Projects on Arizona Department of Transportation, county, or other roadways in other cities may require additional considerations.

Projects must not only be planned for their physical aspects as facilities serving specific transportation objectives; they must also consider effects on the aesthetic, social, economic and environmental values, needs, constraints and opportunities in a larger community setting.

Design guidance in this document meets or exceeds the minimums set by the Americans with Disabilities Act Accessible Design Guidelines (ADAAG) and the Public Right of Way Accessibility Guidelines (PROWAG).

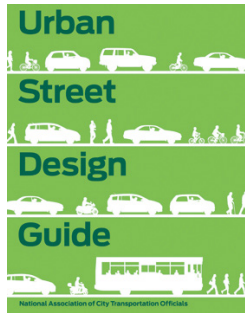
All traffic control devices, signs, pavement markings included in street projects must conform to the Arizona Supplement to the “Manual on Uniform Traffic Control Devices” (MUTCD).



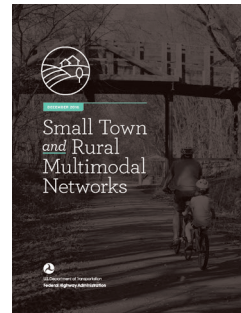
GUIDANCE BASIS

The sections that follow serve as an inventory of pedestrian and bicycle design treatments and provide guidelines for their development. These treatments and design guidelines are important because they represent the tools for creating a pedestrian- and bicycle-friendly, accessible community. The guidelines are not, however, a substitute for a more thorough evaluation by a professional engineer prior to implementation of facility improvements. The following guidelines are incorporated in this Design Guide.

Multi-modal Guidance

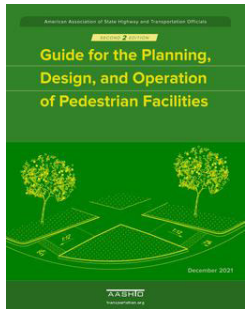


*The National Association of City Transportation Officials' (NACTO) **Urban Street Design Guide (2013)** is a collection of nationally recognized street design standards, and offers guidance on the current state of the practice designs.*



*The Federal Highway Administration's **Small Town and Rural Multimodal Networks Report (2016)** offers resources and ideas to help small towns and rural communities support safe, accessible, comfortable, and active travel for people of all ages and abilities. It connects existing guidance to rural practice and includes examples of peer communities.*

Pedestrian Guidance

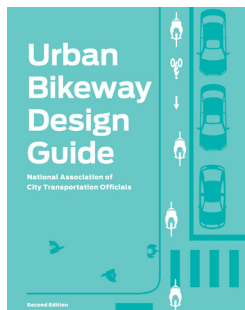


*The American Association of State Highway Transportation Officials' (AASHTO) **Guide for the Planning, Design, and Operation of Pedestrian Facilities (2021)** identifies effective measures for accommodating pedestrians on public rights-of-way, vary among roadway and facility types.*

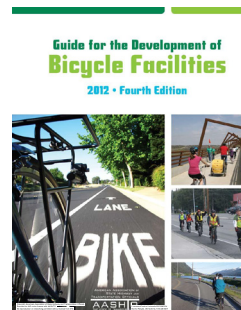


*The Maricopa Association of Governments' (MAG) **Pedestrian Policies and Design Guidelines (2005)** provides information and design assistance to better create and redevelop pedestrian areas throughout the region that integrate facilities for walking with other transportation modes.*

Bikeway Guidance



*The National Association of City Transportation Officials' (NACTO) **Urban Bikeway Design Guide (2012)** provides cities with state-of-the-practice solutions that can help create complete streets that are safe and enjoyable for bicyclists.*



*The American Association of State Highway Transportation Officials' (AASHTO) **Guide for the Development of Bicycle Facilities (2012)** provides information on how to accommodate bicycle travel and operations in most riding environments.*



*The **Separated Bike Lane Planning and Design Guide (2015)** is the latest national guidance on the planning and design of separated bike lane facilities released by the Federal Highway Administration (FHWA). The resource documents best practices as demonstrated around the U.S., and offers ideas on future areas of research, evaluation and design flexibility.*

DESIGN NEEDS OF PEDESTRIANS

Types of Pedestrians

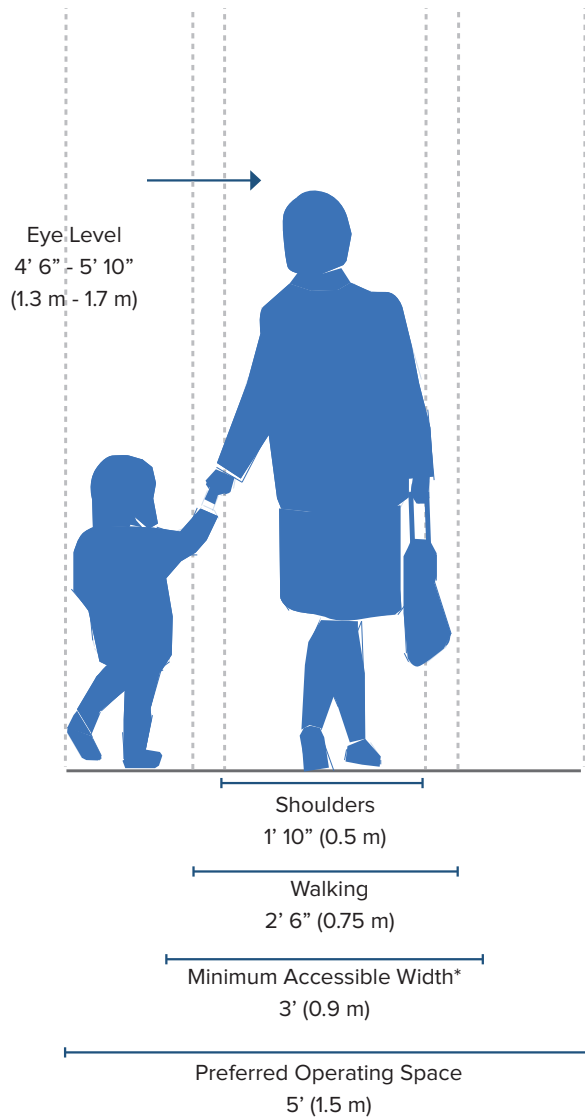
Pedestrians have a variety of characteristics and the transportation network should accommodate a variety of needs, abilities, and possible impairments. Age is one major factor that affects pedestrians' physical characteristics, walking speed, and environmental perception. Children have lower eye height and may walk slower than adults. They also perceive the environment differently at various stages of their cognitive development. Older adults walk more slowly and may require assistive devices for walking stability, sight, and hearing.

Disabled Pedestrian Design Considerations

The table below summarizes common physical and cognitive impairments, how they affect personal mobility, and recommendations for improved pedestrian-friendly design.

Disabled Pedestrian Design Considerations

Impairment	Effect on Mobility	Design Solution
Physical Impairment Necessitating Wheelchair and Scooter Use	Difficulty propelling over uneven or soft surfaces.	Firm, stable surfaces and structures, including ramps or beveled edges.
	Cross-slopes cause wheelchairs to veer downhill or tip sideways.	Cross-slopes of less than two percent.
	Require wider path of travel.	Sufficient width and maneuvering space.
Physical Impairment Necessitating Walking Aid Use	Difficulty negotiating steep grades and cross slopes; decreased stability and tripping hazard.	Cross-slopes of less than two percent. Smooth, non-slippery travel surface.
	Slower walking speed and reduced endurance; reduced ability to react.	Longer pedestrian signal cycles, shorter crossing distances, median refuges, and street furniture.
Hearing Impairment	Less able to detect oncoming hazards at locations with limited sight lines (e.g. driveways, angled intersections, channelized right turn lanes) and complex intersections.	Longer pedestrian signal cycles, clear sight distances, highly visible pedestrian signals and markings.
Vision Impairment	Limited perception of path ahead and obstacles; reliance on memory; reliance on non-visual indicators (e.g. sound and texture).	Accessible text (larger print and raised text), accessible pedestrian signals (APS), guide strips and detectable warning surfaces, safety barriers, and lighting.
Cognitive Impairment	Varies greatly. Can affect ability to perceive, recognize, understand, interpret, and respond to information.	Signs with pictures, universal symbols, and colors, rather than text.
Fatiguing Illnesses	Slower walking speed and reduced endurance; reduced ability to react. Increased chances of tripping or falling.	Longer pedestrian signal cycles, shorter crossing distances, median refuges, and street furniture. Smooth, non-slippery travel surface.



Pedestrian Characteristics by Age

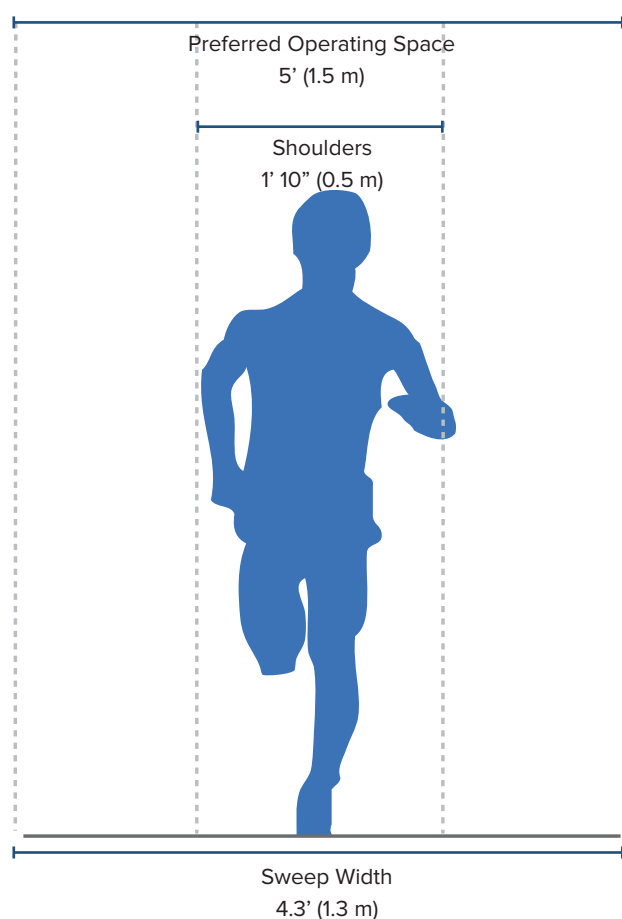
Age	Characteristics
0-4	<p>Learning to walk</p> <p>Requires constant adult supervision</p> <p>Developing peripheral vision and depth perception</p>
5-8	<p>Increasing independence, but still requires supervision</p> <p>Poor depth perception</p>
9-13	<p>Susceptible to "darting out" in roadways</p> <p>Insufficient judgment</p> <p>Sense of invulnerability</p>
14-18	<p>Improved awareness of traffic environment</p> <p>Insufficient judgment</p>
19-40	<p>Active, aware of traffic environment</p>
41-65	<p>Slowing of reflexes</p>
65+	<p>Difficulty crossing street</p> <p>Vision loss</p> <p>Difficulty hearing vehicles approaching from behind</p>

Source: AASHTO. *Guide for the Planning, Design, and Operation of Pedestrian Facilities*, Exhibit 2-1. 2021.

Design Needs of Runners

Running is an important recreation and fitness activity commonly performed on shared use paths. Many runners prefer softer surfaces (such as rubber, bare earth or crushed rock) to reduce impact. Runners can change their speed and direction frequently. If high volumes are expected, controlled interaction or separation of different types of users should be considered.

Runner Dimensions

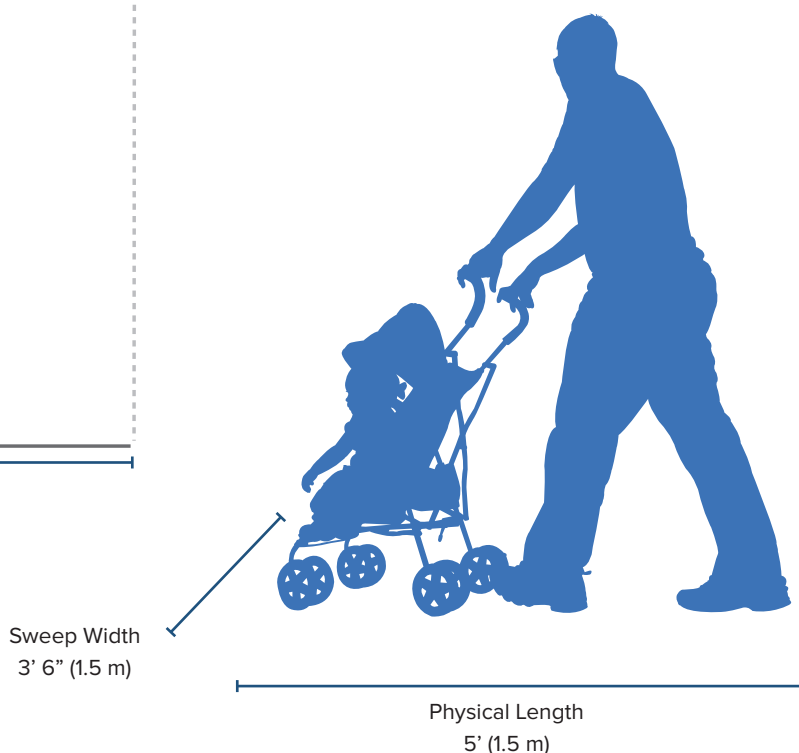


Design Needs of Strollers

Strollers are wheeled devices pushed by pedestrians to transport babies or small children. Stroller models vary greatly in their design and capacity. Some strollers are designed to accommodate a single child, others can carry 3 or more. Design needs of strollers depend on the wheel size, geometry and ability of the adult who is pushing the stroller.

Strollers commonly have small pivoting front wheels for easy maneuverability, but these wheels may limit their use on unpaved surfaces or rough pavement. Curb ramps are valuable to these users. Lateral overturning is one main safety concern for stroller users.

Stroller Dimensions



Design Needs of Wheelchair Users

As the American population ages, the age demographics in Phoenix may also shift, and the number of people using mobility assistive devices (such as manual wheelchairs, powered wheelchairs) will increase.

Manual wheelchairs are self-propelled devices. Users propel themselves using push rims attached to the rear wheels. Braking is done through resisting wheel movement with the hands or arm. Alternatively, a second individual can control the

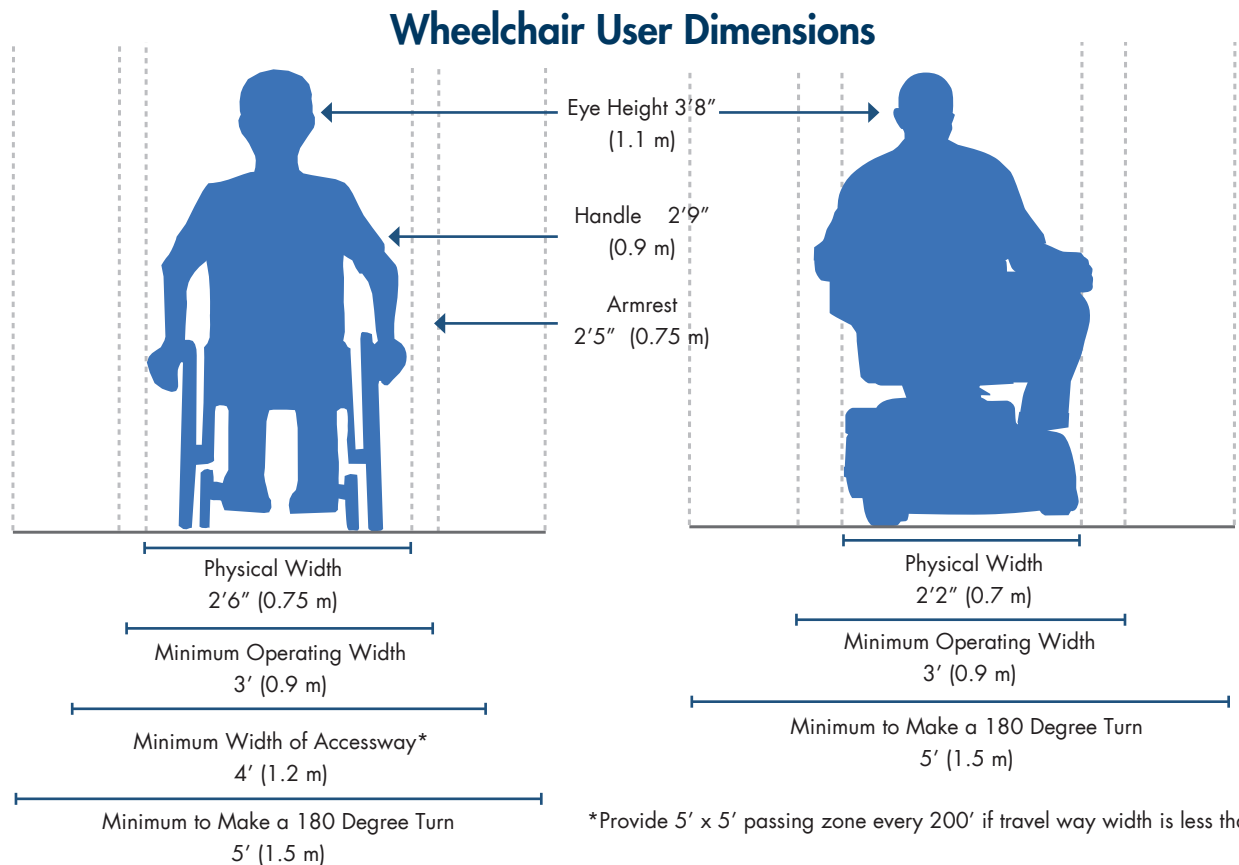
wheelchair using handles attached to the back of the chair.

Power wheelchairs use battery power to move the wheelchair. The size and weight of power wheelchairs limit their ability to negotiate obstacles without a ramp. Various control units are available that enable users to control the wheelchair movement, based on their ability (e.g., joystick control, breath controlled, etc).

Maneuvering around a turn requires additional space for wheelchair devices. Providing adequate space for 180 degree turns at appropriate locations is an important element of accessible design.

Wheelchair User Design Considerations

Effect on Mobility	Design Solution
Difficulty propelling over uneven or soft surfaces.	Firm, stable surfaces and structures, including ramps or beveled edges.
Cross-slopes cause wheelchairs to veer downhill.	Cross-slopes of less than two percent.
Require wider path of travel.	Sufficient width and maneuvering space.



DESIGN NEEDS OF BICYCLE & OTHER MICROMOBILITY DEVICE RIDERS

The facility designer must have an understanding of how bicycles and scooters operate and how the devices themselves influence that operation. People who ride bicycles and other micromobility devices, by nature, are much more affected by poor facility design, construction and maintenance practices than motor vehicle drivers. By understanding the unique characteristics and needs of bikes and micromobility devices, a facility designer can provide quality facilities that work for a wider spectrum of users and minimize user risk.

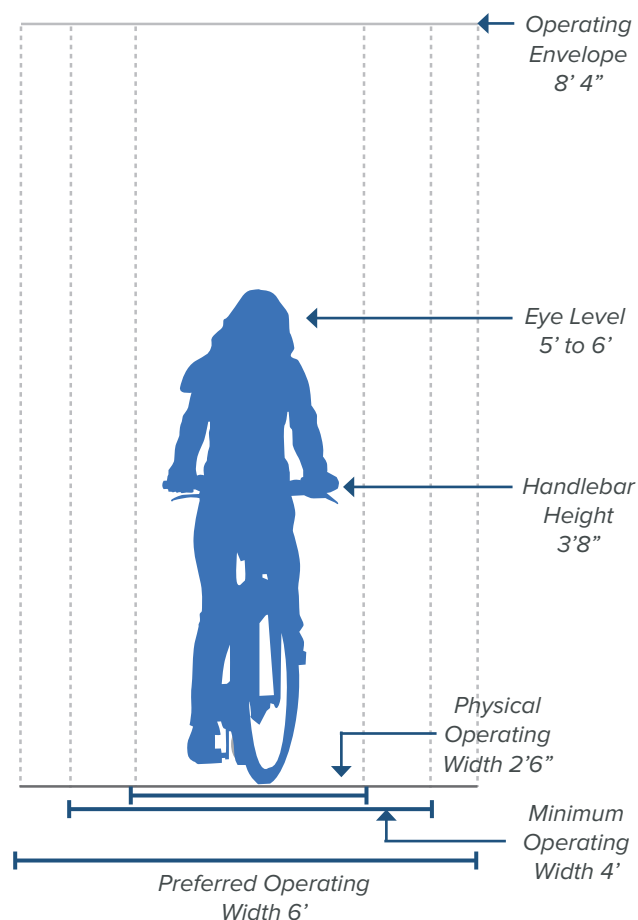
Bicycle as a Design Vehicle

Similar to motor vehicles, bicycles exist in a variety of sizes and configurations. These variations occur in the types of vehicle (such as a conventional bicycle, a recumbent bicycle or a tricycle), and behavioral characteristics (such as the comfort level of the bicyclist). The design of a bikeway should consider reasonably expected bicycle types on the facility and utilize the appropriate dimensions.

The figure illustrates the operating space and physical dimensions of a typical adult bicyclist, which are the basis for typical facility design. Bicyclists require clear space to operate within a facility. This is why the minimum operating width is greater than the physical dimensions of the bicyclist. Bicyclists prefer five feet or more operating width, although four feet may be minimally acceptable if the pavement is continuous and there is no curbing present..

In addition to the design dimensions of a typical bicycle, there are many other commonly used pedal-driven cycles and accessories to consider when planning and designing bicycle facilities. The most common types include tandem bicycles, recumbent bicycles, and trailer accessories.

Bicycle Rider - Typical Dimensions

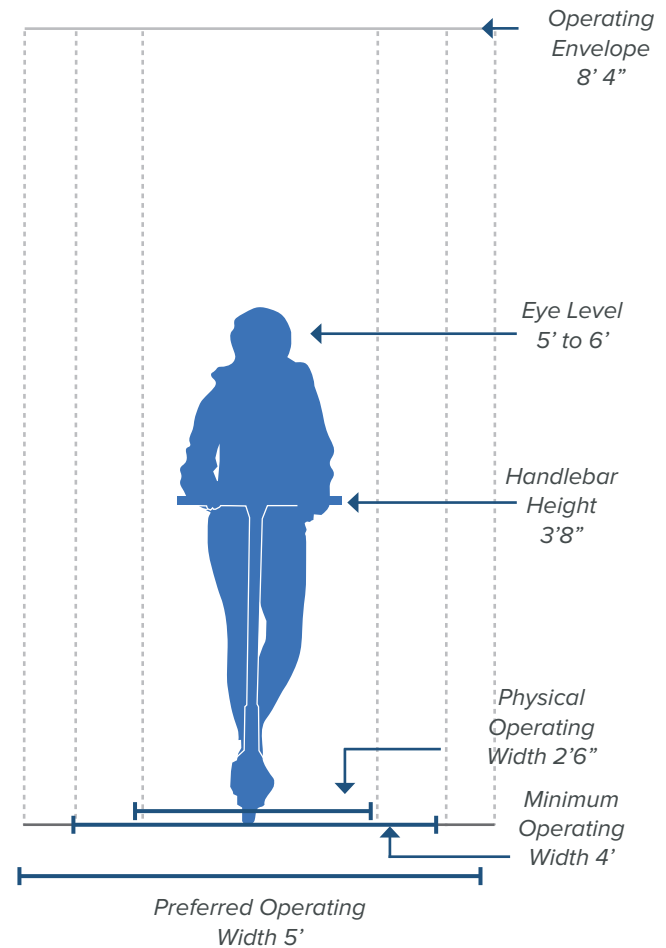


Other Micromobility Devices **Scooter Rider - Typical Dimensions**

Scooters, skateboards, and other similar micromobility devices, both human-powered and battery-powered are low-speed mobility devices that are typically operated in on-street bike facilities. These devices can be entirely human-powered, powered by an electric motor, or a combination of the two. They typically have an operating speed of 20 mph or less, but this can vary widely depending on whether manually-powered or motor driven, and other factors like hills.

In general, these devices have similar design operating envelopes of bicycles, (in some cases even narrower), and can be operated by a wide range of users, including those who may not be able to operate a traditional bicycle. As the wheels are smaller than bicycle wheels, potholes and large cracks are more disruptive to these vehicles

These devices have seen a dramatic increase in use, and will likely only continue to be the case as they become more affordable, available, and accessible, for both personal devices and shared micromobility systems.



Design Speed Expectations

BICYCLE TYPE	FEATURE	TYPICAL SPEED
Upright Adult Bicyclist	Paved level surfacing	8-12 mph
	Crossing Intersections	10 mph
	Downhill	25-30 mph
	Uphill	5-12 mph
Recumbent Bicyclist	Paved level surfacing	18 mph
E-bikes and E-scooters	Paved level surfacing	10-20 mph
	Crossing Intersections	10-12 mph
	Downhill	30 mph
	Uphill	10-15mph



02

PEDESTRIAN TOOLBOX

INTRODUCTION

The Pedestrian Toolbox includes pedestrian-oriented infrastructure elements that create a more comfortable and safe pedestrian experience.

In Phoenix, in addition to all elements listed in the Toolbox, designing for heat mitigation is essential. To mitigate heat, trees, shade structures, and

building heights and setbacks should be designed to provide the maximum shade on sidewalks and streets - preventing the ground materials from absorbing too much heat from the sun. Surface materials and their respective UV reflective properties can also assist in reducing the effects of heat from the sun.

This toolbox will be helpful to in addressing pedestrian needs.



SIDEWALKS

SIDEWALKS

Sidewalk Zones & Widths

Sidewalks are the most fundamental element of the walking network, as they provide an area for pedestrian travel separated from vehicle traffic. Providing adequate and accessible facilities can lead to increased numbers of people walking, improved accessibility, and the creation of social space.

Design Features



Enhancement Zone	Amenity Zone	Pedestrian Access Route (PAR)	Building Frontage Zone
The curbside lane can act as a flexible space to further buffer the sidewalk from moving traffic, and may be used for a bike facility. Curb extensions and bike corrals may occupy this space where appropriate.	The amenity zone, also called the furnishing or landscaping zone, buffers pedestrians from the adjacent roadway, and is also the area where elements such as street trees, signal poles, signs, and other street furniture are properly located.	The pedestrian access route is the area intended for pedestrian travel. This zone should be entirely free of permanent and temporary objects while fully meeting the requirements for pedestrian accessibility. Wide pedestrian zones are needed in areas or where pedestrian flows are high.	The building frontage zone allows pedestrians a comfortable “shy” distance from the building fronts, fencing, walls and vertical landscaping. It provides opportunities for window shopping, to place signs, planters, or chairs.

Street Classification	Parking Lane/ Enhancement Zone	Amenity Zone	Pedestrian Access Route (PAR)	Building Frontage Zone*
Local Streets	Varies	4 - 6 ft	6 - 8 ft	2 ft
Pedestrian Priority Areas	Varies	6 - 10 ft	8 ft	2 - 8 ft
Arterials and Collectors	Varies	4 - 6 ft	6 - 8 ft	4 - 6 ft

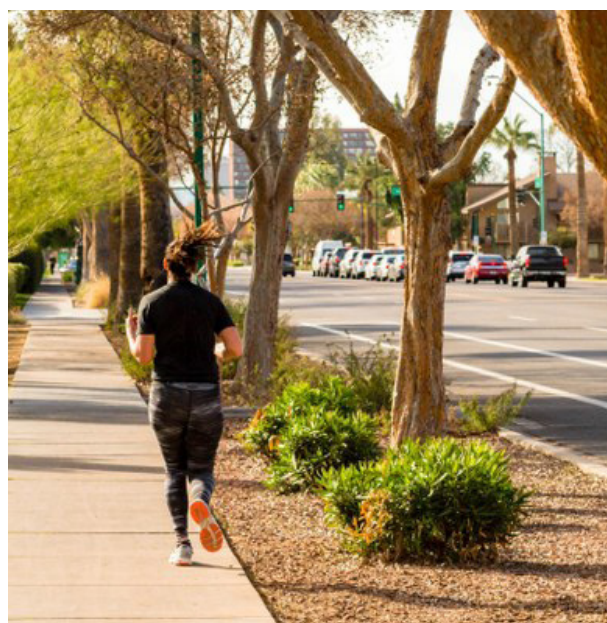
**Indicates ideal frontage zone space. Actual frontage zone is contingent upon the City's development code and required set backs*

Typical Application

- Wider sidewalks should be installed near schools, at transit stops, or anywhere high concentrations of pedestrians exist.
- At transit stops, an 8 ft by 5 ft clear space is required for accessible passenger boarding/alighting at the front door location per ADA requirements.
- Sidewalks should be continuous on both sides of urban commercial streets, and should be required in areas of moderate residential density (1-4 dwelling units per acre).
- When retrofitting gaps in the sidewalk network, locations near transit stops, schools, parks, public buildings, and other areas with high concentrations of pedestrians should be the highest priority.

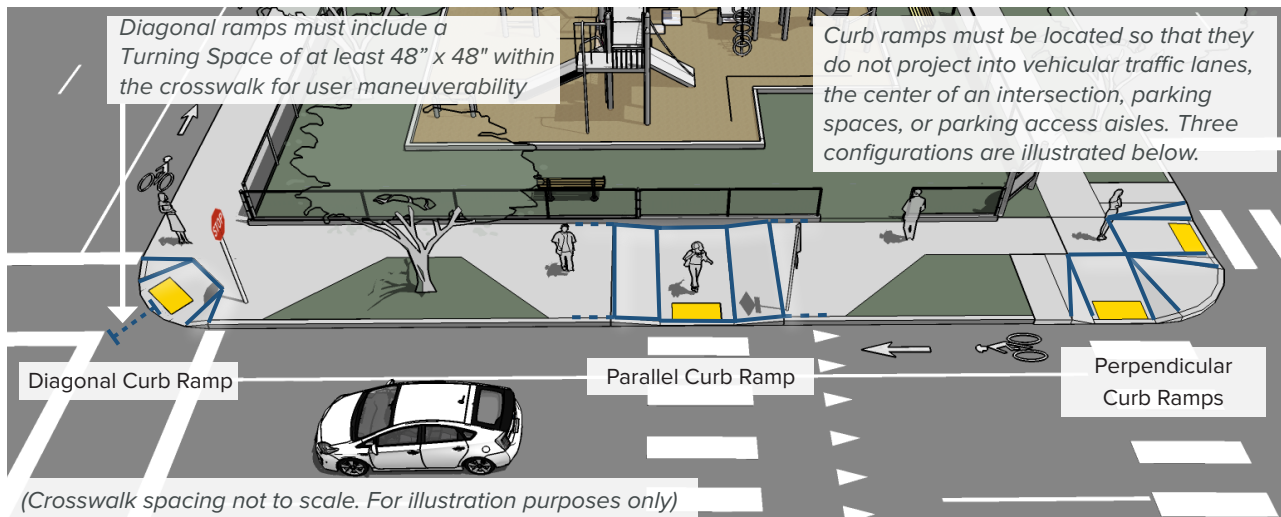
Materials and Maintenance

Sidewalks are typically constructed out of concrete and are separated from the roadway by a curb or gutter and sometimes a landscaped boulevard. Less expensive walkways constructed of asphalt, crushed stone, or other stabilized surfaces may be appropriate. Ensure accessibility and properly maintain all surfaces regularly. Surfaces must be firm, stable, and slip resistant. Colored, patterned, or stamped concrete can add distinctive visual appeal. See 'Sidewalk Maintenance' for more information.



CURB RAMPS

Curb ramps are the design elements that allow all users to make the transition from the street to the sidewalk. A sidewalk without a curb ramp can be useless to someone in a wheelchair, forcing them back to a driveway and out into the street for access. There are a number of factors to be considered in the design and placement of curb ramps.



Typical Application

Curb ramps must be installed at all intersections and midblock locations where pedestrian crossings exist, as mandated by federal legislation (1973 Rehabilitation Act and ADA 1990). All newly constructed and altered roadway projects must include compliant curb ramps. In addition, existing facilities must be upgraded to current standards when appropriate.

The edge of the Pedestrian Access Route (PAR) at the ADA Ramp opening, transitioning from the sidewalk to the street, is equipped with detectable warning surfaces (also known as truncated domes) to alert people with visual impairments to changes in the pedestrian environment. Visual contrast between the raised tactile device and the surrounding infrastructure is important so that the change is readily evident to partially sighted pedestrians.

Design Features

- The level landing at the top of a ramp should be at least 4 feet long and at least the same width as the ramp itself. The slope of the ramp should be compliant to current standards.
- If the top landing is within the sidewalk or corner area where someone in a wheelchair may have to change direction, the landing must be a minimum of 4'-0" long (in the direction of the ramp run) and at least as wide as the ramp, although a width of 5'-0" is preferred.



Not recommended: Diagonal curb ramp configuration.

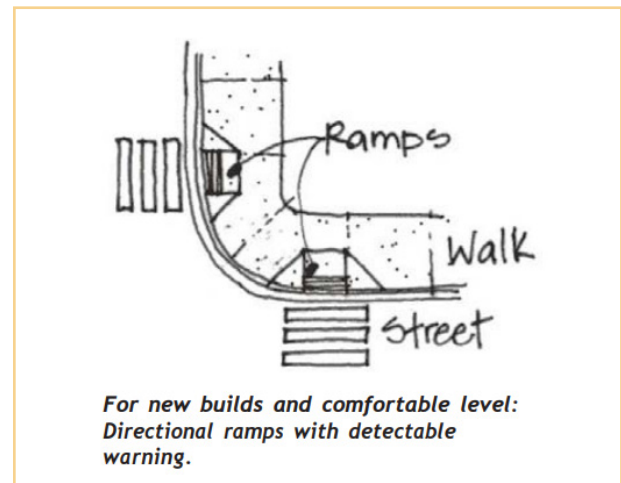


Recommended: Directional curb ramps for crossing in both directions.

Further Considerations

Where feasible, separate directional curb ramps for each crosswalk at an intersection should be provided rather than having a single ramp at a corner for both crosswalks. Ramps dedicated to a single pedestrian travel direction orient pedestrians directly into the center of the intersection, which can be challenging for wheelchair users and pedestrians with visual impairments. Diagonal curb ramp configurations are not allowed during new construction and can only be installed as part of a maintenance activity or after a technical infeasibility study and approval by the city engineer.

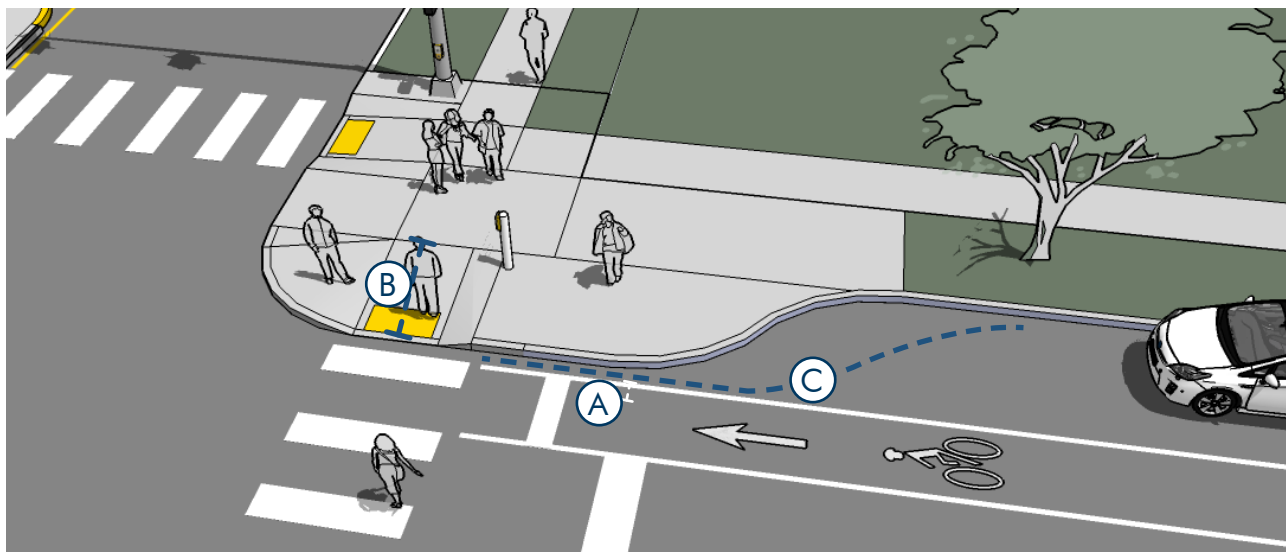
Curb radii need to be considered when designing directional ramps. While curb ramps are needed for use on all types of streets, the highest priority locations are on streets near transit stops, schools, parks, medical facilities, shopping areas.



*Pedestrian Policies and Design Guidelines, pg 56.
Maricopa Association of Governments, 2005*

Materials and Maintenance

It is critical that the interface between a curb ramp and the street be maintained adequately. Asphalt street sections can develop vertical differentials where concrete meets asphalt at the foot of the ramp, which can catch the front wheels of a wheelchair.



CURB EXTENSIONS

Curb extensions, also called curb bulbouts and neckdowns, minimize pedestrian exposure during crossing by shortening the crossing distance and giving pedestrians a better chance to see and be seen before beginning to cross. Curb extensions are appropriate for any crosswalk where it is desirable to shorten the crossing distance and there is a parking lane adjacent to the curb.

Typical Application

- For purposes of efficient street sweeping, the minimum radius for the reverse curves of the transition is 10 ft and the two radii should be balanced to be nearly equal.
- The curb extension width should terminate one foot short of the parking lane to maximize bicyclist safety when bicycle lanes are not present. This buffer is also preferred when bicycle lanes are present.

Design Features

- (A) Where a bike lane runs adjacent to the curb extension, design with a 1' buffer from edge of parking lane (preferred).
- (B) Crossing distance is shortened by approximately 6-8 feet with a parallel parking lane or 15 feet or more with an angled parking lane.

- (C) Curb extension length can be adjusted to accommodate bus stops or street furniture.

Further Considerations

If there is no parking lane, adding curb extensions across a roadway shoulder may be a problem for bicycle travel and truck or bus turning movements.

Materials and Maintenance

Planted curb extensions may be designed as a bioswale, a vegetated system for stormwater management. To maintain proper stormwater drainage, curb extensions can be constructed as refuge islands offset by a drainage channel or feature a covered trench drain.

CORNER RADII

The size of a curb's radius can have a significant impact on pedestrian comfort and safety. A smaller curb radius provides more pedestrian area at the corner, allows more flexibility in the placement of curb ramps, results in a shorter crossing distance and requires vehicles to slow more on the intersection approach. During the design phase, the chosen radius should be the smallest possible for the circumstances and consider the effective radius in any design vehicle turning calculations.

Typical Application

The curb radius may be as small as 3 ft where there are no turning movements, or 5 ft where there are turning movements and adequate street width. Wide outside travel lanes, on-street parking and bike lanes create a larger effective turning radius and can therefore allow a smaller physical curb radius.

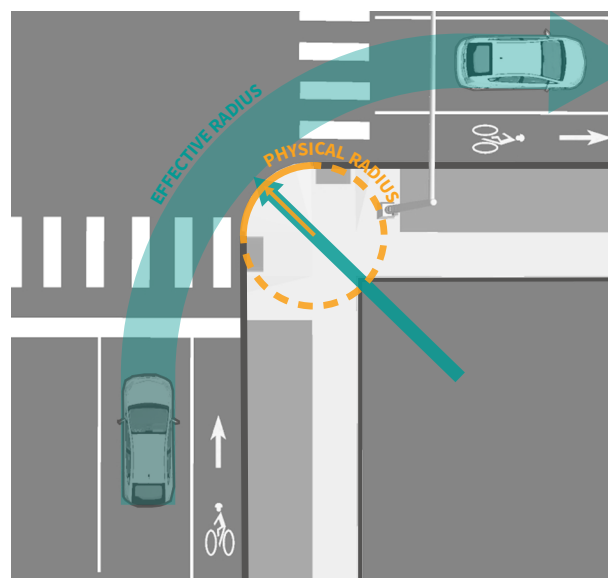
Design Features

Corners have two critical dimensions which must be considered together.

- The physical radius controls the pedestrian experience.
- The effective radius is the widest turning arc that a vehicle can take through the corner and is larger than the physical radius.

Further Considerations

Several factors govern the choice of curb radius in any given location. These include the desired pedestrian area of the corner, traffic turning movements, street classifications, design vehicle turning radius, intersection geometry, presence of a bus or other large vehicle route, and whether there is on-street parking or a bike lane (or both) between the travel lane and the curb. Dual radius corners with mountable aprons or other corner hardening devices such as modular speed bumps can be used to accommodate larger design/control vehicles while still effectively managing ordinary vehicular traffic.



Recommended: Bidirectional curb ramps for crossing in both directions.



HOV 2+
ONLY
6-9AM 3-7PM
MON-FRI
NEXT LEFT

CROSSWALK
STOP
ON
RED

FLASHING RED
STOP
PROCEED
WHEN SAFE

WEST
10

CROSSWALK
STOP
ON
RED

03

BICYCLE TOOLBOX

INTRODUCTION

Facility Selection: Bicycle User Type

The current AASHTO Guide to the Development of Bicycle Facilities encourages designers to identify their rider type based on the trip purpose (Recreational vs Transportation) and on the level of comfort and skill of the rider (Causal vs Experienced). An alternate, and commonly used, user-type framework for understanding a potential rider's willingness to bike is illustrated in the figure below. Developed by planners in Portland, OR* and supported by research**, this classification identifies four distinct types of bicyclists.

Strong and Fearless – This group is willing to ride a bicycle on any roadway regardless of traffic conditions. Comfortable taking the lane and riding in a vehicular manner on major streets without designated bicycle facilities.

Enthusied and Confident - This group of people riding bicycles who are riding in most roadway situations but prefer to have a designated facility. Comfortable riding on major streets with a bike lane.

Interested but Concerned – This group is more cautious and has some inclination towards bicycling, but are held back by concern over sharing the road with cars. Not very comfortable on major streets, even with a striped bike lane, and prefer separated pathways or low traffic neighborhood streets.

No Way, No How – This group comprises residents who simply aren't interested at all in bicycling and may be physically unable or don't know how to ride a bicycle, and they are unlikely to adopt bicycling in any way.

Typical Distribution of Bicyclist Types



* Roger Geller, City of Portland Bureau of Transportation. *Four Types of Cyclists*. <http://www.portlandonline.com/transportation/index.cfm?a=237507>. 2009.

** Dill, J., McNeil, N. *Four Types of Cyclists? Testing a Typology to Better Understand Bicycling Behavior and Potential*. 2012.

Facility Selection: Comfort

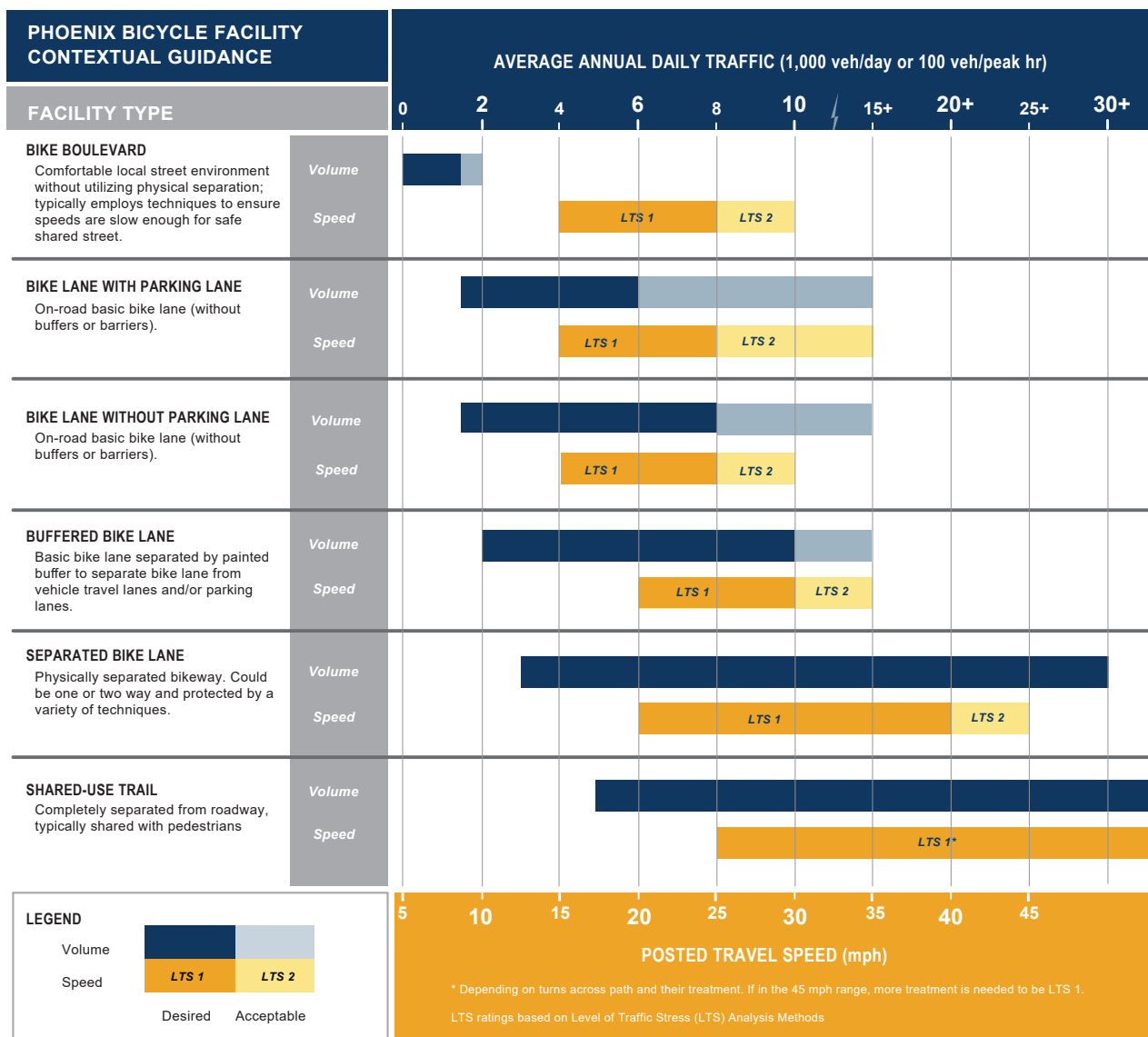
In order to provide a bikeway network that meets the needs of the Phoenix’s “Interested but Concerned” residents (who comprise the majority of the population), bikeways must be low-stress and comfortable. By using a metric called Level of Traffic Stress (LTS), specific facility types can be matched to the needs of people who bicycle in Phoenix. Generally, “Interested but Concerned,” users will only bicycle on LTS 1 or LTS 2 facilities.

Levels of Traffic Stress (LTS)

LTS LEVEL	DESCRIPTION	WHAT TYPE OF BICYCLISTS WILL RIDE ON THIS LTS FACILITY?		
		STRONG & FEARLESS	ENTHUSIASTIC & CONFIDENT	INTERESTED BUT CONCERNED
LTS 1	Presents the lowest level of traffic stress; demands less attention from people riding bicycles, and attractive enough for a relaxing bicycle ride. Suitable for almost all people riding bicycles, including children trained to ride in the street and to safety cross intersections.	YES	YES	YES
LTS2	Presents little traffic stress and therefore suitable to most adults riding bicycles, but demands more attention than might be expected from children.	YES	YES	SOMETIMES
LTS3	More traffic stress than LTS2, yet significantly less than the stress of integrating with multilane traffic.	YES	SOMETIMES	NO
LTS4	A level of stress beyond LTS 3. Includes roadways that have no dedicated bicycle facilities and moderate to higher vehicle speeds and volumes OR high speed and high volume roadways WITH an exclusive riding zone (lane) where there is a significant speed differential with vehicles.	YES	NO	NO

Facility Selection: Bikeways

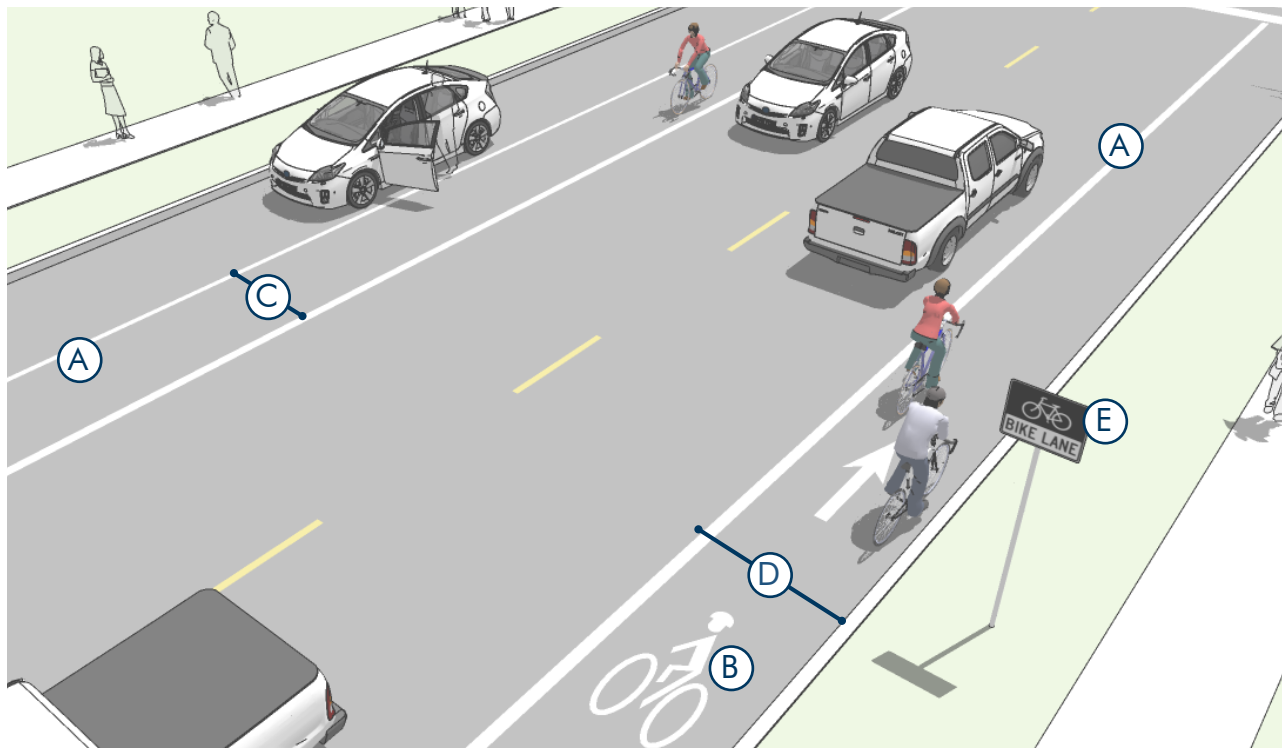
As a starting point to identify a preferred facility, the chart below can be used to determine the recommended type of bikeway to be provided in particular roadway speed and volume situations. To use this chart, identify the appropriate daily traffic volume on the existing or proposed roadway, and locate the facility types indicated by those key variables. Other factors beyond volume which affect facility selection include traffic mix of including heavy vehicles, the presence of on-street parking, intersection density, surrounding land use, and roadway sight distance. These factors are not included in the facility selection chart below, but should always be considered in the facility selection and design process.



This chart can be used to identify a preferred bicycle facility, or facilities, that would provide an LTS 1 or 2 experience at a selected location. For street segments, desired and acceptable vehicular volumes for each facility are shown. These are the motor vehicle volume ranges that are appropriate for that facility. The correspondence between motor vehicle speed on the street and the LTS score for each facility are also shown. The speed entries determine the LTS scores for the facility. A facility should only be chosen when both the street volumes and LTS scores are appropriate. Since ranges overlap, it is important to allow more than one facility type to meet the desired LTS. Other factors should be considered when selecting a treatment, such as proximity to schools, parks, or trailheads.

BIKE LANES

On-street bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signs. The bike lane is located directly adjacent to motor vehicle travel lanes and is used in the same direction as motor vehicle traffic. Bike lanes are typically on the right side of the street, between the adjacent travel lane and curb, road edge or parking lane.



Typical Application

- Bike lanes may be used on any street with adequate space, but are most effective on streets with moderate traffic volumes $\leq 6,000$ ADT ($\leq 4,000$ preferred).
- Bike lanes are most appropriate on streets with lower to moderate speeds ≤ 30 mph.
- Appropriate for skilled adult riders on most streets.
- May be appropriate for children when configured as 6+ ft wide lanes on lower-speed, lower-volume streets with one lane in each direction.

Design Features

- (A) Mark inside line with 8" stripe. Mark 4" parking lane line or "Ts".
- (B) Include a bicycle lane marking at the beginning of the bike lane, beginning and end of bike lane pockets, approaches and farside of arterial crossings, and major changes in direction. MUTCD recommends every 80 ft - 1,000 ft depending on land use context.
- (C) 6 foot width preferred adjacent to on-street parking, (5 foot min.). Buffer preferred when parking has high turnover, see Buffered Bike Lanes.

- ④ 5.5–7 foot preferred adjacent to curb and gutter or 4 feet more than the gutter pan width.
- ⑤ The R3-17 “Bike Lane” sign is optional, but recommended in most contexts.

Further Considerations

- On high speed streets (≥ 40 mph) the minimum bike lane should be 6 feet.
- It may be desirable to reduce the width of general purpose travel lanes in order to add or widen bicycle lanes.
- On multi-lane streets, the most appropriate bicycle facility to provide for user comfort may be buffered bicycle lanes or physically separated bicycle lanes.
- Contraflow bike lanes are a special type of bike lane that can be implemented in specific locations where a dedicated bike lane is needed for a particular direction of travel, but the roadway is oriented for one-way travel in the opposite direction, and/or when space constraints preclude a bike facility on nearby parallel routes that would otherwise serve this need. Contraflow bike lanes are effective in providing short, critical connections along bikeways, and special attention needs to be paid to facility transitions to other bikeway types.

Manhole Covers and Grates:

- Manhole surfaces should be manufactured with a shallow surface texture in the form of a tight, nonlinear pattern.
- If manholes or other utility access boxes are to be located in bike lanes within 50 ft. of intersections or within 20 ft. of driveways or other bicycle access points, special manufactured permanent nonstick surfaces ensure a controlled travel surface for bicyclists breaking or turning.
- Manholes, drainage grates, or other obstacles should be set flush with the paved roadway. Roadway surface inconsistencies pose a threat to safe riding conditions for bicyclists. Construction of manholes, access panels or



Bike lanes provided dedicated spaces for bicyclists to ride on the street.

other drainage elements should be constructed with no variation in the surface. The maximum allowable tolerance in vertical roadway surface will be 1/4 of an inch.

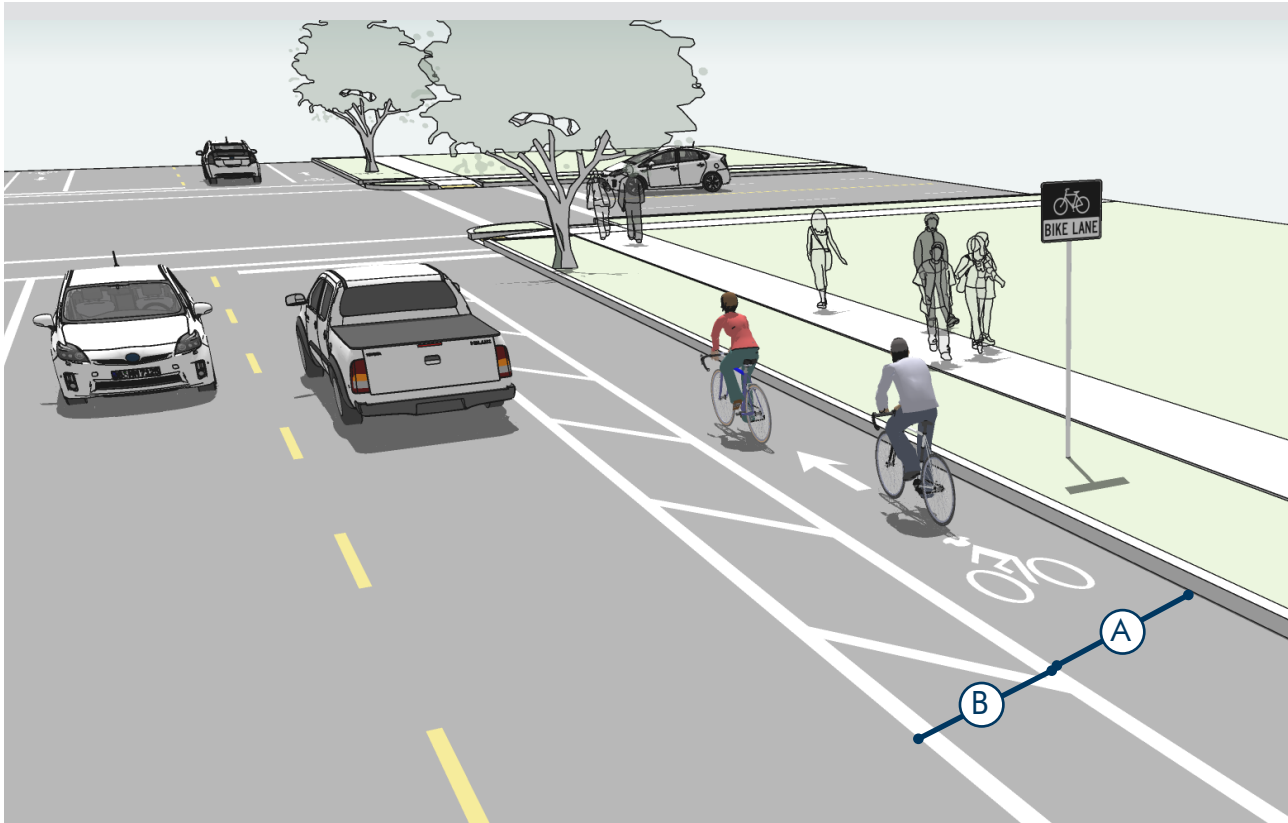
Materials and Maintenance

Bike lane striping and markings will require higher maintenance where vehicles frequently traverse over them at intersections, driveways, parking lanes, and along curved or constrained segments of roadway.

Bike lanes should also be maintained so that there are no pot holes, cracks, uneven surfaces or debris.

BUFFERED BIKE LANES

Buffered bike lanes are conventional bike lanes paired with a designated buffer space, separating the bike lane from the adjacent motor vehicle travel lane and/or parking lane.



Typical Application

- Anywhere a conventional bike lane is being considered.
- While conventional bike lanes are most appropriate on streets with lower to moderate speeds (≤ 30 mph), buffered bike lanes provide additional value on streets with higher speeds (>30 mph) and high volumes or high truck volumes (up to 6,000 ADT).
- On streets with extra lanes or lane width.
- Appropriate for skilled adult riders on most streets.

Design Features

- (A) The minimum bicycle travel area (not including buffer) is 5 feet wide.
- (B) Buffers should be at least 2.5 feet wide - but 3 feet or more in width is preferred. Diagonal markings are used in buffers that are 2.5 to 4 feet wide. Chevron markings are used in buffers over 4 feet wide.
- Buffers may be applied on the parking side, the travel side, both or alternating depending on the main source of concern.



Buffered bike lanes should include a striped buffer that is at least 2.5-3+ feet



The use of additional pavement markings delineates space between vehicles and bicyclists.

Further Considerations

- On multi-lane streets with high vehicles speeds, the most appropriate bicycle facility to provide for user comfort may be physically separated bike lanes.
- NCHRP Report #766 recommends, when space is limited, installing a buffer space between the parking lane and bicycle lane where on-street parking is permitted rather than between the bicycle lane and vehicle travel lane.¹ This buffer is particularly useful in commercial areas where parking turnover is higher.

Materials and Maintenance

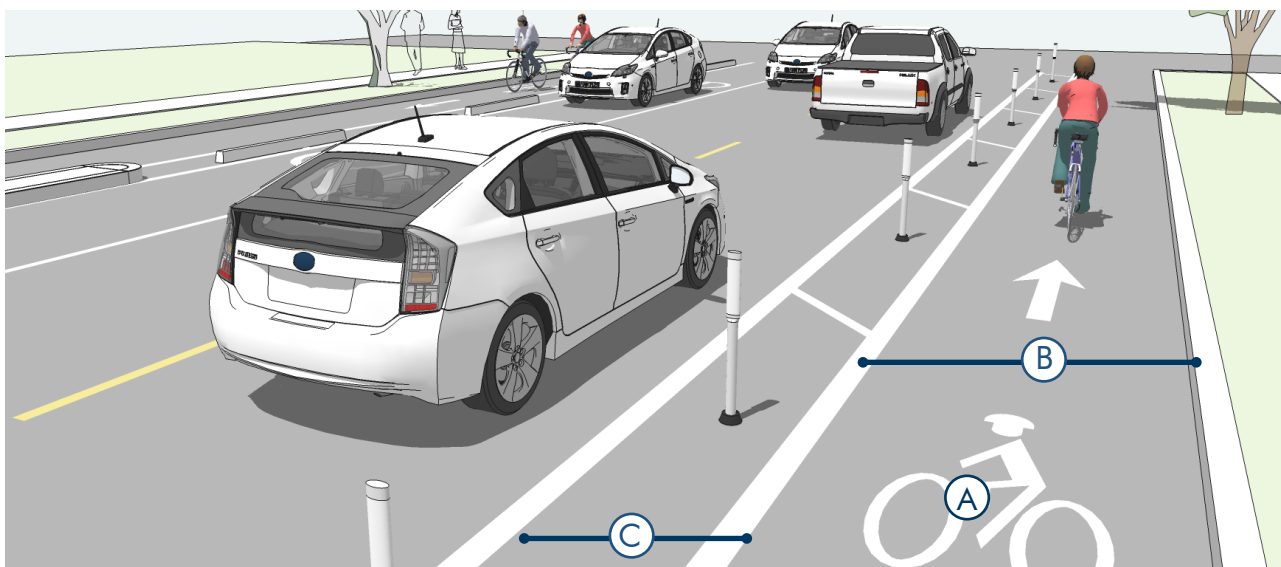
Bike lane striping and markings will require higher maintenance where vehicles frequently traverse over them at intersections, driveways, parking lanes, and along curved or constrained segments of roadway.

Bike lanes should be maintained so that there are no pot holes, cracks, uneven surfaces or debris.

¹ National Cooperative Highway Research Program. Report #766: Recommended Bicycle Lane Widths for Various Roadway Characteristics.

SEPARATED BIKE LANES: ONE-WAY

One-way separated bike lanes, also known as protected bikeways or cycle tracks, are on-street bikeway facilities that are separated from vehicle traffic. Physical separation is provided by a barrier between the bikeway and the vehicular travel lane. These barriers can include flexible posts, bollards, parking, planter strips, extruded curbs, or on-street parking. Separated bikeways using these barrier elements typically share the same elevation as adjacent travel lanes, but the bikeway could also be raised above street level, either below or equivalent to sidewalk level.



Typical Use

- Along streets on which conventional bicycle lanes would cause many bicyclists to feel stress because of factors such as multiple lanes, high bicycle volumes, high motor traffic volumes (9,000-30,000 ADT), higher traffic speeds (35+ mph), high incidence of double parking, higher truck traffic (10% of total ADT) and high parking turnover.
- Along streets for which conflicts at intersections can be effectively mitigated using parking lane setbacks, bicycle markings through the intersection, and other signalized intersection treatments.

Design Features

- A** Pavement markings, symbols and/or arrow markings must be placed at the beginning of the separated bikeway and at intervals along the facility based on engineering judgment to define the bike direction.

- B** 8 feet or more in width preferred in areas with high bicycle volumes or uphill sections to facilitate safe passing behavior. Minimum width, 6 feet (5.5 feet as an absolute minimum).
- C** When placed adjacent to parking, the parking buffer should be 4 ft wide to allow for passenger loading and to prevent door collisions.
 - Buffers should be wide enough to support the type of separation provided without that separation creating a hazard for drivers or bicyclists using the roadway.
 - When placed adjacent to a travel lane, one-way raised cycle tracks may be configured with a mountable curb to allow entry and exit from the bicycle lane for passing other bicyclists or to access vehicular turn lanes.
 - Include green elephant crossings marks at conflict points like intersections or driveways.



Parked cars serve as a barrier between bicyclists and the vehicle lane. Barriers could also include flexible posts, bollards, planters, or other design elements.

Further Considerations

- Diagonal markings are used in buffers that are 2.5 to 4 feet wide. Chevron markings are used in buffers over 4 feet wide.
- Curbs may be used as a channeling device. Grade-separation provides an enhanced level of separation in addition to buffers and other barrier types.
- Where possible, physical barriers such as removable curbs should be oriented towards the inside edge of the buffer to provide as much extra width as possible for bicycle use.
- A retrofit separated bikeway has a relatively low implementation cost compared to road reconstruction by making use of existing pavement and drainage and using a parking lane as a barrier.
- Gutters, drainage outlets and utility covers should be designed and configured as not to impact bicycle travel.
- For clarity at major or minor street crossings, consider a dotted line for the buffer boundary where cars are expected to cross.
- Special consideration should be given at transit stops to manage bicycle and pedestrian interactions.
- Consideration should be given to ensuring that entrances to separated bike lanes do not look like car travel lanes by incorporating clear signage and pavement markings.

Materials and Maintenance

Bikeway striping and markings will require higher maintenance where vehicles frequently traverse over them at intersections, driveways, parking lanes, and along curved or constrained segments of roadway. Green conflict markings (if used) will also generally require higher maintenance due to vehicle wear.

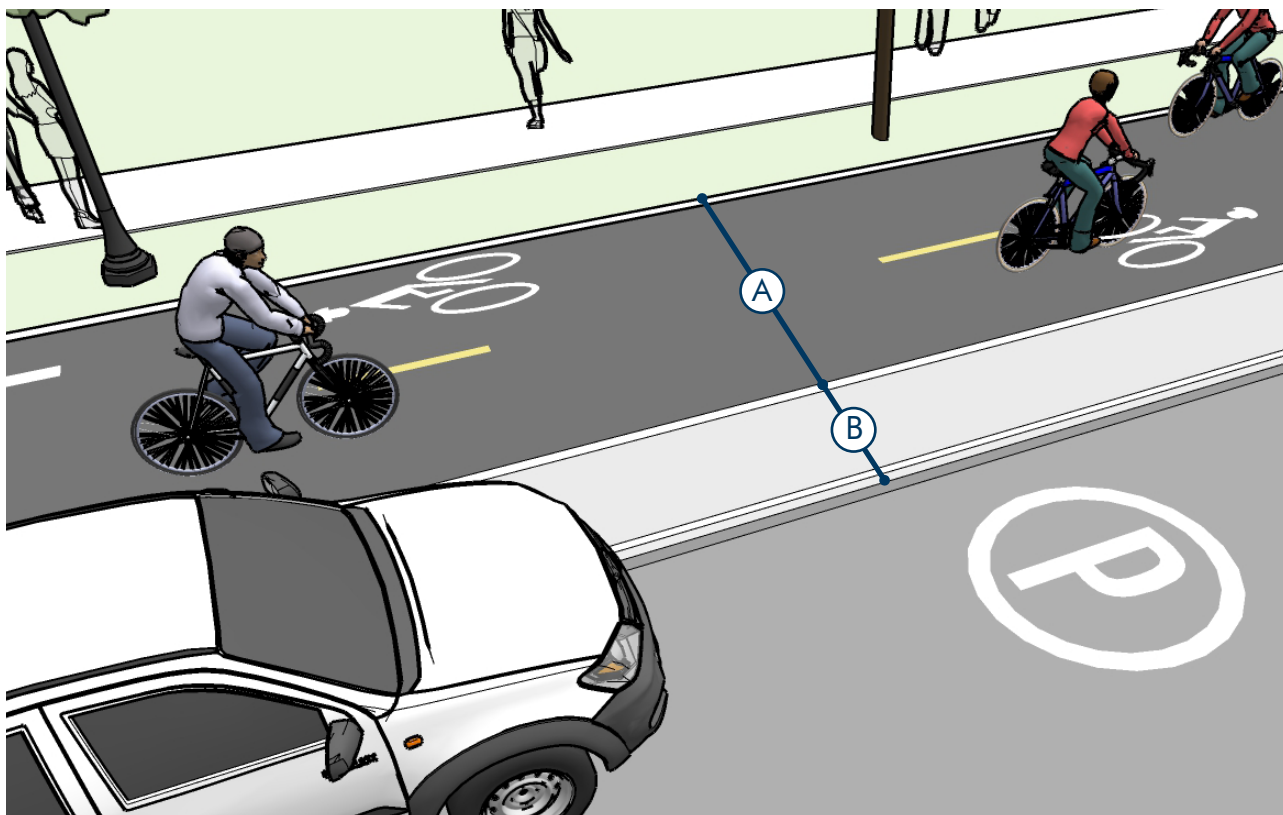
Bikeways should be maintained so that there are no pot holes, cracks, uneven surfaces or debris.

Access points along the facility should be provided for street sweeper vehicles to enter/exit the separated bikeway.

Install composite and reboundable delineator systems, which offer more durability.

SEPARATED BIKE LANES: TWO-WAY

Two-Way separated bike lanes are bicycle facilities that allow bicycle movement in both directions on one side of the road. Two-way separated bikeways share some of the same design characteristics as one-way separated bikeways, but often require additional considerations at driveway and side-street crossings, and intersections with other bikeways.



Typical Application

Works best on the left side of one-way streets.

- Streets with high motor vehicle volumes and/or speeds
- Streets with high bicycle volumes.
- Streets with a high incidence of wrong-way bicycle riding.
- Streets with few conflicts such as driveways or cross-streets on one side of the street.
- Streets that connect to shared use trails.

Design Features

- A** 12 foot operating width preferred (10 ft minimum) width for two-way facility.
 - In constrained locations an 8 foot minimum operating width may be considered for short intervals.
- B** Adjacent to on-street parking a 4 foot minimum width channelized buffer or island should be provided to accommodate opening doors. (NACTO, 2012).
 - Additional signalization and signs may be necessary to manage conflicts.



A two-way facility can accommodate bicyclists in two directions of travel.

Further Considerations

- A two-way separated bikeway on one way street should be located on the left side.
- A two-way separated bikeway may be configured at street level or as a raised separated bikeway with vertical separation from the adjacent travel lane.
- Two-way separated bikeways should ideally be placed along streets with long blocks and few driveways or mid-block access points for motor vehicles.
- Two-way separated bikeways may have implications for signalized and unsignalized intersections that put contra-flow bicyclists in increased levels of risk. This should be strongly considered with any project. Bicycle exclusive signals and other control elements are often recommended with two-way separated bikeways.
- Consideration should be given to ensuring that entrances to separated bike lanes do not look like car travel lanes by incorporating clear signage and pavement markings.

Materials and Maintenance

Bikeway striping and markings will require higher maintenance where vehicles frequently traverse over them at intersections, driveways, parking lanes, and along curved or constrained segments of roadway. Green conflict markings (if used) will also generally require higher maintenance due to vehicle wear.

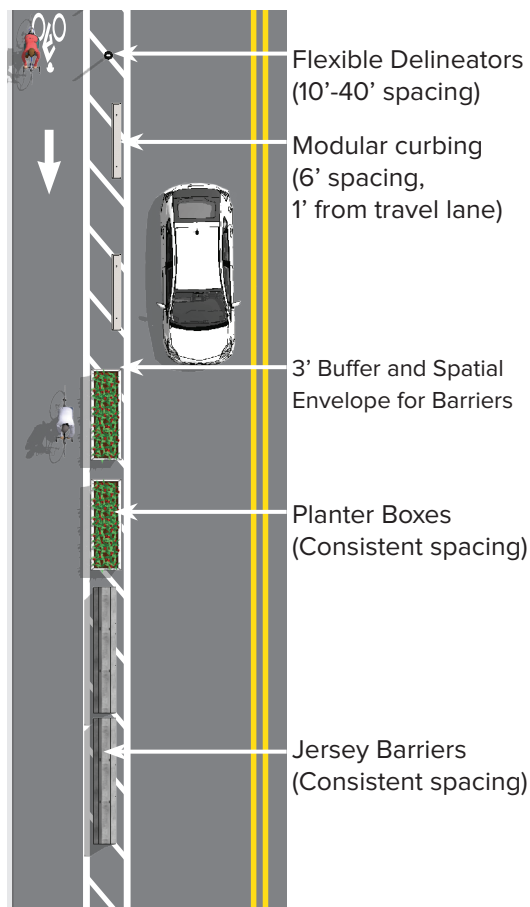
Bikeways should be maintained so that there are no pot holes, cracks, uneven surfaces or debris.

Access points along the facility should be provided for street sweeper vehicles to enter/exit the separated bikeway.

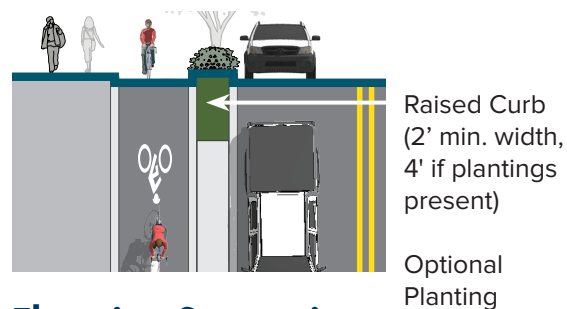
SEPARATED BIKE LANE BARRIERS

Separated bike lanes may use a variety of vertical elements to physically separate the bikeway from adjacent travel lanes. Barriers may be robust constructed elements such as curbs, or may be more interim in nature, such as flexible delineator posts.

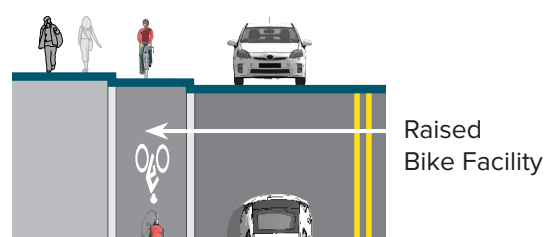
Barrier Separation



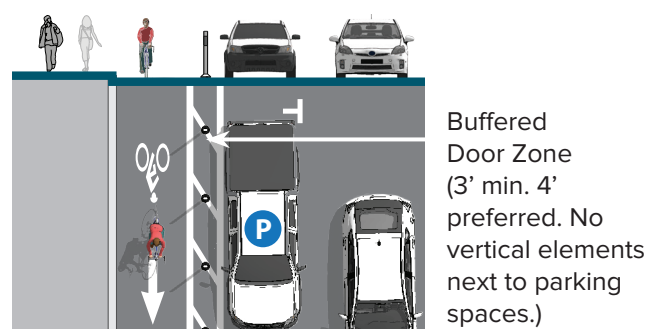
Median Separation



Elevation Separation



Parking Separation



Typical Application

Appropriate barriers for retrofit projects:

- Parked cars
- Flexible delineators
- Planters
- Modular curbing

Appropriate barriers for reconstruction projects:

- Curb separation
- Medians
- Landscaped medians
- Raised protected bike lane with vertical or mountable curb
- Pedestrian Refuge Islands



Raised separated bikeways are bicycle facilities that are vertically separated from motor vehicle traffic.

Design Features

- Maximize effective operating space by placing curbs or delineator posts as far from the through bikeway space as practicable.
- Allow for adequate shy distance of 1 to 5 feet from vertical elements to maximize useful space.
- When next to parking allow for 3 feet of space in the buffer space to allow for opening doors and passenger unloading.
- The presences of landscaping in medians, planters and safety islands increases comfort for users and enhances the streetscape environment.

Further Considerations

- With new roadway construction, a raised separated bikeway can be less expensive to construct than a wide or buffered bicycle lane because of shoulder trenching and sub base requirements.
- Parking should be prohibited within 30 feet of intersections and driveways to improve visibility. Clearly indicate the parking prohibition through the use of a red curb, signs, or other tools.

Materials and Maintenance

Separated bikeways protected by concrete islands or other permanent physical separation, can be swept and plowed by smaller street sweeper vehicles.

Access points along the facility should be provided for street sweeper vehicles to enter/exit the separated bikeway.

BIKE BOULEVARDS

BIKE BOULEVARD OVERVIEW

A Bike Boulevard is a low-speed, low-volume roadway that is designed to enhance comfort and convenience for people bicycling. It provides better conditions for bicycling while improving the neighborhood character and maintaining emergency vehicle access. Bike Boulevards are intended to serve as a low-stress bikeway network, providing direct, and convenient routes across Phoenix. Key elements of Bike Boulevards are unique signage and pavement markings, traffic calming and diversion features to maintain low vehicle volumes, and convenient major street crossings.



Treatments depicted may vary per roadway segment or location.

Typical Use

- Parallel with and in close proximity to major thoroughfares (1/4 mile or less) on low-volume, low-speed streets.
- Follow a desire line for bicycle travel that is ideally long and relatively continuous (2-5 miles).
- Avoid alignments with excessive zigzag or circuitous routing. The bikeway should have less than 10% out of direction travel compared to shortest path of primary corridor.
- Local streets with traffic volumes of fewer than 1,500 vehicles per day (for the majority of their length) and with average operating speeds below 25 mph. Utilize traffic calming to maintain or establish low volumes and discourage vehicle cut through / speeding.

Design Features

- Signs and pavement markings are the minimum treatments necessary to designate a street as a bike boulevard.
- Implement volume control treatments based on the context of the bike boulevard, using engineering judgment. While motor vehicle volumes should not exceed 3,000 vehicles per day, ideal conditions are 1,500 vehicles per day or less.
- Intersection crossings should be designed to enhance comfort and minimize delay for bicyclists of diverse skills and abilities.



A traffic circle included in an intersection along a Bike Boulevard calms traffic since vehicles are forced to slow down. Photo credit: Alta



An example of an large pavement marking to reinforce that the street is a Bike Boulevard.

Further Considerations

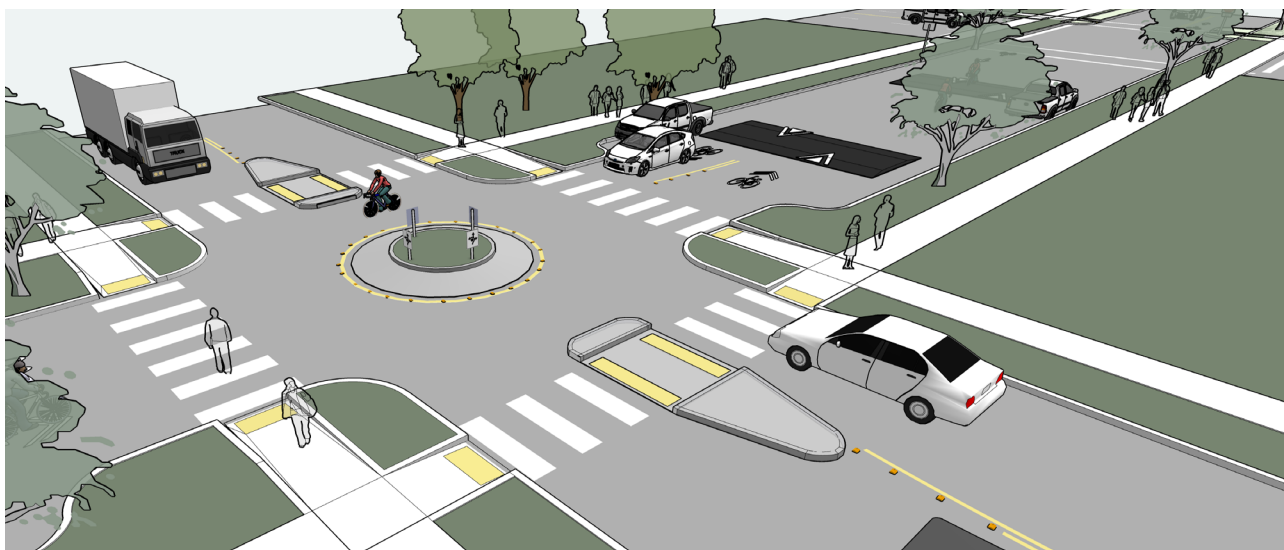
- Bike Boulevards are established on streets that improve connectivity to key destinations and provide a direct, low-stress route for bicyclists, with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority over other modes.
- Bike Boulevard retrofits to local streets are typically located on streets without existing signalized accommodation at crossings of collector and arterial roadways. Without treatments for bicyclists, these intersections can become major barriers along the Bike Boulevard.
- Traffic calming can deter motorists from driving on a street. Anticipate and monitor vehicle volumes on adjacent streets to determine whether traffic calming results in inappropriate volumes. Traffic calming can be implemented on a trial basis.

Materials and Maintenance

Bike Boulevards require few additional maintenance requirements to local roadways. Signage, signals, and other traffic calming elements should be inspected and maintained according to local standards.

TRAFFIC CALMING

Traffic calming devices can help mitigate speeding and cut-through traffic by changing driver behavior through a variety of visual or physical changes to the road environment. Such measures may reduce the design speed of a street and can be used in conjunction with reduced speed limits to reinforce the expectation of lowered speeds.



Typical Application

- Traffic calming measures should be limited to placement along local streets, typically with a maximum posted speed of 30 mph.
- Traffic calming measures should be implemented when the safety of all roadway users, especially pedestrians and bicyclists, is at risk due to high vehicular speeds. The risk can be determined by an engineering study.
- Traffic calming measures can be more applicable in areas with high potential for conflict between pedestrian/bicyclist and motor vehicles.
- Traffic calming measures may be most appropriate in areas with predominantly residential or mixed-use land use.
- If applicable, traffic calming measures should not infringe on bicycle space. Where possible, provide a bicycle route outside of the element so bicyclists can avoid having to merge into traffic at a narrow pinch point.

- Traffic calming measures should always consider emergency vehicle response times and turning abilities.

Design Features

- There are a variety of treatments and combinations of treatments that can be used for traffic calming.
- Priority traffic calming measures include strategies and devices that are primarily focus on safety. They are meant to regulate, warn, inform, enforce, and educate motorists, cyclists, and pedestrians on the road. Examples include, radar signs, pavement markings, turn restrictions, temporary speed bumps.
- Secondary traffic calming devices and roadway design features are used primarily to reduce traffic speeds within residential areas. These measures are used when primary calming devices have not been effective. Examples

include, speed tables, chicanes, traffic circles, and tree planting.

- Traffic diversion may be employed to discourage cut-through traffic from utilizing residential streets designated as Bike Boulevards. Traffic diverters are often employed when traffic volumes in a particular area have been found to be significantly higher compared to similar streets in other areas. Examples include, diverters, partial street closures, and median barrier/forced turn islands.

Further Consideration

Benefits of speed management include:

- Improves conditions for bicyclists, pedestrians, and residents on local streets.
- Reduced travel speeds decreases the exposure risks between bicyclists/pedestrians and motor vehicles.
- Reduced travel speeds result in reduced injury severity in the event of a collision.
- Helps achieve a safer and more livable neighborhood while balancing the transportation needs of the roadway.



Bulb outs narrow the right-of way, creating visual friction and slowing cars.

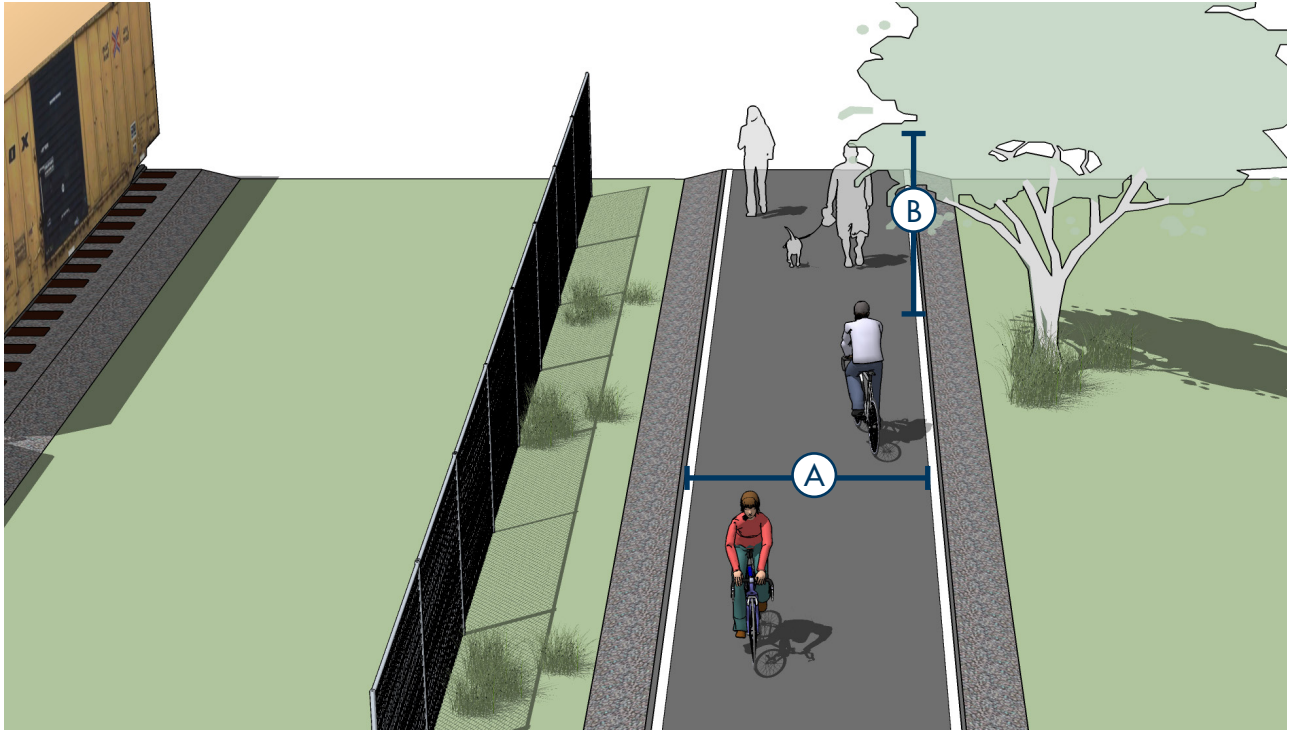


04

SHARED USE PATHS

SHARED USE PATHS

A shared use path provides a travel area separate from motorized traffic for bicyclists, pedestrians, skaters, wheelchair users, joggers, and other users. Shared use paths are desirable for bicyclists of all skill levels preferring separation from traffic. These facilities should generally provide travel opportunities not provided by existing roadways.



Typical Use

- In waterway corridors, such as along canals, drainage ditches, rivers, and creeks.
- In abandoned rail corridors (commonly referred to as Rails-to-Trails or Rail-Trails.)
- In active rail corridors, trails can be built adjacent to active railroads (referred to as Rails-with-Trails.)
- In utility corridors, such as power line and sewer corridors.
- Along roadways.

Design Features

- Ⓐ 12-14 ft is recommended for heavy use situations with high concentrations of multiple users. A separate track (5' minimum) can be provided for pedestrian use.
- 10 ft is recommended in most situations and will be adequate for moderate to heavy use.

Lateral Clearance

- A 2 ft or greater shoulder on both sides of the path should be provided if the trail is constructed from asphalt. If the trail is constructed out of concrete these clearances should be maintained, but no gravel shoulder is required.
- 1-2 ft of clearance should be provided between the edge of path and barriers, such as walls or fences, or railing

Overhead Clearance

- Ⓑ Clearance to overhead obstructions should be 8 ft minimum, with 10 ft recommended.

Striping

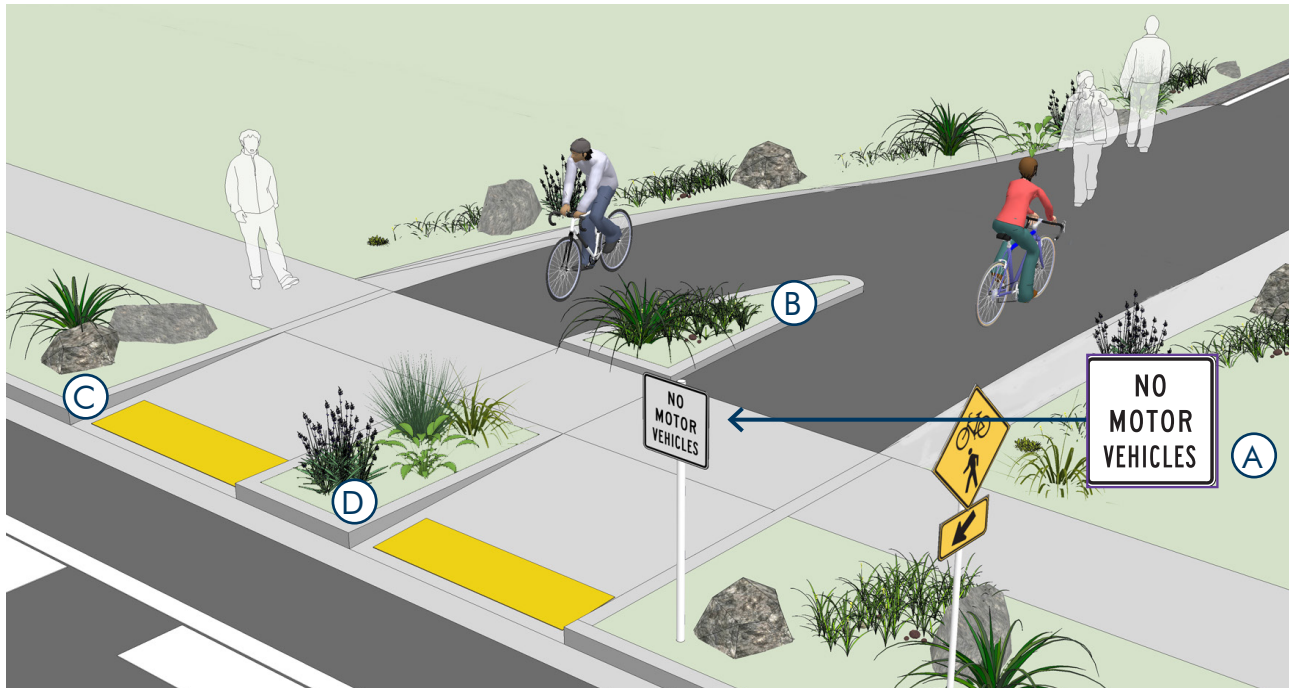
- When striping is desired, use a 4 inch dashed yellow centerline stripe with 4 inch solid white edge lines.
- Solid centerlines can be provided on tight or blind corners and transitions, and on the approaches to roadway crossings.

Further Considerations

- Under most conditions, centerline markings are not necessary. Centerline markings should only be used if necessary for clarifying user positioning or preferred operating procedure: Solid line = No Passing; Dashed line = Lane placement
- Paths with a high volume of bidirectional traffic should include a centerline. This can help communicate that users should expect traffic in both directions and encourage users to travel on the right and pass on the left. Wide trails will function better with higher levels of user traffic.
- Where there is a sharp blind curve, painting a solid yellow line with directional arrows reduces the risk of head-on collisions.
- Small scale signs should be used in trail environments.
- Terminate the path where it is easily accessible to and from the street system, preferably at a trailhead, controlled intersection, or at the beginning of a dead-end street.
- Use of bollards should be avoided when possible. If bollards are used at intersections and access points, they should be colored brightly and/or supplemented with reflective materials to be visible at night.

PATHWAY ENTRANCES

Bollards or other physical barriers are often used to restrict motor vehicle access to the shared use path. Unfortunately, physical barriers are often ineffective at preventing access, and create obstacles to legitimate path users. Alternative design strategies use signage, landscaping and curb cut design to reduce the likelihood of motor vehicle access.



Typical Application

- Bollards or other barriers should not be used unless there is a documented history of unauthorized intrusion by motor vehicles.
- If unauthorized use persists, assess whether the problems posed by unauthorized access exceed the risks and issues posed by bollards and other barriers.

Design Features

- (A) “No Motor Vehicles” signage (R5-3) may be used to reinforce access rules.
- (B) At intersections, split the trail tread into two sections separated by low landscaping.
- (C) Vertical curb cuts should be used to discourage motor vehicle access.
- (D) Low landscaping preserves visibility and emergency access.



05

ENHANCED CROSSING TREATMENTS

INTERSECTION TREATMENTS

TWO-STAGE TURN BOXES

Two-stage turn boxes offer bicyclists a safe way to make turns at multi-lane signalized intersections from a physically separated or conventional bike lane. On separated bike lanes, bicyclists are often unable to merge into traffic to turn due to physical separation, making the two-stage turning critical. This treatment received Interim Approval from FHWA in 2017 (IA-20).

Typical Application

- Streets with high vehicle speeds and/or traffic volumes.
- At intersections of multi-lane roads with signalized intersections.
- At signalized intersections with a high number of bicyclists making a left turn from a right side facility.
- Preferred treatment to assist turning maneuvers on bike lanes, instead of requiring bicyclists to merge to make a vehicular left turn.
- Required for protected bikeways to assist left turns from a right side facility, or right turns from a left side facility.



- This design formalizes a maneuver called a “box turn” or “pedestrian style turn.”
- Design guidance for two-stage turns apply to both bike lanes and separated bike lanes.
- Two-stage turn boxes reduce conflicts in multiple ways; from keeping bicyclists from queuing in a bike lane or crosswalk and by separating turning bicyclists from through bicyclists.
- Bicyclist capacity of a two-stage turn box is influenced by physical dimension (how many bicyclists it can contain) and signal phasing (how frequently the box clears.)

Design Features

- The two-stage turn box should be placed in a protected area. Typically this is within the shadow of an on-street parking lane or protected bike lane buffer area and should be placed in front of the crosswalk to avoid conflict with pedestrians.
- 10 foot x 6.5 foot preferred dimensions of bicycle storage area (6 foot x 3 foot minimum).
- Bicycle stencil and turn arrow pavement markings should be used to indicate proper bicycle direction and positioning. (NACTO, 2012)

Further Considerations

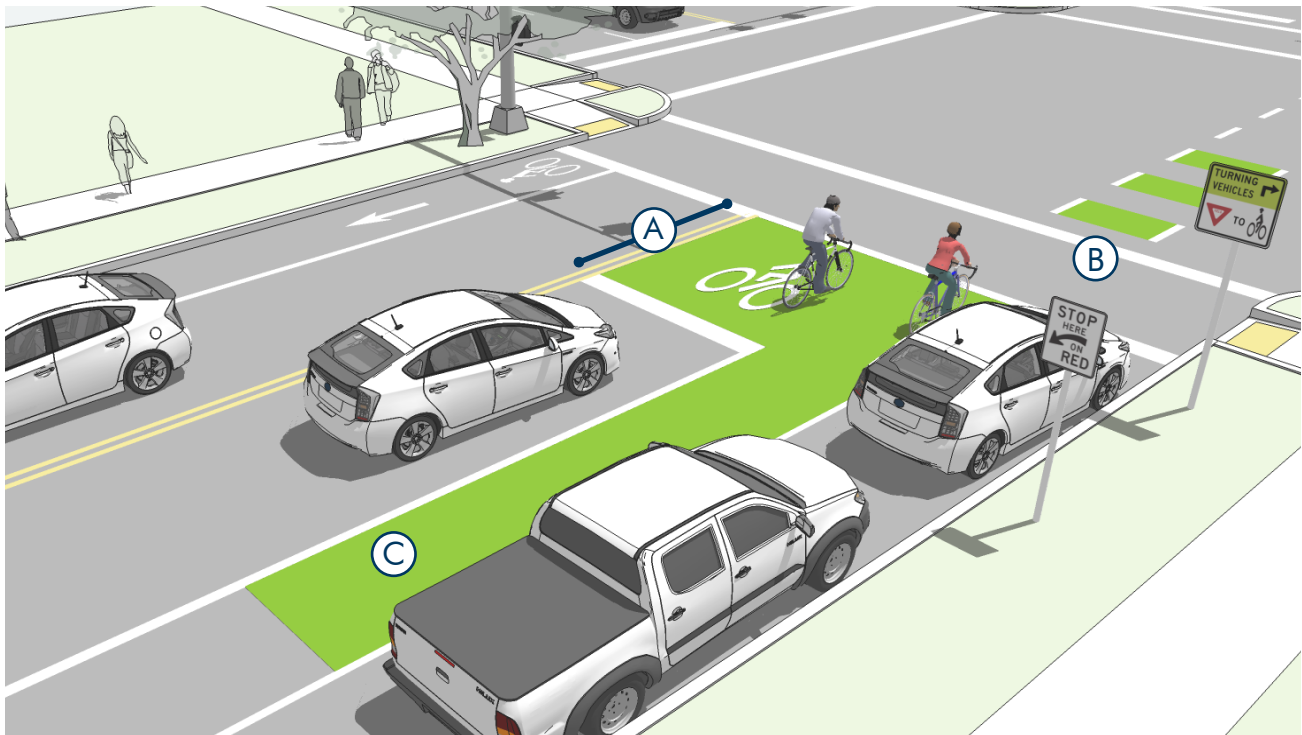
- Consider providing a “No Turn on Red” on the cross street to prevent motor vehicles from entering the turn box.

Materials and Maintenance

Turn boxes may subject to high vehicle wear, especially turning passenger vehicles, buses, and heavy trucks. As a result, bike boxes with green coloring will require more frequent replacement over time. The life of the green coloring will depend on vehicle volumes and turning movements, but Thermoplastic or MMA are generally more durable material than paint.

BICYCLE BOX

A bicycle box is designed to provide bicyclists with a safe and visible space to get in front of queuing traffic during the red signal phase. Motor vehicles must queue behind the white stop line at the rear of the bike box. On a green signal, all bicyclists can quickly clear the intersection. This treatment received Interim Approval from the FHWA in 2016 (IA-18).



Typical Use

- At potential areas of conflict between bicyclists and turning vehicles, such as a right or left turn locations.
- At signalized intersections with high bicycle volumes.
- At signalized intersections with high vehicle volumes.
- Not to be used on downhill approaches to minimize the right hook threat potential during the extended green signal phase.

Design Features

- Ⓐ 14 foot minimum depth from back of crosswalk to motor vehicle stop bar. (NACTO, 2012)
- Ⓑ A “No Turn on Red” sign should be installed overhead to prevent vehicles from entering the Bike Box. A “Stop Here on Red” sign should be post mounted at the stop line to reinforce observance of the stop line.
- Ⓒ A 50 foot ingress lane should be used to provide access to the box.
 - Use of green colored pavement is recommended.



A bike box allows for bicyclists to wait in front of queuing traffic, providing high visibility and a head start over motor vehicle traffic. Photo credit: Marin County.

Further Considerations

- This treatment positions bicycles together and on a green signal, all bicyclists can quickly clear the intersection, minimizing conflict and delay to transit or other traffic.
- Pedestrian also benefit from bike boxes, as they experience reduced vehicle encroachment into the crosswalk.
- Bike boxes require permission from the FHWA to implement, and jurisdictions must receive approval prior to implementation. A State may request Interim Approval for all jurisdictions in that State.¹
- Bike boxes should not be used to accommodate bicyclist turns at intersections that have substantial parallel green time as bicyclists cannot safely occupy the box when arriving on green.

Materials and Maintenance

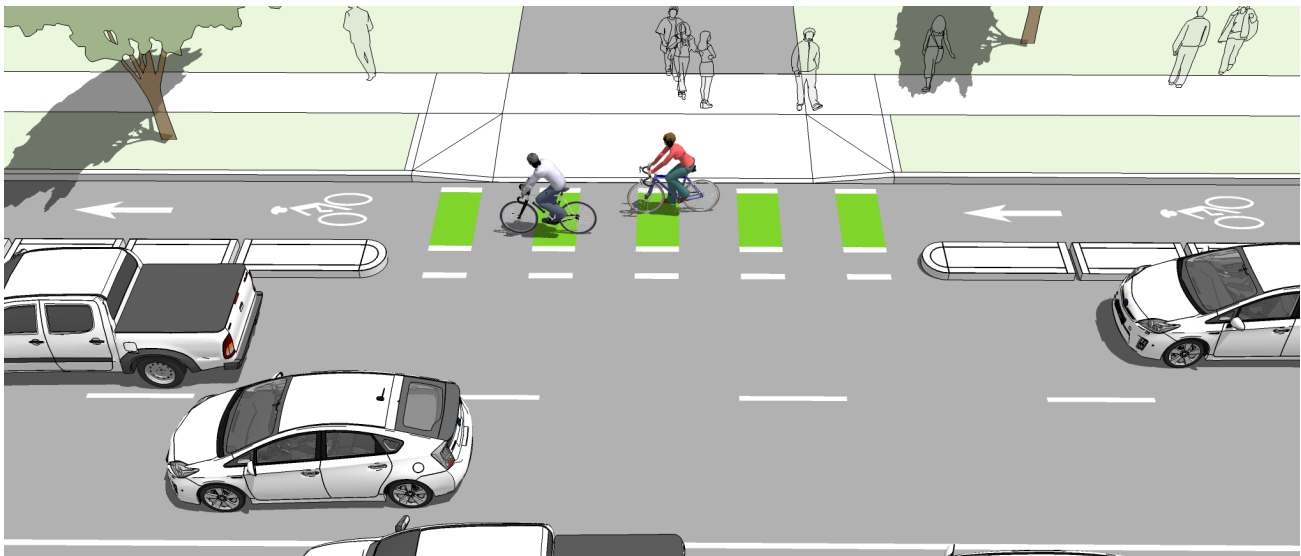
Bike boxes are subject to high vehicle wear, especially turning passenger vehicles, buses, and heavy trucks. As a result, bike boxes with green coloring will require more frequent replacement over time. The life of the green coloring will depend on vehicle volumes and turning movements, but thermoplastic is generally a more durable material than paint.

¹ FHWA. *Interim Approval for Optional Use of an Intersection Bicycle Box (IA-18)*. 2016.

DRIVEWAY & MINOR STREET CROSSINGS

The added separation provided by separated bikeways creates additional considerations at intersections and driveways when compared to conventional bicycle lanes. Special design guidelines are necessary to preserve sightlines and denote potential conflict areas between modes, especially in the case of a two-way bike lane when motorists turning into or out of driveways may not be expecting bicycle travel opposite to the main flow of traffic.

At driveways and crossings of minor streets, bicyclists should not be expected to stop if the major street traffic does not stop.



Typical Use

- Along streets with separated bikeway where there are intersections and driveways.
- Higher frequency driveways or crossings may require additional treatment such as conflict markings and signs.

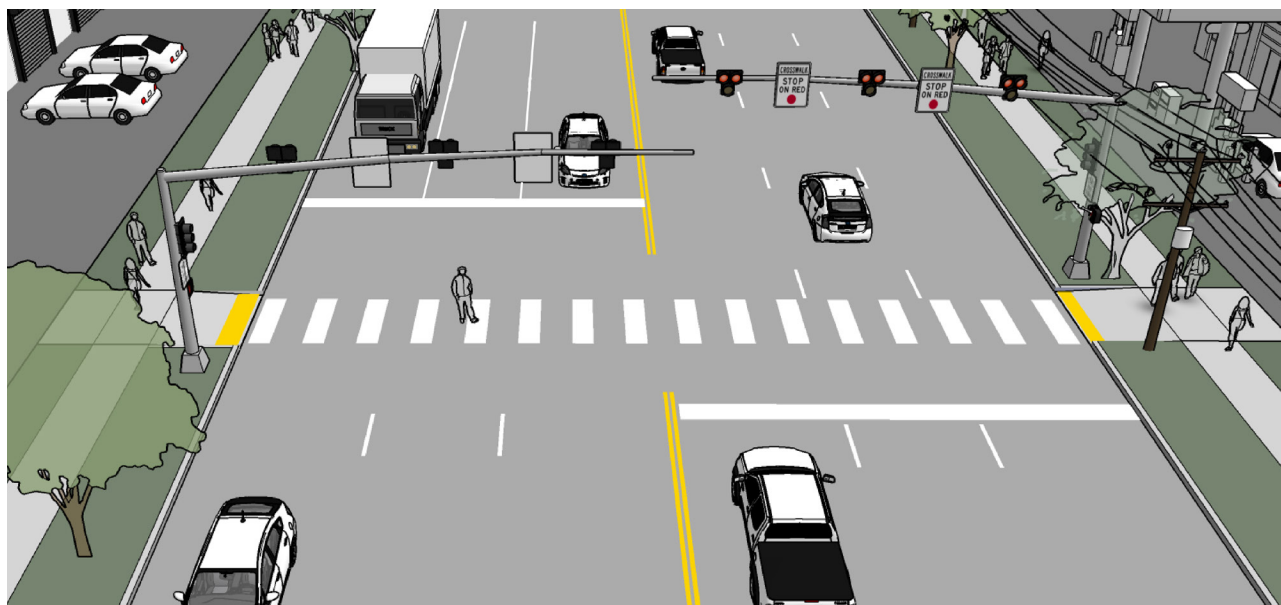
Design Features

- Remove parking to allow for the appropriate clear sight distance before driveways or intersections to improve visibility. The desirable no-parking area is at least 30 feet from each side of the crossing.
- Use colored pavement markings and/or shared line markings through conflict areas at intersections.
- If a raised bikeway is used, the height of the lane should be maintained through the crossing, requiring automobiles to cross over.
- Motor vehicle traffic crossing the bikeway should be constrained or channelized to make turns at sharp angles to reduce travel speed prior to the crossing.
- Driveway crossings may be configured as raised crossings to slow turning cars and assert physical priority of traveling bicyclists.
- Motor vehicle stop bar on cross-streets and major driveways is setback from the intersection to ensure that drivers slow down and scan for pedestrians and bicyclists before turning.

SIGNALS AND BEACONS

HIGH-INTENSITY ACTIVATED CROSSWALKS (HAWK)

High-Intensity Activated Crosswalks (HAWK) are used to improve non-motorized crossings of major streets. A hybrid beacon consists of a signal head with two red lenses over a single yellow lens on the major street, and a pedestrian signal head for the crosswalk. HAWKS are only used at marked mid-block crossings or unsignalized intersections. They are activated with a pedestrian pushbutton at each end. If a median refuge island is used at the crossing, another pedestrian pushbutton can be located on the island to create a two-stage crossing.



Typical Application

- Suitable for multi-lane streets where speeds are above 30-45 mph
- Where off-street bicycle and pedestrian facilities intersect major streets without signalized intersections.
- At intersections or midblock crossings where there are high pedestrian volumes.

Design Features

- HAWKS may be installed without meeting traffic signal control warrants based on engineering judgment if roadway speed and volumes are excessive for comfortable pedestrian crossings.
- If installed within a signal system, signal engineers should evaluate the need for the HAWKS to be coordinated with other signals.
- Parking and other sight obstructions shall be prohibited in advance of, and beyond, the marked crosswalk to provide adequate sight distance.



Further Considerations

- HAWKs are normally activated by push buttons, but may also be triggered by infrared, microwave, or video detectors. If not on-demand, the maximum delay for activation of the signal should be two minutes, with minimum crossing times determined by the width of the street, but a much shorter delay is strongly preferred.
- Each crossing, regardless of traffic speed or volume, requires review to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity, and safety.
- The installation of HAWKs should also include public education and enforcement campaigns to ensure proper use and compliance.

Materials and Maintenance

- HAWKs are subject to the same maintenance needs and requirements as standard traffic signals. Signing and striping need to be maintained to help users understand any unfamiliar traffic control.

TOUCAN SIGNAL

“Toucan” signalized crossings of streets are a special signal configuration at minor street crossings of a major street, exclusively for people walking and biking, so that “two can” cross the major street concurrently. Vehicles on the minor street do not have a signal, and are instead forced to turn right at a stop sign. This does function as a half signal since vehicles are not allowed to turn left or proceed through. The placement of the Toucan can vary within a given intersection, depending on the overall roadway width, and whether one-way vs. two-way operations are contained fully within the median in the middle of the minor street.



A Toucan signal in Tucson, AZ. Motorists must turn right onto Stone Avenue, the major roadway (from either direction). Bicyclists can turn left, right, or go straight. Bicyclists turning left or going straight can push a button to activate a green bicycle signal indication. Photo credit: Steven Vance.

Typical Use

- Appropriate at carefully designed intersection locations
- Across higher traffic streets where people walking and biking both require safe and comfortable crossings, such as along Bike Boulevards.

Design Features

- A toucan signal assembly may be created by pairing a bicycle and pedestrian signal heads. The bicycle signal must comply with requirement from FHWA Interim Approval 16.
- The major street faces a standard traffic signal (red, amber, and green indications) for the major road. When located at an intersection, the minor cross street has Stop sign to control minor street motor vehicle traffic.

- The pedestrian/bike phase is typically activated actively by a pushbutton or passively using other detection devices.
- At street crossings, the design must be paired with access management or other measures to reduce potential conflicts. Such measures as turn restrictions with dynamic (blank-out) No Right turn/No Left Turn signs, or access management to limit conflicting motor vehicle movements into the and out of the intersection
- High visibility crosswalk markings and bicycle lane dotted lane line extensions (when connecting bike lanes) help to clarify pedestrian and bicyclist paths.
- Pedestrians typically need more time to travel through an intersection than bicyclists. Signal timing and recall phases should be responsive to the detection and actuation by different users.
- Bicycle detection and actuation systems include user-activated buttons mounted on a pole, loop detectors that register a call to the bike signal when a bicycle is detected, microwave detectors, or video/thermal detection cameras that detect a change in the activity at the location.

Further Considerations

- The FHWA has been discouraging “half signals” for several decades because of the potential conflict issues caused when minor-street drivers make a right turn onto the major street, in conflict with the crossing pedestrians (the center-running configuration shown in the photo to right eliminates this risk).
- The steady red signal indication provides a clear regulatory message that typically receives a more uniform control response than warning signs or flashing beacons. Red signal indications receive a high-degree of yielding with over 95% compliance (NCHRP 562).
- Because this is not a common signal configuration at intersections, it is important to operate all toucan signals consistently across the jurisdiction for maximum understanding, compliance, and safety.
- FHWA has approved bicycle signals for use, if they comply with requirements from Interim Approval 16.

Materials and Maintenance

Pedestrian and bicycle signal detection equipment should be inspected and maintained regularly, especially if detection relies on manual actuation. Pushbuttons and loop detectors will tend to have higher maintenance needs than other passive detection equipment.

BIKE DETECTION AND ACTUATION

Bicycle detection and actuation is used to alert the signal controller of bicycle crossing demand on a particular approach. Proper bicycle detection should meet two primary criteria: accurately detects bicyclists and provides clear guidance to bicyclists on how to actuate detection (e.g., what button to push, where to stand).

Typical Application

- At signalized intersections within bicycle lanes or general purpose travel lanes.
- At signalized intersections within left turn lanes used by bicyclists.
- At signalized intersections within separated bike lanes.
- In conjunction with active warning beacons and pedestrian hybrid beacons.

Design Features

Video Detection

- Video detection systems use digital image processing to detect a change in the image at a location. These systems can be calibrated to detect bicycle, although there may be detection issues during poor lighting and weather conditions.

Thermal Detection

- Infrared detection systems typically consist of one or more thermal cameras, a microprocessor to process the thermal imagery, and software to interpret the traffic flow data and communicate with the traffic signal controller. These systems are typically able to extract a significant amount of data from the thermal imagery.

Microwave Detection

- Microwave sensor detection is a system which uses frequency modulated continuous wave radio signals to detect objects in the roadway. This method marks the detected object with a time code to determine its distance from the sensor.
- Microwave sensor detection is unaffected by temperature and lighting, which can affect standard video detection.

Materials and Maintenance

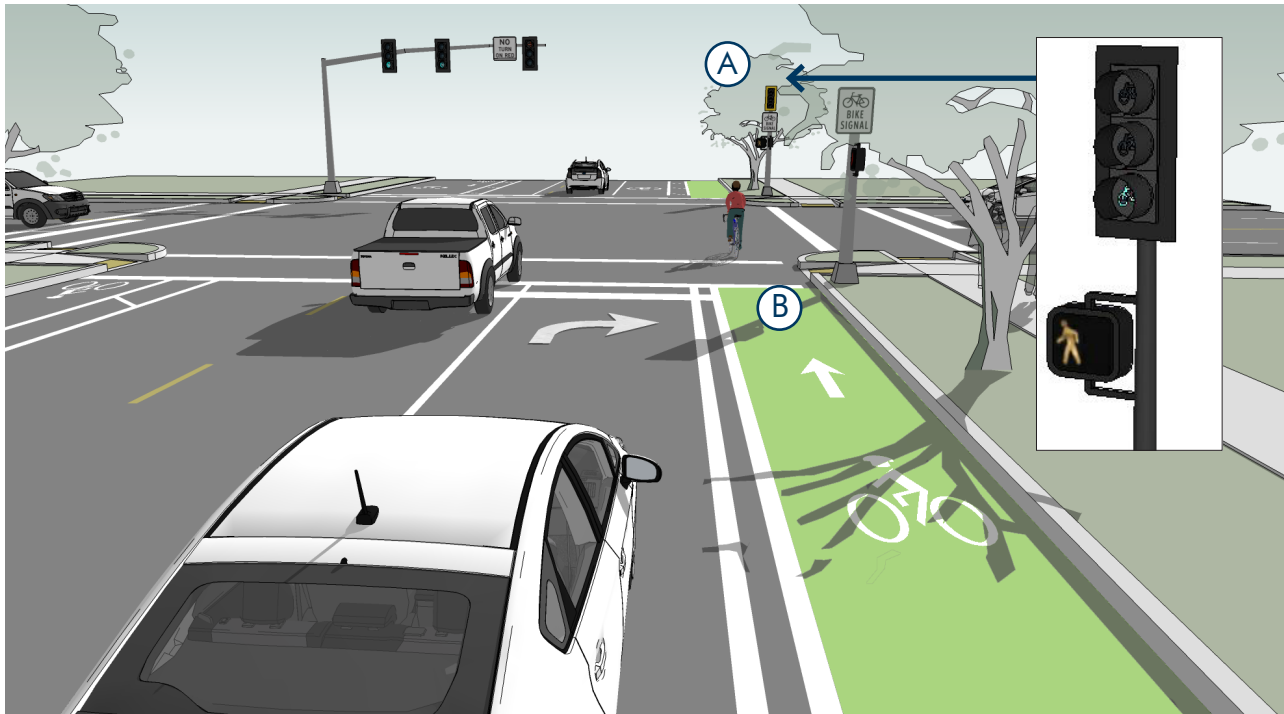
It is important to perform ongoing maintenance of traffic control equipment. Consider semi-annual inspections of controller and signal equipment, intersection hardware, and detectors.



Pavement markings are paired with a sign to teach riders how to activate the bicycle loop detection

BICYCLE SIGNAL PHASE

Separated bicycle lane crossings of signalized intersections can be accomplished through the use of a bicycle signal phase which reduces conflicts with motor vehicles by separating bicycle movements from any conflicting motor vehicle movements. Bicycle signals are traditional three lens signal heads with green, yellow and red bicycle stenciled lenses.



Typical Use

- Two-way protected bikeways where contraflow bicycle movement or increased conflict points warrant protected operation.
- Bicyclists moving on a green or yellow signal indication in a bicycle signal shall not be in conflict with any simultaneous motor vehicle movement at the signalized location
- Right (or left) turns on red should be prohibited in locations where such operation would conflict with a green bicycle signal indication.

Design Features

- Ⓐ An additional "Bicycle Signal" sign should be installed below the bicycle signal head.
- Ⓑ Designs for bicycles at signalized crossings should allow bicyclists to trigger signals via pushbutton, loop detectors, or other passive detection, to navigate the crossing.
- On bikeways, signal timing and actuation shall be reviewed and adjusted to consider the needs of bicyclists.



A bicycle signal head at a signalized crossing creates a protected phase for cyclists to safely navigate an intersection. Photo credit: TREC



A bicycle detection system triggers a change in the traffic signal when a bicycle is detected.

Further Considerations

- A bicycle signal should be considered for use only when the volume/collision or volume/geometric warrants have been met.
- The Federal Highway Administration (FHWA) has approved bicycle signals for use, if they comply with requirements from Interim Approval 16 (I.A. 16). Bicycle Signals are not approved for use in conjunction with Pedestrian Hybrid Beacons.
- Bicyclists typically need more time to travel through an intersection than motor vehicles. Green light times should be determined using the bicycle crossing time for standing bicycles.
- Bicycle detection and actuation systems include user-activated buttons mounted on a pole, loop detectors that trigger a change in the traffic signal when a bicycle is detected and video detection cameras, that use digital image processing to detect a change in the image at a location.

Materials and Maintenance

Bicycle signal detection equipment should be inspected and maintained regularly, especially if detection relies on manual actuation. Pushbuttons and loop detectors will tend to have higher maintenance needs than other passive detection equipment.



06

NETWORK CONNECTIONS AND SUPPORTING FACILITIES

SHORT-TERM BICYCLE PARKING

People need a safe, convenient place to secure their bicycle when they reach their destination. This may be short-term parking of 2 hours or less, or long-term parking for employees, students, residents, and commuters.

Information on short- and long-term bike parking has been informed by the Association of Pedestrian and Bicycle Professionals (APBP) Bicycle Parking Guide, which is updated frequently and is available online at www.apbp.org.

Application

Bike Racks

- Bike racks provide short-term bicycle parking and are meant to accommodate visitors, customers, and others expected to depart within two hours. It should be an approved standard rack, appropriate location and placement.

Bike Corrals

- On-street bike corrals (also known as on-street bicycle parking) consist of bicycle racks grouped together in a common area within the street traditionally used for automobile parking.
- Bicycle corrals are reserved exclusively for bicycle parking and provide a relatively inexpensive solution to providing high-volume bicycle parking. Bicycle corrals can be implemented by converting one or two on-street motor vehicle parking spaces into on-street bicycle parking.
- Each motor vehicle parking space can be replaced with approximately 6-10 bicycle parking spaces.

Design Features

Bike Racks

- When placed on sidewalks, 2 feet minimum from the curb face to avoid 'dooring.'
- 4 feet between racks to provide maneuvering room.
- Locate close to destinations; 50 feet maximum distance from main building entrance.
- Minimum clear distance of 6 feet should be provided between the bicycle rack and the property line.
- While bike racks could be installed perpendicular or parallel to the curb, it is important to ensure there is sufficient room for pedestrian traffic, even when a bike is locked to the rack.

Bike Corrals

- Bicyclists should have an entrance width from the roadway of 5-6 feet.
- Can be used with parallel or angled parking.
- Parking stalls adjacent to curb extensions are good candidates for bicycle corrals since the concrete extension serves as delimitation on one side.

Further Considerations

- Where the placement of racks on sidewalks is not possible (due to narrow sidewalk width, sidewalk obstructions, street trees, etc.), bicycle parking can be provided in the street where on-street vehicle parking is allowed in the form of on-street bicycle corrals.
- Some types of bicycle racks may meet design criteria, but are discouraged except in limited situations. This includes undulating “wave” racks, schoolyard racks, and spiral racks. These discouraged racks are illustrated on the following page.
- Bike racks should be made of thick stainless steel to reduce the chance of thieves cutting through the racks to take bicycles. Square tubing can provide further protection from cutting, as well.
- If a bike rack is installed as surface mount, countersink bolts or expansion bolts should be used to keep the rack in place. Covering the bolts with putty or epoxy can provide additional protection.



Inverted-U racks provide two points of contact.



Racks with square tubing, good spacing, and a concrete base likewise offer two points of contact.

Types of Bike Racks to Use

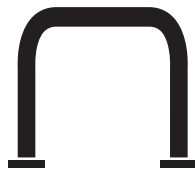
These racks provide two points of contact with the bicycle, accommodate varying styles of bike, allow for the frame of a bicycle and at least one wheel to be secured by most U-locks, and are intuitive to use.



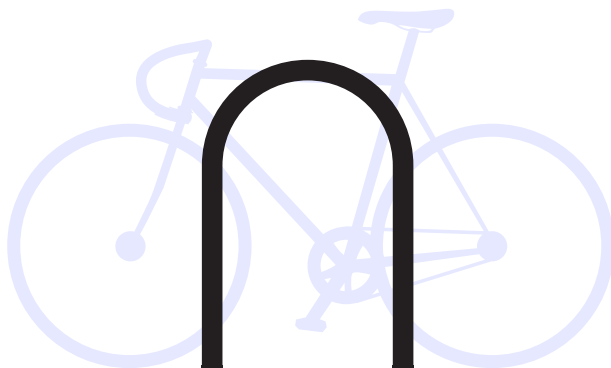
POST & RING



**WHEELWELL
SECURE**



INVERTED-U



Communities may consider purchasing branded U-racks for installation on sidewalks.

Types of Bike Racks to Avoid

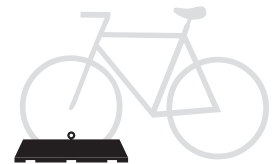
These racks do not provide support at two places on the bike, can damage the wheel, do not provide an opportunity for the user to lock the frame of their bicycle easily, and are not intuitive to use. Because of performance concerns, the APBP Essentials of Bike Parking Report recommends selecting other racks instead of these.



WAVE



COMB



WHEELWELL



COATHANGER

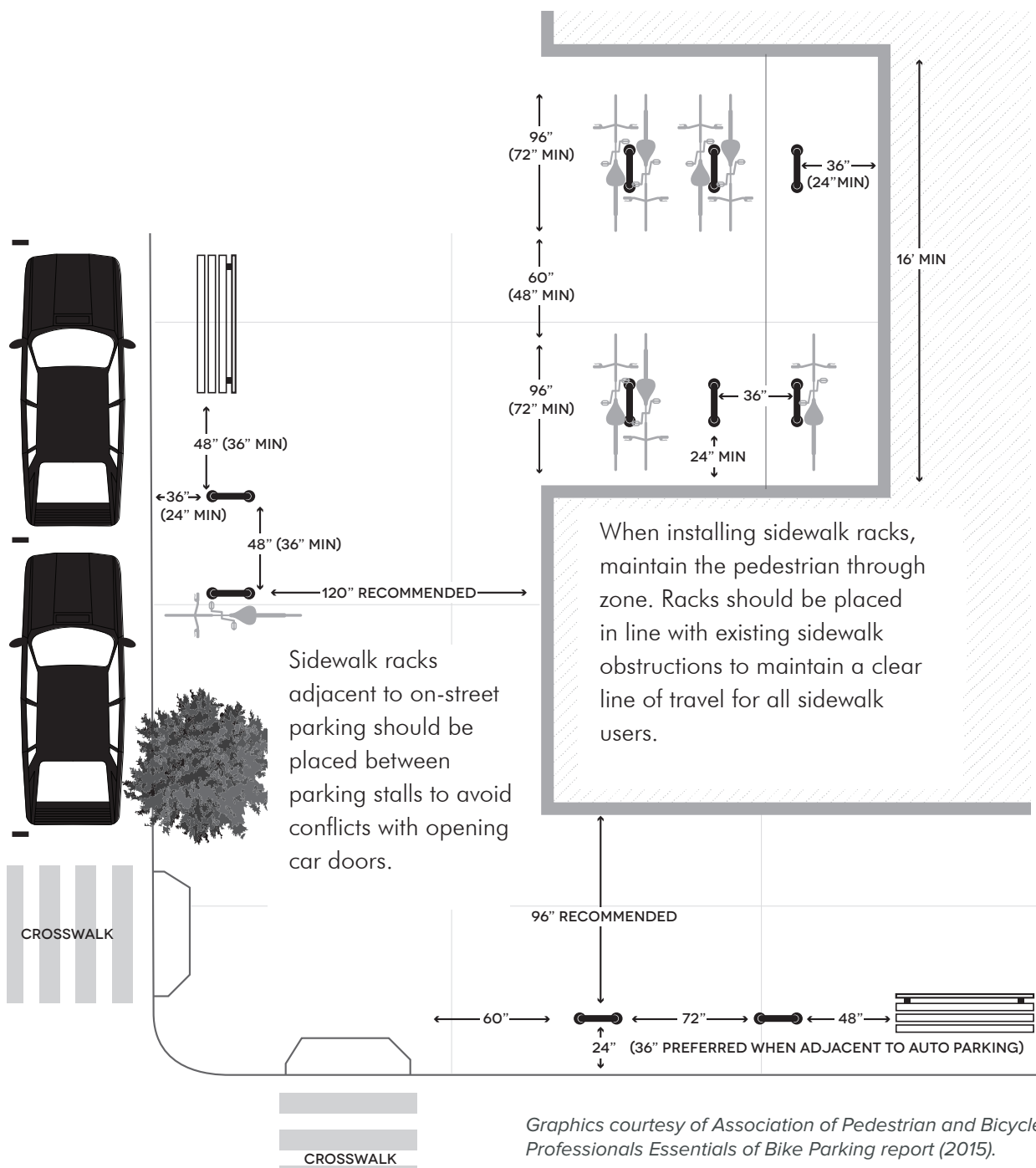


BOLLARD

Graphics courtesy of Association of Pedestrian and Bicycle Professionals Essentials of Bike Parking report (2015).

Space Requirements

The following minimum spacing requirements apply to some common installations of fixtures like inverted U or post and ring racks that park one bicycle roughly centered on each side of the rack. Recommended clearances are given first, with minimums in parentheses where appropriate. In areas with tight clearances, consider wheelwell-secure racks, which can be placed closer to walls and constrain the bicycle footprint more reliably than inverted U and post and ring racks. The footprint of a typical bicycle is approximately 6' x 2'. Cargo bikes and bikes with trailers can extend to 10' or longer.



Graphics courtesy of Association of Pedestrian and Bicycle Professionals Essentials of Bike Parking report (2015).

LONG-TERM BICYCLE PARKING

Users of long-term parking generally place high value on security and weather protection. Long-term parking is designed to meet the needs of employees, residents, public transit users, and others with similar needs.

Information on short and long term bike parking has been obtained from the APBP Bicycle Parking Guide, which is updated frequently and is available online at www.apbp.org.

Application

- At transit stops, bike lockers or a sheltered secure enclosure may be appropriate long term solutions.
- On public or private property where secure, long-term bike parking is desired.
- Near routine destinations, such as workplaces, universities, hospitals, etc.

Design Features

Bike Lockers

- Minimum dimensions: width (opening) 2.5 feet; height 4 feet; depth 6 feet.
- 4 foot side clearance and 6 foot end clearance. 7 foot minimum distance between facing lockers.

Secure Parking Area

- Closed-circuit television monitoring or on-site staff with secure access for users.
- Double high racks & cargo bike spaces.
- Bike repair station with bench and bike tube and maintenance item vending machine.
- Bike lock “hitching post” – allows people to leave bike locks.

Further Considerations

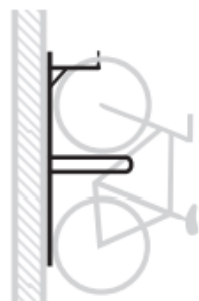
- As the APBP Bike Parking Guide notes, increasing density of bike racks in a long-term facility without careful attention to user needs can exclude users with less-common types of bicycles which may be essential due to age, ability, or bicycle type.
- To accommodate trailers and long bikes, a portion of the racks should be on the ground and should have an additional 36” of in-line clearance.

High Density Bike Racks

Racks may be used that increase bike parking density, like the ones below. While these types of racks provide more spaces, racks that require lifting should not be used exclusively. People with heavier bikes (i.e. cargo bikes) or people with disabilities or people who are simply small in stature may be unable to lift their bikes easily.



STAGGERED WHEELWELL-SECURE



VERTICAL



TWO-TIER

Bike Parking Rooms

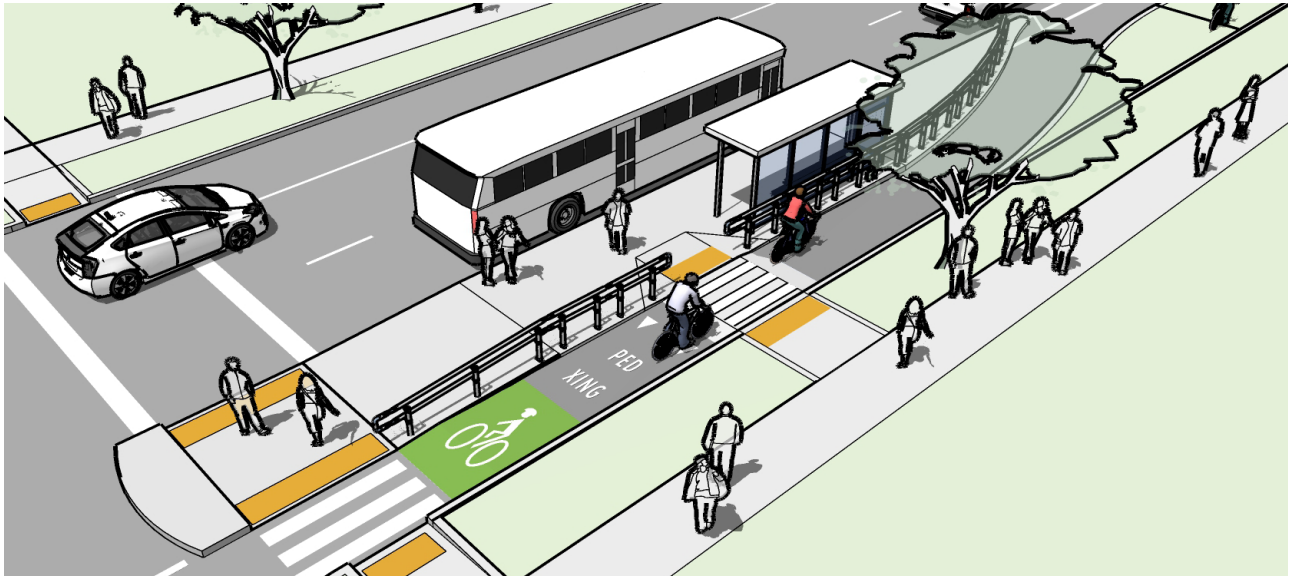
Long term bike parking may be available in dedicated rooms in residential and commercial buildings. Bicycle parking can be accommodated in 15 square feet per space or less.



Bike lockers



Secured parking areas



TRANSIT STOP DESIGN

Bus platforms or waiting areas serve as the critical transition point for pedestrians as transit passengers. As such, bus platforms, shelters, and shelter amenities need to be designed to the benefit of people boarding, alighting, waiting, and passing through. Transit platforms and shelters should be designed to be comfortable and safe, accessible for people with disabilities, sized appropriately based on ridership and demand, use space efficiently, and to minimize delay and conflicts with other modes such as bicycles, and competing sidewalk uses.

Typical Application

- Bus stops can range from simple curbside stops with a pole and seating, to in-roadway platforms with shelters and other shelter amenities depending on demand, adjacent land use, and available right of way.
- Typically, bus stop shelters and amenities occupy an area of the sidewalk, either in the furnishing zone, or a reserved space in the frontage zone. They can also be located on transit islands which accommodates bicycle through traffic, or in medians for center running alignments.
- Shelters can face toward the roadway or away from the roadway. Shelters facing toward the roadway provide better sightlines, but may compete with other sidewalk uses and adjacent property access and circulation.

Design Features

- Bus shelters should be designed to minimize potential for conflicts between the bus, and people walking and bicycling through the area.
- Site visibility is a critical safety and security factor. The bus operator needs to be able to see waiting passengers, and waiting passengers need to be able to see approaching buses. The shelter, street trees, and other vertical elements must not obstruct visibility. The stop and shelter should be adequately illuminated at night for safety and security.
- The shelter should maximize use of materials that maximize visibility for waiting passengers, and minimize incentive for vandalism.
- The shelter canopy should be sized to provide sufficient coverage based on stop demand.

SHARED USE TRAILS AND ON-STREET TRANSITIONS

Transitions occur where the trail meets a roadway or railway, where one trail typology meets another, such as when an elevated trail transitions into an at-grade trail or where separated trail segments transition into shared environments. Transitions may also include horizontal shifts to avoid physical obstacles such as utility towers or other structures. Trail access means providing a formalized way for people to arrive and depart from the trail network by a variety of travel modes.



Typical Application

- Regional trail access points can take several different forms ranging from major trailheads, minor trailheads, and neighborhood entryways. These vary in the level of infrastructure and facility amenities.
- These access points are multimodal transition points; they serve as the transition between the on-street network and the off-street network for people walking, biking, riding transit, and driving.
- All trailheads should be open to the public.

Design Features

- Major trailheads feature convenient access to transit, parking for 10 or more vehicles, (including accessible spaces), short- and long-term bicycle parking, restrooms, trash/recycling facilities, wayfinding/interpretive kiosks, benches/picnic tables, and other day use amenities.
- Minor trailheads include similar facilities as major trailheads but a lower provision of vehicle and bike parking and day use amenities, and may be further from major transit and bike connection points.
- Neighborhood entry points are the most basic form of local accessways that do not provide many of the amenities of trailheads due to space constraints, neighborhood context, and/or proximity to other trailheads.

Typology Transitions

Design elements used to alert trail users include pavement markings such as optical speed bars or zebra stripe crosswalks with yield/stop markings. Other visual indications include bike and pedestrian directional markings, centerlane striping, and the use of colored pavement to visually narrow or indicate a change in environment.

Tactile indications include speed humps, tactile speed bars, and the use of multiple surface types, such as concrete, asphalt, and pavers.

Advisory, regulatory, and/or wayfinding signage are should be considered at transition points. Physical treatments to alert and guide trail users include traffic calming measures such as vertical and horizontal deflection.

Trail illumination is an important design element that must be considered along the trail, but is especially important in transition zones.

Mixing Zones

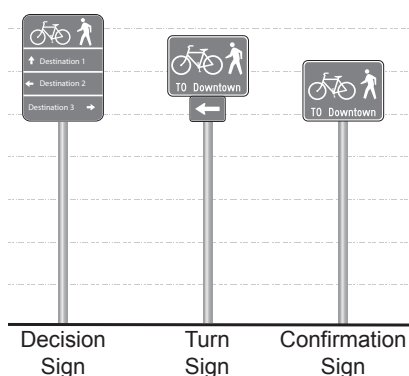
Mixing zones are necessary where physical space constraints do not allow for separated modes, or at locations along the trail where a high level of cross-traffic is expected. Mixing zones need to provide clear indication to all users that a transition is occurring in advance of the change, so that trail users can adjust their speeds and awareness appropriately to proceed carefully into the mixing zone.

Advanced warning can be accomplished with advisory signage, pavement markings, and the use of contrasting surface treatments (e.g. pavers/inlays with contrasting tones/textures, striping, or a combination of these treatments). These design elements help to guide trail users safely through the mixing zone by alerting users to the change in conditions and thus reducing the speed differential.

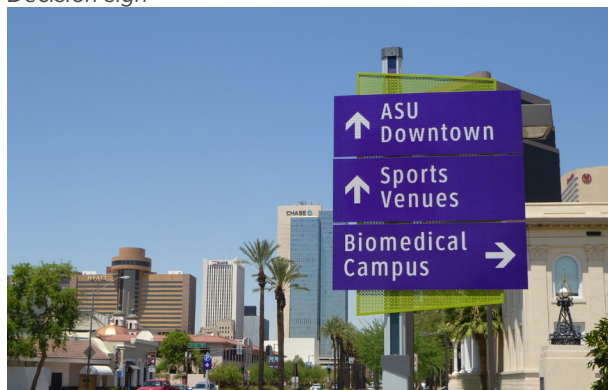
WAYFINDING

The ability to navigate across an urbanized area is informed by landmarks, natural features, and other visual cues. Signs throughout the city should indicate the direction of travel, the locations and travel time distances to those destinations. A pedestrian wayfinding system is similar to a transit, vehicular, or bike facility wayfinding system, in that it consists of comprehensive signing and/or pavement markings to guide pedestrians to their destination along routes that are safe, comfortable and attractive.

Sign types



Decision sign



Typical Application

Wayfinding signs will increase users' comfort and accessibility to the pedestrian system in denser urbanized areas and connections to other destinations across the larger region.

Signage can serve both wayfinding and safety purposes including:

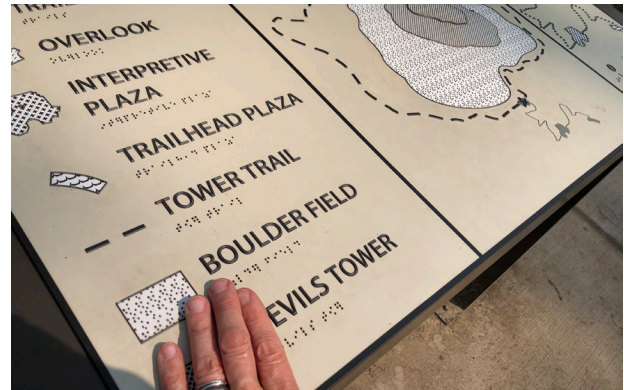
- Helping to familiarize users with the pedestrian network
- Helping users identify the best routes to destinations within walking distance or connections to other modes.
- Helping to address misperceptions about time and distance.
- Helping overcome a "barrier to entry" for people who are not frequent walkers.

Design Features

- Confirmation signs indicate to pedestrians that they are on the right trail to their destinations. They include destinations and distance/time, but not arrows
- Turn signs indicate where a route turns from one street onto another street.
- Decision signs indicate the junction of two or more pedestrian routes to access key destinations. These include destinations, arrows and distances. Travel times are optional but recommended.
- A regional wayfinding sign plan would identify sign locations, sign type, destinations, and approximate distance and travel time to destinations, and highlight connections between urban and non-urbanized areas.
- The Valley Path has existing branding and design guidance, see the *Valley Path Brand & Wayfinding Signage Guidelines*.

Further Considerations

- Bicycle wayfinding signs also visually cue motorists that they are driving along a bicycle route and should use caution. Signs are typically placed at key locations leading to and along bicycle routes, including the intersection of multiple routes.
- Too many road signs tend to clutter the right-of-way, and it is recommended that these signs be posted at a level most visible to bicyclists rather than per vehicle signage standards.
- Green is the color used for directional guidance and is the most common color of bicycle wayfinding signage in the US.
- Check wayfinding signage along bikeways for signs of vandalism, graffiti, or normal wear and replace signage along the bikeway network as-needed.



Tactile navigation sign



07

PEDESTRIAN-BICYCLE OPERATIONS AND MAINTENANCE

SIDEWALK MAINTENANCE

The sidewalk is an essential space for people walking and using wheelchairs and other personal mobility devices, and it is also the location where many other important activities take place. Each of the zones described in 'Sidewalk Zones' needs to be maintained for the overall sidewalk space to function as intended.

Maintaining Sidewalk Zones

- The **Pedestrian Access Route** must remain free and clear of obstacles and impediments. This is the primary accessway for people traveling along streets and to and from adjacent properties, and must be maintained to ADA standards.
 - Property owners are responsible for maintaining all sidewalk zones abutting their property, not just the Building Frontage Zone.
 - Maintaining a firm, stable, and slip resistant surfaces is necessary for people walking or rolling to traverse the Pedestrian Access Route without risk of tripping, slipping or otherwise uneven footing.
 - Regular sweeping ensures the Pedestrian Access Route and other sidewalk zones are kept free of natural debris and litter.
 - Routine maintenance of sidewalk damage due to tree roots, freeze-thaw, etc. is the responsibility of abutting property owners.
- The **Amenity Zone** is where street furnishing are located, where people are often picked up and dropped off, where mail is delivered, and where other loading/unloading happens. It's the space where trees and landscaping are planted, and where street lighting and other utilities are located. The Amenity Zone must be maintained properly to ensure access to this area and all of these curbside uses are possible.
 - Vegetation in the Amenity zone should be regularly maintained by the City so as not to encroach on the pedestrian travel zone. Maintenance should be prioritized by plant species, high demand areas, and/or narrow sidewalk corridors. When they are not maintained on schedule, the space for pedestrian travel becomes constrained, creating bottlenecks, and/or forcing pedestrians into the street.
- The **Building Frontage Zone** is the area between the Pedestrian Access Route and the abutting property. Along commercial corridors this space may be utilized by businesses for outdoor cafe seating by permit, and in residential areas, this space may be occupied by landscaping or other natural screening.
 - Outdoor seating shall not occupy the Pedestrian Access Route or inhibit travel along the sidewalk.
 - Landscaping in the Building Frontage Zone should be maintained in a manner similar to landscaping in the Amenity Zone. Landscaping should be maintained by property owners so as not to encroach on the Pedestrian Access Route.
- The **Enhancement Zone** must be maintained for the following uses: bike facilities, vehicle parking, curb extensions, and bike parking.
 - Street sweeping should be conducted per maintenance schedule and following significant weather events to help to ensure intended use of this space.



PARKING, LOADING, AND GARBAGE ACCESS

Where separated bikeways are adjacent to on-street parking, drop-off locations, freight loading zones, or designated garbage pick-up areas, the design of the separation at those locations should provide an accessible aisle and adequate landing area to allow for travel from the vehicle to the curb ramp.

Colored pavement within a bicycle lane may be used to increase the visibility of the bicycle facility, raise awareness of the potential to encounter bicyclists, and reinforce priority of bicyclists in conflict areas.

Typical Application

- Streets with on-street parking and a separated bikeway along the same block face.
- Where ADA-accessible spaces are desired, either due to proximity to nearby building entrances, street grades, or other factors.
- Where loading and garbage pick-up zones are desired along the same side of the street as a separated bikeway due to adjacent commercial users such as retail or hotels, and cannot be relocated to adjacent block faces or alleys.



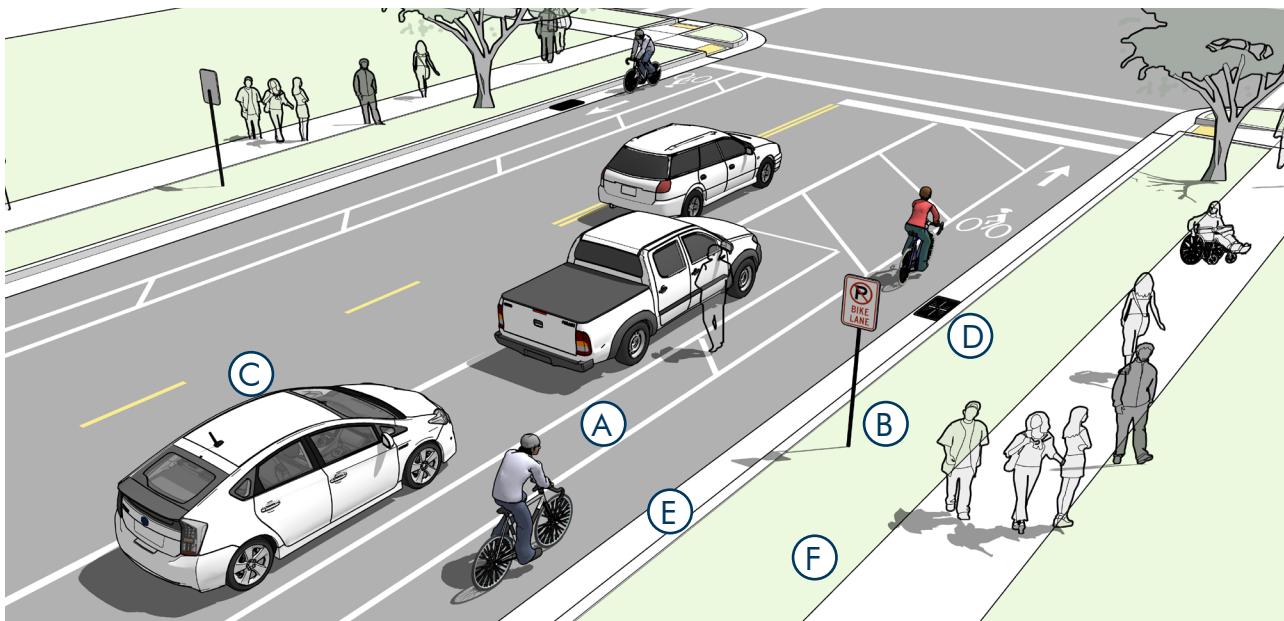
A passenger loading zone allows pedestrians to cross the separated bike lane to access the loading island. These designs should also incorporate truncated domes to alert people walking with vision disabilities of the crossing.

Design Features

- Accessible spaces should be located adjacent to intersections to simplify access to curb ramps.
- Accessible spaces must comply with all ADA requirements.
- To connect between the sidewalk and parking spaces, a crosswalk across the separated bikeway and curb ramp (6' minimum width) must be provided.
- Place a **YIELD HERE TO PEDESTRIANS (MUTCD R1-5)** sign where the separated bikeway crosses the parking access route to clearly establish a right-of-way. Yield line pavement marking may be placed prior to the crosswalk.

Further Considerations

- Garbage pick-up, freight loading, and drop-off hours should be restricted to hours of the day when less bicycle traffic is expected, to minimize potential interactions.
- The City can provide guidance to both waste management operators and customers on desirable recycling/trash can and bin placement with respect to both walkways and bikeways to improve safety and use of these facilities.



BIKE FACILITY MAINTENANCE

Regular bicycle facility maintenance includes sweeping, maintaining a smooth roadway, trimming encroaching vegetation, ensuring that the gutter-to-pavement transition remains relatively flush, and installing bicycle friendly grates. Pavement overlays are a good opportunity to improve bicycling facilities. The following recommendations provide a menu of options to consider to enhance a maintenance regimen.

A Sweeping

Debris that is allowed to accumulate can become a hazard due to loss of control, inner tube blow outs, as well as service dog safety.

- Cover both on-road and off-road bikeways under the jurisdiction of the city. Can establish a seasonal sweeping schedule that allows for prioritization of routes. The schedule could prioritize facilities designated as major bikeways, before roadways designated as minor bikeways.
- Sweep bikeways periodically to minimize accumulation on the facility to maintain safe surface conditions.

B Signage

- Include bikeway regulatory and wayfinding signing as part of the roadway sign maintenance program, regularly checking for vandalism, graffiti, and wear. Schedule replacement/repair as needed.

© Roadway Surface

- Smooth pothole-free surfaces are especially critical for people on bikes.
- The finished surface on bikeways does not vary more than 1/4" for new roadway construction.
- Pavement should be maintained so ridge buildup does not occur at the gutter-to-pavement transition or adjacent to railway crossings.
- Ensure pavement inspections occur after trenching activities are completed and if excessive settlement has occurred to require mitigation prior to the expiration of the project's warranty period.
- To the extent possible, pavement markings and green-colored areas should be placed out of the vehicle path of travel to minimize wear. In general, striping, pavement markings, and green colored areas should be well maintained especially areas in the path of vehicle travel, and where high-turning movements occur.

© Drainage Grates

- New drainage grates should be bicycle-friendly. Grates should have horizontal slats on them so that bicycle tires and assistive devices do not fall through any vertical slats.
- Create a program to inventory all existing drainage grates, and replace hazardous grates as necessary - temporary modifications such as installing rebar horizontally across the grate should not be an acceptable alternative to replacement.

© Gutter-to-Pavement Transition

- Gutter-to-pavement transitions should have no more than a 1/4" vertical transition.
- Pavement transitions should be examined during every roadway project for new construction, maintenance activities, and construction project activities that occur in streets.

© Landscaping

- Vegetation on the edge of the roadway should not hang into or impede passage along bikeways.
- After storm events, remove fallen trees or other debris from bikeways as quickly as possible.

Coordination With Emergency Responders

- General roadway maintenance should be coordinated and prioritized on emergency response routes that overlap with major and minor bikeways.
- Provide fire, police, and EMS services with a map of major and minor bikeway routes.

Recommended Bikeway Maintenance Activities

The City should ensure that each of these activities is addressed in City requirements, various operations plans, or emergency response plans. The frequency of each activity is at the discretion of the City Engineer. However, the activity should be done in a timely enough manner to ensure bikeways are operated in a safe manner for all users.

A group of cyclists is riding on a city street. The image is overlaid with a semi-transparent blue filter. In the background, a street sign reads "Clarendon 3750 N" with a circular logo. A traffic light is visible on the right. The cyclists are wearing helmets and casual clothing. The number "08" is displayed in a large, yellow, sans-serif font.

08

ADDITIONAL DESIGN PARAMETERS & CONSIDERATIONS

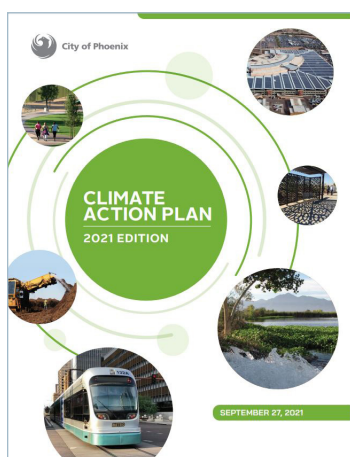
COMPLETE STREETS



THE GOAL

Create a system of streets which encourage and facilitate active transportation, support investment in transit, foster social engagement and community pride, **improves safety for all transportation** modes, supports the local economy and property values, and improve the **livability and long-term sustainability** of our region.

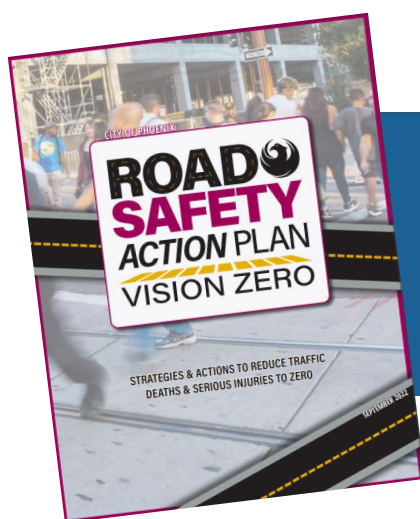
The [Phoenix General Plan](#) (2015) identifies Complete Streets as a key approach for enacting the core value of Connecting People and Places. The role of development is specified in the Land Use and Design Principle, “In order to balance a more sustainable transportation system, development should be designed to include increased amenities for transit, pedestrian and bicyclists such as shade, water, seating, bus shelters, wider sidewalks, bike racks, pedestrian scale lighting and way-finding.”



2050 GOAL

All forms of transportation will be fueled with net-zero GHG sources of energy. Make walking, cycling, and transit commonly used, enjoyed, and accessible for every Phoenix neighborhood, including our disabled community. This goal will result in 90% of the population living within one-half mile of transit, and projects 40% of the population will choose to commute by walking, biking, transit or car share.

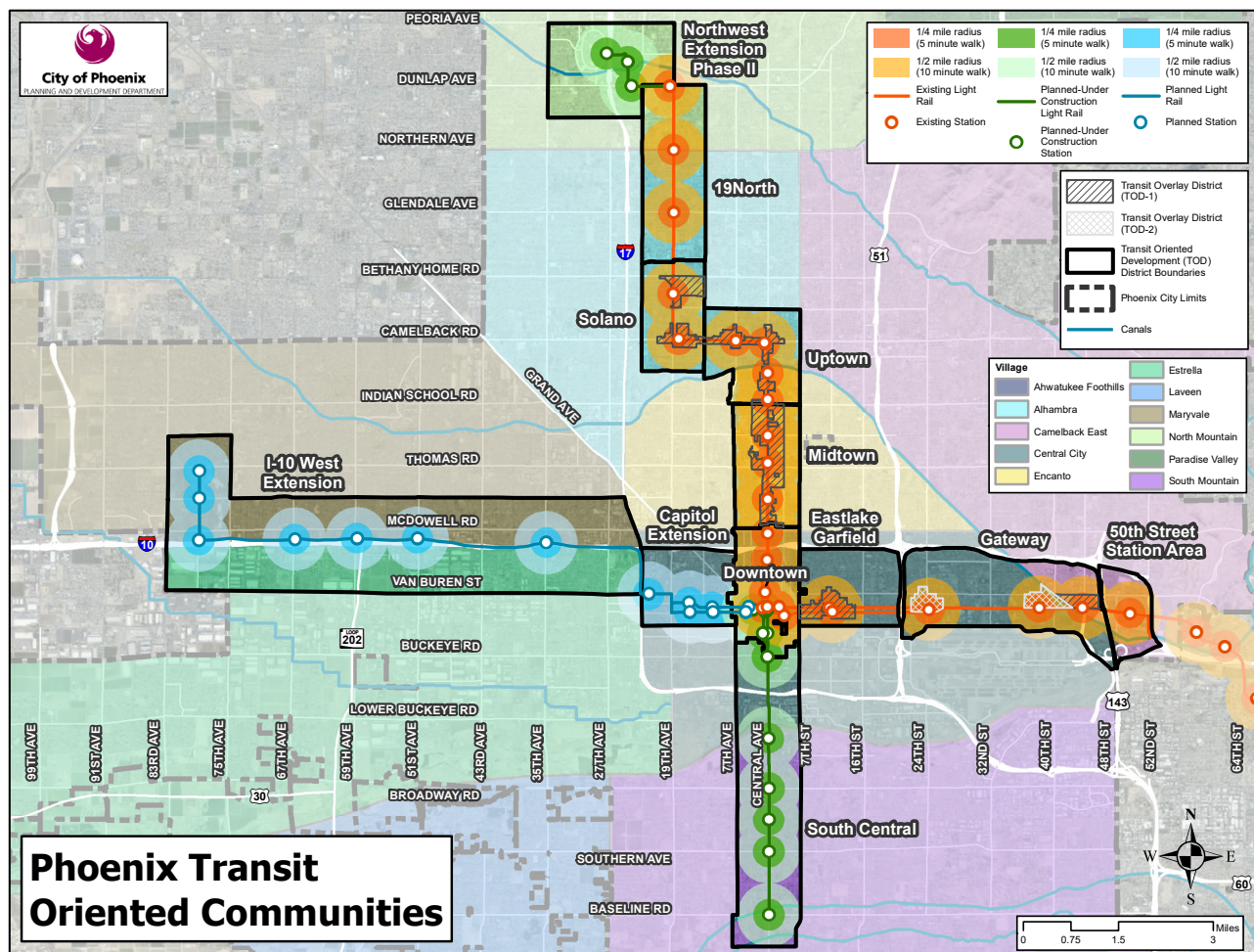
The [Complete Streets Policy](#) (2017) supports the implementation of the General Plan by directing staff to ensure City’s rights-of-way serve a variety of transportation modes. Designing streets for safe and enjoyable walking, biking, and transit use helps Phoenix to achieve the goal of reducing single occupant vehicle trips set in the [Climate Action Plan](#) (2021). Additionally, streets that are designed with the safety of all users supports the goal of the [Vision Zero Road Safety Action Plan](#) to eliminate all serious injuries and fatalities on Phoenix streets.



VISION

Phoenix aspires to reduce the number of fatal and serious injury crashes on its streets to **ZERO** by 2050

HIGH ACTIVITY AREAS



In areas where active transportation is expected to be higher than typical, streets should be designed to ensure people using the street are comfortable and safe, whether they are walking, biking, using micromobility, driving, or taking transit. In Phoenix, planning processes have identified three types of areas where dense, mixed-use development should be concentrated and where walking, biking, and transit should be emphasized in street design.

The downtown area was identified as a dense, multi-modal and mixed use area in the [Downtown Strategic Plan](#) (2004). One of the three planning principles was connectivity, with

a specific emphasis on connecting walking, biking, and transit. In 2008, the [Downtown Urban Form Project](#) (2008) proposed a Form-Based Code for downtown that calls for walkable development. The Circulation and Parking Plan in the document further emphasized the need for streets that support walking, biking, and transit as key for downtown circulation. The Downtown Code was adopted by Council and added to the Zoning Ordinance in 2010. The [Downtown Transportation Plan](#) Update (2020) updated the strategies for increasing multimodal transportation in Downtown Phoenix.

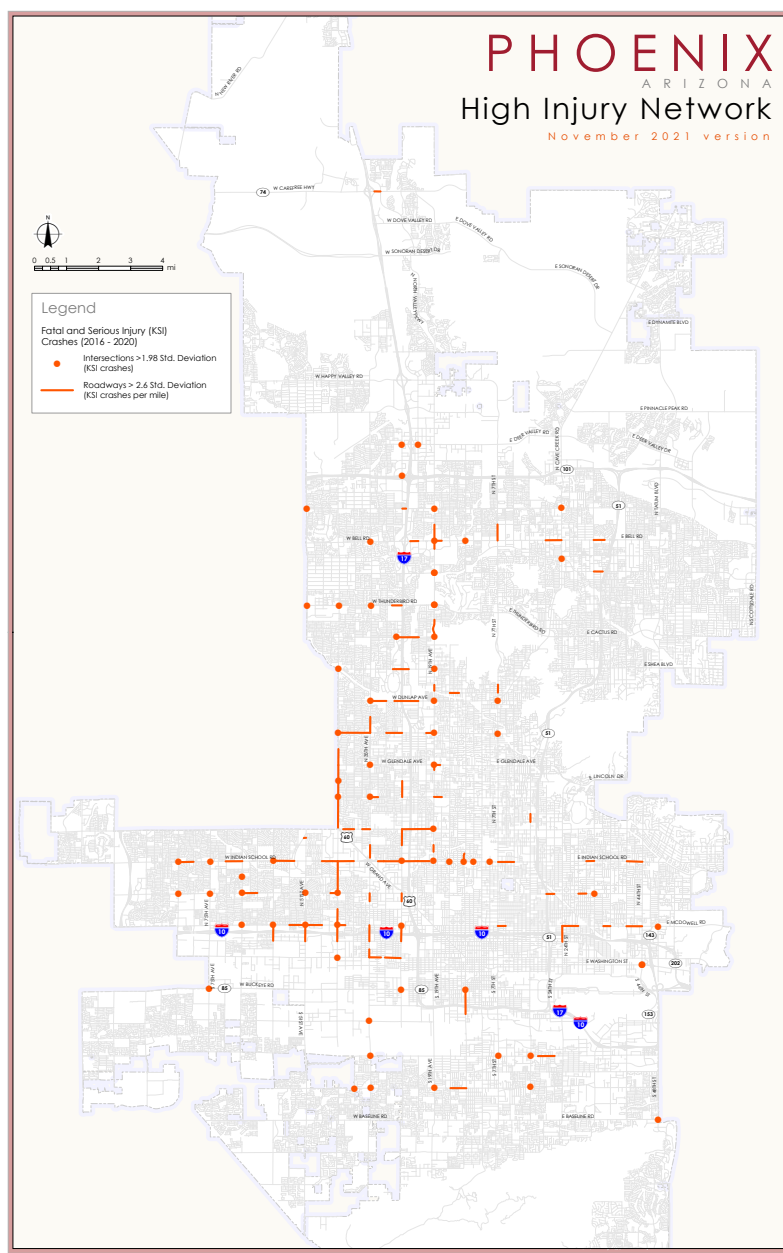
[Transit Oriented Development](#) (TOD) areas have been specifically identified as areas for encouraging multimodal streets and denser development in order to foster access to transit. Currently every TOD area has adopted [Walkable Urban Code](#). TOD areas will continue to be added as the high-capacity transit network in Phoenix develops. Policy plans for individual TOD areas have been developed through the [Reinvent PHX](#) planning effort and through individual [TOD area plans](#).

The City of Phoenix continues to develop plans for the most recently added TOD areas.

Urban Village Cores have also been identified as areas for a concentration of people and activities. The [Phoenix Urban Village Model](#) (1994) identifies multi-modal transportation as a feature of village cores, with a strong emphasis on providing pedestrian amenities in [urban cores](#). While it describes suburban village cores as auto-oriented, it also notes that as villages build out over the next 30-50 years suburban cores may become more urban. The plan was approved 29 years ago and Phoenix has seen this shift happening throughout its suburban cores.

In addition to three types of areas defined in the planning processes above, there are further places where connectivity for people walking, biking, and using micromobility should be emphasized based on surrounding land use.

Large scale development, high-density multifamily/mixed-use Planned Unit Developments (PUDs), regional shopping centers and regional attractions (e.g. spring training facilities and event venues) are expected to increase active transportation. Street design and street crossings should be designed for safe and comfortable walking and biking.



Active transportation is expected to be high in recreation areas and near public facilities such as libraries, hospitals, schools. Streets near parks, preserves, trails, and public facilities should be designed with consideration for people accessing these amenities on foot or on bike. At entry points, appropriate street crossings are important for allowing people to access public facilities and recreation areas safely.

Finally, the [High Injury Network](#) defined in the Vision Zero Road Safety Action Plan has identified corridors and intersections with the highest levels of serious injury and fatality crashes in the City of Phoenix. In 2022, people walking were 43% of the fatal and serious injury crashes in Phoenix, despite walking trips being a small percentage of overall trips. As such, streets and intersections along the High Injury Network should be designed with special consideration for people walking, biking, and taking transit.

In the areas identified above, the following guidance should be considered when designing streets.

City of Phoenix Guidance

City of Phoenix Active Transportation Plan Design Guidance Element (2023)

City of Phoenix Crosswalk Guidance (2023)

City of Phoenix Street Planning and Design Guidelines (2023)

[City of Phoenix Complete Streets Design Guidelines](#) (2018)

National guidance

[Institute for Transportation and Development Policy \(ITDP\) Transit Oriented Development Standard](#) (2017)

[National Association of City Transportation Officials \(NACTO\) Urban Street Design Guide](#) (2013)

[Federal Highways Administration \(FHWA\) Field Guide for Selecting Countermeasures at uncontrolled Pedestrian Crossing Locations](#) (2018)

[Federal Highways Administration \(FHWA\) Proven Safety Countermeasures](#) (website)



City of Phoenix



City of Phoenix

PUBLIC OUTREACH SUMMARY

APPENDIX A

Phoenix Active Transportation Plan
Public Outreach Report

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Executive Summary

Context

For decades, Phoenix has excelled at building car-oriented places; internal policies and practices have been created with cars as the top priority. However, Phoenixians have shown increased interest in multimodal transportation. Therefore, the City of Phoenix responded by expanding the walking, bicycling, and transit network. The City implemented the following planning and policy initiatives to increase multimodal options: Comprehensive Bicycle Master Plan (2014), Complete Streets Ordinance, Policy, and Guidelines, ReinventPHX, the Key Corridors Master Plan, and the Walkable Urban Code.

The Active Transportation Plan (ATP) process was an opportunity to build upon these previous efforts and attempted to answer the following questions:

- When it comes to transportation, what kind of city does Phoenix want to be?
- How well do current policies and practices work to build that desired city?
- What are the strategies for becoming the desired city when it comes to people riding bicycles?

This process focused on understanding priorities, the impacts of decisions, and why they matter to better inform proposed solutions. Feedback from community residents was obtained through an online survey, poster polls, and interviews with local leaders and advocacy organizations.

Methods & Summary

Method	Participation
Online Survey	<ul style="list-style-type: none">• 665 participants submitted a survey response. Of these participants, 655 individuals chose to complete the English Version and 10 individuals chose to complete the Spanish version.
	Summary
	<ul style="list-style-type: none">• Most participants reside in zip code 85013, were age 30-39, identified as male, identified as white, and reported a household income of \$100K-\$200K.• Most participants live and work in the City of Phoenix. In addition, most reported to own or have access to regularly, a car or truck.• The following themes were identified based on the individual comments: Design, Development & Infrastructure, City Website,

	Climate, Homelessness, Issues & Requests, Public Transportation, Routes, Safety & Speeding, Scooters, and Survey Feedback.
Methods	Participation
Poster Polls	<ul style="list-style-type: none"> Staff from the City of Phoenix attended the 70th Annual Laveen BBQ (February 2022) and First Friday (March 2022) to conduct poster polls. In total 79 community members participate in the poster polls.
	Key Findings
	<ul style="list-style-type: none"> Community members tended to either answer the dot poll posters or the open-ended questions, but usually not both. Community members wanted to talk more than interact with posters. The conversations seemed to align with the poll data in that community members were interested in safer, local connections for walking and biking. The following questions were asked at each event: <ul style="list-style-type: none"> Should regional routes or neighborhood routes be priority? Should the focus be on cost versus comfort? What are your top three community priorities? Where do you enjoy walking and biking in Phoenix? What stops you from walking or biking more in Phoenix?
Methods	Participation
Targeted Outreach	<ul style="list-style-type: none"> 4 representatives from two education and advocacy organizations 7 community leaders from the 6 marginalized zip codes identified in the equity map
	Key Findings
	<ul style="list-style-type: none"> Representatives from the advocacy organizations mentioned the need for increased awareness and education about city projects. In addition, they suggested better messaging when relating neighborhood projects to overall city goals. Representatives from the advocacy organizations expressed concerns about traffic, speeding, and the lack of infrastructure to

	<p>make walking and biking safe. In addition, they suggested the city work to improve the culture with the streets department.</p> <ul style="list-style-type: none"> • Representatives from the advocacy organizations recommended the city work to improve the culture with the streets department. In addition, they expressed concerns about turnover and a lack of strong advocates within the department. • Many community leaders expressed concerns about safety. They mentioned the lack of sidewalks in some residential communities (particularly West & South Phoenix), inconsistent bike paths, speeding, homeless encampments, violent crimes, drug use in neighborhoods, and stray dogs. • Many community leaders expressed the need for more accountability and transparency from the city. In addition, they are not confident the city will show up for their communities. However, they seemed to be supportive of additional street infrastructure if it supported their current safety needs.
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Online Survey

665 participants submitted a survey response. Of these participants, 655 individuals chose to complete the English Version and 10 individuals chose to complete the Spanish version. Both English and Spanish responses have been combined. The Spanish qualitative data has been translated to English.

Demographics

Zip codes (N=651)

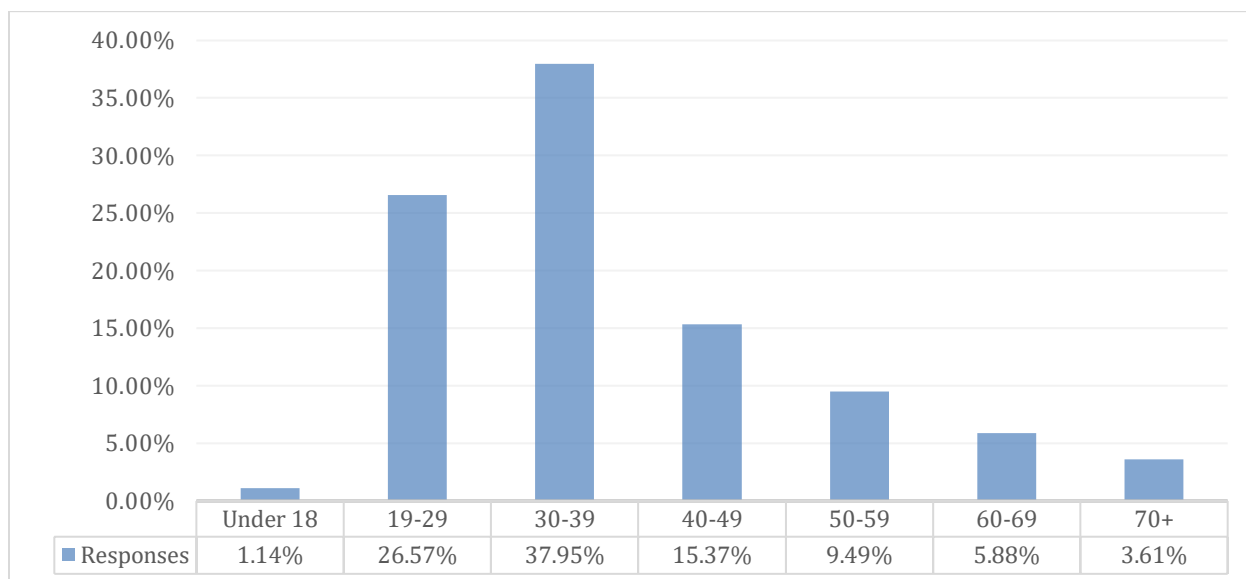
There were 651 responses to this question making the completion rate 98.05%. The zip code with the most respondents was 85013 (Midtown/Uptown), with 62 respondents.

Zip Code	# of Responses	Zip Code	# of Responses	Zip Code	# of Responses
23235	1	85043	3	85282	9
84051	1	85044	15	85283	10
85001	1	85045	1	85286	3
85003	25	85048	4	85295	2
85004	29	85050	9	85296	1
85005	1	85051	2	85297	1
85006	31	85053	9	85301	1
85007	24	85054	2	85302	4
85008	19	85083	3	85303	1
85009	11	85085	4	85305	1
85012	13	85086	1	85306	3
85013	62	85142	1	85308	4
85014	13	85201	5	85309	1
85015	27	85202	2	85326	1
85016	28	85203	3	85331	3
85017	6	85204	1	85335	1
85018	31	85207	1	85338	2
85019	4	85208	3	85339	15
85020	16	85209	1	85345	2
85021	7	85212	1	85353	1
85022	17	85215	1	85374	2
85023	4	85224	7	85375	1
85024	3	85225	1	85377	1

85027	6	85226	2	85379	2
85028	4	85233	1	85381	1
85029	5	85234	3	85382	1
85031	2	85236	1	85383	1
85032	10	85248	1	85388	1
85033	4	85250	1	85395	2
85034	4	85251	6	85396	1
85035	5	85254	6	86018	1
85037	6	85255	1	86016	1
85040	3	85257	8	86281	1
85041	13	85280	1		
85042	8	85281	14		

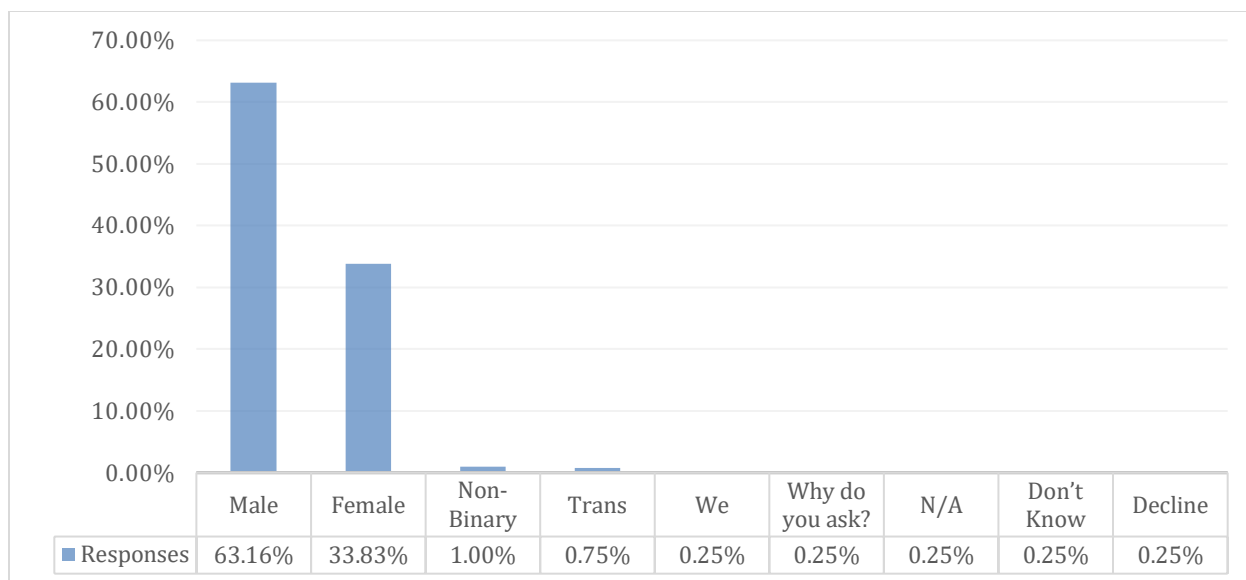
Age (N=527)

There were 527 responses to this question making the completion rate 79.25%. The largest age group was ages 30-39.



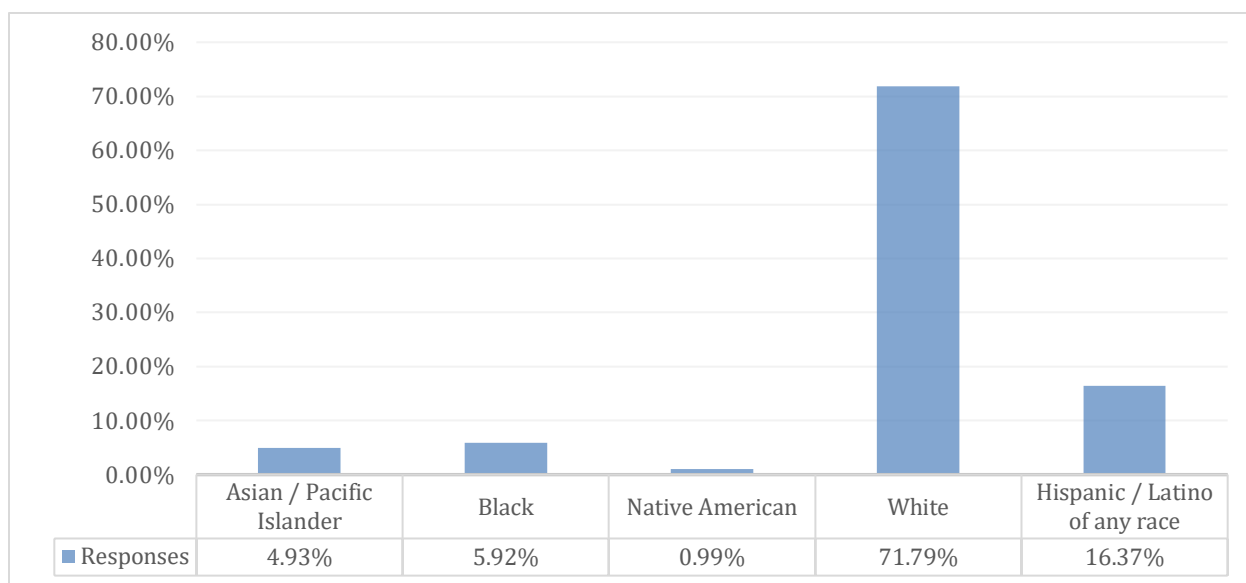
Gender (N=399)

There were 399 responses to this question making the completion rate 60%. Most participants identified as male.



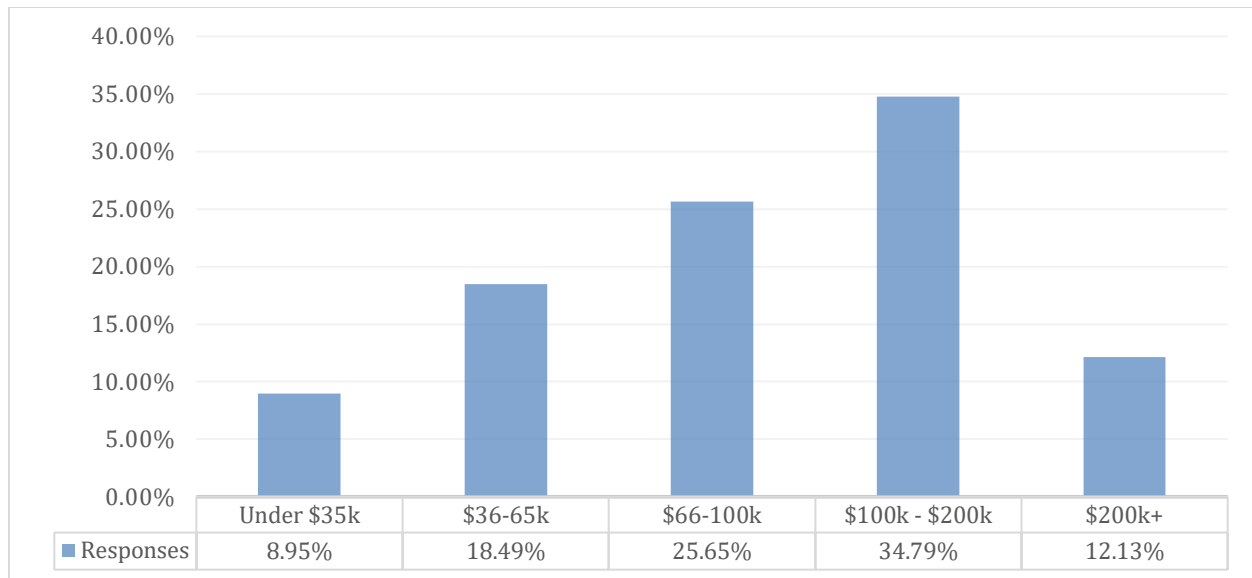
Race/Ethnicity (N=507)

There were 507 responses to this question making the completion rate 76.24%. Most participants identified as White.



Household Income (N=503)

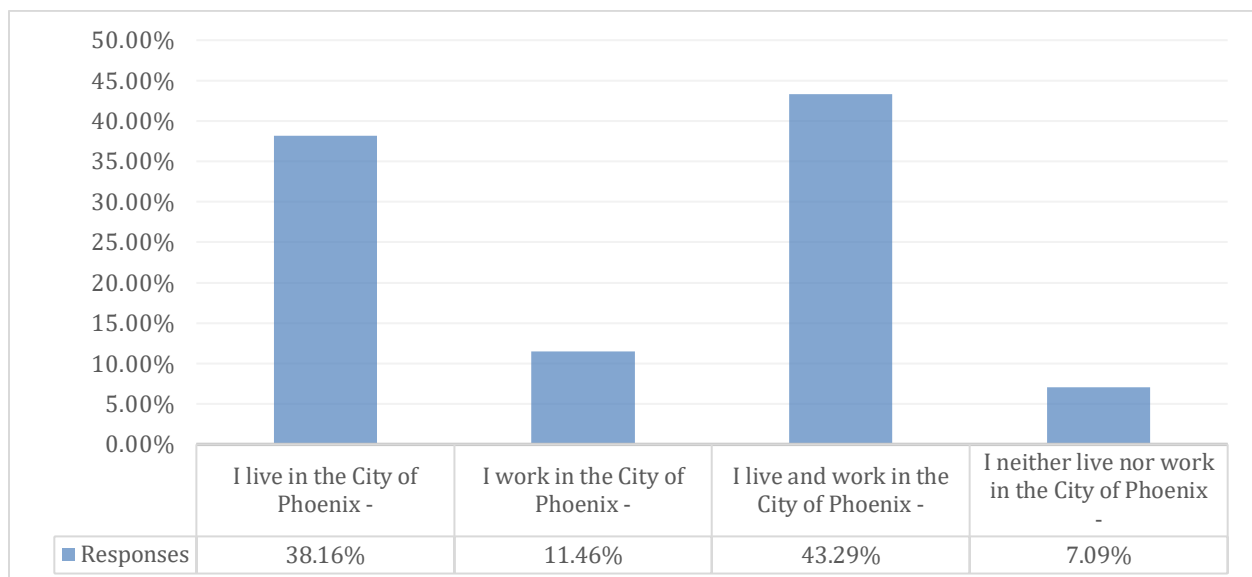
There were 503 responses to this question making the completion rate 75.64%. The most frequent response was a household income of \$100K-\$200K.



Questions

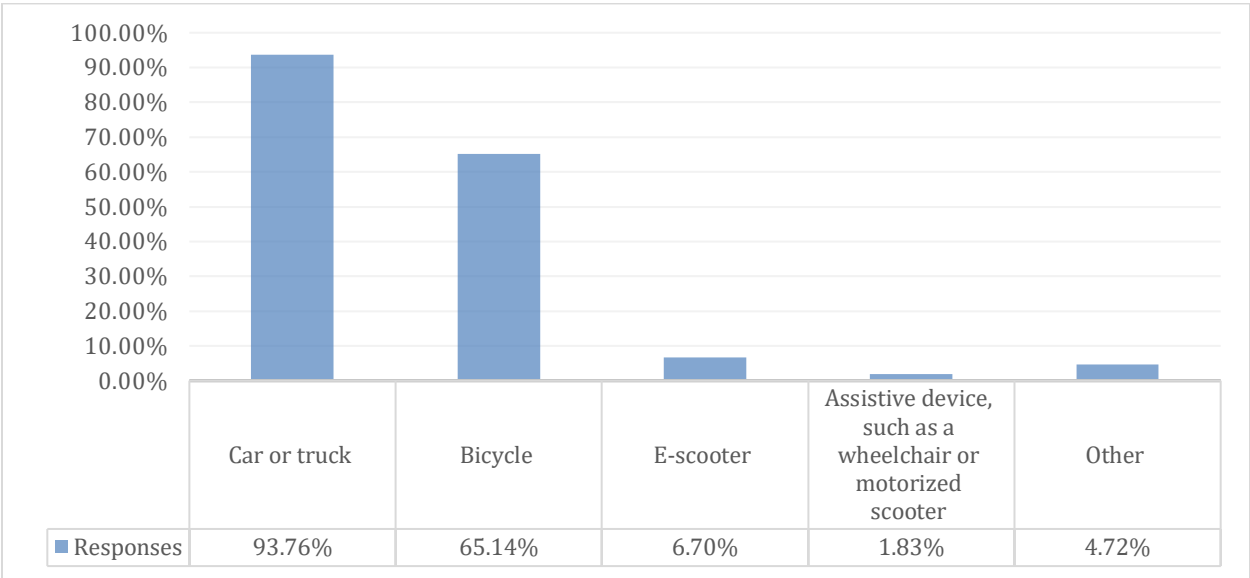
Q1: Which of the following best describes you?

There were 663 responses to this question making the completion rate 99.70%. The most frequent response was both living and working in the City of Phoenix.



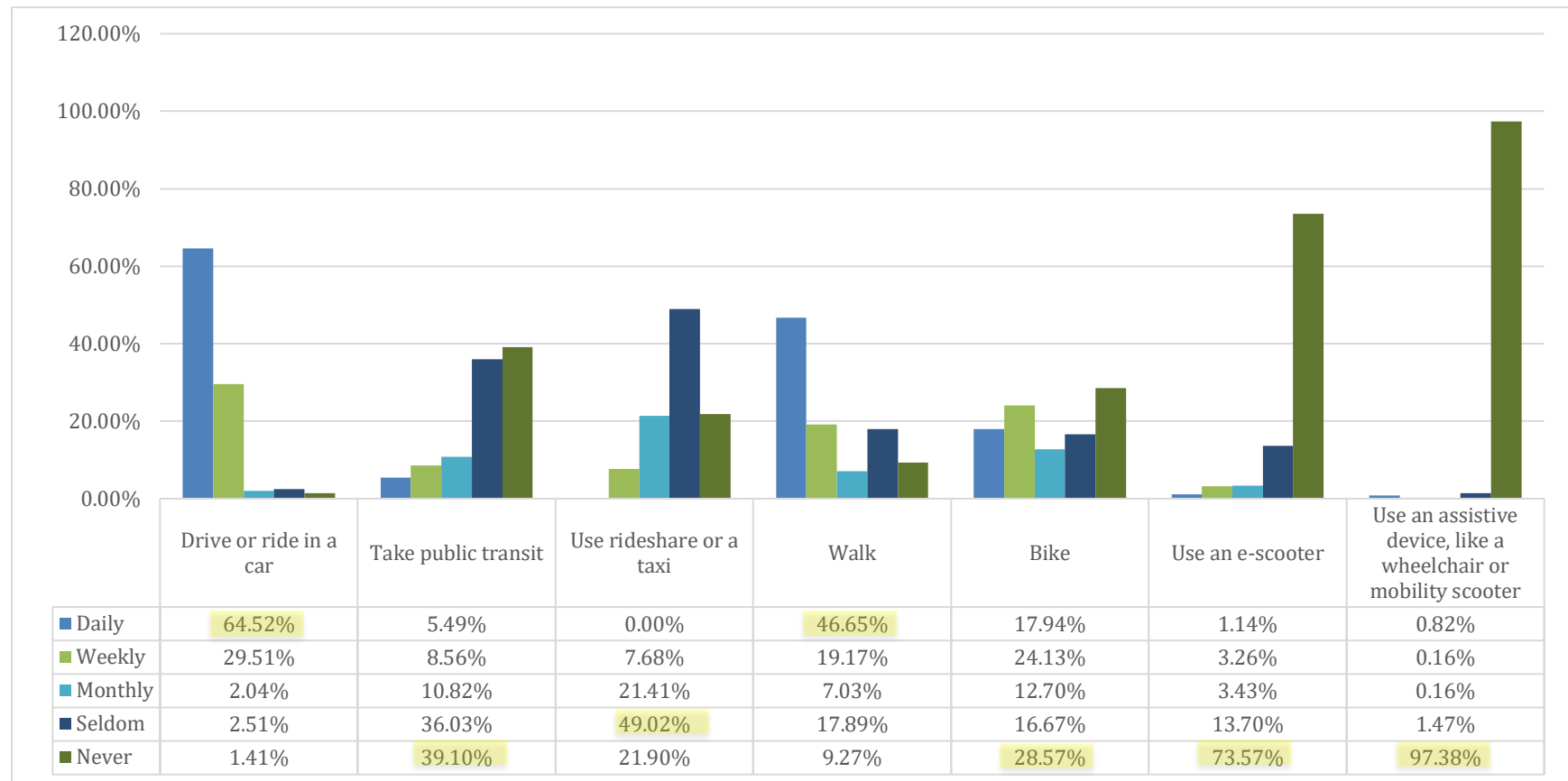
Q3: Which of the following do you own or have access to regularly? Please check all that apply: (N=657)

There were 657 responses to this question making the completion rate 98.80%. Most participants own or have access to regularly, a car or truck.



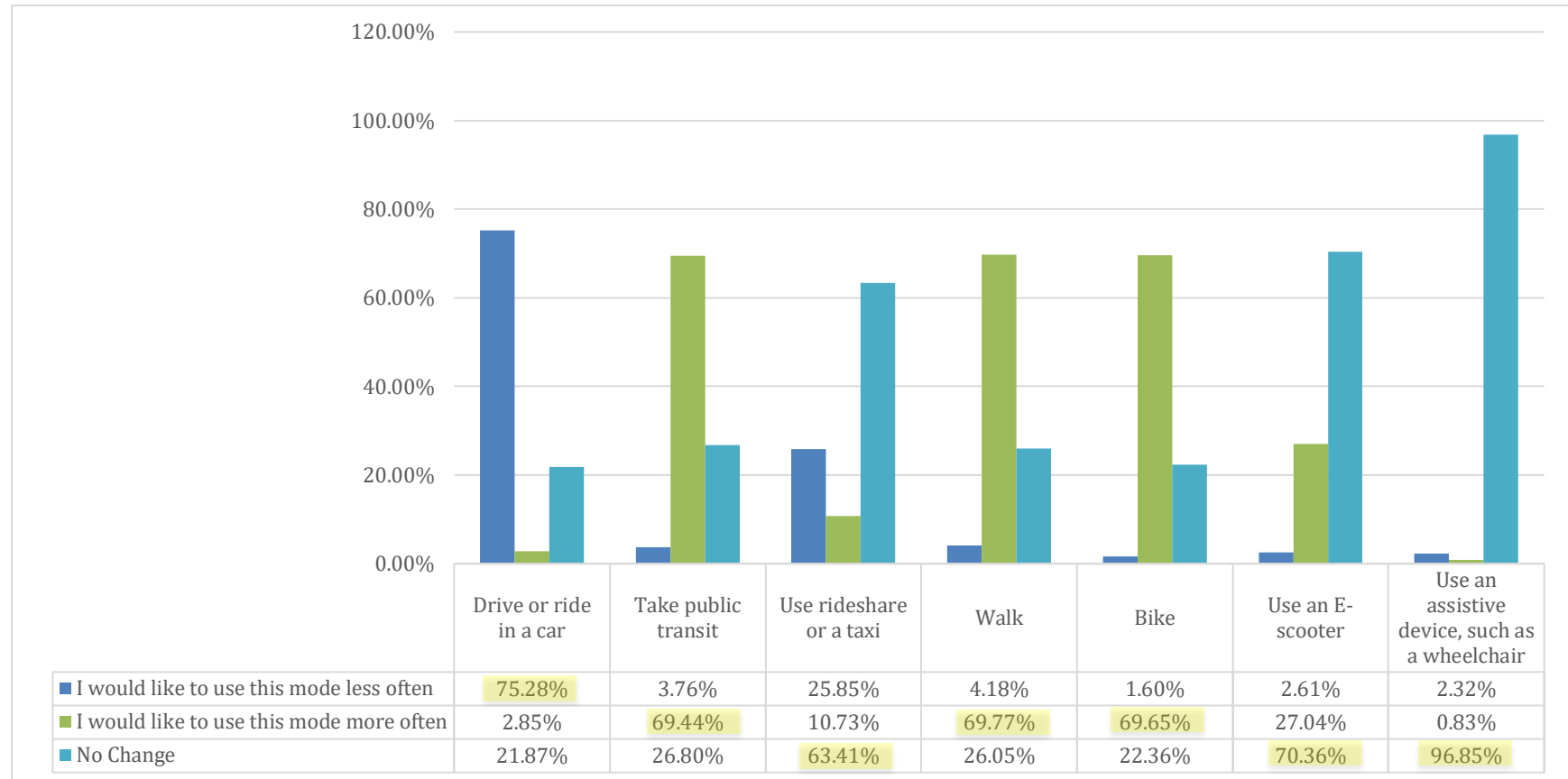
Q4: Please check how often you use each of these different ways of traveling. (N=639)

There were 639 responses to this question making the completion rate 96.09%. Highlighted below are the top responses for each way of traveling.



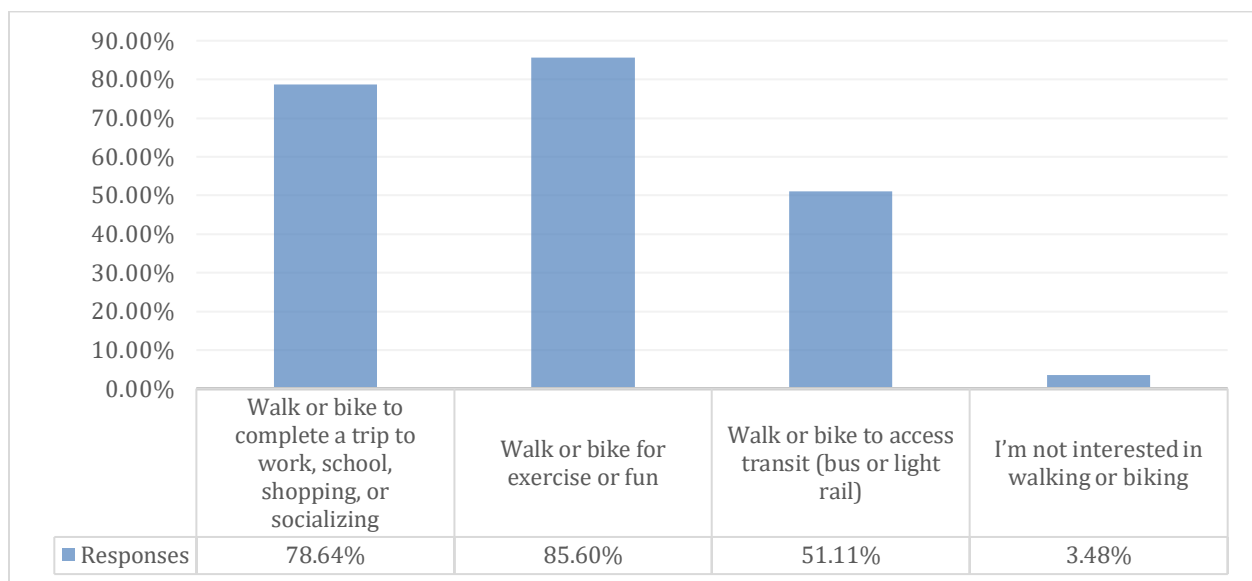
Q5: Please check how often you would like to use these different ways of traveling in the future. (N=636)

There were 636 responses to this question making the completion rate 95.64%. Highlighted below are the top responses for each way of traveling.



Q6: If you were to walk and bike more often, which of the following would describe the purpose of doing so? Please check all that apply. (N=632)

There were 632 responses to this question making the completion rate 95.04%. Most participants reported they would walk or bike for exercise or fun.



Q7: If you would like to provide more details, please use the space below. (N=95)

There were 95 responses to this question making the completion rate 14.29%. Based on the comments, the following themes were identified: Design, Development & Infrastructure, Climate, Public Transportation, Routes, Safety, and Scooters. Below are comments that align with each theme:

Design, Development & Infrastructure

- Phoenix needs to prioritize bicycles as transportation. I bought my home in an adjacent suburb because Phoenix's bicycle infrastructure is totally inadequate by any measure.
- The more walkability, the better. Phoenix currently has a depressing amount of car centric design.
- I dream of living in a city with real, people-centric infrastructure
- Phoenix (and its metro region) is obviously car centric - I know it's unrealistic for that to change in the future but 15 minute walkable communities would do enormous good for

the general welfare of their residents. Walking and biking places is far superior to driving in most circumstances.

- It's going to take more than bike lanes to fix this urban hellscape. We need a dense walkable city not based around cars. Downtown needs to be at least twice as dense as it is.
- Need more grocery stores, pharmacies, hardware stores, and other amenities. Currently, none of these are walking distance for my neighborhood at 7th St & Osborn.
- I would love to be in an area that is walkable or bikeable. My area currently requires a car to get around anywhere.
- i would like to walk and bike more but the current landscape doesnt let me
- I love biking where it is feasible. I appreciate the improvements the city is making and feel that better bike infrastructure, especially physically protected bike lanes, would go a long way.
- If there were more walkable (walking only) spaces downtown, I would be interested in spending time in those areas.
- I bike as much as possible. I use public transit when biking is not possible (weather, health etc). I want to drive as little as possible, but I still have to sometimes because of infrequent bus stops on McDowell and 44th, or because bike infrastructure is incomplete (like on 40th street where the bike lane ends suddenly) and sometimes feels unsafe.
- Street Parking in my area is the real issue. Historic Downtown was not built for this many people and cars.
- Some people don't have the choice and must walk, bike and use transit for daily living. We must consider these most vulnerable members of our community.
- Rideshare would be an option in a self-driving model
- I enjoy biking and taking the bus; it's my "gym" and "study" time. However, I would like it if traffic to Downtown Phoenix were more reliable, so that, on occasion, I could drive to Downtown in case if I have an appointment or need to leave earlier or to sort out logistics like picking something up. Using rideshare or some foldable personal electric transport could also work, but it'd be nice if it weren't so expensive.
- This new project is not where I want my tax dollars going. The Government does not know how to do anything well. Just look at California who tried this plan. Unsuccessful. All forms of government need to get out of the people's lives. They work for us, not the other way around.
- The more opportunity to walk or bike, the better. Even if it comes at the expense of cars, I say as primarily a car user.
- I would also love to see bicycle symbols painted on city streets that are designated bikeways, such as Oak. There are some small street signs, but these can be easy to ignore or miss. Motorists should be aware of bikes and looking out for them on these streets, especially when there's no designated bike lane and bikes have to use the main road.
- We need a traffic light and safe sidewalk crossing at 43 rd Avenue and Dobbins. You need to hold your breath as you take your turn at the 4 way stop. Drivers are unkind and greedy when it comes to taking your turn at the 4 way stop. Children are biking and walking each day and school buses also have a challenging time at this intersection. There

are 4 schools using this intersection = 2 charter and 2 public. Laveen is building approximately 8000 more homes and 2-3 more schools. What and when are the plans to install a traffic signal?

- I drive home on cave creek road at night and the traffic lights will turn red when no one is there. It makes zero sense.

Climate

- We need more shade. The added heat to the city from all the concrete is substantial. I read an article from someone who lived here over 100 years ago, and they described Phoenix as having only 2 seasons, spring and fall since the temperature was always perfect. We need that back
- The zip code 85004 should have more investment into green spaces, we need increased shade, more trees
- I would much prefer to walk and bike, but the general lack of shade throughout most of Phoenix prevents this during the peak summer months.

Public Transportation

- I don't have good access to light rail. If I did, I'd use it more.
- I would take the light rail but it smells of urine and filled with homeless.
- I have mobility issues so walking to bus/light rail is difficult. I wish there were buses that went through the neighborhood.
- The Metro is not an option in my area. I do use it occasionally for special events.
- Please extend the light rail route. The current route mainly runs east and west between Mesa and Phoenix. There should be a north and south route as well between Chandler and Scottsdale.
- I do not drive when possible. I use my electric skateboard or bike to go most everywhere I need to go in the city. I would like to be able to take my electric skateboard on the bus systems but it appears not allowed right now. I would also like better access to rail and bus systems on a more regular basis
- I've been car-free in the Valley for more than 15 years and only drive in case of emergencies. Cars and trucks to me are too much of a danger. This city is a disaster for pedestrians, the light rail was a nice touch but why are buses still only every half-hour? They should cost less to use or be free at least during summer months.
- I would love to walk to a bus or light rail stop, but it's almost a full mile to the nearest stop that goes in a direction I frequent.
- No light rail
- I would love to see more transit options in Laveen.
- I would like to use transit more, but the bus stops in my neighborhood are terrible—some have no shade at all.
- More bike racks for bus stops if there aren't any spaces on the bus.
- Buses absolutely need to come every 15 minutes minimum. We're a major city.
- Most of my car trips are short and only for bulky items. I'd love more separated bike lanes and easier access to public transport/have it go somewhere besides downtown and Tempe

- Walking/biking/public Trans are my main means of transportation. I own a car, but try to not use it if I can help it.
- I wouldn't want to drive to get to public transit
- Trying to use public transport more

Routes

- Walking/Biking is an excellent way to get daily exercise in addition to getting to where you need to go in a quick way. What I believe we should still have a car for is longer trips/trips that involving hauling goods. However we should encourage at every opportunity the ability to choose different modes of transit. I live in Tempe, just east of the I-10, and I am sure that there are bike routes that connect swiftly and safely to Tempe; but I still wish I knew more about them prior. I would also love it if in general more pedestrian paths connected to other pedestrian paths. (Though a project like this is ensured to be expensive) I would love to see more pedestrian freeway overpasses connect to other freeway overpasses, thereby giving pedestrians multiple options of route across a freeway and allowing for a more efficient use of the space overall.
- I hate having to get in the car for a quick trip to the market or even just grab coffee. Better / more walking and bike ways would make this possible
- Would love to see bike paths through neighborhoods so I wouldn't have to ride on 7th Street to get to Thunderbird.
- There are zero bike lanes on Thomas Ave, and there is zero consideration taken for pedestrians to establish that.
- Use the canals for bike and walk paths! Use the large storm drain culverts and washes for bike and walk paths. Separate multi-use paths from traffic, too many stop lights for cyclists. Tie the paths into shopping areas. Make a huge effort to connect existing paths through power, drainage, canal easements. Get creative on the use of other rights-of-way. Work with the flood control district and canal co. on using rights-of-way for trails.
- I would love more multi use paths, separated from traffic by some sort of barrier.
- I use the bike path along the Rio Salado and it's wonderful. I would like to have more and better bike lanes getting to and from that bike path from my office at 1300 W Washington St.
- I would like to see more bike lanes on west to east streets and more bike routes without any vehicles, especially along canals.
- 11th Ave and Bethany Rd to popular shopping areas like uptown plaza and routes into downtown from 7th Ave
- More bike lanes to get around town on streets that are not too heavily used by motor vehicles
- The 3rd/5th Ave bike lanes are fantastic
- I bike to work in 85043 (7 miles from 85006) twice a week. Wish there were better East/west bike lanes especially away from downtown. Also, e scooters are the most goddamn annoying things people leave them everywhere. They need to have designated places to leave them.
- Walking and biking are so much nicer to get around, especially midtown and downtown. Would love more protected bike lanes and shade for pedestrians.

- Many wide secondary streets do not have bike lanes.
- I love long bike rides where I can just GO with friends or by myself to enjoy Phoenix and get exercise. The bikeways throughout the valley are exceptional, I'd love to have more BUT I wish they were like the other canal bike system where it goes under the roadways so I don't ever have to stop at a light.
- I work from home and live a relatively walkable part of town (Melrose). However, I would love it if the city made the road more pedestrian and bicycle-friendly, with improved walkways, crosswalks, parking strips etc.
- I basically want the option to live without a car, weather permitting. I ride into Phoenix at least once per week. The canals are great but don't necessarily get me to the place I'm trying to go. Getting downtown should be easier, for example.

Safety – Cars, Speeding & Traffic

- I would love to be able to bike to the grocery store! I have 3 stores super close to me, but everyone drives so crazily that I can't. :(
- 82 years old so walk is better than bike. Seeing the way MORE DRIVERS with different backgrounds (country upbringing) drive I'm afraid there is going to be more people on bikes or walking getting killed.
- I am interested in walking and biking more, but the speed at which drivers drive through the downtown Phoenix area is outrageous. We need more investment in bicycle and pedestrian infrastructure downtown and drivers need to be held accountable for speeding and driving recklessly. Too many people die in our streets.
- Even with bike lanes, I do not feel safe riding in traffic. There aren't enough safeguards for cyclists. When walking, I often feel unsafe because the sidewalk is very often right next to the traffic lanes vs. having a parkway space giving space between the street and the sidewalk.
- Would walk more from my house downtown if there was more shade and safety projection from the fast cars. Walking along an arterial is suicide. This is why no one walks, the cars drive too fast and its scary.
- Phoenix is pretty pedestrian hostile. I live near some walkable amenities (the intersection of Bethany Home and 16th St), but I don't feel safe walking around this intersection with the volume of traffic it experiences. I especially don't feel safe taking my young daughter there. And safety aside, walking a few feet from cars going 40+ mph is not a PLEASANT experience to say the least, which I think also dissuades people from walking. I think it would be great if the city had things like dedicated bus lanes, protected bike lanes (more than one!) and separated, shaded sidewalks. Such things would go a long way to promoting more walkability and pedestrian safety.
- I'd like to bike more, but Phoenix has some of the most unsafe drivers I've ever seen in my life.
- I want to walk and bike as much as I can, but it's so dangerous because of cars and street design. I live within walking distance to the grocery store, but I feel like my life is at risk if I try to walk or bike there. Pedestrians don't have priority anywhere, speeds are super high on roadways, and drivers are very aggressive against pedestrians and cyclists.

- Cars are noisy and dangerous and it would be nice to have zones that were exclusively pedestrian.
- I would love to be able to bike to work. But crossing streets like 7th St and Central is a death wish during rush hour. There is a single HAWK light I can use at 7th St but I would love to have more options. Also, I would like to express my frustration at the pitiful bike lane along Roosevelt Avenue, specifically near 7th Avenue. It is discontinuous and automobile drivers treat it like part of their own lane instead of a dedicated lane. That intersection also does not provide a protected left turn (dedicated turning green arrow) for cars turning left off of 7th Avenue which means people rush to turn as fast as they can, making the pedestrian crossing from Nortenos to the Circle K extremely dangerous

Safety – Infrastructure & Road Conditions

- Painted lines on the road are not bike infrastructure, not one vehicle respects them and they do nothing for safety. I've lost too many cycling friends over the years, enough is enough.
- If there was safe, shaded routes that are easy to access I would love to have biking as an easy alt. to take from work to surrounding areas. Both as a form of exercise & to enjoy the view outside.
- I would like to have to option to commute via public transit and walk /bike safely for daily needs. This would require road overhaul and increased pedestrian safety near my work place.
- Construction of effective and safe alternative travel is paramount to strong city design. Although not your exclusive jurisdiction, consider talking the Cities of Surprise, Sun City, and Deer Valley into improving bicycle infrastructure.
- I would like improved infrastructure to allow myself and other citizens to safely walk and bike around the city.
- I think if we had more viable alternatives to individual car trips fewer trips would be taken by cars and congestion would get better. Personally, I would like to take every trip by bike or on foot, especially if it was safer. Practically speaking bikes are already better for some trips in Phoenix. For instance, if it's busier downtown/on Roosevelt Row cycling can sometimes actually be faster because of the parking time. The problem is that cycling *is not safe enough*. Our roads are designed for speed, and that's why we have these racing problems now. We need to use engineering to reduce the natural speed, not just the speed limit, on our roads. Some of our roads that kind of act like arterial roads, like 15th ave, should have two-way bike lines, narrower car lanes, and lower speed limits. Please resist the temptation to plan bike infrastructure based on how many people currently cycle; this is like planning bridges based on how many people are swimming across a river. Infrastructure induces demand. Don't just put bike lines around downtown like it's some kind of novelty tourism activity like so many cities do. That's setting us up for failure. Spread our *from* downtown and the canal paths that already exist and make it progressively easier for people to get to the more central parts of the city by bicycle. And do it with *protected* two-way bike paths. These could be utilized by bicycles, class 1 and 2 e-bikes, e-scooters, and eventually perhaps even microcars for disabled people like

they have in cities with better bike infrastructure. Lean on Valley Metro to improve the fare system and the bus routes. Phoenix is way behind in public transit right now.

- I do not feel safe biking to and from work and home. Another good alternative would be for me to bike from my home to the light right, unfortunately there is no safe route to do so.
- I don't feel that biking or walking is safe in Phoenix, and public transit is so unreliable that I do not take it even though I work downtown and would love to not pay for parking.
- Create more safe ways for bikes to cross streets or more bike lanes in high volume areas
- I would like to walk and bike more often however the streets in Phoenix are often very dangerous so my wife worries about me biking. We need better and wider sidewalks and buffered bike lanes so my kids and I have a place to walk and bike safely.
- I already use a bicycle for my daily work commute and am thankful that the route is relatively safe. If I needed to go in another direction, the routes would be much less safe. In much of Phoenix, I am not comfortable riding, especially with my wife and young child. In much of Phoenix, I would not be comfortable walking (even to transit or a nearby park) because the sidewalks are non-existent, uncomfortable due to their proximity to travel lanes, or are unsafe.
- I'm a virtual employee so no drives to an office. But I do go to the grocery store every other day. Being able to safely traverse the Phoenix roadways would make me much more likely to walk or bike.
- Paint is not a sufficient barrier. Both bicyclists and drivers are safer when there is a physical barrier between the road and the bike path. Specifically, there should be a barrier that would meaningfully impede progress, such as a curb or a wall- collapsible reflectors are insufficient.
- Our public transportation system isn't safe and makes it a difficult option to use.
- I would like short distance public transit to access other areas of downtown, to Tempe, etc. Biking is not currently ideal given the general lack of safety in terms of bike lanes, cars, and aggressive people.
- I live relatively close to my work and would love to bike there, but I do not feel safe with the bike infrastructure that currently exists. I would love protected bike lanes around the city. I would definitely bike more places. Walking can also be a challenge because of how close to cars they are. Walking with my young daughter in a stroller sometimes even feels dangerous. We live close to 16th street and Bethany Home where there are great restaurants and cafes, but walking to them is not fun, nor safe.
- I have a car I never use because I like to ride my bike BUT the bike lanes here are on uneven terrible roads, covered in glass, blocked by city of Phoenix street workers. It's very unsafe. For such a flat city it would be nice to utilize my bike outside of the 2 streets that are someone rideable.

Safety – Other

- I have no driver's license. I'd like to be able to reach mostly the same places as someone with a license. Currently, that is not possible safely.
- If biking were safer, and public transit biking options were better, I would see a significant increase in my bike usage for various errands and enjoyment.

- It is very dangerous to drive with bikes on the road. These questions are a set up to push biking. This is not an honest survey.

Scooters

- Missing escooters in the warehouse district (around Maricopa County government center)
- More scooters available for rent would be helpful. Scooters are always hard to find downtown
- Prefer to use escooter for going to work, school, or shopping.
- I would also like to see e-scooters permitted on sidewalks. I don't think it's safe to ride an e-scooter on most streets in Phoenix, and this is a great transit mode for short distances and connecting to the light rail.

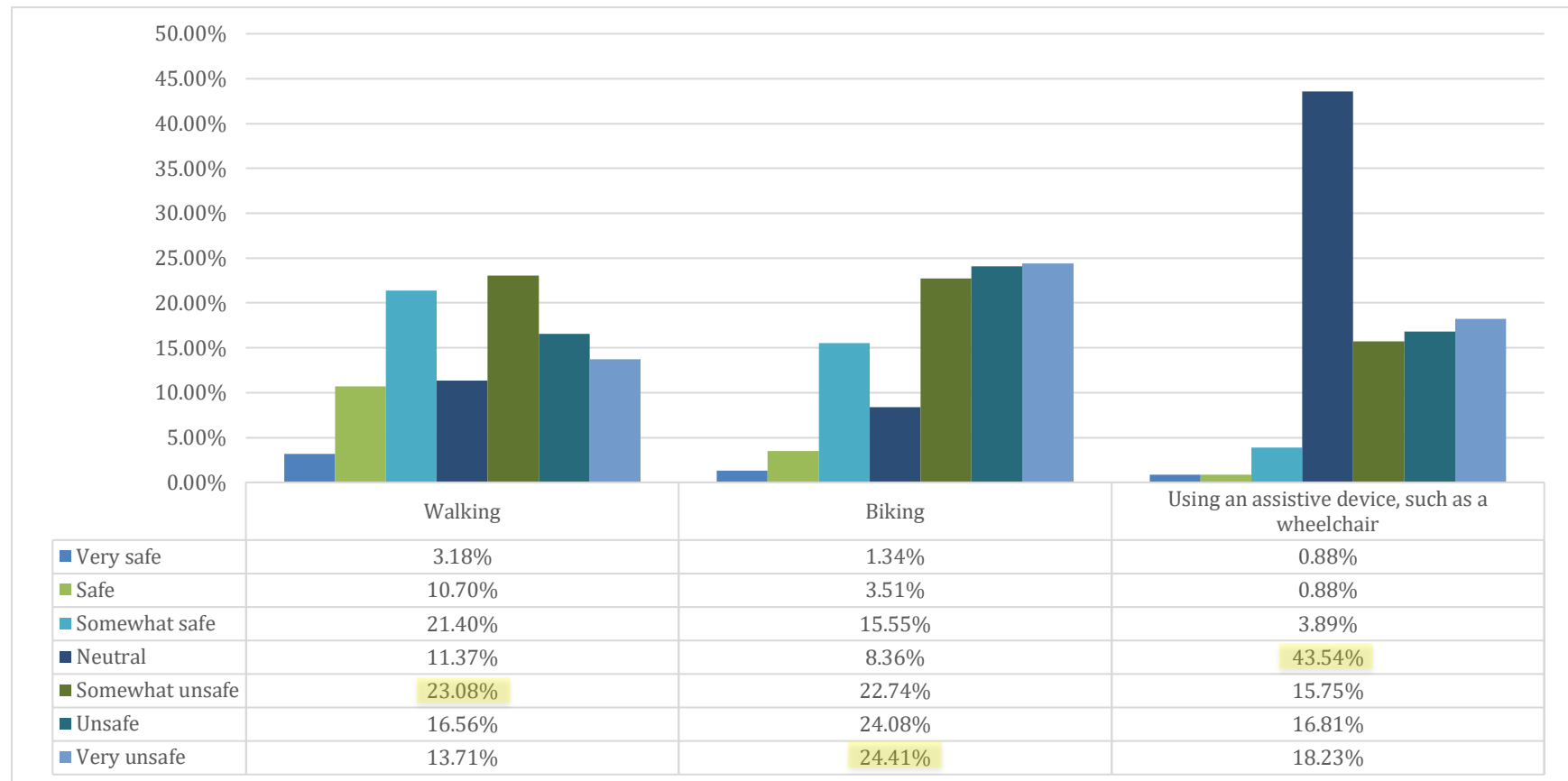
Additional Comments

- More people should bike and walk more and get out of their gas guzzlers.
- Gasoline is steadily going up and it would help the budget.
- I ride my bike daily to work because I enjoy it plus I dont enjoy sitting in traffic or dealing with the idiot drivers
- Primarily bicycle for purpose (no place for casual/enjoyable bike riding nearby). Walk for pleasure or for purpose if close.
- Walk dog more often
- I only bike for exercise and recreation
- Deseo hacer cambios en mi vida diaria , para estar más saludable(bajar colesterol y ayudar a mi presión arterial)

Translation: I want to make changes in my daily life, to be healthier (lower cholesterol and help my blood pressure).

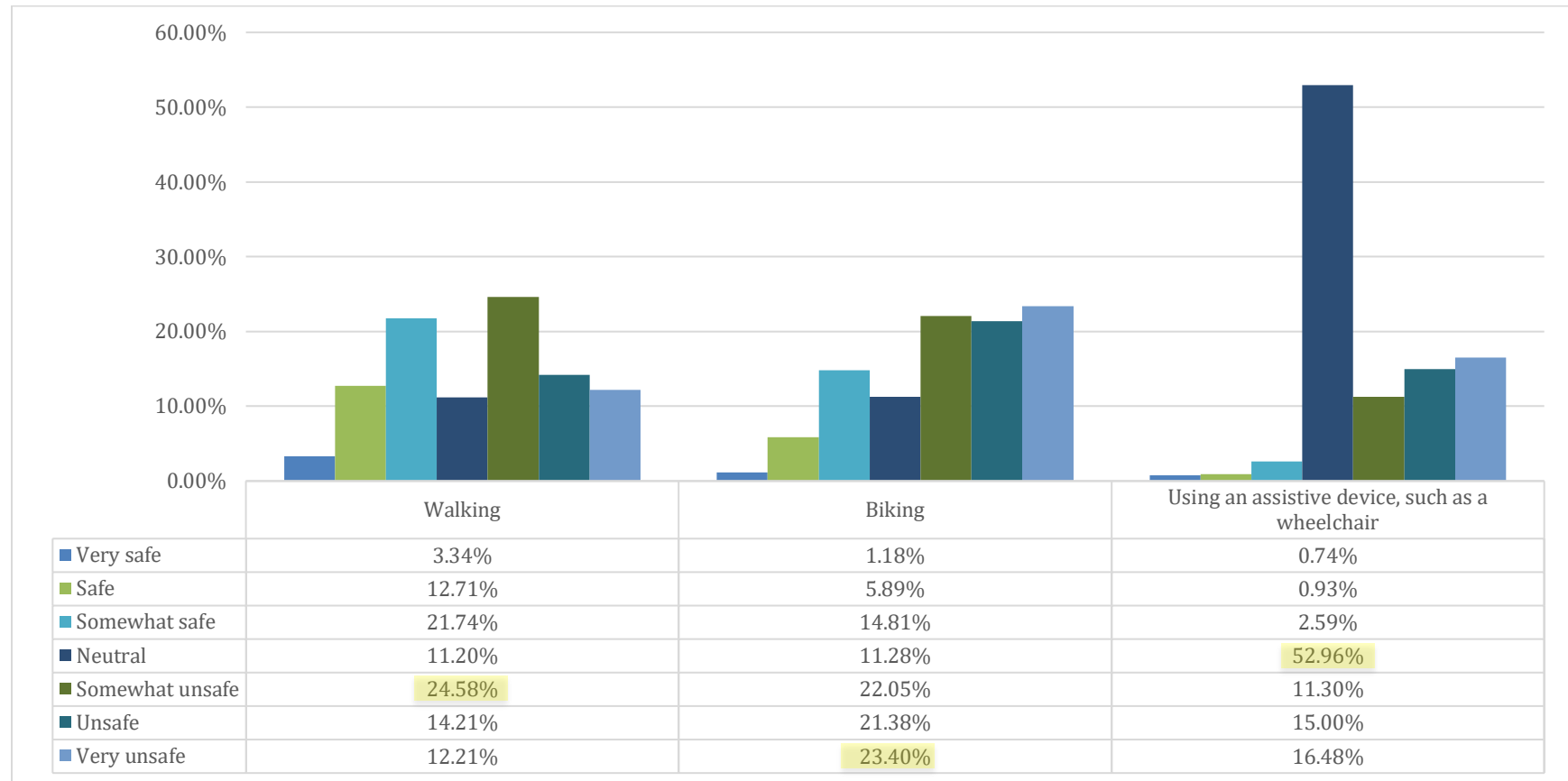
Q8: How would you rate the conditions in Phoenix for the following modes of travel? (N=599)

There were 599 responses to this question making the completion rate 90.08%. Highlighted below are the top responses for each mode of travel.



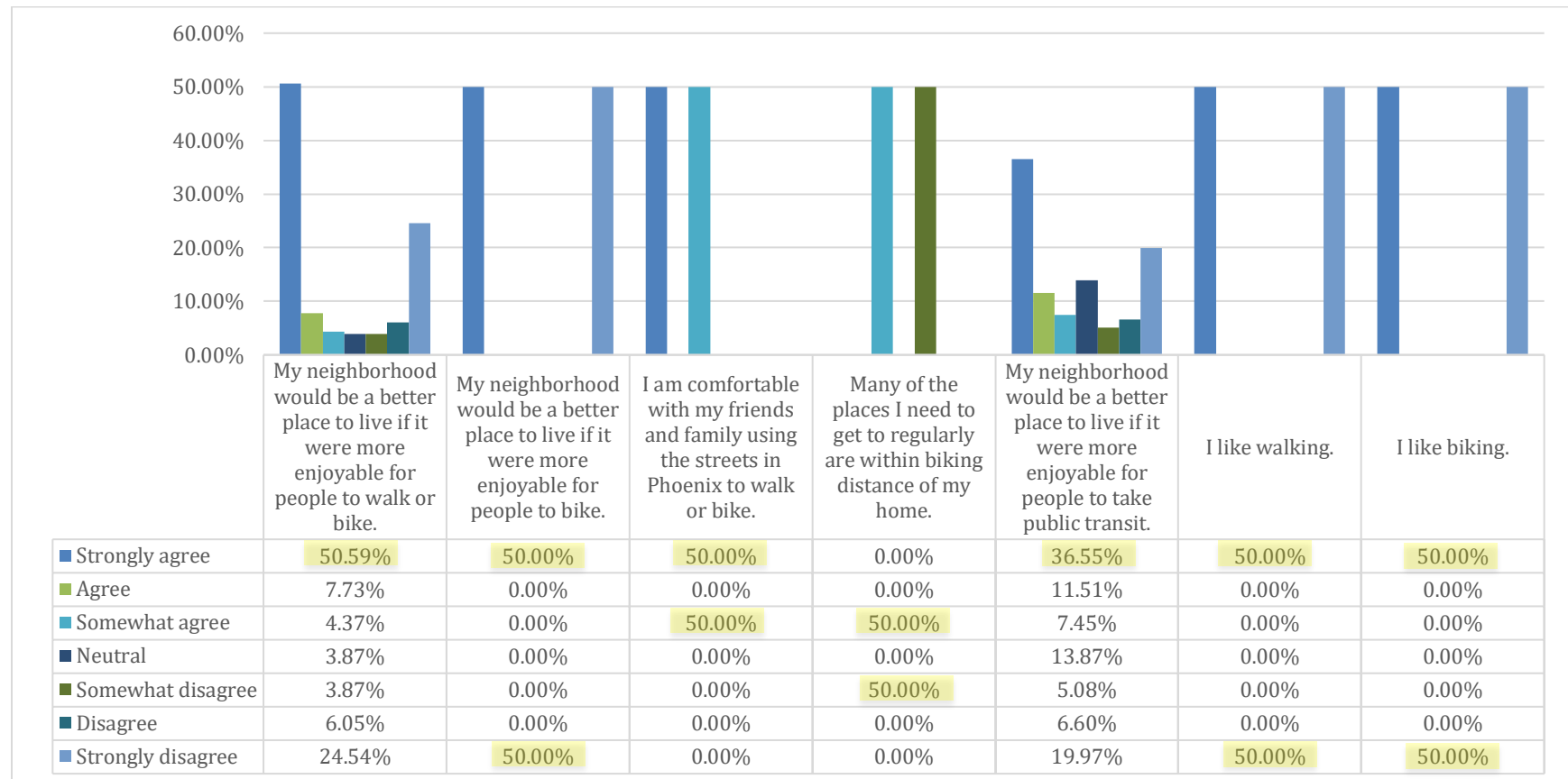
Q9: Thinking about safety, how safe do you currently feel in Phoenix using the following modes of travel? (N=599)

There were 599 responses to this question making the completion rate 90.08. Highlighted below are the top responses for each mode of travel.



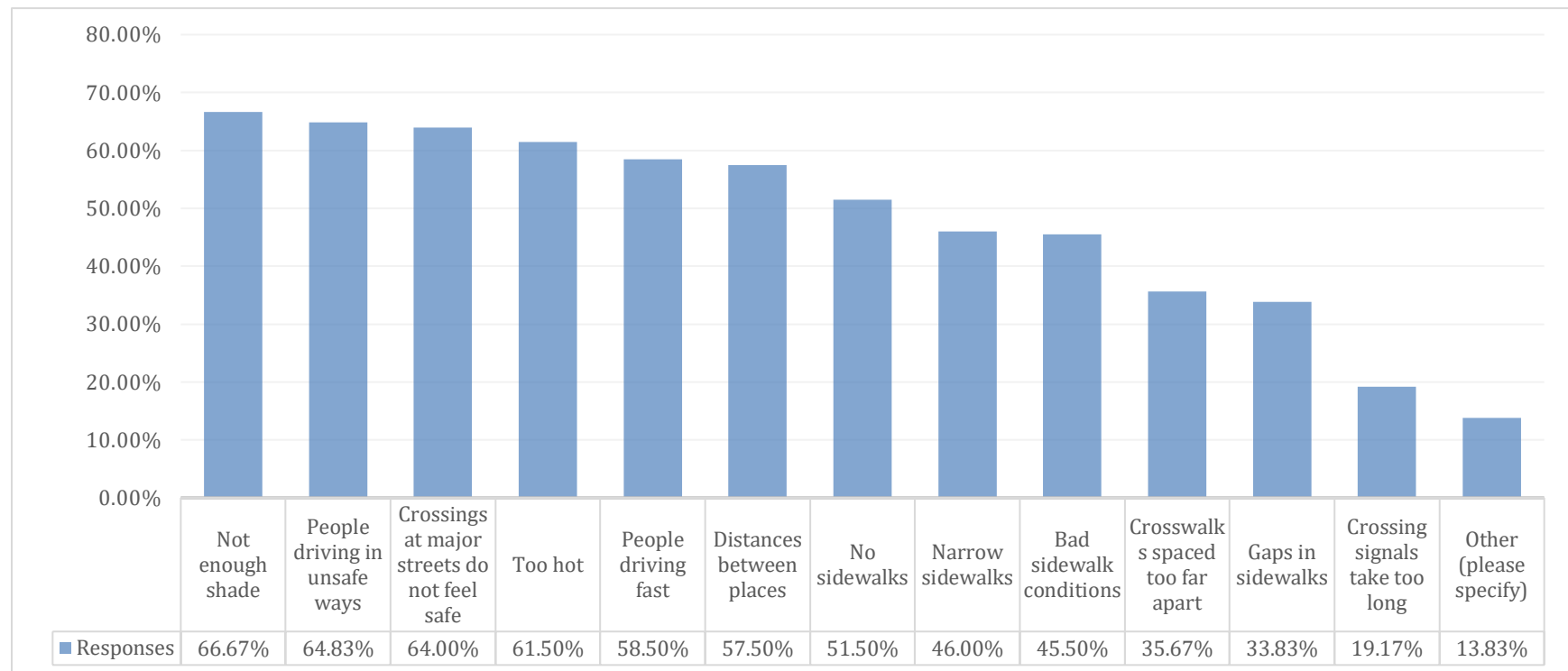
Q10: For the following question, please indicate how strongly you agree or disagree with each of the following statements. (N=601)

There were 601 responses to this question making the completion rate 90.38%. Highlighted below are the top responses for reach statement. **Note:** Due to an error in the survey format, several participants did not response to every statement.



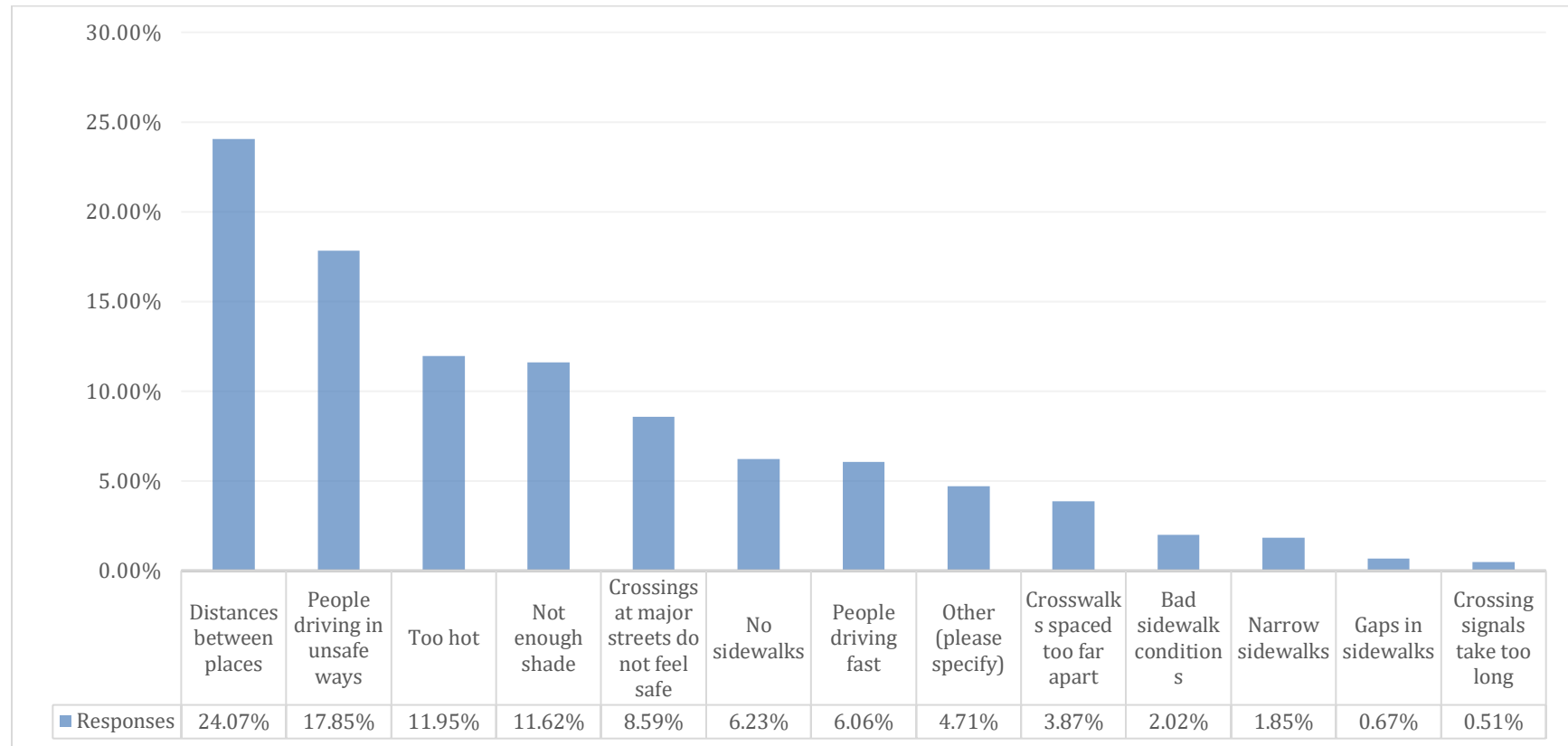
Q11: Which of the following stops you from walking more? Please select all that apply. (N=600)

There were 600 responses to this question making the completion rate 90.23%. Most participants selected not enough shade as the reason for why they do not walk more.



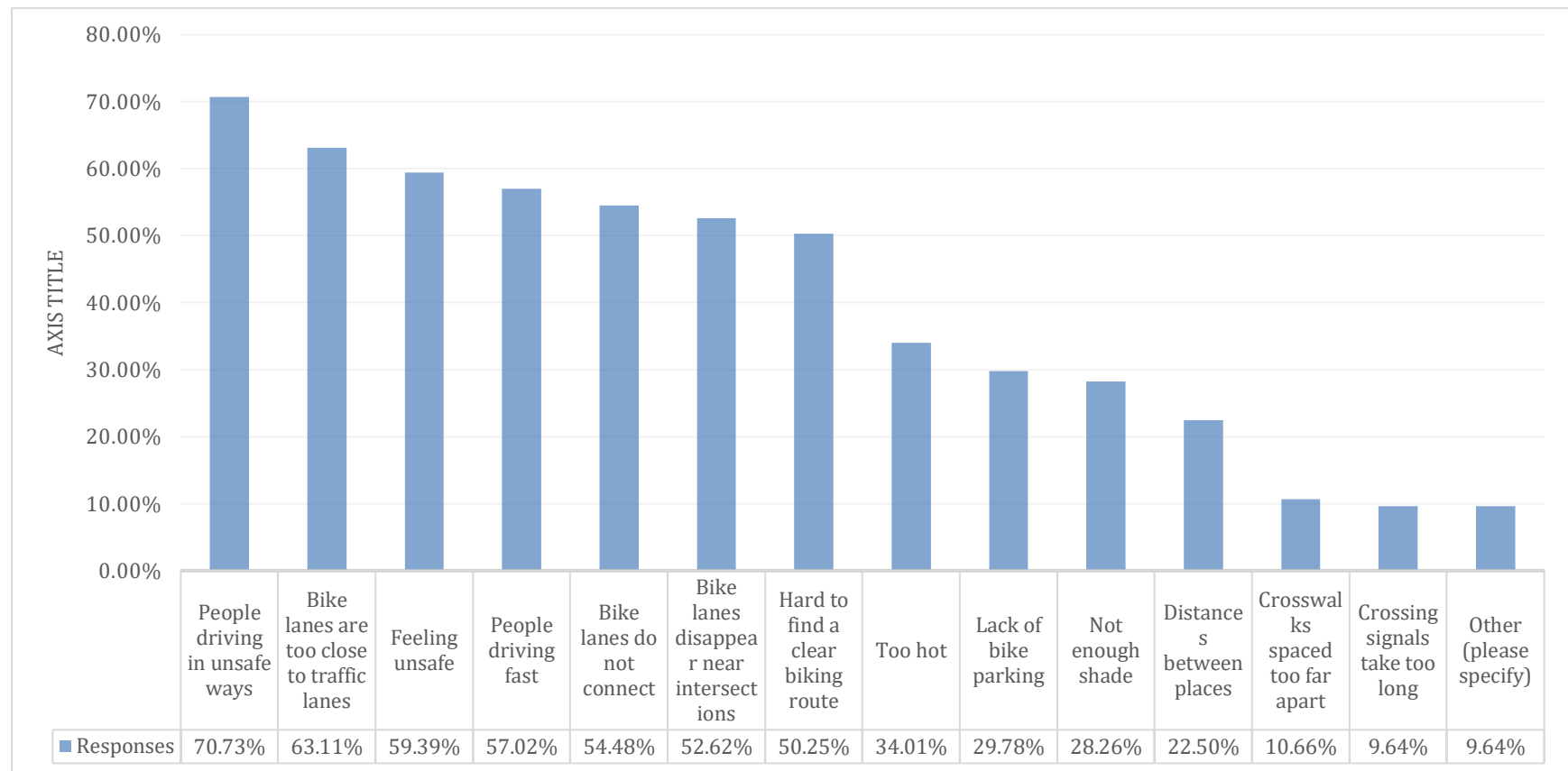
Q12: Thinking of the list above, what is the single biggest barrier when it comes to walking? Please select one. (N=594)

There were 594 responses to this question making the completion rate 89.32%. Most participants selected distance between places as the biggest barrier when it comes to walking.



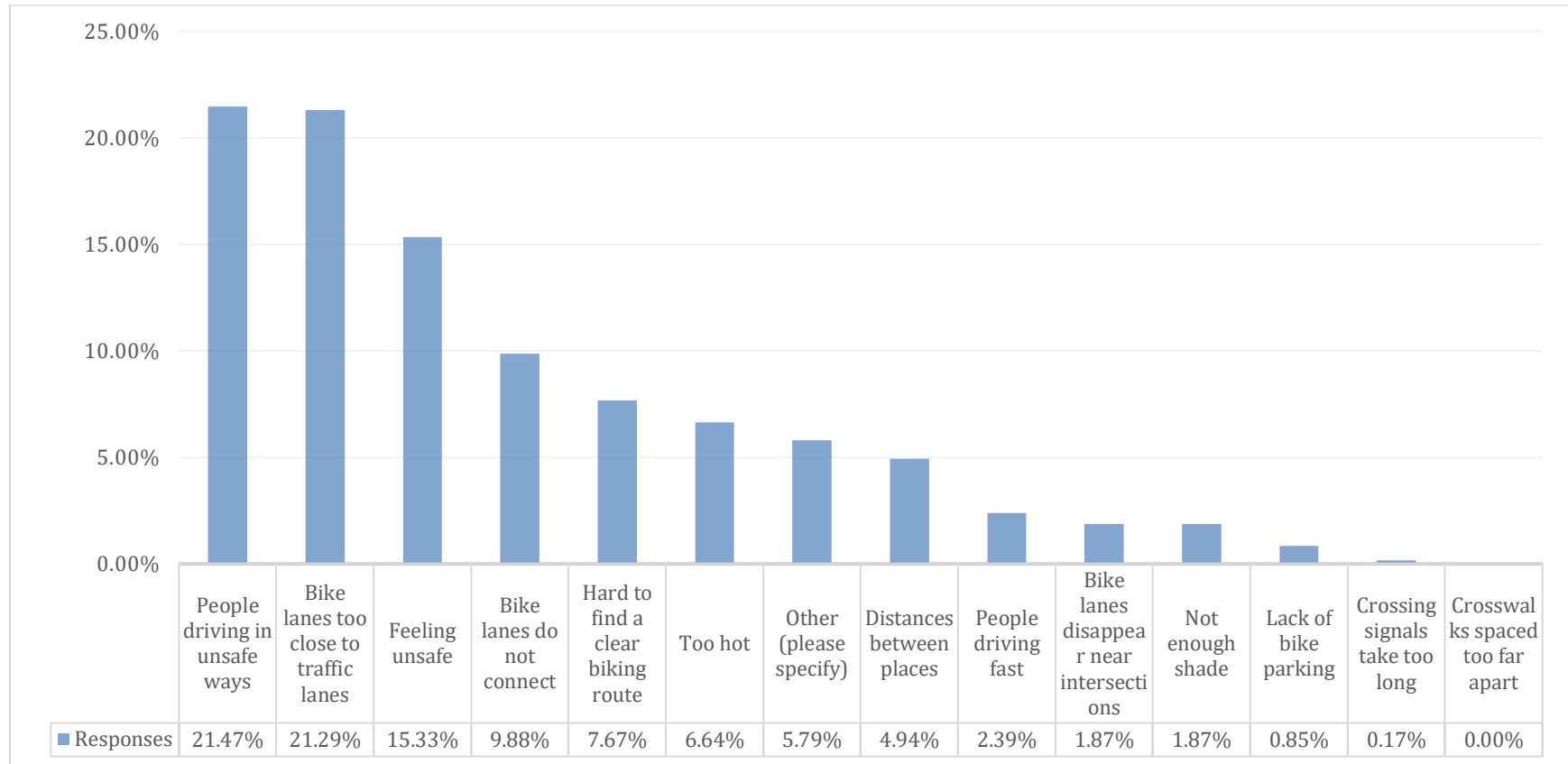
Q13: Which of the following stops you from biking more? Please select all that apply. (N=591)

There were 591 responses to this question making the completion rate 88.87%. Most participants selected people driving in unsafe ways as the reason for what stops them from biking more.



Q14: Thinking of the list above, what is the single biggest barrier for you when it comes to bicycling? (N=587)

There were 587 responses to this question making the completion rate 88.27%. Most participants selected people driving in unsafe ways as the biggest barrier when it comes to bicycling.



Q15: For the following questions, please indicate how strongly you agree or disagree with the following statements. (N=584)

There were 584 responses to this question making the completion rate 87.82%. Highlighted below is the top response for each statement.

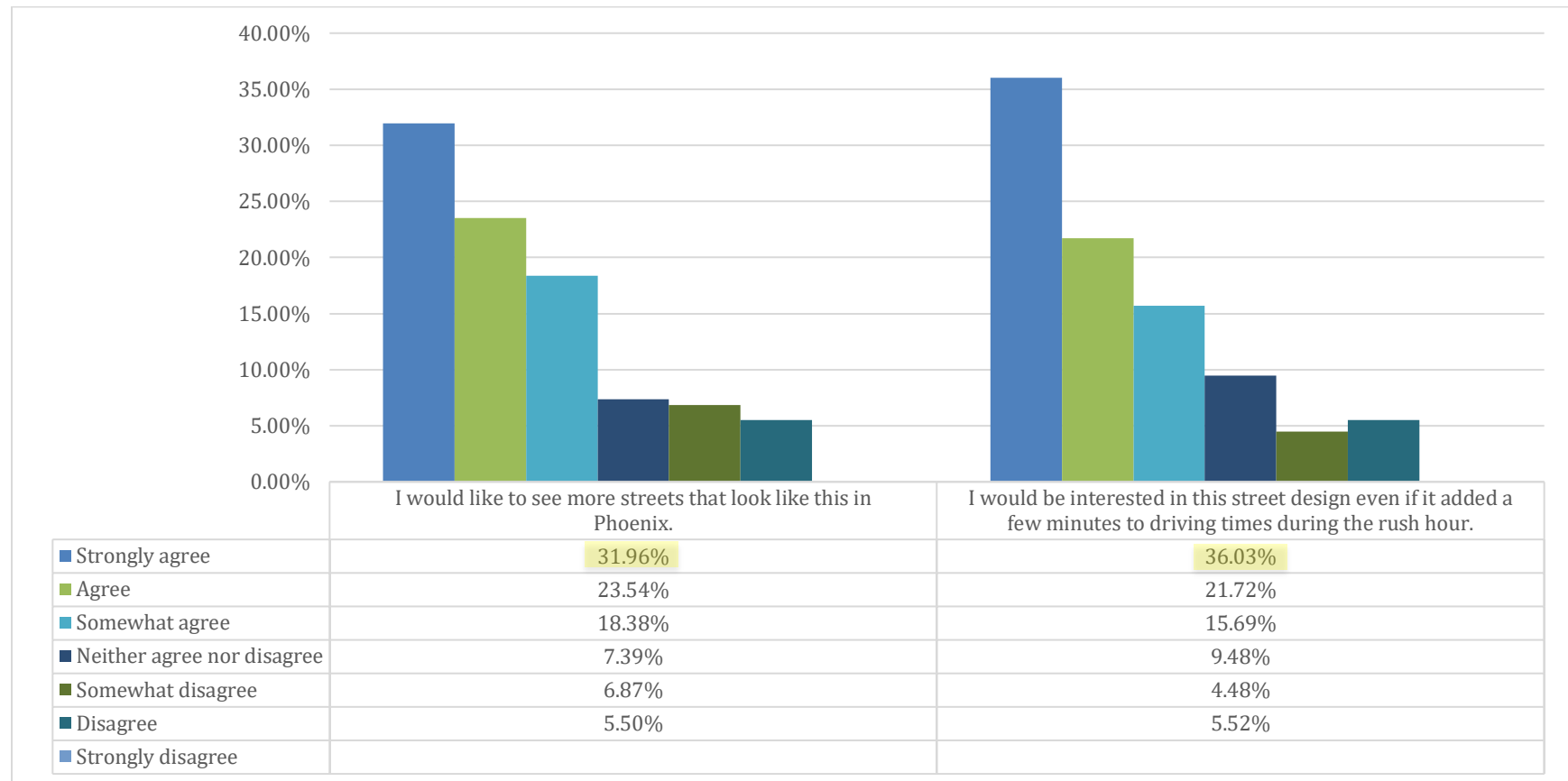


Image: Major Street with a Buffered Bike Lane



Q16: For the following question, please indicate how strongly you agree or disagree with the following statements. (N=584)

There were 584 responses to this question making the completion rate 87.82%. Highlighted below is the top response for each statement.

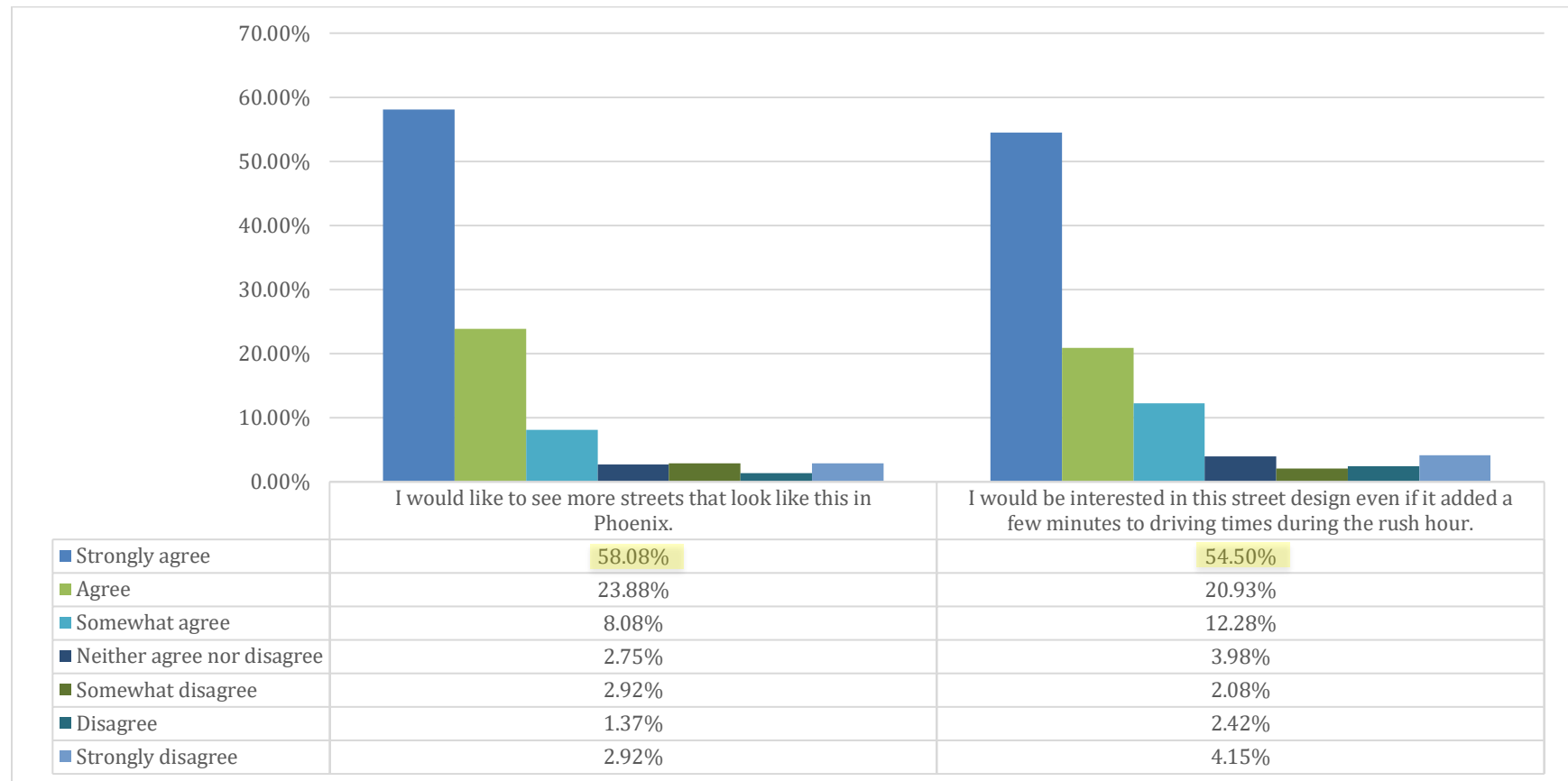


Image: Major Street with a Protected Bike Lan (Bollards Guideposts)



Q17: For the following question, please indicate how strongly you agree or disagree with the following statements. (N=585)

There were 585 responses to this question making the completion rate 87.97%. Highlighted below is the top response for each statement.

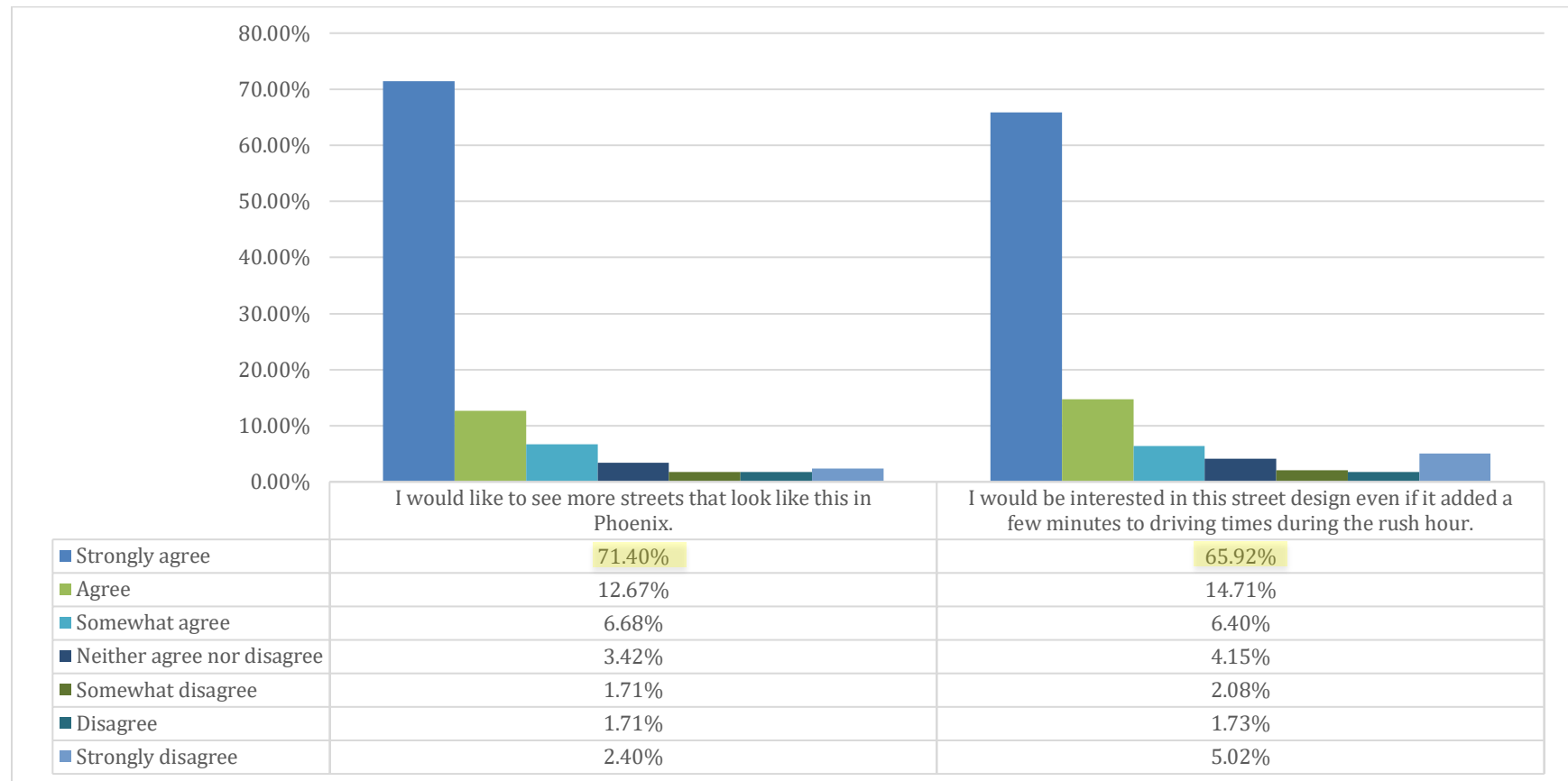


Image: Street with a Protected Bike Lane (Two-way Protected Bike Lane with Curb)



Q18: For the following question, please indicate how strongly you agree or disagree with the following statements. (N=583)

There were 583 responses to this question making the completion rate 87.67%. Highlighted below is the top response for each statement.

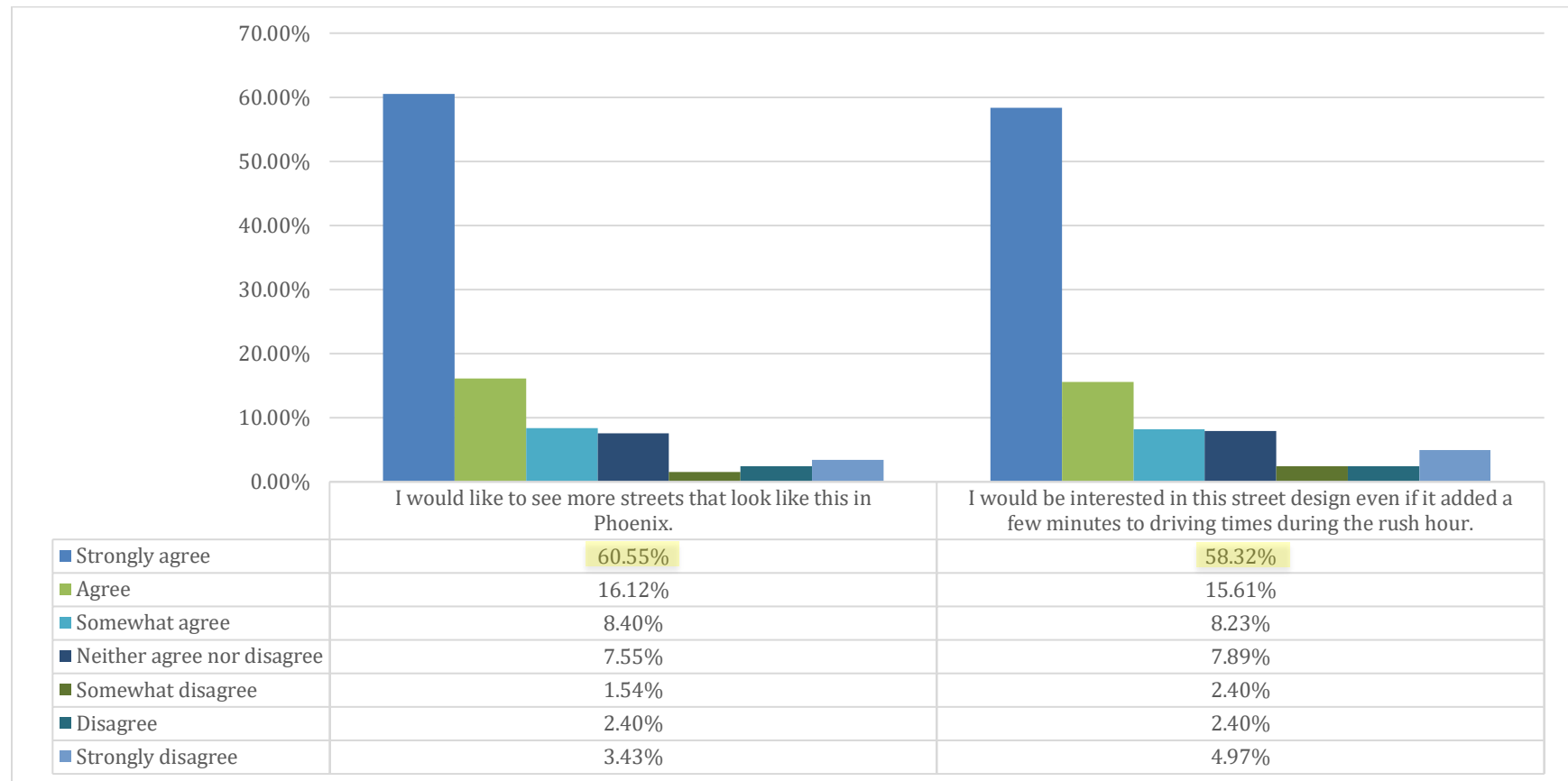


Image: Protected Intersection on Major Street



Q19: For the following question, please indicate how strongly you agree or disagree with the following statements. (N=582)

There were 582 responses to this question making the completion rate 87.52%. Highlighted below is the top response for each statement.

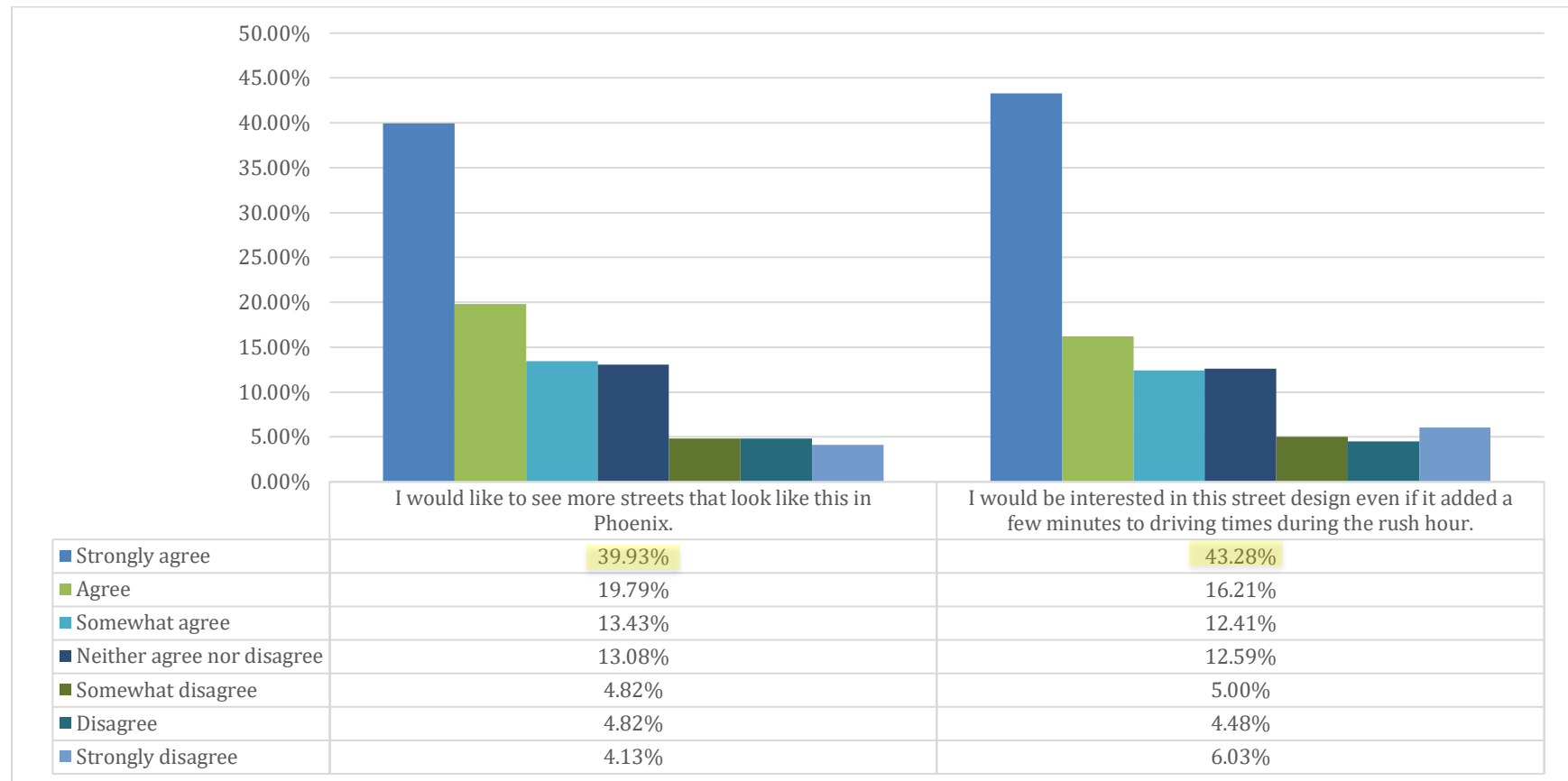


Image: Local street with sharrows and traffic calming (Bike Boulevard)



Q20: For the following questions, please indicate how strongly you agree or disagree with the following statements. (N=568)

There were 568 responses to this question making the completion rate 85.41%. Highlighted below is the top response for each statement.

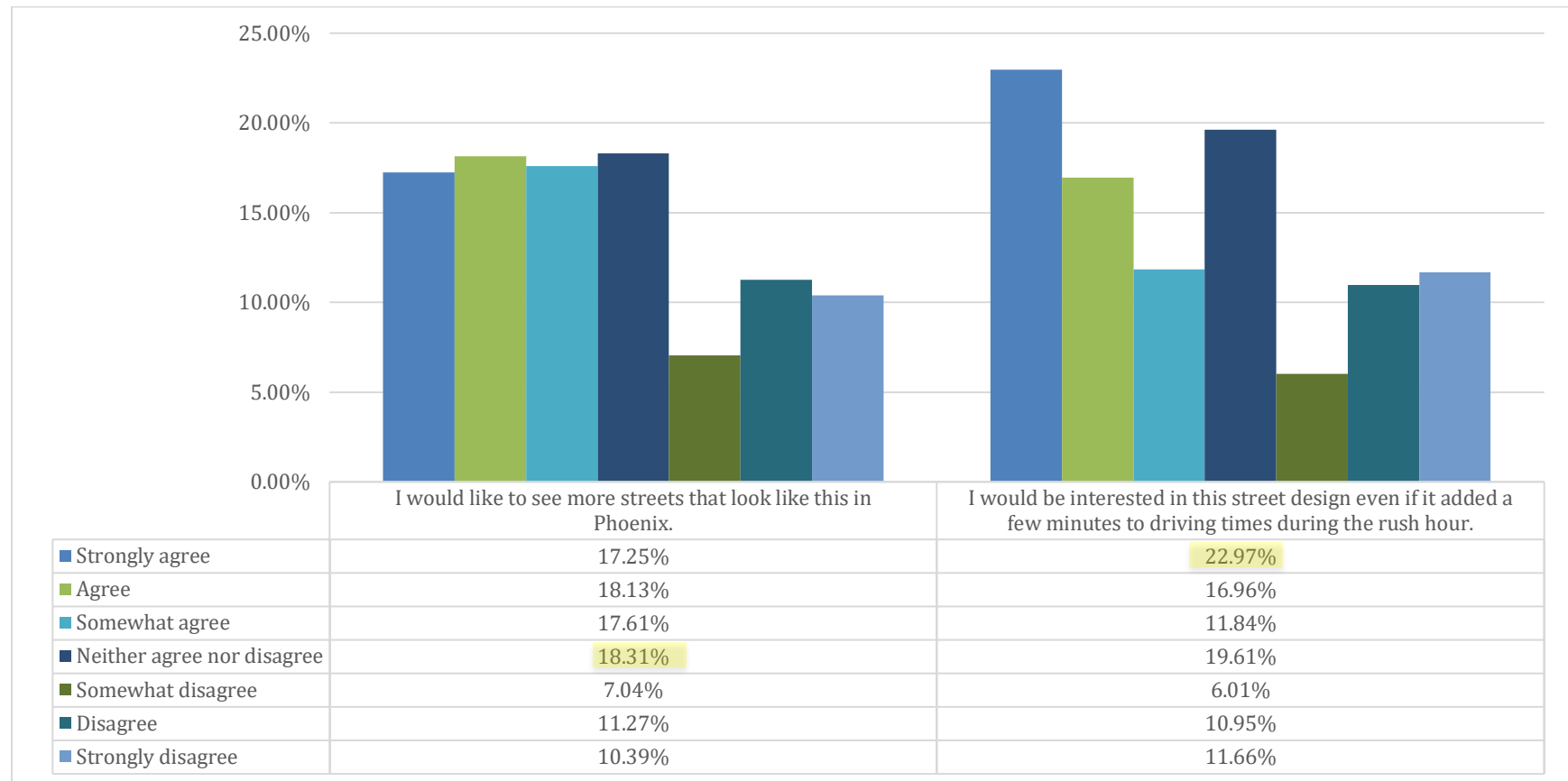


Image: Major street and sidewalk without separation from the roadway (not detached)



Q21: For the following question, please indicate how strongly you agree or disagree with the following statements. (N=568)

There were 568 responses to this question making the completion rate 85.41%. Highlighted below is the top response for each statement.

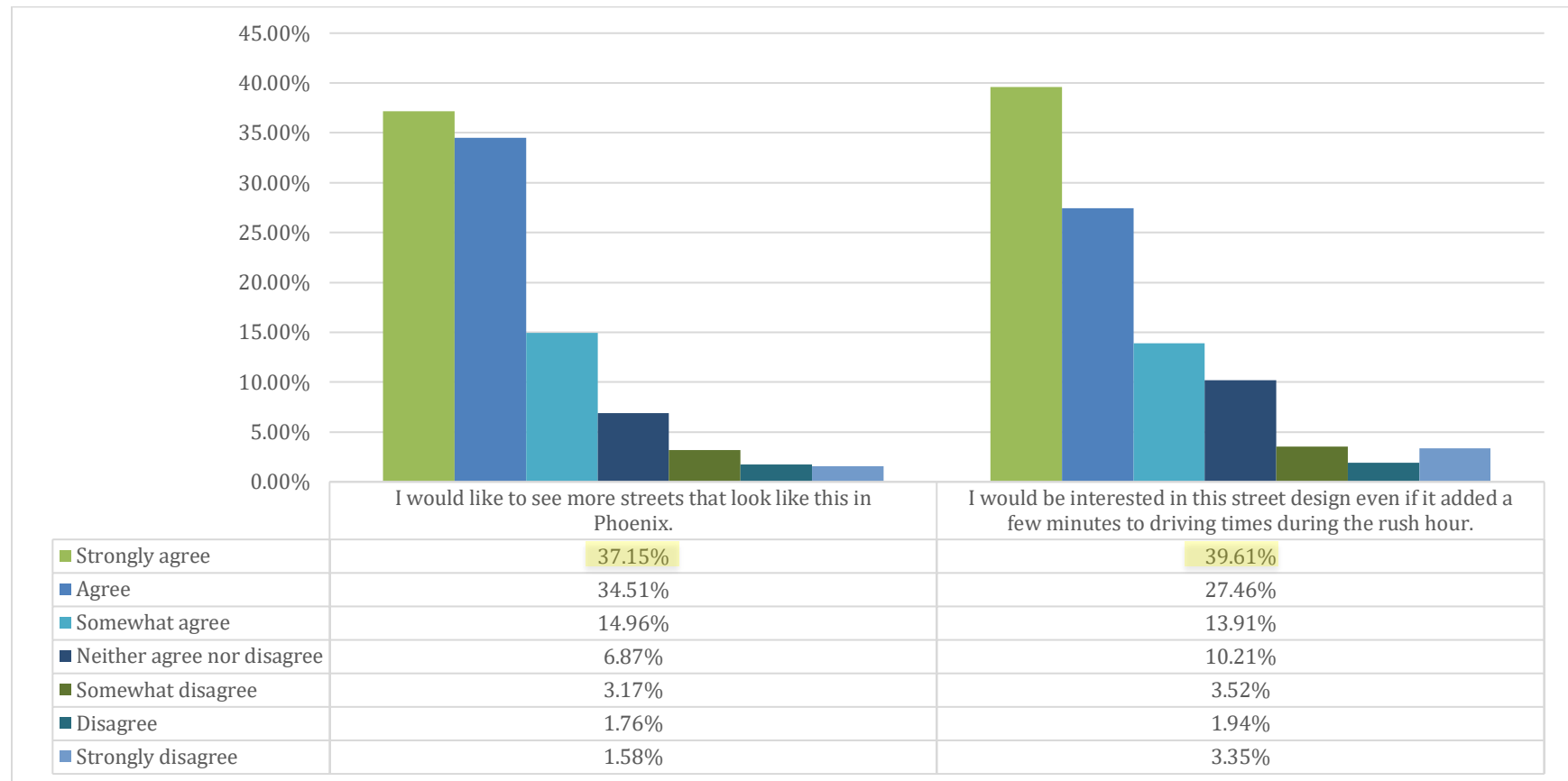


Image: Major street with detached sidewalk



Q22: For the following question, please indicate how strongly you agree or disagree with the following statements. (N=570)

There were 570 responses to this question making the completion rate 85.71%. Highlighted below is the top response for each statement.

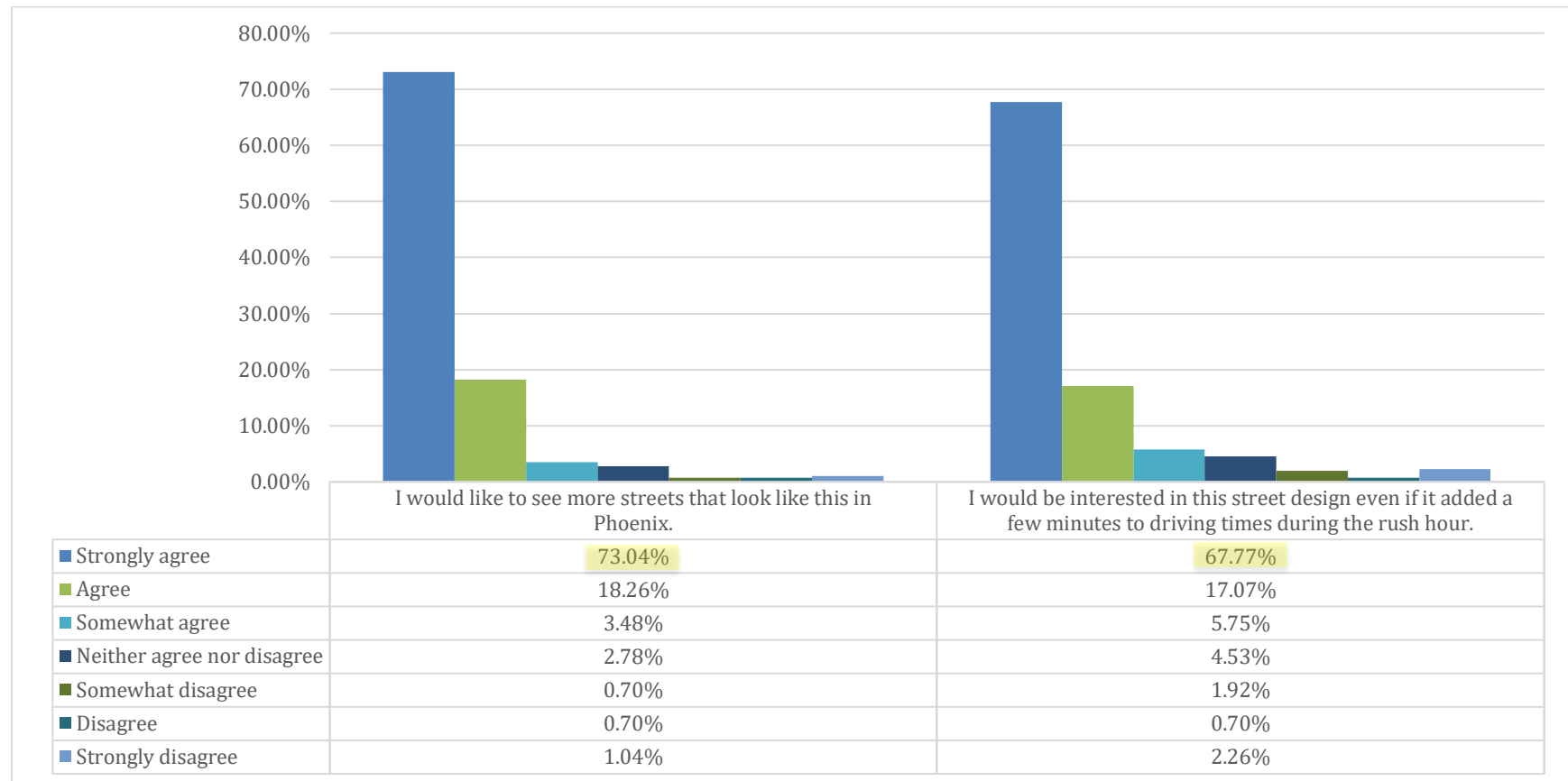


Image: Street with detached sidewalk and shade



Q23: For the following question, please indicate how strongly you agree or disagree with the following statements. (N=569)

There were 569 responses to this question making the completion rate 85.56%. Highlighted below is the top response for each statement.

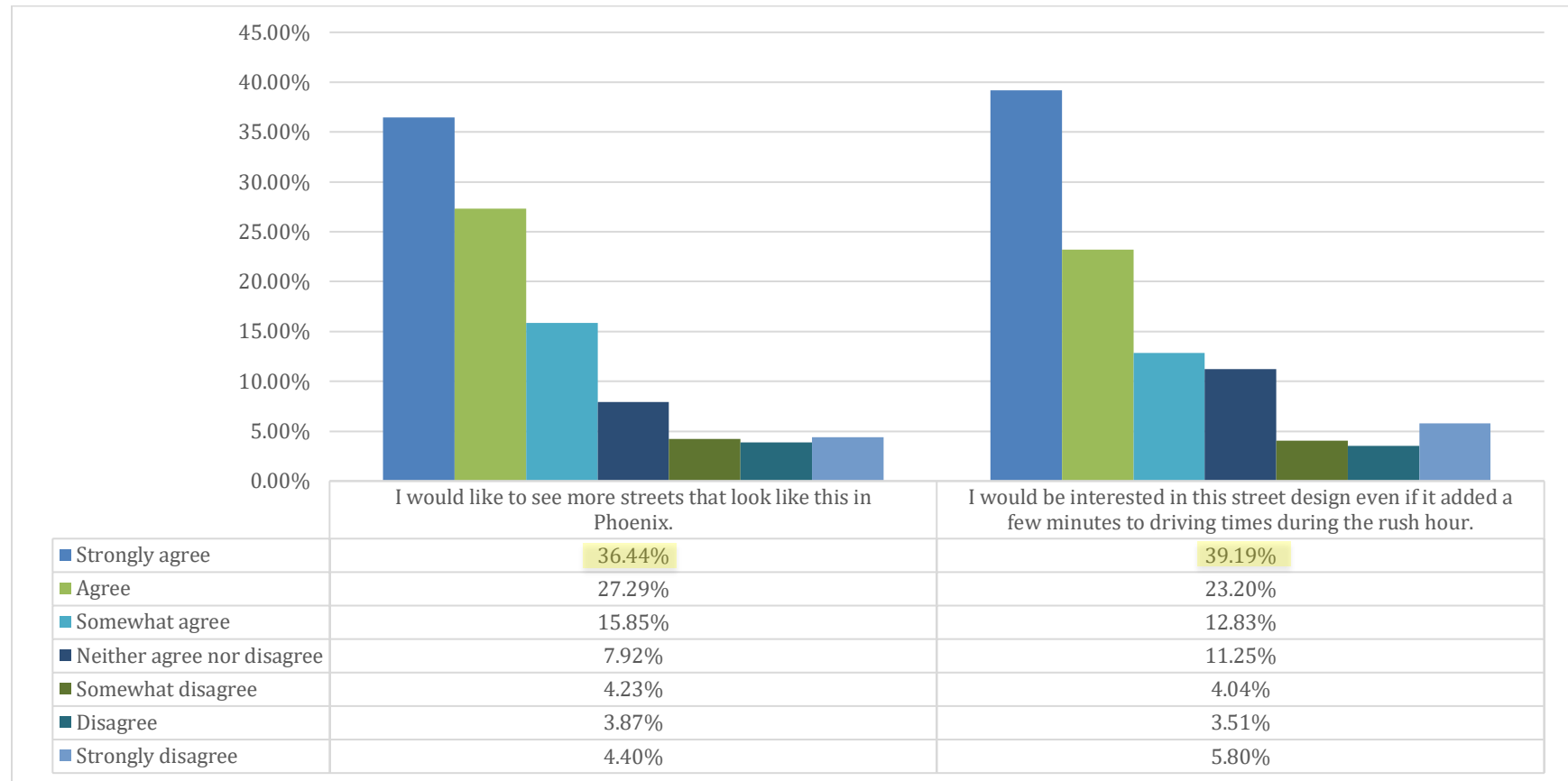


Image: Mid-block crossing with flashing beacon and island



Q24: For the following question, please indicate how strongly you agree or disagree with the following statements. (N=570)

There were 570 responses to this question making the completion rate 85.71%. Highlighted below is the top response for each statement.

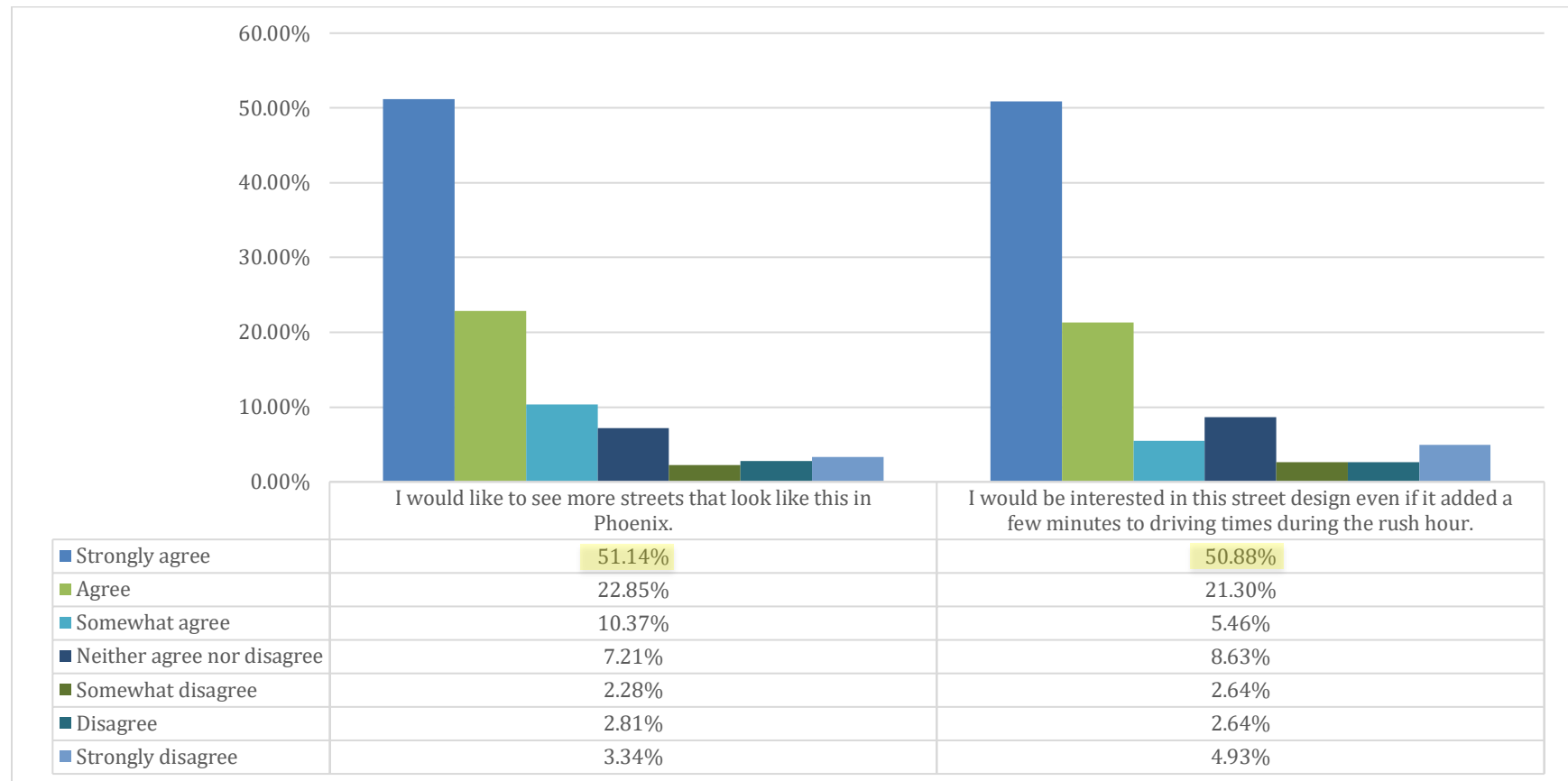
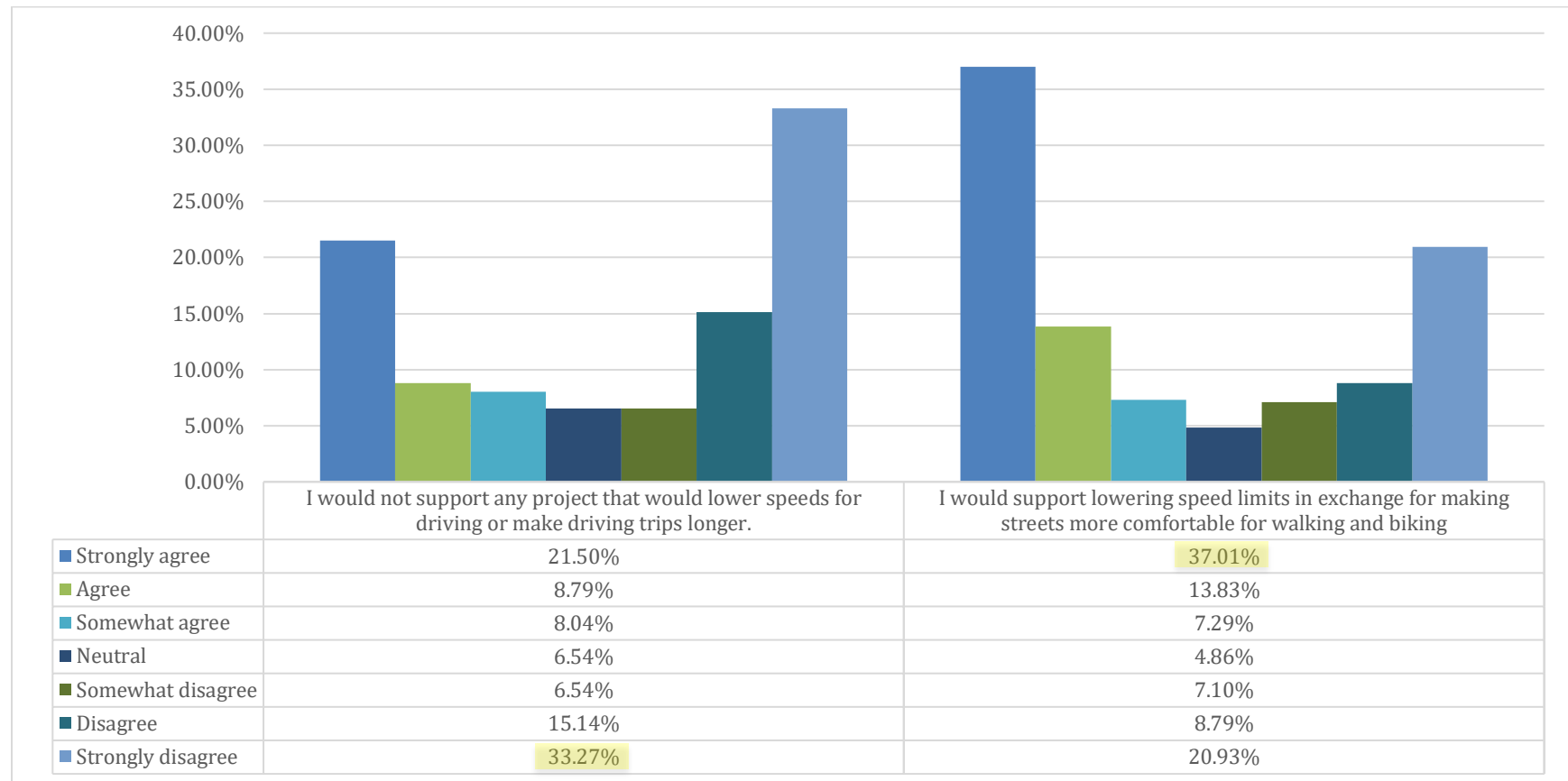


Image: Mid-black crossing with HAWK signal



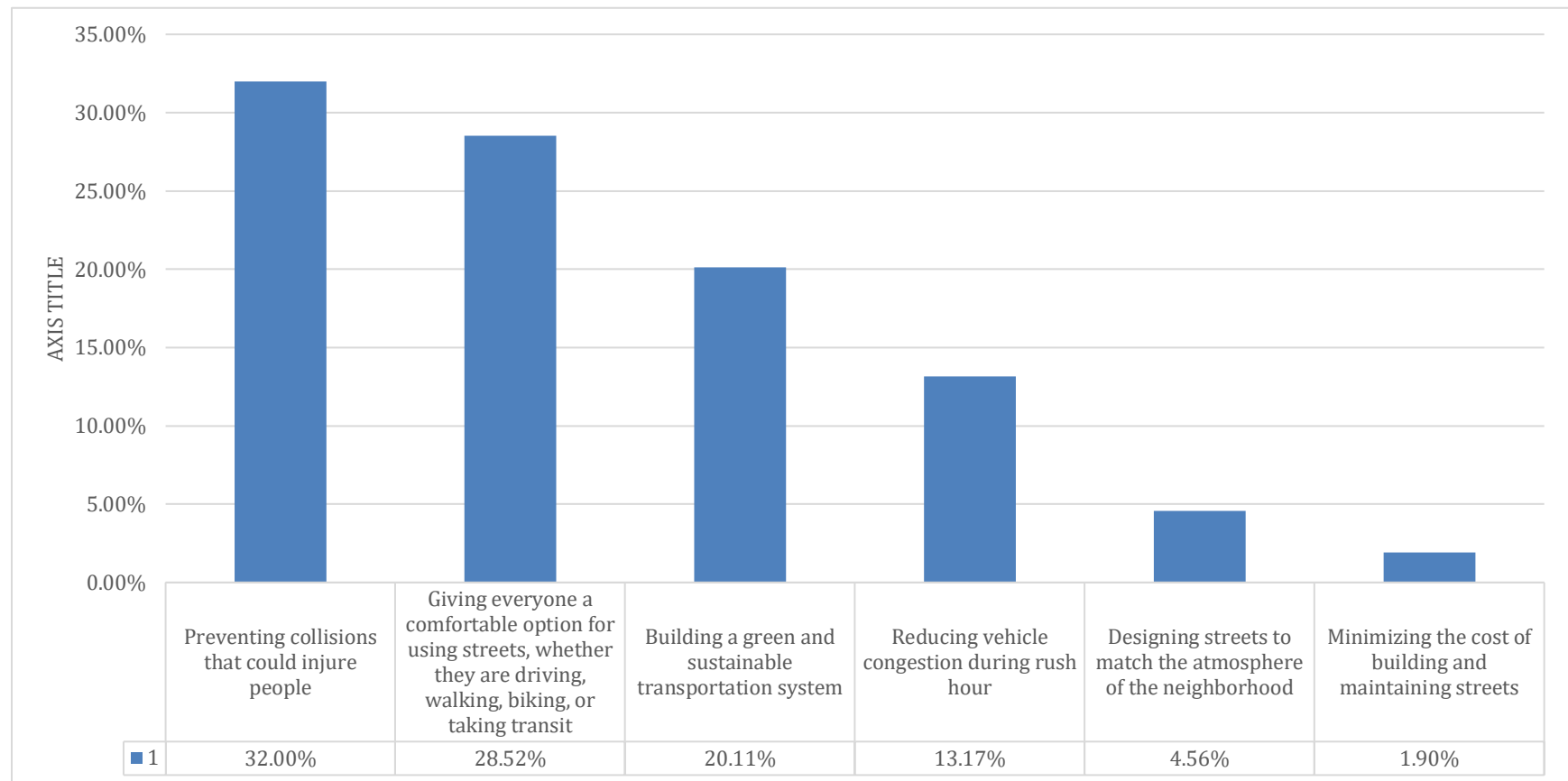
Q25: For the following question, please indicate how strongly you agree or disagree with each of the following statements. (N=536)

There were 536 responses to this question making the completion rate 80.60%. Highlighted below is the top response for each statement.



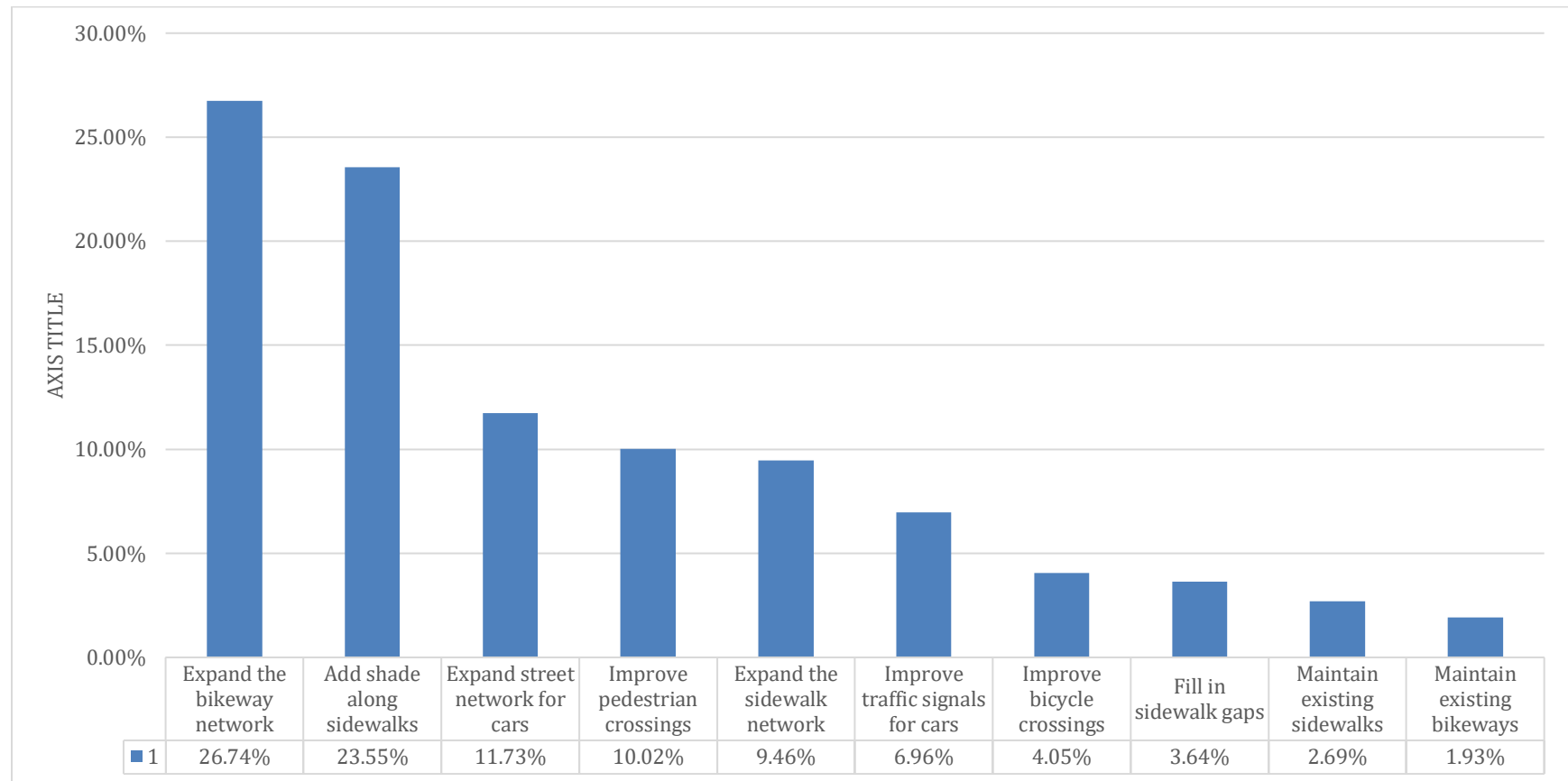
Q26: What are your broader priorities for transportation in Phoenix? Please rank the following choices: Please prioritize the broader transportation objectives listed below from highest (1) to lowest (6) priority: (N=528)

There were 528 responses to this question making the completion rate 79.40%. Highlighted below is the top response for each transportation objective.



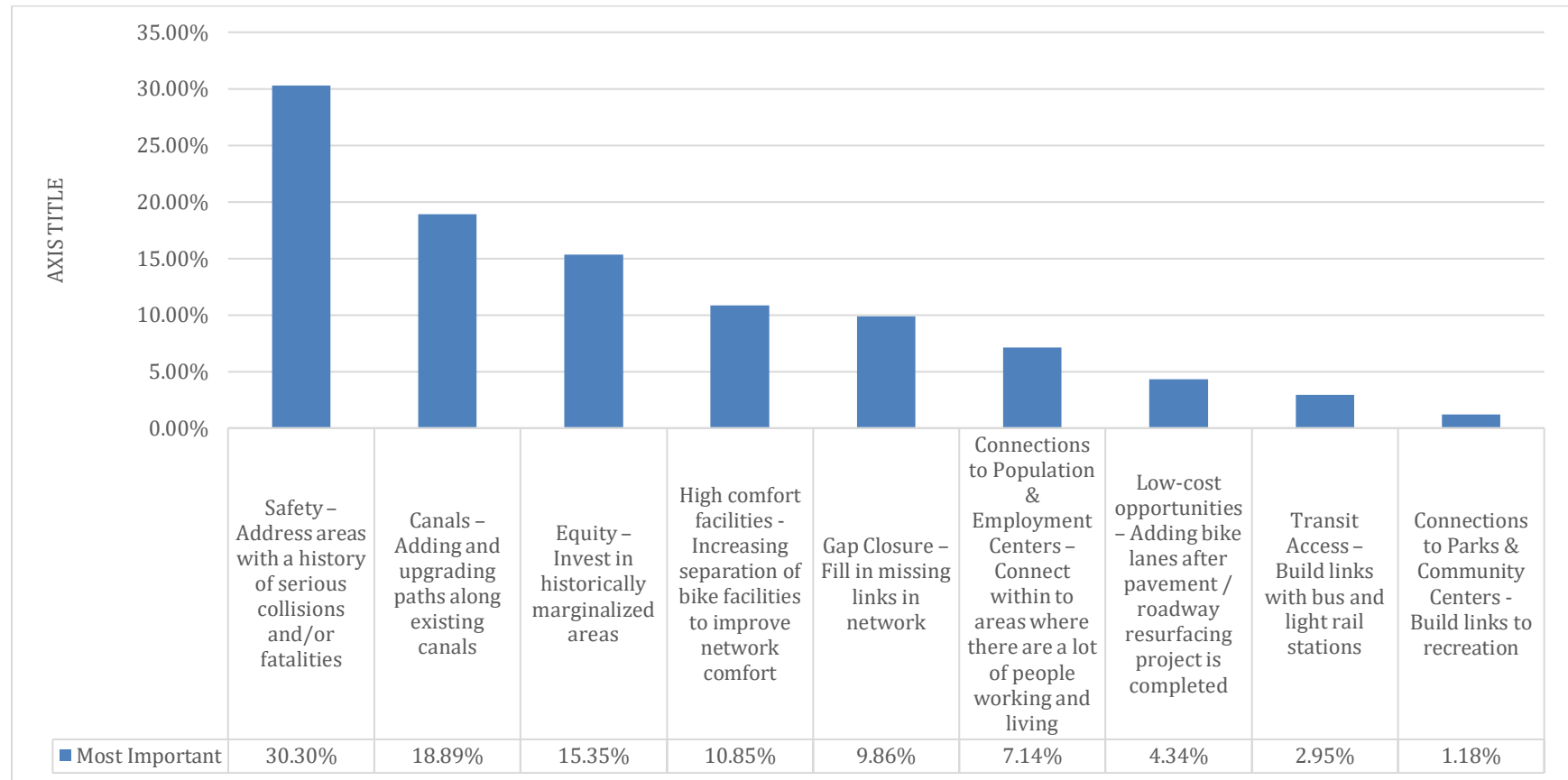
Q27: The list before provides a number of different street-specific priorities. Please organize the list below from your highest (1) to lowest (10) priority. (N=522)

There were 522 responses to this question making the completion rate 78.50%. Highlighted below is the top response for each street-specific priority.



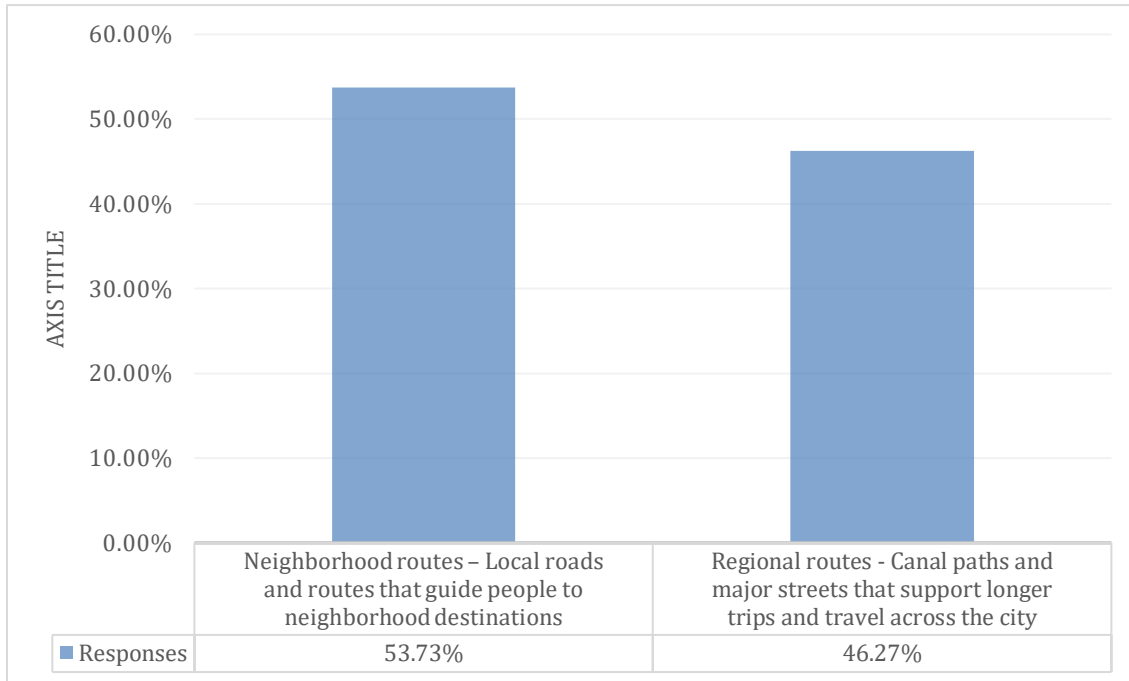
Q28: What types of improvements are most important for Phoenix's bicycle network? Please rank the following based on what you think is most important: (N=510)

There were 510 responses to this question making the completion rate 76.69%. Highlighted below is the top response for each type of improvement.



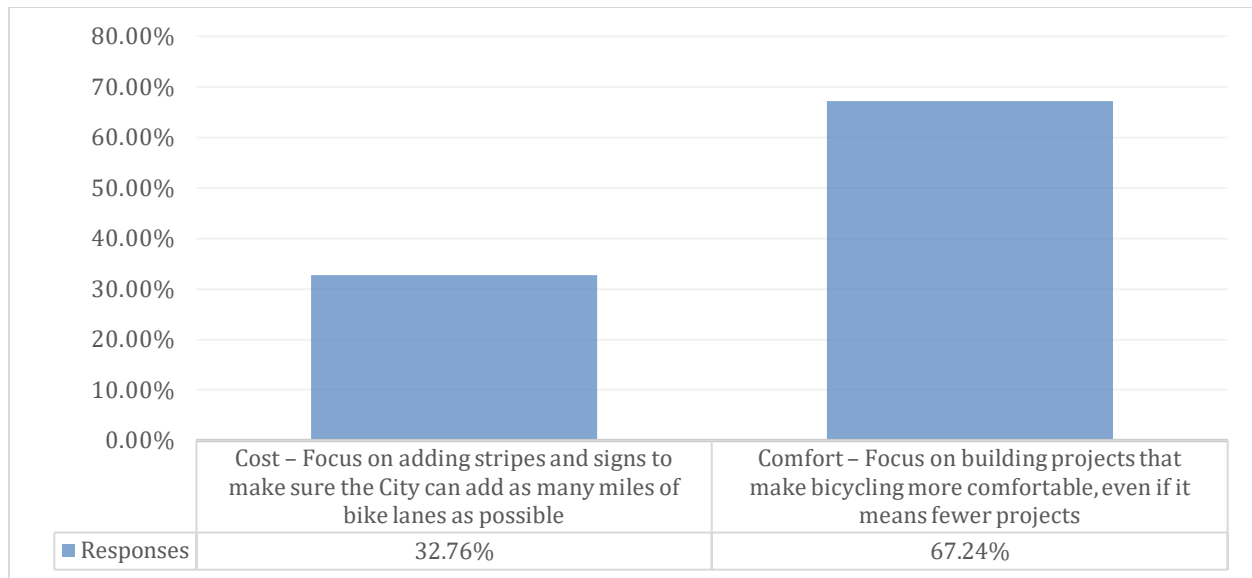
Q29: Which types of bicycle routes are most important? (N=523)

There were 523 responses to this question making the completion rate 78.65%. Most participants chose neighborhood routes as being most important.



Q30: When thinking about the continued development, buildout, and improvement of the city's bicycle and pedestrian network, which of the following do you think is more important? (N=522)

There were 522 responses to this question making the completion rate 78.50%. Most participants chose comfort as being most important.



Q31: Is there any additional information you'd like to share with us about your active transportation priorities for Phoenix? (N=143)

There were 143 responses to this question making the completion rate 21.50%. Based on the comments, the following themes were identified: Design, Development & Infrastructure, Climate, Homelessness, Public Transportation, Routes, Safety, and Survey Feedback. Below are the comments that align with each theme.

Design, Development & Infrastructure

- Phoenix and surrounding cities have way too many parking lots and drive through fast food
- The lack of biking infrastructure makes this a pretty bad place to live, honestly.
- Transportation policy should have as its goal reducing congestion and travel time. For vehicles. Not cars, and not pedestrians. This is about how we move people from point A to point B as efficiently as possible. You people are trying to make driving undesirable through bad transportation planning that increases congestion to force people into your Green New Deal pipe dream of forcing people out of their cars. It won't work. Prioritize real transportation policy that benefits 99% of the population by reducing congestion. Add lane miles, not bike lanes that remove vehicle lanes. Ridiculous polling, for ridiculous ideas.
- The focus should overwhelming be on figuring out how to make Phoenix a more bike-able and walkable city. Car traffic should not be the priority. Part of that is a roadway concern, but it is also a development concern, and the City should prioritize in-fill projects that bring housing and businesses to the heart of the city.
- More focus on active trans projects and less focus on auto centric projects.

- More density and mixed-use zoning to make walking and biking easier
- Infrastructure for physical and mental health and environmental benefits.
- More density everywhere makes it easier to afford and scale bicycle/pedestrian infrastructure
- Any amount of bicycle network additions are worthless if the construction zoning isn't conducive to walkable neighborhoods.
- Thanks for doing this survey. Phoenix could be an amazing bike city if we invest in the infrastructure. Please do as many bike and pedestrian projects as possible. We need to stop relying solely on cars, and we need to make our city more walkable and bikable to improve safety, tourism, satisfaction and equity.
- If we invest heavily up front in making non-car transportation viable, it will help with our car priorities as well by minimizing car-dependence and thus congestion, wear on roads, etc.
- We know bike infrastructure is way cheaper to construct and maintain than car infrastructure. Start being honest with the public please.
- Keep building bike lanes and shading sidewalks. We need road diets whenever possible.
- Design a course on respecting active transportation users required at any stage of getting a driving license.
- Cost for bicycle infrastructure wouldn't be an issue if sufficient funds were diverted from car infrastructure.
- You can't do any of this without addressing zoning and upzoning to mixed use multiple story buildings instead of the obsession with single family homes. Increase density and transit options and stop the sprawl. Separate vehicle traffic from every other mode of traffic to keep people safe.
- I live and bike in a 2 mi radius downtown. Continue to make micro-neighborhood hubs, like Roosevelt row, and switching from cars will be easier for the local people.
- Design streets for people. Cars are not people. People shouldn't need to own a car to thrive in PHX - many people don't have a vehicle and are disadvantaged by our street design
- The city needs to focus on building upwards and reducing the distance between places before address sidewalks or bicycle routes. A well built system of sidewalks and bike paths will be useless if everything is still far apart and impossible to get to in the summer.
- Bikes and pedestrians deserve infrastructure as much as cars do, and should not be treated as less important.
- How about Phoenix Greenbelt Division completely separate from Phoenix Street Division!! People could bike commute 9 months a year if the canals were bike routes. Separate the multi-use trails from streets. Get creative with other rights-of-way. Involve parks department, flood control, power, and canal easements for multi-use trails throughout the city. Make trail connections from existing parks and shopping centers using GIS. Bike commutes and shopping would reduce road traffic considerably. Bikes and walkers don't want to smell like exhaust.
- I would prioritize comfort, but in reality I want coverage to be established & a bike network to be adequately linked, then from there focus on enhancing the areas. I would have put comfort, but am also concerned that it would be invested in major routes that

would serve only a certain population & leave out other disadvantaged areas. So transportation relies on having reliable connections first, then quality can come second. If better design could be implemented as roads & bikelanes are placed (such as shade) that would be the ideal. Both are so important.

- Are there not any win-win solutions where speed/time do not have to decrease for vehicles and where bikes/peds can have better travel conditions without much cost? Perhaps even widening the sidewalk and leveling the driveways so biking on the sidewalk is safer (e.g. Baseline Rd near Recker Rd in Gilbert). Can a protected bike lane be combined with a sidewalk and could cars be slowed down (e.g. square sidewalk connections and less rounding/sidewalk deviation) only when making turns into driveways or right turns where the slow down is splitting hairs (like tens of seconds rather than minutes)? A lot of these questions assume tradeoffs that matter, but are there tradeoffs that don't matter and where we are splitting hairs? Can we trend in investing in cars while also investing in bikes?
- 2. The last question for me isn't about cost v. comfort. It's a question of quantity v. quality. For a bike network to add real value to a population, it needs to connect across the region it serves — at a bare minimum. I chose my response because I think a functional, connected biking network that joins Phoenix with surrounding metro areas in all directions should be a first priority (quantity). When this groundwork is laid, more people will be able to effectively use the system to get where they need to go, making demand and support for future upgrades in quality possible. I want both! But quantity first. The canals are interesting. I'd love to use them for transit but a lot of them are essentially just alleys. They are sparsely populated and unpatrolled. They don't feel particularly safe. Can we make room for appropriate development, maintenance and even attractions, food, or retail along the canalways in some areas? And make the areas that are more peaceful, like nature reserves or residential areas, more well lit and secure?
- Focus on making a state of the art bike network for recreation and exercise.
- When cars were first introduced, pedestrians always had the right of way. Somewhere along the line those switches places and it has become impossible to live in a lot of cities without a car. That is ridiculous.
- We need more transit oriented development and to stop the endless sprawl and urban heat island effect
- Investing in Public transportation/biking/walking will reduce traffic. Consider induced demand: if you build the infrastructure people will use it. This is why adding more lanes doesn't decrease rush hour traffic. The only traffic solution is to have less people on the road. This means getting rid of euclidean zoning and parking lot minimums.
- Everything phoenix does should have a focus on equity
- We shouldn't have to choose between cost and comfort when it comes to prioritizing peoples low cost access to living in a city. We should be able to get both. This is especially when the city continues to overfund a police department infested with crime, corruption, resignations.
- Convenience is key- if it's more convenient to ride a bike, car traffic will lessen as more people ride bikes.

- Implement "superblocks" (i.e. Barcelona, Spain model) where car traffic is restricted.
- Allow active transport through gated communities. Sometimes it takes much, much longer to go somewhere because of the barriers.
- People primarily ride bikes for recreation so I think emphasizing and investing in the canals and connecting trails is key. Traffic can be awful here so I don't think reducing driving lanes for cyclists makes sense when peoples commutes are already pretty bad.
- We dont have the funds to make these improvements. Dont print any more money. Our current government has killed the US dollar
- Incentivize and educate people to use bikeways and ensure that commuters in historically marginalized areas have access to bicycles
- Street diets everywhere
- Id like to see more accessibility and incentives for Phoenix area residents to use alternative methods of transport than cars
- Traffic lights that monitor traffic flow. Mid city traffic lights don't manage traffic and congestion, they're so badly managed they actually create traffic and congestion. Indian School from 16th Street to 33rd avenue is one of the worst stretches of road for that in the country, especially between 12th St and 15th Ave. It's truly the worst thing I've ever seen day on y and day out year over year.
- Hawks are only effective if cars stop for them--and they don't. Bike lanes only function as bike lanes if cars are not parked in them--and they are parked in them.
- Traffic signal needed at 43 rd avenue and Dobbins ASAP!!
- Please put speed cameras at major intersections (ex. McDowell and 7th St). Drivers in this city are completely irresponsible wrt red lights and speed limits. It's one of the worst aspects of Phoenix.
- Put sharrows on Desert Foothills Parkway, please. Tons of people ride there and the locals speed and ride in the right lane.
- I'm all for adding bike access to marginalized communities if we have evidence that it will improve equity. Sharrows are useless. Please do not imitate so many other worthless bike projects by using the sharrow option. Car drivers are always texting and they don't see the sharrows. Car drivers don't think bicycles belong in the street. It doesn't matter if they're wrong if they keep hitting pedestrians and cyclists. I have a ton of hope for how forward-thinking the bike plan is in Phoenix.
- 27th ave and baseline, has a school on the SE corner and cars speed by during school hours due to lack of speed sign, baseline near that area is missing sidewalk so kids walk on dirt paths
- Badly need hawk signal at Tatum and Berneil - popular route for bikers but crossing Tatum is dangerous. No easy way to get to a light.
- There seems to be a new problem at "HAWK" crossing locations where drivers proceed through the flashing red without stopping or yielding. This could be due to misunderstanding on recently-added signs. The city should perform a formal study of this behavior and share the results.

Climate

- Increasing shade throughout the city to help combat the intolerable heat would make biking and walking much more accessible for all communities. When it's nice out, you see Phoenixians out walking everywhere. Heat and lack of shade are the biggest barriers. Then the roads and everything else follow
- Adding bike lanes is nice, but again, won't fix the urban hellscape of terrible city planning that is Phoenix. No one wants to bike or walk miles through 115 degree heat, even in the shade, even on nice paths. The only way to fix this problem is building a dense city, not an endless sea of single family homes.
- Phoenix would be less hot with less asphalt streets and more alternative transportation options
- Too hot for long distance
- Phoenix is never going to be a bike commuter town a la Seattle or San Francisco. It's not dense enough and it's too hot in the summer.
- We live in the desert, we can't afford to ignore climate change. If more people could comfortably walk or bike it would be better for all of us.
- Increasing shade cover across sidewalks and bike lanes will lead to more biking and demand for lanes creating positive feedback loop
- If doing protected bike lanes please don't just add more asphalt and curbing and call it a day. This is an opportunity to provide shade, even if it's on the sidewalk side of the protected lane.
- Consider alternatives to asphalt for streets. There are cooler, and over the long term, cheaper alternatives.
- 1. Shade! There's no way this city can support walking or bicycling without it. I'd like to see the percentage of sidewalks without shade in Phoenix today, and in 5-10 years to see it at 100% over sidewalks and bikeways across the full transit network.

Homelessness

- Reduce roadside areas for homeless to camp. Increase traffic handling capabilities.
- None of this matters if we still have wave after wave of homeless people sleeping in underpasses, and places where I want to ride my bike or walk.
- On existing bike paths, clear out the homeless from under passes; not at all safe.
- I don't use canal paths anymore because the underpasses are trashed - used by homeless. I have compassion for homeless and would like more services for them, but this is a problem that needs to be addressed to improve biking in Phoenix.

Public Transportation

- I want fully separated bike lanes, better sidewalks for pedestrians, and easier access to transit, specifically the light rail. The light rail expansion will help but it has very little use right now.
- Given the heat biking and walking are often hostile, so supporting networks of bike lanes and sidewalks that lead to other public transit makes more sense to me. And thus public transit needs support of bikes etc.

- I wish the light rail went more places especially the west valley. Also I wish it weren't a part of the traffic like above or below.
- I would love to see the various cities in the valley continue working together to make it less car centric! The light rail is a great start but it needs to be supported by other efficient options to facilitate inter-city travel
- I think any transportation plan has to address the abysmal bus and light rail service.
- Expanding the light rail, improving sidewalks & pedestrian crossings
- Prioritize railways
- I would love to see a high speed rail system like other metros have- something that can keep cars and people off the streets to make our beautiful city greener and safer. We have very minimal weather to prevent a rail system, our layout is already a grid, and there are few land features to prevent rail access/construction.
- Bus bays for all stops are needed. When busses are not able to pull out of the lane of moving traffic, it's a problem
- There should be a renewed emphasis on street car expansion
- More crossing on major streets, more bike racks

Routes

- Enforce crosswalk etiquette/rules rather than force hawk lights onto traffic.
- Creating more miles of bike paths would bring out more people on bikes.
- In general I think most streets in Phoenix could be narrowed to make room for additional bike paths (and potentially tax-generating parcels).
- More bike lanes. Wider shoulders.
- Buffered and wider bike lanes would make bicycling with the high volume of car traffic in the Phoenix metropolitan area much more comfortable for both the motorist and cyclist.
- Protections are needed for the bike lanes whether those are truly costly or not.
- painted bike lanes in the gutters are not bike lanes and should not be counted. Especially on Major and Collector roads.
- We desperately need more, longer, and more comfortable bike lanes - especially lanes that have a curb or other physical barrier. We especially need longer routes that connect businesses and parks. For example, we need a long, buffered bike lane from Steele Indian School Park to downtown, and from the Grand Canal to Downtown.
- Protect existing bike lanes with low cost options like flexible bollards (i.e crashing a car into them won't cause a major accident, but they should prevent parking in or passing using bike lanes)
- Painted lanes unfortunately don't work. Slow cars down and provide protected lanes throughout the city. Maybe focus on central Phoenix to start. We bear the brunt of heavy traffic in the region during week days when many of us would like active transit and a small portion of our streets back
- Both neighborhood and regional routes are important. I think something as simple as painting in the bike lane to be a solid color (ie green) would even help tremendously in defining that is a bike specific space and path

- There is no clear bike route from southwest Phoenix to downtown. The salt river used to suffice, but it's been closed. We need more access to southwest Phoenix via bicycle to downtown.
- Some bike lane options, such as those with physical separation between bike and traffic lanes, do not allow for regular sweeping.
- 56th St and Indian School has AZ Falls what a cool spot but yet in either direction theres no pavement on the canal? Why???? So many people travel there, seems dumb this has been overlooked for so long.
- I love using the bike route between glendale and mcdowell along the az51
- The canal system is great and I think that's in a good spot now to where the focus can shift to other regional connections or figuring out where those gaps are.

Safety – Cars, Speeding & Traffic

- Reduce space for cars, make drivers go slower and pay attention. Neighborhood routes would feel safer but they still need to connect to destinations along major streets..
- Safety should be the highest priority and that will require taking space away from cars and slowing them down to make room for pedestrians, bikes and such. Our transportation network needs to focus on moving people, not just cars.
- Making the sidewalks and bikepaths safer for pedestrians is so necessary. It makes me nervous walking on a narrow sidewalk right against the street, when drivers regularly go 10-15 miles over the speed limit. When riding a bike, drivers often straddle the street and the bike lane and do not check for bikers when turning at an intersection. I fully support separations between sidewalks and streets, and protected bike paths and bike intersections. Traffic calming measures would do a lot as well, even if it's just narrowing the street lanes so drivers slow down and drive with more caution.
- Please, please do something to improve this! I hate being in the car, it's terrifying, especially because everyone drives super fast and super recklessly! I want to be able to safely bike to the store and to the light rail without sharing a street with cars; I've seen too many cyclists and pedestrians get run down to feel safe, but I hate being in the car. so I usually just don't go anywhere. If I could safely leave my house and go somewhere by walking or biking or taking transit, the city would be better off because I'd be more willing to spend money at local businesses and I'd be connected to the community and not want to leave here; as it stands, I'm counting down the end of my lease so I can move somewhere cars are unnecessary, like NYC or somewhere in Europe, and I'll be taking my software engineering salary and spending with me. It hurts, though; this is home, I want to stay, but all the traffic and cars are making it impossible for me. :(
- Safety from cars is the biggest issue for bikers and walkers in our city. A huge overhaul needs to occur to make Phoenix a biker/walker friendly city and to encourage people to use alternate modes of transportation other than a car.
- My weekly ride is 50% safe with great paths and 50% hair raising white knuckle in an area that is mostly people in big trucks who could care less about me. It sucks.
- Speeding and safety and NOISE

- Walking and biking along an Arterial is scary. Street trees and on-street parking that buffer bikes and sidewalks are preferred. The trees and cars protect the pedestrians from the cars. Its actually safer to bike and walk when traffic is congested and moving slowly.
- The biggest problem is the lawlessness of some of the driving population. Too fast, too crazy. We need red light cameras back to tamp down on that.
- Please make sure that all bike lanes are as seperated from this high speed traffic! nobody wants to ride next to 2 ton cars going 55mph, it poses a serious saftey concern
- Stop high speed cut through traffic near I-17. Cars exit freeway and cut through neighborhood streets to avoid major intersections and put others at risk. Look at Simpson neighborhood as an example.
- Personally Owned Vehicle operators cannot be trusted whatsoever. They drive fast, reckless, and without regard for their surroundings and people. I've only survived this far by pretending no one can ever see me. People do not pay attention and speeds are too fast.
- Love to bicycle and I've had several close calls with vehicles. My spouse no longer bicycles with me after an SUV ran a red light and missed her by inches. City of Phoenix & Streets department has valued cars over our lives for years, we hope that changes.

Safety – Infrastructure & Road Conditions

- For bicyclists feeling safe is the key. It seems that with the new infrastructure bill, we ought to be able to build more comfortable and safe biking projects. Safe intersection crossings need to be improved on streets with stripes and signs.
- I selected comfort because I think we need high-quality infrastructure to make biking and walking more accessible, but ideally there would be a balance of cost and comfort. More bikers means it's safer for everyone out there biking so the biggest goal should be to break down the barriers to cycling and that means infrastructure that brings more visibility to cycling, helps people feel safe, and signals to drivers that they don't own the road.
- I live near 27th Ave and northern. I want investment in my area. Why can't my neighborhood walkways and bike ways look like downtown? Underserved, lower income communities need these things more than other communities because they often don't have other choice s. Stop trying to appeal to wealthy people to be green and start making working people feel safe on their commute.
- Add as many miles of protected bike lanes as possible and improve safety at street crossings.
- You've made some good progress in the last 30 years, but, the bike network is a shambles that often goes nowhere, signals regularly ignore bikes, and drivers are often very unsafe sharing space with bikes.
- Bike lanes are worthless if they are not protected from out-of-control Phoenix drivers
- A dangerous bike lane is worse than no bike lane. See w Maryland westbound by central!
- My biggest concern is bike and walk crosswalks at intersections. We need more emphasis on traffic light control, biker and pedestrian safety at our intersections. (especially 56th street and Indian School).

- Allow bikes and scooters on sidewalks. Would be much safer.
- I do not consider non-protected bike lanes to be functional infrastructure, more of a "surprise me, theres no rush" method of suicide waiting for the right texting driv
- Maybe making the crossing of major street light more accessible for those who are blind such as traffic light sound when safe to go
- I feel quite strongly that quality of infrastructure should take precedence over quantity. The safer and more comfortable people feel, the more they'll bike, walk and use transit, and the less they'll confine themselves to the relative safety of a private vehicle, which contributes to congestion, road maintenance and climate change.
- Our city's grid layout is hazardous if we "just add lane lines and try adding as many as possible". We need to separate the street from the bike lane so both can be safe
- Put bike lanes where people will use them (i.e., connect important locations) and make them safe so people actually will use them. A focused approach will yield more benefit than adding as many miles of bike lanes as possible
- Suicide lanes are too confusing to new drivers in the area
- Paint is not infrastructure, separate cars and bikes/peds and make the streets safer for all. It costs less to create and maintain infrastructure for humans than it does for vehicles and it should be prioritized. I hope to see a greener, safer Phoenix for all of us who choose to not pollute and drive vehicles the size of tanks. Less stuff for cars and more stuff for humans please
- Safety is number one issue. Bike lanes need to be separated from the road or else it is not completely safe
- Very small % of residents use biks - why spend the \$\$\$ for these few people - we need more \$\$\$ for full community safety not just a very small % of population. More \$\$\$ for police to provide safety for walkers & Bikers
- As a bike commuter, painted bike lanes are terrifying: cars pass too close at too high of a speed and there are conflicts with people making turns. The Dutch have already figured out how to build safe bike infrastructure. Look at CROW. I want to live in a place that is built at the human scale not for cars. Our urban planning prioritizes cars which is bullshit. Public space like streets cannot only be available for people who can afford to spend money on cars. Also, the design of streets causes people to speed, decrease the width of lanes and the road as well as blocking sight lines are great ways to reduce speeds. Changing speed limit signs is not enough. If pedestrians/bicyclists are dying bc of dangerous intersections or cars driving too fast, it is the engineers fault.
- It would be helpful if more decision makers (Traffic Engineers and City Council Officials) were to try walking down a busy arterial street (I suggest 7th Avenue) or bicycling down a unseparated bike facility (I suggest Central). If this happened, none would say they felt safe and hopefully some would change the way they design these public spaces. These are public spaces and should be treated as such, not freeways. I stated that I would like to see more bike boulevards in Phoenix but not as a substitute for actual bike facilities. Local streets should be narrow and tree lined to reduce vehicle speeds. HAWK and RRFB crossing islands are better than nothing but do not solve the problem. The problem is that our streets are hostile to people outside of vehicles.

- The bike and pedestrian networks are only as strong as their weakest links. The path could be fine, but it becomes super dangerous at street crossings--this will also prevent new people from biking and walking.
- The southwest portion of Phoenix not only lacks in bicycle infrastructure, we face the real dilemma of large distribution trucks that sometimes outnumber cars. This makes for a very dangerous situations sometimes when biking on major streets.
- I would cycle more but getting from North Phoenix and around North and Shadow Mountain is impossible. No way would go on 7th Street. The Mountain pass is a incredibly dangerous. Once you get to Sunnyslope it is always dangerous with traffic and homeless to get downtown.
- New bike lanes are near useless unless they are 100% physically separated and protected. Far more phoenicians would start utilizing them and give the city more momentum to continue building out a truly protected system. Cars go wayy too fast in phoenix downtown.
- I skate. Some sidewalks are just plain dangerous! Cobblestones are deadly and cracks that run lengthwise along the sidewalk or path can break bones and make you bleed. Like the path next to the zoo. You spent a lot of money to make it pretty, but you made it very dangerous to skate on. We call it the death path! And stop making paths serpentine through the landscape. If you are trying to get somewhere yo want to go straight.
- At the end of the day, a bike lane is pointless and can not be used if it is on a bumpy, glass and trash covered lane/road. We need a team that maintains this.
- The city does a poor job of maintaining existing bicycle facilities, especially physically-separated ones. Nearly all separated facilities have a lot of loose sand/gravel, glass, thorns, and other hazards. Adding more separated facilities will likely make the situation worse.
- Bicycle punctures (flat tires) are a concern and road debris always accumulates near the curb.

Safety – Laws

- I would like to see stiffer penalties for harming pedestrians and cyclists (even if it was an "accident") as well as more public education awareness on laws for motorists. Today, you can basically murder someone on a bicycle on purpose and get away with a small fine.

Safety – People

- I wish I felt safe walking along the streets in my neighborhood, but there is a lot of violence on the streets. Beggars harassing pedestrians is also concerning, as is the homeless population that sleeps on the sidewalks. I would walk all the time if the crime rate wasn't so concerning. (85015)
- My feeling of safety is not only determined by those driving on the road but by those I encounter on my walking trip that create fear with unpredictable behavior.

Safety - Other

- More so we want to protect the lives of those not choosing to get within a car. Why are peoples lives in cars being valued more than those outside of them?
- I am concerned that some of the questions in this survey present driver convenience as something to be traded off against safety. This is inconsistent with vision zero. You should be focussing on maximizing safety and reducing conflicts.
- Do you ask motorists if safety is a priority? I suspect not. Also, why does every option ask whether we are willing to slow commutes? Many of these should not impact motorist total drive times. The 2014 Bicycle Plan has over 100 pages of ideas for which you already paid a consultant. The city is clearly dangerous for pedestrians and bicyclists. Common sense indicates this. You can have a city with safe places for bicyclists, pedestrians and cars.
- When riding a bike in Phoenix is line riding on the road with a big target on your back. If the cars don't hit you, then your a target for the homeless. Phoenix is not safe for biking or walking. Fix that
- I wish there was a middle ground between cost and comfort. But the reality is that paint doesn't save lives, it just provides a false sense of security.
- Implementar la seguridad para los que usan la bicicleta ayudará a la reducción de jumó en la ciudad y también gente más saludable.

Translation: Implementing safety for those who use a bicycle will help reduce pollution in the city and also make people healthier.

Survey Feedback

- There's too much industry language in this survey. Last ranking question-- what is a comfort facility? What is meant by 'gap closure'? Missing links in what network? What does "Connect within to areas.." mean? It doesn't indicate 1=? and 9=?. Lastly, on the last question. Comfort doesn't have to be more costly.
- You changed the lowest and highest above, that was a trick to get more pluses for bikes. Most important is to train cyclists and make them get insurance. As it is only the driver spends for insurance, and cyclist pays nothing for the collisions he causes. It is not fair.
- We need more (any is an improvement) enforcement of speed limits and stop sign violations by motorists.
- Ranking questions too long.
- Thanks for doing the survey and the chance to give input.

Additional Comments

- Look to city of Minneapolis bike highway system!
- Please watch NotJustBikes and read up on Strongtowns for inspiration.
<https://www.youtube.com/c/notjustbikes> and <https://www.strongtowns.org/>
- This city is great for bike commuting. Even in summer, the mornings are good for cycling. The improvements to the canals have been outstanding. The light rail pairs well with

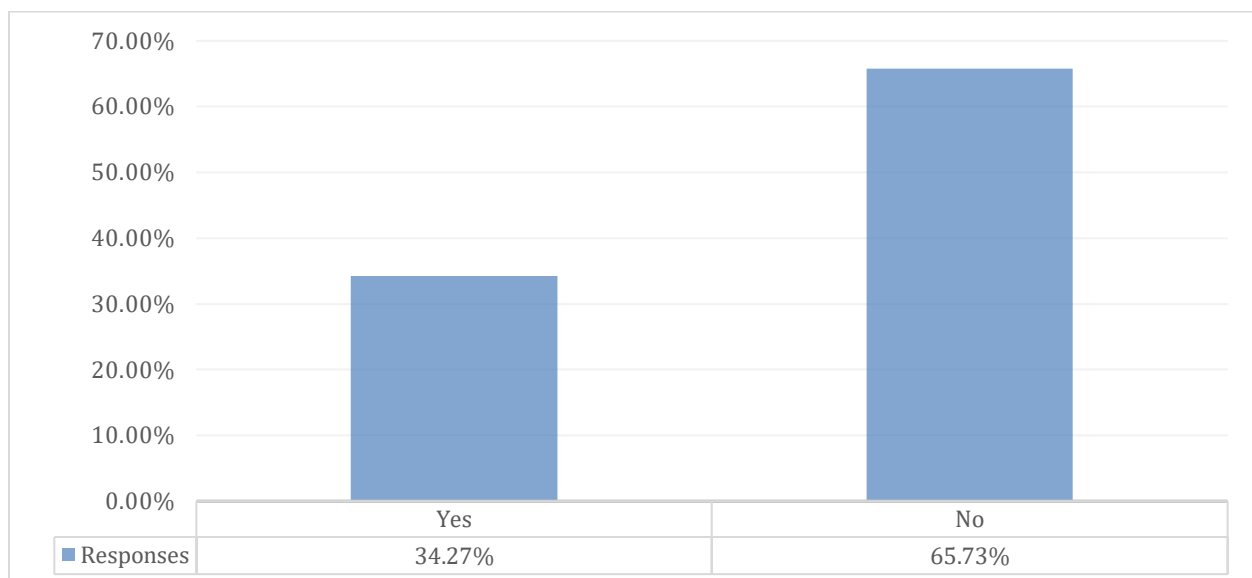
cycling if you are close to it. Thank you for making the city more friendly to non-car transit. Keep going!

- none
- While I no longer ride a bike, I have many friends and relatives who do. My answers are based upon their needs as expressed to me.
- The less attractive driving is as a transportation mode (relatively speaking), the better our city will be
- Go bikes!
- Either make obtaining a driver's license more in depth and harder or start punishing people for bad illegal habits.
- It's great as is.
- Las personas tomando decisiones con respecto al diseno de las calles deberian como minimo caminar y usar el transporte publico. La gente que toma estas decisiones solo piensa en la movilidad vehicular.

Translation: People making decisions regarding street design should at minimum walk and use public transportation. They people who make these decisions only think about vehicular mobility.

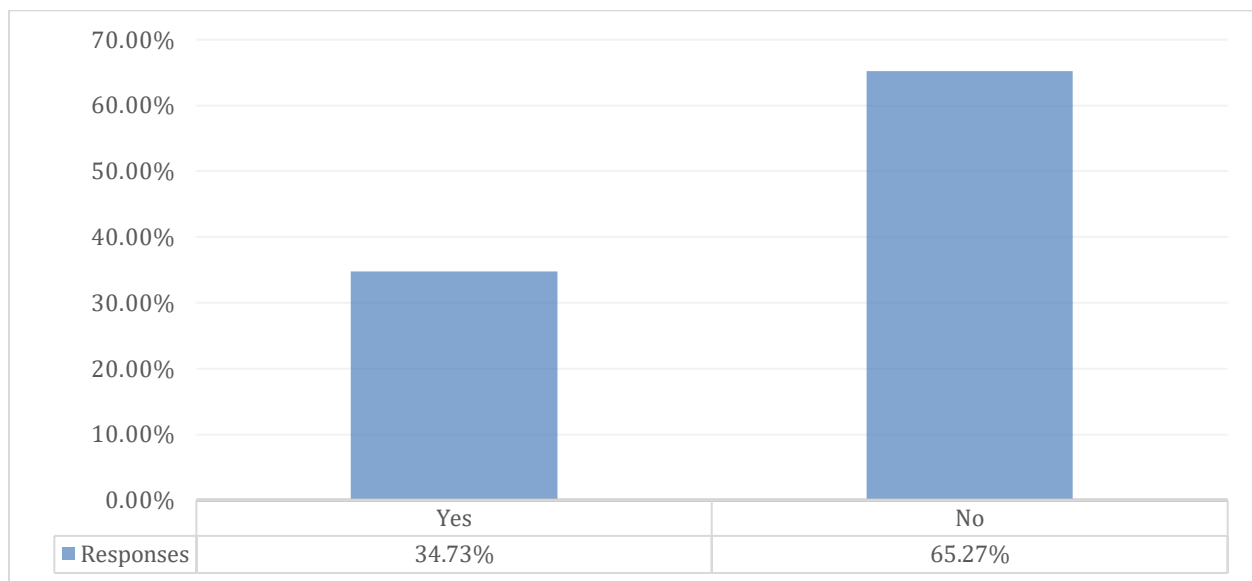
Q32: Do you know how to report street maintenance issues to the City of Phoenix? (N=531)

There were 531 responses to this question making the completion rate 79.85%. Most participants reported they do not know how to report street maintenance issues to the City of Phoenix.



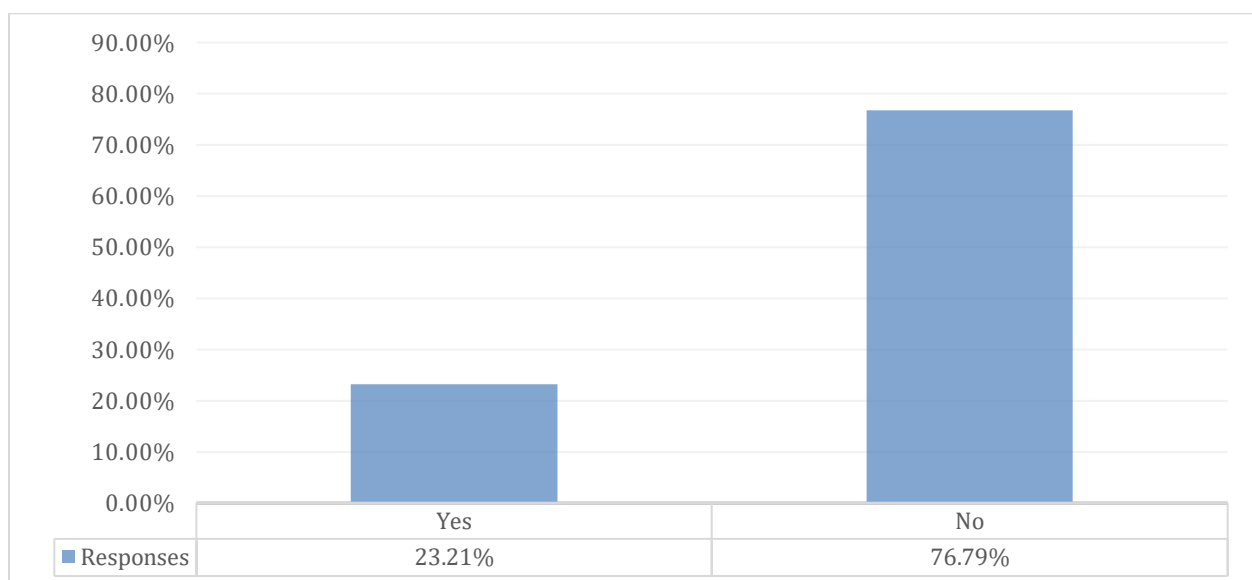
Q33: When there is a bicycle or pedestrian street project in my neighborhood, are you able to find information about the project and provide input? (N=524)

There were 524 responses to this question making the completion rate 78.80%. Most participants reported they do not know how to find more information about the project and provide input.



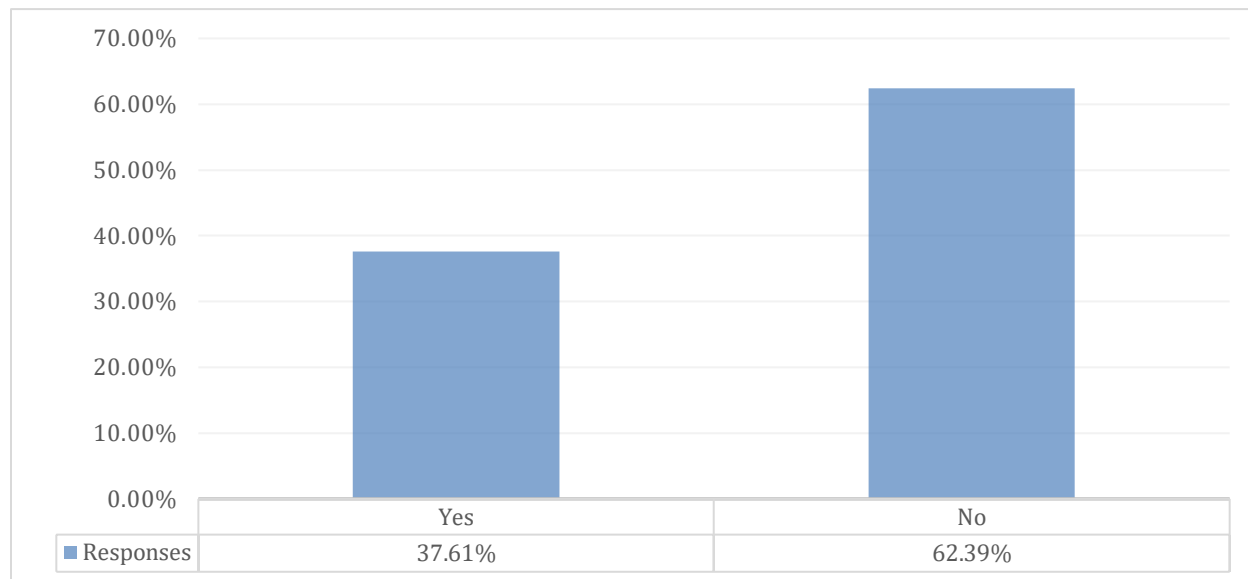
Q34: Have you ever reported a street issue to the City of Phoenix? (N=530)

There were 530 responses to this question making the completion rate 79.70%. Most participants reported they have never reported a street issue to the City of Phoenix.



Q35: If yes, were you satisfied with the outcome? (N=226)

There were 226 responses to this question making the completion rate 33.98%. Most participants reported they were not satisfied when they reported an issue to the City of Phoenix.



Q36: Is there any additional information you'd like to share with us about our outreach and engagement process or your experience reporting/contacting the city about a street-related issue? (N=68)

There were 68 responses to this question making the completion rate 10.23%. Design, Development & Infrastructure, City Website, Homelessness, Issues & Request, and Safety. Below are the comments that align with each theme.

Design, Development & Infrastructure

- Adopt the Key Corridors Master Plan.
- I hope The streets department begins to gradually think of our streets as public space for all, not simply sewers for cars during rush hour
- Very dissapointed in the final outcome of the Oak Street improvements. The improvement was minimal and cars seem to drive faster now that its better paved. None of the community suggestions were implemented to slow down cars. The lighting within the neighborhood seems most appropriate for a freeway. Should have been more pedestrian poles similar to Tempe. A lot of money was spent for minimal impact. Cars are the priority with the design and it shows.
- Bike lanes and paths should be planned comprehensively as a long route not piecemeal as the City does it now. The City currently only plans out and executes bike lanes at 1/4 or

1/2 mile at a time, which is not how people travel or use bike lanes. It is fine for Vin Diesel from Fast and Furious to live his life 1/4 mile at a time, but we need the City to be planning and executing bike lanes at several miles at a time to facilitate people having a safe option to commute to work via bike.

- Pavers, gravel and permeable pavement are better for bikes and feet than asphalt and cement
- You could put QR codes on project signs to learn more about them.
- Every business needs to also have bike racking. Why is it a requirement to have specifics for vehicle parking, yet there's nothing for cycles. In South Phoenix, there's practically no where in official in public to lock up bicycles. Sometimes have to utilize objects not meant to be used for bike parking and therefore comes with increased risks for theft and vandalism.
- If engaging with a community it is critical to research and consult any efforts they have already invested time in. Referencing their past efforts as a starting point is an effective way to continue dialogue and install a design that is context sensitive to the neighborhood. In other words, something that is designed and accepted by the community will be used by the community.
- Investing in media may improve general knowledge about transportation resources. Billboards, signs, or even digital geofence ads are great tools for increasing awareness and reach.
- Downtown is becoming more attractive. I've even looked at houses downtown to be closer to transit. However, I'll continue to spend my time/money in the East Valley & Tucson until Phoenix steps it up and shows that they truly value any activity besides driving. Committees/surveys are not action. I type this as a driver with two cars.
- I've heard of the City doing green efforts & tree/shade programs, but one issue I've heard brought up is that maintenance cuts almost all of the branches off that it defeats the purpose. I understand the costs of maintaining & it may be suitable to have more aggressive measures, but ensuring that it doesn't take away the value is important. In terms of outreach, glad this is being done! I only wish (as with many plan updates) that it was more accessible such as on social media pages or in neighborhood newsletters so it's not only focused on people who are focusing on transportation topics, but everyday citizens.
- Dobbins at 70th Ave right before GRIR is really awful to travel on.
- I sometimes commute by bike from Ahwatukee to downtown and there is currently no good way to get there. But you could fix that.
- Adding a crosswalk to the canal crossing at 44th street and Campbell is a great example of a project that supporting cyclists and pedestrians but doesn't eat into lanes for cars. Projects like this seem like a win win for the community!!

City Website

- I think, as a city/gov website,' it's naturally hard to find the info on certain topics because there is so much info to sort through in general. Maybe if there were a simpler landing page that simply explains / breaks down the category or project and how u can provide input or report street issues would be very helpful in simplifying the user experience.
- I can generally find city info pretty quickly on the web page. It's very helpful.
- I find everything online, so do not know what opportunities are available for those without internet access to get information about city issues.
- The City website is very user friendly.
- Now that I have been on this website and know my way around, I can provide more input. However, this is a recent development.

Homelessness

- Homeless are encamping on the sidewalk/bikeroute just north of mcdowell and SR51. And I have reported it. I have to take a different route now.
- Again, clear out the homeless from underpasses on existing bike paths. not very safe for riders, walkers, joggers.
- I wish we could get the homeless people some help so they stop having sex and doing drugs and Thunderbird Park against the wall my house is up against.

Issues & Requests

- Specifically I have raised several issues with bicycle detection not working or being absent, which is especially frustrating on streets having a bike lane.
- I reported the lack of a crossing on 19th Ave. Years later, a needed hawk light was installed in place of bridge. I was happy with the outcome and use the hawk light often to cross. In two other recent cases, I was told the striped section of the road wasn't in the cue for repair and in the other recent report, I was told there was no money to complete the bike lane to the intersection (roadway too narrow).
- Desert Ridge, Tatum Blvd and 101 interchange needs pavement rehab BADLY. Pavement on 56th Street and Mayo is in too poor of condition for cycling. No bike lanes on Pinnacle Peak between Cave Creek Rd and Scottsdale Rd and you just repaved and didn't even add a bike lane. Why spend money on pavement and not add a bike lane? When will Pinnacle Peak Road be widen between Cave Creek and Scottsdale Rd? How many fatalities and crashes occur at Pinnacle Peak Rd/Scottsdale Rd intersection? Team with Scottsdale to make this intersection safer.
- There are oleander bushes blocking the view for see oncoming cars, pedestrians or bikers at 7th Ave and Clarendon. Between the bush and the large metal street light it's a blind spot every day...every car...

- Traffic signal needed at 43 rd avenue and Dobbins ASAP!!
- I have reported street issues in the past, at least 3, and I have never heard of the resolution. Other cities I have lived in open a ticket and keep the reporter up to date with resolutions.
- I reported it to our City Councilman, Sal Diciccio and never had a reply back
- I have reported 2 street issues to the COP. I was satisfied with one. Unsatisfied with the other.
- The police won't even look into my stolen bike
- Add more shade to Tempe!!
- My mobile phone number is not answered when I call the non emergency number.
- Still need sidewalk on Rubicon near Hopi Elementary in East Phoenix.
- Would love some more civic engagement opportunities!
- I ride around a lot of Phoenix area streets and would love to have a convenient option to report issues with them.
- The above question, when i reported a street issue to the city, it was months later i got an email but they did not have the information i sent. Quit pretending, the city is not interested in knowing what people think, this is just all fakery and you are pushing bikes that have not earned the right to ride with motorists. But you must please the bike lobby which may pay your substantial salaries.
- Never saw my complaint resolved or heard back from streets
- I don't really know who I should contact. There's been times I've seen dangerous debris on the road, but I had no idea if I should call someone or if someone is already coming to fix it.
- I want to be able to report trash, weeds, downed trees, over grown grasses along roads and sidewalks.
- I reported a low visibility corner and while the reporting process was simple, the neighbor still has hedges which prevent you from seeing cross traffic
- Had 15 years of knowing a streets dept staff members who we could report problems to - he has transferred and no one has been hired in his place/. We now have problem reporting streets / public works problems
- I've heard discussions of the ability to report/contact the city about street-related issue, but didn't know it was possible.
- I have been repeatedly told by working staff at the city Street Transportation Department that it is official city policy to refuse to make bicycle-specific improvements to any street that has not been officially-designated as a "bicycle facility". This is in stark contrast to the responsiveness that the department showed in the past under a City Council not dominated by one political party.

Safety – Cars, Speeding & Traffic

- We have a traffic calming circle in the neighborhood that should not have been put in. There were no safety or speed concerns. There's a house nearby (15th Ave/Bethany Home Rd) that has cars drive through their block wall regularly. It's almost like the traffic calming circle has made things more dangerous. Doesn't help make bike riding feel safe either.
- There needs to be accountability for unsafe driving, including red light runners and speeding. Changing speed limits will do nothing if no one is ever ticketed for speeding.
- speed limits should be addressed as part of this effort.
- More traffic enforcement
- Speed is a problem in our neighborhood. Too few speed bumps. Too many entitled drivers passing thru
- Surface street speed limits (45 mph) are too high knowing that motorists rarely obey speed limits. Speed limits should be reduced to 35 mph.
- Canal crossing at 40th st and camelback is a death trap for pedestrians and cyclists

Safety – Law Enforcement

- Defund the police and place more money into alternatives that provide more safety to people such as increased green spaces, creating more sustainable ways of living for people. Pour more money into communities of color that are the way they are because of white supremacy and a city that continually neglects their needs.

Safety – Road Conditions

- Broken glass at a busy sidewalk intersection for weeks.

Additional Comments

- I'd like to be more informed about potential projects; I want to be able to advocate for safer streets for pedestrians and cyclists. :)
- Thank you for this question. Hoping we will have a way of knowing the results of our effort of taking the survey. Even when reaching out to the City regarding neighborhood traffic issues the answer is always no. And we have to be the ones to ask what the decision is. Some current staff are not doing a good job at building relationships.
- Takes too long
- I was surprised by the attention given to the issue. Well done!
- Thank you and please keep connecting routes.
- The recent street maintenance program has been doing a great job!

- i dont live in phoenix, but i hope that innovations taken in other parts of the country will motivate my local government to take action
- I'm really appreciate to contribute my thoughts on these important issues to the city, and I would love more opportunities to do so. I understand that the wheels of change turn slowly and bureaucracy can be labyrinthine, but I have hope that Phoenix can move things in the right direction and create a more sustainable, healthy and equitable urban environment.
- Road closures for events are not communicated well, I live on 7th ave and often get stuck and take much longer to get home after being rerouted. Construction closures are well communicated though.
- Parking in mixed residential/business zoned areas is bad
- It's sporadic and often depends on just how engaged the councilmember is.
- Be less concerned with biking and more with driving
- N/A
- Kind of satisfied with the outcome. Closer to yes than to no.
- Mas transparencia con los residentes con respecto a como los proyectos son elegidos y construidos. Mas presupuesto y consideracion para la movilidad comoda y segura de

Translation: More transparency with residents regarding how projects are chosen and built. More budget and consideration for comfortable mobility and safe mobility.

Additional Community Outreach

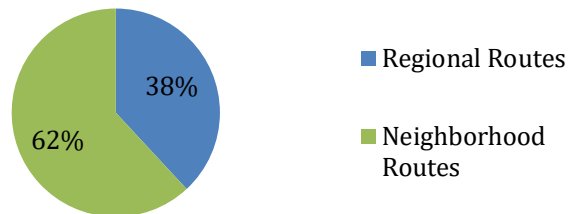
Laveen BBQ Results

On Saturday February 26, 2022, staff from the City of Phoenix attended the 70th Annual Laveen BBQ to conduct poster polls. Community members were asked to provide feedback on four separate posters using sticky dots. On the first poster, community members were asked if regional routes or neighborhood routes should be priority and if the focus should be on cost versus comfort. **63 people** answered those two questions. On the second poster, community members were asked to rank their top 3 community priorities. **185 responses** were received for this question.

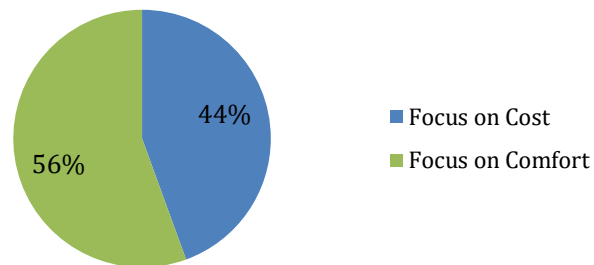
On the third poster, community members were asked to write down where they enjoyed walking and biking in Phoenix. **29 comments** were received for this question. Lastly, on the fourth poster, community members were asked to write down what stops them from walking or biking more in Phoenix. **34 comments** were received for this question.

Poster 1 Data

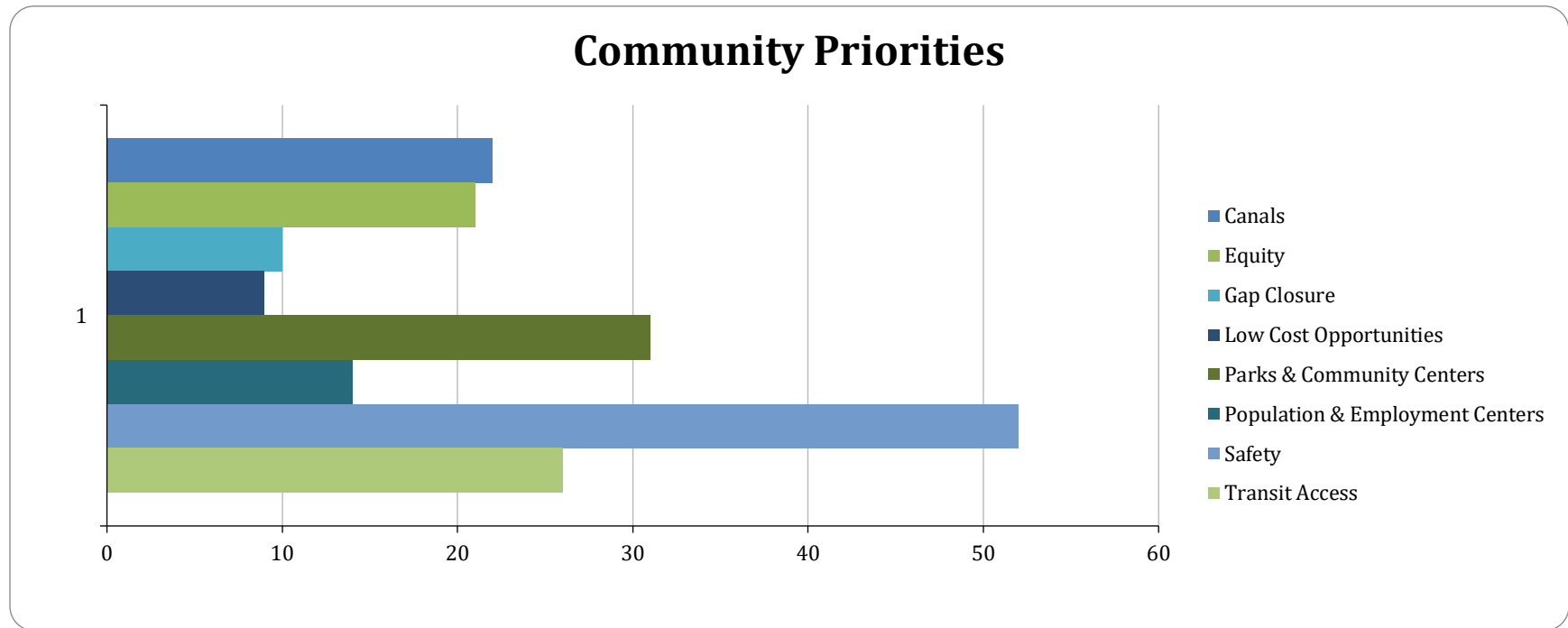
Highest Priority of Routes



Cost Versus Comfort



Poster 2 Data



Posters 3 & 4 Data

Where do you enjoy walking or biking in Phoenix?	What stops you from walking or biking more in Phoenix?
Hiking trails are great	Sidewalks falling apart
South Mtn, hiking trails, conveyance channel in Laveen	The littering; people leave trash
Tempe Lake	Safety; I don't feel safe anymore in Laveen walking or biking
Canals	The high rate of collision between vehicles and cyclists; Safety
Walking and biking along the canals and South Mountain	Safety
South Mountain Park	Unsafe roads or drivers
South/Carver Mtn	51st & Estrella; lots of crashes

More lights	Nothing
Canals	Safety; traffic makes walk dangerous
Community canal trails	Ease of access
Bodies of water; pretty sitting areas; flowers; statues	More lighting on paths
All of the city parks	No time
Prado Park	Cars
Canal paths; parks	Getting to trails involves driving and parking
Parks and neighborhood trails	Scary high speed dangerous traffic! Speed limit too high!
Laveen Channel Trail	There are not enough sidewalks/safe biking paths and everything is very spread out
Canals - Rogers Ranch	I'm fat
Road biking on major streets	Traffic; unsafe areas to walk
Need sidewalks on Estrella Drive	Getto areas; safty; homeless ppl
Parks	We need more sidewalks!
Cesar Chavez Hiking trail	Risk of accidents
Shade	Cars/safety
Along trails	Distance between nice looking areas
Estrella & 51st Ave to 43rd Ave	Lack of shade
I like biking through the canals	Lack of interconnectivity b/n sidewalks and trails
Cesar Chavez Park	Dog poop
Stores	Lack of restaurants
Canals and Parks	Heat
South Phoenix	Road safety
	Having more walking paths off Dobbins
	Racist comments
	Putting shade along canals and biking paths
	Crime
	Safty

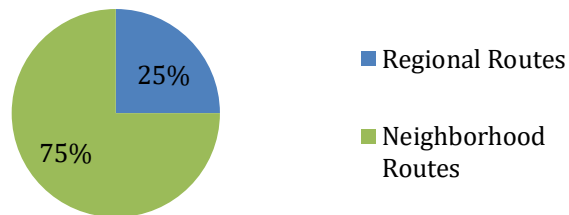
First Friday Results

On Friday March 4th, 2022 staff from the City of Phoenix attended the First Friday to conduct poster polls. Community members were asked to provide feedback on 3 separate posters using sticky dots. On the first poster, community members were asked if regional routes or neighborhood routes should be priority and if the focus should be on cost versus comfort. **16 people** answered those two questions. On the second poster, community members were asked to rank their top 3 community priorities. **48 responses** were received for this question.

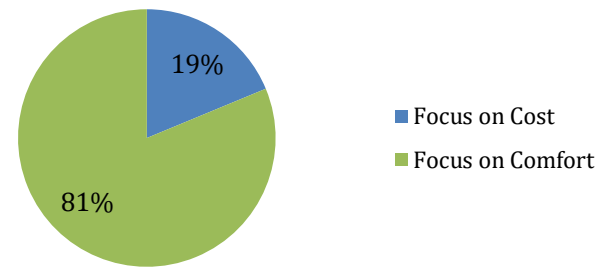
On the third poster, community members were asked to write down where they enjoyed walking and biking in Phoenix and what stops them from walking or biking more in Phoenix. **8 comments** were received for the first question and **9 comments** were received for the second question.

Poster 1 Data

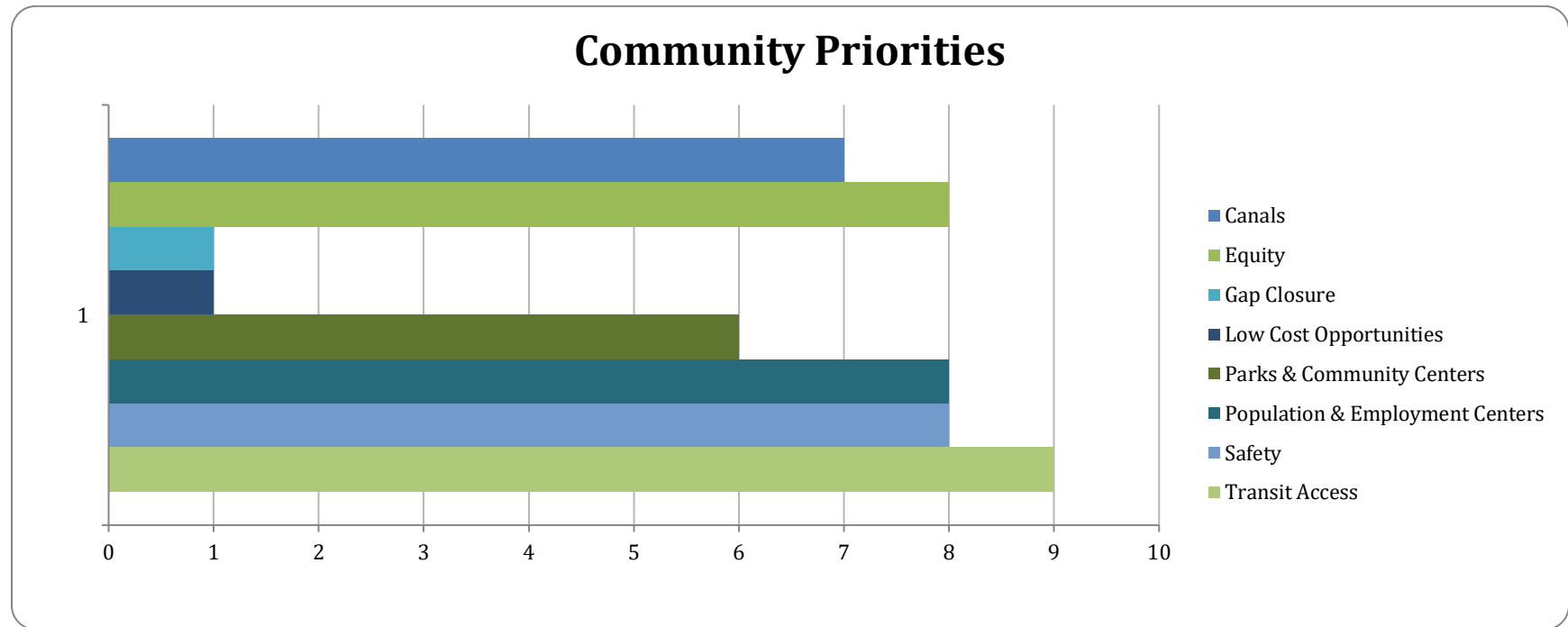
Highest Priority of Routes



Cost Versus Comfort



Poster 2 Data



Poster 3 Data

Where do you enjoy walking or biking in Phoenix?	What stops you from walking or biking more in Phoenix?
Park paths	Proximity to parks
Park paths	Bike lanes/safety
Gym	Safety
Neighborhood	Safety
Park	Homeless
Parks	Wild animals
Park	dangers

Canal, preserve, main streets	loose dogs
	safety

Targeted Outreach

Bike Advocates

To gather information about how the City of Phoenix can become more bike friendly, conversations were held with representatives from advocacy organizations that are working to make The City a better place to bike, walk and commute. Phoenix Spokes People and Urban Phoenix Project were the two organizations engaged.

Questions

The following questions were asked of the representatives:

1. How does your organization advance active transportation?
2. What is going well and where have you seen change improvement?
3. What are our biggest challenges moving forward?
4. What are some opportunities moving forward?
5. Additional comments

Themes

The following themes were identified from the conversations:

- Public Education – Representatives from the advocacy organizations mentioned the need for increased awareness and education about city projects. In addition, they suggested better messaging when relating neighborhood projects to overall city goals.
- Safety – Representatives from the advocacy organizations expressed concerns about traffic, speeding, and the lack of infrastructure to make walking and biking safe.
- City of Phoenix – Representatives from the advocacy organizations recommended the city work to improve the culture with the streets department. In addition, they expressed concerns about internal politics, turnover, and a lack of strong advocates within the department.

Marginalized Zip Codes

To expand outreach and better understand the needs of historically marginalized areas, the project team reached out directly to community leaders in the following zip codes: 85004, 85006, 85007, 85009, 85034 and 85040. The zip codes were selected based on the poverty percentage.

Questions

The following questions were asked of the community leaders:

1. What is the biggest challenge/issue when you walk in your community?
2. If there were more frequent crossings placed in streets (crossing before major street crossings), would you consider walking out of your way to use them?
3. What are some of the attitudes or feelings in your community around biking? What are some of the fears or concerns? Do people want to bike?
 - a. What is a biking economy and what does it mean? What is the walking/biking experience for homeless individuals? (Homeless shelter).
4. Do you walk or bike in your neighborhood? Where are you walking/biking to?
 - a. If yes how often, if no why not?
5. Do you feel safe walking or riding bikes in your neighborhood?
 - a. If yes, why, if no why not?
6. If you bike, what is your experience and where are you biking to?
7. Is there anything that would make you consider walking or biking more?
8. If you could prioritize sidewalks over bike facilities, which would you choose?
9. When you are walking or biking and you witness an issue, do you address it? With whom? If it is with the city, how has your experience been trying to resolve it? If you need something in your neighborhood connected to streets or ATP do you know who to contact or the process to get support?
10. If there was one thing to make walking and biking better, what would it be?
11. Is there anything you would celebrate connected to active transportation?

Themes

The following themes were identified from the interviews:

- Safety – Many community leaders expressed concerns about safety. They mentioned the lack of sidewalks in some residential communities (particularly West & South Phoenix), inconsistent bike paths, speeding, homeless encampments, violent crimes, drug use in neighborhoods, and stray dogs.

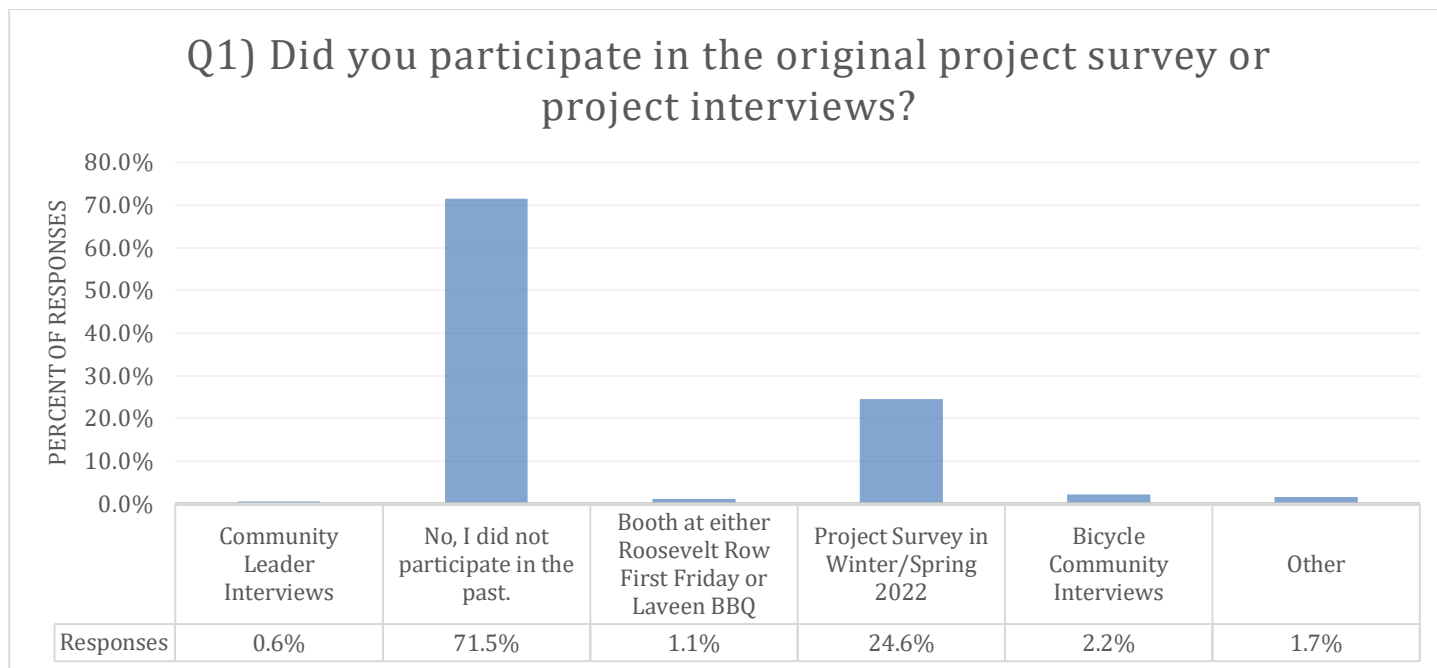
- City of Phoenix's Role – Many community leaders expressed the need for more accountability and transparency from the city. In addition, they are not confident the city will show up for their communities. However, they seemed to be supportive of additional street infrastructure if it supported their current safety needs.

Draft Plan Feedback Survey Results Summary

About the survey

The survey was provided through an online web platform. The survey received 182 individual responses which were received between November 28th, 2022 and January 16th, 2023.

Q1) Did you participate in the original project survey or project interviews?



Other:

- I do not think so.
- I was not aware of the survey previously.
- It happened so fast I didn't an opportunity.

Key takeaways:

- The majority of survey respondents (71.5%) have not previously participated in public outreach for the plan. The majority (3 out of 5) of those responding "Other" also indicated they have not participated in previous public outreach through the comments they provided.
- Of those who have participated previously, a large majority (86%) indicated their participation was through a previous survey.

Q2) If you are interested in walking or biking more in Phoenix, what changes would encourage you walk or bike more?

This question received 159 responses.

Statistics:

- 85 comments were related to biking (53%).
- 63 comments were related to walking and sidewalks (40%).
- 39 comments requested protection and/or separation between vehicles and cyclists/pedestrians (25%).
- 32 comments indicated that heat and lack of shade were a deterrent to walking or biking (20%).
- 21 comments requested the mitigation of dangerous driver behavior and speeding through speed reduction, traffic enforcement, and driver education (13%).
- 18 comments said that “no,” “nothing,” or “not interested” – indicating nothing would make them walk or bike more and no changes were desired (11%).
- 12 comments were related to the unhoused (homeless) population (8%).

Themes:

- Desire for improved (and continuous) sidewalks through better maintained surfaces, additional width, and detachment from vehicular lanes. Respondents indicated that many areas lack sidewalks altogether.
- Desire for more and safer bike infrastructure. Cyclist respondents desire separation/protection from vehicles.
- A need for better-connected routes with continuous facilities that don’t dead-end.
- Improved safety infrastructure for bicyclists and pedestrians at intersections.
- Want protection from the sun and heat mitigation.
- Reduced interaction with the homeless population on the streets by providing housing/space/facilities/treatment for the homeless.
- Vehicle drivers dislike bicyclists intermixed with vehicle traffic.
- There is a need for driver education and increased traffic enforcement to deter unsafe driving behavior and speeds.
- Lack of destinations within walkable distance.

Insightful/Example Comments:

- Completion of Colter Street bike lanes to provide a safe east/west alternative route; Improved safety at the canal crossing at 40th & Camelback; Improvements to overpass bridges such as at Campbell to make them more bicycle friendly; Enforcement of no loitering/homeless in underground tunnels and bridges - (this is very expensive infrastructure and not the place for this/creates safety concerns for users); Paved multi-use path or bike lane on Lincoln from 24th to 32nd Street; Connecting the uptown area to the 3rd/5th Ave bike lanes to create a safe route all the way through to downtown.
- Consistent sidewalks - there are a lot of spots that randomly end or are in bad condition. Same goes for bike lanes. Also, additional trees for shade and lighting for night time.
- Definitely interested in biking more, as I'm an avid road cyclist. The city needs more cycling infrastructure like protected lanes, but we also need to educate drivers on the rights of cyclists. Not a day goes by that I don't have some motorist try to run me off the road or scream at me for NOT riding on the sidewalk.
- Develop inclusivity of safety, addressing barriers for people on wheelchairs, timing of street crossing lights, pavement condition on streets at crosswalks, transition of pavement at crosswalks (bulked), impose violation fees for the hundreds of rental scooters just left blocking on sidewalks. A new problem is the tents being installed by the homeless on sidewalks.
- I want low-level, easy routes where I know there will consistently safe ways to cross big streets, shade, etc. There's a lot of changes I would like to see, but the thing that would make the biggest difference for both biking and walking is tons more HAWK crosswalks.
- The danger from cars is such a big risk, I find myself driving embarrassingly short distances because there is no way to safely cross the 6-lane road that separates me from the drug store or convenience store, etc. I used to love walking with my kids before we lived in Phoenix, but now our routes are very limited thanks to the car danger. Cars do not stop in marked crosswalks here, especially not on arterial roads. They also generally block the crosswalk at intersections and don't seem to look for pedestrians before turning on red. It is not physically possible to cross 6 lanes of traffic with small children during a gap in traffic. If there were those boulevard-style islands in the middle of the road at more places, it would give us a more protected place to wait for all the cars speeding through the crosswalk while we stand in the middle of the road and wait for another break in traffic. More access points and water crossings over the wash/canal trails would make them a more practical option for traveling safely

while on bike or on foot too. Also, I would love to see traffic lights give pedestrians that 2 second head start before any car traffic lanes get the green, since that seems to make pedestrians slightly more visible.

- Unfortunately, there is not much I can walk to in my area. The newest business about to be added nearby is a used car dealership on McDowell near 41st Place, which the zoning will be changed to accommodate if the project is approved. So, I would say that part of the larger picture is what zoning changes the city is approving. There's very little to walk to near me.

Q3) What is your most important active transportation priority (i.e., more sidewalks, safer roadway crossings, protected bicycle facilities, etc.)?

This comment received 164 responses, summarized below.

Statistics:

- 66 comments mention bicycles or bikes (40%).
- 44 comments request protected bicycle lanes (27%).
- 33 comments relate to intersections and safer crossings (20%).
- 31 comments mention sidewalks (19%).

Themes:

- Respondents indicated a desire for the following:
 - Protected Bike lanes and safer bike routes
 - More and safer sidewalks
 - Safer Crossings
 - Better roadways, more driving lanes for cars
 - More shade and trees

Insightful Comments:

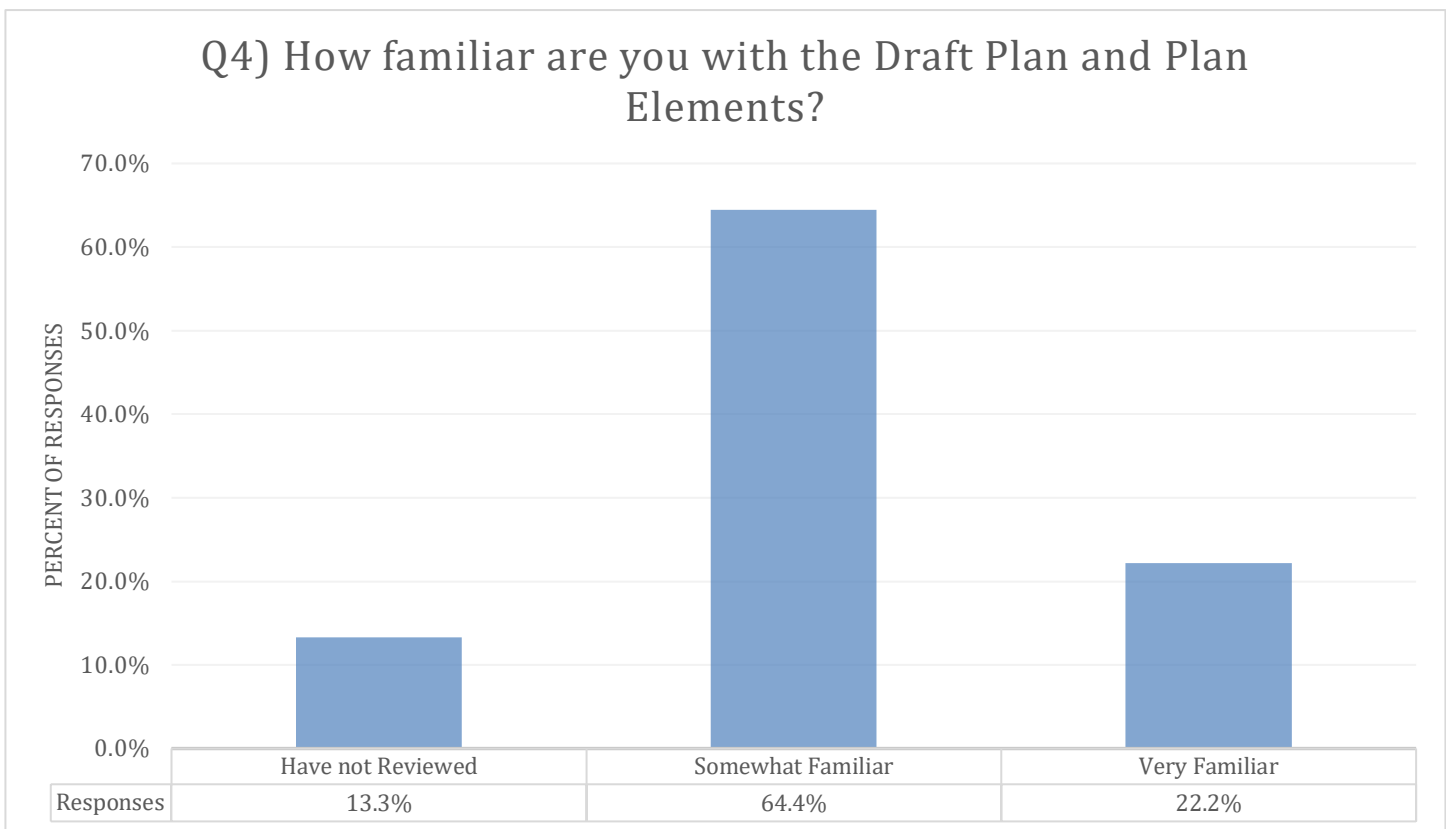
- Protected cycling lanes and paved, maintained, improved greenway/canal paths.
- I love the canal pathways. I think they should be paved/improved and if we can go UNDER the roadways instead doing HAWKS to cross, I can really get moving across

town. For example, Biltmore to Sun city is 1 hour on my bike. Thats a lot of ground in a short amount of time because of those canal tunnels.

- Better roads, more lanes and separated bike lanes.
- Frequent crossing points for pedestrians and bicyclists. It's not a system safe for us if we have to walk or bike a mile out of our way to go anywhere.
- Safer roadway crossings is most important for saving lives.

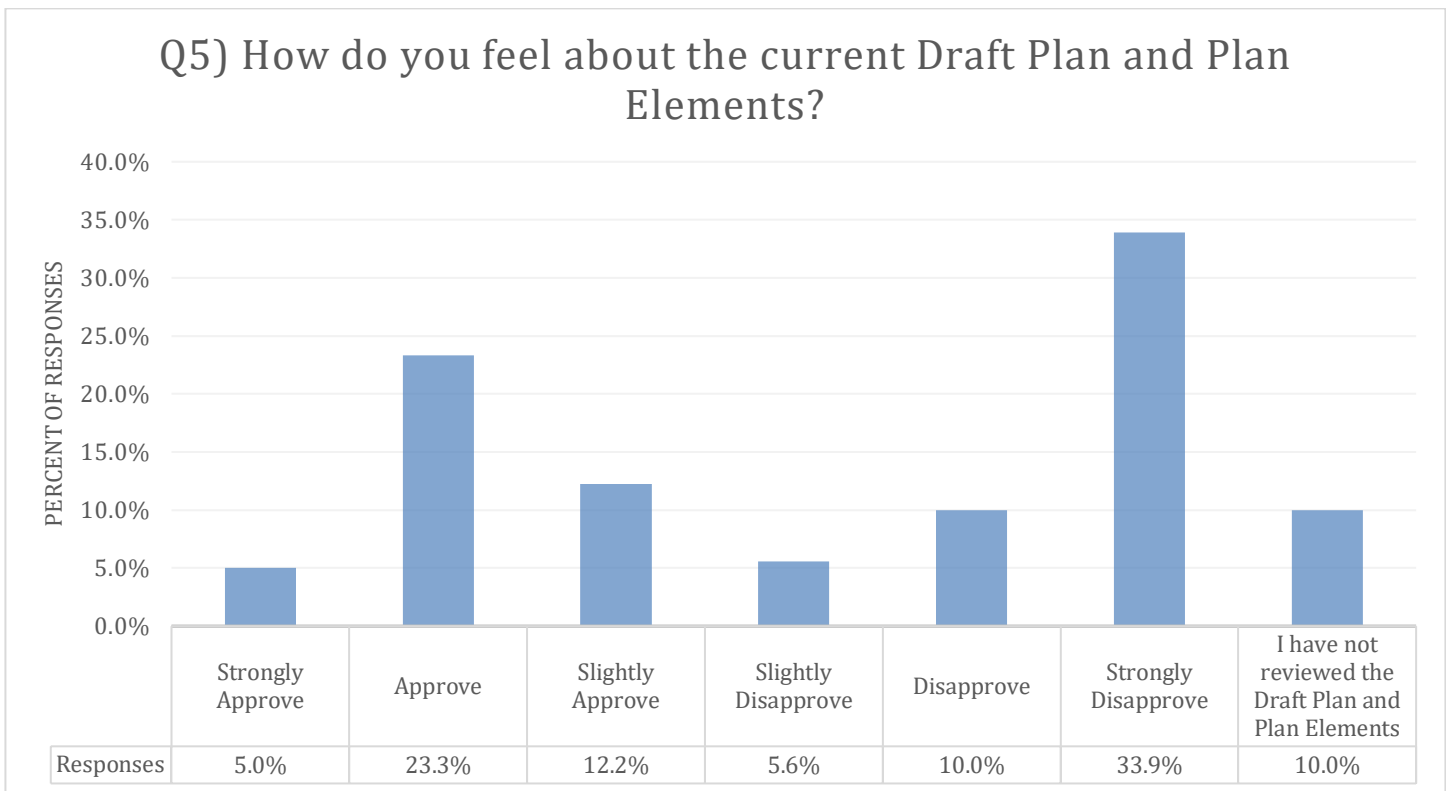
Q4) How familiar are you with the Draft Plan and Plan Elements?

This question received 180 responses and did not provide an open-ended response option. The results of the question are shown below, and indicate a general familiarity with the Draft Plan and the Plan Elements by survey respondents.



Q5) How do you feel about the current Draft Plan and Plan Elements?

This question received a total of 180 responses and did not provide an open-ended response option. In total, 49.5 percent of respondents indicated a disapproving feeling towards the Draft Plan, while 40.5 percent of respondents indicated a positive feeling towards the Draft Plan. Ten percent indicated that they had not reviewed the Draft Plan. While this question did not include an open-ended response option, Question 6 below provides a summary of responses that provide insight into the results of Question 5.



Q6) Please share your comments on the Draft Plan and Plan Elements. For example, What do you like about the plan? What concerns do you have? What recommendations do you have?

This question received 141 comments. However, the amount written for this question far exceeded that of the other questions. Most respondents provided answers in detailed explanatory paragraphs that included a diverse array of topics. As such, comments were not easily encapsulated into statistics about subject matter frequency similar to what was completed in prior questions. Instead, the themes below have been put in rough order of

frequency/prominence. Additionally, more Insightful/example comments have been included below to capture the feeling and message of commenters.

Themes:

- Commentators predominantly express support for the overall plan and its content, followed by varied caveats and suggestions.
- Don't remove car lanes and maintain the priority of vehicles.
- The implementation timeline is too slow and there is a desire for faster improvements/implementation.
- There needs to be increased accountability and concrete goals/actions on the part of the city and in this plan to implement (well) active transportation infrastructure and safety improvements.
- Concerns about traffic speeds and bad driver behavior and the need for additional content around enforcement.
- Road diets and deprioritizing cars is a necessity to fully create space for pedestrian and cyclist infrastructure.
- Many specific locational recommendations for infrastructure and connections.
- A desire to see more bike infrastructure - specifically protected and separated.
- Public transit improvements are needed to connect the distant parts of Phoenix in order to make walking and biking feasible.
- Support for the urban villages and neighborhood approach to implementation.
- Appreciation for the plan's recognition of Phoenix as a car-centric/car-culture city and how that is a barrier to active transportation.
- Content needs to be added discussing the use of roadway and surface materials that reflect instead of absorb heat.
- The city needs to address land use and zoning in order to make a city fabric that is more walkable and bikeable with destinations close by.

Insightful/Example Comments:

- Glad there is an emphasis on equity and underserved communities. Glad there are sections about evaluating progress and the results of the plan. Our Subdivision Code Ch. 32 needs to be redesigned to encourage development in a grid, which increases accessibility to important destinations. We should also re-evaluate our street cross-sections to see if we can build smaller to reduce speeds driven, which would make alternative modes of transportation feel safer.

- Any reduction to the number of lanes for vehicular traffic would have a negative effect on overall transportation.
- Need to use surfaces that do not absorb heat to be re-radiated at night creating a bigger heat island.
- Substituting asphalt, chip seal or tarmac with alternatives like concrete is conspicuously absent from the plan. A reduction in vehicle speed from traffic calming could make concrete a viable alternative. This would save the city tons of money on road maintenance.
- From my brief review, it appears that most of the improvements appear to be in central Phoenix. Tatum Rd from Pinnacle Peak to Cave Creek needs protective bike lanes so people can ride bikes to library from Desert Ridge.
- I am concerned that the plan does not address the root causes of danger to pedestrians but attempts to shoehorn pedestrian infrastructure onto poorly designed, dangerous streets. Real change would require road diets. I still appreciate the effort and the proposed improvements.
- I don't like the idea of making roads smaller and creating "speed diets" or usage diets. The roads are congested enough and enough people will not bike, walk, take a bus or train to make these changes sustainable, to grow the city, nor encourage a healthy lifestyle. I drive around the city and vary rarely see anyone using any of the bike lanes.
- HIN criteria too narrow and thus missing many areas of the city where accidents occur.
- My main concern is the need for more transparency and accountability from the city. Despite an accountability section being a part of the plan, I do not have a good sense of how the plan will address this issue.
- One of my primary concerns is that the city will continue to paint bike lanes and call it a victory for active transportation. Look, a bike lane is better than nothing, but at the end of the day paint is just paint and it's not infrastructure. I speak from experience — paint does not prohibit a car from veering into a bike lane or turning into a cyclist. I appreciate the thought and work that has gone into this plan, but it would be a shame to see it squandered by "good enough" thinking. As for recommendations, I really do think enforcement — which is not mentioned as a pillar of this plan — needs to be considered. Speed and traffic enforcement could go a long way in curbing the worst motorist behaviors and ensuring road safety for all users.
- I like the direction. Need more beautification points.
- I like the focus on prioritizing historically marginalized communities, and the acknowledgement that car culture is a prohibitive factor in making Phoenix more sustainable. I wonder how bus and light rail systems could better support cyclists and pedestrians.

- I'm concerned about only focusing on two neighborhoods at a time, does that mean the other neighborhoods are just neglected or no action is taken on those? What happens when you get to a neighborhood like Central and Bethany Home and they just decide they don't care about bike lanes or walkability? Basically, how they made a big fuss about re-striping that very low traffic section of Central because they'd have to "look for bikes when turning out of the neighborhood". How do we ensure that we have a wholistic vision and common voice for the city and it's not left up to the privileged in that neighborhood to ignore the program and recommendations?
- I think more traffic calming measures are needed in general. I wish that turn lanes that serve no purpose (i.e., in areas where there's no place to physically turn in either direction for 100s of yards) could be replaced with islands.
- My concern is that sharrows or bike lanes next to car parking (where the door could open into a biker) are mentioned at all. I initially don't love the bike boulevard idea, because it's assuming that drivers will be fully attentive and respectful of sharing the road, which is often not the case. I recommend focusing on developing an interconnected network of protected bike lanes with safe crossings especially in downtown/Roosevelt Row where there is so much foot/bike traffic.
- I think that the timeline for some of the recommended changes is way too long. It should not be a 3–10-year process to evaluate the potential to implement a stop bar (changing where the line on the ground is) at SOME intersections. This is something that has already been studied. Why do we need another 3 years of evaluation. To decide on its potential. Overall, I think the framework is good. The network program seems like a step in the right direction. I have lots of doubts on the implementation.
- My one other recommendation is that the city should view HAWK signals as not only pedestrian infrastructure, but bicycle infrastructure. This can be a great tool to allow cyclists to bike through neighborhoods and then be able to cross major streets.
- I think the plan will do a lot for the city and making transportation for all safer. I am concerned on some of the choices in focusing on a small area for overkill projects while neglecting other less "showy" concerns (i.e., a huge bike lane with bollards on 3rd avenue with little traffic but super thin bike lanes on cave creek with cars traveling at 60+)
- I'm extremely pleased that we are acknowledging the benefits and need for facilitating other forms of transportation that is not driving. Cars create noise pollution, air pollution, social isolation, and literal death. They might be good for intercity travel, but we need to focus on neighborhood-centric transportation and I loved seeing that in the plan. Another aspect to consider is working with city zoning to enable more multi-use

zone construction that integrates residential and small-business spaces. Doing this will make the transportation plan much more feasible.

- In your report, you indicate that 2.5% of crashes involve pedestrians, but are 46% of fatalities. On the same page you indicate 21% of KSIs are speed related. Why, then, are you indicating on page 37 that you are going to apply equal behavioral enforcement to both drivers and pedestrians/cyclists (both segments will see 12x/year targeted enforcement)? I would like to see significantly more driver enforcement considering the outcomes of driver-related behavior.
- There is missing inclusion of the wheelchair user population who depend on their devices as mode of transportation.
- Over all I think it's a good plan. I'd like to see benchmarks and goals made more concrete but it's a good start.
- More protected bike infrastructure, with hard protection, bollards, make the tough choices to actually make it safer instead of always bowing to cars instead of safety.
- My concerns are the reduction in vehicular lanes to accommodate bike lanes. The reduction of those lanes increases traffic throughout the neighborhood. For the amount of disruption the bike lanes cause, there are not of bicycle riders who use them compared to cars. It would be wise to have a corridor for bicycles that do not take away vehicular lanes or parking spots (as those are also becoming hard downtown).
- Please do not replace traffic lanes. Look for ways to implement bicycle lanes only where there is unused space. This will be a nightmare otherwise.
- The City must commit to studying the removal of single-family zoning and minimum parking requirements in order to make Phoenix more walkable and stop exacerbating the urban heat island effect, which this plan identifies as a key barrier to active transportation. Collaborate across departments and get things done.
- The issue is that Phoenix is so hostile in its design toward pedestrians and bicyclists that stronger action is required. Anticipatory warrants should be a short-term action and we should be actively designing our streets to be safe for pedestrians and cyclists instead of reacting to their deaths. There is no reason this shouldn't be a short-term goal. When Phoenix for instance allows parking in bike lanes, it is clear who the city prefers. The success of this plan is entirely dependent on the rollout of quickbuild plans. This is not enough to say that Phoenix should be a multimodal city. The metric of success is the deployment of concrete protected bicycle infrastructure and frequent, safe pedestrian crossings.

Appendix A: Survey Questions

English Version

- Which of the following best describes you?
 - a. I live in the City of Phoenix
 - b. I work in the City of Phoenix
 - c. I live and work in the City of Phoenix
 - d. I neither live nor work in the City of Phoenix
- What is your zip code?
- Which of the following do you own or have access to regularly? Please check all that apply:
 - a. Car or truck
 - b. Bicycle
 - c. E-scooter
 - d. Assistive device, such as a wheelchair or motorized scooter
 - e. Other (open text)
- Please check how often you use each of these different ways of traveling.

	Daily	Weekly	Monthly	Seldom	Never
Drive or ride in a car					
Take public transit					
Use rideshare or a taxi					
Walk					
Bike					
Use an e-scooter					
Use an assistive device, like a wheelchair or mobility scooter					

- Which of the following types of transportation would you like to use more in the future? Please check all that apply.
 - a. Car
 - b. Public transit
 - c. Rideshare or a taxi
 - d. Walking
 - e. Bicycle

- f. E-scooter
 - g. An assistive device, like a wheelchair or mobility scooter
 - h. None of the above
- Which of the following types of transportation would you like to use less in the future?
Please check all that apply.
 - i. Car
 - j. Public transit
 - k. Rideshare or a taxi
 - l. Walking
 - m. Bicycle
 - n. E-scooter
 - o. An assistive device, like a wheelchair or mobility scooter
 - p. None of the above
- In the last two months, have you walked or biked for any of the following reasons?
 - a. Walk or bike to complete a trip to work, school, shopping, or socializing
 - b. Walk or bike for exercise or fun
 - c. Walk or bike to access transit (bus or light rail)
 - d. I'm not interested in walking or biking
- If you were to walk and bike more often, which of the following would describe the purpose of doing so? Please check all that apply.
 - a. Walk or bike to complete a trip to work, school, shopping, or socializing
 - b. Walk or bike for exercise or fun
 - c. Walk or bike to access transit (bus or light rail)
 - d. I'm not interested in walking or biking
- How would you describe yourself from the options below, based on how often or comfortable you are with biking?
 - a. Not interested in biking – I do not want to bike
 - b. Interested in biking – I'm interested in biking more if there are more comfortable and safe bike facilities
 - c. Casual bike rider – I'm comfortable using bike lanes and bike paths
 - d. Assertive bike rider – I'm very comfortable biking on streets, even if they don't have bike lanes
- If you would like to provide more details, please use the space below (open text)

- How would you rate the current bicycling conditions in Phoenix?
 - a. Very good
 - b. Good
 - c. Somewhat good
 - d. Neutral
 - e. Somewhat poor
 - f. Poor
 - g. Very Poor

- How would you rate the current walking conditions in Phoenix?
 - a. Very good
 - b. Good
 - c. Somewhat good
 - d. Neutral
 - e. Somewhat poor
 - f. Poor
 - g. Very Poor

- How would you rate the current conditions for assistive devices, such as wheelchairs, in Phoenix?
 - a. Very good
 - b. Good
 - c. Somewhat good
 - d. Neutral
 - e. Somewhat poor
 - f. Poor
 - g. Very Poor

- Thinking about traffic safety, how safe do you currently feel walking in Phoenix?
 - a. Very Safe
 - b. Safe
 - c. Somewhat safe
 - d. Neutral
 - e. Somewhat unsafe
 - f. Unsafe
 - g. Very Unsafe

- Thinking about traffic safety, how safe do you currently feel biking in Phoenix?
 - a. Very Safe

- b. Safe
- c. Somewhat safe
- d. Neutral
- e. Somewhat unsafe
- f. Unsafe
- g. Very Unsafe

- Thinking about traffic safety, how safe do you feel using an assistive device, such as a wheelchair, in Phoenix?

- a. Very Safe
- b. Safe
- c. Somewhat safe
- d. Neutral
- e. Somewhat unsafe
- f. Unsafe
- g. Very Unsafe

- For the following question, please indicate how strongly you agree or disagree with each of the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
My neighborhood would be a better place to live if it were more enjoyable for people to <u>walk</u> .							
My neighborhood would be a better place to live if it were more enjoyable for people to <u>bike</u> .							
I am comfortable with my friends and family							

using the streets in Phoenix to walk or bike.							
Many of the places I need to get to regularly are within biking distance of my home							
I would use public transit more often if it was convenient and safe to walk and bike to							
I like walking.							
I like biking.							

- Which of the following stop you from walking more? Please select all that apply
 - a. People driving in unsafe ways
 - b. People driving fast
 - c. Narrow sidewalks
 - d. Bad sidewalk conditions
 - e. Gaps in sidewalks
 - f. No sidewalks
 - g. Crossings at major streets do not feel safe
 - h. Crossing signals take too long
 - i. Crosswalks spaced too far apart
 - j. Not enough shade
 - k. Too hot
 - l. Distances between places
 - m. Other (open text)

- Thinking of the list above, what is the single biggest barrier for when it comes to walking?
(Repeat list from above, single selection only to prioritize)

- Which of the following stop you from biking more? Please select all that apply
 - a. Bike lanes too close to traffic lanes
 - b. Bike lanes do not connect

- c. Bike lanes disappear near intersections
 - d. Hard to find a clear biking route
 - e. Lack of bike parking
 - f. Crosswalks spaced too far apart
 - g. Crossing signals take too long
 - h. Feeling unsafe
 - i. People driving in unsafe ways
 - j. People driving fast
 - k. Not enough shade
 - l. Too hot
 - m. Distances between places
 - n. Other (open text)
- Thinking of the list above, what is the single biggest barrier for you when it comes to bicycling? *(repeat list, single selection only to prioritize)*
 - Below are descriptions and pictures of different types of bicycle infrastructure. For each photo, please indicate whether you'd like to see more of that type of street in Phoenix and whether you'd support the design even if it added a few minutes to driving times during rush hour. *(for setup, list each of the two questions on a 1-7 scale from strongly agree to strongly disagree. Question 1: I would like to see more streets that look like this in Phoenix. Question 2: I would be interested in this street design even if it added a few minutes to driving times during rush hour).*
 - a. Major street with 5 or 6 lanes / no bike lane
 - b. Major street with bike lane
 - c. Major street with buffered bike lane
 - d. Major street with protected bike lane (bollards / guideposts)
 - e. Major street with protected bike lane (cycletrack w/ curb)
 - f. Major street with wide sidewalk (10')
 - g. Secondary street with bike lane
 - h. Secondary street with buffered bike lane
 - i. Local street with sharrows and traffic calming (bike blvd)
 - j. Local street with no bike infrastructure
 - Below are descriptions and pictures of different types of sidewalk infrastructure. For each photo, please indicate whether you'd like to see more of that type of street in Phoenix and whether you'd support the design even if it added a few minutes to driving times during rush hour. *(for setup, list each of the two questions on a 1-7 scale from strongly agree to strongly disagree. Question 1: I would like to see more streets that look like this in Phoenix. Question*

2: I would be interested in this street design even if it added a few minutes to driving times during rush hour).

- a. Major Street and sidewalk with no buffer (flush with curb)
- b. Major Street with buffer and shade
- c. Secondary Street and sidewalk with no buffer
- d. Secondary Street with buffer and shade
- e. Mid-block crossing with HAWK signal on 6 or 7 lane arterial
- f. Mid-block crossing with HAWK signal on a collector street (3 lanes)
- g. Mid-block crossing without HAWK signal on a collector street
- h. Mid-block crossing without HAWK with pedestrian refuge island
- i. Major intersection with pedestrian enhancements

- For the following question, please indicate how strongly you agree or disagree with each of the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
I would not support any project that would lower speeds for driving or make driving trips longer.							
I would support lowering speed limits in exchange for making streets more comfortable for walking and biking							

- Thinking about transportation overall in the City of Phoenix, please rank your priorities:
 - a. Reducing vehicle congestion during rush hour
 - b. Preventing collisions that could injure people
 - c. Minimizing the cost of building and maintaining streets
 - d. Giving everyone a comfortable option for using streets, whether they are driving, walking, biking, or taking transit
 - e. Designing streets to match the atmosphere of the neighborhood
 - f. Building a green and sustainable transportation system

- Thinking of streets in Phoenix, what are your top five priorities? Please rank them with 1 being highest. *(setup to allow for items to be dragged to prioritize)*
 - a. Expand street network for cars
 - b. Improve traffic signals for cars
 - c. Maintain existing sidewalks
 - d. Expand the sidewalk network
 - e. Fill in sidewalk gaps
 - f. Improve pedestrian crossings
 - g. Add shade along sidewalks
 - h. Maintain existing bikeways
 - i. Expand the bikeway network
 - j. Improve bicycle crossings

- When thinking about how to add to Phoenix's bicycle network, the City has to identify priorities and make decisions on where and how to invest. When we look at adding connections to the bicycle network, we have to prioritize where to connect to first. Please rank the following based on what you think is most important:
 - a. Canals – Adding and upgrading paths along existing canals
 - b. Equity – Invest in historically marginalized areas
 - c. Gap Closure – Fill in missing links in network
 - d. Low cost opportunities – Adding bike lanes after pavement projects
 - e. Parks & Community Centers – Build links to recreation
 - f. Population & Employment Centers – Connect within to areas where there are a lot of people working and living
 - g. Safety – Address areas with a history of serious collisions and/or fatalities
 - h. Transit Access – Build links with bus and light rail stations

- When thinking about how to add to Phoenix's bicycle network, the City has to identify priorities and make decisions on where and how to invest. Regional routes usually use through streets and canals to guide people across the city. Neighborhood routes are focused on guiding people to destinations in their neighborhood. Which do you think is a higher priority?
 - a. Neighborhood routes – Focus on local routes to neighborhood destinations
 - b. Regional routes – Focus on citywide routes for people to make longer trips

- Usually the most comfortable bicycle facilities also cost more money to build and maintain. Thinking about new bicycle facilities, which do you think is more important?
 - c. Cost – Focus on adding stripes and signs to make sure the City can add as many miles of bike lanes as possible

- d. Comfort – Focus on building projects that make bicycling more comfortable, even if it means fewer projects

- What other comments would you like to share with us? (open-ended)

The following questions are meant to help the City of Phoenix understand if it is sharing information. Please answer honestly.

- Do you know how to report street maintenance issues to the City of Phoenix?
 - a. Yes
 - b. No
- When there is a bicycle or pedestrian street project in my neighborhood, are you able to find information about the project and provide input?
 - a. Yes
 - b. No
- Have you ever reported a street issue to the City of Phoenix?
 - a. Yes
 - b. No
- If yes, were you satisfied with the outcome?
 - a. Yes
 - b. No

Please tell us a little more about you...

- Age:
 - a. 18 and under
 - b. 19-29
 - c. 30-39
 - d. 40-49
 - e. 50-59
 - f. 60-69
 - g. 70+
- Race & Ethnicity
 - a. Asian / Pacific Islander
 - b. Black
 - c. Native American
 - d. White
 - e. Hispanic / Latino of any race

- Gender
 - a. _____
- Household Income
 - a. Under \$35k
 - b. \$36-65k
 - c. \$66-100k
 - d. \$100k - \$200k
 - e. \$200k+

Spanish Version

- ¿Cuál de las siguientes te describe mejor?
 - a. Yo vivo en la ciudad de Phoenix
 - b. Trabajo en la ciudad de Phoenix
 - c. Vivo y trabajo en la ciudad de Phoenix
 - d. No vivo ni trabajo en la Ciudad de Phoenix
- ¿Cuál es su código postal?
- ¿Cuál de los siguientes posee o tiene acceso regularmente? Por favor marque todos los que apliquen:
 - a. Coche o camión
 - b. Bicicleta
 - c. Scooter eléctrico
 - d. Dispositivo de asistencia, como una silla de ruedas o un scooter motorizado
 - e. Otro (texto abierto)
- Marque la frecuencia con la que usa cada una de estas diferentes formas de viajar.

	A diario	Semanal	Mensual	Raramente	Nunca
Conducir o viajar en un automóvil					
Toma transporte público					
Usa viajes compartidos o un taxi					

Camina					
Usa bicicleta					
Usa un scooter eléctrico					
Usa un dispositivo de asistencia, como una silla de ruedas o un scooter de movilidad					

- ¿Cuál de los siguientes tipos de transporte le gustaría usar más en el futuro? Por favor marque todos los que apliquen.
 - a. Coche
 - b. Tránsito público
 - c. Viaje compartido o un taxi
 - d. Caminando
 - e. Bicicleta
 - f. Scooter eléctrico
 - g. Un dispositivo de asistencia, como una silla de ruedas o un scooter de movilidad.
 - h. Ninguna de las anteriores

- ¿Cuál de los siguientes tipos de transporte le gustaría usar menos en el futuro? Por favor marque todos los que apliquen.
 - a. Coche
 - b. Tránsito público
 - c. Viaje compartido o un taxi
 - d. Caminando
 - e. Bicicleta
 - f. Scooter eléctrico
 - g. Un dispositivo de asistencia, como una silla de ruedas o un scooter de movilidad.
 - h. Ninguna de las anteriores

- ¿Cuál de los siguientes tipos de transporte le gustaría usar menos en el futuro? Por favor marque todos los que apliquen
 - a. Coche

- b. Tránsito público
 - c. Viaje compartido o un taxi
 - d. Caminando
 - e. Bicicleta
 - f. Scooter eléctrico
 - g. Un dispositivo de asistencia, como una silla de ruedas o un scooter de movilidad.
 - h. Ninguna de las anteriores
- En los últimos dos meses, ¿ha caminado o andando en bicicleta por alguna de las siguientes razones?
 - a. Camine o ande en bicicleta para completar un viaje al trabajo, la escuela, ir de compras o socializar
 - b. Camine o ande en bicicleta para hacer ejercicio o divertirme
 - c. Camine o ande en bicicleta para acceder al transporte público (autobús o tren ligero)
 - d. No estoy interesado en caminar o andar en bicicleta.
- Si tuviera que caminar y andar en bicicleta con más frecuencia, ¿cuál de las siguientes describiría el propósito de hacerlo? Por favor marque todos los que apliquen.
 - a. Camine o ande en bicicleta para completar un viaje al trabajo, la escuela, ir de compras o socializar
 - b. Camine o ande en bicicleta para hacer ejercicio o divertirme
 - c. Camine o ande en bicicleta para acceder al transporte público (autobús o tren ligero)
 - d. No estoy interesado en caminar o andar en bicicleta.
- ¿Cómo se describiría a sí mismo a partir de las siguientes opciones, según la frecuencia o la comodidad con la que se siente andando en bicicleta?
 - a. No me interesa andar en bicicleta - No quiero andar en bicicleta
 - b. Interesado en andar en bicicleta: estoy interesado en andar en bicicleta más si hay instalaciones para bicicletas más cómodas y seguras
 - c. Ciclista ocasional: me siento cómodo usando carriles para bicicletas y senderos para bicicletas
 - d. Ciclista asertivo: me siento muy cómodo andando en bicicleta en las calles, incluso si no tienen carriles para bicicletas
- Si desea proporcionar más detalles, utilice el espacio a continuación (texto abierto)

- ¿Cómo calificaría las condiciones actuales para andar en bicicleta en Phoenix?
 - a. Muy bien
 - b. Bien
 - c. algo bueno
 - d. Neutral
 - e. Algo pobre
 - f. Pobre
 - g. Muy pobre

- ¿Cómo calificaría las condiciones actuales para caminar en Phoenix?
 - a. Muy bien
 - b. Bien
 - c. algo bueno
 - d. Neutral
 - e. Algo pobre
 - f. Pobre
 - g. Muy pobre

- ¿Cómo calificaría las condiciones actuales de los dispositivos de asistencia, como las sillas de ruedas, en Phoenix?
 - a. Muy bien
 - b. Bien
 - c. algo bueno
 - d. Neutral
 - e. Algo pobre
 - f. Pobre
 - g. Muy pobre

- Pensando en la seguridad del tráfico, ¿qué tan seguro se siente actualmente caminando en Phoenix?
 - a. Muy seguro
 - b. A salvo
 - c. Algo seguro
 - d. Neutral
 - e. Algo inseguro
 - f. Inseguro
 - g. muy inseguro

- Pensando en la seguridad del tráfico, ¿qué tan seguro se siente actualmente al andar en bicicleta en Phoenix?
 - Muy seguro
 - A salvo
 - Algo seguro
 - Neutral
 - Algo inseguro
 - Inseguro
 - muy inseguro
- Pensando en la seguridad vial, ¿qué tan seguro se siente usando un dispositivo de asistencia, como una silla de ruedas, en Phoenix?
 - Muy seguro
 - A salvo
 - Algo seguro
 - Neutral
 - Algo inseguro
 - Inseguro
 - muy inseguro
- Para la siguiente pregunta, indique qué tan de acuerdo o en desacuerdo está con cada una de las siguientes afirmaciones.

	Muy en desacuerdo	Discrepar	Algo en desacuerdo	Neutra l	Parcialment e de acuerdo	Estar de acuer do	Totalment e de acuerdo
Mi vecindario sería un mejor lugar para vivir si fuera más agradable para la gente <u>caminar</u> .							

Mi vecindario sería un mejor lugar para vivir si fuera más agradable para la gente andar en <u>bicicleta</u> .							
Me siento cómodo con mis amigos y familiares usando las calles de Phoenix para caminar o andar en bicicleta.							
Muchos de los lugares a los que necesito ir regularmente están a una distancia en bicicleta de mi casa.							

Usaría el transporte público con más frecuencia si fuera conveniente y seguro caminar y andar en bicicleta para llegar.							
Me gusta caminar.							
Me gusta andar en bicicleta							

- ¿Cuál de los siguientes le impide caminar más? Por favor seleccione todas las respuestas válidas
 - h. Personas que conducen de manera insegura
 - i. Gente manejando rápido
 - j. Aceras angostas
 - k. Malas condiciones de la acera
 - l. Huecos en las aceras
 - m. no hay aceras
 - n. Los cruces en las calles principales no se sienten seguros
 - o. Las señales de cruce tardan demasiado
 - p. Pasos de peatones espaciados demasiado lejos
 - q. No hay suficiente sombra
 - r. Demasiado caliente
 - s. Distancias entre lugares
 - t. Otro (texto abierto)
- Pensando en la lista anterior, ¿cuál es la barrera más grande para caminar?

- a. Personas que conducen de manera insegura
 - b. Gente manejando rápido
 - c. Aceras angostas
 - d. Malas condiciones de la acera
 - e. Huecos en las aceras
 - f. no hay aceras
 - g. Los cruces en las calles principales no se sienten seguros
 - h. Las señales de cruce tardan demasiado
 - i. Pasos de peatones espaciados demasiado lejos
 - j. No hay suficiente sombra
 - k. Demasiado caliente
 - l. Distancias entre lugares
 - m. Otro (texto abierto)
- ¿Cuál de los siguientes le impide andar en bicicleta más? Por favor seleccione todas las respuestas válidas
 - a. Carriles para bicicletas demasiado cerca de los carriles de tráfico
 - b. Los carriles para bicicletas no se conectan
 - c. Los carriles para bicicletas desaparecen cerca de las intersecciones.
 - d. Difícil de encontrar una ruta clara para andar en bicicleta.
 - e. Falta de estacionamiento para bicicletas.
 - f. Pasos de peatones espaciados demasiado lejos
 - g. Las señales de cruce tardan demasiado
 - h. Sintiéndome inseguro
 - i. Personas que conducen de manera insegura
 - j. Gente manejando rápido
 - k. No hay suficiente sombra
 - l. Demasiado caliente
 - m. Distancias entre lugares
 - n. Otro (texto abierto)
- Pensando en la lista anterior, ¿cuál es la barrera más grande para usted cuando se trata de andar en bicicleta?
 - a. Carriles para bicicletas demasiado cerca de los carriles de tráfico
 - b. Los carriles para bicicletas no se conectan
 - c. Los carriles para bicicletas desaparecen cerca de las intersecciones.
 - d. Difícil de encontrar una ruta clara para andar en bicicleta.

- e. Falta de estacionamiento para bicicletas.
 - f. Pasos de peatones espaciados demasiado lejos
 - g. Las señales de cruce tardan demasiado
 - h. Sintiéndome inseguro
 - i. Personas que conducen de manera insegura
 - j. Gente manejando rápido
 - k. No hay suficiente sombra
 - l. Demasiado caliente
 - m. Distancias entre lugares
 - n. Otro (texto abierto)
- A continuación se encuentran descripciones e imágenes de diferentes tipos de infraestructura para bicicletas. Para cada foto, indique si le gustaría ver más de ese tipo de calle en Phoenix y si apoyaría el diseño incluso si agregara unos minutos al tiempo de conducción durante las horas pico.

1	2	3	4	5	6	7
desde totalment e de acuerdo (Totally Agree)						totalmente en desacuerd o (Totally Disagree)

Pregunta 1: Me gustaría ver más calles que se vean así en Phoenix.

Pregunta 2: Estaría interesado en esta calle diseño incluso si añadía unos minutos a los tiempos de conducción durante las horas pico).

1. Calle principal con 5 o 6 carriles / sin carril para bicicletas
2. Calle principal con carril bici
3. Calle principal con carril bici protegido
4. Calle principal con carril bici protegido (pilonas / postes indicadores)
5. Calle principal con carril para bicicletas protegido (pista para bicicletas con bordillo)
6. Calle principal con acera ancha (10')

7. Calle secundaria con carril bici
 8. Calle secundaria con carril bici amortiguado
 9. Calle local con sharrows y control de tráfico (bike blvd)
 10. Calle local sin infraestructura para bicicletas
- A continuación se encuentran descripciones e imágenes de diferentes tipos de infraestructura de aceras. Para cada foto, indique si le gustaría ver más de ese tipo de calle en Phoenix y si apoyaría el diseño incluso si agregara unos minutos a los tiempos de conducción durante las horas pico.

1	2	3	4	5	6	7
desde totalment e de acuerdo (Totally Agree)						totalmente en desacuerd o (Totally Disagree)

Pregunta 1: Me gustaría ver más calles que se vean así en Phoenix.

Pregunta 2: Estaría interesado en esta calle diseño incluso si añadía unos minutos a los tiempos de conducción durante las horas pico).

1. Calle principal y acera sin barrera (al ras del bordillo)
 2. Calle Mayor con tope y sombra
 3. Calle secundaria y acera sin amortiguador
 4. Calle Secundaria con amortiguador y sombra
 5. Cruce a mitad de cuadra con señal HAWK en arterial de 6 o 7 carriles
 6. Cruce a mitad de cuadra con señal HAWK en una calle colectora (3 carriles)
 7. Cruce a mitad de cuadra sin señal HAWK en una calle colectora
 8. Cruce a mitad de cuadra sin HAWK con isla de refugio para peatones
 9. Intersección principal con mejoras para peatones
- Para la siguiente pregunta, indique qué tan de acuerdo o en desacuerdo está con cada una de las siguientes afirmaciones.

2. las siguientes afirmaciones.

	Muy en desacuerdo	Discrepar	Algo en desacuerdo	Neutra l	Parcialment e de acuerdo	Estar de acuerdo	Totalment e de acuerdo
No apoyaría ningún proyecto que reduzca la velocidad para conducir o haga que los viajes en automóvil sean más largos.							
Apoyaría la reducción de los límites de velocidad a cambio de hacer las calles más cómodas para caminar y andar en bicicleta.							

- Pensando en el transporte en general en la Ciudad de Phoenix, clasifique sus prioridades:
 - a. Reducción de la congestión vehicular durante las horas pico
 - b. Prevención de colisiones que podrían lesionar a las personas
 - c. Minimizar el costo de construcción y mantenimiento de calles.

- d. Brindar a todos una opción cómoda para usar las calles, ya sea que conduzcan, caminen, anden en bicicleta o tomen el transporte público.
 - e. Diseño de calles para que coincida con la atmósfera de la vecindad.
 - f. Construyendo un sistema de transporte verde y sostenible
- Pensando en las calles de Phoenix, ¿cuáles son sus cinco prioridades principales? Por favor clasifíquelos con 1 siendo el más alto.
 - a. Ampliar la red de calles para automóviles
 - b. Mejorar las señales de tráfico para los automóviles
 - c. Mantenimiento de las aceras existentes.
 - d. Ampliar la red de aceras
 - e. Rellene los huecos de la acera
 - f. Mejorar los pasos de peatones
 - g. Agregar sombra a lo largo de las aceras
 - h. Mantener los carriles para bicicletas existentes
 - i. Ampliar la red de ciclovías
 - j. Mejorar los cruces de bicicletas
- Al pensar en cómo agregar a la red de bicicletas de Phoenix, la Ciudad tiene que identificar prioridades y tomar decisiones sobre dónde y cómo invertir. Cuando buscamos agregar conexiones a la red de bicicletas, debemos priorizar dónde conectarnos primero. Clasifica lo siguiente según lo que creas que es más importante:
 - a. Canales: agregar y mejorar caminos a lo largo de canales existentes
 - b. Equidad: invertir en áreas históricamente marginadas
 - c. Cierre de brecha: complete los enlaces que faltan en la red
 - d. Oportunidades de bajo costo: Agregar carriles para bicicletas después de los proyectos de pavimento
 - e. Parques y centros comunitarios: construya vínculos con la recreación
 - f. Centros de población y empleo: conéctese con áreas donde hay mucha gente trabajando y viviendo.
 - g. Seguridad: aborde las áreas con un historial de colisiones graves y/o muertes
 - h. Acceso al tránsito: construya enlaces con estaciones de autobús y tren ligero
- Al pensar en cómo agregar a la red de bicicletas de Phoenix, la Ciudad tiene que identificar prioridades y tomar decisiones sobre dónde y cómo invertir. Las rutas regionales generalmente usan calles y canales para guiar a las personas por la ciudad. Las rutas de vecindario se enfocan en guiar a las personas a destinos en su vecindario. ¿Cuál crees que es una prioridad más alta?
 - a. Rutas vecinales: concéntrese en rutas locales a destinos vecinales

- b. Rutas regionales: concéntrese en las rutas de toda la ciudad para que las personas hagan viajes más largos
- Por lo general, las instalaciones para bicicletas más cómodas también cuestan más dinero para construir y mantener. Pensando en nuevas instalaciones para bicicletas, ¿cuál crees que es más importante?
 - g. Costo: concéntrese en agregar rayas y letreros para asegurarse de que la ciudad pueda agregar tantas millas de carriles para bicicletas como sea posible
 - h. Comodidad: concéntrese en construir proyectos que hagan que andar en bicicleta sea más cómodo, incluso si eso significa menos proyectos.
- ¿Qué otros comentarios le gustaría compartir con nosotros? (Abierto)
- Las siguientes preguntas están destinadas a ayudar a la ciudad de Phoenix a comprender si está compartiendo información. Por favor responda honestamente.
 1. ¿Sabe cómo reportar problemas de mantenimiento de calles a la Ciudad de Phoenix?
 - a. Sí
 - b. No
 2. Cuando hay un proyecto de calles para bicicletas o peatones en mi vecindario, ¿pueden encontrar información sobre el proyecto y dar su opinión?
 - a. Sí
 - b. No
 3. ¿Ha informado alguna vez sobre un problema de la calle a la ciudad de Phoenix?
 - a. Sí
 - b. No
 4. Si la respuesta es afirmativa, ¿Estuvo satisfecho con el resultado?
 - a. Sí
 - b. No

Cuéntanos un poco más sobre ti...

1. Edad
 - a. 18 and under
 - b. 19-29
 - c. 30-39
 - d. 40-49
 - e. 50-59
 - f. 60-69

g. 70+

2. Raza y etnicidad

- a. Asiático / Isleño del Pacífico
- b. Negro
- c. Nativo americano
- d. Blanco
- e. Hispano/Latino de cualquier raza

3. Género

- a. _____

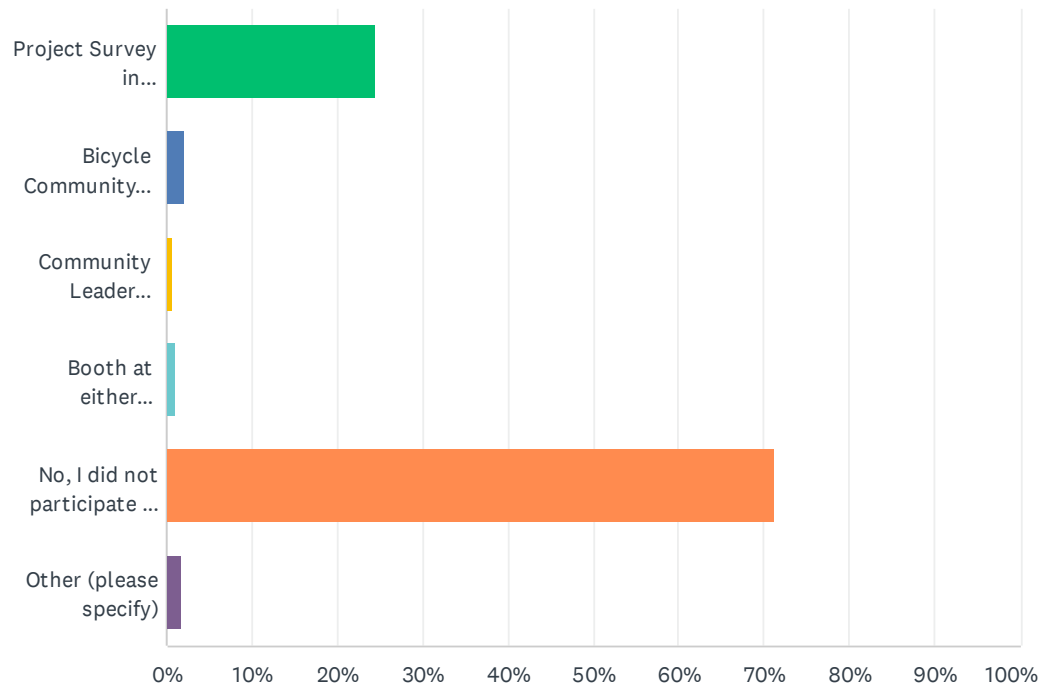
4. Ingresos del hogar

- a. Under \$35k
- b. \$36-65k
- c. \$66-100k
- d. \$100k - \$200k
- e. \$200k+

Appendix B: Draft Plan Survey Responses

Q1 Did you participate in the original project survey or project interviews?

Answered: 180 Skipped: 0



ANSWER CHOICES	RESPONSES	
Project Survey in Winter/Spring 2022	24.44%	44
Bicycle Community Interviews	2.22%	4
Community Leader Interviews	0.56%	1
Booth at either Roosevelt Row First Friday or Laveen BBQ	1.11%	2
No, I did not participate in the past.	71.11%	128
Other (please specify)	1.67%	3
Total Respondents: 180		

#	OTHER (PLEASE SPECIFY)	DATE
1	I was not aware of the survey previously.	1/5/2023 6:02 PM
2	It happened so fast I didn't an opportunity.	1/5/2023 6:00 PM
3	I do not think so.	12/14/2022 3:19 PM

Q2 If you are interested in walking or biking more in Phoenix, what changes would encourage you walk or bike more?

Answered: 159 Skipped: 21

#	RESPONSES	DATE
1	less hostile traffic conditions. slower vehicles. More shade	1/16/2023 12:25 PM
2	Slower auto traffic. More dedicated bus and bike lanes. Signal priority at lights and intersections for non motor vehicles.	1/8/2023 10:54 AM
3	None	1/8/2023 7:51 AM
4	If you actually built good infrastructure instead of saying cars are more important than human lives	1/7/2023 1:16 PM
5	Elevated bike paths, roundabouts for 2 lane streets	1/6/2023 6:56 PM
6	It is fine the way it is.	1/6/2023 4:30 PM
7	N/A	1/6/2023 4:05 PM
8	Not	1/6/2023 3:36 PM
9	N/A	1/6/2023 3:10 PM
10	As a handicap walker sudden dips in sidewalks and uneven pavement make it hard to walk/navigate	1/6/2023 2:33 PM
11	None	1/6/2023 1:24 PM
12	I am interested in safer streets for driving.	1/6/2023 1:22 PM
13	No. Get rid of homeless squatters in city parks.	1/6/2023 10:12 AM
14	Face it, MAJORITY of people will not use bikes as their primary transportation. Money could be better spent finding a solution to the HOMELESS crisis in the valley. (Our streets look like garbage cans, worse than the poor parts of Mexico, it's an embarrassment and disappointment to tax paying citizens.)	1/6/2023 8:30 AM
15	Nothing.	1/5/2023 9:49 PM
16	None. We don't need anymore for the amount of people who use bicycles as their mode of transportation to work etc.	1/5/2023 9:40 PM
17	No.	1/5/2023 9:18 PM
18	Water stations.	1/5/2023 8:51 PM
19	Parks with walkways and bike paths not on the road	1/5/2023 8:39 PM
20	Safer biking	1/5/2023 7:18 PM
21	Not interested in adding any bike lanes and less streets are actively widened. I do not want any car lanes taken away.	1/5/2023 6:47 PM
22	None of these changes would cause me to walk more than I already do.	1/5/2023 6:02 PM
23	We already walk when we can. Many other people do not. Changing the streets doesn't change people.	1/5/2023 6:00 PM
24	Fewer abandoned mental patients living homeless in outdoor bus shelters and the proposed shade structures. I drive because I can lock my car. I'd kive to know why the City pours money into bike lanes that rarely carry a single cyclist but cannot scrape up ten cents to find housing for the mentally ill. I sense a prejudice against the disabled in this mis-prioritization of resources. Overbuilding facilities for healthy people while abandoning a huge disabled	1/5/2023 4:47 PM

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population to remain homeless may actually violate the Americans With Disabilities Act, under which the City is liable for damages.

25	Lower the temperature. I'm not biking when it's 100 degrees.	1/5/2023 3:20 PM
26	None, the current lanes are adequate	1/5/2023 3:19 PM
27	Protected bike lines, space between sidewalks and high-speed roads, lower speed limits	1/5/2023 3:02 PM
28	More physically separated bike lanes (with medians) in downtown. Turn Roosevelt Row into a public walkway and close the street to cars	1/5/2023 1:58 PM
29	Safer streets. More help with homeless population.	1/5/2023 11:22 AM
30	Safe places to ride a bike that is away from traffic.	1/5/2023 11:08 AM
31	Lowering speed limits on ALL streets, more bike lanes throughout the city not just downtown	1/5/2023 8:37 AM
32	More and better sidewalks. Riding on any road with distracted drivers is suicidal.	1/5/2023 7:28 AM
33	Current configuration is fine	1/5/2023 6:18 AM
34	None. Leave us alone. You quit driving if that's what you want.	1/5/2023 6:12 AM
35	This is more of a seasonal activity in Phoenix.	1/4/2023 11:44 PM
36	Reduce crime and homelessness	1/4/2023 11:38 PM
37	Congested cities are not safe for biking and it is too hot to bike at least 4 months of the year.	1/4/2023 10:27 PM
38	More shade covering sidewalks, protected bike lanes, more bike parking.	1/4/2023 9:29 PM
39	I do not want to bike or walk. The weather is toooooo hot in Phoenix. This is a very BAD idea. Plus, it will create unnecessary traffic jams for features that will be minimally used.	1/4/2023 9:28 PM
40	More shade for pedestrians and more curb protected bike lanes all over the city	1/4/2023 8:36 PM
41	More Euro style bike/pedestrian protection. More public education regarding pedestrian and cyclists rights. Serious penalties for hitting/killing pedestrians cyclists.	1/4/2023 8:31 PM
42	I bike the canals and find them amply sufficient	1/4/2023 8:24 PM
43	Safer walk/bike routes with proper hygiene facilities available.	1/4/2023 8:07 PM
44	None	1/4/2023 8:06 PM
45	We need more paths/trails that aren't connected to roads. Like the trail around the Arizona Canal.	1/4/2023 8:00 PM
46	Make the streets more safe. Intersections typically house homeless encampments where drug use and other dangerous activities occur.	1/4/2023 7:24 PM
47	There are enough trails already without taking away from roads	1/4/2023 7:17 PM
48	Not to spend money on this project, if you do, reduce it. This was a mess In Seattle made traffic and accidents worse, and was not used due to hills and weather. It is too hot most of the year to safely bike.	1/4/2023 6:56 PM
49	Less mileage.	1/4/2023 6:52 PM
50	I am not interested in either of these. I walk and bike plenty as weather permits but it's too damn hot here for anything but driving at least six months out of the year.	1/4/2023 6:45 PM
51	More local and affordable businesses along the 32nd St corridor.	1/4/2023 6:37 PM
52	N/A	1/4/2023 6:33 PM
53	Clean up the homeless Street people problem, so we will feel safer to walk the streets	1/4/2023 6:30 PM
54	Parks, definitely not to work.	1/4/2023 6:19 PM
55	None. I can walk and bike fine as is.	1/4/2023 6:18 PM
56	I don't agree with this plan.	1/4/2023 6:18 PM

Phoenix Active Transportation Plan: DRAFT PLAN FEEDBACK

57	Get homeless out of underpasses and tunnels.	1/4/2023 5:59 PM
58	I'm not. Nobody is. We are a sprawling, spread out city. Not a congested communist pit you desire is to be.	1/4/2023 5:57 PM
59	Clean up the homeless population	1/4/2023 5:50 PM
60	More trails.	1/4/2023 5:46 PM
61	None	1/4/2023 5:39 PM
62	No	1/4/2023 5:35 PM
63	more convenient businesses	1/4/2023 5:31 PM
64	More parks to walk or bike to	1/4/2023 5:22 PM
65	To hot for walking and riding a bike!	1/4/2023 5:12 PM
66	Give them designated areas to operate and prioritize motor vehicle traffic in high density areas.	1/4/2023 5:11 PM
67	consistent sidewalks- there are a lot of spots that randomly end or are in bad condition. Same goes for bike lanes. Also, additional trees for shade and lighting for night time.	1/4/2023 5:11 PM
68	Not interested	1/4/2023 5:08 PM
69	Most interested in getting to my destination in my automobile!	1/4/2023 5:06 PM
70	It's fine how it is.	1/4/2023 5:05 PM
71	Lower taxes so fewer work hours would be necessary to pay bills	1/4/2023 5:00 PM
72	Republicans in office	1/4/2023 4:57 PM
73	If people want to bike more they can move back to CA.	1/4/2023 4:54 PM
74	Having more trains or some of train-like specific transportation, so that walking and biking would be a realistic and accessible approach. Doing all of these city wide improvements that focus on bike and pedestrian safety only work so well when you can't get to other parts of the city due to how expansive Phoenix is	1/4/2023 8:44 AM
75	More trees and more bicycling infrastructure	1/3/2023 11:16 AM
76	no	1/2/2023 5:29 PM
77	Protected bicycle infrastructure including solidly separated bike lanes like in Salt Lake City or at the very least flex delineators on major corridors. Additionally I walk a lot and the need for HAWKS or just anything to slow down drivers is critical. I also would like more shade especially in the summer, but the bigger threat to my life is drivers who do not think they have to stop for pedestrians.	12/29/2022 7:13 PM
78	Sidewalks	12/29/2022 1:40 PM
79	Improve intersection signals, many do not have a bicycle/pedestrian interface. Focus on the current users and what significant gaps they see in the infrastructure. /there are large safety gaps that currently exist that are not being addressed by this plan or other current processes/projects	12/29/2022 10:49 AM
80	Buffered lanes with shade	12/26/2022 8:00 AM
81	Slower speed limits and off street paths	12/21/2022 10:04 PM
82	Access to retail with Shaded sidewalks on streets with slower traffic.	12/17/2022 7:55 AM
83	Protected bike lanes, better connectivity, and improvements at intersections. Visibility isn't enough, cars NEED to be slowed down.	12/16/2022 6:03 PM
84	Better-connected routes, slower car traffic	12/15/2022 4:02 PM
85	Dedicated bike lanes that are protected.	12/14/2022 3:19 PM
86	Shaded walkways and fully protected bike lanes	12/13/2022 8:43 PM
87	More sidewalks (many areas do not have sidewalks or the sidewalks suddenly end) Greater	12/12/2022 7:54 AM

Phoenix Active Transportation Plan: DRAFT PLAN FEEDBACK

separation between sidewalks and streets (I'm originally from Milwaukee. The streets there follow this layout: traffic lanes, parked cars, 4ft strip of grass (berm/verge), sidewalk. When I first moved to Phoenix I was surprised to see that the sidewalks here are right up against fast, high traffic streets. More crosswalks Protected bike lanes Clearly marked bike lanes Lower speed limit in residential areas (the neighborhood I live in has 5 lanes of busy traffic. Walking along a narrow sidewalk with cars speeding past at 50 mph make me feel unsafe) Speed limit enforced with cameras and fines

88	The danger from cars is such a big risk, I find myself driving embarrassingly short distances because there is no way to safely cross the 6 lane stroad that separates me from the drug store or convenience store, etc. I used to love walking with my kids before we lived in Phoenix, but now our routes are very limited thanks to the car danger. Cars do not stop in marked crosswalks here, especially not on arterial roads. They also generally block the crosswalk at intersections and don't seem to look for pedestrians before turning on red. It is not physically possible to cross 6 lanes of traffic with small children during a gap in traffic. If there were those boulevard-style islands in the middle of the road at more places, it would give us a more protected place to wait for all the cars speeding through the crosswalk while we stand in the middle of the road and wait for another break in traffic. More access points and water crossings over the wash/canal trails would make them a more practical option for traveling safely while on bike or on foot too. Also I would love to see traffic lights give pedestrians that 2 second head start before any car traffic lanes get the green, since that seems to make pedestrians slightly more visible.	12/11/2022 6:34 PM
89	Sidewalks! My neighborhood for whatever reason doesn't have them. I would get out more with the kids, walk	12/8/2022 1:21 PM
90	More protected bike lanes, more sidewalks, more shaded sidewalks, beautification of walls with murals from local muralists, more street facing retail shops	12/8/2022 1:06 PM
91	Reduced speed. Increased education for drivers, bikers, and walkers. Enforcement.	12/8/2022 12:50 PM
92	More HAWKS and bike lanes.	12/8/2022 11:56 AM
93	Upgrade existing bicycle lanes; add new bicycle lanes where feasible.	12/8/2022 6:30 AM
94	Protected bike lanes, water stations on bike paths.	12/7/2022 2:27 PM
95	Safer, more abundant infrastructure for pedestrians and biking. Auto lane reductions and controlling traffic through better street design.	12/6/2022 4:02 PM
96	Definitely interested in biking more, as I'm an avid road cyclist. The city needs more cycling infrastructure like protected lanes, but we also need to educate drivers on the rights of cyclists. Not a day goes by that I don't have some motorist try to run me off the road or scream at me for NOT riding on the sidewalk.	12/6/2022 3:46 PM
97	More protected lanes and slower vehicle speed limits	12/6/2022 2:27 PM
98	Less emphasis on accommodating cars, stricter policing on cars for blowing stop lights, rolling through stop signs, etc. more designated bike lanes and safer pedestrian crossings.	12/6/2022 10:49 AM
99	Bicyclists are a hazard to motorists	12/6/2022 7:31 AM
100	more green space to make commuting paths cooler in the summer months	12/6/2022 4:05 AM
101	protected bike lanes, safer bike parking,	12/5/2022 10:46 PM
102	safe paths that are blocked off from cars. Stoplights that allow for fast crossing. Paths that have appropriate tree coverage so the path stays cool.	12/5/2022 9:35 PM
103	cycling paths AWAY from traffic	12/5/2022 8:03 PM
104	Better/more bike infrastructure.	12/5/2022 5:59 PM
105	I want low-level, easy routes where I know there will consistently be safe ways to cross big streets, shade, etc. There's a lot of changes I would like to see, but the thing that would make the biggest difference for both biking and walking is tons more HAWK crosswalks.	12/5/2022 4:06 PM
106	Walking. More Rapid/Express Transit to get me places where I don't need my car. Rapid transit to downtown Phoenix is great and it would be great to take it other places beyond DTPHX and not only during rush hour.	12/5/2022 2:58 PM

Phoenix Active Transportation Plan: DRAFT PLAN FEEDBACK

107	I'm more a cyclist than a walker. Cars remain my biggest concern on a bicycle - too many distracted drivers and too many disrespectful drivers (those that intentionally intimidate cyclists with their cars) remain primary blockers to my cycling more for transportation than for fitness/fun.	12/5/2022 1:33 PM
108	Develop inclusivity of safety, addressing barriers for people on wheelchairs, timing of street crossing lights, pavement condition on streets at crosswalks, transition of pavement at crosswalks (bulked), impose violation fees for the hundreds of rental scooters just left blocking on sidewalks. A new problem too is the tents being installed by the homeless on sidewalks.	12/5/2022 7:26 AM
109	More zebra painted cross walks, speed bumps through newer neighborhoods, multi purpose buildings (retail on bottom, living space above); have bus stops closer together	12/5/2022 12:46 AM
110	reduced speed limits in pedestrian areas	12/4/2022 8:15 PM
111	more protected bike lanes, or at least more buffered bike lanes. lower speed limits for motor vehicles on streets with just bike lanes or no bike lanes. Better signage fir existing bike infrastructure. Overall more protection for cyclists and pedestrians, stronger enforcement of motor vehicle speed limits.	12/4/2022 7:40 PM
112	More shade and improvements in safety infrastructure	12/4/2022 7:09 PM
113	Less interaction with motorized vehicles is required as Scottsdale has done with underpasses so bikers are not hit by vehicles.	12/4/2022 3:47 PM
114	Real bike lanes with a barrier between car traffic lanes and the bike lane, not just a painted line. More no right on red restrictions at intersections. More sidewalks that are kept in better condition.	12/4/2022 10:35 AM
115	Protected bike/walking lanes along major roads	12/3/2022 3:40 PM
116	I walk more than I bike. My neighborhood has people parking on the sidewalk. Children going to school and others walking have to go out in the street to get past vehicle's parked on the sidewalk.	12/3/2022 8:54 AM
117	More protected bike paths and more shade on side walks	12/3/2022 7:51 AM
118	There needs to be more of an incentive to walk. I live 10 minutes away from a Walgreens and would love to walk there, but I always choose to drive. Walking is not only dangerous, but also very uncomfortable. I can't have conversations during my walk, I have to use the same route as the cars, and there is no shade or barriers to protect me from danger. I recommend having seperate walking/biking paths that pedestrians can use to get where they are going. These paths would prioritize pedestrians and allow a comforting experience to travel or to just hang out.	12/3/2022 7:38 AM
119	Protected infrastructure, as long as there is a physical and immovable barrier I will feel safer walking (add STRONG, IMMOVABLE bollards) or cycling (add jersey barriers to test routes or separate with plants/shade trees). I think road's need to go on diets and make it so people don't feel free to go as fast as possible just because the width of the road tricks their minds into thinking "it's ok because it's like a freeway" Central Ave needs a diet from the very south to the very north.	12/2/2022 9:18 PM
120	Safer street crossings, more bike lanes, smarter bike lanes connecting residential to businesses and commercial, otherwise where are we biking? More RED LIGHT CAMERAS.	12/2/2022 2:46 PM
121	Continue detached sidewalks. Have more safe ways across freeways.	12/2/2022 1:17 PM
122	Lower enforced speeds, speed cameras, traffic light cameras, total ban on right turn on red, bike parking facilities, and protected bike lanes.	12/2/2022 1:08 PM
123	Enforce traffic laws for cars. Speeding. Red light running. Driving in bike lanes. Running through HAWKs. Ignoring stop signs. I never see traffic stops, and there is no camera enforcement.	12/2/2022 1:04 PM
124	Bikers act as if they own the road rather than sharing with cars - bikers on central Avenue make rush hour impossible and yet they are struggling to bike up the road, get some practice in and attempt to keep up with the flow of traffic rather than crawling along and swerving around in the lane so that cars cannot pass through	12/2/2022 8:17 AM
125	Protected Bike Lanes and Safer Road Crossings.	12/2/2022 6:46 AM

Phoenix Active Transportation Plan: DRAFT PLAN FEEDBACK

126	car-free roads	12/2/2022 12:53 AM
127	I am very interested in both when temps are acceptable. Shaded buffered bike and bed paths. I think they are called multi use pathways.	12/1/2022 9:34 PM
128	I am interested in walking more than biking. I would like more shaded sidewalks. I would rather drive than ride a bicycle	12/1/2022 9:22 PM
129	Shaded pedestrian walkways, or, at the very least, shade structures or trees placed on the corners of the busiest intersections, where pedestrians often have to wait for long periods while they wait for the traffic lights to cycle through. Protected bike lanes are the single most effective option for encouraging more biking.	12/1/2022 8:50 PM
130	Biking more, where safer side streets are used. Walking more if there were more shade walking to and from Light Rail or bus stops.	12/1/2022 6:34 PM
131	protected bike lanes where I bike	12/1/2022 3:35 PM
132	Completion of Colter Street bike lanes to provide a safe east/west alternative route; Improved safety at the canal crossing at 40th & Camelback; Improvements to overpass bridges such as at Campbell to make them more bicycle friendly; Enforcement of no loitering/homeless in underground tunnels and bridges - (this is very expensive infrastructure and not the place for this/creates safety concerns for users); Paved multi-use path or bike lane on Lincoln from 24th to 32nd Street; Connecting the uptown area to the 3rd/5th Ave bike lanes to create a safe route all the way through to downtown.	12/1/2022 3:20 PM
133	Protected bike lanes, consistent cleaning of debris from bike lanes	12/1/2022 2:57 PM
134	More protected bike lanes, traffic calming, safer pedestrian/bike crossings.	12/1/2022 2:45 PM
135	be less hot outside	12/1/2022 2:17 PM
136	Protected Bike/Pedestrian Lanes Ped/bike bridges Bike paths	12/1/2022 12:32 PM
137	Protected bike infrastructure, lowered speed limits, protected crossings — and ENFORCEMENT. I cannot stress how important enforcement is to making changes such as these work. If people can park in bike lanes with impunity, speed with no consequences and place pedestrians in danger without repercussions	12/1/2022 12:11 PM
138	Real traffic enforcement, lower speed limits, red light cameras. Literally everything is needed.	12/1/2022 12:10 PM
139	Protected Bike lanes, wider sidewalks, MORE SHADE, traffic calming	12/1/2022 11:53 AM
140	Protected, separate bike lanes are the absolute biggest thing preventing me from cycling more in Phoenix. After that shade and drainage would be a priority as well, as well improvements to the existing trails, the canal trails in particular, they could really use more lighting and paved routes.	12/1/2022 11:15 AM
141	Lower driving speed limits, fewer car lanes, and barriers between lanes.	12/1/2022 9:58 AM
142	more efficient light rail, established protected bike lane network, more shade for walking	12/1/2022 1:11 AM
143	Protected bike lanes, more public transit, less priority of cars in the city	11/30/2022 11:31 PM
144	i wish there was less noise and air pollution and it was less hostile to be outside without being in a car	11/30/2022 9:57 PM
145	Safety. Too many criminal transients and drug addicts to safely walk or ride	11/30/2022 9:35 PM
146	walking, separation barriers between cars and pedestrians/bikers	11/30/2022 6:45 PM
147	Decrease homelessness so streets are safe and bikes don't keep getting stolen. Expand sidewalks so they aren't only big enough for a single person at a time. Enforce traffic rules in high density areas.	11/30/2022 6:23 PM
148	More interested in biking because everything is so far apart for walking in a lot of phoenix.	11/30/2022 6:06 PM
149	More continuous bike lanes, we have a lot of forgotten lanes where they just randomly end, how can we contribute and report these? Sometimes it seems like there's such a disconnect between our bike lanes and people that actually ride bikes, that's not a blanket statement, we have some great routes but we also have some weird ones that could use a little help. More	11/30/2022 3:16 PM

Phoenix Active Transportation Plan: DRAFT PLAN FEEDBACK

guarded bike lanes and buffered bike lanes, the 15th ave buffered addition is great, the Fillmore addition is lovely, the 3/5th additions are great. Better routes on quieter streets, there's no business having a bike lane on 16th, invest in 12th st. and the related lower vehicular traffic routes. The major through streets are always going to have higher speed limits which I know is hard to reduce or get people to comply with, invest the streets that'll work instead of trying to bend the major streets to work.

150	Protected bike lanes! Sharrows and bike lanes next to street parking are even more dangerous than having nothing at all. They give newer riders false confidence and can lead to more accidents. The priority NEEDS to be on protected bike lanes.	11/30/2022 1:54 PM
151	Road Diets, Reducing Speed Limits Citywide, Reducing traffic lanes and utilizing them for buffered bike lanes and/or extend curbs and widen sidewalks to create raised protected bike lanes which improve safety, reduce accidents and ensure accessibility for everyone. Lane conversion allows for additional area for shade trees or shade structures, increased public transportation, and economic benefits all while improving traffic, not adding to it.	11/30/2022 11:49 AM
152	Have you heard of Sunday Parkways in Portland, OR? Community events like that!	11/30/2022 11:47 AM
153	Separated/protected bike lanes, and bike crossing signals. I use the bike lane traveling west on Oak St to 3rd St, and I'm not sure how to safely turn south onto 3rd Street. There's no bike signal or stop sign for oncoming 2-way traffic. Luckily traffic has been light the times I was there but it makes me wary of biking there in the future. Also, the 3rd/5th Ave bike lanes were full of debris from cars running into/over the barriers and breaking them.	11/30/2022 11:42 AM
154	Road diets, protected bike lanes, speed enforcement, improved pedestrian crossing (i.e. delayed left turn arrows, no turns on red).	11/30/2022 9:11 AM
155	Unfortunately there is not much I can walk to in my area. The newest business about to be added nearby is a used car dealership on McDowell near 41st Place, which the zoning will be changed to accommodate if the project is approved. So I would say that part of the larger picture is what zoning changes the city is approving. There's very little to walk to near me, including all along McDowell (which has lots of car washes, tire shops, etc.), and this zoning change will likely have a negative effect for many years to come, as I don't think restaurants, coffee shops, etc. will be eager to place themselves near something like a car dealership that doesn't draw in any pedestrians or neighbors. This is obviously a larger conversation beyond the active transportation plan. Additionally, McDowell Road from 40th Street to 44th Street (which is the closest area to my home) appears to be one of the worst stretches of road in the area for traffic fatalities/serious injuries (9 in the last 5 years based on city data), so it doesn't feel like a great area to walk around. Two other stretches of McDowell west of me (before you reach downtown) are also hot points. Overall, McDowell could use some improvement when it comes to safety and also zoning/development. I do very much enjoy walking when I'm able to do so! Particularly when visiting Downtown Phoenix, where I feel safe getting around on foot. I find that cars are more likely to be looking for pedestrians than cyclists. And because as a pedestrian I am grade-separated from cars, it feels much safer. I love biking and now get around primarily by e-bike. The biggest hurdles to biking are the lack of safe infrastructure/necessity to ride close to fast-moving traffic, dominant car culture/aggressive attitude towards cyclists, and also lack of shade (especially May to September). I try to choose the best routes but there aren't always great options. Commuting all around town, I'd say my least favorite stretch of road I have to use regularly is 40th Street between McDowell and Camelback, as it has about 7,000 cars per day (according to data from 2015) and the bike lane is narrow and unprotected, with most cars driving over 40mph. I don't feel super safe on this route but try to reassure myself that only 3% of car/bike crashes happen in bike lanes (based on 2019 city data).	11/29/2022 11:21 PM
156	More safe routes to destinations that I actually want to go to	11/29/2022 9:21 PM
157	More infrastructure for safe and wide enough bike lanes through popularly ridden streets. Also, for the lanes to remain clear of debris.	11/29/2022 6:35 PM
158	For walking - more shaded sidewalks. More sidewalks in general. And more shops and restaurants in walking distance to my home. For biking - I am scared to bike because drivers in Phoenix are fast and aggressive.	11/29/2022 4:46 PM
159	Vegetation barriers between cars and pedestrians/cyclists would make the streets much more walker/biker friendly while trees could provide shade and better air quality.	11/29/2022 4:10 PM

Q3 What is your most important active transportation priority (i.e., more sidewalks, safer roadway crossings, protected bicycle facilities, etc.)?

Answered: 164 Skipped: 16

#	RESPONSES	DATE
1	safer roadway crossings, protected bicycle lanes, road bollards to discourage 4-wheeled vehicle operations and increase pedestrian confidence	1/16/2023 12:25 PM
2	Safety, convenience, accessibility	1/8/2023 6:17 PM
3	How about maintaining the sidewalks and protected bike lane we have now? And attached sidewalks on arterial roads is unacceptable. More of the same isn't getting us anywhere to vision zero goals.	1/8/2023 10:54 AM
4	Wider lanes for automobiles, traffic laws enforced for bicycles	1/8/2023 7:51 AM
5	Make driving a car in Phoenix more difficult	1/7/2023 1:16 PM
6	More busses, bus stops, wheelchair access in bike paths	1/6/2023 6:56 PM
7	N/A	1/6/2023 4:05 PM
8	Better roads	1/6/2023 3:36 PM
9	Better public transportation More police presence at crosswalks to arrest drivers who don't yield to pedestrians	1/6/2023 3:10 PM
10	Safer sidewalks	1/6/2023 2:33 PM
11	More sidewalks	1/6/2023 1:24 PM
12	Fix the damn roads you currently have.	1/6/2023 1:22 PM
13	Repair existing streets . Reduce light rail funding	1/6/2023 10:12 AM
14	Keep existing sidewalks clear of debris (rocks, plants, garbage)	1/6/2023 8:30 AM
15	Putting these recreational uses in other places that don't interfere with roads.	1/5/2023 9:49 PM
16	N/A	1/5/2023 9:40 PM
17	Traffic lights synched for vehicles and more pull out lanes for buses	1/5/2023 9:18 PM
18	Driving a vehicle	1/5/2023 8:51 PM
19	Street repairs for auto transportation	1/5/2023 8:39 PM
20	Safer roadway crossings	1/5/2023 7:18 PM
21	My most important, active transportation priority is being able to drive where I want without excessive traffic	1/5/2023 6:47 PM
22	Phoenix has a great layout of sidewalks and bike paths that are already very underutilized. It is very hot here in the summer months and we rarely see people walking or biking. "Safer" bike paths will not increase usage and will be a waste of taxpayer dollars.	1/5/2023 6:02 PM
23	I think Phoenix is already well structured and the existing walking paths and bike lanes don't see that much activity. Adding more is nothing but a waste of tax dollars.	1/5/2023 6:00 PM
24	Crosswalk safety is vitally important. Many intersections are poorly lit and motorists enter crosswalks, not seeing pedestrians attempting to cross.	1/5/2023 4:47 PM
25	More sidewalks.	1/5/2023 3:20 PM
26	Protected bike lanes would make it safer for bikers and walkers alike	1/5/2023 3:02 PM

Phoenix Active Transportation Plan: DRAFT PLAN FEEDBACK

27	Safer bike routes	1/5/2023 1:58 PM
28	Do not restrict car lanes. It will achieve only congestion and more smog.	1/5/2023 1:44 PM
29	Safer crossings	1/5/2023 11:22 AM
30	Safer Roadway Crossings	1/5/2023 11:08 AM
31	More car lanes	1/5/2023 8:55 AM
32	Lowering speed limits	1/5/2023 8:37 AM
33	Sidewalks sidewalks sidewalks	1/5/2023 7:28 AM
34	Protected bike facilities	1/5/2023 6:18 AM
35	Actual streets. For driving.	1/5/2023 6:12 AM
36	Less traffic. So if this is something that will influence traffic in a negative way then we need to circle back and think when this would be utilized. An example would be it will be utilized more in fall and winter.	1/4/2023 11:44 PM
37	Increase number of lanes for cars. Build sidewalks. Bicycles are for spandex wearing chumps!	1/4/2023 11:38 PM
38	Repair Phx highways, too many pot holes, it's worse than ever. Bike lanes are a WASTE of taxpayer dollars, invest in electric car charging stations instead.	1/4/2023 10:27 PM
39	Protected bine lanes	1/4/2023 9:29 PM
40	Safer roadway for vehicles	1/4/2023 9:28 PM
41	Protected bike lanes	1/4/2023 8:36 PM
42	more sidewalks with integrated bike path I would also like to see the heat level lowered by painting streets and roof tops white	1/4/2023 8:31 PM
43	More lanes for cars	1/4/2023 8:24 PM
44	Cost and usage effectiveness	1/4/2023 8:07 PM
45	No traffic	1/4/2023 8:06 PM
46	More lanes for cars. Almost no one bikes. There is already a serious traffic issue in the Phoenix area. Are you seriously considering CLOSING vehicle lanes?!?	1/4/2023 7:44 PM
47	Updating & expanding infrastructure to accommodate growth in the valley and the fact that people are having to move further out for affordability. Our roads and highways are already congested, fix that, not complicate a system that cannot handle current conditions.	1/4/2023 7:26 PM
48	N/A	1/4/2023 7:24 PM
49	Efficient and sufficient roadway space to handle car traffic	1/4/2023 7:17 PM
50	Safe road crossings in areas with high accident rates	1/4/2023 6:56 PM
51	Timed red lights.	1/4/2023 6:52 PM
52	Driving lanes.	1/4/2023 6:45 PM
53	Safer roadway crossings	1/4/2023 6:37 PM
54	Easy, unimpeded and well-managed flow of traffic and bikes/pedestrians	1/4/2023 6:33 PM
55	More sidewalks	1/4/2023 6:30 PM
56	More expressways, more sidewalks, more traffic lanes.	1/4/2023 6:26 PM
57	Better roads, more lanes and separated bike lanes	1/4/2023 6:19 PM
58	None	1/4/2023 6:18 PM
59	Please leave the roads alone.	1/4/2023 6:18 PM
60	None. We don't need to waste money on this stuff. There are higher properties such as homelessness etc	1/4/2023 5:59 PM

Phoenix Active Transportation Plan: DRAFT PLAN FEEDBACK

61	Less vehicle traffic.	1/4/2023 5:57 PM
62	Safer better maintained roadways and crossings	1/4/2023 5:51 PM
63	Trying to get around the homeless camps	1/4/2023 5:50 PM
64	Safe roads.	1/4/2023 5:46 PM
65	Mone	1/4/2023 5:39 PM
66	Avoiding do gooder efforts that only further ensnarl traffic so people can feel good about themselves while harming the greater mass of commuters	1/4/2023 5:35 PM
67	more courteous drivers - nothing that involves any expenditure	1/4/2023 5:31 PM
68	More diving lanes for cars. Rush hour congestion is ridiculous. How can such a new city have such bad traffic?	1/4/2023 5:22 PM
69	Safer roadways better street surfaces!	1/4/2023 5:12 PM
70	Less motor vehicle congestion.	1/4/2023 5:11 PM
71	more, and wider, sidewalks	1/4/2023 5:11 PM
72	Better roadways	1/4/2023 5:09 PM
73	Safer roads for vehicles. There's almost no bicycle travel. This will cause congestion, angry motorists, and more accidents.	1/4/2023 5:08 PM
74	Available motor vehicle lanes	1/4/2023 5:06 PM
75	Most interested in getting to my destination in my automobile!	1/4/2023 5:06 PM
76	More sidewalks are fine.	1/4/2023 5:05 PM
77	Less homelessness and crime around light rail stops	1/4/2023 5:00 PM
78	Less traffic not more	1/4/2023 4:57 PM
79	Stop the building in metro Phoenix.	1/4/2023 4:54 PM
80	Trains; Our city is expanding at a rapid rate that cannot be sustained by adding lanes on roads. If Phoenix wants a realistic and active transportation strategy that can be easily accessible to all while still cutting down on congestion and pollution then some form of train transport needs to be considered. Whether that be trolley/street car, and/or a high speed commuter train that runs in the median between freeways. Ultimately less cars on the road means a more pedestrian and bike friendly city as it means safer sidewalks and bicycle lanes. Especially when in 2020 AZ had the 6th highest pedestrian fatality rate in the country. We are not a pedestrian friendly city, because we do not offer an effective public transit system that works throughout the city.	1/4/2023 8:44 AM
81	Less money towards car-centric roads and more money towards tree shade and bicycle infrastructure	1/3/2023 11:16 AM
82	none	1/2/2023 5:29 PM
83	Frequent crossing points for pedestrians and bicyclists. It's not a system safe for us if we have to walk or bike a mile out of our way to go anywhere.	12/29/2022 7:13 PM
84	More sidewalks	12/29/2022 1:40 PM
85	Updating current roadways that have no sidewalk or bike lanes.	12/29/2022 10:49 AM
86	Crossings	12/26/2022 8:00 AM
87	Safer roadways	12/21/2022 10:04 PM
88	Safer sidewalks with shade and slower traffic.	12/17/2022 7:55 AM
89	Safer roadway crossings is most important for saving lives.	12/16/2022 6:03 PM
90	Protected bicycle facilities, more shade	12/15/2022 4:02 PM

Phoenix Active Transportation Plan: DRAFT PLAN FEEDBACK

91	Protected sidewalks, bike paths, and parallel parking to be a buffer for restaurants on 7th street from McDowell to Thomas.	12/14/2022 3:19 PM
92	Protected bike lanes	12/13/2022 8:43 PM
93	My greatest priority is safety, such as safer sidewalks and bike lanes.	12/12/2022 7:54 AM
94	Safer crosswalks	12/11/2022 6:34 PM
95	Sidewalks	12/8/2022 1:21 PM
96	Protected bicycle paths	12/8/2022 1:06 PM
97	Speed reduction. Cushion space between sidewalks and roads. Travel safety education.	12/8/2022 12:50 PM
98	Safer crossings	12/8/2022 11:56 AM
99	Protected bicycle lanes	12/8/2022 6:30 AM
100	Protected bike lanes, bike cages or lockers.	12/7/2022 2:27 PM
101	Bike facilities accessible for all ages and abilities.	12/6/2022 4:02 PM
102	More bike lanes.	12/6/2022 3:46 PM
103	Slower vehicle speed limits and improved bicycle/pedestrian crossings at intersections	12/6/2022 2:27 PM
104	Safer roadway crossings and protected bike lanes	12/6/2022 10:49 AM
105	police enforcement of traffic laws	12/6/2022 7:31 AM
106	actions that promote bicycle commuting	12/6/2022 4:05 AM
107	protected bike lanes	12/5/2022 10:46 PM
108	protected bike lanes and favorable crossings	12/5/2022 9:35 PM
109	shade spots and protected cycling paths	12/5/2022 8:03 PM
110	protected bike infrastructure	12/5/2022 5:59 PM
111	HAWK crosswalks. They would be most useful if we designed them thoughtfully to form consistent routes to walk on small neighborhood streets.	12/5/2022 4:06 PM
112	Safer roadway crossings	12/5/2022 2:58 PM
113	Protected cycling lanes and paved, maintained, improved greenway/canal paths.	12/5/2022 1:33 PM
114	All of the above mentioned as part of question.	12/5/2022 7:26 AM
115	All of it!!	12/5/2022 12:46 AM
116	pedestrian safety	12/4/2022 8:15 PM
117	Protected bike lanes—separate bicycles and pedestrians from high speed motor vehicles.	12/4/2022 7:40 PM
118	more sidewalks and scenic walks, safer roadway crossings and intersections.	12/4/2022 7:20 PM
119	Safer roadway crossings and protected bicycle facilities	12/4/2022 7:09 PM
120	Safer crossings, protected right of use.	12/4/2022 3:47 PM
121	safer roadway crossings	12/4/2022 10:35 AM
122	Safer roadway crossings	12/3/2022 11:19 PM
123	Protected bike/walking lanes for safe transportation	12/3/2022 3:40 PM
124	Safer roadway crossings.	12/3/2022 8:54 AM
125	Bike paths	12/3/2022 7:51 AM
126	Not just more sidewalks, but also wider sidewalks. Sidewalks with beautiful trees between pedestrians and cars to not only protect pedestrians but to beautify the roads/ streets. I see aggressive driver on the road every day. Many of them run through red light intersections. Red	12/3/2022 7:38 AM

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light cameras are good but there needs to be better infrastructure to not allow cars to reach fast speeds in the first place. And definitely protected bike lanes. Not just space or cones but an actual barrier to deincestivise cars from driving where bikes are.

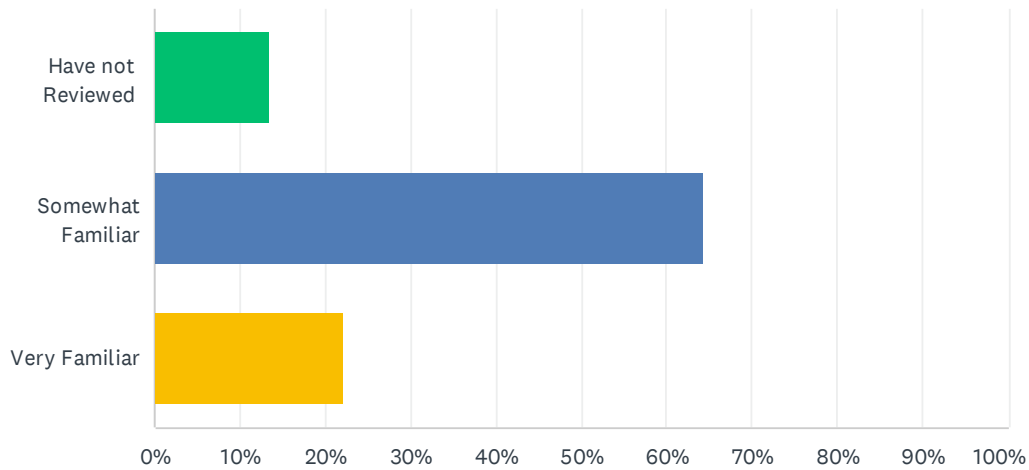
127	Safer road crossings, I see too many oversized trucks ride the curb while turning which can be deadly to pedestrians waiting for a light change. Ban right on red.	12/2/2022 9:18 PM
128	Protected bike lanes, then red light cameras and safer roadways.	12/2/2022 2:46 PM
129	safer roadway crossings	12/2/2022 1:17 PM
130	Protected bike facilities.	12/2/2022 1:08 PM
131	Slower cars. I avoid some bike lanes because the cars are faster there. For example, 11st in Garfield and the new Oak Street in Coronado. The side roads are safer because the cars are slower. The infrastructure doesn't matter until we slow the cars and get motorists to obey the traffic laws.	12/2/2022 1:04 PM
132	Protected Bike Lanes and Safer Road Crossings.	12/2/2022 6:46 AM
133	Zoning reform to encourage mixed use nearby dense residential shifting focus away from car-dependency	12/2/2022 12:53 AM
134	I love the canal pathways. I think they should be paved/improved and if we can go UNDER the roadways instead doing HAWKS to cross, I can really get moving across town. For example Biltmore to Sun city is 1 hour on my bike. Thats a lot of ground in a short amount of time because of those canal tunnels.	12/1/2022 9:34 PM
135	More sidewalks, safe roadway crossings.	12/1/2022 9:22 PM
136	Pedestrian improvements, including more sidewalks and pedestrian bridges, more signaled crosswalks and more shade structures/trees.	12/1/2022 8:50 PM
137	Protected bike facilities and safer crosswalk sites that do not recall a pedestrian to walk half a mile or more to the next stoplight.	12/1/2022 6:34 PM
138	protected bike lanes, safer roadway crossings and less stupidity and rushing on the part of automobile drivers!	12/1/2022 3:35 PM
139	Improved bicycle infrastructure - bike lanes and protected bike lanes - in the central city/uptown area. Connect the Uptown area to the 3rd/5th Ave bicycle improvements to allow a safe commute all the way downtown.	12/1/2022 3:20 PM
140	Sidewalks AND protected bike lanes	12/1/2022 2:57 PM
141	Safer crossings and more protected bike lanes.	12/1/2022 2:45 PM
142	Safe Cycling Infrustructure	12/1/2022 2:17 PM
143	protected bicycle facilities	12/1/2022 12:32 PM
144	1.) Wider sidewalks, better insulated from traffic. I live on 16th Street, near a commercial node on Bethany Home and can walk to a lot of amenities. It's not a pleasant walk, nor does it feel particularly safe (especially with my child) because there's near-highway speed traffic mere feet away whipping by us on the sidewalk. 2.) Protected bike lanes are a close second for all the reasons above. If I had a dollar for every time a driver cut me off to get ahead or nearly hit me because they didn't see (or didn't care), drinks would be on me.	12/1/2022 12:11 PM
145	Increase reliability and scheduling of transit intervals 15 minutes, not 30 minutes. Also, ensure all buses are equipped with 3 bike rack slots, not 2 (you never know if you're going to work and will get a slot on the bus as it could be a two racker or a three racker, no uniformity)	12/1/2022 12:10 PM
146	protected bike facilities	12/1/2022 11:53 AM
147	Protected bicycle facilities, protected bicycle lanes, and safer roadway crossings.	12/1/2022 11:15 AM
148	Fewer and narrower car lanes that share space with protected, wider bike lanes and sidewalks.	12/1/2022 9:58 AM
149	safer roadway crossings and more traffic lights downtown for local residents	12/1/2022 1:11 AM
150	Protected bike lanes	11/30/2022 11:31 PM

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151	all of the above: fewer cars	11/30/2022 9:57 PM
152	Safer area without mentally ill, criminal transients and drug pushers on the right of ways	11/30/2022 9:35 PM
153	Wider sidewalks	11/30/2022 6:23 PM
154	More sidewalks and safer bicycle facilities. A big reason I don't bike more places is because I had a bike stolen and it's really common here. Obviously there's a bigger problem of economic inequality and homelessness, but in the mean time some sort of protected bike racks with codes or something would be cool. Just an idea not sure how it would work- I would be willing to pay a small fee for that like a parking monitor	11/30/2022 6:06 PM
155	Protected bicycle routes and facilities	11/30/2022 3:16 PM
156	Protected bicycle facilities, safer crossings, bike boxes, less parking by mixed-use developments. It's not just about the bikes, all other forms of transportation benefit from better bike infrastructure.	11/30/2022 1:54 PM
157	Protected Bicycle facilities and a truly connected network, especially in Southwest Phoenix (estrella & laveen villages)	11/30/2022 11:49 AM
158	Community awareness and participation in active transportation	11/30/2022 11:47 AM
159	protected bicycle facilities	11/30/2022 11:42 AM
160	Protected bicycle facilities, roadway crossings, road diets, lower speed limits + enforcement.	11/30/2022 9:11 AM
161	protected bicycle facilities - whether that's a buffered lane or something safer	11/29/2022 11:21 PM
162	More sidewalks and protected bicycle lanes.	11/29/2022 6:35 PM
163	More sidewalks and shaded sidewalks.	11/29/2022 4:46 PM
164	Shaded sidewalks are very important. Especially in the summer months. Without shade, the heat can make it unbearable to walk.	11/29/2022 4:10 PM

Q4 How familiar are you with the Draft Plan and Plan Elements?

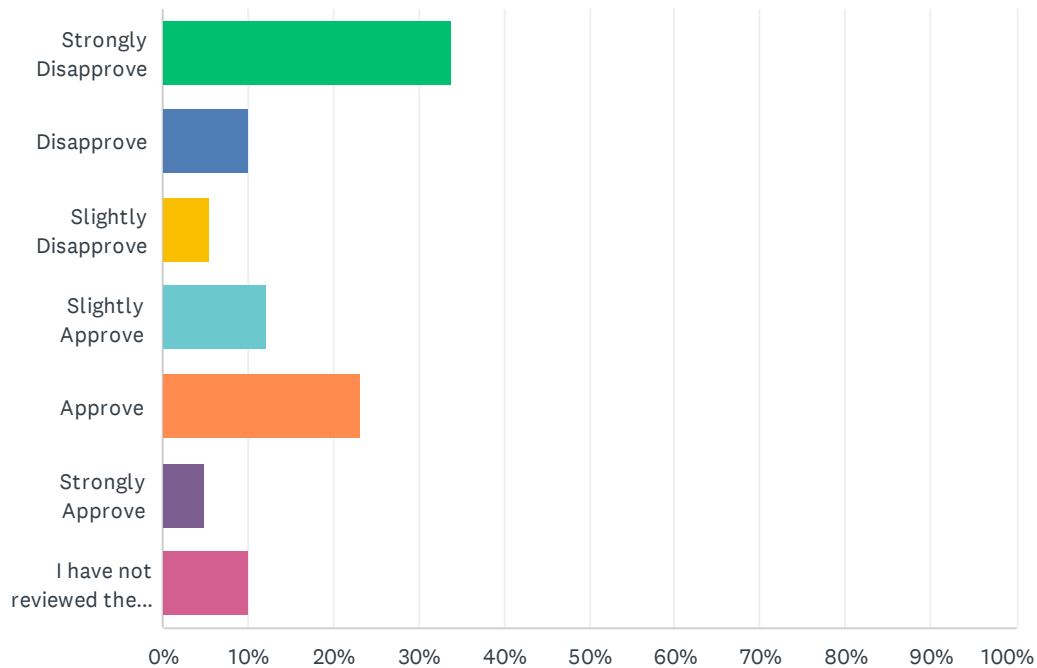
Answered: 180 Skipped: 0



ANSWER CHOICES	RESPONSES	
Have not Reviewed	13.33%	24
Somewhat Familiar	64.44%	116
Very Familiar	22.22%	40
TOTAL		180

Q5 How do you feel about the current Draft Plan and Plan Elements?

Answered: 180 Skipped: 0



ANSWER CHOICES	RESPONSES	
Strongly Disapprove	33.89%	61
Disapprove	10.00%	18
Slightly Disapprove	5.56%	10
Slightly Approve	12.22%	22
Approve	23.33%	42
Strongly Approve	5.00%	9
I have not reviewed the Draft Plan and Plan Elements	10.00%	18
TOTAL		180

Q6 Please share your comments on the Draft Plan and Plan Elements. For example, What do you like about the plan? What concerns do you have? What recommendations do you have?

Answered: 139 Skipped: 41

#	RESPONSES	DATE
1	hi, substituting asphalt, chip seal or tarmac with alternatives like concrete is conspicuously absent from the plan. A reduction in vehicle speed from traffic calming could make concrete a viable alternative. This would save the city tons of money on road maintenance.	1/16/2023 12:25 PM
2	I don't like the idea of making roads smaller and creating "speed Diets" or usage diets. The roads are congested enough and enough people will not bike, walk, take a bus or train to make these changes sustainable, to grow the city, nor encourage a healthy lifestyle. I drive around the city and vary rarely see anyone using any of the bike lanes.	1/8/2023 6:20 PM
3	Section 3 Objective 5 - YES to recommendation 5.2 – pilot use of NACTO city speed limit guide. Failing to slow cars down is malfeasance. Additionally, education is crucial to explain speed-related dangers and the proven benefits of lowering speeds. School crossing speed limits are 15mph with generally high compliance; drivers know slowing down is crucial for safety, and need to apply this knowledge to all streets. Section 3 Objective 7 – YES to recommendation 7.1 – process to include traffic calming in capital improvement projects. The Streets Department must also consider broad toolkit of self-enforcing design features/traffic calming beyond just speed humps and speed bumps (see West 5th Street in Tempe between Hardy and Farmer for an example of effective traffic calming). Recommendation 7.4 must be moved to medium or near term; we cannot afford to wait a decade on this when our city has so much ground to make up. Section 3 Objective 8 - Innovative and thorough community engagement is critical. Over 100,000 Phoenix households do not own a car. A few hundred out of 1.6 million people responded to the initial Active Transportation Plan survey. How will marginalized and vulnerable residents, such as busy working poor people, homeless constituents and non-English-speaking residents be sought out and included in network development? Posting a survey link on City social media accounts is not sufficient. The City must commit to studying the removal of single-family zoning and minimum parking requirements in order to make Phoenix more walkable and stop exacerbating the urban heat island effect, which this plan identifies as a key barrier to active transportation. Collaborate across departments and get things done. Appendix A page 5 - 85103/85013 zip code typo	1/8/2023 6:17 PM
4	It doesn't go far enough to really encourage people to replace motor vehicle trips in their everyday routines.	1/8/2023 10:54 AM
5	The draft plan focuses too much on non-automobile transportation, at the cost of making driving less safe.	1/8/2023 7:51 AM
6	More protected bike infrastructure, with hard protection, bollards, make the tough choices to actually make it safer instead of always bowing to cars instead of safety	1/7/2023 1:16 PM
7	Traffic maker, kills bikers, destroys businesses. Waste of money and lives	1/6/2023 6:56 PM
8	Will create too much vehicle traffic.	1/6/2023 4:30 PM
9	Not to move forward with this plan	1/6/2023 4:05 PM
10	Don't like taking away car lanes.	1/6/2023 1:24 PM
11	No one rides bikes for six months in the summer to commute. Less \$ on bike lanes, more \$ for street maintenance.	1/6/2023 10:12 AM
12	My concern is this is a waste of money for a minority of the population, it will bottleneck traffic (even more than current). As it is I loathe driving in downtown Phx because of light rail confusion, one way streets etc. Use the money somewhere else like homeless transition	1/6/2023 8:30 AM

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services and supporting our Police Department that are overloaded because of the terrible border enforcement.

13	The city should stop trying to manipulate behavior to force people out of their cars. People love their freedom of mobility and unencumbered ability to choose to access a number of destinations. Stop foisting your anti-car agenda on residents and taxpayers - cars are the greatest asset to the democratization of the freedom to mobility.	1/5/2023 9:49 PM
14	It's a ridiculous waste of money. It isn't complicated to figure out what problems this will cause with traffic etc. there aren't enough bicyclists that use this as their main mode of transportation to work etc. in Phoenix to warrant this, and you know it.	1/5/2023 9:40 PM
15	Phoenix is not laid out to be walkable or bikeable.	1/5/2023 9:18 PM
16	This will make traffic unbearable.	1/5/2023 8:51 PM
17	Repair roadways stop wasting money	1/5/2023 8:39 PM
18	I feel the current plan would back up traffic actually making biking more dangerous	1/5/2023 7:18 PM
19	I am not interested in adding anything to our transportation system that causes more traffic that gets backed up	1/5/2023 6:47 PM
20	My biggest concern is what a waste of money this will be. We have yet to see any significant use of the light rail system. Creating these specific lanes will reduce vehicle lanes and could cause even greater vehicle emissions.	1/5/2023 6:02 PM
21	The roads are well set up to manage traffic loads. Restricting them with the proposed modifications would be foolish. In the hot summer months, in particular, people will not want to walk or bike. By decreasing traffic lanes you will cause more traffic backups and increased emissions.	1/5/2023 6:00 PM
22	I recommend the City give tax incentives to landlords who take in at least one Section 8 recipient, and fund it by delaying the Active Transportation Plan implementation. Our existing investment in light rail and bus transportation is underutilized because of abandoned mental patients using them in place of housing. AHCCS can provide continuing care for the mentally ill, if those people have a home address somewhere. But keeping on a medication schedule and attending therapy is nearly impossible if one lives on the streets. This increases costs for AHCCS because patients are re-hospitalized in emergencies but are discharged right back to the condition of homelessness that interferes with their therapy and recovery. A plan to expand light rail service across Mesa, through Gilbert, and into developing communities southeast of the city met opposition this election season, specifically because voters understood that abandoned mental patients would come into their cities and live homeless along the route. Active transit and mass transit will remain underutilized and the capital already invested in those assets will appear to be a poor investment. The City must solve the problem of patient abandonment by working with landlords and charitable groups, to see that patients with serious mental illness have a safe place to live.	1/5/2023 4:47 PM
23	The answer is NOT to make life more difficult for drivers. We live in a desert! People need cars...not more bike lanes. Anything that causes more traffic congestion (like one lane roads bc you want to put in useless bike lanes) will cause MORE accidents. Also, bicyclists are often reckless and ignore traffic laws and cause most accidents. We need more enforcement and harsher penalties when they don't follow the laws. We also need to prosecute them when they injure pedestrians.	1/5/2023 3:20 PM
24	We do NOT need to take away car lanes. It is important that people can move about in cars and by wanting to remove car lanes is dangerous to the future of our city	1/5/2023 3:19 PM
25	I love that it takes a neighborhood approach and considers all types of active transportation users. My biggest hesitation to biking is that I don't want to ride down arterials like 7th Ave - it is so scary! It is also scary to walk on those sidewalks. Small measures will make a big difference.	1/5/2023 3:02 PM
26	I like that it calls out car culture in Phoenix. We need to stop seeing EVs as the solution (which only add to more cars on the road), and start incentivizing more public transportation and safer bikeways.	1/5/2023 1:58 PM
27	Ignores the need for easier flow of inevitable auto traffic.	1/5/2023 1:44 PM

Phoenix Active Transportation Plan: DRAFT PLAN FEEDBACK

28	We do not need smaller roadways. We don't need single lanes. We have enough traffic and it is only getting worse as more people move to AZ.	1/5/2023 11:22 AM
29	I would like to see Skunk Creek be connected in Phoenix to Glendale at the intersection of 51st Ave South of Beardsley. Let's take advantage of the Skunk Creek Riparian from 43rd Ave all the way to 51st Ave.	1/5/2023 11:08 AM
30	We have cars. Build more car lanes.	1/5/2023 8:55 AM
31	I think the plan will do a lot for the city and making transportation for all safer. I am concerned on some of the choices in focusing on a small area for overkill projects while neglecting other less "showy" concerns (ie., a huge bike lane with bollards on 3rd avenue with little traffic but super thin bike lanes on cave creek with cars traveling at 60+)	1/5/2023 8:37 AM
32	Stop destroying car travel lanes for less used bike lanes. I want a sidewalk to ride my bike on.	1/5/2023 7:28 AM
33	Any reduction to the number of lanes for vehicular traffic would have a negative effect on overall transportation	1/5/2023 6:18 AM
34	I want to see all public officials ride their bikes as a test program for 1 year and report back on how they like it. They can not drive anywhere. Not once!	1/5/2023 6:12 AM
35	Typical green new BS. This will increase traffic dramatically and the few who use the bike lanes will be harassed by vagrants and crime.	1/4/2023 11:38 PM
36	It is not realistic, will cause significant increase in traffic congestion and biking in the city is a hobby, not a viable mode of daily transportation, especially once temps are above 100 degrees.	1/4/2023 10:27 PM
37	Do not implement this.	1/4/2023 9:28 PM
38	Over all I think it's a good plan. I'd like to see benchmarks and goals made more concrete but it's a good start	1/4/2023 8:36 PM
39	I love the tree/shade Master plan.	1/4/2023 8:31 PM
40	It's been problematic in other cities, squeezing cars into bumper to bumper single lanes	1/4/2023 8:24 PM
41	Plan is lacking in any actionable detail. Costs, locations, priorities, public safety while using public transportation, racists and sexist prioritization through equity initiatives.	1/4/2023 8:07 PM
42	Trying to move a large metropolitan center away from a "car-centered culture" can have problems. Taking away lanes of roads to make metro-rail lanes or bike lanes can increase car congestion on streets. This will lead to increased traffic and increased idling in high traffic areas. Which in turn, will lead to MORE carbon emissions. Since part of the goal of the action plan is to REDUCE carbon emissions, such a result would be counterproductive. The board and the plan need to balance car travel with active travel, not just focus on active travel. Even with active travel improvements, many people in Phoenix will still have to travel by car to far away places (distance was a large barrier to active travel as mentioned in the plan). The Plan needs to recognize this and focus some of its funds to improving car travel. Also the plan needs to realize that Phoenixians who live in the "suburbs" will not receive the same benefit from this program as will those living in high populous places. Any benefits of this plan will highly favor those living in highly populated neighborhoods of Phoenix.	1/4/2023 8:00 PM
43	There is already a VERY serious traffic issue around Phoenix. Currently there aren't enough roads for all the vehicles. Traffic is a nightmare! PLEASE DO NOT close any vehicle lanes!!!!!! Do you understand that you will directly affect the increase in driver's rage and most likely push people to leave Phoenix because of this horrible proposal!?!?	1/4/2023 7:44 PM
44	Shared bike lanes impede auto traffic in high use roadways downtown. They result in safety issues and will make cycle less safe and auto travel less effective.	1/4/2023 7:24 PM
45	Don't do it, quit pushing agenda 2030 at taxpayers expense, for things not highly utilized.	1/4/2023 6:56 PM
46	You're idiots. You can't walk or ride bike 5-6 months out of the year!	1/4/2023 6:52 PM
47	I work downtown. Stop turning driving lanes into anything other than driving lanes!	1/4/2023 6:45 PM
48	Similar plans have been implemented in cities such as Washington DC, and the result has been clogged streets with bumper-to-bumper traffic. Phoenix is a commuter city and people are not going to give up their cars. This plan will only cause congestion and frustration. As a	1/4/2023 6:33 PM

Phoenix Active Transportation Plan: DRAFT PLAN FEEDBACK

commuter who lives in the suburbs but is frequently downtown for both work and recreation, I am against this plan.

49	Streets are congested enough	1/4/2023 6:31 PM
50	The bike lanes that were put in on third Street going towards downtown. Phoenix are unsafe and confusing. They are just as confusing as the suicide lanes on seventh Street and seventh Avenue. Furthermore, the confusion mix traffic backed up.	1/4/2023 6:30 PM
51	Please do not replace traffic lanes. Look for ways to implement bicycle lanes only where there is unused space. This will be a nightmare otherwise.	1/4/2023 6:26 PM
52	It will ruin our roads and create crazy congestion to focus more on biking and walking.	1/4/2023 6:19 PM
53	Please don't impede in traffic flow for walking and bicycles. There is ample other ways.	1/4/2023 6:18 PM
54	Money could be used for more urgent proposes. Very small percentage of population would benefit. I'm an avid cyclist and don't see the need	1/4/2023 5:59 PM
55	This will make vehicle traffic significantly worse, as it has everywhere else.	1/4/2023 5:57 PM
56	Don't need to increase the width of bike right of ways on the streets and reduce area for vehicles. Need to use surfaces that do not absorb heat to be re-radiated at night creating a bigger heat island.	1/4/2023 5:51 PM
57	Phoenix is too densely populated to give up traffic lanes. It made Washington DC a mess.	1/4/2023 5:51 PM
58	Please do not reduce the number of vehicle lanes, AT ALL.	1/4/2023 5:46 PM
59	There are not enough bicyclists to enact this policy. It will cause more wrecks and congestion. I recommend making a bike lane on the sidewalks and more bicycle trails.	1/4/2023 5:46 PM
60	These efforts make things worse in American cities. Just stop.	1/4/2023 5:35 PM
61	I don't like the idea of creating traffic bottlenecks to create bike paths	1/4/2023 5:31 PM
62	I have many concerns with how adding more bike lanes will impede traffic further and increase traffic accidents and first responder times.	1/4/2023 5:22 PM
63	Better streets!	1/4/2023 5:12 PM
64	I think the City is trying to minimize motor vehicle traffic under the agenda of inclusiveness. If a proper study was done, one would find that bicyclists rarely stay in their bike lanes. Removing traffic lanes in what the draft states as the 5th largest and fastest growing city is inane. The City needs to improve traffic flow for motor vehicles and spend less time worrying about pedestrian and bicycle traffic.	1/4/2023 5:11 PM
65	The plan will clog up the ability for people to move around in vehicles	1/4/2023 5:09 PM
66	Stop spending my money on this idiocy.	1/4/2023 5:08 PM
67	It lacks insight and a basic understanding of the vastness of the metro area and commuter needs	1/4/2023 5:06 PM
68	Don't reduce lanes on our streets. I pay taxes for streets to drive on, not to dodge bicycles. Consider us "old folks" that need to go to the doctor or lawyer. Downtown is already a maze to navigate with homeless camping on the streets and crapping there, too. Focus our dollars on cleaning the city, not making more room for "campers".	1/4/2023 5:06 PM
69	This is going to make commuting by vehicle take longer and create more traffic jams.	1/4/2023 5:05 PM
70	Taking traffic lanes away is idiotic	1/4/2023 4:57 PM
71	Do not implement it.	1/4/2023 4:54 PM
72	I like increasing of width of bike lanes and sidewalks. And adding more parking and loading zones. However, I'm worried that these improvements are only going to affect a small subsection of the population, and mostly for leisure rather than for accessibility and regular use.	1/4/2023 8:44 AM
73	The plan is good. But it's yet another plan and the City has put forth plans for more than a decade, which the streets department ignores. From the Shade Master (2010) to Complete	1/3/2023 11:16 AM

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Streets (2017), it is clear that the streets department leadership is hostile to shifting its focus from car-centric culture. If the City wants real change on this point, city management needs to change leadership in streets. It needs personnel that will actively shift the priority and budget requests from car-centric streets to tree shade and bicycle infrastructure. Until that happens, I'm afraid this plan that builds on years of other plans, will have as much to show 10 years from now as we currently have to show for the plans of the last 20 years.

74	The money is being wasted and could be used in better housing for the homeless I do not live in Phoenix but my tax dollars are being used.	1/2/2023 5:29 PM
75	There is a lot of good in the plan and I won't go into detail on that for the sake of time but know that it is passable. The issue is that Phoenix is so hostile in its design toward pedestrians and bicyclists that stronger action is required. Anticipatory warrants should be a short term action and we should be actively designing our streets to be safe for pedestrians and cyclists instead of reacting to their deaths. There is no reason this shouldn't be a short term goal. When Phoenix for instance allows parking in bike lanes, it is clear who the city prefers. The city has bent over backwards to make every aspect of life convenient for motorists while at the same time endangering the lives of cyclists and pedestrians throughout the city. The success of this plan is entirely dependent on the rollout of quickbuild plans. This is not enough to say that Phoenix should be a multimodal city. That has been done time and time again. The metric of success is the deployment of concrete protected bicycle infrastructure and frequent, safe pedestrian crossings. Protected intersections should be the norm. And the irony is while we have done a somewhat better job at the basics with Complete Streets in the exurban villages due to the new builds, it is still not enough as those are largely rural roads that still encourage speeding and dangerous driving behaviors.	12/29/2022 7:13 PM
76	More sidewalks	12/29/2022 1:40 PM
77	The timeline and scope is completely unacceptable and it does very little to address current safety issues. This plan does very little to close gaps. I appreciate the effort, but it doesn't even bring Phoenix to the same level as Scottsdale is already at.	12/29/2022 10:49 AM
78	Enhance and build on existing plans	12/26/2022 8:00 AM
79	Too long for laypeople to read, implementation will take too long.	12/15/2022 4:02 PM
80	Get as many urban designers on board as possible.	12/14/2022 3:19 PM
81	I like the focus on creating urban villages.	12/12/2022 7:54 AM
82	I love everything that's included so far. Although I think more traffic calming measures are needed in general. I wish that turn lanes that serve no purpose (ie in areas where there's no place to physically turn in either direction for 100s of yards) could be replaced with islands. It would calm traffic by reducing the perception that the roads are wide enough for extreme speeds, it could give pedestrians a place shelter from cars in crosswalks, and you could even plant some trees to reduce the heat island effect -- it's a win all around, at least in my opinion :)	12/11/2022 6:34 PM
83	I like the direction. Need more beautification points	12/8/2022 1:06 PM
84	HIN criteria too narrow and thus missing many areas of the city where accidents occur.	12/8/2022 12:50 PM
85	I believe the plan is well developed and comprehensive.	12/8/2022 6:30 AM
86	I am very encouraged by some improvements and plans for the Central Avenue light rail and pedestrian/bike bridge near central. I commute from west Mesa to downtown and can get most of the way safely by bicycle. This will allow a complete trip without encountering much auto traffic, if any.	12/7/2022 2:27 PM
87	The plan timeline is way too long. People are dying on the streets of our city due to poor infrastructure and street design. We can afford to wait any longer on improvements. Please prioritize people's lives and do it as soon as possible.	12/6/2022 4:02 PM
88	Need more bike lanes on major streets to encourage cycling.	12/6/2022 3:46 PM
89	In your report, you indicate that 2.5% of crashes involve pedestrians, but are 46% of fatalities. On the same page you indicate 21% of KSIs are speed related. Why, then, are you indicating on page 37 that you are going to apply equal behavioral enforcement to both drivers and	12/6/2022 2:27 PM

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pedestrians/cyclists (both segments will see 12x/year targeted enforcement)? I would like to see significantly more driver enforcement considering the outcomes of driver-related behavior.

90	I like the emphasis on improving safety! I'd take it a step further and honestly start shrinking road sizes and creating more bike lanes.	12/6/2022 10:49 AM
91	I like the focus on prioritizing historically marginalized communities, and the acknowledgement that car culture is a prohibitive factor in making Phoenix more sustainable. I wonder how bus and light rail systems could better support cyclists and pedestrians.	12/6/2022 4:05 AM
92	Please build more bike lanes, specifically connecting central phoenix to south phoenix. There are no safe ways to ride south	12/5/2022 10:46 PM
93	Faster implementation	12/5/2022 9:35 PM
94	I was hoping to discuss the pathway along the Salt Water River from around Central going east into Tempe. It's away from traffic which is wonderful but need lights for night use. And homeless prevention under bridges please.	12/5/2022 8:03 PM
95	Painted bike gutters are not safe. Eliminate that 3 feet of asphalt, bring the curb out to the motor vehicle lanes, and make the bike paths grade separated from the roadway.	12/5/2022 5:59 PM
96	I think the plan would be more impactful if it included more specificity, particularly with regard to cost and funding sources.	12/5/2022 4:06 PM
97	It would be great to separate more bike lanes from driving lanes, possibly off roads all together	12/5/2022 2:58 PM
98	Yes, we need to make facilities better for carless households, but relying too much on "equity" as a focus for areas of improvement, and not taking into account those most likely to utilize those improvements isn't appropriate.	12/5/2022 1:33 PM
99	Just learned of the Draft Plan, a quick scan shows great plans and improvements needed for our City to encourage people to seek alternative methods of transportation for work and leisure. But there is missing inclusion of the wheelchair user population who depend on their devices as mode of transportation.	12/5/2022 7:26 AM
100	N/A	12/5/2022 12:46 AM
101	concerns that funds will not be utilized with high infrastructural impact	12/4/2022 8:15 PM
102	I'm a new bike commuter in Phoenix and appreciate the goals of the plan. I feel like high motor vehicle speed and lots of interaction between cyclists and motor vehicles are a major hazard in the Phoenix area. I really appreciate areas with improved safety measures.	12/4/2022 7:40 PM
103	I'm concerned about the protected bike lanes and how they will affect travel by automobiles. Particularly in downtown and crowded areas, traffic is already a challenge.	12/4/2022 7:20 PM
104	Speed limits should be lowered in most places and no more funding for wide roads or highways. Let's focus on mass transportation and walking and biking. Offer monetary incentives to builders to infill closer into the city center to curtail urban sprawl.	12/4/2022 10:35 AM
105	The changes that have been made and want to be made benefit very few people while negatively impacting thousands. While the principle of making Phoenix a more walkable city is desirable, the reality is that these changes don't impact very much. It is too hot for most of the year to walk or bike outdoors, and the rest of the time only a few people take advantage of the streets and sidewalks. These changes largely benefit only the nearby residents while thousands of people all over the valley commute to and from central Phoenix. Traffic has been made worse by these changes, and as the covid pandemic winds down more people will be out driving. Another point is that only 665 people were surveyed. Over a million people live and work in the Phoenix metro area, 665 people is not enough to be an accurate reflection on the desires of all Phoenicians who are impacted by these changes. There were also already options to safely bike and walk, there is no need to add even more that will only be utilized by very few. The elimination of lanes of traffic are a detriment to society. Emissions from cars will be greater as cars must spend more time in traffic; these changes will not make people change their mode of transportation, the demand of cars will always be there especially as electric vehicles become more prevalent. Overall, these changes benefit a very very small fraction of the people who live here at the detriment of all commuters and drivers. These changes should be reversed and these plans scrapped entirely.	12/3/2022 3:50 PM
106	More focus on traffic lights. So many vehicles run red lights. More speed humps on	12/3/2022 8:54 AM

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neighborhood streets. Traffic control around schools. The increase in bike lanes has been a huge improvement.

107	Public transportation is terrible in Phoenix. It needs to be more accessible to all parts of the valley. I would love to bike to work, but it's too dangerous. I would love to take the bus to go eat out, but a bus stop is too far away from my house and the wait for a bus is unbearably long. I would love to just walk around outside and get some fresh air, but the cars on the street are loud, fast, and wreckless. Phoenix is built for the car, and I would like to see it transition to favor more pedestrians. Cars and people can coexist comfortably.	12/3/2022 7:38 AM
108	Painted lines and plastic poles are not infrastructure, you need to physically separate modes of transportation or ban cars on certain roads all together. I think the plan is a joke and will never get people to leave their cars behind if there is no real change to the roads because there will always be a chance of death if vehicles are allowed to cross a paint stripe. I think there is a lot of emphasis on first mile/last mile connectivity but why bother with that when there aren't near enough buses moving every hour? Make BUS LANES, make it so you don't need to look at a schedule and get people moving... Phoenix's population is only going to rise more in the near future before it starts dropping off drastically, that means either more cars or more transit to move those people. You increase transit ridership by increasing how many buses/trains there are moving. Have you Heard of Induced Demand? That also works for transit. If this city even has water in future years and there are people still living here with climate change happening, they will probably not be riding in cars because they won't be able to afford the gas/energy AND their rent, so stop allowing cars to dictate how this city burns and start removing privileges they've stolen from pedestrians. Ban cars from Downtown. Make it safe and people will start moving themselves without any encouragement.	12/2/2022 9:18 PM
109	I'd like to see more concrete examples of locations that the city is looking at through this plan's lens.	12/2/2022 2:46 PM
110	More money needs to be allocated to the elements.	12/2/2022 1:17 PM
111	Pay particular attention to school zones. Parents picking up their kids are an environmental and traffic nightmare. Sidewalks full of irrigation water are dangerous for pedestrians and bikers. Car drivers still park on bike lanes. Didn't they try to use a protected bike lane?	12/2/2022 1:08 PM
112	Lack of emphasis on motorist traffic enforcement, preferably through ticketing via traffic cameras. Traffic calming is recommended in the report--but I think it needs to be a higher priority. For me a bike lane is less important than much slower auto traffic.	12/2/2022 1:04 PM
113	I'm glad there is an initiative at all. Most bike lanes in my zip are "standard" and rarely used which is no surprise given how dangerous it'd be. Obviously the best lanes are entirely separate from the road but that's not usually possible. There are many roads lined with businesses and small parking lots. Perfect places to be more walkable and yet the car traffic is so violent that if you can't grab a spot in their small lot you'd just leave. Bad for business and a shame they have to use all that space for parking.	12/2/2022 6:46 AM
114	Wi-Fi on transit is a cost-sink with very little pay off. Build transit around libraries and third places to bring passengers to places with Wi-Fi should they want it. As much funding as soon as possible should be in Bus Rapid Transit. Suburbs like Scottsdale and Glendale need to allow light rail into their communities and every effort should be made to encourage or force them to allow it.	12/2/2022 12:53 AM
115	That plan took me forever to get through it's like 100 pages! I just want more bike and shared use roads in PHX. I also would prefer multi use paths instead of dedicated bike or ped paths.	12/1/2022 9:34 PM
116	My concerns are the reduction in vehicular lanes to accommodate bike lanes. The reduction of those bike lanes increase traffic throughout the neighborhood. For the amount of disruption the bike lanes cause, there are not of bicycle riders who use them compared to cars. It would be wise to have a corridor for bicycles that do not take away vehicular lanes or parking spots (as those are also becoming hard downtown). I am a resident downtown. 3rd avenue should remain a one lane street with the separate bike lane. Making 3rd street one lane from Indian School Park to Roosevelt was downright stupid. Also there seems to be a lack of a bicycle, walking path for South Mountain Village and Laveen Village.	12/1/2022 9:22 PM
117	I generally like everything about the plan, and understand that some initiatives may be limited due to funding. My main concern is the need for more transparency and accountability from the city. Despite an accountability section being a part of the plan, I do not have a good sense of how the plan will address this issue.	12/1/2022 8:50 PM

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118	This plan seems like a grab for federal money, while doing very little to improve Phoenix roads or the driving experience.	12/1/2022 7:14 PM
119	Under types of changes, the Words are absolutely meaningless: "update" "Continue" "Prioritize" - - - In other words the City is committing to nothing, no deadlines, no goals to fully achieve. BE MORE SPECIFIC. Complete a plan and goal. Green poles on heavily trafficked arterial streets are not sufficient to be safe. Address width and shading of sidewalks for wheelchairs, motorized wheelchairs or scooters, strollers, etc. Address more e-bikes and motorized scooters, that are becoming more common, plus skateboards or the like esp near college campus and other schools. Address electric charging stations. Bike storage areas.	12/1/2022 6:34 PM
120	From my brief review, it appears that most of the improvements appear to be in central Phoenix. Tatum Rd from Pinnacle Peak to Cave Creek needs protective bike lanes so people can ride bikes to library from Desert Ridge... or build a branch library in the empty lot at the corner of 40th and Deer Valley!!!	12/1/2022 3:35 PM
121	I love the changes that were made to the 3rd Ave/5th Ave bike lanes and bikeways and use them regularly!	12/1/2022 3:20 PM
122	Have not reviewed	12/1/2022 2:17 PM
123	I like a lot of what I see in this document. It gives the impression that the city is taking active transportation seriously and that is very promising. I think the appetite for active transportation is out there, people just need to feel empowered and safe to pursue it. One of my primary concerns is that the city will continue to paint bike lanes and call it a victory for active transportation. Look, a bike lane is better than nothing, but at the end of the day paint is just paint and it's not infrastructure. I speak from experience — paint does not prohibit a car from veering into a bike lane or turning into a cyclist. I appreciate the thought and work that has gone into this plan, but it would be a shame to see it squandered by "good enough" thinking. As for recommendations, I really do think enforcement — which is not mentioned as a pillar of this plan — needs to be considered. Speed and traffic enforcement could go a long way in curbing the worst motorist behaviors and ensuring road safety for all users. With ebikes becoming more and more accessible, I think the city needs to really prioritize safe cycling and getting people out of cars. I would love to feel safe enough to bike to the grocery store instead of driving the 1 mile there. Furthermore, I think this plan needs to be upfront and bold about one thing: deprioritizing cars is a necessity for a healthy, vibrant city. Phoenix has so far to go before one can feasibly be car free here, but I think that should be the goal. If someone wants to drive, great. The option to walk, bike or use transit should be just as reasonable and attainable for non-motorists. Thank you for all the hard work!	12/1/2022 12:11 PM
124	I want Phoenix to not be such a lawless, demolition derby with a heap of road rage, daily. I am terrified to drive here. I choose to cycle/walk/transit as much as possible, I feel like I have more control of the situation around me. Lower the speed limits EVERYWHERE. Install many red light/speed on green camera systems for police officer safety, allowing them to focus on other policing work. Install bike racks at EVERY bus stop, every business.	12/1/2022 12:10 PM
125	This is all excellent, but I'm tired of the streets department constantly prioritizing cars. All of this is hot air unless the department ACTUALLY works towards implementation. We need better follow through. The more recent bike improvements on 3rd Ave and 3rd St are an excellent example of what should be prioritized and implemented. I appreciate Equity was evaluated as part of this effort as well.	12/1/2022 11:53 AM
126	I'm extremely pleased that we are acknowledging the benefits and need for facilitating other forms of transportation that is not driving. Cars create noise pollution, air pollution, social isolation, and literal death. They might be good for intercity travel, but we need to focus on neighborhood-centric transportation and I loved seeing that in the plan. Another aspect to consider is working with city zoning to enable more multi-use zone construction that integrates residential and small-business spaces. Doing this will make the transportation plan much more feasible.	12/1/2022 9:58 AM
127	concerned about speed of construction for improvements. we need effective but rapid improvements.	12/1/2022 1:11 AM
128	asphalt, markings and signage may be helpful if they inconvenience cars. but the important part is the inconvenience of cars, it would be just as good to simply remove some asphalt and let us have a little bit of space back as dirt	11/30/2022 9:57 PM

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129	We have to keep our roads safer so people are able to walk or ride without being harassed by drug users. This is not addressed in the plan	11/30/2022 9:35 PM
130	It ignores any mention of enforcement for poor drivers. We don't need more e scooters. Who will maintain the bike lanes? The bollards are hit all the time and the city never replaces them	11/30/2022 6:23 PM
131	N/a	11/30/2022 6:06 PM
132	I like the parts in the plan that outline all of the specifics around making intersections and streets more walkable and bikeable, it looks like a great reference doc that can be utilized at meetings and to explain to the various neighborhoods. I'm concerned about only focusing on two neighborhoods at a time, does that mean the other neighborhoods are just neglected or no action is taken on those? What happens when you get to a neighborhood like Central and Bethany Home and they just decide they don't care about bike lanes or walkability? Basically how they made a big fuss about re-striping that very low traffic section of Central because they'd have to "look for bikes when turning out of the neighborhood". How do we ensure that we have a wholistic vision and common voice for the city and it's not left up to the privileged in that neighborhood to ignore the program and recommendations? How do we get better about leaning into how cheap biking and walking infrastructure is over vehicular? In talking with other advocacy groups I know they explained about the expensive bike lane "paint" but we're talking pennies compared to what it takes to build a road or add a lane for a vehicle. How we get a stipend/grant/discount/rebate on active transportation purchases? Denver for instance provided up to \$1200 to residents that purchased e-bike and e-cargo options for themselves last year and they're doing it again in 2023 because of how successful it was. Do we need a sponsor? Do we need a petition? https://denvergov.org/Government/Agencies-Departments-Offices/Agencies-Departments-Offices-Directory/Climate-Action-Sustainability-Resiliency/Sustainable-Transportation/Electric-Bikes-E-Bikes-Rebates#:~:text=Denver's%20e%2Dbike%20rebate%20program,please%20subscribe%20to%20our%20newsletter.	11/30/2022 3:16 PM
133	I love that the draft recognizes the problems with how we've developed a car-centric infrastructure in the past. My concern is that sharrows or bike lanes next to car parking (where the door could open into a biker) are mentioned at all. I initially don't love the bike boulevard idea, because it's assuming that drivers will be fully attentive and respectful of sharing the road, which is often not the case. I recommend focusing on developing an interconnected network of protected bike lanes with safe crossings especially in downtown/roosevelt row where there is so much foot/bike traffic.	11/30/2022 1:54 PM
134	I am supportive of any improvements, which this plan is. Create a sense of place Allow Transit Oriented Development along streets with bicycle lanes, even in areas like Laveen and Estrella. Public Outreach and Community Education is vital to success. Eliminate Parking Minimums to allow for more pedestrian and bicycle facilities Attract new walkers/riders Strengthen bicycle policies Form a denser bikeway network Increase bicycle parking Expand programs to support bicycling Increase funding for bicycle facilities Allow for innovative public transportation programs Create a more pedestrian oriented environment. Close existing streets and alleys with historically low traffic volume to vehicle traffic, and create multi-modal districts that allow for pedestrians and micro-mobility options within a residential/commercial area or corridor. I'm thinking Monton Trail in Carmel, Indiana	11/30/2022 11:49 AM
135	Glad there is an emphasis on equity and underserved communities. Glad there are sections about evaluating progress and the results of the plan. Our Subdivision Code Ch. 32 needs to be redesigned to encourage development in a grid, which increases accessibility to important destinations. We should also re-evaluate our street cross-sections to see if we can build smaller to reduce speeds driven, which would make alternative modes of transportation feel safer.	11/30/2022 11:42 AM
136	I am concerned that the plan does not address the root causes of danger to pedestrians but attempts to shoehorn pedestrian infrastructure onto poorly designed, dangerous streets. Real change would require road diets. I still appreciate the effort and the proposed improvements.	11/30/2022 9:11 AM
137	I think the plan is great and am very excited to see the city making this a priority! The plan is very comprehensive and is clearly working towards a lot of solutions for different users. I also think that splitting this up by village is ideal as well. My main concern is that I expect change to be quite slow and still having a lot of gaps in the road network when it comes to cycling. One specific recommendation I have is that e-bike 'typical speed' [page 93] should be noted as 10-20mph, not 10-15 mph. My average is 15mph, and I am biking at 20mph for significant portions of each ride. I'm doing that with a Class I e-bike (pedal assist only), so those with	11/29/2022 11:21 PM

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Class II e-bikes (with throttles) will be riding at 20mph even more often than I do. This speed is actually a huge advantage as it makes biking more practical for longer commutes and during hotter weather since it takes less time to get from place to place. My one other recommendation is that the city should view HAWK signals as not only pedestrian infrastructure, but bicycle infrastructure. This can be a great tool to allow cyclists to bike through neighborhoods and then be able to cross major streets. For example, I can leave my home on Almeria Road and bike north on 42nd Street to avoid biking on busy 40th Street, but there's no way to cross Thomas Road at 42nd Street (or Indian School at 42nd Street - but I know a HAWK is in the works there). A HAWK signal would essentially convert a mile of neighborhood street into solid bike infrastructure (just because the street is low-speed and low-traffic, even though there are no bike signs/lanes) with no cost along the route, just the cost of the HAWK signal at the intersection (which would also benefit pedestrians). I should also note, Thomas Road & 42nd Street used to have a crosswalk (not a safe one as there were no signals), but the road was repaved and now there is very little sign of a crosswalk.

138	I think that the timeline for some of the recommended changes is way to long. It should not be a 3-10 year process to evaluate the potential to implement a stop bar (changing where the line on the ground is) at SOME intersections. This is something that has already been studied. Why do we need another 3 years of evaluation. To decide on its potential. Overall I think the framework is good. The network program seems like a step in the right direction. I have lots of doubts on the implementation.	11/29/2022 9:21 PM
139	I like how nuanced and detailed the plan is - it takes many different aspects into account. Also, it's nice to see an emphasis on walking and biking in such a car-dominant city. I am concerned of its ambition, and how much is feasible and obtainable.	11/29/2022 4:46 PM



Street Planning and Design Guidelines Manual Update

This report requests the Transportation, Infrastructure and Planning Subcommittee recommend City Council approval of the Street Planning and Design Guidelines Manual.

THIS ITEM IS FOR DISCUSSION AND POSSIBLE ACTION.

Summary

The Street Transportation Department has amended its current Street Planning and Design Guidelines Manual (SPDGM) last updated Dec. 1, 2009 (**Attachment A**). This update references appropriate State and Federal guidelines, aligns recent City adopted policies and plans, and incorporates many visual graphics and exhibits to increase ease of use.

The SPDGM was recently reviewed and approved by the Development Advisory Board (DAB), Technical Subcommittee Dec. 20, 2022, with Formal DAB approval Feb. 13, 2023. This plan provides design guidelines for public and private sector developments.

Concurrence/Previous Council Action

Ordinance S-44639 (**Attachment B**) approved June 6, 2018, procured the professional services contract for the updated SPDGM.

Responsible Department

This item is submitted by Deputy City Manager Alan Stephenson, the Street Transportation Department and the City Engineer.

STREET PLANNING AND DESIGN GUIDELINES MANUAL

DRAFT

AUGUST 2022



City of Phoenix

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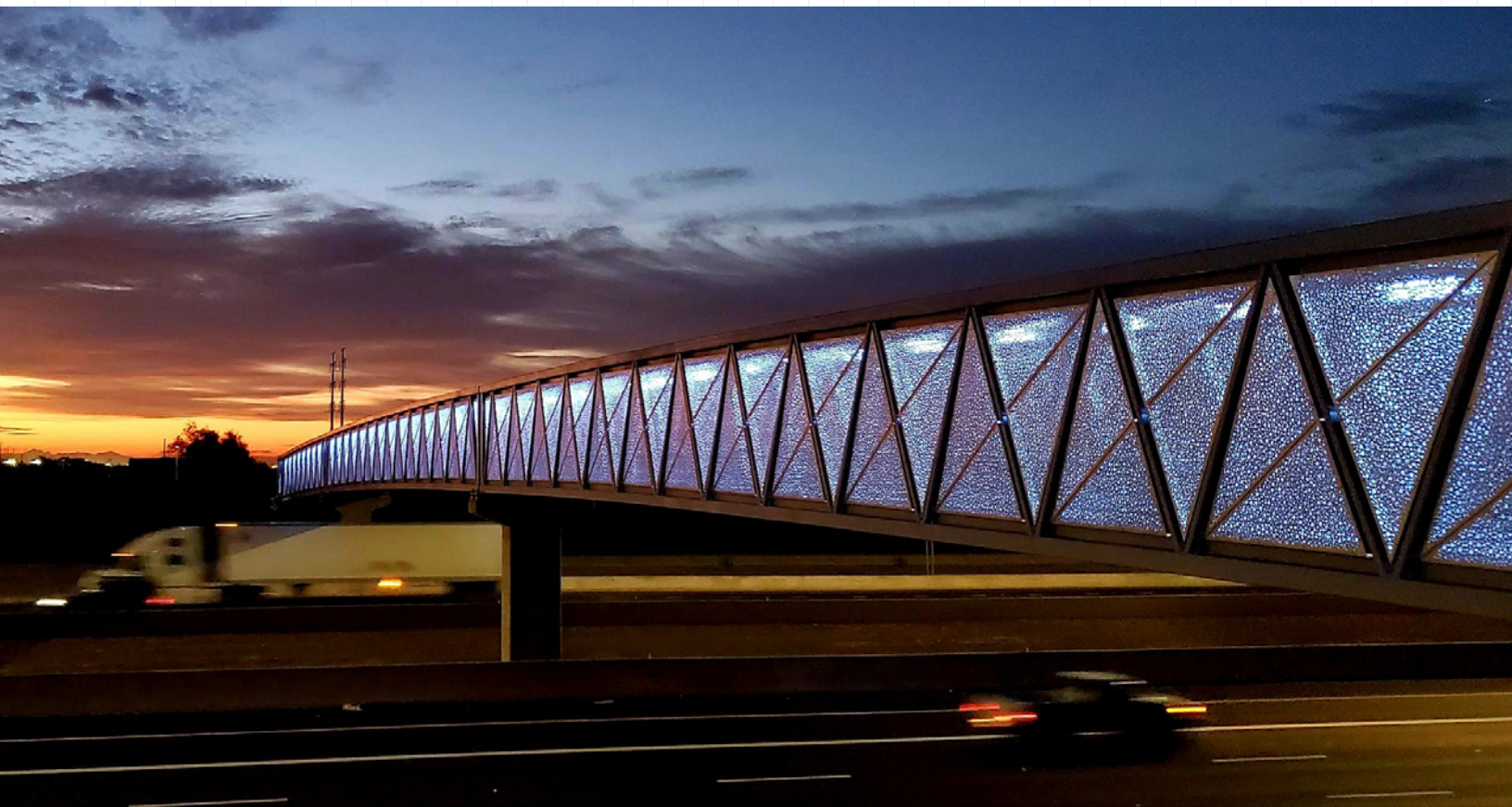
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1. INTRODUCTION

OVERVIEW

The City of Phoenix has developed this updated Street Planning and Design Guidelines (SPDG) Manual to assist City staff and others with the planning and design of streets that reflect City of Phoenix policies and guidelines informed by multimodal planning best practices.

It is intended that application of the transportation design and planning principles outlined in this manual will improve safety for all users, including bicyclists, pedestrians, and transit users.





1

1.1 AUTHORITY OF THIS DOCUMENT

These design guidelines, along with all future amendments, shall be known as the City of Phoenix Street Planning and Design Guidelines (hereinafter called “this manual”).

Preliminary approval of projects after adopted date shall fall under the requirements as outlined within this manual.

1.2 PURPOSE OF THIS STREET PLANNING AND DESIGN MANUAL

The purpose of this manual is to provide concise, usable information to assist in transportation planning and road design.

This manual:

- *Integrates current adopted codes, plans, and policies that support the City’s proactive efforts to make the streets safer and more comfortable to use for all.*
- *Provides reference to other accepted local and national state of the practice planning and design standards, policies, and guidelines.*

This manual standardizes roadway design elements where necessary for consistency and to ensure, as practical, that minimum requirements are met for efficiency, safety for all users (vehicles, bicyclists, and pedestrians), welfare, convenience, pleasant appearance, environmental sensitivity and economical maintenance.

The guidelines outlined in this manual cannot apply to all situations. They are intended to assist the professional engineer’s judgment but not serve as a substitute. Professional engineers are expected to bring the best of their skills and abilities to each project so that it is designed in an optimal manner.

For items not covered by this manual, the City of Phoenix may require the use of the resource standards as identified in Section 1.4 below.

These guidelines are not intended to unreasonably limit any innovative or creative effort that might result in a higher quality or increased savings. Any proposed departure from these guidelines will be evaluated based on whether such exception will yield an equivalent or better result for the road users and City residents.

While every effort has been made to ensure the accuracy and completeness of this manual, the City of Phoenix shall not be held responsible for any errors or omissions. It is the responsibility of the design engineer to ensure a proper design and the accuracy and completeness of construction documents sealed and signed by a registered professional engineer.

Vision, Goals and Objectives for Street Design in the City Of Phoenix

The overall philosophy of street design in the City of Phoenix is summarized in the Street Transportation Department Vision and Mission Statements:

VISION

We will provide a safe and sustainable transportation network and deliver infrastructure services through a forward thinking and dedicated workforce to address the changing needs of the City.

MISSION

To provide for the safe, efficient, and convenient movement of people and goods within the City and support citywide infrastructure projects to improve the quality of life in Phoenix.

To best address the changing needs of the City, this manual is a forward-looking manual and provides insights to emerging trends and potential future developments in transportation.

OBJECTIVES

1 EFFICIENCY, PUBLIC SAFETY AND CONVENIENCE. To protect the public health, safety, and welfare to the greatest extent possible and minimize inconvenience resulting from construction and maintenance activities within the public right-of-way.

2 MAINTAINING PUBLIC USE. To assure that bicycle, pedestrian and vehicular uses of rights-of-way are the primary uses thereof, and that the rights-of-way are properly maintained during construction and repair work in these areas.

3 STANDARDIZING CRITERIA. To protect the City's infrastructure investment by establishing standardized design, materials, construction, and repair criteria for all public improvements.

4 OPTIMIZING USE. To optimize the use of the limited physical capacity of public rights-of-way held by the City of Phoenix.

5 PROTECTING PRIVATE PROPERTY. To protect private property from damages that could occur because of faulty design during the construction of public improvements within public rights-of-way.



1.3 CITY OF PHOENIX IS COMMITTED TO STREET PLANNING AND DESIGN FOR ALL USERS

Over the past several years, the City of Phoenix has completed several multimodal-focused plans and initiatives, such as the following:

1. Comprehensive Bicycle Master Plan and Comprehensive Downtown Transportation Study: 20-year plan to develop, grow and connect bicycle facilities in Phoenix.
2. Plan PHX and Reinvent PHX: commits to develop walkable, opportunity-rich communities connected to light rail.
3. Transportation 2050 Program: emphasizes street needs including; street maintenance, new pavement, bike lanes, sidewalks and ADA accessibility which will all compliment the increase in transit services; commits to new sidewalks and new bike lanes.
4. City of Phoenix Complete Streets Design Guidelines (adopted in 2018) advances Phoenix's goal to create a multimodal transportation system that is safe and accessible for everyone. Complete streets provide infrastructure that encourages active transportation such as walking, bicycling, transportation choices and increased connectivity.

These advancements reflect the aspirations of elected officials, City staff, and residents to embrace a progressive approach to mobility, through context sensitive solutions that support neighborhood character, and provides mobility choices for a diverse population and their individual needs.

However, leveraging these investments into successful mobility is continually challenged by the diversity of needs and available choices. Public rights-of-way are being asked to provide more and more functions within existing footprints—"every road, every user, every function". This City of Phoenix Street Planning and Design Guide is written to address this challenge and provides the information and guidance to plan and design streets that reflect and balance community context area sensitivity, roadway function, capacity requirements, right-of-way, and mode-specific plans/design considerations.



CONSIDERATION OF EACH STREET ELEMENT WILL HELP ALL STAKEHOLDERS TO NAVIGATE THE COMPLICATED QUESTIONS SUCH AS:

“Is there enough room to accommodate all of the desired features within the existing right-of-way?”

“How should this driveway be designed to maximize safety for pedestrians?”

“What does a separated bicycle facility look like on a City street?”

“How do I prioritize roadway design features when there is simply not enough room to accommodate all modes of travel?”

1.4 | RESOURCES

Engineers and planners follow established standards and guidelines to prepare designs for roadway projects.

Relationship between this Manual and Other City Documents/Plans

This manual is intended to assist City staff and others with the planning and design of streets that reflect City of Phoenix policies and guidelines informed by multi-modal planning best practices.

Where possible, this manual refers to established policies, guidelines, and ordinances. **The user is directed to ensure that they are following the most current and recent version of the referenced document.**

NATIONAL STANDARDS, POLICIES, AND GUIDELINES

- **AASHTO Guide for the Development of Bicycle Facilities, 2019 (PENDING PUBLICATION)**
- **AASHTO A Policy on Geometric Design of Highways and Streets (AASHTO Green Book), 7th Edition, 2018**, <https://store.transportation.org/item/collectiondetail/180>
- **ADOT Arizona Supplement to the 2009 Edition of the Manual of Uniform Traffic Control Devices for Streets and Highways, January 2012**, [https://www.azdot.gov/docs/business/arizona-supplement-to-the-manual-on-uniform-traffic-control-devices-\(2009-mutcd-edition\).pdf?sfvrsn=0](https://www.azdot.gov/docs/business/arizona-supplement-to-the-manual-on-uniform-traffic-control-devices-(2009-mutcd-edition).pdf?sfvrsn=0)
- **FHWA Achieving Multimodal Networks: Applying Design Flexibility & Reducing Conflicts, FHWA-HEP-16-055, 2016**, https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/multimodal_networks/
- **FHWA Flexibility in Highway Design**, <https://www.fhwa.dot.gov/environment/publications/flexibility/flexibility.pdf>
- **Highway Capacity Manual - Sixth Edition: A Guide for Multimodal Mobility Analysis, 2016**, <http://www.trb.org/Main/Blurbs/175169.aspx>
- **ITE Designing Walkable Urban Thoroughfares: A Context Sensitive Approach, 2010**, <https://www.ite.org/pub/?id=e1cff43c%2D2354%2Dd714%2D51d9%2Dd82b39d4dbad>
- **NACTO Blueprint for Autonomous Urbanism, module 1**, <https://nacto.org/publication/bau/>
- **NACTO Transit Street Design Guide**, <https://nacto.org/publication/transit-street-design-guide/>
- **NACTO Urban Bikeway Design Guide (2nd Edition), 2014**, <https://nacto.org/publication/urban-bikeway-design-guide/>

- **NACTO Urban Street Design Guide, 2013**, <https://nacto.org/publication/urban-street-design-guide/>
- **NCHRP Report 672, Roundabouts: An Informational Guide, 2nd Edition, 2010**, <http://www.trb.org/Publications/Blurbs/164470.aspx>
- **United States Department of Justice, 2010 ADA Standards for Accessible Design**, https://www.ada.gov/2010ADASTandards_index.htm
- **USDOT MUTCD for Streets and Highways**, <https://mutcd.fhwa.dot.gov/>

STATE AND REGIONAL RESOURCES

- **MAG Uniform Standard Details for Public Works Construction, 2019 Revision to the 2015 Edition**, http://azmag.gov/Portals/0/Documents/MagContent/2019_Detail-Drawings-All-Bookmarked.pdf
- **MAG Uniform Standard Specifications for Public Works Construction, 2018 Revision to the 2015 Edition**, http://azmag.gov/Portals/0/Documents/MagContent/2019_Specifications_and_Details_Book.pdf

CITY OF PHOENIX POLICY DIRECTION

- **City of Phoenix Zoning Ordinance**, <https://www.codepublishing.com/AZ/Phoenix/>
- **PlanPHX, 2015 General Plan, Adopted March 4, 2015**, <https://www.phoenix.gov/pdd/pz/phoenix-general-plan>
- **Reinvent PHX - Transit-Oriented Development Policy Plans, 2015**, <https://www.phoenix.gov/pdd/topics/reinvent-phx>

BUILDING COMMUNITY REFERENCE MATERIAL

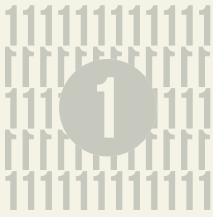
- **2012 City of Phoenix Supplements to MAG**, <https://www.phoenix.gov/streets/reference-material/2012maguniformstd>
- **2015 City of Phoenix Supplement to the 2015 Edition MAG Uniform Standard Specifications for Public Works Construction**, <https://www.phoenix.gov/streetssite/Documents/2015%20City%20of%20Phoenix%20Supplement%20to%20the%202015%20MAG%20Specifications.pdf>
- **2015 City of Phoenix Supplemental Standard Details for Public Works Construction**, <https://www.phoenix.gov/streetssite/Documents/2015%20City%20of%20Phoenix%20Supplemental%20Details.pdf>
- **Administrative Procedure 155 (Project Development Requirements and Guidelines)**, *February 2012*, <https://www.phoenix.gov/streetssite/Documents/ap155.pdf.pdf>
- **AutoCAD Tools for Consultants**, <https://www.phoenix.gov/streets/reference-material/autoCADhelp>
- **City of Phoenix Standard Traffic Signal Details**, https://www.phoenix.gov/streetssite/Documents/COP_Standard_Traffic_Signal_Details_09152017a.pdf
- **City of Phoenix Standard Specifications and Details for Public Works Construction, 2015 Edition**, <https://www.phoenix.gov/streetssite/Documents/City%20of%20Phoenix%20Specifications%20and%20Details%20for%20Public%20Works%20Construction,%202015%20Edition.pdf>
- **Design & Construction Management AutoCAD Standards**, <https://www.phoenix.gov/streetssite/Pages/DCM-AutoCAD-Standards.aspx>
- **SB1598 Licensing Time Frames**, <https://www.phoenix.gov/streetssite/Documents/091967.pdf>
- **Storm Water Policies and Standards Manual**, <https://www.phoenix.gov/streets/reference-material/sw-manual>
- **Street Classification Map**, <https://www.phoenix.gov/streetssite/Documents/7546mar2014.pdf>
- **Street Landscape Standards (2006)**, <https://www.phoenix.gov/streetssite/Documents/streetman.pdf>
- **Street Light Information for Development Projects**, <https://www.phoenix.gov/streets/reference-material/street-light-information-for-development-projects>

OTHER CITY OF PHOENIX GUIDELINES, STUDIES, AND PLANS

- **An Ordinance Establishing Complete Streets Guiding Principles**, *Ordinance S-41094, July 2014*, https://www.phoenix.gov/streetssite/Documents/Complete_Streets_Principles_Ordinance.pdf#search=An%20Ordinance%20Establishing%20Complete%20Streets%20Guiding%20Principles%2C
- **Complete Streets Design Guidelines**, *Adopted March 8, 2018*, <https://www.phoenix.gov/streetssite/Documents/CSAB%20Complete%20Streets%20Advisory%20Board%20Recommended%20Guidelines%20March%208%202018.pdf>
- **Comprehensive Bicycle Master Plan**, *November 2014*, <https://www.phoenix.gov/streetssite/Pages/Bicycle-Master-Plan.aspx>
- **Tree and Shade Master Plan**, *2010*, <https://www.phoenix.gov/streetssite/Documents/Shade%20Master%20Plan/Tree%20and%20Shade%20Master%20Plan.pdf#search=Tree%20and%20Shade%20Master%20Plan>
- **Phoenix Comprehensive Downtown Transportation Study: Final Study Report**, *September 2014*, <https://www.phoenix.gov/streetssite/Documents/DowntownComprehensiveTransportationPlan/FinalDowntownReport.pdf>
- **Traffic Barricade Manual**, *9th Edition, 2017*, https://www.phoenix.gov/streetssite/Documents/d_039129.pdf

1.5 | MANUAL OVERVIEW

This manual is comprised of ten chapters. A brief overview of these chapters is provided as follows.



INTRODUCTION: This chapter introduces the purpose, vision and goals of the Street Planning and Design Guidelines Manual and provides links to local and national design standards and policies that are references for this Manual.



GEOMETRIC DESIGN STANDARDS

Key topics include design considerations, pedestrian zone design, flex zone design (shared street areas that can be used for multiple purposes), roadway design, mobility zone design, intersections, crossings, and design details.



STREET CONSTRUCTION: This chapter provides information specific to the City of Phoenix and references source materials where possible. Topics include information on pavement thickness and approved asphalt mixes for street classes,

use of alternative paving materials, opportunities for incorporating other transportation improvements into the repair process, and stormwater management and green infrastructure construction.



TRAFFIC SIGNALS, SIGNING, AND STRIPING:

An overview of relevant design standards and policies for traffic signal improvements are provided in this chapter. Requirements for level of improvements for new development and funding in escrow are discussed.



TRAFFIC CALMING/TRAFFIC MANAGEMENT:

This chapter discusses traffic calming and traffic management policies. Requirements for level of improvements for new development and funding in escrow with respect to traffic calming and traffic management are discussed.



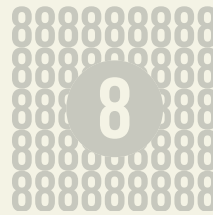
ACCESS MANAGEMENT: Topics discussed in this chapter include City of Phoenix requirements for:

- Driveways
- Frontage roads/ access roads
- Alleys
- Median spacing
- Median opening design
- Mid-block crossings
- Location of bus bays and pads



SUBDIVISION STREET PLANNING:

Topics discussed include requirements of the Subdivision Ordinance and Zoning Ordinance (Chapter 32) and the Downtown Urban Walkable Code as well as information on cul-de-sac street lengths, private street and gated access design standards.



BIKEWAYS AND PEDESTRIANS: This chapter discusses integrating bicycle and pedestrian infrastructure into roadway design. This chapter provides design guidance on bikeway system components, shared use paths, transit stops, and rail crossings, among others.



TRAFFIC IMPACT ANALYSIS: This chapter is prepared to assist an applicant to satisfy the requirement of performing a Traffic Impact Analysis (TIA) when requesting access to a city street.

2. GEOMETRIC DESIGN STANDARDS

OVERVIEW

Chapter 2 presents the geometric design standards for streets and roadways.

The design standards support Complete Streets principles, including safety for all travelers—pedestrians, bicyclists, transit users, and motorists



Chapter 2 --- GEOMETRIC DESIGN STANDARDS

2.1 INTRODUCTION

Chapter 2 presents the geometric design standards for streets and roadways. The design standards support Complete Streets principles, including safety for all travelers—pedestrians, bicyclists, transit users, and motorists.

The design standards presented in this chapter are not a substitute for experience, professional judgment, or ongoing communication between the designers and reviewers. An exception process provides flexibility when necessary to accommodate site-specific opportunities and constraints. All exceptions will be evaluated based on whether it will provide an equivalent or better result for the road users and City residents. When reviewing and approving projects in City of Phoenix right-of-way, the City makes every attempt to balance the vision for a project with adopted policy, regulation, user acceptance, and public safety.

2.1.1 COMPLETE STREETS

The City of Phoenix adopted Complete Street Guidelines on March 8, 2018, contains the following design principles:

- Design for Safety, returning balance to the transportation network for users of all modes of transportation
- Design for Comfort and Convenience
- Design for Context
- Design for Sustainability
- Design for Cost-Effectiveness

A Complete Streets design approach using context-sensitive methods may result in variable design parameters, function, and appearance throughout the City based on community input, surrounding land uses, available right-of-way, street type, adopted general and specific plans and overall intent of the corridor in coordination with other city codes and ordinances.

2.1.2 FLEXIBILITY IN DESIGN

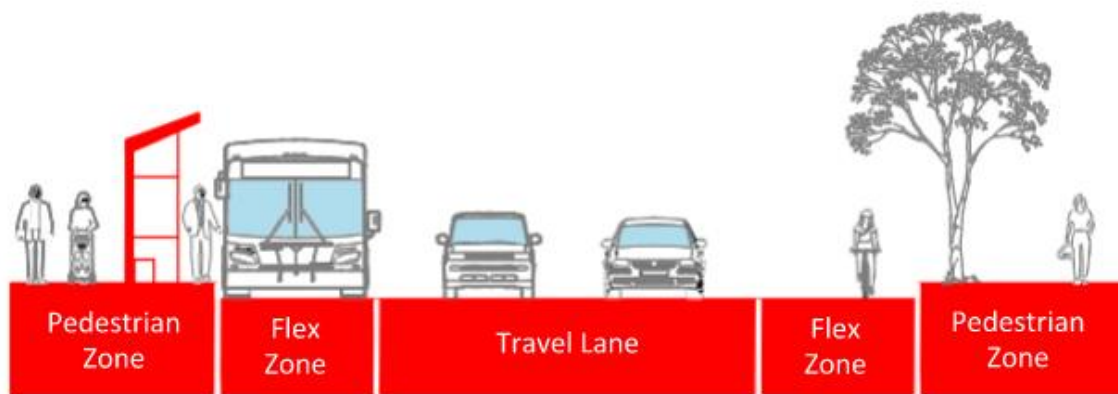
In many cases, existing right-of-way or utility requirements may not allow for the desired typical cross section to be constructed. Consistent with the desired function of the roadway, the design engineer must use engineering judgement to determine appropriate design values within limited or constrained right-of-way.

“Design flexibility is of critical importance because each project has a specific purpose and need, has specific context and constraints, serves a unique set of users, and fills a unique position in the transportation network.” — (AASHTO A Policy on Geometric Design of Highways and Streets)

2.1.3 RIGHT-OF-WAY ZONES

The City of Phoenix Street Classification Map defines right-of-way widths for City of Phoenix street cross-sections. The street cross section can be organized into three basic zones of the right-of-way, as illustrated in **Figure 2.1-1**.

- **Travel Lane:** Travel lanes can serve all modes or be dedicated to serve specific modes such as a bus or light rail.
- **Flex Zone:** Flex Zone is the space between the Travel Lane Zone and the Pedestrian Zone. This zone can contain multiple uses such as bike lanes, transit stops, commercial deliveries, on-street parking, taxi zones, passenger loading, and shared mobility areas. The Flex Zone serves as a buffer between moving vehicles in the Travel Lane Zone and the users in the Pedestrian Zone.
- **Pedestrian Zone:** This space includes the sidewalk, planting areas, bus shelters, street furniture, sidewalk cafes, and bicycle racks. It is always desirable to achieve preferred design widths to accommodate these features. At times accommodating preferred widths in urban settings is not possible due to various contextual constraints. When this occurs, design flexibility should be applied, and minimum widths considered where appropriate.



Source: Adapted from *Seattle Right-of-Way Improvements Manual, Standard 2.1 Right-of-Way Allocation*, <https://streetsillustrated.seattle.gov/street-types/row-allocation/>

Figure 2.1-1 Right-of-Way Zones

2.2 SUMMARY OF GEOMETRIC DESIGN CRITERIA BY ZONE

Table 2.2-1 summarizes Geometric Design Criteria for each zone. Subsequent sections include additional discussion and detail regarding each zone. All street design should follow City Code 32-27.

Table 2.2-1 Roadway Geometric Design Criteria by Zone

Street Design Element	A	B	C	CM	D	E	F	G	H	I
	Major Arterial	Major Arterial & Arterial	Major Arterial & Arterial	Major Arterial & Arterial with Raised Median	Arterial and Major Collector	Collector	Minor Collector	Local Commercial & Multi-Family	Local (Single-Family Residential)	Local (Single-Family Residential)
Design Speed	Posted +10 mph	Posted +10 mph	Posted +10 mph	Posted +10 mph	Posted +10 mph	Posted +10 mph	Posted +10 mph	Posted +5 mph	Posted +5 mph	Posted +5 mph
Right-of-Way Width	140'	130'	110'	110'	100'	80'	60'	50'	50'	50'
Pavement Width, Measured from Face of Curb to Face of Curb	104'	94'	74'	74'	64'	50'	36 – 40' ⁷	36'	32'	28'
Number of Travel Lanes	6	6	4	4	4	2	2	2	2	2
Travel Lane Width (Typical)¹	10' – 11'	10' – 11'	11'	≥11'	10' – 11'	12'	12' – 14' ⁸	-	-	-
Median Width (Typical)	24' Raised	14' Raised	12' Two-Way Left-Turn Lane	14' Raised	10' Two-Way Left-Turn Lane	10' Two-Way Left-Turn Lane	-	-	-	-
Bicycle Lane²	6'	6'	6' ⁶	6'	6', 5.5 min. ³	5.5'	-	-	-	-
Curb Type⁴	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical	Vertical; Ribbon/Flush	Vertical
Sidewalk⁵	5'	5'	5'	5'	5'	5'	4' – 5'	4' – 5'	4'	4'

Note:

1. 10' wide outside travel lane will typically only be considered in cases of limited pavement width, as a retrofit to accommodate on-street bicycle facilities. Final lane widths will be determined by Street Transportation Department.
2. 5.5' wide bicycle lane allowable when combined with 2.5' wide buffer; may require width of other travel lanes to be narrowed; bike lane width measured from face of curb.
3. Bicycle lane may not be able to be accommodated within Cross-Section D. Final lane widths will be determined by Street Transportation Department.
4. Refer to City of Phoenix supplement to Uniform Standard Specifications and Details for Public Works Construction for cross sections and elements including curb type.
5. City of Phoenix Downtown Code (DTC), Walkable Urban (WU) Code, or other zoning overlays supersede published sidewalk widths.
6. 3' wide buffer allowed; travel lane width will be adjusted to provide width for the buffer.
7. Rear facing home (F) allows for 36' wide section.
8. 12' wide lanes with on-street parking or 14' wide lanes with a 6' wide bike lane.

2.3 TRAVEL LANE

2.3.1 DESIGN SPEED

Streets help define the character of neighborhoods. A street's design should interact with the surrounding context including its history, character, land uses, and nearby landmarks. Design speed contributes to the function and character of a street to be more walkable and bikeable, support investments in transit, foster social engagement and community pride, support the local economy and property values, and improve livability.

Design speed should be established considering surrounding land uses, available right-of-way, street type, adopted general and specific plans and overall intent of the corridor in coordination with other city codes and ordinances.

On City of Phoenix collector and arterial streets in typologies **outside of urban and downtown**, the **design speed is equal to the posted speed limit plus 10 MPH**. Design speed is governed by geometrics such as vertical and horizontal curves.

Within urban core and downtown street typologies, the design speed may be **equal to the posted speed limit**, in consultation with Street Transportation Department.

On local streets, the design speed is equivalent to the posted speed limit plus 5 MPH. Design speeds are shown in **Table 2.2-1**.

Lower speeds are desirable for thoroughfares in walkable, mixed use urban areas and this desire for lower speeds should influence the selection of the design speed. For the design of such speeds, a target speed should be selected. (AASHTO A Policy on Geometric Design of Highways and Streets)

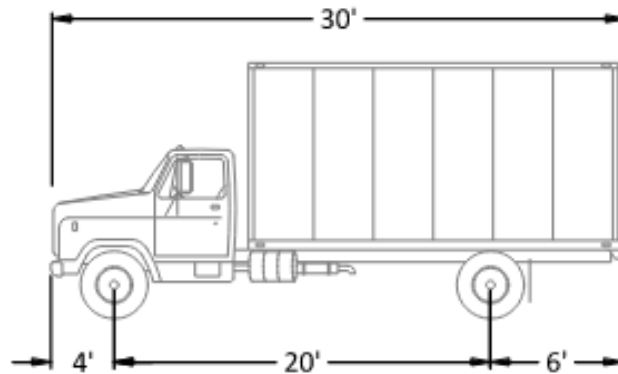
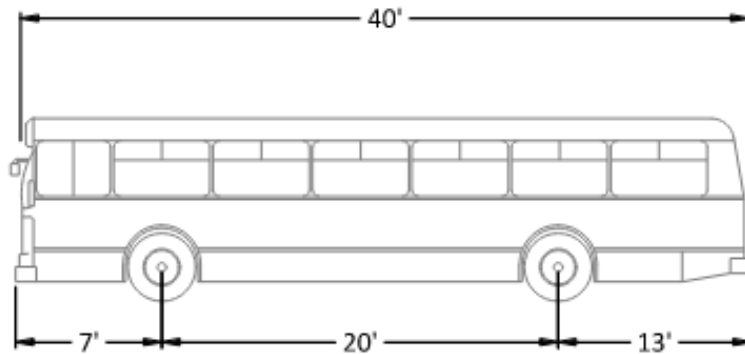
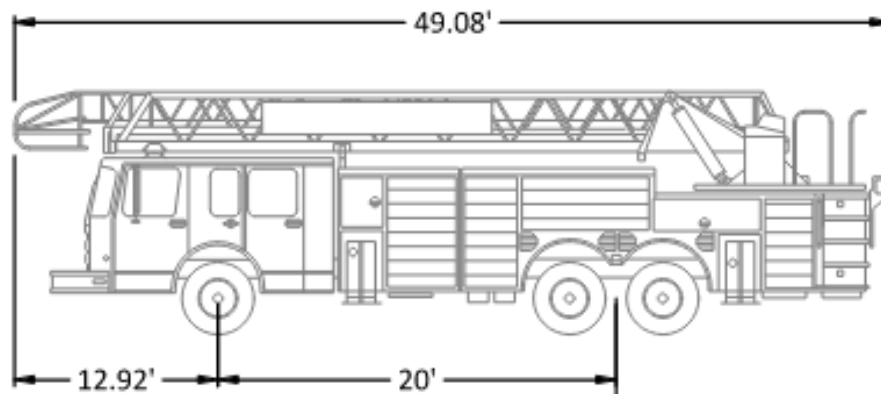
2.3.2 DESIGN VEHICLE

The **design vehicle** is a frequent user of a given street and dictates the minimum required turning radius and lane widths for street intersections and driveways. The design vehicle should be able to make all movements on the street and at intersections without encroaching in the travel way of conflicting vehicles. If the design vehicle is too small or has too small a minimum turning radius, conflicts in the pedestrian zone or street edge may occur. If a vehicle is excessively large for the context, there may be too much space allocated for motor vehicles.

The **control vehicle** is an infrequent large user. A control vehicle dictates how an intersection accommodates a larger vehicle's turning needs. In some cases, the control vehicle can encroach on other lanes or overhang an area unlikely to be occupied by other road users. The decision is made considering the context of the surrounding land uses and priority of the roadway.

- The design vehicle in downtown and urban typologies is a SU-30 truck.
- The design vehicle in suburban and rural typologies is a BU-40 school bus.
- The control vehicle on all city streets is a 49-foot fire truck.
- The control vehicle on streets in industrial areas is a WB-67 interstate semitrailer.

Design vehicles and control vehicles are shown in **Figure 2.3-1** unless otherwise dictated by the values in **Table 2.2-1**.

Downtown/Urban Areas: SU-30, 42-Foot Minimum Turning Radius**Suburban/Rural Areas: School Bus, BU-40, 39.1-Foot Minimum Turning Radius****Control Vehicle: Rear-Mounted Aerial Fire Truck****Sources:**

SU-30 Design Vehicle: AASHTO, *A Policy on Geometric Design of Highways and Streets*, 7th Edition, 2018, Page 2-65.

BU-40 Design Vehicle: AASHTO, *A Policy on Geometric Design of Highways and Streets*, 7th Edition, 2018, Page 2-71.

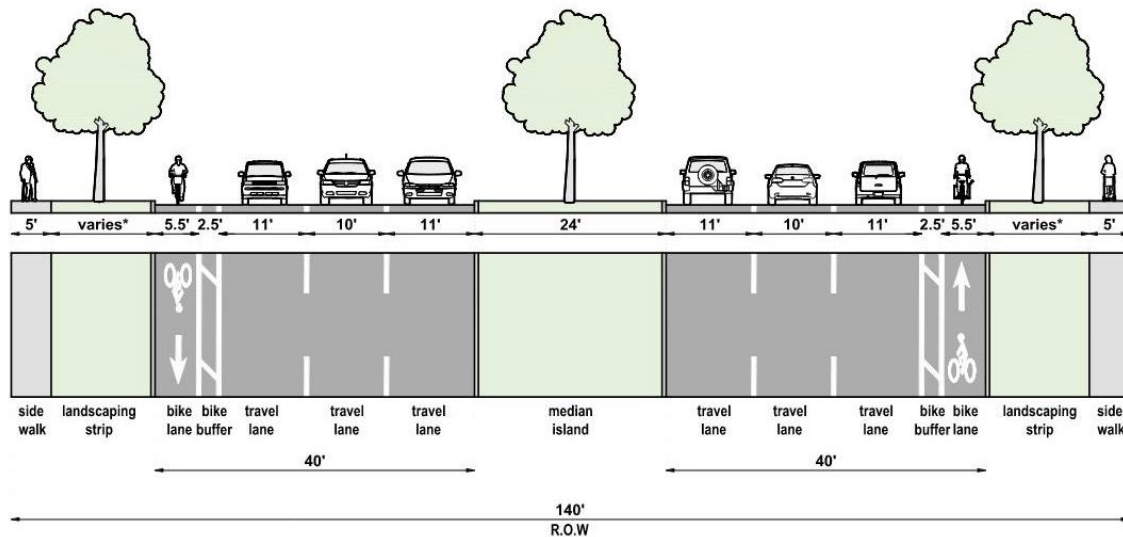
Three Axle, Rear-Mounted Aerial Fire Truck, AUTOTURN program.

Figure 2.3-1 Design Vehicle Illustrations

2.3.3 STREET CROSS-SECTIONS

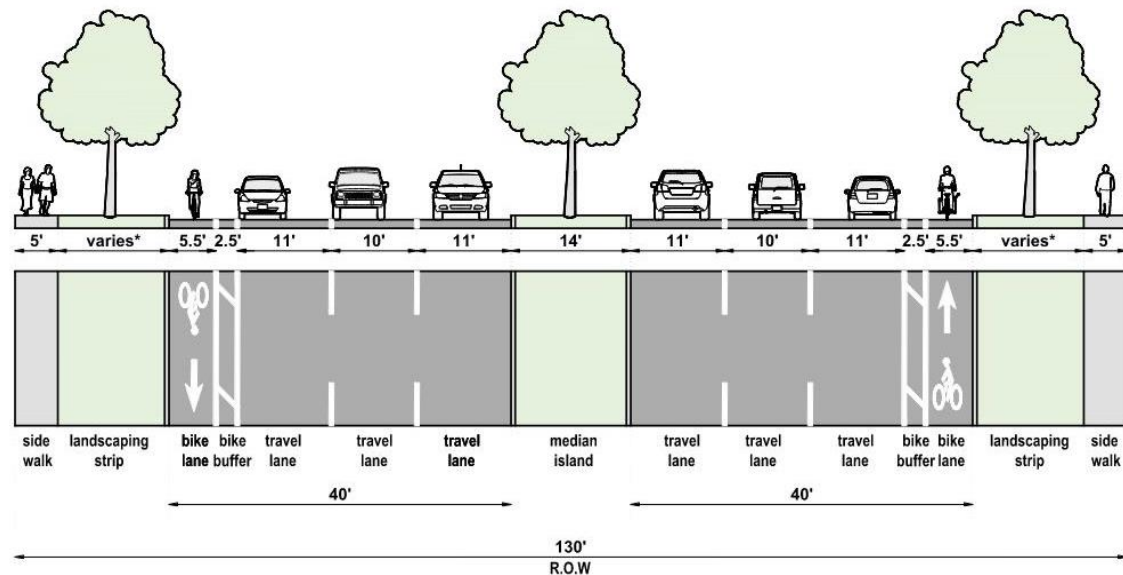
There are 11 street cross-sections (**Figure 2.3-2** through **Figure 2.3-12**) based upon the type and level of use for which the streets are intended. The adopted street cross-sections are shown on the *Street Classification Map* for each arterial and collector within the City.

The corresponding figures show the geometric details of each of the cross-sections. **Lane dimensions are typical, and subject to striping review from Street Transportation Department.** Lane widths may be modified with approval from the Street Transportation Department. Pavement width, as measured from curb face to curb face, generally remains fixed.



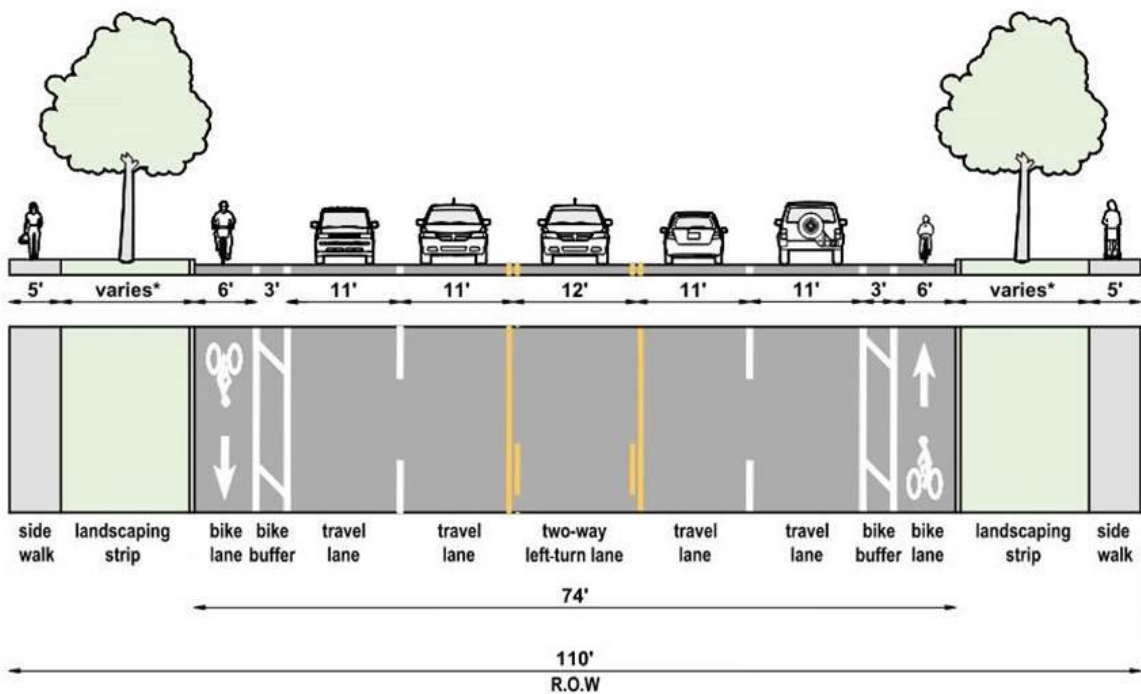
*Preferred minimum width is 10', and is subject to character area, neighborhood, or specific plans.

Figure 2.3-2 Cross-Section "A," Major Arterial



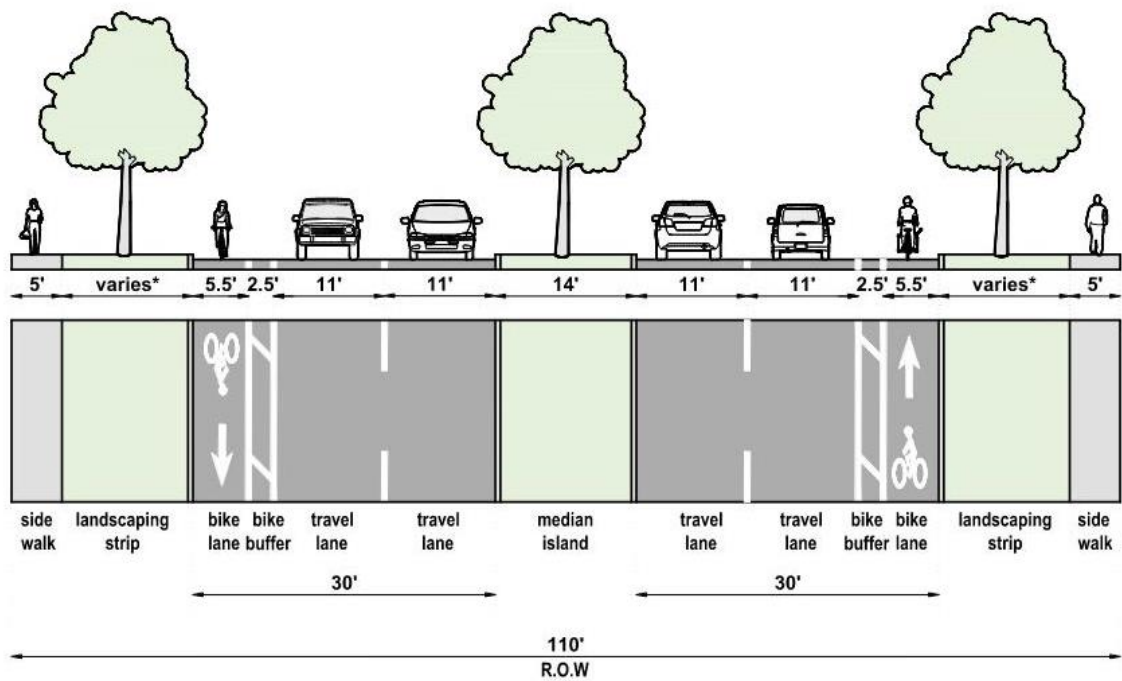
*Preferred minimum width is 10' and is subject to character area, neighborhood, or specific plans.

Figure 2.3-3 Cross-Section "B," Major Arterial and Arterial



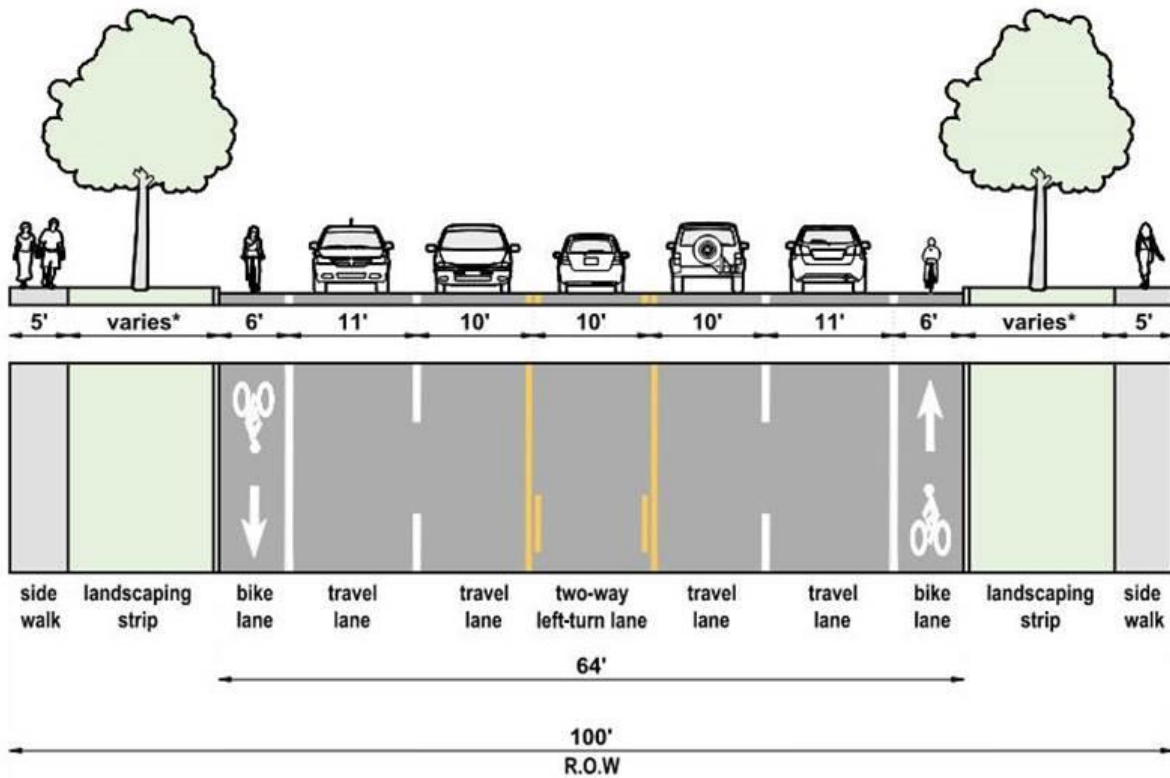
**Preferred minimum width is 10' and is subject to character area, neighborhood, or specific plans.*

Figure 2.3-4 Cross-Section "C," Major Arterial and Arterial



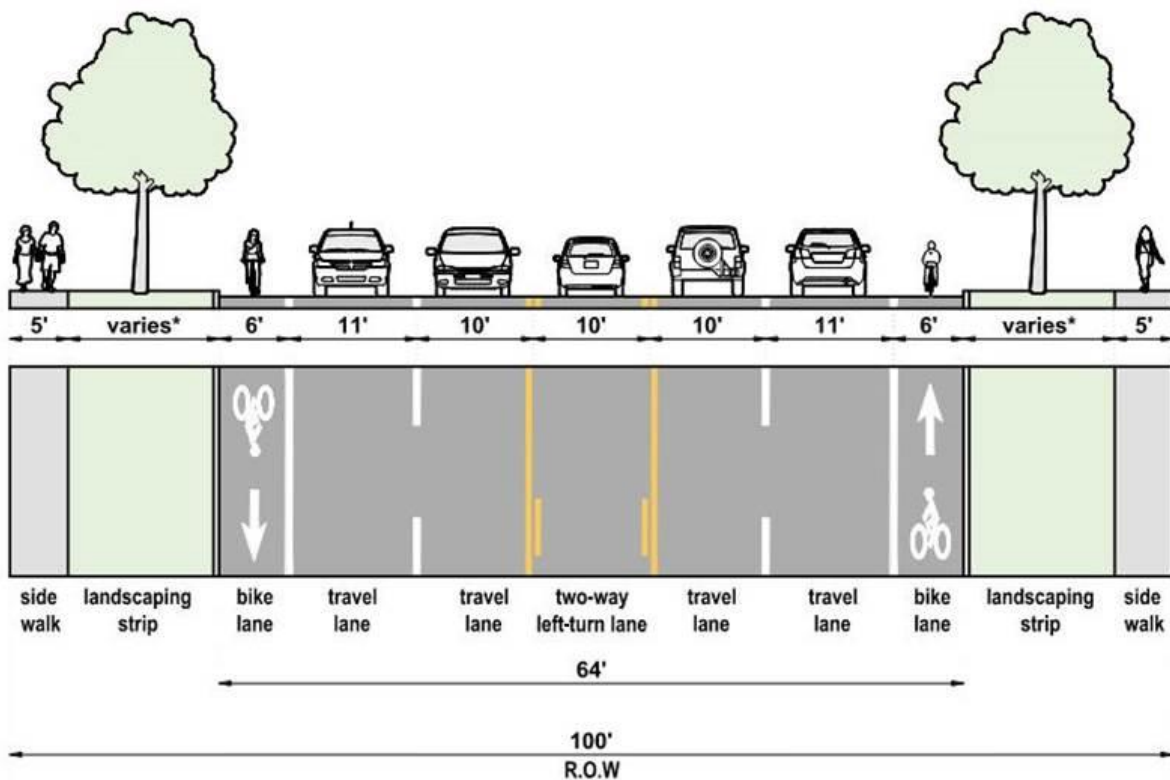
**Preferred minimum width is 10' and is subject to character area, neighborhood, or specific plans.*

Figure 2.3-5 Cross-Section "CM" (C with Raised Median), Major Arterial and Arterial



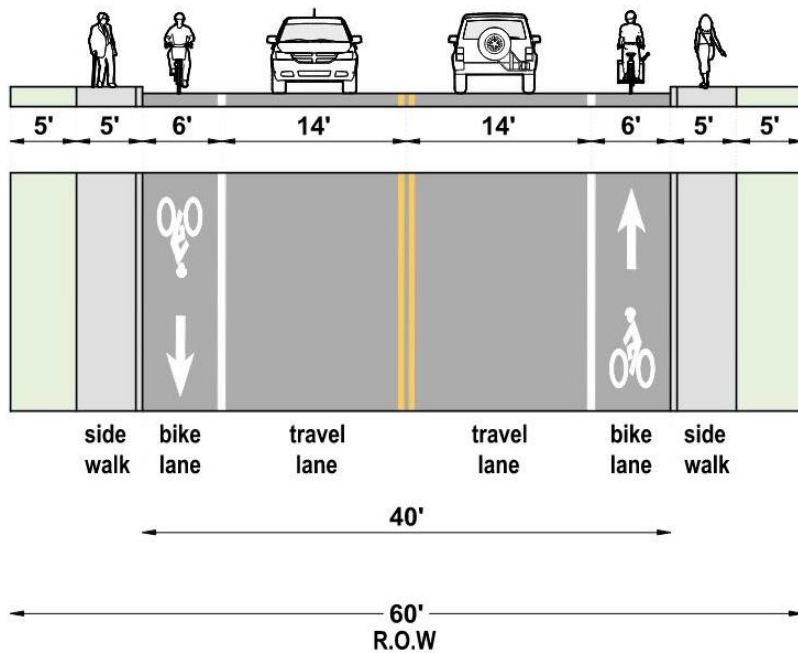
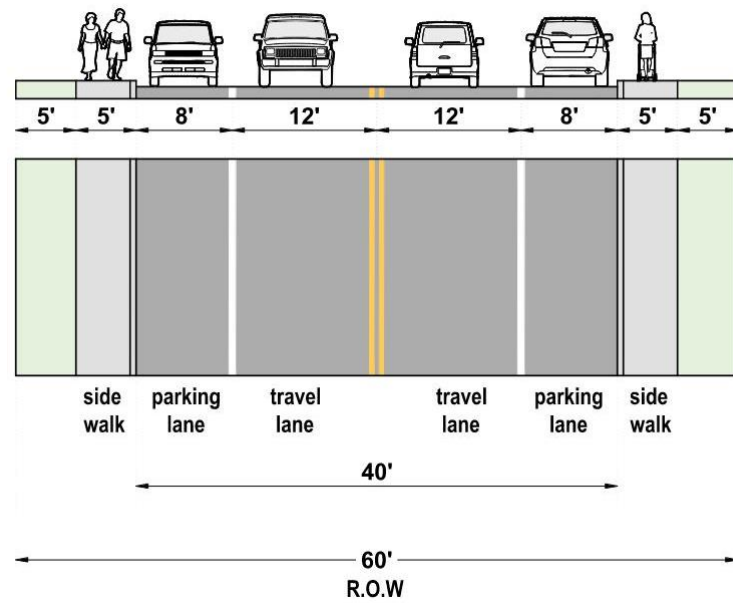
*Preferred minimum width is 10' and is subject to character area, neighborhood, or specific plans.

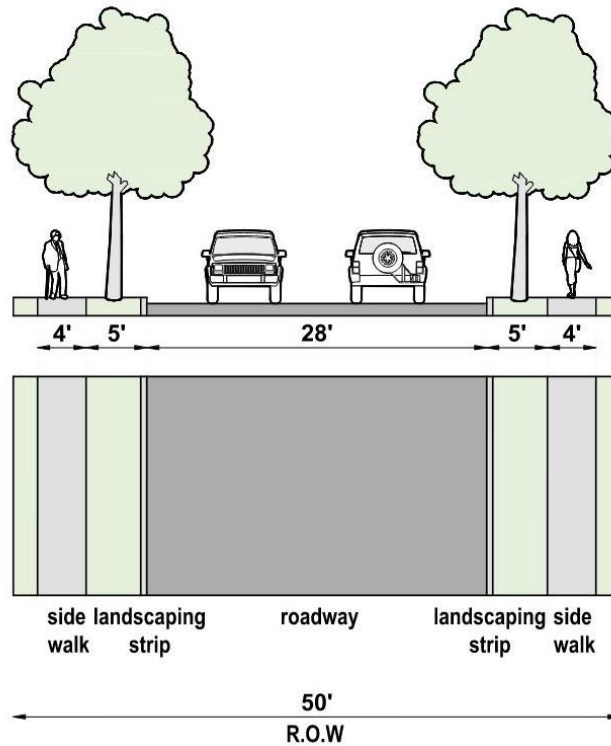
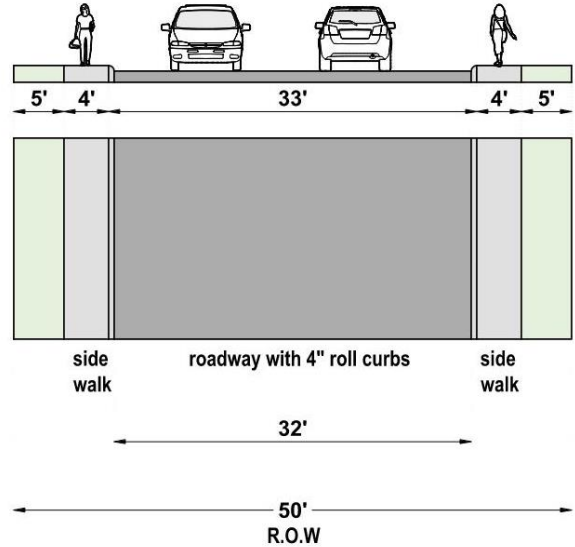
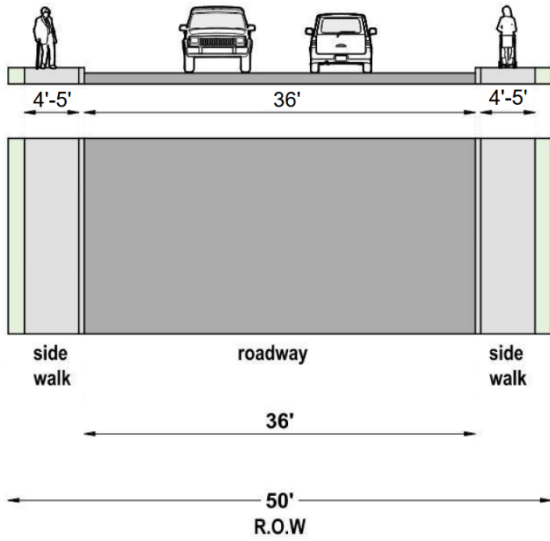
Figure 2.3-6 Cross-Section "D," Arterial, and Major Collector



*Preferred minimum width is 10', and is subject to character area, neighborhood, or specific plans.

Figure 2.3-7 Cross-Section "E", Collector





*Utilization of cross-section "I" requires approval of the Street Transportation Department; See Section 7.2.6 of this Manual.

Figure 2.3-12 Cross-Section "I," Local (Single Family Residential)

2.3.4 TRAVEL LANE AND TURN-LANE WIDTH

Travel lane widths are measured from the center of each longitudinal pavement marking lane line. Outside lane widths are measured to the face of curb and are inclusive of the gutter pan. Lane widths are specified in **Table 2.2-1. Chapter 4** contains additional information about pavement markings.

2.3.5 PAVEMENT TRANSITION TAPERS

AASHTO A Policy on Geometric Design of Highways and Streets specifies design criteria and guidelines for pavement tapers for lane transitions (**Figure 2.3-13**).

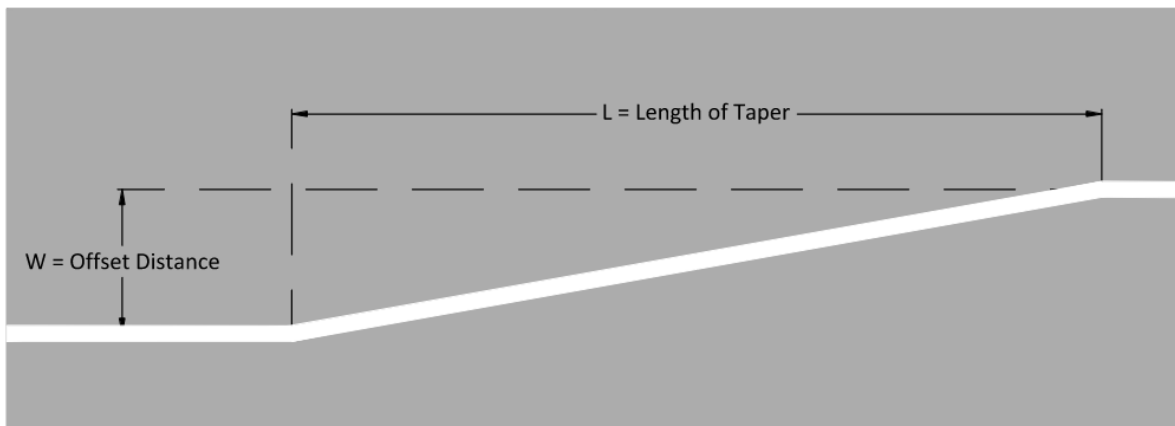
When development causes the widening of a portion of the pavement of an existing road, pavement transitions are required at each end of the widened portion. The transitions should be made on a tangent section whenever possible. Locations with horizontal and vertical sight distance restrictions should be avoided. Whenever feasible, the entire transition should be visible to the driver of a vehicle approaching the narrower section. Intersections at grade within the transition area should be avoided. A pavement taper is required regardless of the striping transition in the adjacent area.

Transition to a Wider Pavement Section

If right-of-way is available, a transition from a narrower cross-section to a wider cross-section should have a taper that is 25:1. Additional taper length may be required based on the location of cross streets and driveways downstream from the new improvements.

Transition to a Narrower Pavement Section

If right-of-way is available, a transition from a wider cross-section to a narrower cross-section should have a length equal to the difference of the two (2) widths in feet times the street design speed in miles per hour.



Source: Adapted from AASHTO Green Book, Straight Line Taper, page 9-103

Figure 2.3-13 Lane Transition Tapers

2.3.6 Turn Lanes

Right-Turn Lanes

At intersections or driveways, the width of a right-turn lane is 12' measured from face of curb to center of longitudinal lane line.

Typical storage length is 100' from curb return or driveway wing. The maximum allowable storage length is 250' and must be supported by a traffic study.

The taper length may be calculated by applying a taper rate of 8:1 for design speeds up to 30 mph; for 35 mph and 45 mph design speed the taper length may be 125'; and 180' for design speeds 50 mph and greater.

Continuous right-turn lanes between driveways will not be allowed. There will be a minimum of 20' from curb return/wing of driveway to the start of the approach taper for the next right-turn lane.

Left-Turn Lanes

Left-turn lane storage requirements are subject to a traffic engineering study. Storage lengths are typically as follows in **Table 2.3-1** and **Table 2.3-2**.

For high-speed rural highways, deceleration distances and large truck volumes must be considered when determining the total left-turn lane length.

Any left-turn storage lengths that differ from the guidelines must be reviewed and approved by the Traffic Services Division of the Street Transportation Division.

Refer to Detail 7336¹, Intersection Flare, available from Street Transportation Department for lane transitions. The detail shows transitions for addition of through lanes, right-turn lanes, and left-turn lanes for each cross-section. A representative depiction of how a Cross-Section F transitions to include taper and turn lane is shown in **Figure 2.3-14**.

Table 2.3-1 Arterial Street Left-Turn Lane Storage

<i>Intersection Type</i>	<i>Arterial Street Storage Length</i>
<i>Intersection with Arterial Streets (including dual left turns)</i>	250' ¹
<i>Intersection with Collector Streets</i>	150'
<i>Intersection with Local Streets</i>	100'
<i>Intersection with Driveways</i>	100'

¹Dual left-turn lanes are required when vehicle queue exceeds 250'.

Table 2.3-2 Collector Street Left-Turn Lane Storage

<i>Intersection Type</i>	<i>Collector Street Storage Length*</i>
<i>Intersection with Arterial Street</i>	100'

*Collector street turn lanes may be required based on TIA recommendations

¹ <https://www.phoenix.gov/streets/reference-material/>

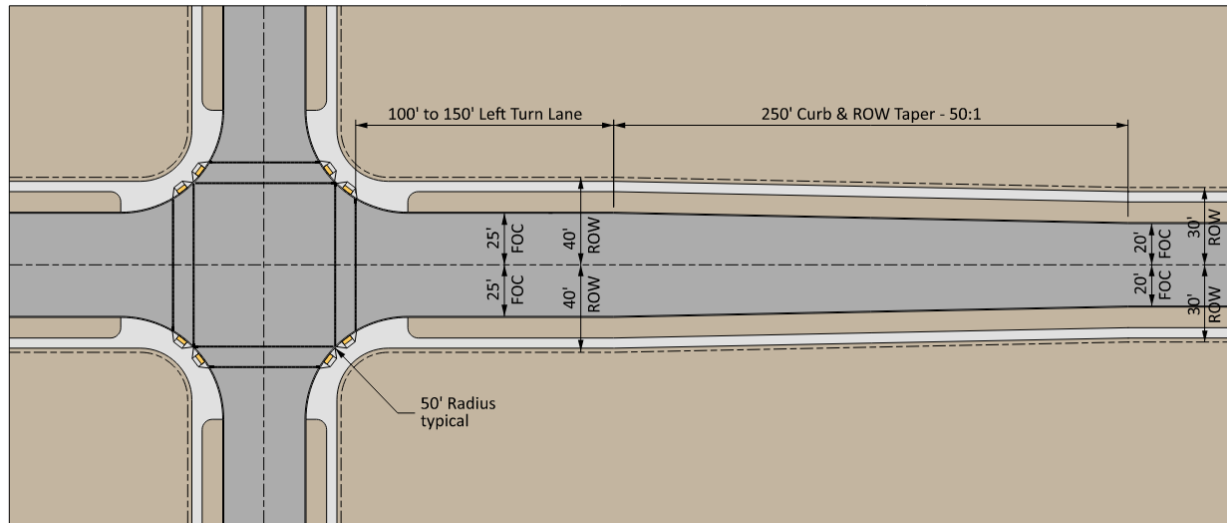


Figure 2.3-14 Intersection Flares, Cross-Section F

2.3.7 MEDIANS

Medians shall be provided as identified by street classification and may be permitted on collector and local streets with the approval of the Street Transportation Department and the inclusion of a private maintenance agreement. Raised median islands are intended to separate opposing traffic flows, restrict indiscriminate crossing maneuvers, control turns, and protect vehicles waiting to turn left. The basic purpose of a median island is to expedite traffic and increase vehicle and pedestrian safety. Too frequent openings may void these benefits.

Median Widths

The width of a raised median is measured from the face of median curb to the face of median curb. The nominal width of a raised median island is specified in **Table 2.2-1**.

At intersections, when a raised median island is narrowed for a left-turn pocket, the minimum width should be 4'. Only in exceptional circumstances will a raised median be approved to a width of less than 4'.

Raised Medians

Raised medians that are more than 4' in width are normally landscaped. Landscaping and other median features shall not restrict the sight distance for vehicles turning left on the through street. Median landscaping shall not restrict sight distance in the vicinity of intersections for side street traffic. Per City of Phoenix Street Landscape Manual, no plant material within 10' of the end of street median islands and no trees planted within 80' of the end of the street median. Street median islands 0 to 800' in length must maintain an open area equal to 30' in length at either end or have turning lane (non-signal) to provide for parking a service vehicle. Street median islands greater than 800' in length must maintain an open area equal to 75' length at the mid-point, and either end or have a turning lane (non-signal) to provide for parking of a service vehicle. A mid-point open area should be provided for each additional 1,000' of median island.

Street median island 4' or less in width to be hardscaped, including stamped concrete. Concrete to be 6" thick, 3000 psi with welded wire reinforcement and stamped brick finish. Coordinate with Street Transportation Department for texture, brick pattern, and color.

Raised medians on collector and local public streets shall be maintained by the Development's Homeowners Association and/or applicable private maintenance agreement with the City of Phoenix.

Where initial development constructed only one-half of the travel way, the development that completes the cross-section is responsible for construction of the median. This construction may extend beyond property frontage to tie to existing constructed medians.

Median Nose Islands

A median island nose of 4' to 5' in width should be paved. The paved surface should have the same cross-slope as the street pavement. Acceptable paving material is Portland concrete cement. The median island nose shall be constructed per City of Phoenix Standard Details for Construction.

Spacing and Location of Median Openings

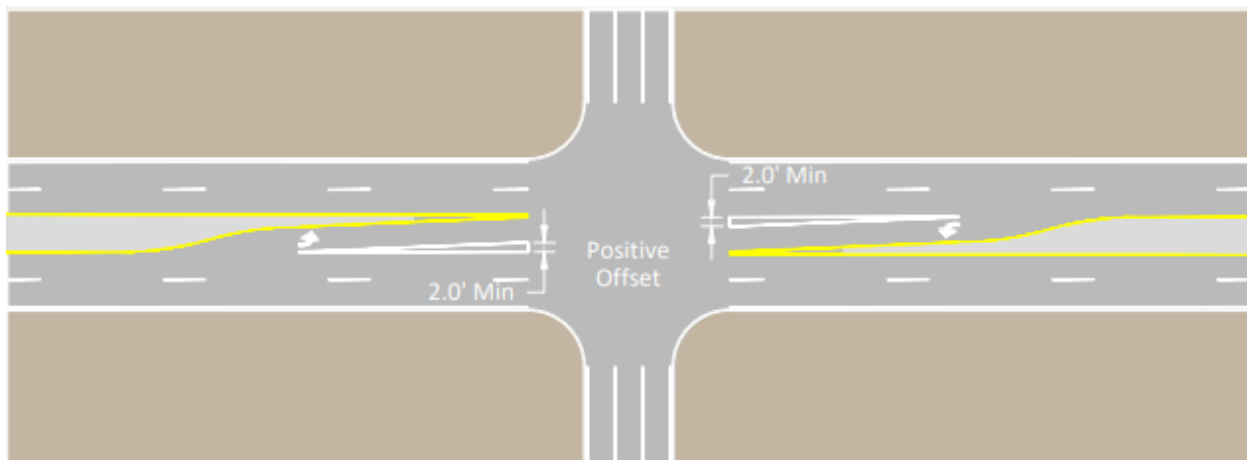
See **Chapter 6, Access Management**, for median opening criteria.

Intersection Raised Median Positive Offset

Medians at intersections should be constructed with positive offset. A positive offset of left-turn lanes improves sight distance and reduces risk of left-turn crashes.

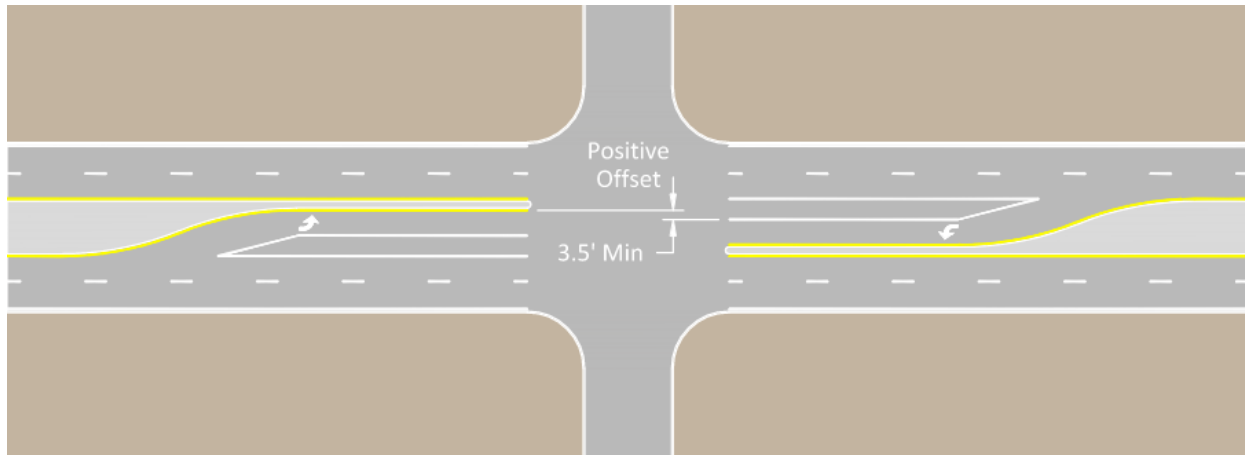
At intersection approaches that have straight alignment with no horizontal curves and the roads intersect at or close to 90 degrees, a 2' positive offset provides unrestricted sight distance when the opposing left-turn vehicle is a passenger car, as shown in **Figure 2.3-15**. A 3.5' positive offset provides unrestricted sight distance when the opposing left-turn vehicle is a truck (based on a truck width of 8.5', which corresponds to City Transit Bus, WB-50, and WB-67). These conditions generally apply to existing conditions where retrofit improvements are being made. Use truck offset conditions where 10% or more trucks are present.

When installing left-turn lanes or designing new intersections where left-turning traffic must yield to on-coming traffic, designer shall provide a minimum of 3.5' of positive offset for opposing left-turn lanes, as shown in **Figure 2.3-16** to ensure adequate sight distance for left-turning drivers. When median width is less than 2', the raised median may be terminated at the point where the median narrows to 4'. Striping and raised pavement markers, in accordance with City of Phoenix standards, is then carried through the remainder of the median taper and storage length, as shown in **Figure 2.3-17**.



Source: Adapted from MAG Left-Turn Crash Mitigation Implementation Template and Guidance, May 2018, p. 3

Figure 2.3-15 Positive Offset for Left-Turn Lanes



Source: Adapted from MAG Left-Turn Crash Mitigation Implementation Template and Guidance, May 2018, p. 3

Figure 2.3-16 Minimum Positive Offset for New Left-Turn Lanes

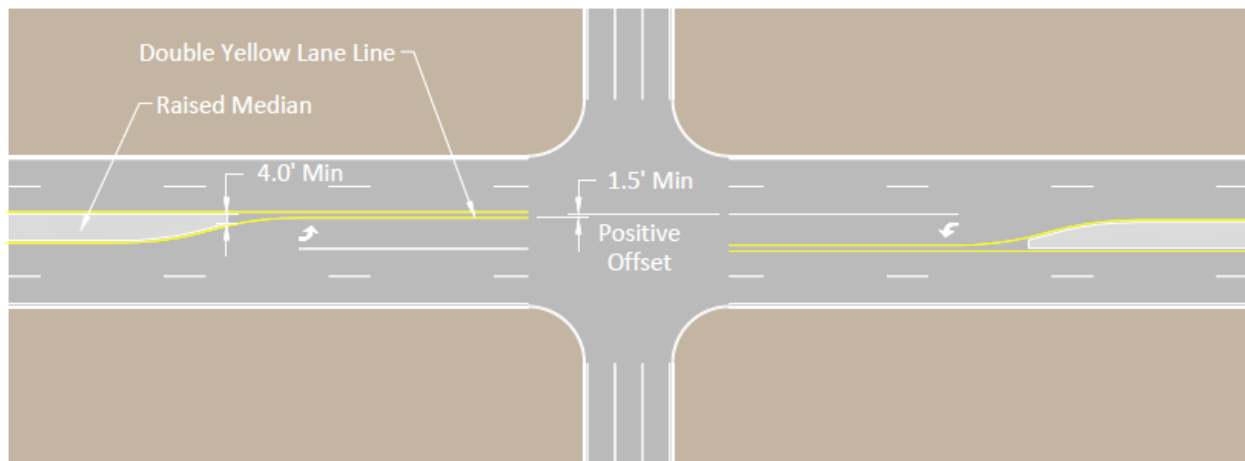


Figure 2.3-17 Truncated Raised Median to Striping for New Left-Turn Lanes

2.3.8 CURB TYPE

Vertical Curbs

Vertical curbs (6" typical) are required for all streets except local single-family residential streets, where traffic calming is not being implemented. Vertical curb is required on collector streets. New subdivisions must be platted accordingly to accommodate vertical curb. For new development within in-fill areas, front-facing single-family homes will need to be wing-type driveways when on collector designated streets.

Vertical curb shall be used through the curb return from the Point of Curve (PC) to the Point of Tangent (PT) regardless of whether the tangent curb sections are vertical, ribbon or roll curb. All curb returns shall be provided with curb ramps with sidewalk from PC to PT per the applicable City of Phoenix sidewalk ramp detail as required by the Americans with Disabilities Act (ADA).

Local single-family residential streets with special narrower cross-sections will be constructed with vertical curbs and offset (separated) sidewalks. Vertical curbs should also be used where drainage considerations make such use desirable. Vertical curbs with gutter are to be constructed in accordance with the current City of Phoenix supplements to the MAG (Maricopa Association of Governments) standard details.

Vertical curb and gutter type shall match the adjacent pavement slope to the gutter cross slope direction. The curb height shown on the standard detail is 6", but the following variations may be used where appropriate:

- Where fire lane or public maintenance vehicle access to abutting property must be provided over the curb, use mountable curb and gutter.

Ribbon Curb

Ribbon curb is permitted as specified by the City of Phoenix Zoning Ordinance, Section 32-35.C Option 2.2. Local residential streets may be paved with ribbon curbs if drainage and pedestrian traffic permit; all collector streets are to have vertical curbs and sidewalks. Ribbon curbs may be provided if the sidewalk is set back a minimum of 5' from the curb. Ribbon curb is discouraged but may be used in lieu of roll curb for local residential streets, where attached sidewalks are not provided. When ribbon curb is used, drainage runoff from the road shall not drain with the road but shall be directed to roadside drainage ditches.

Roll Curb

Roll curb is permitted on local single-family residential streets except where vertical curb is required for drainage and is to be constructed in accordance with the current City of Phoenix supplements to the MAG Standard Details.

2.3.9 HORIZONTAL ALIGNMENT

AASHTO A Policy on Geometric Design of Highways and Streets specifies design criteria and guidelines for horizontal curves. The City of Phoenix also requires:

Tangent Sections Between Reverse Curves

- On arterial and collector streets a tangent section must be provided between two curves that curve in the opposite direction. AASHTO requires that a tangent be provided between reverse curves long enough to satisfy superelevation transitions. For urban roadways without superelevation, a minimum tangent length of 100' is desired between reverse curves. Generally abrupt reversals in alignment should be avoided.

Tangent Sections Approaching Intersections

- Tangent sections must be provided between an intersection and a curve on collector and arterial streets. The tangent section should be designed to satisfy AASHTO's criteria for intersection sight distance.

Tangent Sections Between Curves in the Same Direction

- If super-elevation is provided in the curved portions of the roadway, tangent lengths will be determined by the super-elevation transition lengths indicated in AASHTO A Policy on Geometric Design of Highways and Streets.

2.3.10 VERTICAL ALIGNMENT

Longitudinal Grades

Longitudinal grades should follow the guidelines:

- **Arterial streets.** As determined by the Street Transportation Director.

- **Collector streets.** Maximum of seven percent.
- **Local streets.** Maximum of nine percent.
- **All streets:** Minimum of 0.4 percent; grades less than 0.4 percent to 0.15 percent require written approval from Street Transportation Department.

Cross Slopes

Cross slopes should follow the guidelines:

- Streets with concrete gutters:
 - ▶ Cross-slope desirable: 2 percent.
 - ▶ Cross-slope maximum: 3 percent
 - ▶ Cross-slope minimum: 1 percent, with a gutter slope minimum of 0.3 percent .

Where rigid adherence to these standards causes unreasonable or unwarranted hardship in design or cost without commensurate public benefit, exceptions may be made by the Street Transportation Department upon review and approval of the Department's Deputy Director.

Vertical Curves

AASHTO A Policy on Geometric Design of Highways and Streets specifies design criteria and guidelines for vertical curves. Vertical curves shall be designed to provide adequate sight distance, safety, comfortable driving, good drainage, and a pleasant appearance.

Algebraic difference in grades without a vertical curve on continuous roadways shall be equal to or less than the values specified for the following conditions:

- 0.2% Federal Aid Projects (applies to National Highway System roads)
- 0.3% Equal to or greater than 55 mph design speed
- 0.5% Equal to or greater than, 40 mph, but less than 55 mph design speed
- 1.0% Less than 40 mph design speed
- 2.0% Local residential street

Minimum Vertical Curve Lengths

Vertical curve should be in compliance with City Ordinance 32-27C.

A parabolic vertical curve is to be used. AASHTO A Policy on Geometric Design of Highways and Streets provides all necessary mathematical relations for computing a vertical curve for both crests and sags. Minimum vertical-curve lengths are determined by sight distance requirements for a given design speed.

Crest Vertical Curve Lengths

Minimum crest curve lengths are determined by either the stopping sight distance or the passing sight distance, whichever provides the greatest curve length, unless the street is striped for no passing.

i) The minimum crest vertical curve lengths on streets with two or more through travel lanes per direction must only meet stopping sight distance requirements.

ii) Two-Lane Streets – Passing sight distance requirements should be met on streets with one through travel lane per direction. When crest curve construction in accordance with passing sight distance requirements would result in the creation of drainage problems or excessive cuts or fills, the curve length may be reduced with the installation of appropriate traffic control measures.

iii) Minimum Crest Vertical Curve Length Determined by Stopping Sight Distance – The following equations are to be used to determine the minimum crest vertical curve lengths based upon stopping distance requirements (assumes AASHTO minimum requirements of 3.5' driver height and a 2.0' object height):

$$\text{When } S_s < L, L = \frac{AS_s^2}{2158}$$

$$\text{When } S_s > L, L = 2S_s - \frac{2158}{A}$$

Where:

S_s = Stopping sight distance in feet for a given design speed

L = Length of curve in feet

A = Algebraic grade difference in percent

iv) Minimum Crest Vertical Curve Length Determined by Passing Sight Distance – The following equations are to be used to determine the minimum crest vertical curve lengths based upon sight distance requirements (assumes AASHTO minimum requirements of 3.5' driver height and a 2.0' object height):

$$\text{When } S_p < L, L = \frac{AS_p^2}{2800}$$

$$\text{When } S_p > L, L = 2S_p - \frac{2800}{A}$$

Where:

S_p = Passing sight distance in feet for a given design speed

L = Length of curve in feet

A = Algebraic grade difference in percent

Sag Vertical Curve Lengths

Minimum sag vertical curve lengths are determined by either the stopping sight distance or comfort factors. The longer of the two possible minimum curve lengths will be used.

i) Minimum Sag Vertical Curve Length Determined by Stopping Sight Distance – The following equations are to be used to determine the minimum sag vertical curve length based upon stopping sight distance requirements (assuming AASHTO minimum requirements of two ft headlight height and a 1° divergence):

$$\text{When } S_s < L, L = \frac{A \times S_s^2}{400 + 3.5 \times S_s}$$

$$\text{When } S_s > L, L = 2 \times S_s - \frac{400 + 3.5 \times S_s}{A}$$

Where:

S_s = Stopping sight distance in feet for a given design speed

L = Length of curve in feet

A = Algebraic grade difference in percent

ii) Minimum Sag Vertical Curve Length Determined by Comfort – The following equation is to be used to determine the minimum sag vertical curve length based upon comfort:

$$L = \frac{A \times V^2}{46.5}$$

L = Length of curve in feet

A = Algebraic grade difference in percent

V = Design speed in mph

Combined Horizontal and Vertical Curves

Where horizontal and vertical curves are required, care should be taken to understand resulting alignment for sight distance and visual perception. Sharp horizontal curves should not be introduced at or near the top of significant crest vertical curves where sight distance may be limited. Horizontal curves near the bottom of short sag vertical curves appear foreshortened and influence driving. Where horizontal and vertical curves are combined, the horizontal curve lengths should lead (i.e., be made longer) than the vertical curve. Refer to AASHTO A Policy on Geometric Design of Highways and Streets.

2.3.11 ALIGNMENT SIGHT DISTANCE

Stopping sight distance is the minimum sight distance to be provided at all points on streets. Stopping sight distance is that required for a vehicle traveling at the design speed to bring the vehicle to a stop after an object on the road becomes visible under worst case (wet pavement, slow-driver reaction) conditions.

Stopping sight distance shall also be provided in the vicinity of intersections. Sight distance is measured from the driver's eye, 3.5' above the pavement to the top of an object on the pavement 2.0' high for stopping sight distance.

Minimum stopping sight distances is consistent with AASHTO A Policy on Geometric Design of Highways and Streets, shown in **Table 2.3-3** Stopping Sight Distance on Level Roadways. These distances vary with design speed.

City of Phoenix does not designate passing zones on City of Phoenix streets.

Table 2.3-3 Stopping Sight Distance on Level Roadways

Design Speed (mph)	25	30	35	40	45	50	55
Stopping Sight Distance (ft)	155	200	250	305	360	425	495

Source: AASHTO Green Book, 2018, Tables 3-1

Superelevation

Superelevation is not used on downtown and urban roadways. Superelevation is discouraged on suburban, rural, and industrial roadways. Superelevation may only be used when other means of design is not feasible. All superelevation will be reviewed by the Street Transportation Department. When superelevation is used, the following criteria shall be followed:

Superelevation 0.02 ft/ft (2%)

Superelevation of 0.02 ft/ft may be used when the standard radius cannot be provided due to circumstances beyond the control of the engineer and the general alignment cannot be changed.

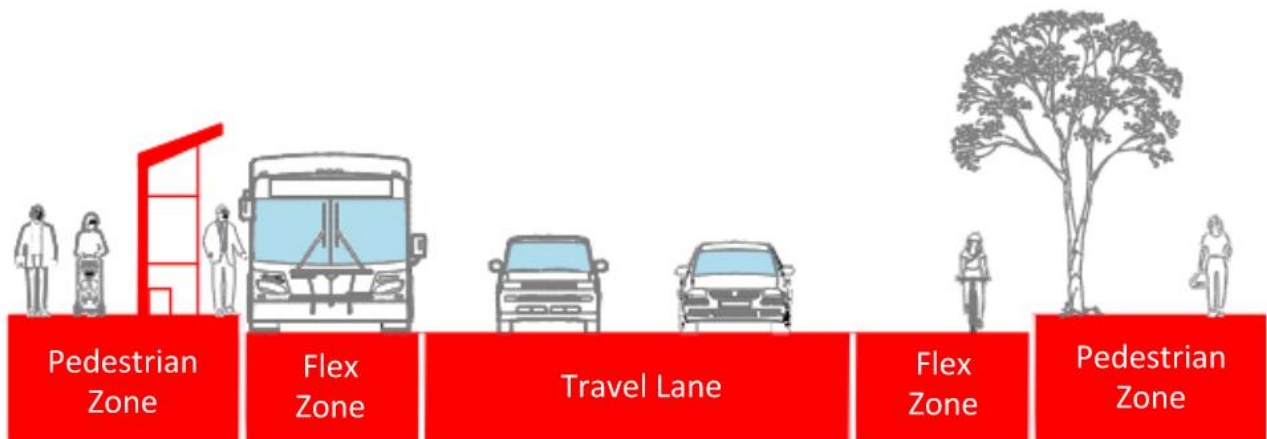
Superelevation Greater than 0.02 ft/ft (2%)

Superelevation greater than 0.02 ft/ft may not be used except when approved by the Street Transportation Department. In no case shall a superelevation exceed 0.04 ft/ft.

Transition for superelevation is consistent with AASHTO A Policy on Geometric Design of Highways and Streets. A 1% minimum slope is required in at least one direction for drainage purposes.

2.4 FLEX ZONE

The flex zone is the part of the right-of-way adjacent to an existing curb face that can be used for multiple purposes such as bicycle facilities, transit stops, parking, delivery zones, and drop off zones. The flex zone in relation to other right-of-way zones is depicted in **Figure 2.4-1**.



Source: Adapted from *Seattle Right-of-Way Improvements Manual, Standard 2.1 Right-of-Way Allocation*

Figure 2.4-1 Right-of-way Zones

2.4.1 BICYCLE FACILITIES

On-street bike lanes may be used where a minimum of 6' from curb face can be obtained. Where practical, it is desirable to provide 8' from curb face to provide a buffered bicycle lane.

ARS 28-815 prohibits motorized vehicles to park or stop in the bike lane. To recognize the needs of residents along commuter routes on collector/local streets, the bike lane may be signed as in effect for only part of the day and imposing parking restrictions only during commute periods (7:00 a.m. - 6:00 p.m. Monday through Friday).

More information on the design of bicycle facilities is provided in Chapter 8, Bikeways.

2.4.2 ON-STREET PARKING

General principles for when parking is desirable or allowed are described in this section.

Local streets and collectors provide for on-street parking to provide access to dwelling units but may be limited by specific ordinances which require a neighborhood parking permit or equivalent or in situations where parking would obstruct access to fire hydrants or cause a safety issue.

In general, parking is accounted for in the design of typical cross sections for local streets and collectors.

Streets in an industrial context should be designed for parking of the WB-67 interstate semi-trailer design vehicle, and parking is included in the typical cross section design for streets in industrial areas.

Arterials should not be designed for parking.

On-street parking may be desirable on collector streets in an urban context where sufficient curb width is available.

2.4.3 TRANSIT

Flex zone may include bus stops or bus pullouts/bus bays, boarding-bulb stops, and side-boarding island stops.

Transit Stops

Transit Stop Placement

The preferred location for a bus stop is on the intersection exit (far side) rather than the intersection approach. Near side bus-stop locations are normally less desirable than far-side bus stops, particularly near signalized intersections, because they:

- Block vehicles from turning right on red.
- Force following vehicles to stop even when there is a green signal.
- May partially obstruct motorist's and pedestrian's view of each other at crosswalks.

The Public Transit Department decides if a transit stop is needed to service their patrons and staff reviews operational considerations and determines the optimal location for signs. The following criteria should be considered in selecting bus stop locations:

- At unsignalized intersections, bus stops should normally be far-side and clear of the crosswalk to prevent blocking of pedestrian movements.
- At signalized intersections, bus stops should offer additional clearance from the crosswalk at locations with three through lanes. When only two through lanes exist, the bus stop should be further down the street if there is no bus pullout. For example, on signalized collector streets, the left lane is normally blocked by left turns, leaving only one lane, this means the bus stop should be located sufficiently downstream to not block the only effective through lane.

Design engineers should consult City of Phoenix Standard Details for location and layout design.

Bus Bays

Location of bus bays, bus bay shelters and installation and removal of existing bus bays/bus bay shelters are an important design feature and shall be evaluated and approved early in design with Valley Metro, Street Transportation Department, and the Public Transit Department.

Design engineers should reference City of Phoenix Standard Details for bus bay, pad, and shelter design.

2.5 PEDESTRIAN ZONE

The pedestrian zone is the portion of a street that is between the flex zone and the edge of right-of-way. It is comprised of the landscape/streetscape/furniture area, the pedestrian clear area, and the frontage area.

Landscape/Streetscape/Furniture Area (including the curb) is the area between the roadway curb face and the front edge of the pedestrian-clear zone. This area buffers pedestrians from the adjacent roadway and is the appropriate location for, street trees and vegetation, as well as amenities permitted by revocable permit with the city and includes the 6" curb in its dimensions. It is also the preferred location for other elements, such as signage, pedestrian lighting, hydrants, and above and below grade utilities. Clearance and setback requirements apply to many elements located in the landscape/furniture area.

Pedestrian Clear Area is the area of the sidewalk corridor that is specifically reserved for pedestrian travel. As required by City of Phoenix Zoning Ordinance or policy plans, wider clear area widths are required within transit areas and high-pedestrian activity areas street furniture, street trees, planters, and other vertical elements such as poles, fire hydrants and street furniture, as well as temporary signs and other items shall not protrude into the pedestrian clear area. The desirable clear area width is 5'. The clear area width must be compliant with ADA requirements.

Frontage Area is the area between the property line and pedestrian clear area. Frontage area can accommodate store entrances outdoor dining, landscaping, or other amenities. A minimum of 2' is recommended for the frontage area to allow for shy distance from fixed objects.

2.5.1 SIDEWALKS

Sidewalks shall be provided along all streets unless a specific exemption allows. Exceptions require approval by the Street Transportation Director.

Sidewalks should be constructed a minimum of 5' wide on arterial and collector streets, and 4' wide on local streets, and in no case less than identified on the City-approved Street Classification Map and/or adopted Neighborhood or Area Specific Plans. In areas with high pedestrian volumes, wider sidewalks may be required. Sidewalks shall be constructed consistent with current City of Phoenix standard cross-sections.

Sidewalks shall be designed in accordance with current ADA guidelines. A 5' by 5' passing area must be provided every 200' to allow wheelchairs to pass on all sidewalks less than 5' wide. Driveways and other connecting sidewalks may be used to provide the passing area, as long as the cross-slope meets ADA standards. Poles and fire hydrants may encroach into the pedestrian realm, but the sidewalk must meet current ADA minimum clear widths.

Sidewalks should stay at-grade and level (1.5 percent preferred cross-slope) across driveway openings.

Slopes of pedestrian facilities shall not exceed the maximum grades indicated in ADA: sidewalk cross slope of 2 percent, ramp slope of 8.33 percent, ramp and landing cross slope of 2 percent and flared side (wing) slope of 10 percent. Expansion joints and contraction joints are required to be constructed per the MAG Uniform Standard Specifications for Public Works Construction and Standard Details and the City of Phoenix Supplements to these.

The surface of concrete sidewalk or curb ramp shall not deviate in excess of 1/8" over 5' as tested with a five-foot straightedge except for the 1/4" recess of the preformed material in expansion joints.

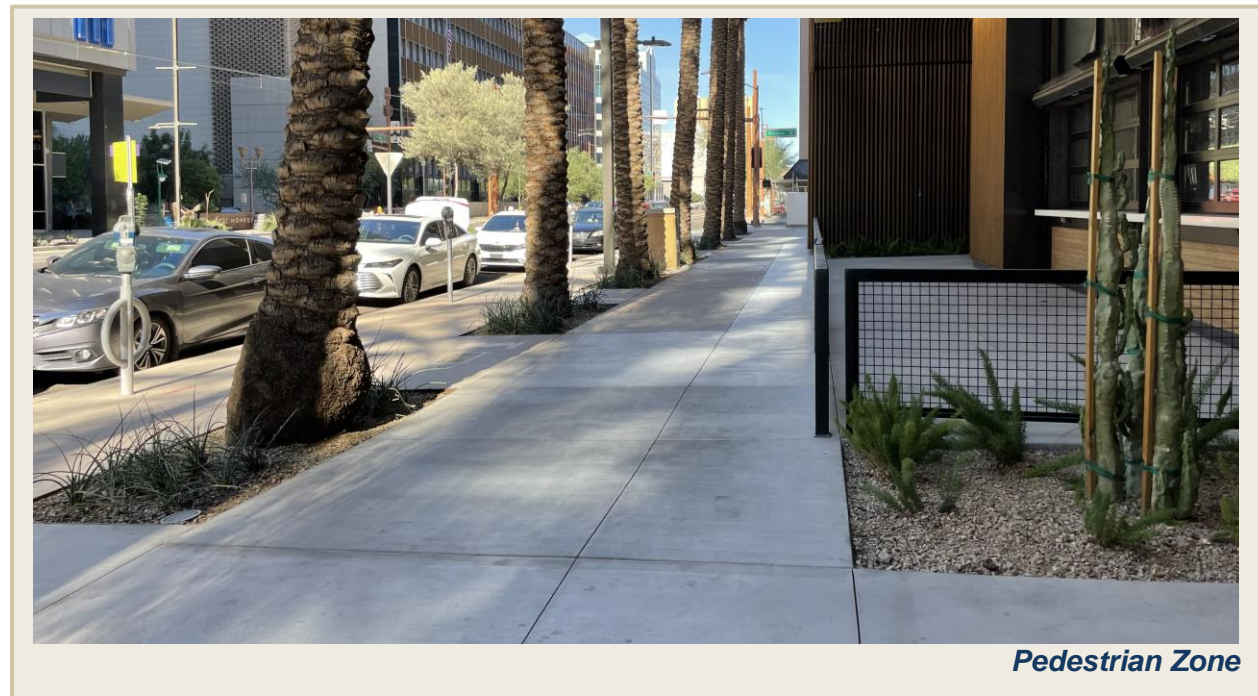


Figure 2.5-1 Pedestrian Zone Example

2.6 INTERSECTIONS

2.6.1 CURB RETURN RADII

Table 2.6-1 presents curb return radii to accommodate turning movements of vehicles by street typology.

Table 2.6-1 Curb Return Radii

Classification of Intersecting Streets	Curb Return Radii (ft) by Area Type			
	Downtown/Urban	Residential	Suburban	Industrial
Arterial and Arterial	20'	35'	35'	35'
Arterial and Collector	20'	30'	30'	35'
Arterial and Local	20'	25'	25'	35'
Collector and Collector	10'	30'	25'	35'
Collector and Local	10'	20'	20'	35'
Local and Local	10'	20'	20'	35'
Local and Private	10'	20'	20'	35'

2.6.2 INTERSECTION SIGHT DISTANCE

Intersection sight distance is the distance a motorist can see approaching vehicles before their line of sight is blocked by an obstruction near the intersection. The driver of a vehicle approaching or departing from a stopped position at an intersection should have an unobstructed view of the intersection, including any traffic control devices, and sufficient lengths along the intersecting roadway to permit the driver to anticipate and avoid potential collisions. Examples of obstructions include crops, hedges, trees,

parked vehicles, utility poles, or buildings. In addition, the horizontal and vertical alignment of the roadway approaching the intersection can reduce the sight triangle of vehicles navigating the intersection. Sight distance must also be provided for left-turning traffic turning from the major road.

The required intersection sight distance is dependent upon the traffic speed and width of the major road. Sight distance triangles should be calculated based on AASHTO A Policy on Geometric Design of Highways and Streets. The design speed shall be 10 mph higher than the speed limit of the major road.

The design must demonstrate that other vehicles, such as opposing left-turn vehicles, do not block sight distance, particularly along curves. Both approach triangles and departure sight triangles must be shown in intersection plans.

Landscaping plans must be consistent with sight visibility requirements. It is the responsibility of the developer to provide landscaping between the property line and the curb consistent with sight visibility triangle requirements. Vegetation within the sight triangle is allowable if it is of a low variety that remains below 24" when mature. Trees may be considered as long as the canopy is above 10' and if it is a single trunk variety and less than 12" in diameter.

Driveways shall not be placed where it creates a sight visibility issue with existing large diameter power poles, landscaping, and other obstructions. Conflicts should be resolved through utility relocation or by demonstrating through a sight distance analysis performed by a registered traffic engineer in conformance with AASHTO guidelines.

Approach Sight Triangles

Approach sight triangles demonstrates that drivers have sufficient time to react to vehicles on uncontrolled or yield-controlled intersecting cross streets. According to *AASHTO A Policy on Geometric Design of Highways and Streets*, "Each quadrant of an intersection should contain a triangular area free of obstructions that might block an approaching driver's view of potentially conflicting vehicles. The length of the legs of this triangular area, along both intersecting roadways, should be such that the driver can see any potentially conflicting vehicles in sufficient time to slow or stop before colliding within the intersection." Approach sight triangles are illustrated in **Table 2.6-2** and **Figure 2.6-1**.

Departure Sight Triangles

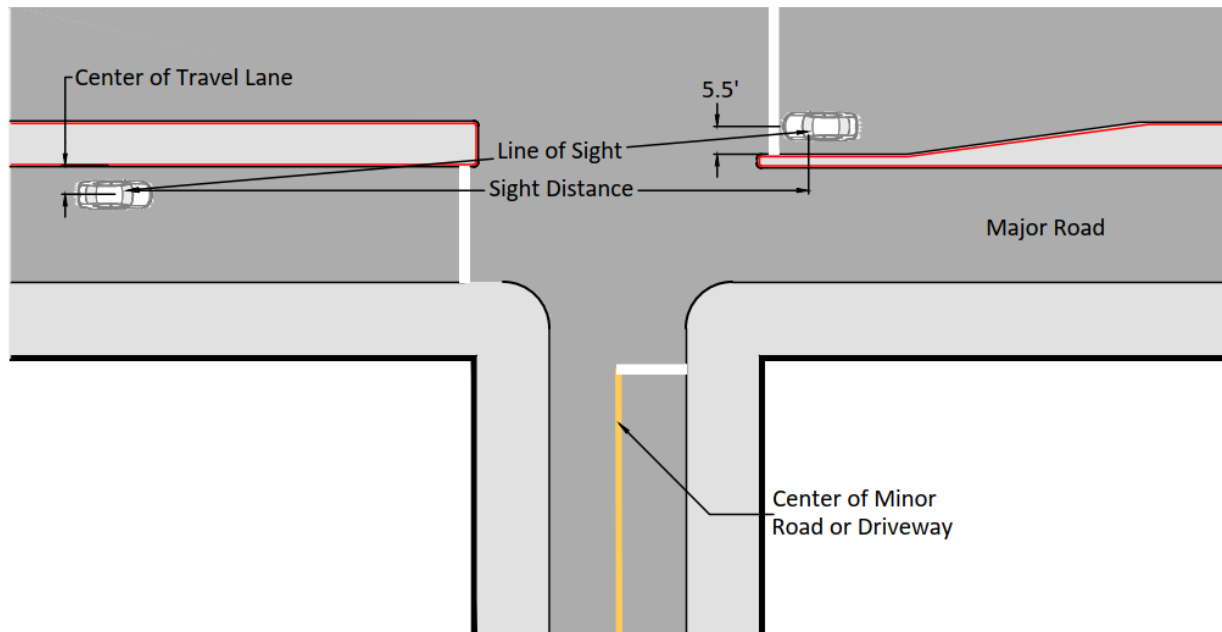
AASHTO A Policy on Geometric Design of Highways and Streets, states "A second type of clear-sight triangle (departure sight triangle) provides sight distance sufficient for a stopped driver on a minor-road approach to depart from the intersection and enter or cross the major road." Departure sight triangles are illustrated in **Table 2.6-3** and **Figure 2.6-2**.

Alignment and Profile

Intersections occurring on horizontal, or crest vertical curves are undesirable. When there is latitude in the selection of intersection locations, vertical or horizontal curvature should be avoided. An alignment or grade change is frequently warranted when major intersections are involved. If a curve is unavoidable, it should be as flat as site conditions permit. Where the grade of the through roadway is steep, flattening through the intersection is desirable as a safety and efficiency measure. Grade breaks through major-major, major-collector, and any other signalized or potentially signalized intersections shall not exceed 2.5 percent desirable or 3.0 percent absolute maximum. Sight triangles on horizontal curves are illustrated in **Table 2.6-4** and **Figure 2.6-3**.

Table 2.6-2 Required Sight Distance, Left Turn from Major Road

City of Phoenix Street Cross-Section	A	B	C, CM, D	E
Through Road Pavement Width	104'	94'	64', 74'	50'
Time Gap (sec)	8.25	7.75	7.25	6.5
Design Speed				
30 mph	364'	342'	320'	287'
35 mph	424'	399'	373'	334'
40 mph	485'	456'	426'	382'
45 mph	546'	513'	480'	430'
50 mph	606'	570'	533'	478'



*Passenger car, at-grade/level; adjustments required for trucks and grades

Figure 2.6-1 Sight Triangles, Left-Turn from Major Road

Table 2.6-3 Sight Distance (feet), Left-Turn from Stop

City of Phoenix Street Cross-Section	A	B	C, CM, D	E	F (Industrial)	F (Residential), FN, G, H, I
Through Road Pavement Width	104'	94'	64', 74'	50'	50'	36'
Time Gap (sec)	9.75 sec	9.5 sec	8.75 sec	8.5 sec	8 sec	7.75 sec
Design Speed						
30 mph	430'	419'	386'	375'	353'	342'
35 mph	502'	489'	450'	437'	412'	399'
40 mph	573'	559'	515'	500'	470'	N/A
45 mph	645'	628'	579'	562'	529'	N/A
50 mph	717'	698'	643'	N/A	N/A	N/A

Values are provided for guidance only based on passenger car equivalent and minor road approach grades of 3 percent or less; professional engineer should verify site-specific conditions including vehicle type, grades, and pavement widths

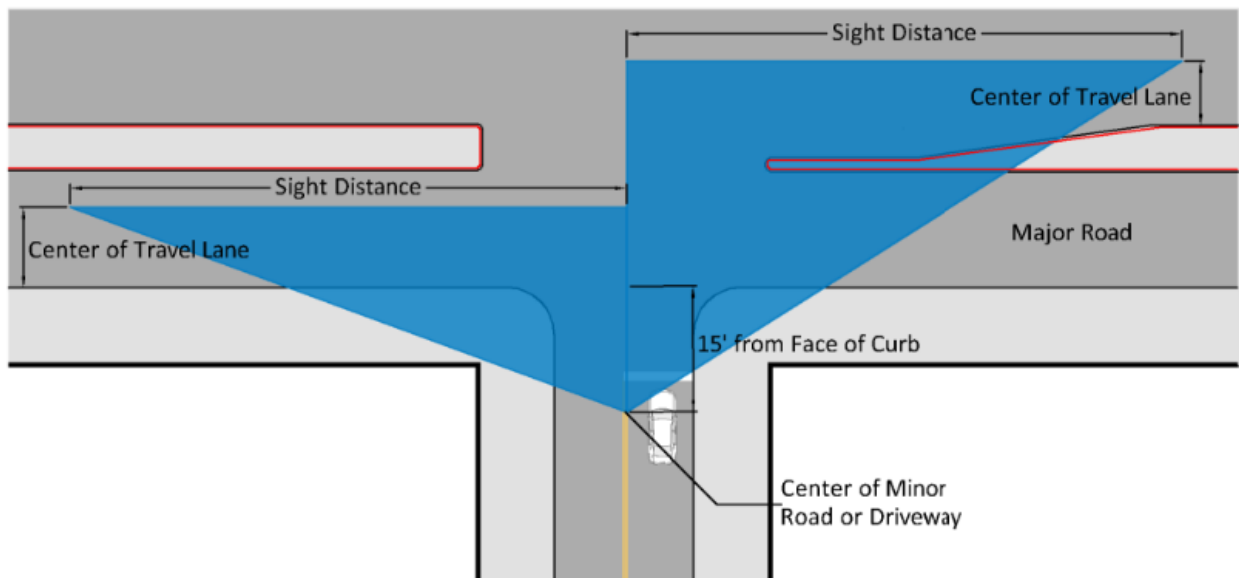


Figure 2.6-2 Sight Triangles, Left-Turn from Stop

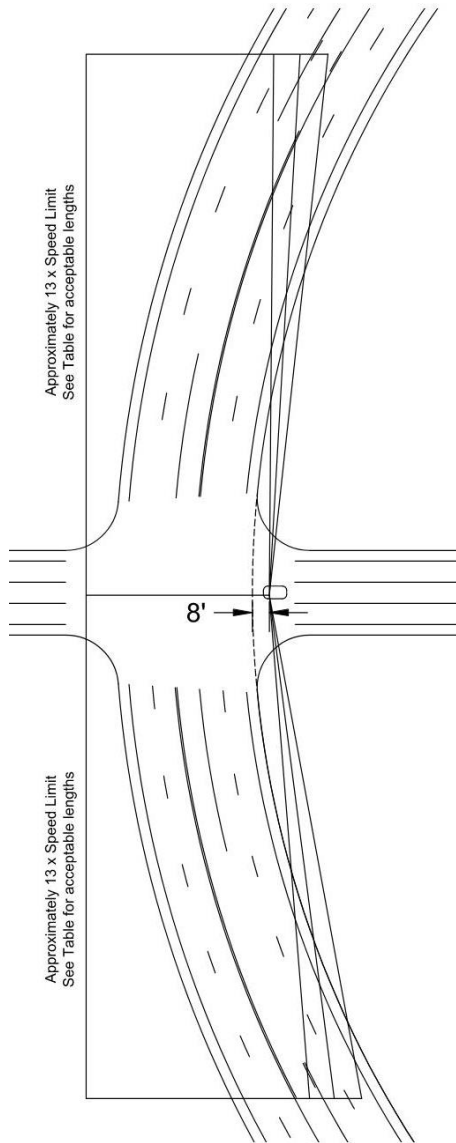


Figure 2.6-3 Sight Triangles, Horizontal Curve

Table 2.6-4 Sight Distance, Horizontal Curve

3-Lane Streets (Bike Lane, Thru, Left, Thru, Bike Lane) or Smaller			
Speed	Length Passenger Vehicle	Length Single Unit Truck	Acceptable Average
25 mph	280'	350'	315'
30 mph	335'	420'	380'
35 mph	390'	490'	440'
5-Lane Streets (Bike Lane, Two Thru, Left, Two Thru, Bike Lane)			
Speed	Length Passenger Vehicle	Length Single Unit Truck	Acceptable Average
25 mph	295'	375'	335'
30 mph	353'	450'	402'
35 mph	412'	525'	469'
40 mph	471'	600'	536'
45 mph	530'	675'	603'
50 mph	588'	750'	670'
6-Lane Streets (Bike Lane, Three Thru, Left, Three Thru, Bike Lane)			
Speed	Length Passenger Vehicle	Length Single Unit Truck	Acceptable Average
25 mph	315'	400'	358'
30 mph	380'	481'	431'
35 mph	438'	561'	500'
40 mph	500'	641'	571'
45 mph	563'	721'	642'
50 mph	625'	801'	713'

2.6.3 VISIBILITY FOR TRAFFIC CONTROL DEVICES

Stop Signs

All stop signs shall be fully visible to approaching traffic from a distance no less than the stopping sight distance. Design speed is 5 mph over the speed limit.

Stopping sight distance triangles for approaches controlled by stop signs are shown on **Figure 2.6-4**. There shall be no fence, wall, shrubbery, tree, or any other obstruction to vision between a height of 2.5' and 10' above the sidewalk within the stopping sight distance triangle approaching a stop sign.

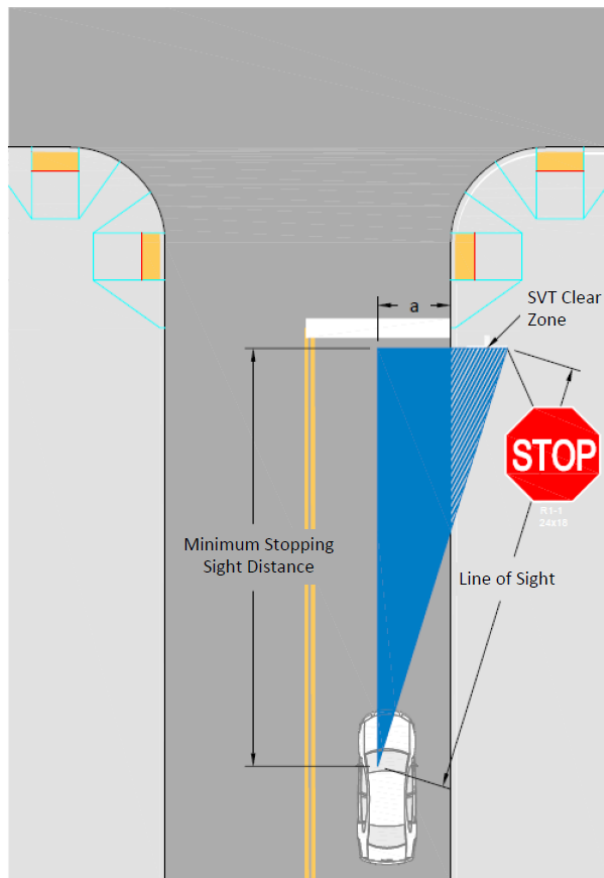


Figure 2.6-4 Sight Triangles Approaching STOP Signs

Table 2.6-5 Stopping Sight Distance, Approaching Stop Signs

Speed Limit of Street Approaching STOP Sign (mph)	Minimum Stopping Sight Distance (feet)
25	200'
30	250'
35	305'
40	360'
45	425'
50	495'

'a' = eye location, approximately measured from center of outside travel lane; lateral location of sign is defined by MUTCD Figure 2A-2.

Traffic Signals

Visibility of traffic signal indications shall be maintained per Section 4D.12 of the current *Manual on Uniform Traffic Control Devices (MUTCD)*.

2.7 INTERSECTION CONTROL EVALUATION

As described by FHWA², Intersection Control Evaluation (ICE) is a data-driven, performance-based framework and approach used to objectively screen alternatives and identify an optimal geometric and

² <https://safety.fhwa.dot.gov/intersection/ice/fhwasa18076.pdf>

control solution for an intersection. ICE is recommended for new intersections or when considering any substantive changes to the traffic control or geometry of existing intersections. Substantive changes are often considered for the following reasons:

- Safety improvement
- Congestion mitigation
- Broader corridor improvement/widening
- Multimodal facility enhancement
- Change of access to an adjacent parcel of land or land development

City of Phoenix encourages an ICE evaluation when considering the following intersection improvements:

- Roundabout
- Displaced Left-Turn/Continuous Flow Intersection
- Median U-turn/Indirect Left-Turn/Thru-Turn/Michigan Left-Turn
- Signalized or Unsignalized Restricted Crossing U-Turn Intersection Jug Handle Intersection/Quadrant Intersection

ICE is typically conducted in two scoping stages as described below.

2.7.1 SCOPING

The purpose of the scoping phase of ICE is to determine, from dozens of potential alternatives, which intersection type and control solutions merit further consideration for the project. The scoping phase of ICE occurs early in project development, helping to inform a project scope and develop a cost estimate and schedule. The purpose of Stage I is to assess the alternatives individually to determine if and to what extent they potentially meet project purpose and need, strategic program goals, project context, and funding constraints. The Stage I scoping analysis involves a combination of quantitative and qualitative performance metrics:

- Does the alternative meet the transportation purpose and need?
- Does the alternative address the key system performance criteria (e.g., safety, non-motorized user accommodation, operational quality, etc.)?
- Does the alternative meet the needs and values of the local community and directly affected stakeholders?

The scoping analysis includes and assessment of safety benefits, operational analysis, and multimodal considerations.

2.7.2 Alternative Selection

Stage II Alternative Selection is intended to differentiate among the intersection alternatives brought forward from the Stage I screening analysis. Stage II analysis is conducted as part of preliminary engineering and includes the estimating of environmental, utility, and right-of-way impacts. The analysis

occurs at a level of detail that allows objective comparisons of alternatives to each other. Stage II evaluates each viable alternative based on the following aspects:

- Safety performance (motorized and non-motorized)
- Operational performance (present vs. projected, peak vs. off-peak)
- Cost
- Benefit-cost
- Environmental, utility, and right-of-way impacts
- Multimodal accommodations (pedestrian, bike, and transit)
- Public opinion and input
- Context (consistency with future land use, transportation plans for the surrounding area)

2.8 ROUNDABOUTS

Roundabouts are circular intersections with design and traffic control features including yield control of all entering traffic, channelized approaches, and geometric curvature to ensure that travel speeds on the circulatory roadway are typically less than 30 mph. Roundabouts provide fewer conflict points, lower speeds, and easier decision points than intersections controlled by stop signs or traffic signals.

Roundabouts can offer advantages that conventional intersections (signalized or unsignalized) do not. Benefits can include enhanced safety and operational efficiency (capacity). Safety improvements at roundabouts may be realized due to fewer vehicle conflict points and reduced speeds. From an operations perspective, roundabouts typically function with lower vehicle delays as compared to other intersection forms and control types.

The City of Phoenix generally adheres to Roundabouts: An Informational Guide, U.S. Department of Transportation, Federal Highway Administration for development and design of roundabouts.³

For guidance regarding traffic circles for traffic-calming purposes, see Chapter 6 of this manual.

2.8.1 Roundabout Considerations

A majority of roundabouts within the City of Phoenix are at intersections of local/local, local/collector or collector/collector streets. All roundabouts on arterial and collector streets must be approved by the Street Transportation Department.

Locations recommended for roundabout design should be evaluated based on many factors including:

- At intersections where stop-control causes unnecessary delay
- At intersection with a high left-turn percentage from one or more intersection approaches
- Where a disproportionately high number of crashes involve crossing or turning traffic, resulting in head-on and right-angle crashes

³ <https://www.fhwa.dot.gov/publications/research/safety/00067/00067.pdf>

- Where it is not desirable to give priority to either roadway
- At intersections with unusual geometry

Roundabouts are NOT typically recommended for the following intersection conditions, but MAY be considered with City approval:

- At the intersection of a collector/arterial where any leg is posted 45 mph or higher
- Where the grade for any intersection leg exceeds 4 percent
- Where traffic volumes are unbalanced with higher flows on one or more intersection approaches
- Where a collector/arterial intersects with a local street and a roundabout would result in unacceptable delays to the collector/arterial street
- Where there is high pedestrian activity including special needs pedestrians
- Where there is inadequate sight distance
- Where there is a large volume of bicycle traffic
- Where a downstream traffic control device such as a traffic signal would result in a queue that extends into the roundabout

Locations where roundabouts are not recommended include intersections:

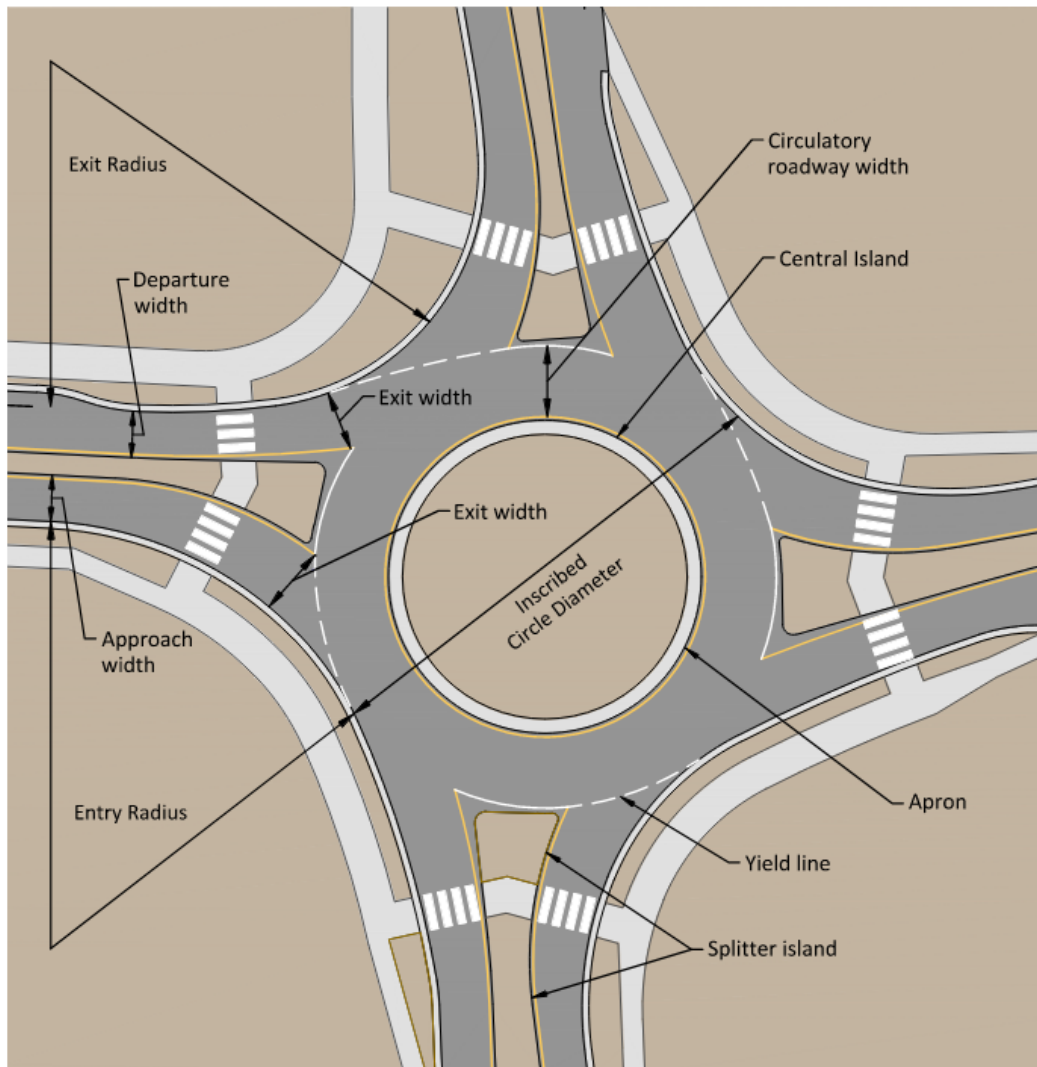
- Where a satisfactory design cannot be provided
- Where reversible lanes are required
- At a single intersection in a network of linked traffic signals
- Where a signal interconnect system provides a better level-of-service
- Where it is desirable to adjust traffic movements via signal timing

For operational and design purposes, roundabouts have several unique features and dimensions that must be considered.

City of Phoenix Street Transportation Department recommends following Roundabouts: An Informational Guide, U.S. Department of Transportation, Federal Highway Administration, for development and design of roundabouts. **Figure 2.8-1** illustrates these elements.

FHWA describes the inscribed circle diameter as the basic parameter in roundabout design. The inscribed circle diameter is the distance across the circle inscribed by the outer curb (or edge) of the circulatory roadway. It is the sum of the central island diameter (which includes the apron) and twice the circulatory roadway. The inscribed circle diameter is determined by a number of design objectives, which must be optimized for a given location. At single-lane roundabouts, the size of the inscribed circle is largely dependent upon the turning requirements of the design vehicle. At double-lane roundabouts, the size of the roundabout is usually determined either by the need to achieve deflection or by the need to fit the entries and exits around the circumference with reasonable entry and exit radii between them.

Generally, the inscribed circle diameter of a double-lane roundabout should be a minimum of 45 mph (150').



Source: Adapted from *Roundabouts: An Informational Guide*, Chapter 6, *Geometric Design*, FHWA

Figure 2.8-1 Key Roundabout Dimensions (Source: *Roundabouts: An Informational Guide*)

2.8.2 Traffic Volumes

Single-lane roundabouts can generally accommodate up to 25,000 veh/day (4-leg conditions) while double-lane roundabouts can service approximately 50,000 veh/day. To confirm effectiveness, roundabout traffic operations are to be evaluated in accordance with Highway Capacity Manual procedures. A variety of software tools are available for these purposes. **Table 2.8-1** provides preliminary guidance on capacity of a roundabout considering traffic volumes, number of lanes, and the percentage of left-turn traffic. The table shows that AADT may be used to predict the possible number of circulating lanes required for planning-level consideration.

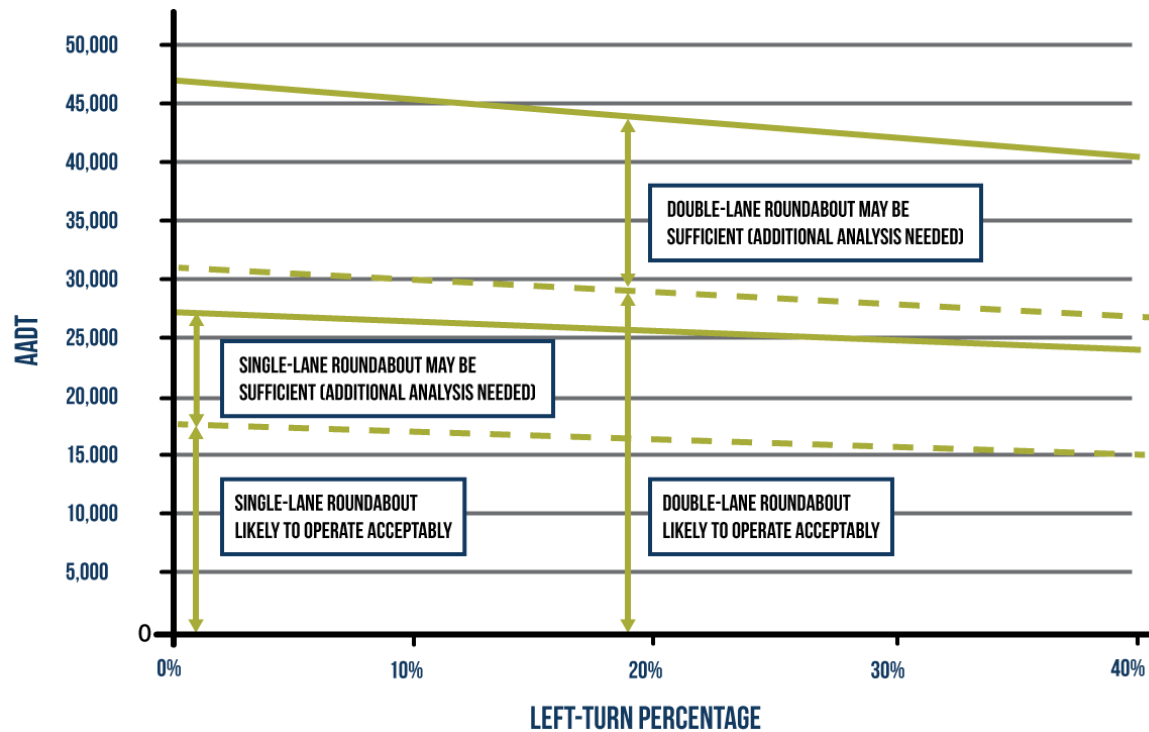


Table 2.8-1 Roundabout Planning-Level Daily Intersection Traffic Volumes (Source: Roundabouts: An Informational Guide)

2.8.3 Design Submittal and Review Requirements

All roundabout design submittals submitted to the City of Phoenix will need to include:

- Roundabout layout (including but not limited to the inscribed circle diameter, splitter islands, entry width, circulatory roadway, central island, entry and exit radius, and truck apron)
- Capacity Analysis
- Design Vehicle Accommodations and Tracking
- Fastest Path Review Documentation
- Sight Distance Review (stopping sight distance and intersection sight distance)
- Drainage
- Landscaping

Additionally, accommodations for pedestrians and bicyclists are to be appropriately designed.

2.9 SPECIAL CONSIDERATIONS

2.9.1 Construction of Half-Streets

Local half-street construction is avoided as per City Ordinance, Section 32 – 26 (k), which states “Half-streets at subdivision boundaries should be discouraged except where necessary for continuation of existing patterns. Where a platted half-street abutting the tract to be subdivided exists, and said half-street furnishes the sole access to residential lots, the remaining half shall be platted within the tract.”

Design of Cross-Section for Half-Streets

Local and Collector Streets

If a half-street must be constructed, a minimum of 24' of pavement shall be provided for local and collector streets. In the event that right-of-way is not available, and the developer is unable to obtain the additional right-of-way necessary to construct 24' of pavement, a minimum of 18' of paving for local streets or 20' for collector streets, shall be provided. Half-street construction should provide adequate transitions and full-depth asphalt tapers to the adjoining roadways.

Arterial Streets

Arterial half-street construction shall provide a minimum of ½ of the approved cross-section of the street, as per the Street Classification Map.

Design of Half-Street to Join Existing Street Pavement

The half-street shall be designed to match existing construction unless doing so is likely to create an unsatisfactory condition. If changes are needed to correct conditions on an existing half-street to properly construct the other half of the street, the solutions must be developed with Planning and Development Department, and/or Street Transportation Department staff. Plans for the new half-street must contain sufficient information on the profile and cross-sections of the existing street to demonstrate that the new construction shall match the old construction and result in a full street with a proper cross-section. Tapers are not limited to the frontage of the subject parcel and should extend beyond the subject parcel to the maximum extent consistent with available right-of-way.

Design of Half-Street at Intersections

Collector and arterial half-streets must be flared at all arterial street intersections to provide one lane in each direction and a left-turn lane. The inbound lane on a half street, at an arterial or collector street intersection should be a minimum of 18' in width. The outbound lane should be a minimum of 12' wide. Additional consideration must be given to the lane alignment if a street exists on the opposite side of the arterial street.

2.9.2 Street Terminations and Alleys

Cul-de-Sac Streets

Cul-de-sac streets in residential subdivisions shall terminate in a circular right-of-way 50' in radius with an improved traffic turning circle 45' in radius. The Street Transportation Department may approve an equally convenient configuration where extreme conditions justify.

Dead-End Streets

Sites designed with dead-end streets will not be approved except in locations designated by the Street Transportation Department as necessary for future extension in development of adjacent lands. In any case, a dead-end street serving more than four lots shall provide by easement a temporary turning circle with a 50-foot radius or other acceptable design to accomplish adequate access with an improved surface.

Access roads adjacent to arterial streets will be provided as required by current City standards.

3. STREET CONSTRUCTION

OVERVIEW

This chapter provides information specific to construction of City of Phoenix streets. Topics addressed include pavement design, culverts, stormwater management, and green infrastructure, among others.



Chapter 3 --- STREET CONSTRUCTION

This chapter provides information specific to the City of Phoenix and provides reference sources for design guidance.

3.1 PAVEMENT DESIGN

This section describes references for procedures to be used in the design of the structural section of flexible pavements which are to be constructed in Phoenix's public rights-of-way.

3.1.1 Definitions

- **Structural section:** the combination of an asphalt concrete surface course and a base course of either rock aggregate materials or asphalt concrete.
- **Subgrade:** native soil or fill material over which the structural section is to be placed.
- **Asphalt concrete course:** the total depth of asphalt concrete which may be placed in one or more layers. The upper layer is called asphalt concrete surface course (ACSC) and the lower layer is called asphalt concrete base course (ACBC).
- **Rock aggregate base material:** the total depth of rock aggregate material which may be placed in one or two layers. If one layer is placed, it shall be "Aggregate Base Course" (ABC) in accordance with Table 702 of the MAG Specifications. If two layers are placed, the top 4" must be ABC and the bottom layer may be ABC or "Select material" in accordance with Table 702 of the MAG Specifications. The rock aggregate base material is called the "base course" in this manual.

3.1.2 Geotechnical Investigation Requirements

General procedures for geotechnical investigation are provided in the City of Phoenix Street Transportation Department Design and Construction Management Division, Administrative Procedure (AP) No. 155, Project Development Requirements and Guidelines.

A geotechnical investigation shall be performed for all projects that include roadways; major structures in the right-of-way, such as bridges or box culverts; or underground facility design, including storm drain, water, and sewer. Additional borings shall be taken to clearly define limits of anomalous conditions including but not limited to poor soil conditions, hard rock if encountered, etc.

In addition to soil borings, most projects that have significant underground work shall also require seismic refraction surveys to provide understanding of subsurface soil conditions.

City of Phoenix shall review the Consultant's geotechnical report and recommended pavement structural section(s) for the new pavement.

3.1.3 Design Parameters

Resilient modulus (MR)

MR can be determined by any of the following methods:

- From relationships proposed by AASHTO,
 $MR = 1000 + 555 \cdot R\text{-value}$ (for $R\text{-value} < 20$) or

$$MR \text{ (psi)} = 2555 \text{ (CBR)}^{0.64}$$

- B. From back-calculation of surface deflections measured using non-destructive devices such as Dynaflect or Falling Weight Deflectometer (FWD)
- C. From laboratory test on representative sample using AASHTO T274 procedure
- D. From Arizona Department of Transportation (ADOT) procedure using actual and correlated R-values.

The geotechnical engineer utilizes engineering judgment in choosing the most appropriate value of resilient modulus for the design.

Reliability

Arterials Reliability=95%

Collectors Reliability=90-95%

Local Streets Reliability=80%

Overall Standard Deviation(s)

Arterials s=0.4

Collectors and local streets s=0.45

Serviceability

Initial serviceability $P_o=5.0$

Terminal serviceability $P_t=2.5$

Change in serviceability index $PSI=2.5$

Regional Factor

This factor is used to adjust the Structural Number for climatic and environmental conditions different from those of the AASHTO road test site. The Regional Factor to be used for Phoenix is 1.0.

Projected Traffic Loading

The Projected Traffic Loading is based on the cumulative expected 18-kip single axle load (ESAL) during the analysis period, which is a minimum of 20 years. The information is typically obtained from project specific traffic studies or geotechnical design reports.

Design Procedure

Pavement thickness designs shall be determined using the *AASHTO Guide for Design of Pavement Structures 1993 version* (1993 AASHTO Guide) except as modified herein. The minimum thickness of asphalt concrete shall be calculated using the Layered Design Analysis presented in section 3.1.5 of the 1993 AASHTO Guide. The analysis shall be provided as an appendix in the geotechnical report.

Unsuitable Subgrade Soils

The geotechnical report shall address and provide roadway subgrade mitigation measures for conditions including but not limited to the following with concurrence of the City's materials Lab:

- Moderate to high plasticity and/or expansive (swelling) soils per **Table 3.1-1**.
- Non-granular soils with % fines >35% and Plasticity Index >10.
- Collapsible soils.
- Otherwise poor subgrade soils.

Table 3.1-1 Expansion Potential Mitigation

Expansion Potential	Recommended Treatment
< 2 percent	None
2 percent to 5 percent	Stabilize ^a in-place to depth determined by designer, but not less than 8"
> 5 percent	Stabilize ^a in-place to depth determined by designer, but not less 12"

^aThe soil can be stabilized with either lime, cement, or lime/cement combination by specifying the requirements of MAG Section 309 Lime Slurry Stabilization or MAG Section 311 Soil Cement Base Course. For either method, a minimum compressive strength of 160 psi shall be achieved when tested as required by the specification.

The soil should be stabilized with lime in at least two layers following the requirements of MAG Section 311. The bottom layer can be stabilized in place.

Structural Coefficients

Design structural number (SN) can be converted to thickness of various flexible pavement layers by using structural layer coefficients. In the absence of specific values, the following structural coefficients are recommended (**Table 3.1-2**):

Table 3.1-2 Structural Coefficients

Material	Structural Coefficient
Asphaltic Concrete	0.39
Aggregate Base	0.12
Select Material	0.11
Cement Treated Base	0.27
Bituminous Treated Base	0.31

Minimum Pavement Thickness

For the City's streets, the following are provided as the minimum allowable thicknesses for asphaltic concrete and base materials or full-depth sections on prepared subgrade (**Table 3.1-3**). Minimum pavement thickness only applies after a 20-year pavement design is conducted and the resulting design pavement thickness is less than the required minimum values in **Table 3.1-3**. If the resulting pavement design is thicker than the minimum, then the design thickness applies.

Table 3.1-3 Minimum Pavement Thickness

Street Type	Option 1		Option 2
	AC	ABC	Full-Depth AC on Prepared Subgrade
All Arterial Classifications	6"	8"	9"
All Collector Classifications ¹	5"	8"	8"
Local and Cul-de Sacs ²	3"	6"	5"

1. Also applies to local commercial/industrial streets

2. Also applies to paved alleys

Asphaltic Concrete Mixes

The following mixes and oil contents are general guides for arterial/high traffic volume streets and local streets/low volume streets.

Arterial/Collector Streets/High Traffic Volume:

A-1 1/2" Base Course only, Asphalt Binder Content: 4.3 +/- 0.4%

C- 3/4" Base and Surface Course, Asphalt Binder Content: 5.0 +/- 0.4%

D- 1/2" Surface Course only, Asphalt Binder Content: 5.1 +/- 0.4%

D-1/2" or Polymer modified Asphalt Concrete Surface course only, Binder: 8.0 +/- 0.4%

Local Streets/Low Traffic Volume:

C- 3/4" Base and Surface Course, Asphalt Binder Content: 5.5 +/- 0.4%

D- 1/2" Surface Course only, Asphalt Binder Content: 5.6 +/- 0.4%

D-1/2" or Polymer modified Asphalt Rubber Concrete Surface Course only, Binder 8.5 +/- 0.4%

The current list of approved mixes can be found at the following link:

<https://www.phoenix.gov/streetssite/Pages/COP-MaterialsLab.aspx>

The City of Phoenix Materials Lab can review other asphalt mixes for use on a project-by-project basis.

Substitution of Asphalt Concrete for Aggregate Base Material

If the total structural section depth determined is undesirable, a deeper asphalt concrete section can be used in lieu of some or all the aggregate base material at a rate of 1" of asphalt concrete for 3" of aggregate base material.

Recycled Asphalt Concrete and Asphalt Millings (RAP)

If these materials meet the MAG specifications for aggregate base course, then these materials shall be allowed in sub-base and as backfill. However, RAP can be used in the pavement structure on a case-by-case basis only with the approval of the Engineer and the City's Materials Lab and appropriate client Department.

3.2 CULVERTS

Storm drain design will be consistent with the most recent version of City of Phoenix Storm Water Policies and Standards.

3.2.1 Poured-in-Place Reinforced Concrete Arches Bridges in Subdivisions

City of Phoenix receives occasional requests to install poured-in-place reinforced concrete arch bridges, tunnels, and culverts. It is the policy of City of Phoenix that, if installed, they will be maintained by the developer, homeowners association, or neighborhood. A maintenance agreement between the City of Phoenix and the developer, homeowners association, or neighborhood is required, as part of the platting and development approval process, for installation of poured-in-place reinforced concrete arch system.

Poured-in-place reinforced concrete-arch bridges, tunnels, and culverts shall be designed with pedestrian facilities (sidewalk) and access ramps both upstream and downstream.

3.2.2 Culverts Under Half-Streets

A culvert provided in conjunction with half-street construction (**Figure 3.2-1**) must extend beyond the edge of the traveled way a minimum of 10' into the area where the other half of the street shall be constructed in the future. The 10' distance is measured perpendicular to the street alignment. The

culvert capacity, flow line slope, and alignment must be based upon the ultimate design requirements for the culvert if it were to be built under the full cross-section where it could be considerably longer.

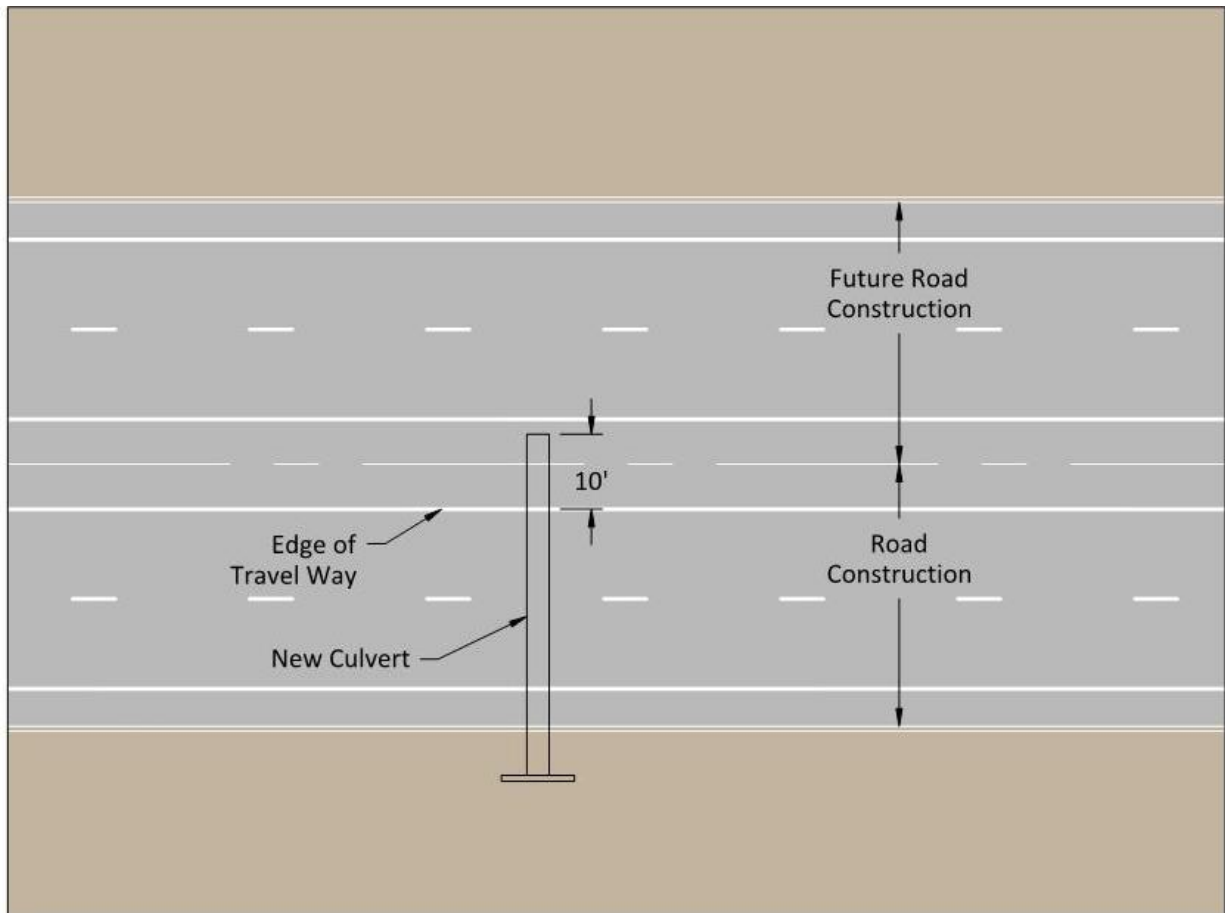


Figure 3.2-1 Culvert Under Half-Street

3.3 BRIDGES AND MAJOR STRUCTURAL PLANS

3.3.1 Bridges

ADOT Standard Specifications and Details serves as primary design reference for major structures, such as bridges, culverts, or special vaults. The Consultant shall provide any necessary special provisions or details.

City of Phoenix requires Load and Resistance Factor Design (LRFD) method. The Consultant shall verify the required method with the City of Phoenix Project Manager at the time of project scoping.

The Consultant shall refer to City of Phoenix Storm Water Policies and Standards Manual (<http://phoenix.gov/STREETS/index.html>) for other bridge design criteria.

The City of Phoenix Administrative Procedure (AP) No. 155, Project Development Requirements and Guidelines provides information on the sheet sequence for bridge and other major structural plans and references for bridge design guidelines. If a bridge structure exceeds 20' in length, there is a need to request a bridge number from ADOT.

Bridge Roadbed Width

The clear width of all bridges, including grade separation structures, shall equal the full width of the physical improvements of the approaching roadway, consisting of sidewalk, street, median, and curb and gutter.

Approach Guardrail

If a vehicular railing or safety-shaped barrier is provided, which is within 10' of a traveled way with or without a sidewalk, approach guardrails should be installed on all approach ends in accordance with AASHTO guidelines.

Several types of approach railings are available, including Metal Beam Guardrail, Bridge Approach Guardrail (Types I and II), and Safety-Shape Barriers. The type of approach railing selected should match the rail to be used on the bridge. When long runs of guardrail (such as embankment guardrail) precede the bridge, the guardrail should connect to the bridge railing and thus serve the approach railing function.

Cross Slope

The crown is normally centered on the bridge except for one-way bridges, where a straight-cross slope in one direction shall be used. The cross slope shall be the same as for the approach pavement.

Median

On multi-lane divided highways, a bridge median that is 26' wide or less shall be decked. The decking of all medians greater than 6' wide should be grated to allow natural light into the structure. Exceptions must be submitted to the Street Transportation Department for approval.

Railings

The railings to be used are the ADOT standard design railings.

3.3.2 Structural Clearances

Horizontal Clearance

All roadways shall comply with its approved street cross sections which all include a curb, gutter, and sidewalk. For curbed sections, the MUTCD, in chapter 2 and chapter 4, indicate that the distance for objects behind a curbed section shall be a minimum of 2' from the face of the curb. Designers should increase that distance when practicable.

If a standard street cross section cannot be constructed for a segment of roadway, then a clear zone shall be provided along that segment. The term "clear zone" is used to designate the unobstructed, relatively flat area provided beyond the edge of the traveled way for the recovery of errant vehicles. The clear zone includes any shoulders or auxiliary lanes. Horizontal clearances must follow AASHTO roadside design guidelines and ADOT standards. Horizontal clear zone requirements are presented in **Figure 3.3-1** and **Table 3.3-1**. If the clear zone requirements cannot be met at a segment of roadway, a guardrail section shall be used along that segment. Guardrail design shall be consistent with ADOT standards.

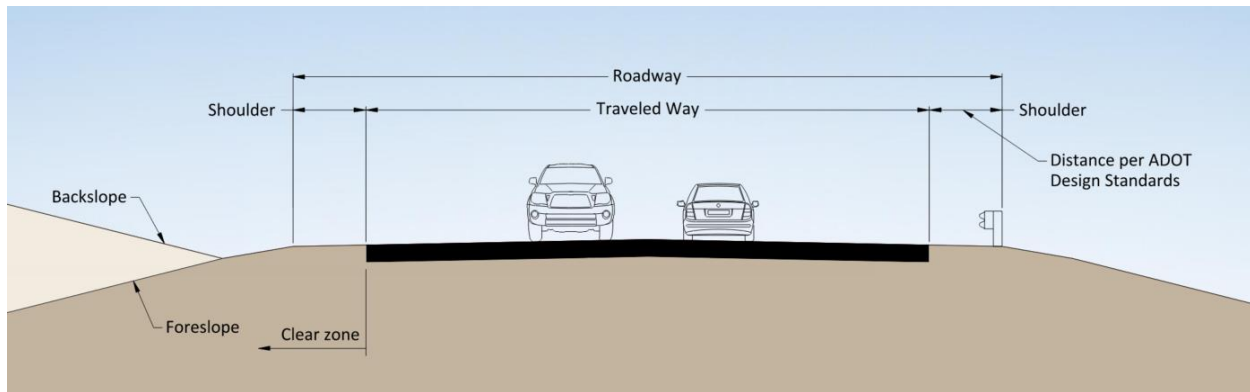


Figure 3.3-1 Horizontal Clearance Requirements

Table 3.3-1 Preferred Clear Zone Distances

	Foreslopes		Backslopes		
	6:1 or flatter	Steeper than 6:1, up to and including 4:1	Steeper than 4:1	4:1 or flatter, up to 6:1	6:1 or flatter
40 mph or less	16	18	16	16	16
45 – 50 mph	22	28	16	20	22
55 mph	24	32	18	22	24
60 mph	32	44	22	26	28

Vertical Clearance

The minimum vertical clearance shall be 16.5' over the entire width of the traveled way of an arterial street or major collector street. On other streets, the minimum shall be 14.5'. Exceptions must be submitted to, and approved by, the Street Transportation Department. Vertical clearance requirements are shown in **Figure 3.3-2**.

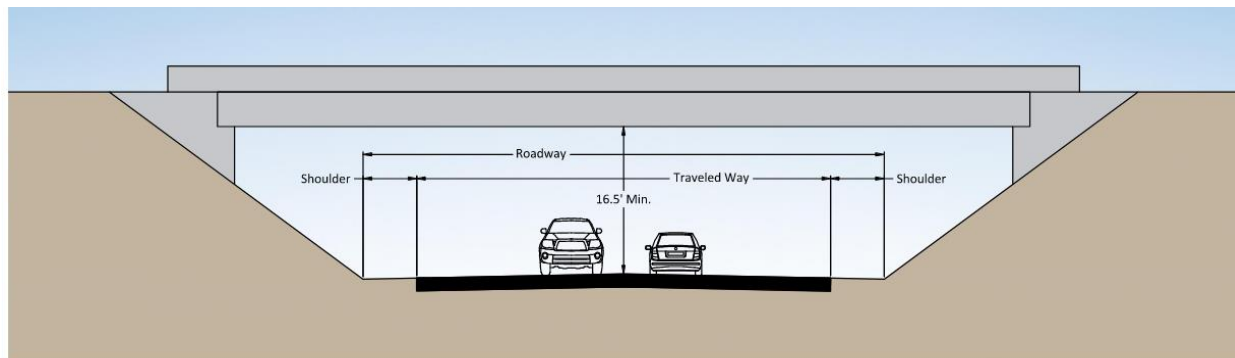


Figure 3.3-2 Vertical Clearance Requirements

3.4 CUT OR FILL SLOPES

Side slopes shall be designed for functional effectiveness, ease of maintenance, and pleasing appearance. Cut or fill lines shall be shown on the plans and roadway typical sections where significant cuts or fills shall be required to match proposed work to existing adjacent property.

The maximum slope of the cut or fill slope behind a sidewalk or shoulder area is 4:1. Cut slopes steeper than 4:1 may need to be set further back from the roadway or sidewalk. Retaining walls may be necessary. Fill slopes steeper than 4:1 may require vehicular protection, such as guard rail or barrier wall.

The top of all cut slopes shall be rounded where the material is other than solid rock. A layer of earth overlaying a rock cut also shall be rounded. The top and bottoms of all fill slopes for, or adjacent to a traveled way, sidewalk, or bicycle path shall also be rounded. Cut or fill slope requirements are presented in **Figure 3.4-1**.

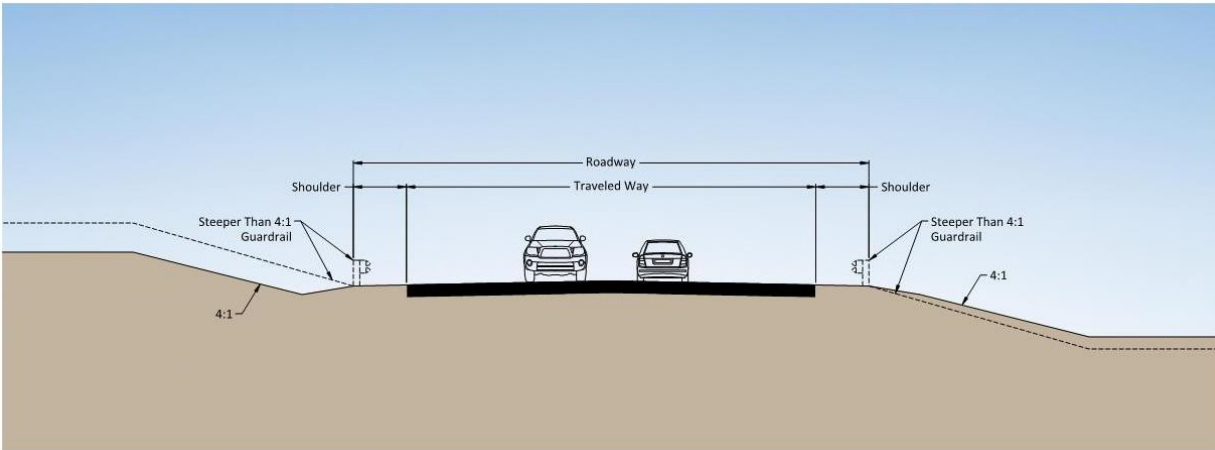


Figure 3.4-1 Cut or Fill Slopes

3.5 PAVEMENT TRANSITIONS

When development causes the widening of a portion of the pavement of an existing road, transitions between pavements of different widths should be consistent with the design standards of the superior facility. Taper treatments for lane transitions are discussed in Chapter 2, Section 2.3.5, Lane Transition Tapers.

3.6 STORMWATER MANAGEMENT

Design and construction guidance is provided in the most current version of the *City of Phoenix Storm Water Policies and Standards*.⁴

The City of Phoenix also uses storm water design software – Drainage Design Management System for Windows (Phoenix – DDMSW).

3.7 GREEN INFRASTRUCTURE

Green infrastructure (**Figure 3.7-1**) are techniques designed to help mitigate flooding, reduce runoff and stormwater, reduce heat-island effect, preserve natural wildlife. Common examples of green infrastructure are vegetated bioswales or stormwater harvesting basins, permeable pavement/pavers, and curb openings, sediment traps, and domes overflow structures.

⁴ <https://www.phoenix.gov/streets/reference-material/sw-manual>.

The information in this section is based on the *Greater Phoenix Metro Green Infrastructure and Low Impact Development (LID) Handbook* (2019). Current City adopted LID details are available in the City of Phoenix Supplement to the MAG Uniform Standard Specifications and Details.

3.7.1 Permeable Pavement

Permeable pavements can effectively reduce pollutants and elements can include pervious concrete, pervious concrete pavers, and permeable pavement with underground reservoir and underdrain.

Permeable pavement is not appropriate for use on areas exposed to vehicular traffic within the right-of-way. However, permeable pavement and pavers could potentially be used for private development on-site uses and privately maintained parking areas.

Refer to MAG Uniform Standard Specifications for Public Works Construction, Section 323, Placement of Pervious Concrete and Section 723, Pervious Concrete.



Green Infrastructure

Figure 3.7-1 Green Infrastructure

3.7.2 Low Impact Development Curb Openings

Curb openings (LID-02 and LID-03) convey runoff into and out of features, such as swales or bioretention areas. This treatment can be retrofitted into an existing roadway or can be built as part of new construction. Considerations for use of these curb openings are:

- Acceptable for use with detached sidewalks. Curb openings are not recommended for use with attached sidewalks.
- Minimum 24" curb opening required to prevent clogging.
- A private maintenance agreement issued by the street transportation department is required in coordination with use of bioswales or bioretention areas within the right of way.
- Use in combination with MAG Detail 206, Concrete Scupper. The metal plate on top of the curb opening, as shown in the details, is not required.

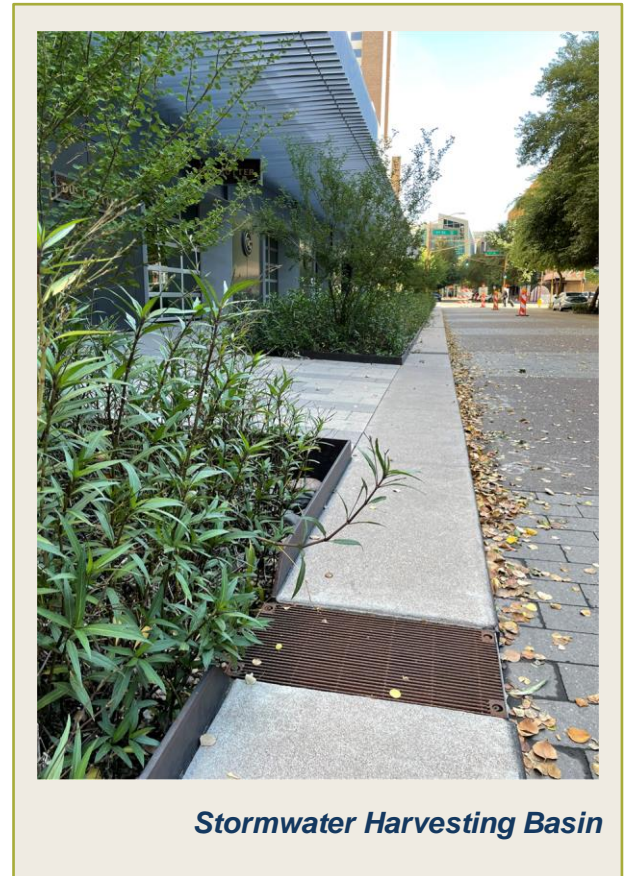
3.7.3 Sediment Traps

Sediment traps should be installed at curb openings and/or inlets that receive concentrated stormwater flows. A sediment trap provides a collection point for sediment and other debris before runoff enters a stormwater capture or LID facility. They are typically used in conjunction with curb openings and vegetated/rock bioswales.

3.7.4 Stormwater Harvesting Basins

Stormwater harvesting basins (**Figure 3.7-2**) are shallow vegetated earthen depressions that collect stormwater and cleanse it prior to the water percolating into the subsurface. These differ from typical retention basins in that they provide subsurface storage within the constructed facility. Harvesting basins require a larger area to implement. Implementation considerations are:

- This feature is appropriate for use in subdivisions.
- Because of space requirements, it is typically not suitable for use on public road projects, however there may be occasions when appropriate right-of-way space is available to accommodate this feature. Stormwater harvesting basins are not permitted along arterials.
- Basins are not permitted along arterial classified streets.



Stormwater Harvesting Basin

Figure 3.7-2 Stormwater Harvesting Basin

3.7.5 Vegetated or Rock Bioswales and Bioretention Systems

Vegetated or Rock Bioswales

Vegetated/rock swales are open, shallow channels that may have trees, grasses, and other low-lying vegetation covering the swale bottom and side slopes, with pervious surface materials, such as decomposed granite, larger rocks, and/or mulch. Vegetated or rock bioswales are designed to slow the flow of runoff to downstream discharge points. When landscaped, vegetated swales may provide additional pollutant removal. Bioswales can provide water harvesting opportunities, depending on the

site conditions and their hydraulic requirements. Similar to stormwater harvesting basins, a larger area is required to construct this feature. Implementation considerations are:

- Bioswales are more suitable for use in subdivisions.
- Can be used on public road projects if sufficient right-of-way is available.
- Bioswales are not permitted along arterial classified streets.

Bioretention Systems

Bioretention systems (LID-07) may either allow percolation into the subsoil or may have an underdrain that directs infiltrated stormwater to a downstream drainage system. These differ from stormwater harvesting basins and rain gardens because they are generally deeper, and their main purpose is to capture pollutants and to provide a medium to infiltrate stormwater. Implementation considerations are:

- Bioretention systems require space and are more suitable for use in subdivisions.
- Can be used on public road projects if sufficient right-of-way is available.
- Bioretention systems are not permitted along arterial classified streets.

3.7.6 Domed Overflow Structures

Domed overflow structures (LID-10) allow for ponding within multiple stormwater capture facilities and provide an outlet for larger storm events that exceed the capacity of each facility. Overflow structures drain into a downstream collection system, such as a storm drain, basin, channel, or natural wash.

Implementation considerations are:

- Suitable for public and private road projects within the right-of-way.
- A maintenance agreement is required for use in subdivisions or private development projects.

3.8 RIGHT-OF-WAY MANAGEMENT PROCEDURES

The City has procedures in place to assure that construction, maintenance, and events within street right-of-way are planned to minimize the disruption of traffic and maximize access to adjacent land use. These procedures are contained in the City of Phoenix Traffic Barricade Manual, 9th Edition and more information on certifications, Temporary Restrictions and Closures (TRACS) permits, regulations for traffic restrictions, and special requirements for the Phoenix downtown area are available through the Right-of-Way Management Program Office.

For private development projects within the downtown area (**Figure 3.8-1**), developers shall submit a Construction Logistics Plan to the Planning and Development Department for approval prior to building permit issuance.

Construction scheduling is provided on the City Manager's Construction Project Map.

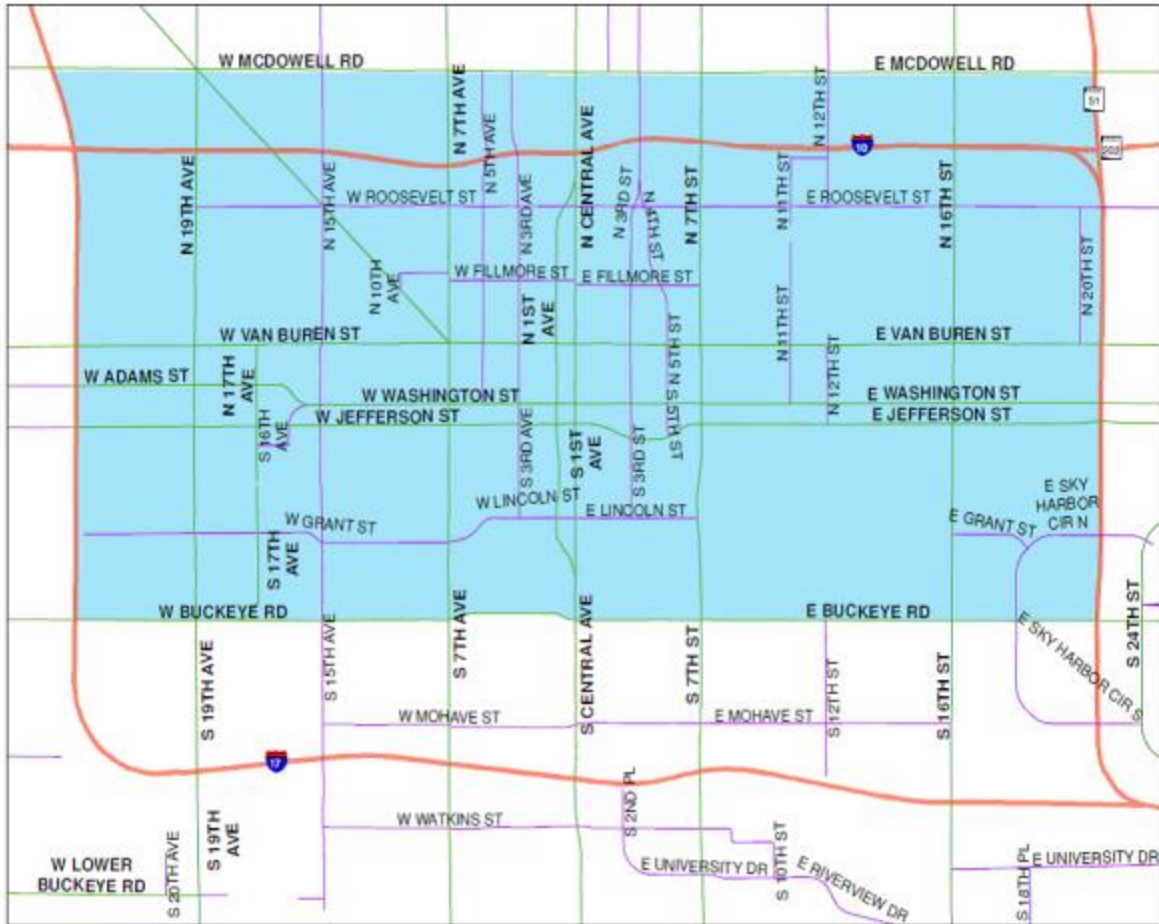


Figure 3.8-1. Downtown Right-of-Way Management Area Map

4. TRAFFIC SIGNALS, SIGNING + STRIPING

OVERVIEW

Chapter 4 provides an overview of City of Phoenix traffic design practices to assist consultants and others who are preparing traffic signal, signing, and striping plans for the City of Phoenix.



Chapter 4 --- TRAFFIC SIGNAL, SIGNING, AND STRIPING

4.1 INTRODUCTION

This chapter provides an overview of City of Phoenix traffic design practices to assist consultants and others who are preparing traffic signal, signing, and striping plans for the City of Phoenix.

4.1.1 Traffic Design References

All traffic signal, pavement markings, and sign plans must satisfy the current edition of the following guidelines and references:

- *City of Phoenix Standard Traffic Signal Details* [<https://www.phoenix.gov/streets/reference-material>]
- *City of Phoenix Standard Pavement markings and Sign Details* [<https://www.phoenix.gov/streets/reference-material>]
- *City of Phoenix Street Transportation Department, Administrative Procedure (AP) No. 155, Project Development Requirements and Guidelines, 2012*
- *U.S. Department of Transportation Federal Highway Administration, MUTCD, 2009*
- *Arizona Supplement to the MUTCD, 2009*



Traffic Signal at 16th Street and Bethany Home Road

4.2 TRAFFIC SIGNAL DESIGN

The City maintains standard detail sheets and specifications for traffic signal installation at: <https://www.phoenix.gov/streets/reference-material>.

4.2.1 Developer Traffic Signal Work Overview

Improvements within the right-of-way may require relocation of existing traffic signal equipment, installation of new traffic signals, or installation of conduit/junction boxes for a future signal. These are typically triggered under the following scenarios.

- 1) Physical change to an intersection:
 - a. Adding roadway curb returns
 - b. Adding or upgrading ramps, or other improvements to comply with ADA requirements and City of Phoenix traffic signals standards
 - i. Ramps should be upgraded if the facility only has a single ramp (diagonal or apex ramp).
 - ii. Dual ramps should be installed at all signalized intersections unless the designer (developer/staff/etc.) has completed a technical feasibility to determine the design has provided the Maximum Extent Feasible (MEF) threshold for design improvements.
 - c. Expansion of existing roadway, such as lanes of traffic, turn lanes, etc.
- 2) Operational change based upon development scope:
 - a. Traffic Impact Analysis requirement - Signal modification to mitigate increased capacity, such as adding vehicle movement to and within an intersection
 - b. One or more traffic signal warrants are met
 - c. Master Street Plan Document calls for new signal



Curb Ramp Under Construction

- 3) Future Signalized Intersection
 - a. Conduit and junction boxes are required to be installed to facilitate future signalization

For projects not initiated by the City, the developer shall bear the full responsibility and cost for all associated signal work.

4.2.2 Development Review Process

Traffic impact, street improvements, and traffic signal installation or

modification requirements are determined during the site plan review process. Street Transportation. Development Coordination Division's Traffic Engineer coordinates with the Planning and Development Department to review site development applications and provides comments to developers regarding

their street and traffic improvement or mitigation requirements. Street Transportation staff provide initial comments with the Preapplication Site Plan review.

Traffic Impact Studies are required to be approved prior to submission of Preliminary Site Plans so that all off-site traffic and roadway improvements are clearly indicated with Preliminary Site Plan approval.

Traffic signal and roadway improvements may be required, above and beyond those identified in the initial review of the preliminary site plan and/or associated Traffic Impact Study, due to prior-approved planning documents, such as a Master Street Plan, paving plans for an adjacent development.

4.2.3 Traffic Signal Plans

The developer is responsible for providing or paying for traffic signal plans for all signal work that will be a part of their project. This requirement is for traffic-signal modification of existing signals, constructing new traffic signals, and conduit-only plans. Signal plans require the full extent of the intersection with new work clearly identified, and unmodified equipment to be shown as existing. Signal plan notes will indicate the division of labor.

Final approved developer signal plans shall be signed by Deputy Director of Traffic Services Division. An approved set of plan documents shall be present on the job site during construction.

Developer Costs and Escrow Account

All work and costs incurred related to the construction, modification, or reconstruction of the intersection traffic signal is the responsibility of the developer. Traffic Services will provide a detailed cost estimate of the traffic signal work that includes a lump sum cost for signing and markings. The City of Phoenix policy requires that the developer provide a check in the amount of the estimate to create an escrow account to cover the amount of the estimated work.

Escrow accounts are set up and funded prior to any traffic signal final design and construction. The Traffic Signal Engineer and the Development Coordination Traffic Engineer will establish the appropriate cost share percentage for the project. When the development creates a need for a new traffic signal, the developer shall cause the installation of the signal at their full expense.

Traffic Services completes and submits a Capital Improvement Project (C.I.P.) request project form accompanied by a copy of the developer's check.

The Street Transportation Department establishes a project number to bill against. At the end of the project, the City prepares a final bill and either bills for any overage or refunds the remaining amount in escrow to the payee.

Maintenance of Traffic

As part of any site plan improvement that encroaches into the public right-of-way, a Temporary Restriction and Closure System (TRACS) permit will be required. The City of Phoenix Barricade Manual (https://www.phoenix.gov/streetssite/Documents/d_039129.pdf) includes the requirements and procedures to obtain this permit. The TRACS process is the City's mechanism to ensure safe operation and minimal disruption to the travelling public during construction activity on Phoenix streets. The required plans vary with the complexity of work and traffic design should generally consider constructability to assist in efficient installation.

4.3 PAVEMENT MARKINGS AND SIGN PLANS

The City of Phoenix relies on a streamlined approach to the design and installation of pavement markings and signs. The City of Phoenix fabricates and manages installation of all signs on public streets. The City of Phoenix installs all pavement markings on public streets.

The signing of streets and public rights-of-way is a critical design element. Sign choices, locations, and installation types can significantly impact their effectiveness for the intended use. All sign installations shall include a review of existing sign locations and types and a field review of existing conditions and visual sight lines to meet the intended use.

Final approved developer Pavement Marking and Signing plans shall be signed by Deputy Director of Traffic Services and Traffic Engineering Supervisor. An approved set of plan documents shall be present on the job site during construction.

4.3.1 Design – Signs and Pavement Markings

The City maintains standard detail sheet and a template CAD file that includes City of Phoenix standard blocks, line types, and title blocks. This template will be used to expedite the drafting and approval process. These standards and templates can be found at: <https://www.phoenix.gov/streets/reference-material/dcm-autocad-standards>. Signing and striping plans shall conform to the design information from the other applicable chapters of this manual.

4.3.2 Developer Requirements

Sign and pavement marking plans are required for any development project that impacts an existing City sign or will require the installation of any new sign or pavement marking. This requirement may be established as early as Preapplication Site Review, or as required as part of off-site paving plans submitted into the City. The developer is responsible for the cost of providing engineered drawings of signing and striping required as part of the development. The City performs the installation of any signing and pavement markings, or as required through permit procedures of the Planning and Development Department.

Traffic Services will review all Pavement Marking and Sign Plans and provide comments and feedback prior to approval of plans. **Paving plans will not be approved until the Pavement Markings and Sign plan has been approved.** Developers are encouraged to engage with Traffic Services early in the process for design assistance and informal feedback prior to filing of permits. Traffic Services holds weekly plan reviews. Developers may attend these meetings to receive input from Traffic Services engineers.

4.3.3 Signing

To eliminate unnecessary signposts, every effort should be made to use existing streetlights where applicable. Some types of signs, such as STOP signs, are in critical locations and cannot be moved to the nearest street light pole but many others, such as parking and speed limit signs, may be universally mounted on the nearest light pole.

Traffic signal poles are normally not to be used for sign placement. However, some signs, such as turn restrictions, large street-name signs (G-4), ONE WAY, KEEP RIGHT, and lane-control signs are intersection-related and are suited to signal pole mounting. Care must be taken to ensure that installing these signs on signal poles would not interfere with the pedestrian push-button signs.

4.3.4 Pavement Markings

The developer/contractor will be responsible for the removal of existing pavement markings as shown on the approved plans, or as directed by the inspector. The removal of pavement markings is preferred by a pavement treatment as defined in the City of Phoenix pavement cut ordinance.

An edge lane shall be installed on all arterials streets that do not have adjacent curb or gutter. When a bike lane is present the edge stripe is omitted.

Crosswalk striping shall be provided at all signalized intersections and all existing striped crosswalks. Or as determined by the Street Transportation Department.

4.3.5 Citizen Initiated Requests

Citizen requests for traffic signals are made to the Arterial Systems Management Section of the Street Transportation Department. Requestors can contact 602-262-6021 for further information or to report traffic signal problems 24 hours/7 days a week.

Citizen requests for signing and/or striping modifications are made to the Traffic Operations Section of the Street Transportation Department. Requestors can contact 602-262-6549 for further information.

5. NEIGHBORHOOD TRAFFIC CALMING

OVERVIEW

Chapter 5 provides an overview of allowable traffic calming elements and approaches within City of Phoenix right-of-way, to improve the safety and livability of neighborhoods by reducing vehicular speeds.



Chapter 5 --- NEIGHBORHOOD TRAFFIC CALMING

5.1 INTRODUCTION

Neighborhood traffic calming consists of design elements to improve the safety and livability of neighborhoods by reducing vehicular speeds. This chapter provides an overview of allowable traffic calming elements and approaches within City of Phoenix right-of-way.

5.2 RESIDENT REQUESTED TRAFFIC CALMING

The Street Transportation Department offers a program for neighborhoods to request speed humps and speed cushions along local and collector streets.⁵ The City of Phoenix offers the traffic calming programs as explained in this chapter.

5.2.1 Speed Hump Program

The City of Phoenix has a program for installing speed humps in existing local streets in neighborhood areas where the speed limit is 25 mph. Speed humps, illustrated in **Figure 5.2-1**, are only installed after completion of an approval process, which includes submission of a neighborhood petition.



Speed Hump

Figure 5.2-1 Speed Hump in City of Phoenix

⁵ <https://www.phoenix.gov/streets/neighborhood-traffic-programs-services/speed-hump-program>, and <https://www.phoenix.gov/streets/neighborhood-traffic-programs-services/speedcushions>.

5.2.2 Speed Cushion Program

Speed cushions as illustrated in **Figure 5.2-2** are speed humps that include wheel cutouts to allow emergency vehicles (fire trucks) to pass unaffected, while reducing passenger car speeds. They can be offset to allow unimpeded passage by emergency vehicles and are typically used on key emergency response routes. Speed cushions extend across one direction of travel from the centerline, with longitudinal gap provided to allow wide wheelbase vehicles to avoid going over the hump.

The City of Phoenix only allows speed cushions on public streets classified as minor collector streets in residential areas, with speeds of 30 mph or less. An information packet describing this approval process is available on the program website. Speed cushions should be located periodically along the corridor (every 500') to accomplish speed control.



Figure 5.2-2 Speed Cushion

5.3 TRAFFIC CALMING GUIDELINES

Traffic calming is most effective when it is self-enforcing by providing physical and visual cues in, and adjacent to, the roadway to encourage drivers to travel at slower speeds. The design of the roadway results in the desired effect, without relying on compliance with traffic control devices, such as signals,

signs, and enforcement. Street landscape may complement traffic calming strategies to provide visual cues that encourage people to drive more slowly.

Traffic calming devices should be aligned with open space and pedestrian pathways as much as possible, and consistent with City policies.

5.3.1 City of Phoenix Policies

The Phoenix General Plan, Plan Phoenix includes the following goal: *The community should be protected from the negative effects of the volume, speed, and cut-through traffic in neighborhoods (Part III, Core Values, Safe Neighborhoods-Traffic).*

The City of Phoenix Zoning Ordinance, Chapter 5, Section 507 TAB A, Guidelines for Design Review Part II. C. Subdivision Design/Development, states that “Local streets exceeding 600’ in length should incorporate traffic calming measures.”

Any traffic calming that is installed on an existing street will need to complete the Street Transportation Department petitioning process. Traffic calming that is installed on streets before being opened to the public does not require the public petition process.

5.3.2 Traffic Calming and Functional Classification

The purpose of traffic calming is to help traffic align with the posted speed limit of the street functional class and nature of adjacent land use. City of Phoenix local streets and collector streets, as defined on the *City of Phoenix Street Classification Map*, are eligible for traffic calming measures.

Arterials are major streets, which are typically the major north/south and east/west transportation corridors spaced at each mile. Traffic calming is not constructed on arterial streets as the primary function of arterials is to serve regional traffic. Arterials often connect to freeways, are several miles long, and have higher speeds and higher traffic volumes.

Collectors are important transportation corridors generally running on the ½-mile north/south and east/west streets between the arterial streets. Collector streets with multiple lanes in one direction are not eligible for traffic calming. Collector streets with a speed limit of 30 mph or less are eligible for traffic calming.

Local streets are typically in residential areas and provide connectivity between collectors and arterials for local traffic. Local streets are eligible for traffic calming.

5.4 TRAFFIC CALMING STRATEGIES

5.4.1 Speed Humps/Cushions

Speed humps/cushions are only allowed through the city sponsored speed hump program and are not allowed for development use to meet City of Phoenix Zoning Ordinance, Chapter 5, Section 507 TAB A Guidelines for Design Review Part II. C. Subdivision Design/Development for block length mitigation.

5.4.2 Speed Tables (Raised Crosswalks)

Speed tables (**Figure 5.4-1 Speed Table**) are longer than speed humps and flat on top rather than the rounded speed hump design. They allow for slightly higher operating speeds and can support transit and emergency vehicle access. They shall be incorporated into mid-block crossings and curb extensions to

increase the safety of such crossings and provide a level surface for pedestrians. Speed tables are not appropriate at intersections.

Design Considerations

- Permissible on streets with posted speed of 30 mph or less.
- Drainage must be accommodated within the device.
- Clear markings and signage are necessary to alert street users of presence.
- Device works well with curb extensions.
- The flat top shall be a minimum of 10' in width.
- The raised crosswalk location shall be installed in coordination with the City Street Light Policy.



Figure 5.4-1 Speed Table

5.4.3 Chicanes

Chicanes (Figure 5.4-2) are a series of curb extensions, pinch-points, parking bays, or landscaping features which alternate from one side of the road to the other, to establish a serpentine path of travel for motorists along a street. Chicanes reduce vehicle speeds by requiring motorists to shift laterally, by a distance of one half, to one full lane width. Chicanes may provide the opportunity to add street trees; mature tree canopy can have a traffic calming effect along a neighborhood street.

Design Considerations

- Device is permissible on streets with posted speed of 30 mph or less.
- Device requires curb and gutter and must accommodate drainage.
- The Chicane location shall be installed in coordination with the City Street Light Policy.
- No driveways or community mailboxes within or near the chicane.
- Device must be at least 500' from nearest traffic calming device.
- Device must be placed at least 200' from a traffic control device.
- Device may require the removal of on-street parking.
- Bike lanes shall be accommodated in the design if on a collector street.

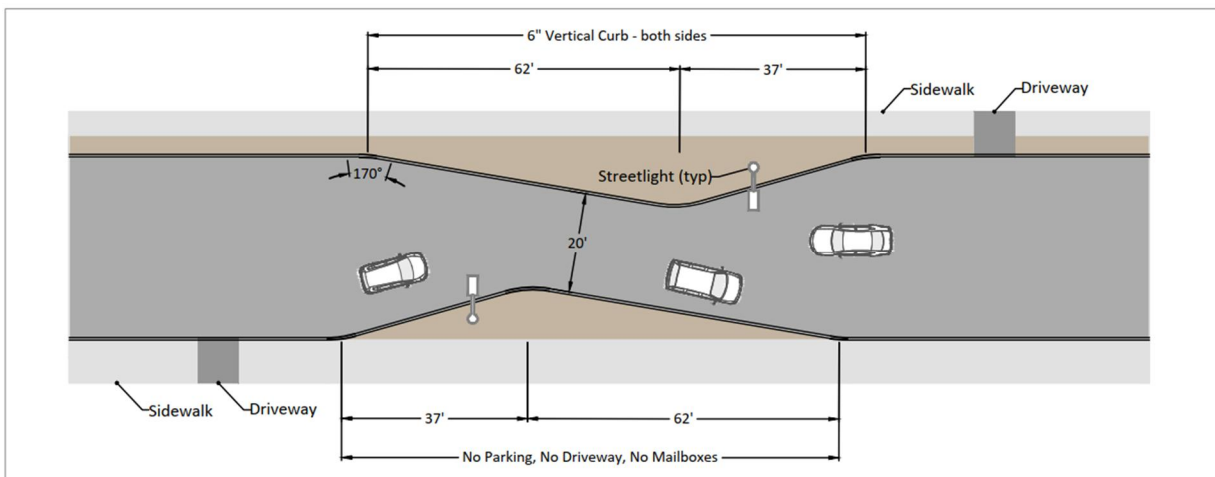


Figure 5.4-2 Chicane

5.4.4 Chokers

Long blocks can lead to high-traffic speeds as vehicles have longer travel distances between intersections. Traffic speeds can be reduced through mid-block neckdowns or “pinch-points,” which are mid-block bulb-outs that physically and visually narrow the roadway (**Figure 5.4-3**). They can add also public space to the sidewalk realm by allowing for additional landscaping/streetscaping.

Mid-block chokers (**Figure 5.4-4**) are mid-block curb extensions placed opposite each other to physically narrow the roadway, forcing motorists to reduce speed and yield to oncoming traffic to pass before proceeding.

Design Considerations

- Device is permissible on streets with posted speed of 30 mph or less.
- Device requires curb and gutter and must accommodate drainage.
- Location shall be installed in coordination with the City Street Light Policy.
- Should not be placed within driveways or near community mailboxes (at least 10' from the transition); chokers should be placed in open space areas.
- Device must be at least 500' from any other traffic calming device.
- Device must be placed at least 200' from a traffic control device.
- No parking shall be allowed within the limits of the choker.
- Bike lanes shall be accommodated in the design when built on a collector street; choker must be directly adjacent to the travel lane.



Source: <https://nacto.org/publication/urban-street-design-guide/street-design-elements/curb-extensions/>

Figure 5.4-3 Mid-Block Choker Examples

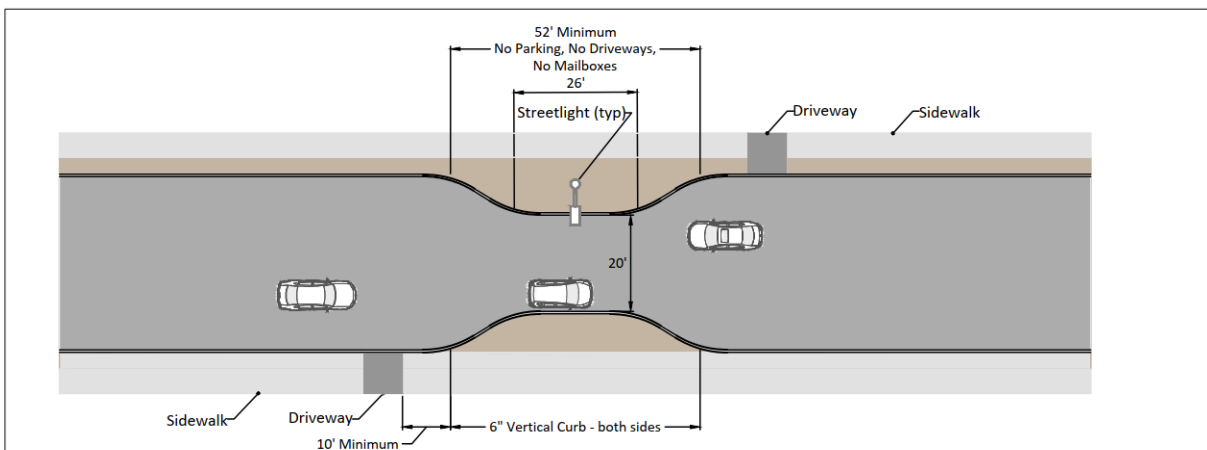


Figure 5.4-4 Choker

5.4.5 Center Islands

Center islands (**Figure 5.4-5**) are short medians placed in the center of the street at mid-block or at uncontrolled intersections to narrow motor vehicle lanes and create a small shift in the path of travel for roadway users. Center islands reduce street width from the middle rather than from the edges, encouraging vehicles to reduce speeds. Center islands can be designed in a circular shape “baseball” configuration (**Figure 5.4-6**) or an elongated shape “football” configuration (**Figure 5.4-7**).

Center medians may provide the opportunity to add landscaping and aesthetic features. A private maintenance agreement will be required for special treatment proposed within the island. Landscaping and planting will be required to meet visibility requirements.

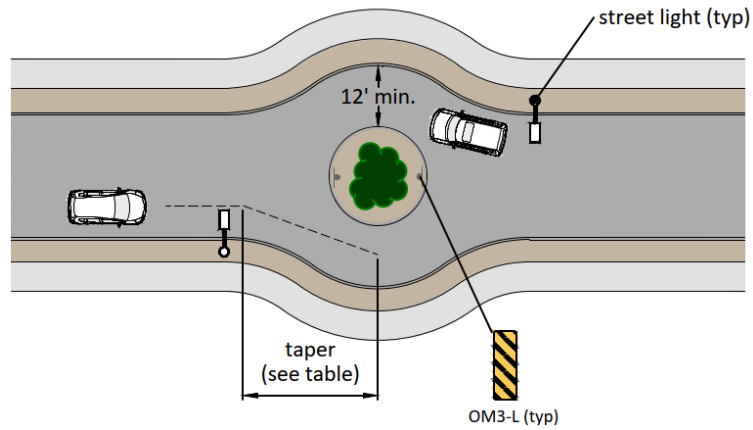
Design Considerations

- Device is permissible on streets with posted speed of 30 mph or less.
- Drainage must be accommodated within the device.
- The center island location shall be installed in coordination with the City Street Light Policy.
- No driveways, parking, or community mailboxes are allowed within the center island area.
- Device must be placed at least 300’ from nearest traffic calming device.
- Device requires curb and gutter.
- Installation requires approval from the City of Phoenix Fire Department and Valley Metro (if on a transit route); mountable curb may be necessitated to accommodate fire and transit.
- Bike lanes will be accommodated in the design when built along a collector street.



Center Island

Figure 5.4-5 Center Island

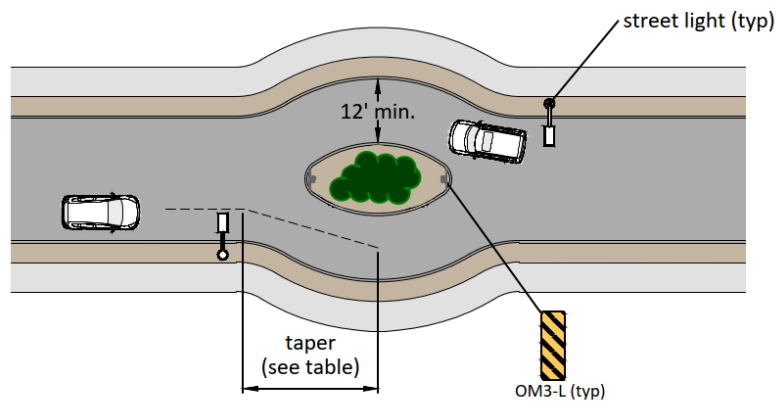


SHIFTING TAPER	
PREFERRED	7:1
MINIMUM*	3:1

*ACCEPTABLE IN CONSTRAINED CONDITIONS WHERE ANTICIPATED OPERATING SPEED IS ≤ 13 MPH

SEE MUTCD SECTION 6C.08 FOR SHIFTING TAPER EQUATION TO DETERMINE APPROPRIATE TAPER WHERE OPERATING SPEED IS ANTICIPATED TO BE >20 MPH

Figure 5.4-6 Center Island, Baseball Configuration



SHIFTING TAPER	
PREFERRED	7:1
MINIMUM*	3:1

*ACCEPTABLE IN CONSTRAINED CONDITIONS WHERE ANTICIPATED OPERATING SPEED IS ≤ 13 MPH

SEE MUTCD SECTION 6C.08 FOR SHIFTING TAPER EQUATION TO DETERMINE APPROPRIATE TAPER WHERE OPERATING SPEED IS ANTICIPATED TO BE >20 MPH

Figure 5.4-7 Center Island, Football Configuration

5.4.6 T-Intersection Bulb-Out

Intersection bulb-outs calm traffic physically and visually by narrowing the street by extending the curb and sidewalk into the intersection, typically where a parking lane ends at an intersection.

Intersection bulb-outs are acceptable traffic calming for compliance with City of Phoenix Zoning Ordinance, Chapter 5, Section 507 TAB A, if the total length of the tangent is at least 25' with a minimum of 10' for one side of the intersection, as illustrated in **Figure 5.4-8**. The intersection shall meet the turning radius for a BU-40 school bus. The pedestrian crosswalk shall be accommodated in the bulb-out section.

Design Considerations

- Curb extensions tighten intersection curb radii and encourage slower turning speeds.
- The design of curb bulbs shall not reduce the resulting width of the traveled way below the requirement for the street type.
- Device is permissible on streets with posted speed of 30 mph or less.
- No parking is allowed within 30' from the device.
- Device requires curb and gutter; drainage and drainage inlets must be evaluated due to possible gutter realignment.
- Where application of a curb extension adversely impacts drainage, curb extensions may be designed as edge islands with a 1–2' gap from the curb or a trench drain.
- Typical device offset from travel lane at least 1.5'.
- Device should not extend into bicycle lanes.
- Landscaping should maintain visibility for intersection.

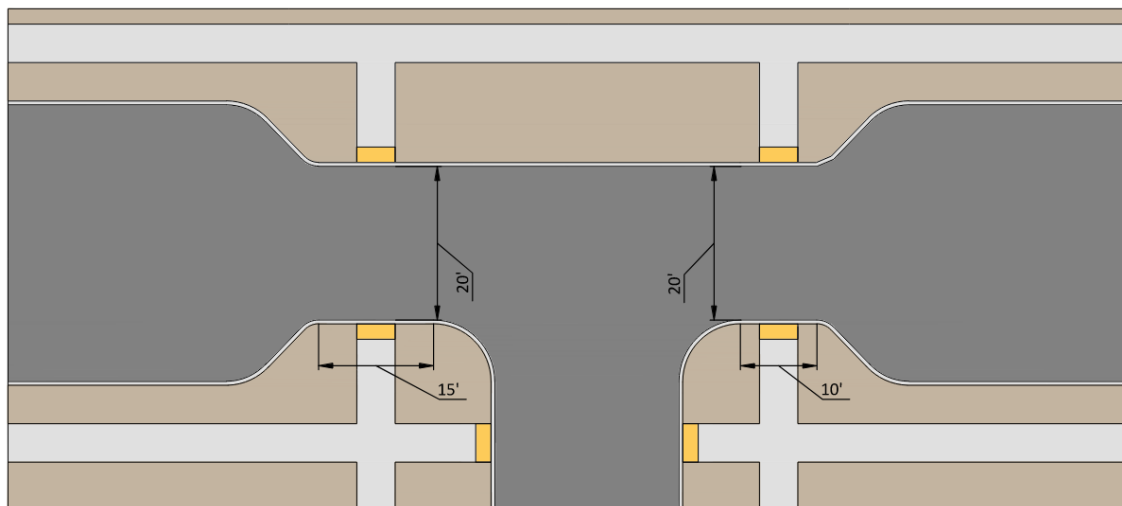


Figure 5.4-8 T-Intersection Bulb-Out

5.4.7 Neighborhood Traffic Circles

Traffic circles (**Figure 5.4-9**) replace stop signs at low volume, low-speed intersections (local streets). Neighborhood traffic circles slow traffic by requiring cars to deflect slightly as they travel through the

intersection. Neighborhood traffic circles are different than roundabouts. Neighborhood traffic circles are used for traffic calming purposes on local streets with low traffic volumes in residential areas and can include stop signs or yield signs. Neighborhood traffic circles are typically 20'-25' in diameter, much smaller than a single-land roundabout which may have a center island with a diameter of 75' or more. See **Section 2.8** for more information on roundabouts. The neighborhood traffic circle is designed to slow passenger vehicles, while still allowing occasional access for larger vehicles. The circle may be designed to be fully mountable for larger vehicles.

Design Considerations

- Traffic circle diameter should be large enough to slow a vehicle. Traffic circles placed at local/local intersections will typically have a central island of 20' to 25'. The circulating roadway is typically 20' from face of curb to face of curb.
- The design speed is 20 mph.
- Traffic circles shall be designed to not impede emergency vehicles.
- Traffic circles may incorporate green storm water infrastructure to optimize aesthetics.



Neighborhood Traffic Circle

Figure 5.4-9 Neighborhood Traffic Circle

5.5 MAINTENANCE

Landscaping on traffic circles, chokers, and other traffic calming devices must meet City guidelines and is maintained by the Homeowner's Association. If there is no Homeowner's Association, typically decomposed granite is used. For further information, contact the City of Phoenix Street Maintenance Department, 602-262-6441.

6. ACCESS MANAGEMENT

OVERVIEW

Chapter 6 provides guidance related to access management, the proactive management of vehicular access points to land parcels adjacent to roadways, to promote safe and efficient use of the roadways.



Chapter 6 --- ACCESS MANAGEMENT

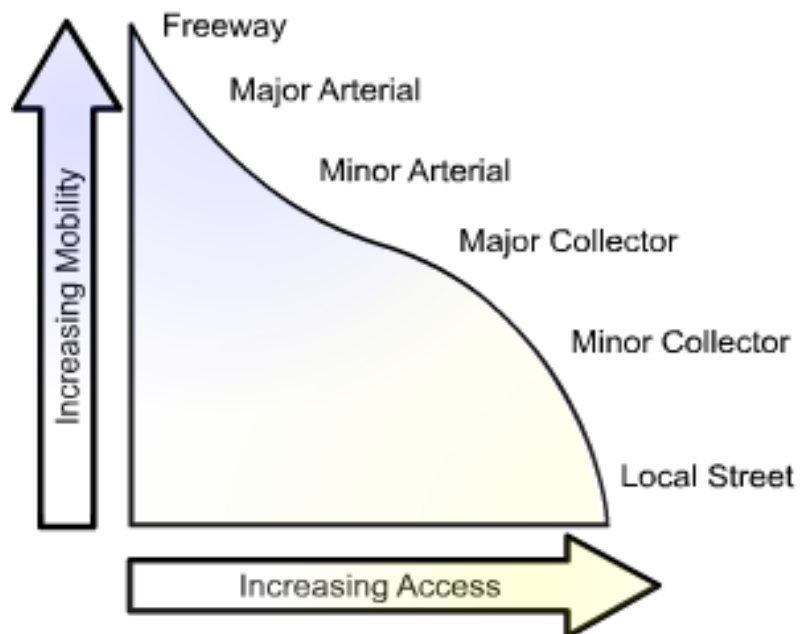
6.1 INTRODUCTION

Access management is the proactive management of vehicular access points to land parcels adjacent to roadways, to promote safe and efficient use of the roadways. Access management techniques include:

- Managing spacing between intersections.
- Managing number of and spacing between driveways.
- Providing left- and right-turn lanes.
- Constructing raised medians with appropriately spaced median openings.

Inadequate access management can result in inefficient traffic operations from blocked movements into and out of driveways, increased number of rear-end crashes, conflicting and confusing turns at intersections, and insufficient distance for vehicle maneuvers.

Access management principles are based on the relationship of functional classification of the roadway, to mobility and access. Functional classification of roads in City of Phoenix are described in *Street Classification Map*⁶. The relationship between access, mobility, and functional classification is shown in **Figure 6.1-1**. A local street provides access to adjacent land. Collectors and arterials balance access with the mobility needs of the traveling public. Freeways are fully access controlled and do not provide direct access to adjacent land.



Source: https://ops.fhwa.dot.gov/access_mgmt/what_is_accsmgmt.htm

Figure 6.1-1 Mobility and Functional Classification

6.2 GREENFIELD VS. EXISTING/ REDEVELOPMENT

The access guidelines presented in this chapter represent the desired condition for new roadways in new developments. When redevelopment is requested of existing parcels connecting to existing streets, the Applicant will strive to achieve the desired condition to the extent feasible. All signals, driveway locations, and access control that varies from these guidelines will be reviewed for safety and the

⁶ <https://www.phoenix.gov/streetssite/Documents/098996.pdf>

surrounding context. Deviation from these guidelines requires consultation and approval by the Street Transportation Department.

Large projects (TIA Category I to IV, as defined in **Table 9.2-1, Chapter 9**) requesting access to arterials will evaluate driveway locations, including a Level-of-Service analysis, in a Traffic Impact Study.

6.3 EXTERNAL AGENCY COORDINATION

6.3.1 Arizona Department of Transportation

Development within ¼-mile of an ADOT controlled facility requires notification to ADOT through a Red Border Letter submission. Development projects will be required to modify their design plans based upon ADOT stipulations within their right-of-way or access control limits prior to plan submittal and approval by the City.

Refer to ADOT's Roadway Design Guidelines for access control policies relative to ADOT jurisdiction.

Figure 506A stipulates access control within the vicinity of an interchange.

Traffic Signals: Proposed traffic signals within a ½ mile of an ADOT facility require the review of ADOT prior to City approval of an associated signal warrant analysis. Traffic signals located within ADOT controlled right-of-way or limits of control requires ADOT approval.

Driveway Location: Access proposed within ADOT's right-of-way or access control limits require ADOT approval prior to plan approvals by the City.

Traffic signal and access control within or adjacent to ADOT facilities shall follow the *ADOT 2021 Roadway Design Manual, Section 104 – Control of Access*.

6.3.2 Adjacent Municipality or Entity

Access control, traffic signalization, and/or infrastructure improvements to non-City controlled right-of-way requires the documentation of approval be presented from the affected jurisdiction or entity prior to plan approvals by the City.

6.4 ACCESS MANAGEMENT SUMMARY

6.4.1 Disclaimer

The City has the right to change or remove access as necessary, as specified in City Code Section 31-43.

“Provision may be made by the City for vehicular access to private property from streets and alleys, but in so doing due consideration must be given to pedestrian and vehicle safety, the resulting interference with the movement of vehicular traffic, and interference with public improvements. In establishing permissible curb cuts and sidewalk driveway crossings for access to private property, authorization shall not be granted where they are unnecessary or where they would unreasonably interfere with the rights of the public in the adjacent street or alley, and in no event shall any such cut or crossing be of greater width than necessary for reasonable access to the private property to be served thereby. (Code 1962, § 35-55)”

6.4.2 Authority of Street Transportation Director

City of Phoenix Code 31-44 designates the duty of the Street Transportation Director to authorize new driveway connections to City streets.

City of Phoenix Code 31-49 directs the removal of driveway connections for those that are not needed when a land use changes.

6.4.3 Access Management Guidelines Summary

The spacing and location of intersections, median openings, and driveways is critical to public safety. Their location must balance access to adjacent land uses with the capacity and traffic flow impacts to the roadway.

Access spacing requirements for signalized intersections, median opening, and driveways by street classification, are summarized in **Table 6.4-1**.

Table 6.4-1 Signalized and Unsignalized Intersection and Access Spacing Summary

	Major Arterials	Arterials	Collector	Minor Collector	Local
Signalized Intersections					
Downtown Core and Walkable Urban Areas	Per warrant analysis and approval from the Street Transportation Department				
Urban, Suburban, spacing in areas of significant density permitted as outlined in Section 6.5.2.	1-mile desirable, ½ mile minimum spacing	1-mile desirable, ½ mile minimum spacing	½ mile	½ mile	N/A
Rural	1-mile	1-mile	N/A	N/A	N/A
Unsignalized Median Opening Spacing					
Downtown Core and Walkable Urban Areas	Per Downtown Code and Walkable Urban Code, as applicable and approval from the Street Transportation Department				
Residential, Industrial, Suburban Commuter Center	660' intervals	660' intervals	660' intervals	N/A	N/A
Rural	660' intervals	660' intervals	660' intervals	N/A	N/A
Unsignalized Driveways and Corner Clearance Spacing					
Divided Roadways	150'	150'	100'	N/A	-
Undivided Roadways	300'	300'	150'	100'	-
Signalized Intersection Corner Clearance Spacing					
Divided Roadways, See Table 6.7-1	175-275' upstream, 360' downstream		175' upstream, 250' downstream		-
Undivided Roadways	360'	360'	250'	250'	-

6.5 SIGNALIZED INTERSECTIONS

6.5.1 Signalized Intersection Spacing

Traffic signals must meet warrants per the MUTCD. In the City of Phoenix, the typical spacing between signalized intersections is at ½-mile intervals. This spacing typically occurs at the intersection of arterial and collector streets. This spacing facilitates two-way signal coordination for traffic speeds of 35-45 mph.⁷

⁷ Transportation Research Board Access Management Manual, Second Edition, 2014, page 360
Chapter 6 | Access Management

6.5.2 Urban, Downtown Core, and Walkable Urban Areas

In urban or core areas, as well as other unique situations, the Street Transportation Department may consider signals at other spacing intervals as demonstrated through a signal warrant analysis or existing planning document (Downtown Transportation Study) identifying future signalized intersections. Alternative locations must be approved by the Street Transportation Department and demonstrated by an engineering analysis.

6.5.3 Signalized Access to Private Development

Signalized access to private development requires a higher level of design to accommodate traffic signal equipment and lane configurations. This may require additional right-of-way or additional easements to provide appropriate signal spacing. The intersection should be designed to a typical public street intersection for roadway design and ADA compliance, winged type driveways will not be allowed on the private side access unless approved by the Street Transportation Department.

Traffic signals proposed by private development projects must meet warrants per the MUTCD, as reviewed and approved through the Traffic Impact Study procedures and must be approved by the Street Transportation Department.

6.6 UNSIGNALIZED MEDIAN OPENINGS

Median island openings on arterials and collectors will be allowed at no less than 660-foot intervals. Openings other than at the 660' locations may be permitted if approved by the Street Transportation Department. Deviation may be considered based upon demonstrating the following:

- Does not create a conflict or negatively affect neighboring properties and future access control at appropriate spacing.
- Promotes cross access for adjoining uses.
- Site does not have frontage on any other public street providing access to the site.
- Does not conflict with any corridor specific roadway and landscaping plan.

Median openings may consist of full-median openings (left-in/left-out), or partial-median openings with left-turn restrictions.

6.7 DRIVEWAYS

6.7.1 Spacing

The distance between adjacent driveways must be sufficient to allow driveway vehicles to safely queue, accelerate, decelerate, and cross conflicting traffic streams, without excessive interference with through traffic or traffic using adjacent driveways.

Driveway spacing requirements (**Table 6.4-1**) are also reviewed in the context of the roadway and right-of-way, the size and location of parcels under development, and existing traffic control and safety mitigations.

6.7.2 Driveways Frequency and Location

In compliance with the City of Phoenix Complete Street Ordinance, driveways should be minimized to reduce pedestrian conflicts and support multimodal enhancements of the street. Multiple driveways

create additional vehicular conflict points and degrade the overall performance of the through street.

Generally, lots not associated with a larger development or subdivision process will be minimally allowed a single right-in, right-out drive access to a public street. There is no assurance of a full-access driveway. New developments that establish multiple parcels shall provide cross access between parcels to minimize the number of driveways to the street and meet the applicable spacing requirements.

For development over 2,000 SF of building footprint, Street Transportation review is typically triggered and will provide the Planning & Development Department documentation and review comments regarding access.

Existing, unused driveways must be replaced with curb, gutter and sidewalk constructed to City standards, consistent with City Code 43-49.

Downtown Core and Walkable Urban Areas

Driveway locations in the downtown core and urban neighborhoods in proximity to light rail are governed for driveway size and location by the Downtown Code, Walkable Urban Code, and Transit Overlay District areas.

Local /Collector Street Frontage

Zoning Ordinance 507 Tab A 6.3.1 directs that non-residential land uses should not be permitted to access local or collector streets if adequate access is available to arterial streets.

If necessary, a restricted-access driveway contravening the requirements for local or collector street access shall be requested to the Planning and Development Department. The applicant will need to overcome the presumption and demonstrate no negative effect on surrounding properties for consideration.

Residential Access

There should be no direct residential lot access to arterials. Direct residential lot access to collectors should be avoided in new Subdivision designs. Direct access may be considered by the Street Transportation Department on a case-by-case basis if arterial or collector access is the only available street frontage.

6.7.3 Alignment

Proposed driveways should align with any existing driveways on the opposite side of the roadway to reduce conflicts. If conditions prevent alignment and require offset driveways to be constructed, the left-turn movements should not overlap each other. Offset driveways shall be designed so the left-turn movements do not share the same space in existing or future two-way left-turn lane or left-turn pocket or otherwise interfere or create conflicts with intersecting street intersections.

Divided Roadways

Access points at full median openings should align or be offset by the limits of the left-turn lane striping or the driveway spacing requirement, whichever is greater, as outlined in **Table 6.4-1** and **Figure 6.7-1**.

Increased distance may be required to accommodate vehicle storage requirements, as analyzed in a Traffic Impact Study. If the noted design requirements for driveway locations cannot be met, then driveway turning movement restrictions may be imposed. Cross-access or shared access should be obtained where possible.

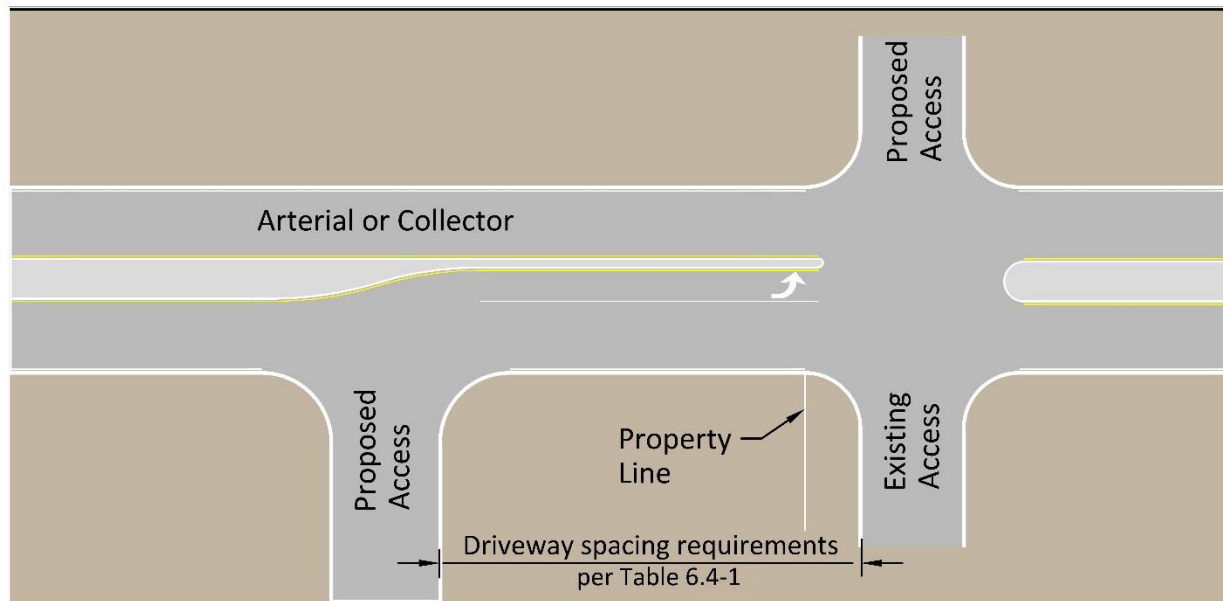


Figure 6.7-1 Divided Roadway, 150' Offset Driveway Locations – Median Opening

Undivided Roadways

On undivided arterial and collector roadways, the access points on both sides of the roadway should align or be offset by 300' for arterials, and 150' for collectors (Figure 6.7-2), as measured from edge of asphalt to edge of asphalt. If the noted design requirements for driveway locations cannot be met, then driveway turning movement restrictions may be imposed.

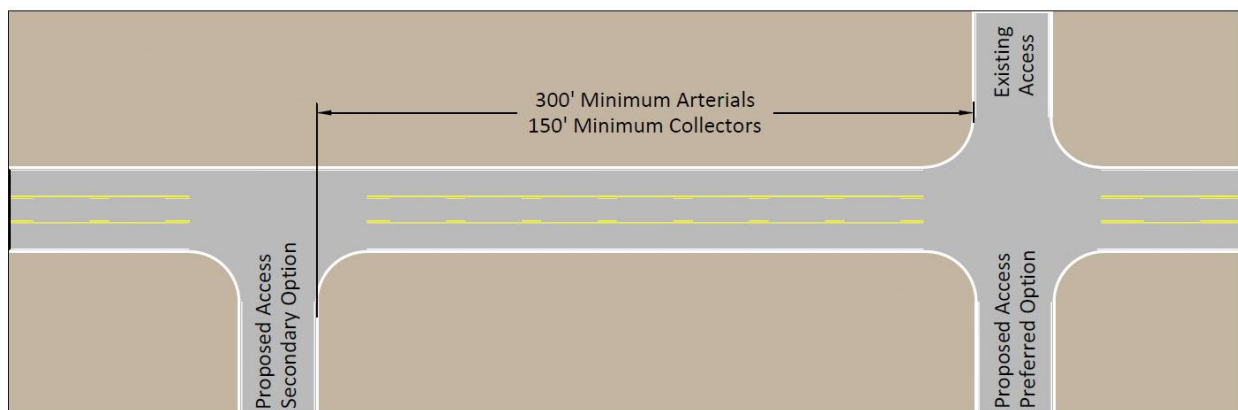


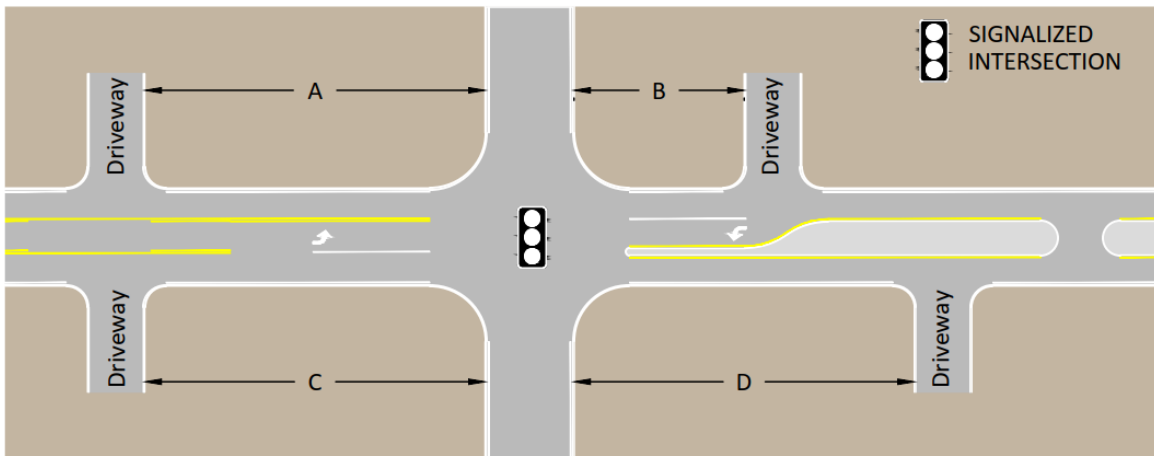
Figure 6.7-2 Undivided Roadway

6.7.4 Corner Clearance

Driveways to corner lots should be located as far away from the intersection as practical. Driveways located near a signalized intersection along a street are to meet the minimum corner clearance requirements shown in Table 6.7-1 and Figure 6.7-3. Distances are the minimum clear distance between the face of curb and the edge of the driveway.

Table 6.7-1 Driveway Corner Clearance (Signalized Intersections)

Distance	Corner Clearance Distance	
	Arterials, Major Arterials (ft)	Collector, Minor Collector (ft)
A	360	250
B	175-275 ¹	175 ¹
C	360	250
D	360	250



Note 1: Distance shall be no less than the length of the left-turn storage lane.

Figure 6.7-3 Corner Clearance

6.7.5 Non-Greenfield/Existing Constrained Environment

Arterial and collector roadways in established parts of the City, are frequently defined by small parcels with access driveways in close spacing. It may not be possible to constrain access locations to desired minimum spacing. The following considerations shall apply in order listed to determine site access:

- Establish and utilize cross-access to existing driveways on neighboring sites.
- Installation of right-in/right-out restricted driveways (per the P1243 standards series).
- Utilization of paint and sign alternatives for restriction of directional access.
- Notation of site plan establishing future access restrictions in the event of City safety improvement, such as median installation.
- The safety of the traveling public is paramount.
- For any lot with less than 300' of street frontage, the driveway shall be placed as far from the nearest street intersection as possible. Driveway access locations within 150' of an arterial intersection, or 100' of a collector intersection, require documented approval by the Street Transportation Department.

6.7.6 Driveway Width

Table 6.7-2 identifies driveway entrance widths for driveway types and land uses consistent with current City of Phoenix Standard Detail.

Wing type driveways will be the standard driveway type unless the need for a return type driveway is proven and approved by the Street Transportation Department. The top of wings for driveways should be located a minimum of 2'6" from the property line. Radius-return driveways will be considered on arterials and collectors with a speed limit of 45 mph or greater at high-turnover sites or sites with high truck volume. Pedestrian safety is paramount.

A minimum 36" clear accessible walkway must be provided around the perimeter of all driveways to provide a maximum cross slope of 2 percent MAX.

Table 6.7-2 Driveway Width

Street Classification	Type of Development				
	Single Family	Multi-Family/Commercial		Gas Station	Truck Facilities
		<30 Spaces	>30 Spaces		
Alley	16' Minimum	20'	20'	-	-
Local Residential	12' One Car 16' One Car – Recommended	24'-30'	30'	-	-
Local Commercial/Industrial	-	30' – 40' **	30' – 40' **	40' **	40' – 50' **
Collector Residential	16' Minimum	30' **	30' **	40' **	-
Collector Commercial/Industrial	-	30' – 40' **	30' – 50' **	40' – 50' **	40' – 50' **
Arterial	Discouraged except for large lot-circular drives*	30' **	40' **	40' – 50' **	40' – 50' **

Source: City of Phoenix Supplemental Standard Detail P1255-4 Driveway Widths Policy

*Minimum 82' property width.

**Median -30' Maximum unless there is significant truck access, then 40'.

6.7.7 One-Way Driveways

One-way directional driveways "In or Out" are discouraged to/from public streets. Allowance may be considered for sites that have existing constraints, such as existing buildings on a lot with constrained widths, or other existing non-site development induced constraints. Allowance shall require the approval of the street transportation department. The development will be responsible for installation and maintenance of all associated on-site directional signage and markings.

For one-way driveways the width shall be 24' for entrance-only driveways on all streets, 16' for exit-only driveways on local or collector streets, and 20' for exit-only driveways on arterial streets.

6.7.8 Cross Access and Common Driveway

Cross access is achieved when property owners agree to allow vehicles traveling to adjacent parcels to cross their property to access a driveway access point.

Common driveway access is achieved when adjacent property owners agree to share a single driveway that is located on the property line (half of the driveway on each parcel).

On major arterial and arterial streets, the sharing of driveways between adjacent properties and common ingress/egress easements is encouraged. New development creating multiple parcels or projects that seek to split lots shall require cross access between parcels to minimize the number of driveways connections to the street.

The City of Phoenix Planning and Development Department has developed a checklist for a cross access/common driveway/cross parking agreement, which is used when adjacent properties desire, or are required to, provide non-exclusive access (for vehicles and pedestrians) to driveways, maneuvering areas, and parking areas (https://www.phoenix.gov/pddsite/Documents/TRT/dsd_trt_pdf_00407c.pdf).

6.7.9 Light Rail Corridors

The following design considerations must be made throughout all Phoenix light rail corridors:

- Curb returns and driveways must be designed to minimize large truck and bus turning movement encroachments onto the guideway curb and trackway, where applicable. Fences, signs, poles, etc. must be set back far enough to minimize large vehicle maneuvers onto the trackway area. A truck turning analysis may be required to demonstrate safe maneuvers into and out of driveways.
- Vehicular access will not be allowed across the trackway except at traffic signal locations. Non-signalized driveways and cross-streets will be right-in/right-out and will not cross the rail line unless specifically permitted by roadway signage and striping.

6.8 AUXILIARY TURN LANES

6.8.1 Right-Turn Lanes

Right-turn/deceleration lanes may be required at driveways to assist traffic exiting the roadway. The need for right-turn lanes to developments are based on criteria that consider traffic volume and street cross section as identified in **Table 6.8-1**.

Street Transportation Department will indicate installation requirements based on the recommendations in consideration of the site context.

No driveways are to be located within the limits of deceleration lanes. Deceleration lanes will be constructed to serve individual driveways. No continuous deceleration lanes will be allowed to serve multiple driveways. Dimensions of storage and taper lengths for right-turn lanes is described in Chapter 2, Section 2.3.6.

Table 6.8-1 Site Driveways Turn Lane Criteria

Driveway Auxiliary Lane	Arterial and Collector Roadway	Industrial/Freight Development
Driveway Right-Turn Lane/Deceleration Lanes	<p>Driveway right-turn lane is to be provided when:</p> <ul style="list-style-type: none"> ▶ The outside/curb lane has an expected volume of 250 vph or greater and the right-turn volume is greater than 55 vph. <p>Or, when 3 of the following are met:</p> <ul style="list-style-type: none"> ▶ 5,000 vehicles per day on the adjacent street. ▶ Posted speed limit is greater than 35 mph. ▶ 1,000 vehicles per day are expected to use the driveway. ▶ At least 30 vehicles are expected to make right-turns into the driveway within a one-hour period. <p>Driveway right-turn lane/deceleration lanes may be required on interim-condition arterial roads that are not yet currently built to the ultimate cross section.</p>	<p>For large industrial or commercial developments with a significant percentage of truck traffic entering the site from a high-volume arterial, driveway right-turn deceleration lanes may be required at the below described criteria and will be evaluated on a case-by-case basis.</p> <p>Auxiliary lanes will be required for all sites with 25 or more truck bays at all primary entrance route driveways.</p>

6.8.2 Left-Turn Lanes

Traffic volume warrants for adding a left-turn lane to a roadway that a two-way left turn lane is not present are shown in **Table 6.8-2**. The volumes provided in **Table 6.8-2** are the minimum left-turn peak-hour volume and minimum through volume in the same direction. A left-turn lane will be required if the left-turn peak-hour volume is equal to or greater than the volume shown in **Table 6.8-2**.

Dimensions of storage and taper lengths for left-turn lanes is described in **Chapter 2, Section 2.3.6**.

Table 6.8-2 Volume Warrants for Auxiliary Left-Turn Lanes

Peak Hour Traffic Volume on the Roadway in the Advancing Direction	Minimum Peak Hour Left-Turn Traffic Volume			
	Number of Through Lanes Per Direction			
	1		2	
	< 45 MPH Posted Speed	≥ 45 MPH Posted Speed	< 45 MPH Posted Speed	≥ 45 MPH Posted Speed
≤ 200	30	15	-	-
201-300	12	12	40	30
301-400	12	12	30	25
401-500	12	12	25	18
501-600	12	12	15	12
601-1000	12	12	10	8
1001+	12	8	10	8

Source: MCDOT Roadway Design Manual, p. 7-19

6.8.3 Angle of Entry/Exit and Driveway Throat Length

The preferred driveway angle of entry and exit is 90 degrees. Up to 15 degrees deviation is permissible. The driveway throat should be of sufficient length to enable the intersection of the driveway and abutting roadway and the on-site circulation to function without interference with each other. Drivers

entering the site should be able to clear the intersection of the roadway and the driveway before encountering any on-site intersections. Driveway throat length is a minimum 60' (three car lengths) but could require longer lengths considering on-site circulation. On-site driveway aisle to a driveway to be a minimum 3:1 taper.

6.8.4 Driveway Sight Visibility Triangle

Single-family residential driveways should not be located within the curb radius return on a corner lot. A 10' by 20' sight visibility triangle is required on both sides of a driveway as illustrated in **Figure 6.8.1**. If a property has 10' of right of way behind the curb, then the sight visibility triangle could be measured 7' from back of curb.

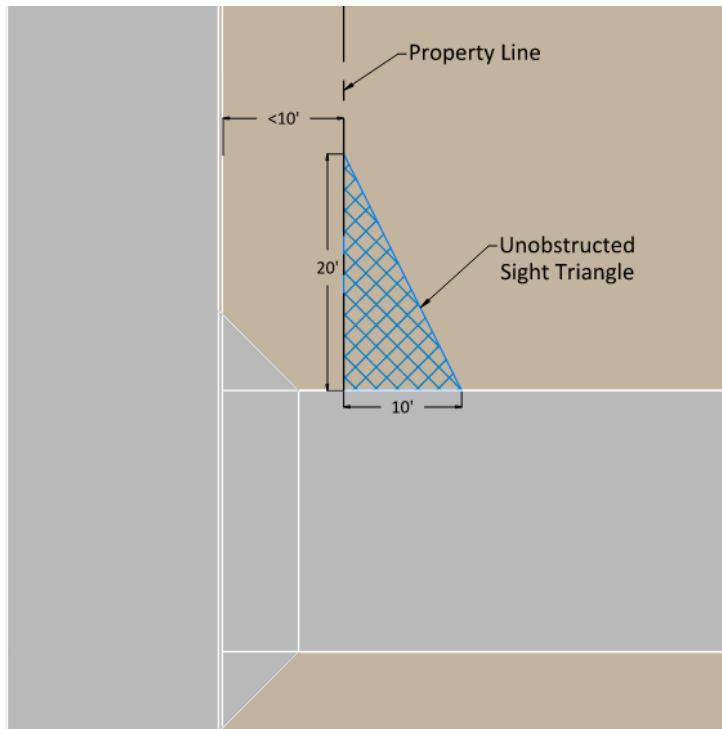


Figure 6.8-1 Driveway Sight Visibility Triangle

31-13 depicts the method used to determine the sight triangle as measured along the property line, as illustrated in **Figure 6.8-2**.

If a property has 10' or more of right-of-way behind the curb, then the sight visibility triangle could be measured 7' from back of curb as illustrated in **Figure 6.8-3** and **Table 6.8-3**.

6.8.5 Intersection Sight Visibility Triangle

Sight visibility triangles shall be used to limit the height of structures, vegetation, and other improvements on corner properties immediately adjacent to intersections.

Visibility triangles are not to be used as a substitute for intersection sight distance.

Visibility triangles provide visibility around corners for all intersection approaches and should be applied to the design of perimeter walls and landscape features. Items within the triangle shall be no higher than 36" measured from the roadway surface. City Ordinance

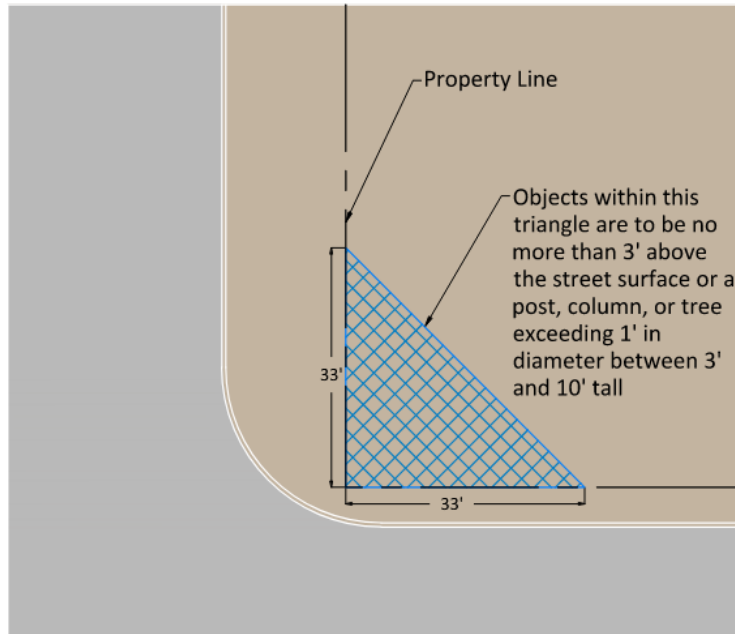


Figure 6.8-2 Street Intersection Sight Visibility Triangle

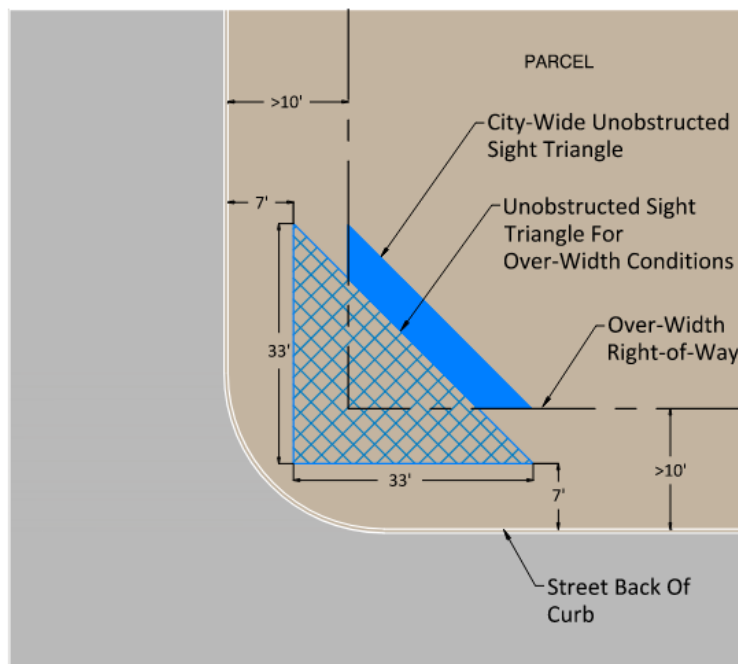


Figure 6.8-3 Street Intersection Alternative Sight Visibility Triangle

Sec. 31-13. OBSTRUCTING VISIBILITY AT INTERSECTIONS.

At public street intersections in residential areas, there shall be no fence or wall or hedge higher than 3', nor any obstruction to vision other than a post or column or tree not exceeding 1' in diameter between a height of 3' and 10' inside the triangular area formed by the lot lines at the following distances from the point of their intersection.

Table 6.8-3 Street Intersection Sight Visibility Triangle

Classification of Intersecting Street	Distance Measured Along Each Street
Local-Local	33'
Local-Collector	33'
Collector-Collector	33'
Collector-Arterial	33'
Arterial-Arterial	33'
Arterial-Local	33' along arterial street 15' along local street

In non-residential areas, the above provisions for unobstructed sight triangles on private property apply only to landscaping.

6.8.6 Turn Restrictions

Where full access will impact the safety along the adjacent roadway, turning restrictions at driveways may be implemented. The restriction may be for left-turn movements in or out of the driveway, which is a right-in, right-out driveway.

Turning restrictions should be imposed for driveways that are too close to signalized intersections, or where existing driveways or roadway characteristics may increase crash potential or at locations with a history of high-crash rates. **Figure 6.8-4** provides examples of turning movements restrictions. Signage identifying the movement restrictions shall be installed in the median per current MUTCD standards.

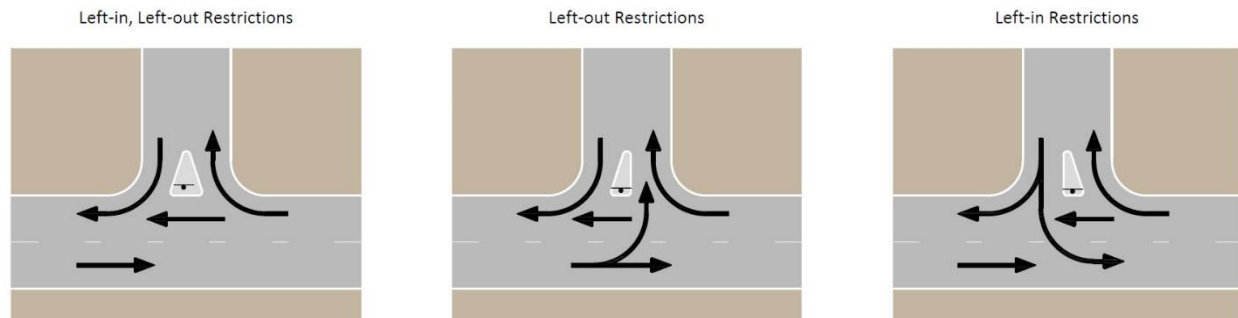


Figure 6.8-4 Examples of Turn Restrictions

6.8.7 Alleys

Alley access shall be provided where required by applicable City Ordinance. The Driveway Ordinance prohibits access from commercial property to alleys that abut residential property. Commercial access to residential alleys not permitted by City Ordinance must be applied for and shall be considered by the Driveway Hearing Officer.

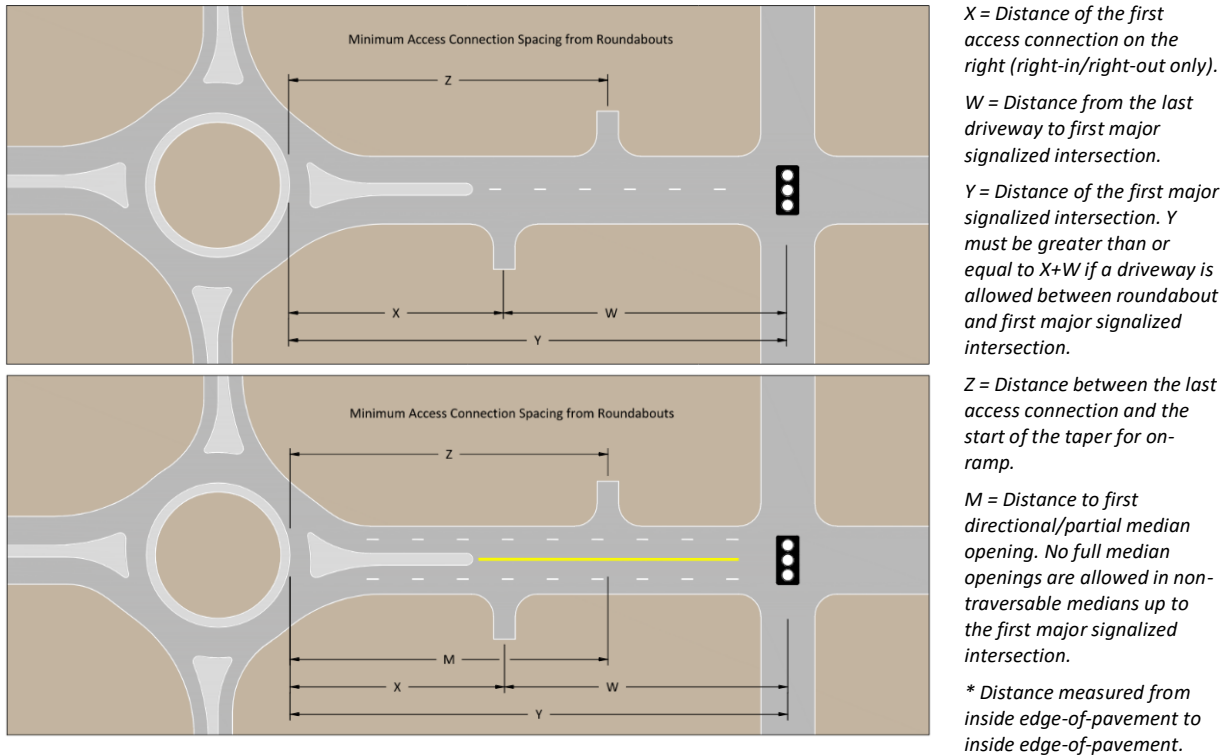
Alleys utilized for site access shall be paved to the nearest cross street. Development located mid-block or fronting 50 percent or more of the block shall be paved to the two nearest intersecting streets to a local street standard.

Vehicular movement shall be contained on-site and not within the alleyway unless approved by Planning Hearing Officer by variance through the Planning and Development Department. Contact the Planning and Development Department for additional information.

6.9 DRIVEWAY AND INTERSECTION SPACING NEAR ROUNDABOUTS

Table 6.9-1 presents typical driveway and intersection spacing recommendations for roundabouts along two-lane and four-lane streets in urban and suburban areas.

Table 6.9-1 Minimum Access Connection Spacing from Roundabouts



Urban Area		Spacing Dimension (feet)*				
Number of lanes	Design Speed (mph)	X	W	Y	Z	M
2-lane	25	400'	1000'	1000'	460'	N/A
	30	490'	1090'	1090'	460'	N/A
	35	590'	1140'	1140'	460'	N/A
4-lane	25	400'	1000'	1000'	510'	475'
	30	490'	1090'	1090'	510'	565'
	35	590'	1140'	1140'	510'	665'

Source: Transportation Research Board Access Management Manual, Second Edition (2014), p. 438

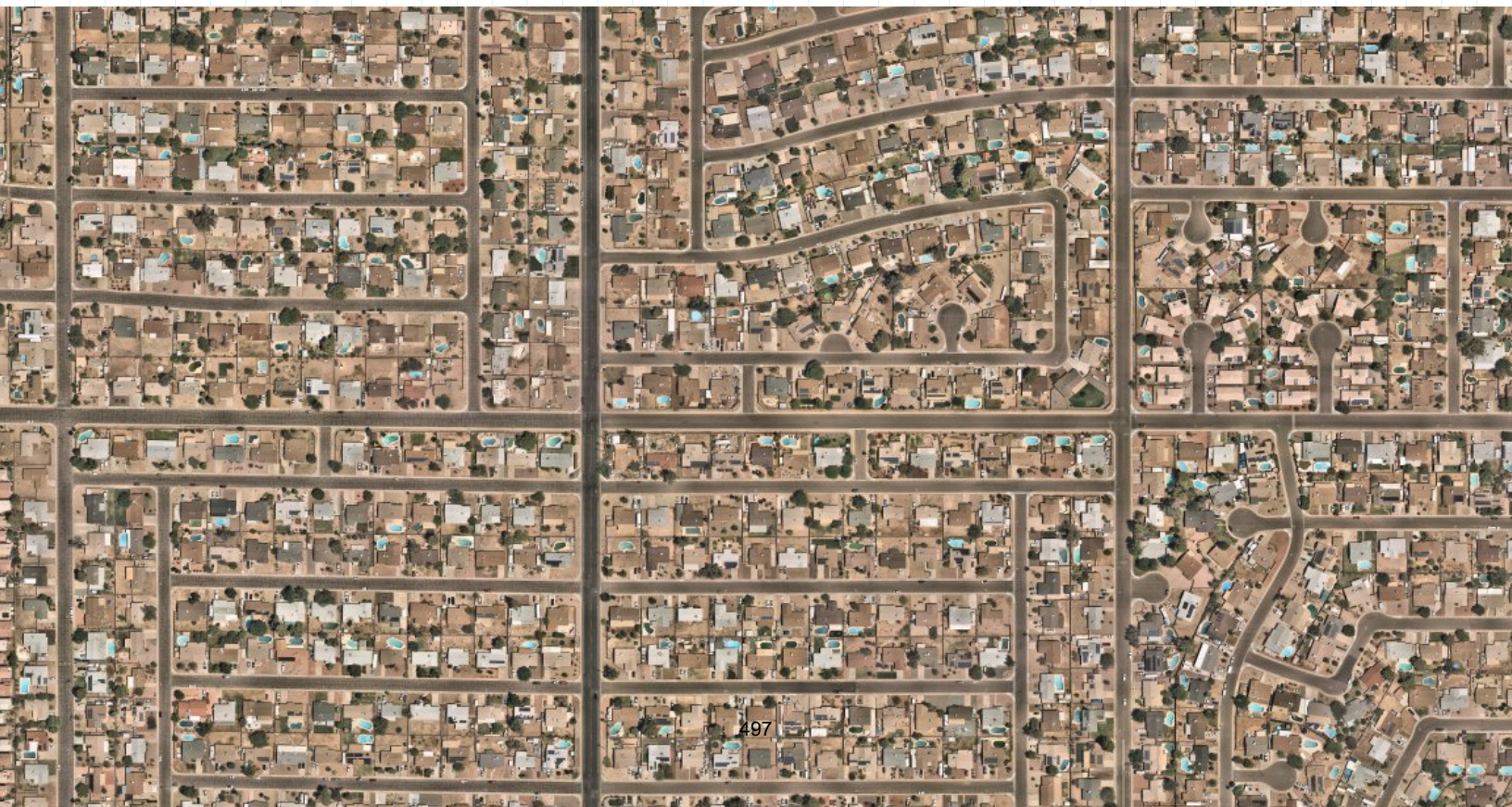
6.10 DRIVEWAYS AT BUS BAYS

City of Phoenix Public Transit Department standards and policies dictate placement of bus stops and bus bays. Additional requirements may include enhanced pedestrian infrastructure and shade. Driveways are prohibited within the passenger waiting area of bus stops. Driveways should be located such that bus stop improvements are beyond the projection of driveway visibility triangles and drivers will be able to see around bus stop improvements, both existing and planned. Driveways are not to be located within the flat portion of the bus bay (bus standing area). See City of Phoenix Supplemental Standard Details for Public Works. Contact the Public Transit Department at pubtrans@phoenix.gov or 602-262-7242 for more information.

7. SUBDIVISION STREET PLANNING

OVERVIEW

Chapter 7 provides an overview of key requirements and formal interpretations for subdivision street planning and design, such as street location principles, street design guidelines for subdivisions, and block design and connectivity



Chapter 7 --- SUBDIVISION STREET PLANNING

This chapter provides an overview of key requirements and formal interpretations for subdivision street planning and design, such as street location principles, street design guidelines for subdivisions, and block design and connectivity. Requirements for subdivision street planning are contained in Phoenix City Code, Chapter 32 – Subdivisions, as well as applicable sections of Phoenix Zoning Ordinance Sec 507 Tab A. C. Subdivision Design/Development. Further subdivisions shall meet the criteria and intent as outlined in the City of Phoenix adopted Complete Street Guidelines for all-inclusive multimodal design.

General design principles for public and private streets are contained in Chapter 32-25, Design Principles and Development Standards in General, which states:

Every subdivision shall conform to the requirements and objectives of the City General Plan, or any parts thereof, as adopted by the City Council, to the Zoning Ordinance, the Planning and Development Department Development Review Guidelines, and to other ordinances and regulations of the City, and to the Arizona Revised Statutes.

The following sections are to be viewed in relation to Chapter 32 of the City Code and Section 507 Tab A of the Phoenix Zoning Ordinance. It is the intent of this section to provide additional commentary, detail, and context sensitivity in providing City direction on subdivision planning and review.

7.1 STREET TYPE AND ARRANGEMENT

Street location and arrangement shall be consistent with City Code 32-26, as well as the City's current adopted Street Classification System (1992) Handbook^{8,9} and Council adopted specific plans.

7.1.1 Local Streets

- Local streets are not intended for regional through traffic; local streets provide internal trips connections to adjacent collector and arterial streets. Traffic volumes should be under 1,000 ADT; 100 vehicles an hour for single family homes, 2,000 ADT; 200 vehicles an hour within more dense developed areas.



Source: planPHX, 2015 General Plan, Adopted April 2018, p. 15.

⁸ https://www.phoenix.gov/pddsites/Documents/PZ/pdd_pz_pdf_00176.pdf

⁹ <https://www.phoenix.gov/streetsites/Documents/098996.pdf>

- Local streets' primary function is to provide direct access to abutting lands and for traffic movements within neighborhoods connecting to localized entities as schools, parks, trailheads, and shopping centers.
- The Street Classification map does not reflect local street locations or alignments.
- Local streets typically shall remain and/or be dedicated as public roadways.

7.1.2 Collector Streets

- The Street Classification map may not reflect all collector street locations and alignments. Collector streets are to be designated at the half-mile point east to west and north to south within every quarter section. Consideration can be given to existing topography, wash corridors, and existing street network in identifying its ultimate placement.
- Collector streets' primary function is to collect and distribute traffic between local streets or high-volume traffic generators and arterial streets at evenly disbursed intersections. As such collector streets shall remain and/or be dedicated as public roadways.
- Collector streets placement should reflect existing alignments and be connected and extended in areas where a collector street exists to facilitate network connectivity.
- Traffic volumes for collectors may range between 5,000 to 30,000 ADT dependent on one (1) or two (2) through lanes in each direction.
- Minor residential collector volumes may range between 1,000 to 8,000 ADT with one (1) lane in each direction.
- Single family lots fronting onto a collector street should be avoided. If proposed within a new subdivision, a minimum collector street section shall be provided to allow for on-street parking, separated bicycle lanes and turn lane striping at intersections.

7.1.3 Arterial Streets

- Arterial streets shall be dedicated as public streets as their primary function is to collect and disburse regional traffic at evenly disbursed intersections.
- Arterial street placement should reflect existing alignments and be connected and extended in areas where arterial street exists to facilitate network connectivity.
- Arterial street volumes may range between 15,000 to 50,000 ADT with two (2) to three (3) through lanes in each direction.
- Traffic volumes for major arterial streets may range between 30,000 to 60,000 ADT with three (3) lanes, up to four (4) lanes in the transition area where the street serves as an extension of a freeway or expressway in each direction upon build-out.

7.2 STREET DESIGN

Street design shall be consistent with City Code 32-25 thru 35 and Sec 507 Tab A. C. Subdivision Design/Development. When connecting into an existing platted subdivision, the requirements of existing City Code and following shall apply.

7.2.1 Block Lengths

The City of Phoenix Zoning Ordinance, Chapter 5, Section 507 TAB A, Guidelines for Design Review Part II. C. Subdivision Design/Development, states that “Local streets exceeding 600’ in length should incorporate traffic calming measures.” See Chapter 5 Neighborhood Traffic Calming for approved standards and details to be utilized.

7.2.2 Cul-de-Sac Streets

Cul-de-sac streets shall comply with City Code 32-27. In residential subdivisions cul-de-sacs shall terminate in circular right-of-way 50’ in radius with an improved traffic turning circle. A 45’ radius may be used when rolled curb is permitted. When vertical curb is required or where sidewalk is offset, the traffic turning circle shall be a minimum 50’ in radius. City of Phoenix Planning and Development Department may approve an equally convenient form of space where extreme conditions justify.

When a cul-de-sac terminates adjacent to an amenity area or public open space vertical curb should be utilized.

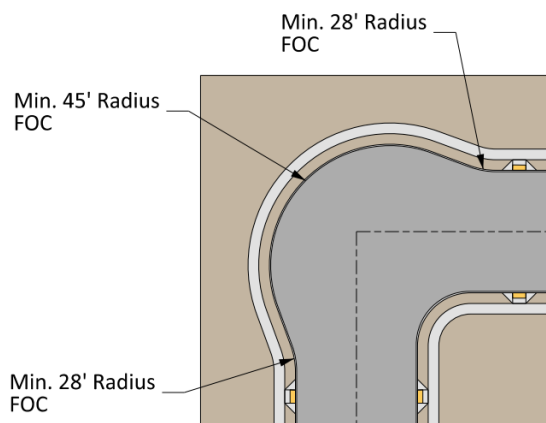
7.2.3 Knuckles

Subdivision knuckles (**Figure 7.2-1**) are areas on the roadway expanded to provide a turn-around and additional access or lot frontage on residential-collector and local streets. Knuckles are required at intersections where each street extends in only one direction from the intersection.

Sidewalk ramps are not required at knuckles; however, if they are provided, they should be in accordance with City Standard Details. Ramps should be provided if there are amenities on either side of the “elbow.” Knuckle dimensions are shown in **Figure 7.2-2**. Design shall consider sight visibility when designing the ramp location.



Figure 7.2-1 Neighborhood Street Knuckle



NOTES:

1. Alternate knuckle configurations may be used. Alternate design must accommodate a standard City of Phoenix Solid Waste Collection truck, inside wheel track radius of 28.4' and outside wheel track of 44', without the truck encroaching on the sidewalk.
2. Alternatives must be approved by Public Works.
3. Knuckles are not required if lots not requiring sanitation pick-up are proposed for the outside of the "elbow."
4. Pedestrian crossings shown require ramps on both sides of the street.

Figure 7.2-2 Subdivision Knuckles

7.2.4 Eyebrows

Eyebrows (**Figure 7.2-3**) are permitted between intersections to improve accessibility to odd-shaped sites. The design of an eyebrow should be in accordance with plans approved by the City of Phoenix Development Services Department.

7.2.5 Alleys

Alleys (**Figure 7.2-4**) shall comply with City Code 32-27 and 32-33. When an alley is proposed for site access or utilization for public or private services, the alley pavement structural section shall be paved to a minimum local street standard to the nearest cross street. Development located mid-block or fronting 50 percent or more of the block shall be paved to the two nearest intersecting streets.

7.2.6 Residential Subdivision Street Cross Sections

Single-family subdivision local streets requesting detached sidewalks shall be designed to a minimum cross section “H” City Std Detail with a minimum of 32’ of asphalt paving.

Subdivisions utilizing local street cross section City Std detail “I” with detached sidewalks shall be constructed with 6” vertical curb and City standard wing type driveways.

7.3 BLOCK DESIGN

Block Design shall be consistent with City Code 32-28. The maximum length of cul-de-sac streets is 400’, measured from the intersection of right-of-way lines to the extreme depth of the turning circle along the street centerline. An exception may be made where topography justifies but shall not be made merely because the tract has restrictive boundary dimensions, in which a provision should be made for extension of street pattern to the adjoining un-platted parcel and a temporary turnaround installed.

Cul-de-sac lengths in excess of the City Code maximum may be considered only if the following conditions are present:

- The subdivision is be zoned RE-43, RE-35, RE-24, R1-18, and R1-14.
- The minimum lot width 110’.
- In no instance shall the cul-de-sac length exceed 600’.

7.4 EASEMENT PLANNING

Easement shall follow City Code 32-30. Plats that seek to combine previously subdivided parcels for consolidation may not be required to dedicate an 8’ Public Utility Easement (PUE) adjacent to the right-of-way.

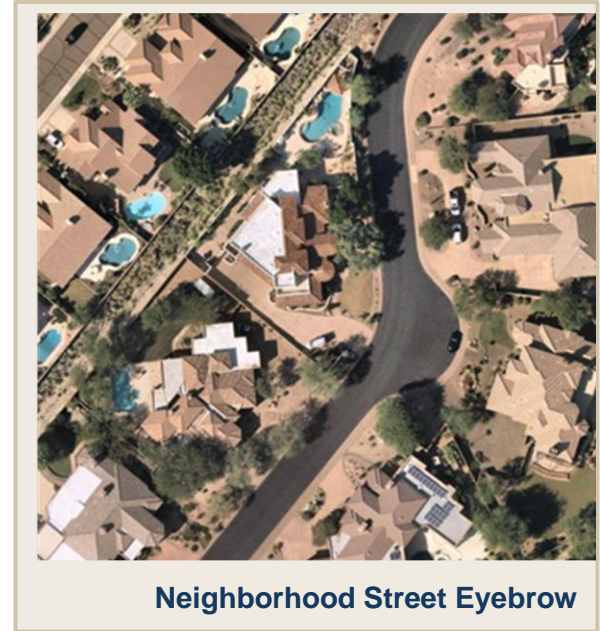


Figure 7.2-3 Eyebrow

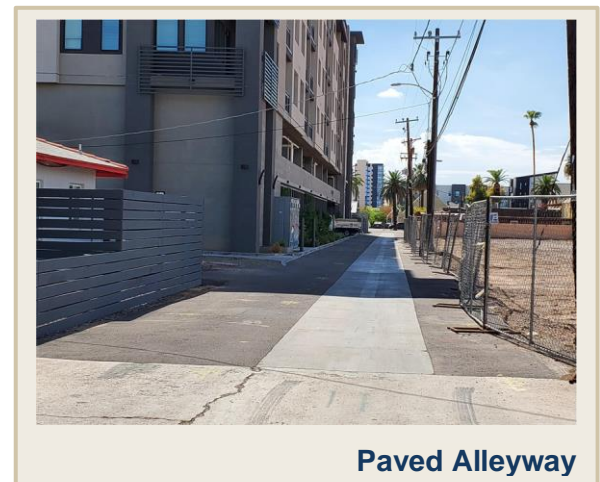


Figure 7.2-4 Paved Alleyway

7.4.1 Street Abandonment

Abandonments are to be in conformance to City Code, Chapter 31 Article V.

- An existing street may be considered for abandonment if it is not a street indicated on the City of Phoenix Street Classification Map or an Area Plan and will not eliminate reasonable and legal access to existing properties or negatively affect the connectivity of a neighborhood or street network. The abandonment should alleviate a significant traffic problem and not create new problems. If a street is approved to be abandoned, the abandonment must occur prior to the submittal of a final plat to the City Council. If a plat is required, the abandonment must occur concurrent with approval of the plat by City Council.
- Alleys and excess right-of-way as identified by the City's Street Classification System on any type of street may be considered for abandonment if approved by the City.

7.4.2 Street and Utility Improvement Requirements

Engaging with utilities early in a project is critical to prevent delay. Coordinating utility improvements on project that involve SRP Irrigation relocations (typically associated with a land transaction and the need for an SRP Irrigation design) can often take 18 months or more. A meeting with the City of Phoenix is not required prior to beginning discussions with SRP on Land and or Irrigation requirements.

Street and Utility Improvements Requirements shall be in conformance to City Code 32-33. The following provides additional detail, context and clarity in the design and intent of City Code 32-33.

SRP Irrigation Relocations:

- Existing SRP closed or open irrigation channels/facilities shall be tiled (i.e.) undergrounded, piped, and relocated outside of existing or proposed rights-of-way dedications or as approved by the Utility Coordination Section of the Street Transportation Department for areas where special conditions exist.
- When Irrigation facilities are within USA Fee land, the Developer shall apply for formal land transfer with SRP and the Bureau of Reclamation. Land transfers shall be relocated outside the entirety of existing or proposed rights-of-way and associated public utility easement and be completed prior to subdivision plat approval. Developments seeking exception will require the approval of the Utility Coordination Section of the Street Transportation Department for areas where special conditions exist.
- When Irrigation facilities are within USA Easement, the Developer shall apply for relocation of the easement with SRP and the Bureau of Reclamation. The USA Easement shall be relocated outside the entirety of existing or proposed rights-of-way and associated public utility easement and be completed prior to subdivision plat approval. Developments seeking exception will require the approval of the Utility Coordination Section of the Street Transportation Department for areas where special conditions exist.
- USA Easements may be platted over the right-of-way for the transition area between the relocated and existing facility tie-in point.
- USA Fee Title Transfers and USA Easements shall be coordinated through SRP in conformance with their most current processes.

- Per City Code 32-30 SRP easements shall not overlap within a public utility easement and shall begin at the back of the required 8' public-utility easement.
- Required right-of-way and site tree planting shall be designed to be outside of existing or proposed SRP designated areas.

Large Diameter Power Poles

- Developer will perform due diligence by engaging pole owners during project scope to obtain information pertaining to relocation and/or required roadway clearances, as well as any existing easements or land rights that need to be maintained or revised due to the development process.

Small Diameter Power Poles

- Small diameter power poles (12 kV or less) shall be in conformance with Phoenix Municipal Code 507 Tab A.II.B.7 (7.5), which requires that all new or relocated electric lines 12 kV and smaller, communications and cable television and all on premise wiring should be placed underground in all developments where visible from streets or adjoining properties. Phoenix Municipal Code 32-25 A.2 requires all electrical lines 12.5 kv and smaller shall be installed underground.

Overhead Conversion Power Poles

- Development plans that require the conversion of electrical conductors from overhead to underground shall have the underground installation shown in the engineered plans submitted to the Street Transportation Utility Coordination section. Any deviation from this requirement will be denied unless accompanied with by approved Technical Appeal from the Planning and Development Department.

Existing Overhead Power Pole Clearances

- Development plans that do not have an overhead to underground conversion requirement will perform due diligence by engaging pole owners during project scope to obtain requirements pertaining to overhead line clearances from vertical structures, or "clear zones" as represented by APS or SRP.
- Development plans that do not have an overhead to underground conversion requirement will perform due diligence by engaging pole owners during project scope to obtain requirements pertaining to any existing aerial easements that need to be maintained or revised due to the development process.

Street Transportation Requirements for Developer Utility Installations

Conduit installation by Developer for dry utilities requires a Trenching Permit from the Planning and Development Department that is only issued when accompanied by an approved APS or SRP Utility Permit issued by the Street Transportation Department. The bullet points below provide guidance on what information should be shown on Development plans provided to utility companies for submittal to obtain a Street Transportation Utility Permit.

- Development plans submitted to Street Transportation for utility permitting will be reviewed for adherence to Administrative Procedure (AP) 5.1 Requirements for Obtaining a Permit and Utility

Construction Guidelines in Public Rights-of-Way.¹⁰

- Development off-site plans for underground utility installation will identify whether utilities will be installed jointly, and if so, will include which utility companies will be occupying the joint utility trench.
- Development off-site plans for underground utility installation will identify whether underground installation will be performed via trench or bore.
- Developer will supply to utility companies their final version of off-site plans for utility design. Supplying preliminary designs where revisions may be needed will delay the Street Transportation permitting process, therefore delaying utility installation.
- Development supplied off-site plans will include a well-defined area for utility companies to include linear footages for work in rights-of-way, private streets, and public utility easements. Accurately providing this information is crucial to the creation and issuance of the Developer's Trenching Permit for conduit installation.

Existing Private Facilities within existing and/or proposed Right-of-Way

- When any existing underground or above-ground private facilities on private property must remain operational or in place, either as installed or within proximity to its current location to provide continuous operation of the service that it provides, the owner of the private facility and the property owner must contact the City's Street Transportation Department to determine if the private facility will be allowed to remain in the existing and/or proposed dedicated right-of-way.
- When existing underground private facilities are located on private property that will be or is acquired by a developer and the ongoing operation of the private facilities require it to remain underground in existing and/or proposed dedicated right-of-way, the owner of the facilities may apply for a Revocable Permit to allow for the facilities to remain in place. The City may allow the private facility to remain in place, require it to be relocated in another section of right-of-way, or require it to be relocated to private property. If the City allows the private facility to remain in the right-of-way under a Revocable Permit, the owner of the private facility must: 1) register their facility with AZ811 (Blue Stake) Center, 2) pay the fee for the Revocable Permit, and 3) maintain insurance in accordance with the terms of the Revocable Permit.
- When existing above-ground private facilities are located on private property that will be or is acquired by a developer and the Streets Transportation and the Planning and Development Departments have approved the ongoing presence and location of the above-ground private facilities in existing and/or proposed dedicated City right-of-way, the owner of the facilities may apply for a Revocable Permit to allow for the facilities to remain in place. The City may allow the private facility to remain in place, require it to be relocated in another section of right-of-way, or require it to be relocated to private property. If the City allows the private facility to remain in the right-of-way under a Revocable Permit, the owner of the private facility must: 1) register their facility with AZ811 (Blue Stake) Center, 2) pay the fee for the Revocable Permit, and 3) maintain insurance in accordance with the terms of the Revocable Permit.

¹⁰ <https://www.phoenix.gov/streetssite/Documents/AP%205%201%20-%20September%202017.pdf>

8. BIKEWAYS AND ACTIVE TRANSPORTATION

8

OVERVIEW

The City of Phoenix is committed to providing a safe, connected, and comfortable active transportation system. The primary purpose of the active transportation network is to provide enjoyable transportation options for all residents.

The focus of this chapter is to provide design guidance for facilities that are used by people riding bicycles.



Chapter 8 --- BIKEWAYS AND ACTIVE TRANSPORTATION

8.1 INTRODUCTION

The City of Phoenix is committed to providing a safe, connected, and comfortable active transportation system. The primary purpose of the active transportation network is to provide enjoyable transportation options for all residents. Active transportation supports sustainability and provides access to those who utilize active modes regularly or periodically. Active transportation includes walking, bicycling, using mobility aids, or other small electric vehicles, such as e-scooters.

While the focus of this chapter is to provide design guidance for facilities that are used by people riding bicycles; the City of Phoenix recognizes that scooters, non-motorized skateboards, and others may utilize the same infrastructure. For simplicity and clarity, the term “bicycles,” “bicycling,” or “persons riding a bicycle” are used, but not to the exclusion of people using mobility aids, riding scooters, and using non-motorized skateboards, etc.



Example of Active Transportation Improvement

8.1.1 Planning for Active Transportation

Active transportation can be used for commuting, utilitarian, social, recreational, or fitness/health purposes. Providing enjoyable active transportation infrastructure for all residents can:

- Replace the use of cars for many short trips.
- Help reduce traffic congestion, air pollution, and demand for parking.
- Benefit those who cannot drive or cannot afford a car.
- Provide healthy recreation for families and people of all ages.
- Help maintain Phoenix as a livable city with an outdoor lifestyle.

Planning for active transportation should be approached in a similar way to conventional transportation planning considering factors such as access, convenience, safety, cost, efficiency, latent demand, induced demand, travel demand, connections, and engineering.

However, unlike design guidelines for motor vehicle infrastructure, previous bicycle infrastructure design has focused on the users with the highest levels of risk tolerance. In order for bicycle infrastructure design to be widely used, all potential users must be considered in the design. As the age range of bicyclists includes children, the physical and cognitive abilities of children must be considered during design. Network connectivity is important for ensuring people using bicycles can access the

places they want to go. The bicycle network should facilitate short trips and make it easy for people to substitute car trips for bicycle trips or bicycle plus transit trips to take care of their everyday travel needs. Even a small network gap, such as a dropped bike lane at an intersection can deter someone from riding a given route. A connected network is one with no gaps, a density of routes appropriate for the intensity of land uses, and direct, seamless transitions between facilities.

The City of Phoenix encourages enhanced bikeway design in accordance with City of Phoenix Climate Action Plan, Complete Streets Policy, and Vision Zero resolution. Developers are encouraged to meet with City of Phoenix Street Department, Active Transportation Team, to discuss design need and requirements. Any design that would impact the roadway capacity will need approval of the Street Transportation Department.

8.2 BIKEWAY SYSTEM COMPONENTS

The types of bikeways used in the City of Phoenix are on-street bicycle lanes, including protected and buffered bike lanes, shared-use paths or multi-use trails, and bicycle boulevards.

Not all streets have a designated bicycle travel facility, but they are open to bicycles. This includes all public streets unless specifically posted to prohibit cyclists. While the suitability of streets will vary, the basic street grid will always provide the major foundation for bicycle travel.

Opportunities to provide bicycle access may occur in conjunction with public or private development, greenbelts, canal banks, flood control projects, vista corridors, or any place with available open space or right-of-way. It is the intention of Phoenix's bicycle planning efforts to remain flexible and open to new opportunities.

On-Street Bicycle Boulevard: Bicycle boulevards are local streets designed to prioritize bicycle travel. These streets have low traffic volumes, and the motor vehicles present are mostly making local trips and traveling at speeds 25 mph or lower. Traffic calming and diversion measures are necessary to achieve these conditions. Other important elements of bicycle boulevards include wayfinding signage/pavement markings and safe arterial crossings that include traffic control measures and minimize travel delay for bicyclists.

On-Street Bicycle Lanes: On-street bike lanes are an integral section of a roadway which is marked for exclusive bicycle use. On-street bike lanes are one-way facilities. Buffered bicycle lanes, with a buffer between the bicycle lane and the adjacent travel lane, enhance the bicyclists experience and comfort.

Protected Bike Lanes: Protected bike lanes (also known as cycle tracks or separated bike lanes) are bike lanes separated from adjacent traffic by a lateral buffer with vertical elements. These bikeways offer a higher degree of safety and comfort to people bicycling. When one-way protected bike lanes on both sides of the street are not feasible, two-way protected bike lanes can allow bicycle movement in both directions on one side of the street. These two-way protected bike lanes share the same design characteristics as one-way protected bike lanes but require additional considerations at driveways and intersections.

Shared-Use Paths: Shared-use paths are paved pathways that are clearly separate from the road infrastructure. Shared-use paths are shared with bicycles, scooters, skaters, and pedestrians. In general, shared-use paths are intended for two-way traffic.

Multi-Use Trails: The trails surface generally consists of stabilized, decomposed granite. These trails are open to equestrian, bicycle, and pedestrian travel.

Intersection treatments: Treatments including signalization and phasing can improve the safety and comfort of bicyclists. These include continuing the bike facility up to and through the intersection, providing queuing space out of the flow of vehicle traffic, bicycle signals, etc.

Grade-Separated Crossings: Underpasses or overpasses separate motorized and non-motorized traffic from each other at points where these roadway users intersect.

8.3 ON-STREET BICYCLE BOULEVARD

Many local and neighborhood streets with low-existing speeds and volumes provide the basic components of a safe and comfortable environment for people riding bicycles. These streets can be enhanced with design treatments, tailored to existing conditions and desired outcomes, to create neighborhood on-street bicycle boulevard:

1. Signs and Pavement Markings to make the boulevard easy to find and to follow.
2. Speed Management to slow motor vehicle speeds to 25 mph or less.
3. Volume Management to reduce motor vehicle volumes to less than 3,000 vehicle per day, 1,500 vpd preferable.
4. Minor Street Crossings to minimize bicyclist delay.
5. Major Street Crossings to provide safe and convenient crossings.
6. Green Infrastructure to enhance comfort.

Refer to the City of Phoenix Active Transportation Team for design example, at Bike@Phoenix.gov.

8.4 ON-STREET BICYCLE LANES

Striped/painted bike lanes are a portion of the roadway designated for preferential use by bicyclists by use of pavement markings and, optionally, signage. Parking should not be permitted in bike lanes at any time.

All collector streets should have striped/painted bike lanes unless otherwise directed by the Street Transportation Department. All new construction shall include striped/painted bike lanes on parkway, arterial, and collector streets.

Buffered bike lanes, separated bike lanes, or protected bike lanes may be required on streets with high traffic volumes or favorable curb to curb geometry.

8.4.1 Bike Lanes on Bridges/Tunnels/Grade Separation

Bridges, tunnels, or any grade separation structure, should allow the full width of the physical improvements including standard bike lanes. Bridges and tunnels with solid barriers alongside often become dangerous constriction points for bicycle travel. Consideration should be given to maintaining extra width on bridges and in tunnels even if the street does not have bike lanes.

8.4.2 Bike Lanes on Rural Streets

In rural areas, a paved shoulder can serve the function of a bike lane, in which case it should have a minimum of 5' of paving.

8.4.3 Bike Lanes on Streets with On-Street Parking/Parking Protected Bike Lanes

A bicycle lane can be delineated with striping between an area for parallel parking and a traffic lane or between parking and the curb. This second arrangement constitutes a parking protected bike lane. A parking protected bike lane should provide a 4' buffer between the bike lane and the parked car to allow the buffer to be used as a walkway to access the curb ramp at the nearest intersection.

8.4.4 Bike Lane Width

Bike lane width should meet dimensions summarized in **Table 8.4-1**. Changes in bike lane width and horizontal and vertical alignment should be smooth. A solid 8" white stripe is used to mark the bike lane. The use of minimum bike lane widths is preferable to the provision of wide outside vehicle-travel lanes. Minimum-width bike lanes should be limited to constrained situations where the preferred widths cannot be provided after all other travel lanes have been narrowed to minimum widths.

Table 8.4-1 Preferred and Minimum Widths of Bike Lanes

Bike Lane Description	Preferred Width (ft)	Minimum Width (ft)
<i>Bike lane with buffer</i>	6' (bike lane) 3' (Buffer)	5.5' (bike lane) 2.5' (Buffer)
<i>Bike lane adjacent to curb (from face of curb)*</i>	6' – 7.5'	5.5'
<i>Bike lane adjacent to edge of pavement</i>	5' – 7.5'	4.5'
<i>Bike lane between travel lanes and turn lanes</i>	6' – 7.5'	5'
<i>Bike lane adjacent to parking**</i>	6' – 7.5'	5'
<i>Intermediate or sidewalk level bike lane (see Figure 8.7.1)</i>	6' – 10'	5'
<i>Bike lane to allow side-by-side bicycling or passing</i>	8' – 10'	8'

*Parking protected bike lanes require a 4' buffer (3' minimum) between the bike lane and parking lane.

**Assumes a 1.5' gutter. Minimum bike lane width 4' (even surface) exclusive of gutter unless the gutter is integrated into the full width of the bike lane.

Adding buffer space or wider bike lanes may be preferable in the following situations:

- Where parking is present and turnover is high.
- Where it is desirable to allow bicyclists to travel side-by-side or to pass each other.
- On roadways with posted speeds over 25 mph or 3,000 vehicles/day.
- Where the percentage of heavy vehicles exceeds 5 percent.
- Where bicycle lanes are located between two moving travel lanes, such as between a through lane and a turning lane.
- Where there are multiple lanes of vehicle traffic per direction.

Bike lanes wider than 7.5' (assuming a 1.5' gutter) should include a buffer or buffer with vertical elements to minimize their appearance as a travel lane or parking lane for motorists.

8.4.5 Bicycle Stencils

Painted/striped bike lanes are demarcated with a white-lane line and green-backed bicycle stencils. Bicycle stencils are added to alert all users of the roadway that a designated area is identified as the bike lane.

Bicycle stencils (**Figure 8.4-1**) should be placed 30'-50' downstream from an intersection. The first marking after an intersection or driveway should be placed outside of the wheel path of turning vehicles, to reduce wear. If a far side bus stop is present, the bicycle lane marking should be placed after the bus stop, outside of the area frequently used for the bus to merge into the adjacent lane.

Bicycle stencils are generally spaced every quarter mile. In Downtown and urban areas, where conflicts with motorists may be higher (i.e., where there is significant parking turnover, at intersections, at driveways, at turn lanes), it is appropriate to space the symbols closer than the quarter mile spacing. In areas with long distances between intersections and little roadside activity, bicycle stencils may be spaced even further apart, as approved by the Street Transportation Department.

Bicycle stencils are added in conflict zones or to denote where a bike needs to move to another area. For example, where a bike lane continues on the left side of a right-turn-only lane, bicycle stencils should be placed in the bike lane adjacent to the turn arrows for the right-turn-only lane. Bike lanes should be continuous between intersections and not stop or leave a gap as approaching the intersections or driveways.

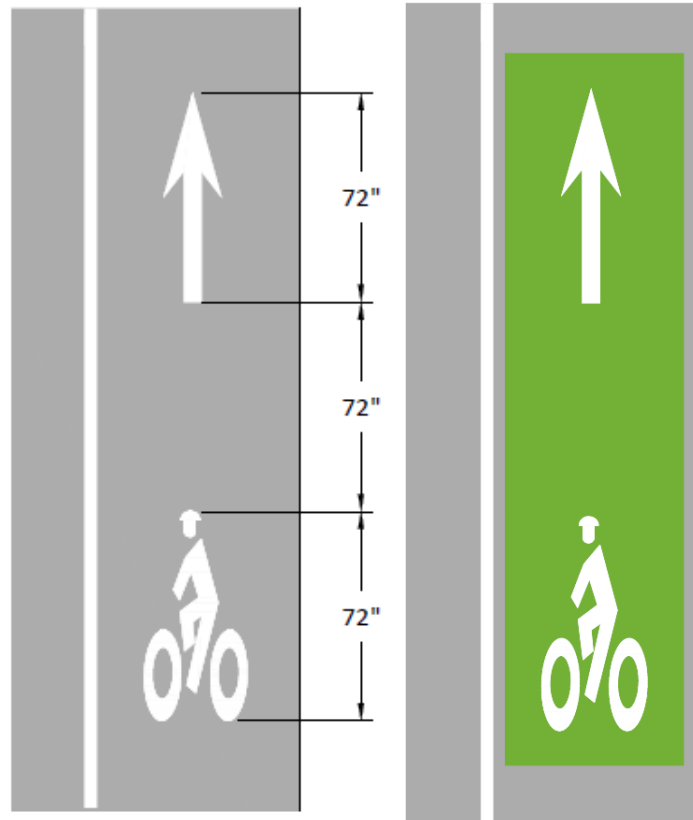


Figure 8.4-1 Standard and Green Backed Bike Symbol

8.5 ON-STREET BUFFERED BIKE LANES

Increasing the lateral separation between motor vehicles and people riding bicycles provides a more comfortable condition for both those riding bicycles and vehicles. Buffered bike lanes are the preferred bike lane wherever space allows.

Bike lanes can be improved through the provision of a painted buffer (Figure 8.5-1,

Figure 8.5-2, and Figure 8.5-3) between the bike lane and adjacent travel lane and/or between the bike lane and parking lane. The painted buffer provides a spatial and visual separation between parked or moving motor vehicles and the bicycle lane. The bike can be reduced to the 4' minimum

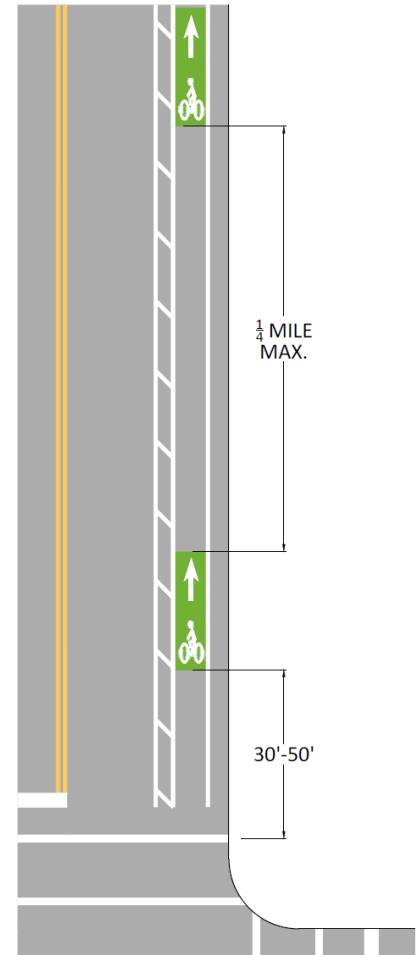


Figure 8.5-1 Typical Bike Lane Layout

(excluding gutter) to achieve a buffered bike lane.

Figure 8.5-2 On-Street Buffered Bike Lane

Buffered bike lanes (Figure 8.5-3) generally consist of a combination of standard longitudinal markings and cross hatching as illustrated in Figure 8.5-4. Buffers less than 2.5' in width are to be used only in short, constrained sections, and do not have cross hatching.

Where provided, cross hatching should be provided at a regular interval. A typical spacing (L) is 40' for speeds less than 40 mph and 80' for speeds 40 mph or greater. Spacing may be reduced to as frequent as 5' where engineering judgment determines a more frequent spacing is desirable.

The use of an additional buffer between the bike lane and parking lane is desirable when parking turnover is frequent (e.g., short-term parking), where loading/unloading activity is high, or when larger vehicles are typically using the parking lane.

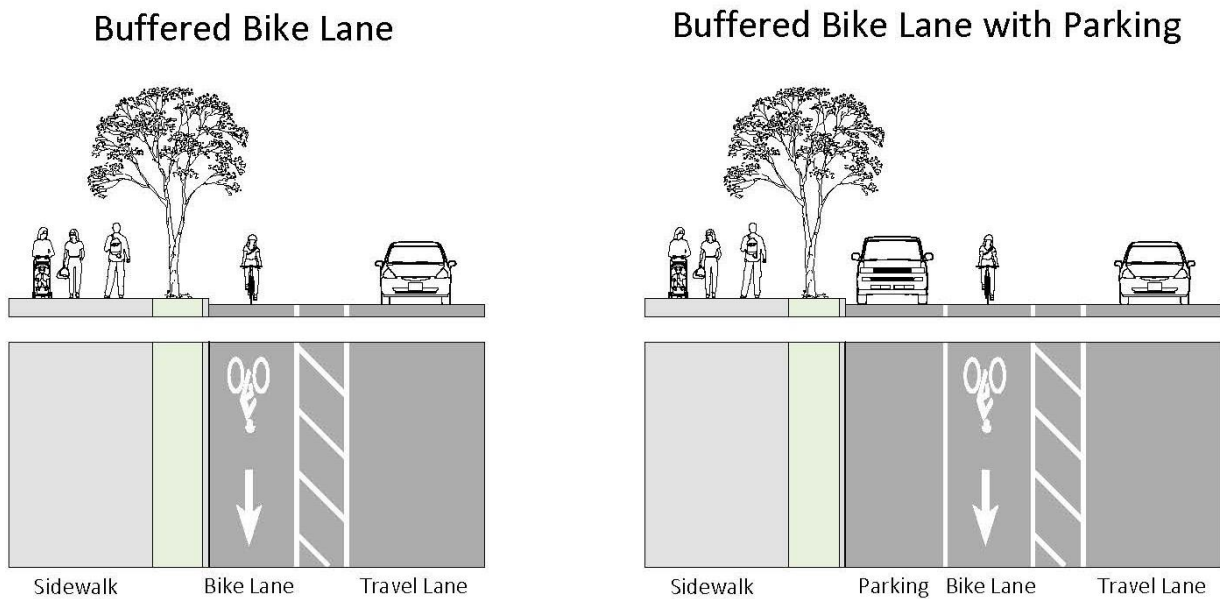
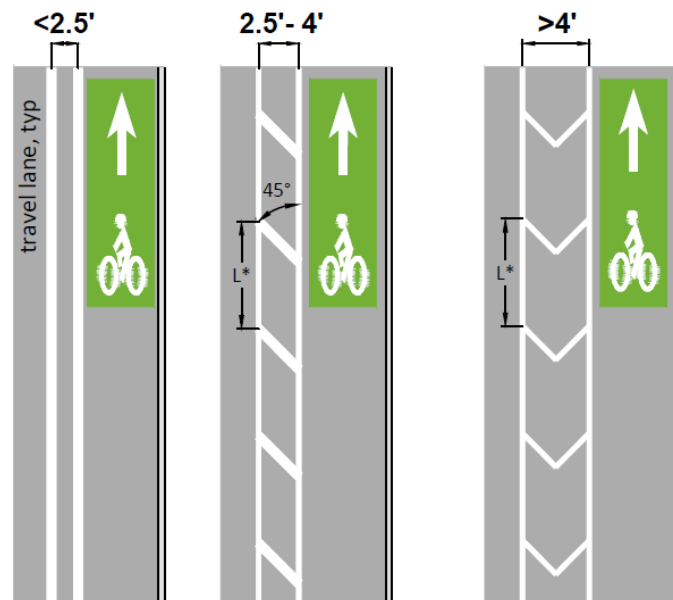


Figure 8.5-3 Typical Buffered Bike Cross-Sections



L = 20' (typical); L = posted speed limit (max)

*spacing may be reduced where engineering judgement determines more frequent spacing

Figure 8.5-4 Typical Buffered Bike Lane Pavement Markings

8.6 PROTECTED BIKE LANES

Protected bike lanes are a type of bicycle facility that provides an exclusive space for bicyclists along or within a roadway. Protected bike lanes (**Figure 8.6-1**) have two fundamental elements: horizontal offset from adjacent motor vehicle lanes and vertical objects located within that offset. An offset between bike lanes and pedestrian space is also desired if the bike lane is at sidewalk level. Developers are instructed to contact City of Phoenix Streets Department if a protected bike lane is adjacent, planned, or desired.

Protected bike lanes may be designed as either one-way or two-way (**Figure 8.6-2**), and may be constructed at street level, sidewalk level, or at an intermediate level between the street and sidewalk. Separation can be achieved by objects such as vertical curb, planters, flexible delineator posts, or parked vehicles, among others, placed in the street buffer.



Figure 8.6-1 Two-Way Protected Bike Lanes

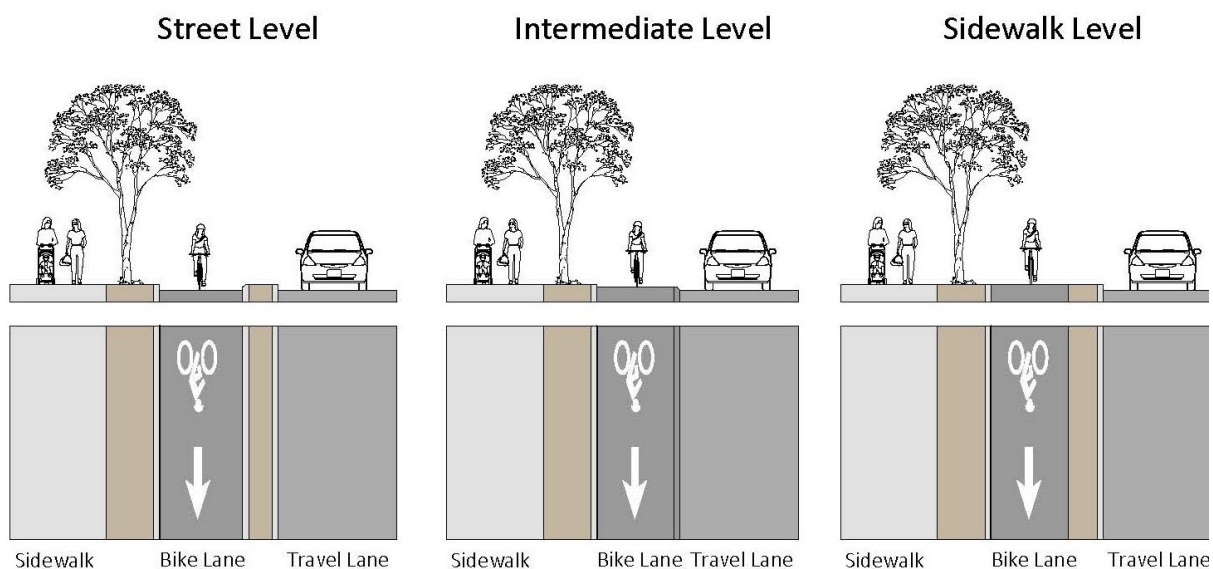


Figure 8.6-2 Separated Bike Lane Types

8.7 CURB INLETS/STORM DRAIN GRATES

Drainage grates with openings running parallel to the direction of bicycle travel can cause narrow bicycle wheels to drop into the gaps and cause a crash. It is preferable to avoid drainage grate concerns by installing inlets, which only have curb face openings. Drainage grates should be located outside the bicycle facility whenever possible, however when unavoidable, care should be taken to ensure that drainage grates are bicycle-compatible, with openings small enough to prevent a bicycle wheel from falling into the slots of the grate (See **Figure 8.7-1**).

Drainage grates and utility covers that extend into the bicyclist operating space may cause bicyclists to swerve, effectively reducing the usable width of the bike lane. Where grates are located within a bicycle facility or adjacent to bicyclists' operating space, the gap between the drainage grate and its frame should be 0.5" or less, and it should be perpendicular to the path of travel. Another option is to place the grate entirely within a gutter or curb rather than extending it into the bicycle facility.

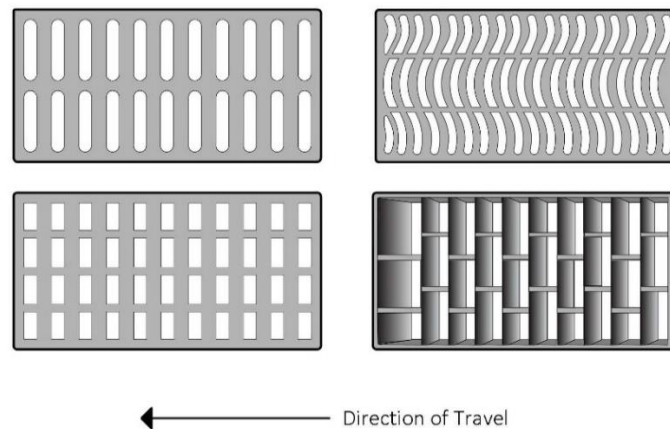


Figure 8.7-1 Bicycle Compatible Drainage Grates

8.8 CONNECTIONS TO PRIVATE PROPERTY

Developers are encouraged to provide comfortable and safe access from a protected bicycle lane to the adjacent property. Access may be provided at block ends, using a standard or widened curb ramps, mid-block using a driveway or a modified driveway (6'-8' wide) for bicycle access, or with a bike ramp with a trapezoidal delineator (**Figure 8.8-1**). Contact the City of Phoenix Street Transportation Department for information about a modified driveway for bicycle access.

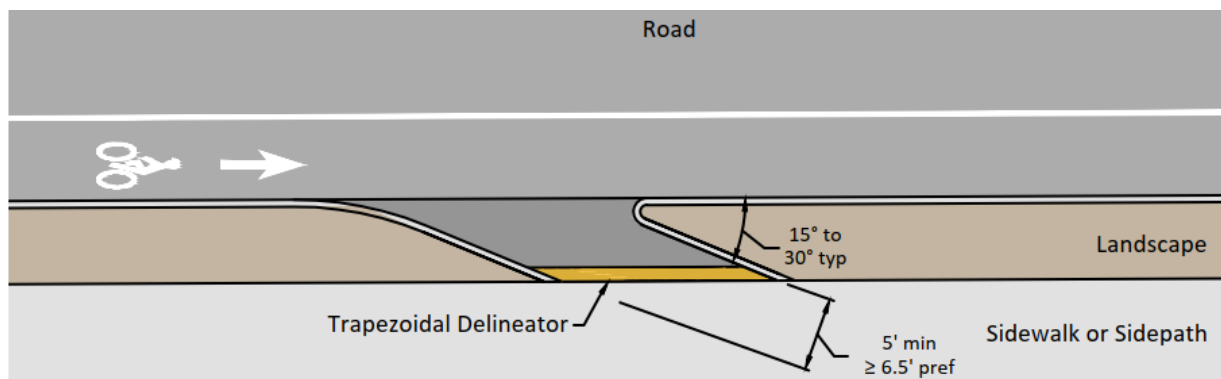


Figure 8.8-1 Example of Bike Ramp

8.9 SHARED-USE PATHS

8.9.1 Design Considerations

Shared use paths (**Figure 8.9-1**) are facilities on exclusive right-of-way. Shared use paths are sometimes referred to as trails; however, to some, the term trail means an un-improved recreational facility.

City of Phoenix requirements for shared-use paths (**Table 8.9-1**) are found in City of Phoenix Supplement to MAG Uniform Standard Specifications, section 429 and details P1130 and P1131. For additional information, please refer to the AASHTO Guide for the Development of Bicycle Facilities.

Every attempt should be made to avoid having a path adjacent to a street. If this is unavoidable, on arterial streets a separation of at least 8' with landscaping should be provided and on collector streets a separation of at least 5' should be provided.

Connections between different types of facilities is important to ensure an efficient and functional system. Shared-use paths may be used to connect sections of roadways that would otherwise dead-end. However, it is critical not to attempt to substitute a path or a sidewalk where bike lanes are warranted. Bike lanes allow direct, higher-speed travel for cyclists, unimpeded by pedestrians.

Shared-use paths are typically two-way; designing a path to connect with one-way bike lanes requires study and design to that the bicyclist does not end up riding the wrong way (against traffic) in one of the bike lanes.

As shared-use paths connect or cross arterial or collector streets, the crossing of the street needs to be considered in the overall design to maintain connectivity. A safe and convenient crossing needs to be implemented with the overall design of the shared-use path. A traffic signal, pedestrian hybrid beacon, or raised median island may be required depending on the volume, speed, width, and additional factors of the roadway. The developer is instructed to contact Street Transportation Department for type of crossing required.



Example of Shared-Use Path

Figure 8.9-1 Shared-Use Path

Table 8.9-1 Shared-Use Path Design Considerations

Design Speed	20 mph
Typical Width	10' wide (minimum) with 2'-foot graded shoulder on each side, 5' horizontal clearance, and 10' vertical clearance.
	8' or more where paths can be paired so each can have one-way travel.
	14' in areas with high use and/or a wide variety of users. Where pedestrian and bicycle activity are very high it may be advantageous to have separate paths for walking and bicycling rather than increase the path width to minimize speed differential between pedestrians and wheeled users.
Surface	Variables by use. Surfaces may include decomposed granite, turf, or concrete with medium broom finish. On concrete surface, it is desirable to provide traction, but not to a degree that impedes skaters.
Shoulders	Material for the shoulders should allow for recovery if a user runs off the path. Substances such as turf, decomposed granite, exposed aggregate, or very low shrubs/grasses are appropriate. No spiny/thorny plants.
Clear Zone	An area clear of fixed objects such as poles or tree trunks for another 3' beyond the shoulder is desirable.
Fencing/Rail	Where needed, fences or railings for paths or bikeways should be 54" in height (40" minimum) and be flared at the ends.
Vertical Clearance	8' over the path and shoulder areas; 10' for underpasses
Horizontal Grade	5 percent or percent or less. Where this is not feasible, refer to the AASHTO Guidelines.
Cross-Slope	Maximum side slope is 2 percent. Maximum cross-slope is 2 percent. Adjacent grades should always direct water away from the path surface.
Alignment	Alignment is as linear as possible. Avoid compound curves. Unnecessary "meandering" reduces the effective width of the path, can create sight distance problems, and increases possibility of users running off the path.
Tunnels	Tunnels should be lighted Provision in tunnels to keep nuisance water off the path and allow the water to rapidly drain or be removed. One solution is a small channel constructed with a sloping side, built on one side of the tunnel. Sump pumps are needed in areas prone to flooding.
Ramp	Path ramp design where the pan for any curb ramp shall be as wide as the path. The ramp should be aligned with the path, and not require users to make sudden swerves, or to be directed towards oncoming traffic.

8.9.2 Easements, Dedications, and Abandonments

Sometimes on-street facilities may need to be connected with short sections of paved path. As an example, connecting cul-de-sacs that have only one direct access to the public street system. The cul-de-sac street can be connected to allow bicycle and foot access to reach adjacent streets, paths, trails, or property.

If a private-gated community will cut off functional access for cyclists, means should be explored to maintain a public-use easement on the streets and through the gates for pedestrians and cyclists.

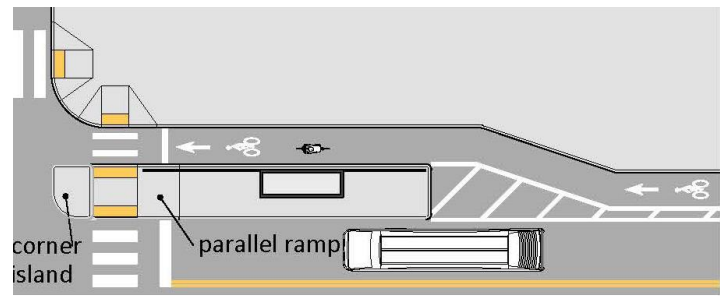
For off-street paths/trails, right-of-way may need to be obtained from development stipulations, or purchased. Any easements or dedications for paths should include a clear statement of maintenance responsibilities: for the actual concrete path, any adjacent landscaping or lighting, and for maintaining proper grades and drainage along the path. Dedicated right-of-way or public use easements for paths must be noted in the stipulations and on the site plan. This should occur in the Project Review process for new developments. If the classification of an existing or planned street is proposed to be changed, or a street easement or right-of-way proposed for abandonment, present and potential pedestrian and bicyclist connections should be reviewed. The proposed change shall be evaluated against the needs of the active transportation program. Public use easement for bicycle and/or foot access should be obtained or retained.

8.10 TRANSIT STOPS

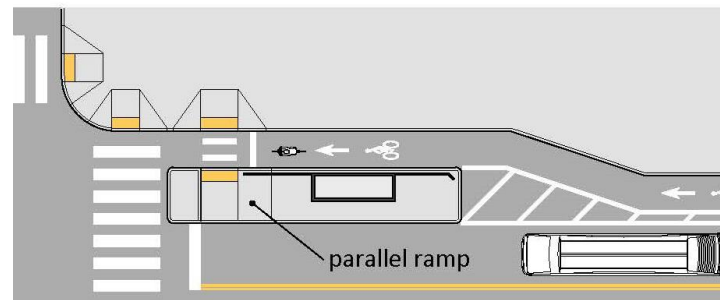
Transit stops in locations with bike lanes are generally configured in two ways: by continuing the bicycle facility through the stop area (requiring a bike/bus shared space, or bike/bus merge zone), or by routing the bicycle facility around or behind the transit platform (floating stop).

A bike/bus shared space is used in locations where there is insufficient space to route bicyclists behind the transit stop area. Depending on the available width, the bus may cross over or occupy the bike lane.

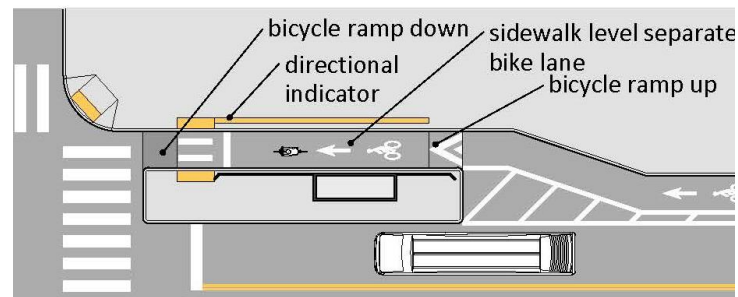
In locations where an in-lane transit stop is proposed, a floating stop should be considered, by routing the bicycle facility behind the transit platform. **Figure 8.10-1** through **Figure 8.10-3** shows configurations that are applicable for near, far, and mid-block stops. In all cases, a 5' by 8' clear boarding and alighting area that connects to a pedestrian access route must be provided. On multi-lane streets, floating transit stops should be placed on the far side of the intersection only. The pedestrian crossing of the bicycle facility should be marked with crosswalk markings and pavement marking/signage should indicate that bicyclists should stop for pedestrians accessing the transit platform. Additional guidance related to accessibility, clearances, and mitigating conflicts is provided in the AASHTO Guide for Development of Bicycle Facilities.



ALTERNATIVE 1

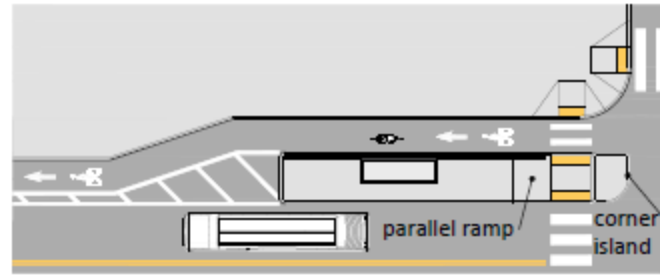


ALTERNATIVE 2

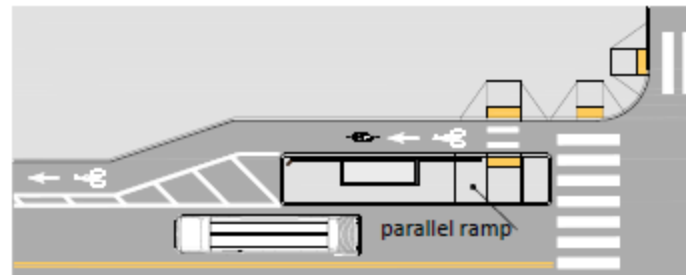


ALTERNATIVE 3

Figure 8.10-1 Bike Lane Routing Behind Transit Stop (Near-Side)



ALTERNATIVE 1



ALTERNATIVE 2

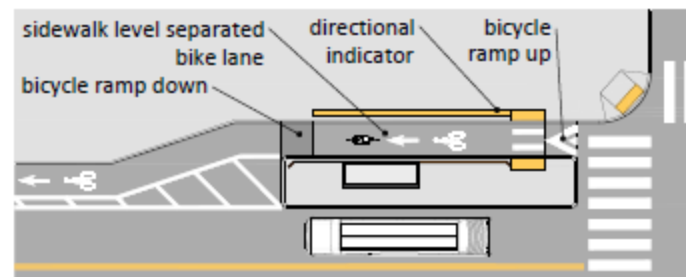
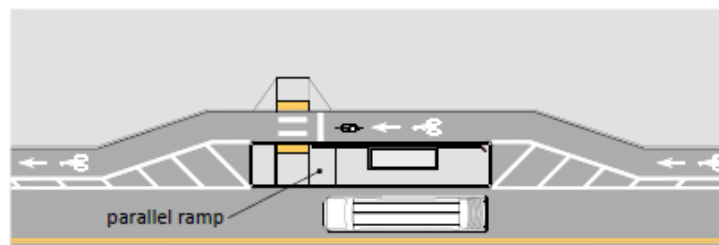


Figure 8.10-2 Bike Lane Routing Behind Transit Stop (Far-Side)



ALTERNATIVE 1

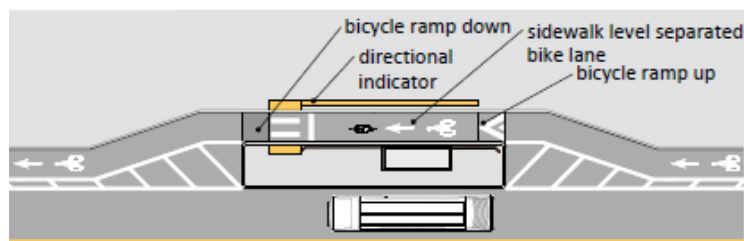


Figure 8.10-3 Bike Lane Routing Behind Transit Stop (Mid-Block)

8.11 RAIL CROSSINGS

The angle at which at-grade rail lines intersect with a bicycle facility is a critical design consideration. The preferable skew angle between the center line of the tracks and the bicycle facility is between 60 and 90 degrees (**Figure 8.11-1**) so bicyclists can avoid catching their wheels in the flange and losing their balance.

When rails curve through an intersection, the safe path for a cyclist may not be intuitive. In this case, pavement markings may be used to indicate the bicyclists' path of travel across the rails. Care should be taken that the path of travel does not conflict with movements from other roadway users.

When rails are located parallel to a bicycle facility, consideration should be given to connections to adjacent bicycle facilities at intersections. Two-stage turn queue boxes are provided to facilitate a 90-degree crossing of the rails, to indicate an alternative to crossing the parallel tracks.



Figure 8.11-1 Bike Lanes at Rail Crossings

8.12 TRANSITION POINTS AND ENDING BICYCLE FACILITIES

Each bicycle facility begins and ends at a specific location and will either terminate or transition into another distinct bikeway. The following section describes design considerations to safely transition and terminate the facilities described above.

Transitions of two-way separated bike lanes to bikeways or shared lanes that require one-way bicycle operation require particular attention. Bicyclists operating counterflow to traffic will be required to cross two roadways. Failure to provide a clear transition to the desired one-way operation may result in wrong-way bicycle riding. It may also be desirable to use green-colored pavement within crossings and

two-stage bicycle turn boxes to improve legibility and provide strong visual guidance of the intended path across the intersection to all users. The crossing may warrant bicycle signals at signalized crossings. The signal should be coordinated with the intersecting street signal phase. Site-specific conditions and engineering judgement should determine the most appropriate treatments for ensuring a safe and intuitive bikeway transition.

8.13 CONFLICT ZONE MARKINGS

At locations where designated bicycle facilities cross intersections and driveways, conflict markings (**Figure 8.13-1**) may be provided to guide bicyclists along their path of travel while clearly designating locations where bicycles and motor vehicles will intersect. Bicycle intersection treatments requires coordination with traffic services and the City of Phoenix Active Transportation Team.

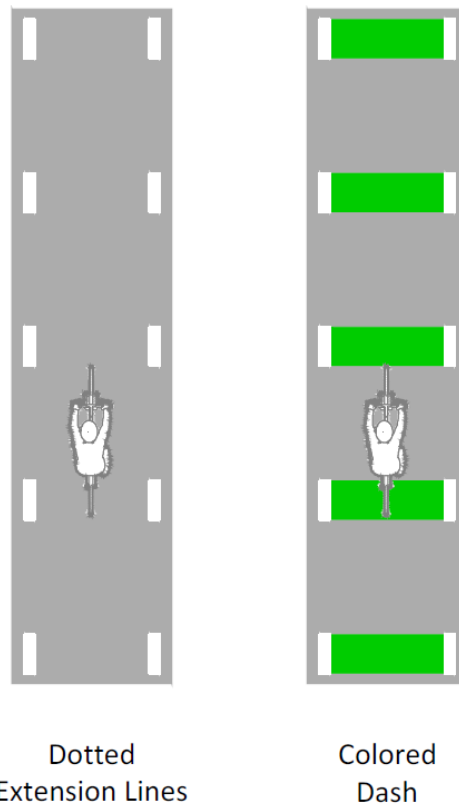


Figure 8.13-1 Typical Bicycle Conflict Markings

9. TRAFFIC IMPACT ANALYSIS

OVERVIEW

This chapter is prepared to assist an applicant to satisfy the requirement of performing a Traffic Impact Analysis (TIA) when requesting access to a city street.



Chapter 9 --- TRAFFIC IMPACT ANALYSIS

9.1 INTRODUCTION

This chapter is prepared to assist an applicant to satisfy the requirement of performing a Traffic Impact Analysis (TIA) when requesting access to a city street.

Development or redevelopment may require improvements to adjacent and nearby streets to ensure that traffic continues to operate safely and efficiently. A TIA evaluates the magnitude of traffic impact resulting from the proposed development or redevelopment project and provides recommendations to effectively mitigate adverse contributions.

The TIA scope is tailored to the scale of the proposed development activity. Development that is expected to have minimal traffic impacts will complete a focused and limited analysis or potentially no analysis.

Development or redevelopment activity that is expected to have greater impacts would complete a broader, multimodal, in-depth analysis. The Applicant and Street Transportation Department will coordinate to define the scope, type, and scale of analysis appropriate to the development or redevelopment activity.

The TIA shall be prepared in accordance with guidelines published by the Institute of Transportation Engineers and submitted studies shall be sealed by a Civil Engineer duly experienced in their preparation and licensed by the State of Arizona.

9.1.1 Scoping Process

The requirement and scope for a TIA is identified considering the scale of the project, intensity of land use, and the resulting anticipated vehicular trip generation. Additional considerations that may lead to a TIA or an expanded scope, include:

- Identified traffic safety or crash histories adjacent or nearby to the site.
- Existing neighborhood traffic concerns or complaints.
- Access control considerations.
- Proximity to transit or other amenities with significant pedestrian demand.
- An overview of the TIA Process Flow is provided in **Figure 9.1-1**.

The Applicant is strongly encouraged to arrange a pre-application scoping meeting with Street Transportation Department staff. At this meeting, Street Transportation Department staff and the Applicant will review the project, discuss any known critical issues pertaining to site access, and discuss TIA assumptions and methodologies.

9.1.2 City of Phoenix Street Classification Map

The City of Phoenix publishes a General Plan that includes a Street Classification Map. Prior to commencing any study within the City of Phoenix, the Applicant should reference the Street Classification Map for minimum roadway alignments and cross-sections.

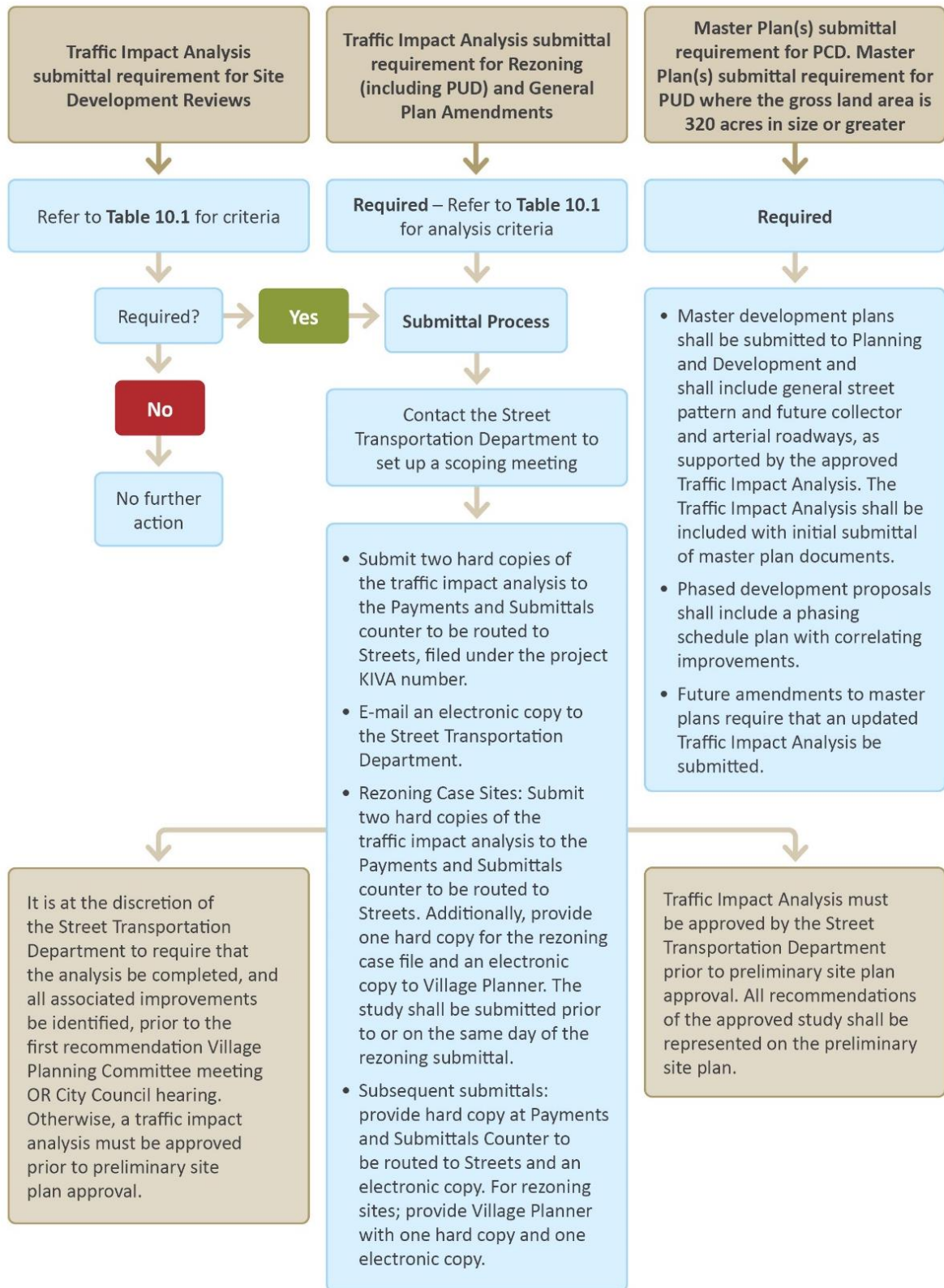


Figure 9.1-1 TIA Flowchart

9.2 CITY OF PHOENIX TIA REQUIREMENTS

The Street Transportation Department reserves the right to require a traffic study, and its component scope, from any proposed development project in consideration of unique project elements, existing traffic operational or safety concerns, or reasonably anticipated operational challenges.

The City may require or request TIA submission to or from adjacent municipalities or agencies, in which controlling jurisdictions roadways or facilities may be affected. It is the responsibility of the submitter to coordinate these reviews and provide necessary approvals from municipalities or agencies prior to final TIA approval being granted.

9.2.1 Site Development Permits

Generally, any project that creates a subdivision of property, or a ground disturbance of at least 2,000 square feet, is routed to the Street Transportation Department for review. All such projects are evaluated for traffic study requirements. Where Street Transportation staff determine that a TIA is required, a stipulation will be indicated on the site plan review report. Refer to Chapter 5 of the City's Zoning Ordinance for additional information regarding site development requirements.

A TIA that is prepared for a site development will conduct the evaluation against observed traffic counts.

9.2.2 Zoning Applications

A TIA for a land entitlement/rezoning process will conduct the evaluation against observed traffic counts. In addition, the TIA will include an evaluation of the projected trip generation for the requested entitlement/rezoning, in comparison with projected trip from the current entitlement/rezoning. This comparison will demonstrate the net effect of the zoning/entitlement change. All applications for modifications of property entitlements require documentation of the expected change in vehicular trip generation to accompany the public review process of the zoning application. Certain zoning modification procedures require more well-defined TIA scope and timing for review and approval.

9.2.3 Planned Community Development (PCD)

Refer to Section 636 of the Zoning Ordinance for full procedural requirements. Traffic studies are required, with approval prior to development of Master Street Plans. Projects at the PCD scale typically involve multiple parcels with phased installation of roadway infrastructure exceeding individual parcel frontages as necessary to support regional growth.

9.2.4 Planned Unit Development (PUD)

Refer to Section 671 of the Zoning Ordinance for full procedural requirements. The PUD model allows for flexible development standards that may not correspond to traditional land use categories. As such, a TIA is required with the initial application to inform the anticipated traffic impacts associated with the proposal. Street Transportation, in coordination with the Planning and Development Department, will determine whether TIA approval is required prior to setting City Council hearing dates.

9.2.5 Downtown Code, Walkable Urban Code, and Transit-Oriented Design Districts

Urban-focused districts require additional evaluation of the non-vehicular interface to public right-of-way. All studies within these districts must include analytical and/or narrative elements discussing active modes considerations and the streetscape interface. The TIA must include a section addressing pedestrian considerations.

TIA recommendations must be consistent with the Downtown Code, Walkable Urban, or Transit-Oriented Development Zoning Districts. These include the use of alleyways and minimal use of driveway access points.

9.2.6 Guidelines for Traffic Study Scope

The scope of the TIA is commensurate with the number of trips to be generated by the development.

Table 9.2-1 presents approximate ranges for anticipated vehicular trip generation by TIA analysis category. The appropriate scope must be discussed with the Street Transportation Department prior to commencing data collection or analysis. Projects that generate less than 100 peak-hour trips may *initially* submit a *traffic statement* that provides key information about the project for further evaluation. Street Transportation may accept the statement as fulfillment of the study requirement.

Table 9.2-1 Criteria for Determining TIA Study Requirements

Analysis Category	Development Characteristic	Study Horizons	Minimum Study Area
Traffic Statement	Single phase developments which generate < 100 peak hour trips during AM or PM per hour	-	-
I	Single phase developments which generate < 500* peak hour trips during the AM or PM peak hour <i>Note: *200 peak hour trips for Downtown Code, Walkable Urban Code, or Transit-Oriented Development Code</i>	1. Opening year	1. Site access drives 2. Signalized and/or potential signalized intersections adjacent to development
II	Single phase or multi-phase developments which generate 500 or more peak hour trips but fewer than 1,000 trips during the AM or PM peak hour	1. Opening year 2. 5 years after opening	1. Site access drives 2. Signalized and/or potential signalized intersections within ¼ mile of development
III	Single phase or multi-phase developments which generate 1,000 or more peak hour trips but fewer than 1,500 trips during the AM or PM peak hour	1. Opening year 2. 10 years after opening	All site access drives Signalized and/or potential signalized intersections within ½ mile of development
IV	Multi-Phase developments (such as PCDs), and developments which generate more than 1,500 trips during the AM or PM peak hour	1. Opening year 2. Significant phases 3. 15 years after opening	Determined by the Street Transportation Department based on project size, location, and surrounding traffic conditions; typically, major intersections within one (1) mile of the development

a. Assume full occupancy and build-out for single-phase developments. Multi-phase developments may require assessment of multiple horizon year's corresponding to key phases as directed by the Street Engineering Department.

b. An enlarged study area may be required when the minimum study areas identified in 10.1 does not provide sufficient information to meet the intent of the Traffic Impact Study guidelines.

9.3 TRAFFIC IMPACT STUDY CONTENT

The following must be included in the Traffic Impact Study:

9.3.1 Required Sections

- **Introduction:** Describe the reason for the TIA, identify the project, and state its location. Identify the TIA Category.
- **Proposed Development:** Include information on location, land use, size, density, phasing, build-out year, access points, and any other relevant descriptions of the development.
- **Study Area:** Identify intersections and roadways analyzed within the report.
- **Surrounding Land Use:** Describe the existing land uses surrounding the development.
- **Surrounding Transportation System:** Describe the existing streets, intersections, transit, bike, and pedestrian facilities. Include information regarding planned improvements in the area not a part of the planned development.
- **Existing Traffic Counts:** State when, where, and how counts were collected. Include count data in the Appendix.
- **Analysis Time Periods and Study Horizon Years:** Document the peak hours to be analyzed within the report and all scenarios (existing, background, total, improved, etc.) to be analyzed.
- **Proposed Development Traffic:** Describe the trips to be generated by the proposed development and how the generated trips will be distributed to the street network.
 - ▶ **Trip Generation:** Document the estimated trips generated by the development using the Institution of Transportation Engineers (ITE) Trip Generation. Include the calculations in the Appendix.
 - ▶ **Trip Reductions:** Document Street Transportation Department approved trip reductions for internal capture, pass-by or mode split.
 - ▶ **Distribution:** Document the trip distribution of development trips based on the employment and population data for the study area. This can be done on a figure.
 - ▶ **Assignment:** Document the specific route trips will take to arrive at and depart from the development. This can be done on a figure.
- **Off-Site Future Traffic:** Describe the process utilized to calculate the growth rate and future traffic volumes in the study area.
- **Analysis:** Include the calculations for all analyses required by the Street Transportation Department (Level-Of-Service, auxiliary lanes, etc.). Document multimodal considerations and impacts.
- **Safety:** Discuss crash data and key findings of the crash analysis; sight distance, alignment of driveway/streets; speed; multimodal considerations.
- **Recommendations:** Identify any improvements necessary for safe and efficient operation of the transportation system. Identify multimodal considerations and recommendations.

9.3.2 Required Figures

- **Site Location:** Area map showing site location and area of influence.

- **Conceptual Plan of Proposed Development:** Land use components, access points for vehicular and pedestrian connections, and on-site circulation.
- **Surrounding Transportation System:** All major streets, minor streets adjacent to site, planned improvements not part of proposed development, transit, bicycle, and major pedestrian routes, right-of-way widths, and traffic signal locations.
- **Existing and Anticipated Area Development:** Existing and future land uses in area.
- **Existing Traffic Volumes:** Daily traffic volumes and peak-hour traffic volumes; turning movement counts for peak hours.
- **Distribution:** Portion (by percentages) of site traffic approaching and departing proposed development.
- **Site Traffic:** Daily traffic volumes and peak hour traffic volumes for each horizon year (if separate phasing is expected); turning movement counts for the peak hours.
- **Off-Site Future Traffic:** Daily traffic volumes and peak-hour traffic volumes for each scenario (horizon year); turning movements for peak hours.
 - ▶ Analysis scenarios (horizon years) analyzed in the report must be described such as ‘*Existing Traffic Volumes + Site Phase 1 Traffic Volumes*’ and ‘*Year 2025 Traffic Volumes + Site Full Build-out Traffic Volumes*’; figures showing the total traffic volumes for each scenario and analysis time period.
- **Total Traffic:** Daily traffic volumes and peak hour traffic volumes for each scenario (horizon year); turning movements for peak hours.
- **Recommend Improvements:** Recommended geometrics, cross sections, and traffic control. Include phasing if applicable.

9.4 SPECIAL CONSIDERATIONS FOR TRAFFIC COUNTS

The City of Phoenix generally experiences reduced traffic volumes during summer months. Traffic counts collected during summer months, or for periods where schools are not in normal operation, should be adjusted by a seasonal factor between 0.90 and 0.95. Collected counts should be divided by the agreed on seasonal factor.

Projects with unique traffic patterns may include data collection from comparison sites, adjusted for relevant factors, such as square footage or number of operational units.

Street Transportation concurrence on modification factors should be obtained prior to conducting the study analysis.

- All data shall be collected in accordance with the ITE Manual of Traffic Engineering Studies or as directed by the Street Transportation Department.
- Traffic count data should be no more than two years old.
- Adjust counts for average conditions due to seasonal differences when necessary.

- Existing daily traffic volumes may be obtained from the Street Transportation Department's 'Average Weekday Traffic Flow' map or from our Traffic Count Section.
- The directional split should be based on existing conditions. In the case where existing peak traffic is not available, a 60/40 split should be used.
- The peak factor (K) should be based on existing conditions. If traffic data are not available, 7 percent of daily traffic should be used for the morning peak hour and 8 percent for the evening peak hour.

9.5 TRIP REDUCTIONS FOR PASS-BY AND/OR INTERNAL TRIPS

Trip reductions, if appropriate, may be applied subject to approval by the Street Transportation Department:

- The ITE *Trip Generation Manual, 10th Edition* introduced subcategories for land use codes corresponding to urban project settings. These categories are the preferred method for estimating internal capture and mode split reductions. Reductions for pass-by or diverted trips may be based on ITE data or documentation of similar case in type and location.
- Internal trip reductions should generally not exceed 5-10 percent. All applications of trip reductions require an affirmative justification. Internal trip reductions in excess of 10 percent require approval from Street Transportation prior to submittal of the study.

9.6 OFF-SITE FUTURE TRAFFIC

As applicable, growth rates, MAG projections, and/or other traffic studies in the area may be used.

If the proposed site is surrounded by future developments or developable land, the Street Transportation Department may require that these developments be considered when estimating future traffic volumes.

9.7 LEVEL-OF-SERVICE ANALYSIS

Level-of-service analyses must be performed for the analysis time periods for each study intersection and site access in accordance with the Highway Capacity Manual.

Each analysis scenario (horizon year) should be analyzed with and without recommended improvements. The level-of-service calculations will be included in the Appendix.

Level-of-service 'D' is the minimum acceptable level-of-service at both signalized and unsignalized intersections during the peak hours. Level-of-service 'D' may be achieved by increasing intersection capacity and/or reducing vehicular traffic demand.

A level-of-service 'E' may be acceptable during peak hours within the most densely developed sections of Phoenix with the approval of the Street Transportation Department.

When requested by the Street Transportation Department, additional traffic analyses should be included in the study, such as queuing, gap, and speed. For large commercial developments, an internal circulation plan inclusion is required.

9.8 AUXILIARY TURN LANES

9.8.1 Intersections

Auxiliary lanes (right-turn, left-turn lanes) at intersections are required when thresholds as presented in **Table 9.8-1** are expected to be met with the addition of the projected development traffic.

Thresholds presented in **Table 9.8-1** are consistent with those established by *Maricopa County Department of Transportation, Roadway Design Manual, Section 6.1.6 (February 2020)*.

Table 9.8-1 Intersection Auxiliary Turn Lane Criteria

Intersection Auxiliary Lane	Criteria
Intersection Right-Turn Lane/Deceleration Lanes	<p>Intersection right-turn lane is to be provided:</p> <ul style="list-style-type: none"> ▶ When the roadway has 2 approach through lanes, a posted speed limit of 45 mph or greater, and an expected right-turn peak hour volume of 300 vph or greater. ▶ When the roadway has 1 approach through lane, a posted speed limit of 35 mph or greater, and an expected right-turn peak hour volume of 300 vph or greater. ▶ On any roadway where a traffic impact analysis indicates the level-of-service would be increased to a level-of-service of D or better with the addition of a right-turn lane. <p>In rural and developing urban areas with higher speeds, a separate right-turn lane may be required for lower right-turn volumes.</p>
Intersection Left-Turn Lane	<p>Intersection left-turn lane is to be provided:</p> <ul style="list-style-type: none"> ▶ At all signalized intersections.¹ ▶ When the left-turn movement into another roadway results in a level-of-service less than the minimum level-of-service of D during any peak hour.
Intersection Dual Left-Turn Lanes	<p>Intersection dual left-turn lane is to be provided:</p> <ul style="list-style-type: none"> ▶ When the peak hour left-turn volume exceeds 300 vehicles per hour. ▶ When the peak hour conflicting through movement volume exceeds 1,000 vehicles per hour. ▶ When a traffic impact analysis indicates the level-of-service would be increased to a level-of-service of D or better with the addition of dual left turns.

1. In some circumstances, left-turn lanes may not be required at signalized intersections; those intersections will generally require split phase signal operation and will be evaluated by the City on a case-by-case basis.

9.8.2 Site Driveways

Driveway Right-Turn Lane/Deceleration Lane

Right-turn/deceleration lanes may be required at driveways to assist traffic entering or exiting the roadway. The need for right-turn lanes to developments are based on criteria that consider traffic volume and street cross section as identified in **Table 9.8-2**. Street Transportation Department will indicate installation requirements based on the recommendations in consideration of the site context.

No driveways are to be located within deceleration lanes. Deceleration lanes will be constructed to serve individual driveways. No continuous lanes will be allowed to serve multiple driveways.

Table 9.8-2 Site Driveways Turn Lane Criteria

Driveway Auxiliary Lane	Arterial and Collector Roadway	Industrial/Freight Development
Driveway Right-Turn Lane /Deceleration Lanes	<p>Driveway right-turn lane is to be provided when:</p> <ul style="list-style-type: none"> ▶ The outside lane has an expected volume of 250 vph or greater and the right-turn volume is greater than 55 vph. <p>Or, when three of the following are met:</p> <ul style="list-style-type: none"> ▶ 5,000 vehicles per day on the adjacent street. ▶ Posted speed limit is greater than 35 mph. ▶ 1,000 vehicles per day are expected to use the driveway. ▶ At least 30 vehicles are expected to make right-turns into the driveway within a one-hour period. 	<p>For large industrial or commercial developments with a significant percentage of truck traffic entering the site from a high-volume arterial, driveway right-turn deceleration lanes may be required at below the above-described criteria and will be evaluated on a case-by-case basis.</p> <p>Auxiliary lanes will be required for all sites with 25 or more truck bays at all primary entrance route driveways.</p>

Driveway Left-Turn Lanes

Traffic volume warrants for adding a left-turn lane to an arterial or collector roadway are shown in **Table 9.8-3**. The volumes provided in **Table 9.8-3** are the minimum left-turn peak hour volume and minimum through volume in the same direction. A left-turn lane will be required if the left-turn peak hour volume is equal to or greater than the volume shown in **Table 9.8-3**.

Table 9.8-3 Volume Warrants for Auxiliary Left-Turn Lanes

Peak Hour Traffic Volume on the Roadway in the Advancing Direction	Minimum Peak Hour Left-Turn Traffic Volume			
	Number of Through Lanes Per Direction			
	1		2	
	< 45 mph Posted Speed	≥ 45 mph Posted Speed	< 45 mph Posted Speed	≥ 45 mph Posted Speed
≤ 200	30	15	-	-
201-300	12	12	40	30
301-400	12	12	30	25
401-500	12	12	25	18
501-600	12	12	15	12
601-1000	12	12	10	8
1001+	12	8	10	8

9.9 MITIGATION

Applicants will propose mitigations for all development action impacts that degrade modes to unacceptable performance levels or that generate travel demand in a way inconsistent with city goals.

Mitigation measures are identified by comparing Future Conditions with and without the proposed mitigation. A summary table of the Total Future analysis with the proposed mitigation measures, and for each phase of multi-phase developments will be presented and a map of the analysis results also be prepared.

9.9.1 Approach to Mitigation

The approach to mitigate vehicle trip impacts to the transportation network is to first establish optimal site design and operations to support efficient site circulation. When these efforts alone cannot properly mitigate an action's impact, reducing vehicle parking; implementing travel demand management (TDM) measures; and making upgrades to the pedestrian, bicycle, and transit networks to encourage use of non-auto modes shall be proposed.

In some instances, it may not be feasible to mitigate impacts to all modes. For example, established high-density areas typified by heavy vehicular traffic and constrained right-of-way will have few if any options for improving traffic operations. In these cases, the TIA must describe the challenges in mitigating impacts, with a focus on constrained right-of-way and negative secondary impacts on other modes. The Applicant shall instead explore and commit to other non-auto mitigations that have the potential to reduce demand for vehicular travel to the site. Performance monitoring may be appropriate in certain circumstances to ensure that a development's actual impacts do not exceed the impacts projected during zoning review and could require additional mitigation measures.

Any change required to the transportation network to reduce or minimize an action's impacts is considered "mitigation." All actions with proposed mitigation measures to be implemented over multiple phases will require the Applicant to commit to an implementation schedule by phase.

9.9.2 Non-Automotive Network Impacts

An assessment of non-automotive network impacts is required for sites within the Downtown Code, Walkable Urban, or Transit-Oriented Development Zoning Districts in support of the City's adopted Complete Street Ordinance.

Definitions for impacts to non-auto transportation networks and infrastructure are less quantitative than impacts to the roadway network. In general, any action is said to have an impact and requires mitigation if:

- It leads to overcrowding on infrastructure such as sidewalks, bike lanes, or transit service and facilities. This pedestrian or bicycle congestion may be measured via Highway Capacity Manual methodologies, other quantitative means (such as area of sidewalk per pedestrian, etc.), or shown via qualitative site and facility analysis; and
- There are any inadequate or missing pedestrian facilities, bicycle facilities, or transit stops in the vicinity of the site that are anticipated to be used by site-generated trips.
- The Following Sections should be considered and incorporated within the TIA in support of the City's adopted Complete Streets Ordinance.

9.9.3 Non-Automotive Network Enhancements

It is expected that the Applicant will fill gaps in the non-automotive network and fix substandard non-automotive facilities, as identified in the TIA. The Applicant should look for opportunities to upgrade site-adjacent and off-site pedestrian, bicycle, and transit facilities. The Applicant should focus particularly on improvements to facilities that link between the site and transit facilities, schools, parks, and other major activity centers.

9.9.4 Pedestrian Facilities

When determining appropriate pedestrian mitigations, special attention should be paid to facilities that promote pedestrian safety. Examples include installing missing sidewalk segments, widening sidewalks, correcting non-ADA compliant curb ramps, removing right-turn slip lanes, refurbishing crosswalks and pedestrian signage, installing curb extensions to shorten wide pedestrian crossings, installing pedestrian signal heads, and planting new street trees. Improvements to the pedestrian network should be accessible for all users and encourage a reduction in speeds of vehicles which in turn reduces the likelihood of collision with a pedestrian or bicyclist as well as the severity of the crash. For larger projects, both internal and external pedestrian circulation should be considered.

9.9.5 Bicycle Facilities

A principal impact for development projects on the stress of the bicycle network is the number and access condition of site driveways. For sites fronting an identified bicycle route, all reasonable efforts should be made to consolidate access locations, utilize shared access, and narrow site driveways. For larger projects, providing protected or conventional bike lanes and space for, or contributing to, a multi-use trail may be appropriate during the development process. Typically, on-street bicycle facilities are not required unless a project is large enough to cover an entire block or more. Smaller projects adjacent to City-planned bicycle lanes are expected to reserve space along the site frontage, as appropriate, to ensure the facility can be installed. However, an Applicant may be required as mitigation to upgrade facilities to a greater degree of cyclist protection where appropriate (i.e., converting conventional bicycle lanes to separated facilities by flipping the parking and bicycle lane).

9.9.6 Transit Facilities

Improved access to and quality of Valley Metro bus stops and Light Rail stations should be considered for mitigation. Connections should be provided directly to building entrances, utilize distinct surface materials, and offer concentrated shade. Examples include coordinating with Valley Metro and the City on bus stop relocation to locations that are preferred for safety and operations, ensuring ADA-accessibility, electrification of bus shelters, and installation of real-time digital displays or new wayfinding signage.

9.9.7 Roadway Operational and Geometric Changes

If traffic operation changes on a street are proposed (i.e., closing, direction change, reconfiguration of traffic lanes, etc.), analysis and clear rationale should be provided to support the change. In addition to operational changes, restrictions to site access points at other intersections may be appropriate, including turning and time-of-day restrictions. Restrictions may need to be reinforced through design elements, such as internal signage, physical barriers, or channelization identified in the project impact assessment phase.

The Street Transportation Department will review the proposed changes and determine if they are feasible, effective, and appropriate. The mitigations shall be designed to sufficient detail for the City to evaluate their potential effectiveness. Proposals for widening roads or installing turn lanes must be accompanied by a right-of-way analysis to determine if the available right-of-way can accommodate the proposed mitigation, along with impacts to existing street trees and on-street parking. Preliminary engineering may be needed to determine the feasibility of proposed changes.

9.9.8 Intersection Control

For all intersections where the Applicant is proposing a change in intersection control, such as converting an existing two-way stop control intersection to all-way stop control, an assessment of appropriate traffic control shall be performed. Refer to Section 2.7 of this manual.

Traffic signal warrant analyses, as established by the MUTCD, should be provided for site access locations and adjacent intersections that demonstrate operational degradation.

Warrant analysis shall be included for any arterial/arterial or arterial/collector intersection within the study area. Additional intersections may be subject to warrant evaluation based on the engineer's judgement or by request of the Street Transportation Department.

Satisfaction of warrant criteria is not the sole consideration for a recommendation or requirement to install a traffic signal as identified in a study. Proportional funding may be required regardless of warrant satisfaction due to considerations, such as existing master plans prepared by prior development and location of collector street intersections anticipated to meet signal warrants for time horizons beyond the scope of the development's study.

Development projects may be required to install underground traffic signal infrastructure, such as conduits and junction boxes, with corresponding off-site improvements due to the efficiencies gained in limiting future excavation work.

If the proposed traffic control device is a traffic signal, Pedestrian Hybrid Beacon (PHB) (**Figure 9.9-1**), also referred to as a HAWK, or Rectangular Rapid Flashing Beacon (RRFB) and is primarily driven by traffic

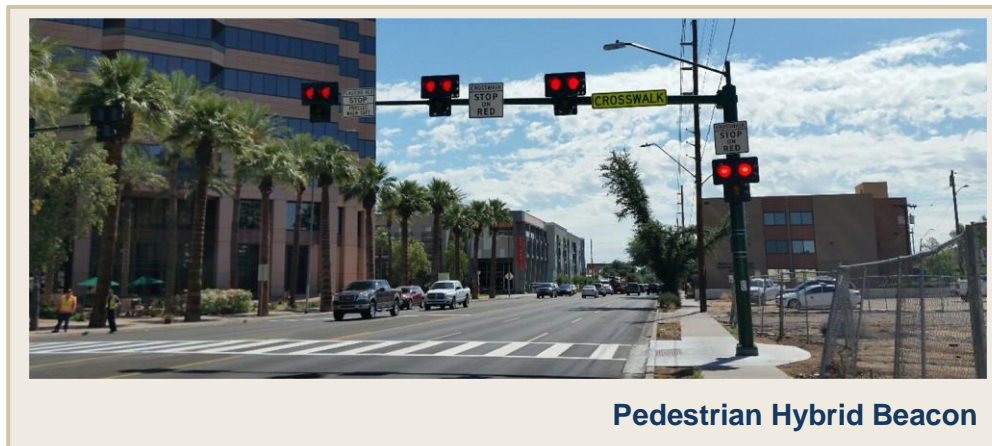


Figure 9.9-1 Pedestrian Hybrid Beacon

conditions anticipated by the "Total Future" scenario, the Applicant will be required to provide a traffic control justification in support of the recommendations. The justification shall include future traffic volume analysis of the threshold necessary to reach the signal warrant thresholds.

Development funding responsibilities will be identified in the response letter provided by the Street Transportation upon final review of a study, or as stipulations provided to site development or zoning application review reports.

REFERENCES

CHAPTER 2

2.1 Introduction

AASHTO A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018, Section 1.8 Design Flexibility, p. 1-32

2.1.3 Right-of-way Zones

City of Phoenix, Key Corridors Master Plan

City of Phoenix Bicycle Master Plan

City of Seattle, Right-of-Way Improvements Manual, Standard 2.1 Right-of-Way Allocation

2.3 Travel Lanes Zone

City of Phoenix, Key Corridors Master Plan

2.3.1 Design Speed

NACTO Urban Street Design Guide, 2013, p. 141

AASHTO A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018, p. 2-24

2.3.2 Design Vehicle

AASHTO A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018, Section 2.8 Design Vehicles, pp. 2-55 to 2-85

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2.3.3 Street Section Elements

City of Phoenix Street Transportation Department, Traffic Operations Manual, Chapter 4, Pavement Narrowing Treatments, p. 144-145

Maricopa County 2018 Roadway Design Manual, Section 5.20.1, Narrowing Transitions

2.3.6 Turn Lanes

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2.3.7 Medians

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City of Phoenix Street Planning and Design Guidelines 2009

MAG Left-Turn Crash Mitigation Implementation Template and Guidance, May 2018, p. 3-8

2.3.8 Curb Type

2009 City of Phoenix Street Planning and Design Guidelines, Sections 3.5.4 Curb Returns, p. 3-7 and p. 3-8.

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2015 City of Phoenix Supplement to the 2015 Edition MAG Uniform Standard Specifications for Public Works Construction, Section 340, Concrete Curb, Gutter, Sidewalk, Curb Ramps, Driveway and Alley Entrance and Section 401 (G), Pedestrian Access Requirements

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2.3.9 Horizontal Alignments

AASHTO, A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018, pp. 3-120, 3-121, and 9-32

2.3.10 Vertical Alignment

AASHTO, A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018, pp. 3-167, 3-171, 3-173

2.3.11 Alignment Sight Distance

AASHTO, A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018, Section 3.2.6.2

Superelevation

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2.4 Flex Zone

2.4.1 Bicycle Facilities

Arizona Revised Statute 28-815, Riding on roadway and bicycle path; bicycle path usage

City of Phoenix Street Transportation Department, Traffic Operations Handbook— Chapter 5 Bicycle Facilities, pp. 167 - 168

2.4.2 On-Street Parking

City of Phoenix Zoning Ordinance 662, Interim Transit-Oriented Zoning Overlay District 1 (TOD-1), Section L, Parking and Loading Regulations

City of Phoenix Zoning Ordinance 663, Interim Transit-Oriented Zoning Overlay District 2 (TOD-2), Section L, Parking and Loading Regulations

2.4.3 Transit

Valley Metro Light Rail Transit Projects LRT Design Criteria Manual, January 2018, p. 3-20

MAG Uniform Details for Public Works Construction, 2019 Revision to the 2015 Edition, Standard Detail 252, Bus Bays

NACTO Transit Street Design Guide, pp. 70 – 81

City of Phoenix Street Transportation Department, Traffic Operations Manual, Chapter 14, Bus Stop Signing, pp. 420-421

Valley Metro Light Rail Transit Projects LRT Design Criteria Manual, January 2018, p. 3-20

City of Phoenix Standard Details

P1256-1 Bus Bay (Type 1)

P1256-2 Bus Bay (Type 2)

P1258 bus shelter pad location (bus stop)

P1260 bus shelter/accessory pad bus stop

P1261 bus shelter/accessory pad bus bay

P1262 parkway bus shelter/accessory pad

P1263-1 bus shelter/accessory pad frontage road mid-block

P1263-2 parkway bus shelter/accessory pad

2.5 Pedestrian Zone

2.5.1 Sidewalks

City of Phoenix Administrative Procedures No. 155, Project Development Requirements and Guidelines

2.6 Intersections

2.6.2 Intersection and Driveway Sight Distance

City of Mesa Engineering and Design Standards, 2017, Section 211, Sight Distance and Visibility, pp. 29-30, 43

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City of Phoenix Street Transportation Department, Traffic Operations Manual, Chapter 9, Traffic Circle/Roundabout Signing and Pavement Markings, p. 220-221

CHAPTER 3

3.1 Introduction

3.1.2 Definitions

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3.1.3 Geotechnical Investigation Requirements

City of Phoenix Street Transportation Department Design and Construction Management Division, Administrative Procedure (AP) No. 155, Project Development Requirements and Guidelines, pp. 26-28

MAG Standard Specifications for Public Works Construction, 2019 Revisions to the 2015 Edition

3.1.3 Design Parameters

AASHTO Guide for Design of Pavement Structures

ADOT Standard Drawing C-05.40, Median Paving and Nose Taper

City of Phoenix Ordinance, Section 32 – 26 (k)

3.3 Bridges and Major Structural Plans

3.3.1 Bridges

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AASHTO LRFD Bridge Design Specifications

AASHTO LRFD Bridge Construction Specifications, 4th Edition, 2017 with March 2018 errata

AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017

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City of Phoenix Administrative Procedure (AP) No. 155 Project Development Requirements and Guidelines, pp. 52-53

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3.3.2 Structural Clearances

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3.4 Cut or Fill Slopes

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3.5 Pavement Transitions

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3.6 Stormwater Management

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<https://www.phoenix.gov/waterservicessite/Pages/STORMWATER-Construction.aspx>

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3.7 Green Infrastructure

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3.8 Right-of-way Management Procedures

City of Phoenix Traffic Barricade Manual, 9th Edition, 2017

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CHAPTER 4

4.2 Traffic Signal Design

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4.2.3 Traffic Design Reference

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4.3 Pavement Markings and Signing Plans

4.3.3 Signing

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4.3.4 Pavement Markings

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CHAPTER 6

6.4 Access Management Summary

6.4.3 Access Management Guidelines Summary

Transportation Research Board Access Management Manual, Second Edition, 2014

6.7 Driveways

City of Phoenix Supplemental Standard Details for Public Works Construction (2021):

- No. P1243: Return Type Driveways with Attached Sidewalk
- No. P1243-1: Limited Access Driveway with No LT-In and without Deceleration Lane
- No. P1243-2: Limited Access Driveway with No LT-In/Out and without Deceleration Lane
- No. P1243-3: Limited Access Driveway with No LT-In and with Deceleration Lane
- No. P1243-4: Limited Access Driveway with No LT-In/Out and with Deceleration Lane
- No. P1244: Driveway-Pedestrian Ramp Combination (For use at T type intersections)
- No. P1255-1: Driveway Entrance – Type I (Sidewalk Adjacent to Curb)
- No. P1255-2: Driveway Entrance – Type II (Detached Sidewalk)
- No. P1255-3: Driveway Entrance – ADA Retrofit
- No. P1255-4: Driveway Widths Policy

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MAG Standard Detail 250-2 Driveway Entrances with Sidewalk attached to Curb MAG Standard Detail No. 251 – Return Type Driveways

6.8 Auxiliary Turn Lanes

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No. P1018: Alley Access Road Termination at Alleys

No. P1164: Maximum Driveways and Alleys Slope

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No. P1258: Bus Shelter Pad Location (Bus Stop)

CHAPTER 8

Manual of Uniform Traffic Control Devices, and adopted revisions, Arizona Supplement

American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities, current version

National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide, most current version. NACTO has prepared additional guidance documents relevant to bikeway design that should be referenced.

MAG Active Transportation Plan and Toolbox, 2020

MAG Uniform Standard Specifications for Public Works Construction

City of Phoenix Active Transportation Plan

City of Phoenix Trails Master Plan

City of Phoenix Supplement to MAG Uniform Standard Specifications

City of Phoenix Complete Streets Policy and Complete Streets Design Guidelines



City of Phoenix

ATTACHMENT B

ORDINANCE NO. S-44639

AN ORDINANCE AUTHORIZING THE CITY MANAGER TO ENTER INTO A CONTRACT WITH KIMLEY-HORN AND ASSOCIATES, INC. TO PROVIDE PROFESSIONAL SERVICES FOR THE STREET PLANNING AND DESIGN MANUAL PROJECT FOR THE STREET TRANSPORTATION DEPARTMENT; AND FURTHER AUTHORIZING THE CITY CONTROLLER TO DISBURSE FUNDS.

BE IT ORDAINED BY THE COUNCIL OF THE CITY OF PHOENIX as follows:

SECTION 1. The City Manager or his designee is authorized to execute a contract with Kimley-Horn and Associates, Inc. to provide professional services for the Street Planning and Design Manual upgrade and amendment project. The contract term is eighteen months, and the total cost will not exceed THREE HUNDRED FORTY-NINE THOUSAND NINE HUNDRED NINETY-SIX DOLLARS AND SIXTEEN CENTS (\$349,996.16).

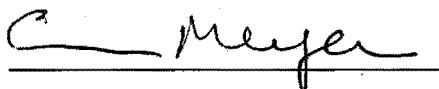
SECTION 2. The City Controller is authorized to disburse the necessary funds.

PASSED by the Council of the City of Phoenix this 6th day of June, 2018.



ACTING MAYOR

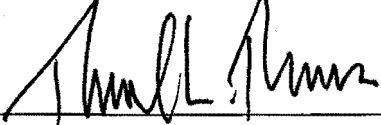
ATTEST:



City Clerk



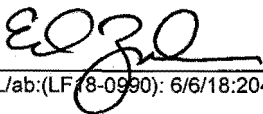
APPROVED AS TO FORM:



Acting City Attorney



REVIEWED BY:



City Manager

LWL/ab:(LF 18-0990): 6/6/18:2040299



Phoenix Bus Rapid Transit Program Planning Support Services Contract Amendment

This report requests the Transportation, Infrastructure and Planning Subcommittee recommend City Council approval to execute an amendment to the Phoenix Bus Rapid Transit (BRT) Planning Support Services Contract 149143 with HDR Engineering Inc. to provide continued project management, community and business engagement and outreach, transit planning, and engineering oversight for the approved BRT corridor of 35th Avenue/Van Buren Street. The additional expenditures included in this amendment will not exceed \$5.5 million through the remainder of the contract.

THIS ITEM IS FOR DISCUSSION AND POSSIBLE ACTION.

Summary

In 2015, Phoenix voters approved Proposition 104, creating the 35-year street and transit plan known as Transportation 2050 (T2050) which identified BRT as a key component to continue expanding the City's high-capacity transit network. BRT is a high-capacity bus service that focuses on improved speed, reliability, convenience, and the overall transit experience. There are common recurring elements found in successful BRT systems, such as: advanced fare collection, enhanced stations, dedicated lanes, custom buses, transit spot improvements, and unique system branding.

In 2019, the Phoenix BRT team was tasked by the Citizens Transportation Commission (CTC) and City Council with reevaluating the BRT corridors as originally outlined in the T2050 plan. The reevaluation was sought as the result of the passage of time since the development of the T2050 plan, whereby Phoenix has experienced significant changes in residential and commercial developments, population growth, and density, in addition to ongoing regional efforts to identify additional BRT corridors that may travel through Phoenix.

In March 2022, the BRT Program exercised the final three-year contract extension through March 2025. This time-only amendment did not include additional funds to the base contract amount of \$3 million, as strategies for increased community outreach and other planning tasks were being developed. Since that time, the BRT Program has

evaluated expenditures to support future phases of community and business engagement, transit planning, engineering oversight, and project management to continue developing the approved BRT corridor.

Based on a robust technical analysis and community education and engagement efforts, the initial BRT corridor of 35th Avenue/Van Buren Street was approved by the CTC in May 2021, the Transportation, Infrastructure and Planning (TIP) Subcommittee in September 2021, and the City Council in October 2021.

The overall structure of the BRT Program included two contract packages to provide transportation planning services. Package A, with HDR Engineering Inc., includes project management, transit planning, and community education and engagement services. Package B, with AECOM, includes conducting an Alternatives Analysis, developing conceptual designs, and developing 15% preliminary engineering design plans.

To further develop and design the approved corridor, the CTC in February 2022 and City Council in April 2022 approved an extension to AECOM's contract for 24 months, ending in September 2024, to conduct an Alternatives Analysis, develop conceptual designs, and develop 15% preliminary engineering design plans.

Currently, the BRT Program is conducting an Alternatives Analysis process and developing conceptual designs for the corridor, which includes various phases of community and business engagement efforts.

With the unanimous approval of the initial corridor, the BRT program has identified the continued need of HDR because of their multidisciplinary, national BRT planning experience and insight to provide community and business engagement support.

The scope of work for HDR's services include:

- Project management
- BRT Planning
- Community and Business Engagement
- Funding, Finance and Delivery strategies
- Corridor Program

BRT Program major milestones

- August 2022: Established a Technical Advisory Committee (TAC) and Executive Leadership Committee (ELC) to gather technical insight and perspective on key decisions for the development of the 35th Avenue and Van Buren Street BRT

Corridor. The TAC and ELC include representatives from the BRT Program team, City of Phoenix departments, regional/state government agencies, and council districts.

- October 2022: Completed Phase I of community and business engagement for the Alternatives Analysis. This phase included a BRT Corridor Survey and a revamp of the MeetPhoenixBRT.com website.
- October 2022: Identified BRT priorities based on input from the public and a Goals Workshop with the ELC and TAC.
- December 2022: Toured the MetroRAPID Silver Line BRT in Houston, Texas with Phoenix Mayor, and Council District 1, 4, 7, and 8 teams.
- January 2023: Identified and documented initial BRT Alternatives Analysis Design Assumptions.
- February 2023: Developed initial BRT cross-sections to demonstrate the range of opportunities, impacts, and necessary trade-offs of a BRT corridor alignment.
- March 21, 2023 to April 21, 2023: Phoenix BRT Program hosted two in-person public meetings, one virtual public meeting, and two outreach events within the 35th Avenue and Van Buren Street corridor.
- March 21, 2023: The BRT Program launched the BRT Online Meeting website and the Preliminary BRT Cross-Section Survey at MeetPhoenixBRT.com.

The BRT Program next steps

- Continued and focused community education, stakeholder outreach, and business owner engagement throughout the proposed corridor.
- Monthly meetings with the Technical Advisory Committee to refine corridor alternatives to align priorities and balance amenities, benefits, and impacts.
- Continuing coordination with ongoing and correlating projects along the corridor.
- Preparing efforts for Phase 3 of community and business engagement for the Alternatives Analysis.

Contract Term

The Package A contract with HDR Engineering Inc. commenced on March 15, 2019, and it expires on March 14, 2025.

Financial Impact

The initial authorizations and previous amendments for the Transportation Planning Support Services Package A Contract 149143 were authorized for an expenditure not to exceed \$3 million. This amendment will increase the authorization for the contract by an additional \$5.5 million. Funding for the BRT program is available in the T2050 fund.

Concurrence/Previous Council Action

This item was recommended for approval at the Citizens Transportation Commission meeting on April 27, 2023, by a vote of 11-0.

Responsible Department

This item is submitted by Deputy City Manager Mario Paniagua and the Public Transit Department.