US-60/Grand Avenue

Corridor Optimization, Access Management Plan, and System Study (COMPASS)

Loop 303 to Interstate 10

Open House 2 Summary Report

Prepared for:

Maricopa Association of Governments

Prepared by:

Burgess & Niple, Inc.
Wilson & Company, Inc.
Partners for Strategic Action, Inc.

June 2014

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1.0 Introduction

US-60/Grand Avenue is an important regional facility controlled and maintained by the Arizona Department of Transportation (ADOT) as part of the National Highway System. Because of its regional significance, and importance to local agencies, it has been the subject of numerous studies, improvement projects, and public interest. It serves multiple purposes, including local access, commuter travel, and freight movement. It also serves as a link to Kingman, Arizona and Las Vegas, Nevada.

As the region and communities along the corridor have developed, the need to reach a consensus on the ultimate future role for the corridor has never been greater. Maricopa Association of Governments (MAG) has initiated the Corridor Optimization, Access Management Plan, and System Study (COMPASS) along the US-60/Grand Avenue corridor. The study area begins at the State Route 303 Loop (SR-303L) traffic interchange in Surprise and ends at the Willetta Street intersection in Phoenix. It passes through portions of the City of Surprise, City of El Mirage, Town of Youngtown, City of Peoria, City of Glendale, City of Phoenix, and Maricopa County. The corridor is operated and maintained by ADOT.

As part of the study, interested public agencies, non-profit organizations, private interest groups, and the general public were invited to participate in project open houses. Two open houses were held: June 23, 2014 at the Glendale Main Library Auditorium and June 24, 2014 at the Northwest Regional Library – Surprise Branch; both open houses were held from 6:00 to 8:00 p.m. The workshops were advertised through a MAG-issued press release and invitations sent to the project database via email. A total of 32 participants signed into the two workshops.

The comments presented in this report represent input from workshop participants and will be reviewed and considered by the study team and planning partners.

1.1. Open House Overview

The purpose of the two open houses was to present study findings, as well as to solicit input on recommended improvements, including access management strategies and traffic interchange options. Participants were provided a bi-fold handout highlighting the project and its findings to date. Each open house featured a continuously-running presentation for participants to view, along with roll-plots showing a plan view of the entire project corridor outlining the proposed access management plan and recommended locations for intersection improvements. Handouts documenting the project Vision Statement and access management primer materials were available at each open house. Participants were encouraged to review the roll-plots and provide input using comment forms or directly on the roll-plots.

1.2. Open House Summary

Input received to applying access management throughout the corridor was positive. Aside from a few intersection recommendations and access management questions/comments, the majority of input received focused on opportunities to beautify the corridor and incorporate signage, landscaping, multimodal aspects (i.e., bicycle accommodations), and other improvements that could establish a unique corridor.

All input received is outlined as provided in Section 2 of this summary.

2.0 Input and Comments Received

Input is provided as submitted and not edited nor corrected for grammar.

2.1. Submitted Comments – Glendale Main Library Auditorium

The following input was submitted via comment form at the June 23, 2014 meeting held at the Glendale Main Library:

- How can the infrastructure we add make Grand more GRAND? More beautiful? More appealing and worth looking at? Thank you!
- Bethany Home: Place underground—under both railroad & Grand Ave. providing free flow of traffic for both Bethany & Grand Ave.
  Camelback Rd: (& to other east/west roads that must cross the railroad tracks) set the traffic signals to allow the east/west roads to get the first green light after the train/switch engines clear the intersection. Consideration for the citizens & businesses that are in Phoenix & must commute east/west past Grand Ave. Not just the wants of the people who have chosen to live miles out of town and now want to commute across our neighborhoods at high speeds at our expense.

2.2. Submitted Comments – Northwest Regional Library – Surprise Branch

The following input was submitted via comment form at the June 24, 2014 meeting held at the Northwest Regional Library – Surprise Branch:

- Some of this sounds very good. There are so many businesses that don't make it in Phx, Glendale & Peoria so if it will close a lot more of them you have to think of something that will bring more or to keep them open. Many places of Grand look terrible.

2.3. Roll-Plot Input

The following input was submitted by making notes on the corridor roll-plots on June 23 and 24, 2014. Graphics of comments received are used, where appropriate.

General input:

- Connect trees, plants, signage between each city hub & public art, bike lanes, walking paths, rest areas.
- Create bike lanes, walking lanes, public art along ___ to create connection between city ____ and highlight each to underscore its uniqueness, history, etc. Trees, shrubs, signage could create nice visual connectors.
- How can we make the corridor more beautiful? How can the infrastructure be beautiful?

Geographic-specific input (reported from west to east):

- Thompson Ranch Road/US-60/Grand Avenue traffic intersection: Let's get some artist to do something w/ the big metal traffic light apparatus!
- US-60/Grand Avenue and Loop 101 interchange: see ***Figure 1***, below.

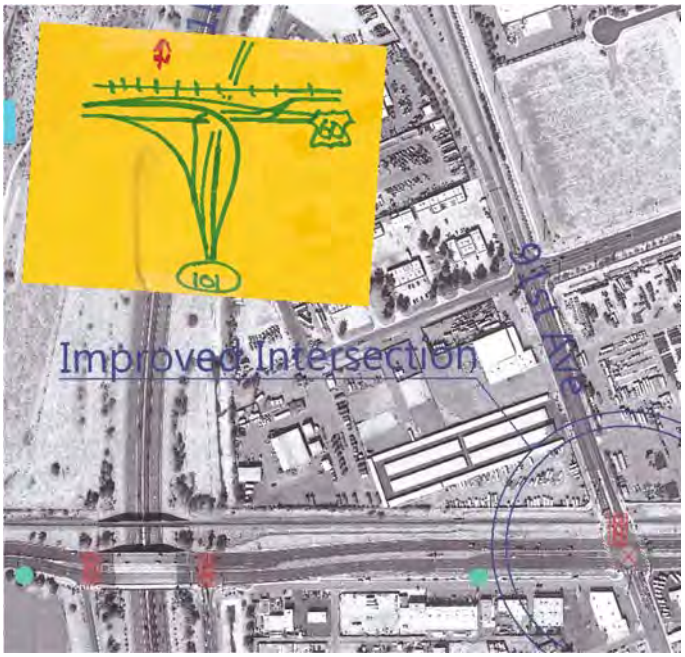


Figure 1 - Recommendation for US-60/Grand Avenue and SR-101L

- Access management recommendations at 88th Drive and 87th Avenue: see ***Figure 2***, below.

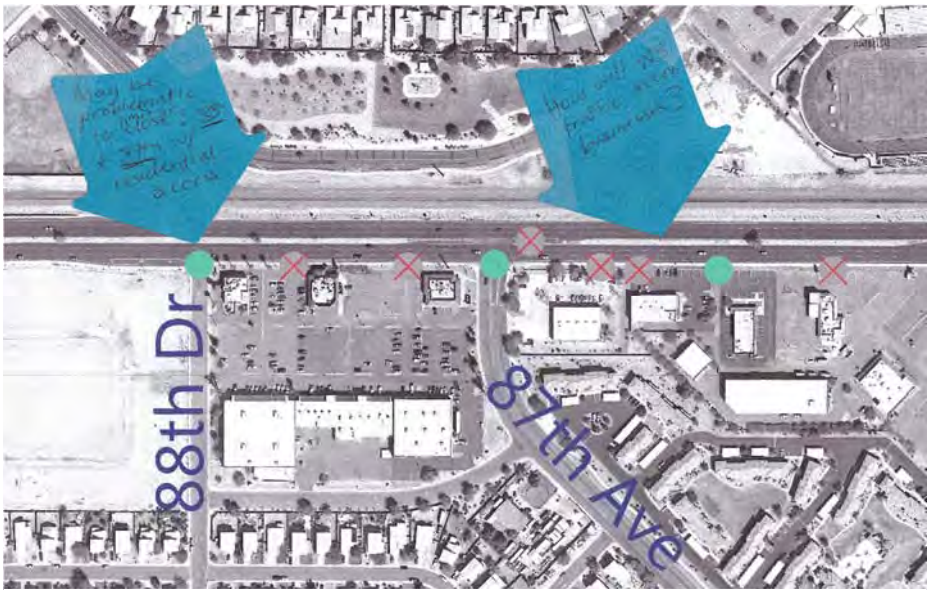


Figure 2 - Comments near 88th Drive and 87th Avenue.

- US-60/Grand Avenue and West Myrtle Avenue recommendation: remove signal?
- US-60/Grand Avenue and 57th Drive recommendation: remove signal?
- US-60/Grand Avenue and West Missouri Avenue question regarding existing access condition: see ***Figure 3***, below.

Figure 3 - Question Regarding Existing Access Condition at US-60/Grand Avenue and West Missouri Avenue

- US-60/Grand Avenue and Interstate 17 recommendation: public art at arch. Overpass to disguise the structure of the overpasses
- US-60/Grand Avenue, southeast of Interstate 17: create bike lanes, walking lanes, public art along ___ to create connection between city ____ and highlight each to underscore its uniqueness, history, etc. Trees, shrubs, signage could create nice visual connectors.
- US-60/Grand Avenue at 19th Avenue and West McDowell Road recommendation: Lower Grand needs connectivity to 19th Ave & McDowell.

- "Lower Grand" bicycle-friendly recommendations: see ***Figure 4***, below.

Figure 4 - Lower Grand Bicycle-Friendly Recommendations

3.0 List of Attendees by Meeting

3.1. Attendees of June 23, 2014 Open House (Glendale Main Library)

Table 1 – Glendale Open House Attendees		
First Name	**Last Name**	**Organization**
Debbie	Albert	City of Glendale
Marcia	Gault	
Mike	Levault	Town of Youngtown
Lindsay	Kinkade	Design RePublic Studio
Peter	Knudson	Dibble Engineering
Beatrice	Moore	Bragg's Pie Factory LLC
Michelle	Rider	Westmarc
Thomas	Ritz	City of Glendale
Joef	Robinson	
Greg	Rogers	Glendale Community College
Gary	Sherwood	City of Glendale
Edith	Swadley	
Robert	Swadley	
Valerie	Swick	Flood Control District of Maricopa County
Ericka	Varela	RAZA development
John	Willett	
Roger	Willis	
Ryan	Winkle	Neighborhood Economic Development
Tim	Wolfe	Dibble Engineering

Project Team: Bob Hazlett and Chaun Hill, Maricopa Association of Governments; Jason Pagnard and Dana Biscan, Burgess & Niple; Dan Marum and Jim Townsend, Wilson & Company; Audra Koester Thomas, Partners for Strategic Action

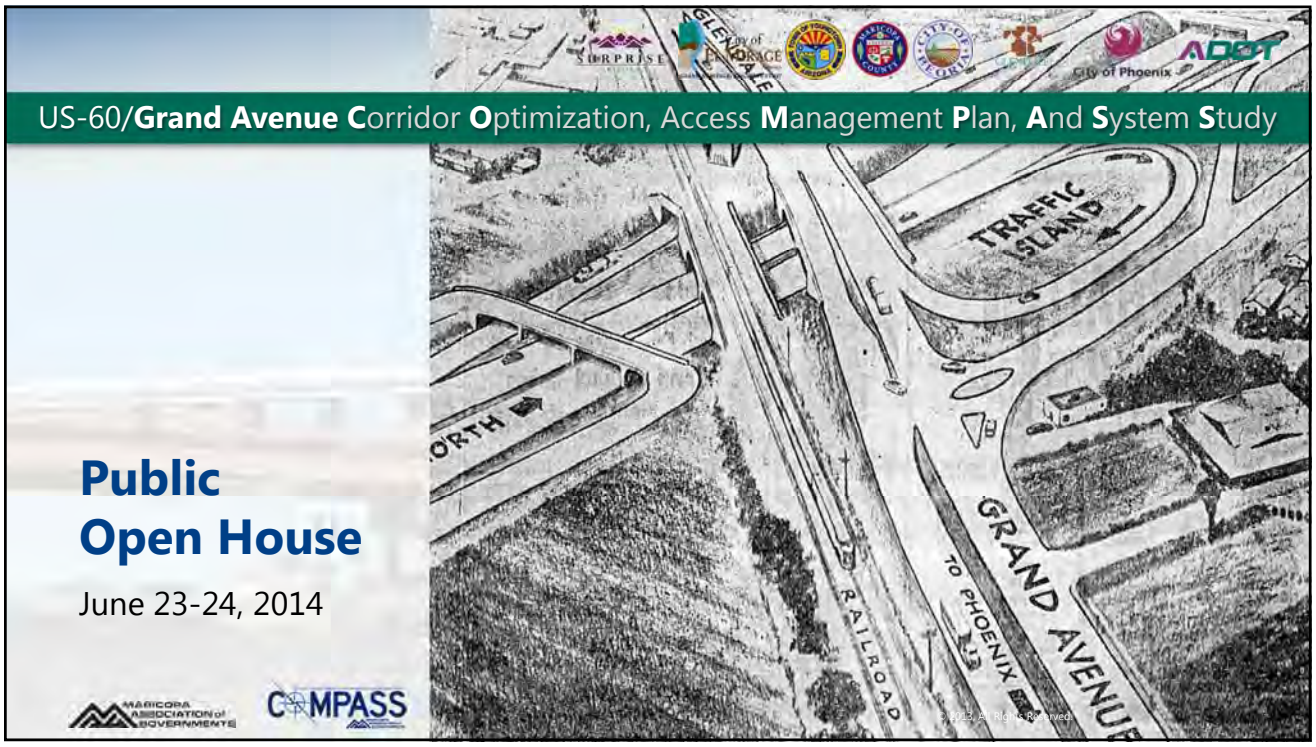
3.2. Attendees of June 24, 2014 Open House (Northwest Regional Library – Surprise)

Table 2 – Surprise Open House Attendees		
First Name	**Last Name**	**Organization**
Jim	Dickey	Arizona Transit Association
Bill	Hagg	
Cassy	Hagg	
Phil	Haldiman	Arizona Republic
Skip	Hall	City of Surprise
Spencer	Isom	City of El Mirage
Jeanine	Jerkovic	City of Peoria
Mike	Levault	Town of Youngtown
Bob	Mickelson	Kimley Horn & Associates
Lana	Mook	City of El Mirage
Amber	Wakeman	City of El Mirage
Bob	Wingenroth	City of Surprise
Sharon	Wolcott	City of Surprise

Project Team: Bob Hazlett and Chaun Hill, Maricopa Association of Governments; Jason Pagnard and Dana Biscan, Burgess & Niple; Jim Townsend, Wilson & Company; Audra Koester Thomas, Partners for Strategic Action

APPENDIX OH2-1

Presentation


US-60/Grand Avenue Corridor Optimization, Access Management Plan, And System Study
Public
Open House
June 23-24, 2014
TRAFFIC ISLAND
GRAND AVENUE
TO PHOENIX
RAILROAD
City of Phoenix
ADOT
MARICOPA ASSOCIATION of GOVERNMENTS
COMPASS

Project Background
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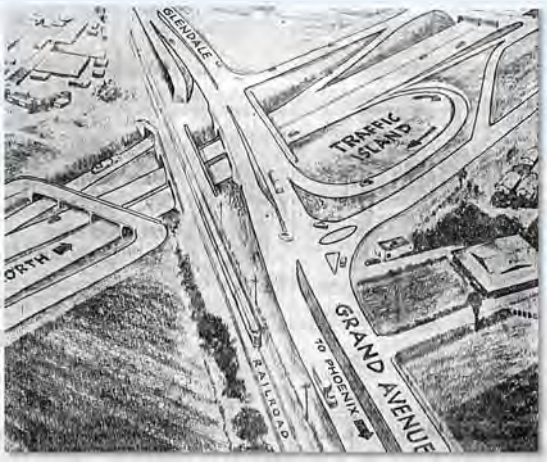
Project Purpose

Project Background

Unite the communities along the Grand Avenue Corridor to create and implement a long-term vision that embraces the important regional function of the Corridor.



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Project Partners

Project Background

The project is being conducted by the Maricopa Association of Governments in collaboration with the jurisdictions along the Corridor.

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Project Charter

Project Background

Political leadership signed a Charter in February 2012 pledging to the following study goals:

- Create an **Overall Vision**.
- Cooperatively define the **Operational Character**.
- Establish **Access Management System**.
- Develop **guidelines** for **signage, landscaping** and **aesthetic treatments**.

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Corridor Limits

Project Background

The study extends from Loop 303 to Willetta Street (about 24 miles).

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Project Tasks

Project Background

1 - Initiate Project → 2 - Develop Public Involvement Plan → 3 - Perform Existing Conditions Analysis → 4 - Review Past Studies and Identify Recurring Themes

5 - Formulate Corridor Goals and Visions → 6 - Establish Alternative Schematics → 7 - Analyze Alternatives and Develop Recommendations → 8 - Establish Access Management Plan and Policies

9 - Develop Implementation Plan → 10 - Document Project

Anticipated study completion:
Fall 2014.

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Concepts

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Input Received

Concepts

Over the course of the project, the study team met with:

- Elected leadership and staff from local agencies;
- Planning partners in facilitated focus groups;
- Stakeholders and landowners along the Corridor; and the
- Public at two previous workshops (July 22 and 24, 2013).

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Based on Input Received

Concepts

Four Concepts Were Considered, Two Move Forward

Continue with planned improvements from **Regional Transportation Plan**.

Rec[illegible] he US [illegible] **Av[illegible]ue Expressway** Option.

Plan for **Commuter Rail with operational improvements**.

Ider[illegible]er **Hi[illegible]ap[illegible] Tra[illegible]t Op[illegible]ns** with US-60 enhancements.

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Concepts

Continue with planned improvements from **Regional Transportation Plan**.

- Maintains current corridor character.
- Leaves economic development opportunities unchanged.
- Requires general plan updates.
- Limits transit options.
- Addresses some operational issues.
- Provides minimalist approach for improvements.
- Requires limited additional funds.

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Concepts

Plan for **Commuter Rail with operational improvements**.

- Operates during peak-hour, peak-direction only.
- Limits potential transit ridership.
- Requires BNSF Railway coordination for operation.
- Constrains transit routing within the corridor.
- Calls for additional funds/investment.
- Provides fewer opportunities for station locations.

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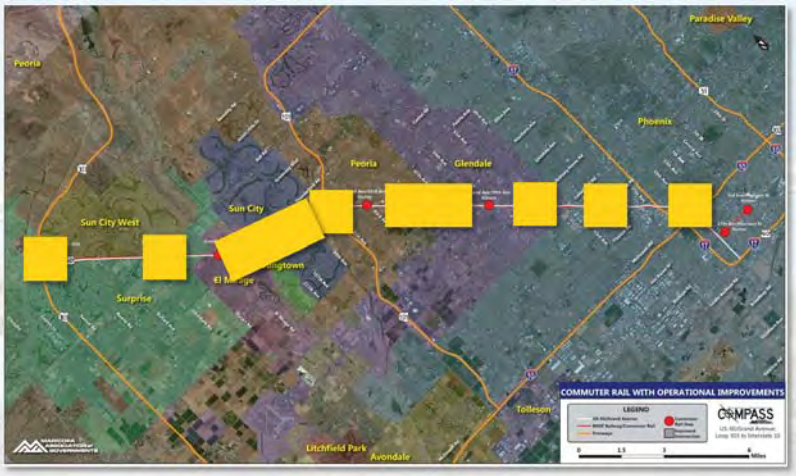
Corridor Optimization

What is Corridor Optimization?

Corridor Optimization

Corridor Optimization refers to the ease of traffic flow and safety. This includes:

- Left-turns minimized;
- Improve existing intersections; and
- Introduce up to nine new interchanges.



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Access Management

What is Access Management?

Access Management

Access management is the systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway.

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Why is Access Management Important?

Access Management

- **Safety benefits:** reduces vehicular crashes and collisions involving pedestrians and cyclists.
- **Economic benefits:** preserves long-term property values, increases market reach, and supports on-site amenities (such as increased parking availability).
- **Environmental benefits:** improves traffic flow resulting in greater fuel efficiency and reduced emissions.

Source: NCHRP 420, Access Management Manual.

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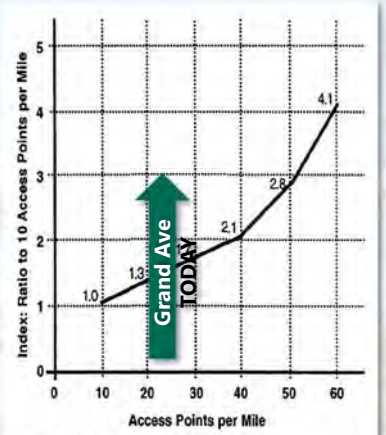
There is No Such Thing as "Safe Access"

Access Management

- Each intersection and driveway is an access point.
- As the number of access points per mile **increases**, the **frequency and rate of crashes increases**.
- **Each access point = 4% increase in crash rate.**



Source: Estimated from Various Sources

Figure 15. Composite accident rate indices.

Source: NCHRP 420, Access Management Manual.

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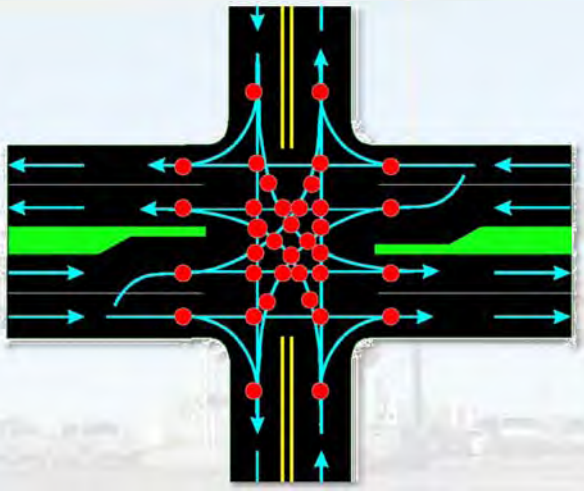
Intersection Conflict Points

Access Management



Intersections create **conflict points**, or spots where a vehicle can hit another vehicle.

- Four-leg intersections can have **32 conflict points** or more.
- More than **two-thirds** of all access related crashes involve **left-turning vehicles**.

Sources: Teachamerica and Florida Department of Transportation. "Traffic Engineering", Vol. 37, No. 3

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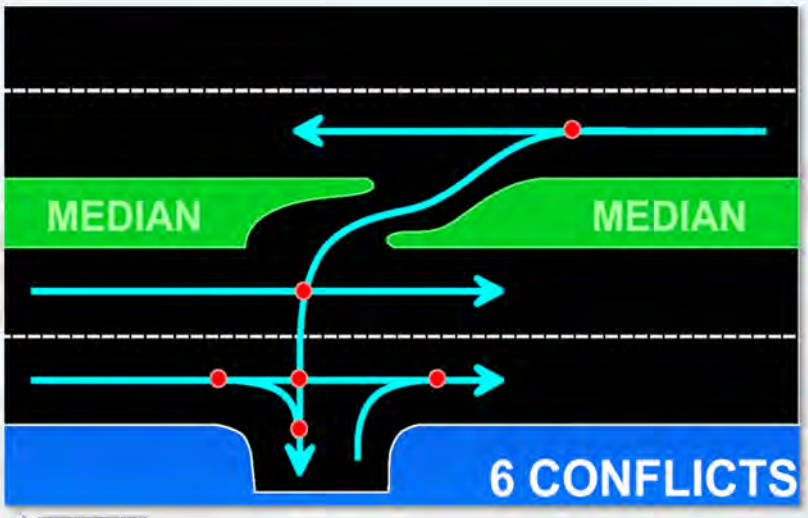
Intersection Option: "3/4 Intersection"

Access Management

Reduces conflict points by preventing "left exits"



Source: Florida Department of Transportation.

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Access Management Plan

Access Management

Access Management Plan

A primary objective is to create a long-term plan that:

- Provides guidance for existing and future access points, and
- Establishes an appeal process that safeguards redevelopment opportunities.

Plots of the recommended Access Management Plan are displayed in the room this evening for review and input.

Source: NCHRP 420, Access Management Manual.

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Workshop Format

Provide Your Input!

Workshop Format

- **Review plots** of the recommended access management plan.
- **Talk with a member of our study team.**
- Provide input on a **comment form.**

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Roll Plot Format

Workshop Format

- Proposed access closure
- Proposed right-in, right-out access
- Proposed 3/4-movement access
- Proposed full movement access
- Proposed intersection improvement
- Existing traffic signal to be removed
- Existing traffic signal to remain

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US-60/Grand Avenue Corridor Optimization, Access Management Plan, And System Study
Thank you!
TRAFFIC ISLAND
GRAND AVENUE
TO PHOENIX
RAILROAD
City of Phoenix
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COMPASS

APPENDIX OH2-2

Handouts

VISION

US-60/Grand Avenue Corridor Optimization, Access Management Plan and System Study (COMPASS)

Loop 303 to Interstate 10

Historically, the US-60/Grand Avenue corridor has played an important role in connecting northwest Valley communities, providing connections to six downtowns, and serving as an economic driver moving freight and goods by roadway and freight rail. The US-60/Grand Avenue corridor is projected to experience growth in population and employment over the next 25 years requiring a regional, integrated, and multimodal approach to providing transportation in the West Valley. This vision sets in motion an integrated approach to multimodal transportation in the US-60/Grand Avenue corridor that respects individual characteristics of each city and provides alignment of the consistent complete streets goal that each of the cities along the corridor has adopted.

2035 Vision

> *US-60/Grand Avenue serves as a high capacity, multimodal state highway corridor that provides safe and reliable connectivity to and through the West Valley. This is facilitated by employing a variety of solutions—including roadway improvements, commuter rail and other transit modes—in an access-managed corridor to provide efficient movement of people and goods. The corridor is essential for economic vitality, contributing to the vibrancy of Surprise, El Mirage, Youngtown, Peoria, Glendale, Phoenix, and unincorporated Maricopa County, and recognizes the unique character of each community it traverses.*

Guiding Principles

Preserve and Promote Transportation Capacity
Implement operational improvements, access management, and the effective use of technology and information to improve upon the efficient movement of goods and people within the corridor and maximize available potential roadway capacity.

Integrate Multimodal Transportation
Use innovative transportation systems to develop a multimodal network that accommodates commuter-based, high-capacity transit, such as commuter rail within the BNSF Railway corridor and/or bus rapid transit; augment the network with local and regional bus transit service and a well-connected local and regional roadway system.

Support and Enhance Economic Growth
Enhance the transportation system to serve activity centers, link land use and transportation effectively, and support regional/local economic growth opportunities.

VISION

Advance Safety and Security
Design, build, operate, and maintain a multimodal transportation system that is safe and secure, reducing the risk of property damage and injury/fatality as well as limiting conflicts between modes in the corridor.

Establish a Unified and Coordinated Approach to Land Use Access
Develop an integrated and well coordinated approach to managing private property access to US-60/Grand Avenue for the benefit of all corridor users in the Northwest Valley, and secure commitment of all local agencies along the corridor.

Promote a Transit-Supportive Development Pattern
Encourage a higher density, well-connected mixed use development pattern within the corridor at activity centers to support corridor transit implementation and success.

Encourage Coordinated Aesthetics
Develop urban design improvements (signage, landscaping, lighting, and aesthetic treatments) that recognize the uniqueness and heritage of each community while providing a consistent corridor theme.

Connect Communities in a Cost Effective Manner
Promote and provide an integrated, cost effective transportation system that efficiently moves people and freight while connecting communities and activity centers throughout the Northwest Valley.

Revise the Partnering Charter to Extend Through Implementation
Collaboratively create and adopt an implementation partnering agreement that defines how the US-60/Grand Avenue corridor is developed, including a corridor-based funding strategy.

US-60/Grand Avenue COMPASS

Loop 303 to Interstate 10

Corridor Optimization, Access Management Plan, And System Study

June 2014

A project to cooperatively create an overall vision for the Grand Avenue Corridor that embraces the important regional function of Grand Avenue

On February 22nd, 2012, political leadership of the agencies along the US-60/Grand Avenue corridor signed the Partnering Charter of the Corridor Optimization, Access Management Plan, and System Study (COMPASS). The goals of COMPASS are to:

- Create an **overall vision** for the Corridor embracing the important regional function and unique character of US-60/Grand Avenue.
- Define the **operational character** for the US-60/Grand Avenue Corridor that will enhance economic development, maintain accessibility to adjacent land uses, improve traffic operations, and reduce highway and rail conflicts.
- Establish an **access management system** providing an efficient access to and from adjacent properties.
- Develop **guidelines for signage, landscaping and aesthetic treatments** along the corridor.
- Provide the affected stakeholders with information about the project and **opportunity to contribute** to the study's outcome and recommendations.

The agencies that are partner to the COMPASS Charter are: ADOT, City of Surprise, City of El Mirage, Town of Youngtown, City of Peoria, City of Glendale, City of Phoenix, and Maricopa County.

The study is guided by the Planning Partners, agency representatives that are responsible for technical review and input throughout the process.

For more information

Bob Hazlett
Maricopa Association of Governments
302 N. First Ave., Suite 300
Phoenix, AZ 85003
(602) 254-6300
BHazlett@azmag.gov

us-60compass.azmag.gov

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What We've Heard

The Study Team initiated the project in 2012 by meeting with each agency along the corridor. The following are a few highlights of themes heard:

- Improve travel time by optimizing and simplifying traffic signals operation.
- Improve access control and reduce conflict points.
- Explore and incorporate innovative transportation solutions.
- Continue implementation of planned traffic interchanges and consider new traffic interchanges.
- Eliminate six-leg intersections.
- Accommodate future growth and encourage development opportunities.
- Develop aesthetic policies, including uniformity or character areas, way-finding signage and branding.
- Address railroad interaction at new and existing crossings.
- Consider access to transit.

Concepts Studied

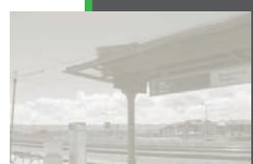
Concepts endorsed by Charter Partners and stakeholders

Continue with planned improvements from Regional Transportation Plan.

Plan for commuter rail with operational improvements.

Concepts that were studied, but are no longer being considered

Reconsider the US-60/Grand Avenue Expressway option.



Identify other high capacity transit options with US-60/Grand Avenue enhancements.

US-60/Grand Avenue COMPASS Framework

Continue with planned improvements from Regional Transportation Plan.

Establish a Corridor-wide Access Management Plan.

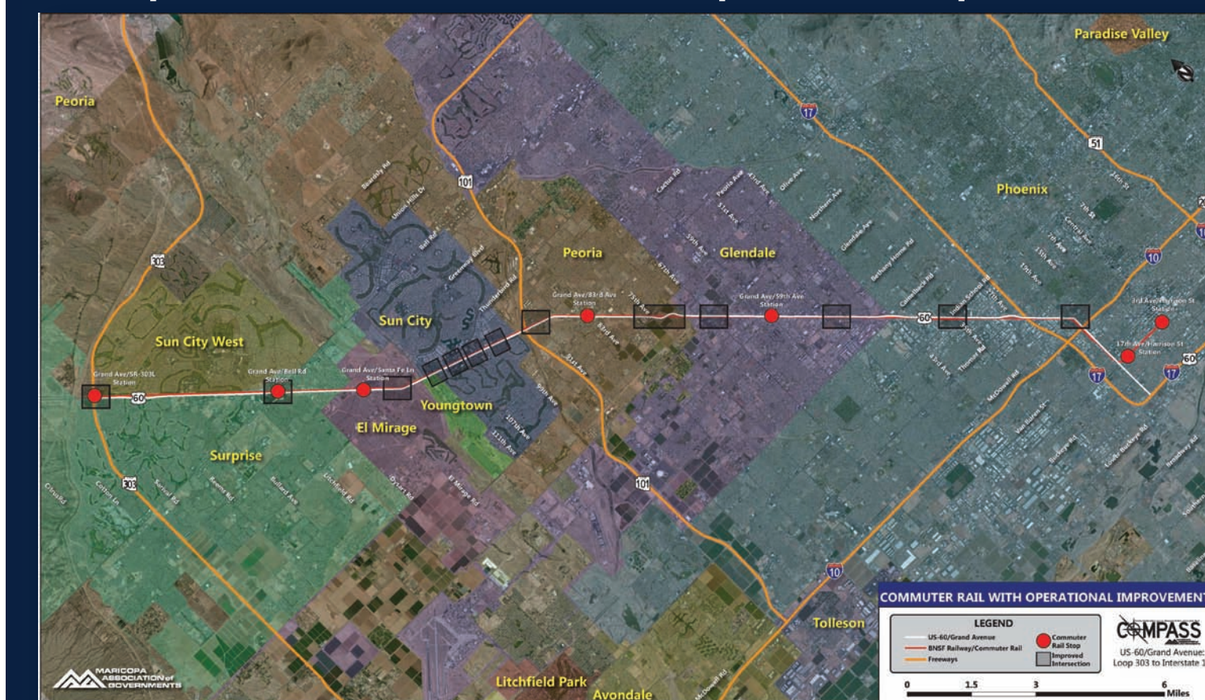
Address remaining bottlenecks and congestion points.

Plan for commuter rail with operational improvements.

Study Area

The study area begins at the State Route 303 traffic interchange in Surprise and ends at the Willetta Street intersection in Phoenix. It passes through portions of six municipalities and unincorporated Maricopa County. The corridor is operated and maintained by the Arizona Department of Transportation as part of the National Highway System.

Concept Detail: Commuter Rail with Operational Improvements



Concept Features

Seven stations identified within project area.

At least 10 improved traffic interchnages within project area.

Left-turn lanes from US-60/Grand Avenue restricted or eliminated, where possible.

Adjacent property access limited focusing primarily on right-in/right-out driveways.

ACCESS MANAGEMENT

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WHAT IS IT?

Access management is the systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway. The purpose of access management is to provide access to land development in a manner that preserves the safety and efficiency of the transportation system.

WHY IS IT IMPORTANT?

Access management provides a cost effective approach to improve roadway safety and reduce congestion. Failure to manage access creates adverse social, economic, and environmental impacts. Successful access management results include:

- Reduced vehicular crashes and collisions involving pedestrians and cyclists.
- Reduced commute times, fuel consumption, and vehicular emissions as numerous driveways and traffic signals intensify congestion and delays along major roads.
- Less cut-through traffic in residential areas due to overburdened arterials.
- Reduced unsightly commercial strip development.

Vehicles caught in the median from heavy traffic.

Strip development with closely spaced driveways.

SAFETY BENEFITS:

Inadequate access management can result in traffic operation and safety problems, such as blocked movements into and out of driveways, conflicting and confusing turns at intersections, and insufficient distance for vehicle maneuvers. Research suggests that:

- Crash rates increase as the number of driveways per mile increases.
- Crash rates are lower on roadways with a non-traversable median than roads with two-way left turn lanes or no medians.
- U-Turn movements are generally safer than direct left turns and result in fewer accidents resulting in injuries or fatalities.
- Drivers making U-turns experience less delay than drivers making a direct left turn under high volume conditions.
- Medians improve pedestrian safety because they provide a refuge as pedestrians cross the road.

Proper spacing, design, and location of driveways can improve average travel speeds by up to 5 to 10 mph.

Source - Transportation Research Board, Access Management Manual, 2003

ECONOMIC BENEFITS:

Access management helps to preserve long-term property values and the economic viability of abutting development.

- Properly designed entrances shared by multiple businesses allow for more on-site parking, more customer options to access your site, and improved landscaping or other site amenities.
- Frontage roads allow customers to enter and exit businesses conveniently and safely, away from the faster moving traffic on the main roadway.

"Corridors with completed access management projects performed better in terms of retail sales than the surrounding communities."

Source - Transportation Research Board, Access Management Manual, 2003

ENVIRONMENTAL BENEFITS:

Uncontrolled access can carve up rural landscapes and damage sensitive ecosystems, such as preserves and washes. Additionally, improved traffic flow translates into greater fuel efficiency and reduced vehicular emissions. Efficient traffic movement improves direct air quality because fewer brake dust particulates and emissions from slowing or stopped vehicles are being released into the air.

Fuel savings on a 10-mile urban arterial roadway with ½-mile signal spacing instead of ¼-mile spacing can save up to 575,000 gallons of gasoline a year.

Source - Transportation Research Board, Access Management Manual, 2003

HOW ACCESS MANAGEMENT IS ACHIEVED:

State and local agencies can implement successful access management programs through the systematic application of planning, regulatory, and design strategies that include:

- Providing a specialized roadway system.
- Limiting direct access to major roadways.
- Promoting intersection hierarchy.
- Locating signals to favor through movements.
- Preserving the functional area of intersection and interchanges.
- Limiting the number of conflict points.
- Separating conflict areas.
- Removing turning vehicles from through traffic lanes.
- Using non-traversable medians to manage left-turn movements.
- Providing a supporting street and circulation system.

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CONFLICT POINTS

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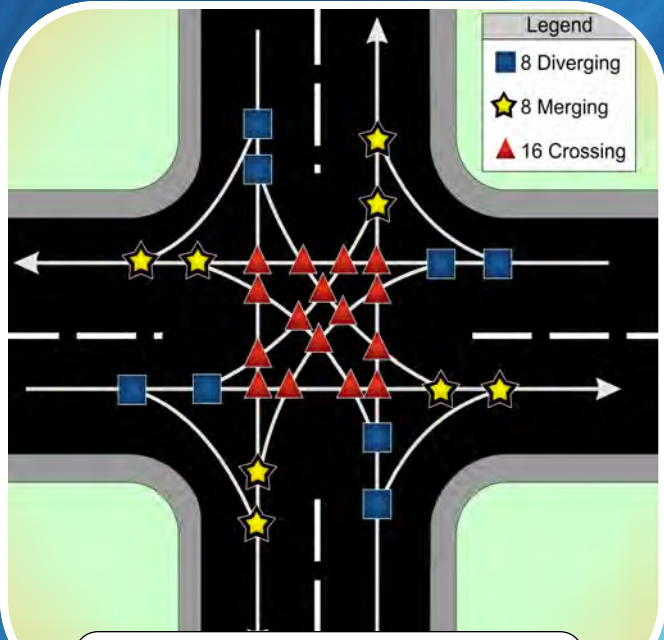
Conflict Point: The point at which a roadway user can cross, merge, diverge, etc. with another roadway user.

Drivers make more mistakes and are more likely to have collisions when they are presented with complex driving situations created by numerous conflicts. Simplifying the driving task results in fewer collisions, improves safety, and reduces congestion. A less complex driving environment is accomplished by limiting the number and type of conflicts between vehicles. There are 48 additional conflict points at intersections when considering pedestrian-vehicle and bicycle-vehicle conflicts.



32 Conflict Points at an Intersection

DRIVEWAY LEFT-TURN CONFLICT POINTS

Approximately 72% of the crashes at a driveway within the physical area of an intersection involve a left-turning vehicle. Of these left-turn crashes, 47% are attributed to the egress (exiting) movement conflicting with the near-side through movement, approximately 39% are attributed to the ingress (entering) movement, and 14% are attributed to the egress movement merging with the far-side through movement. This indicates that reducing or eliminating left turns to or from driveways where possible, enhances safety.

Source - "Access Management", Issue Briefs No. 13, FHWA, 2009.

More than two-thirds of all access related collisions involve left-turning vehicles.

Source - "Traffic Engineering", Vol. 37, No. 3, Dec. 1966

SEPARATE CONFLICT AREAS

Drivers need sufficient time to address one potential conflict before facing another conflict. As travel speed increases, the space needed between conflict areas also increases. Separating conflict areas helps to simplify the driving task and contributes to improved traffic operations and safety.

Source - "Access Management Manual", TRB, 2003.

Numerous studies over the past 40 years have shown accident rates rise with greater frequency of driveways and intersections. Accident rates on a roadway will increase by approximately 4% for every additional access point over 10 access points, per mile.

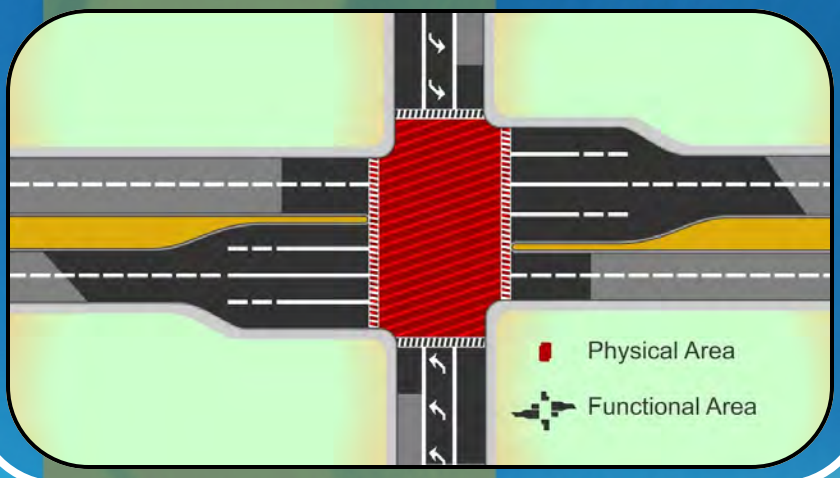
Source - Transportation Research Board, NCHRP Report 420, Impacts of Access Management Techniques, 1999.

Pedestrian-Vehicle conflicts are an issue of safety and inhibit traffic flow

FUNCTIONAL AREA OF AN INTERSECTION

The functional area of an intersection is the area where motorists are responding to the intersection or interchange, decelerating, and maneuvering into the appropriate lane to stop or complete a turn. The functional area of an intersection extends significantly past the physical area of an intersection or interchange and includes all areas that are critical to its function.

Source - "Access Management Manual", TRB, 2003.



U-TURNS REDUCE CONFLICTS AND IMPROVE SAFETY

U-Turns result in a 20% accident rate reduction by eliminating direct left turns from driveways and a 35% reduction when the U-turns are signalized.

Source - "NCHRP Report 420, Impacts of Access Management Techniques", TRB, 1999.

EFFECT OF ACCESS POINTS ON TRAFFIC SPEED

One study in Florida showed that the poor design, location, and spacing of driveways reduced average vehicular speeds by up to 10 mph.

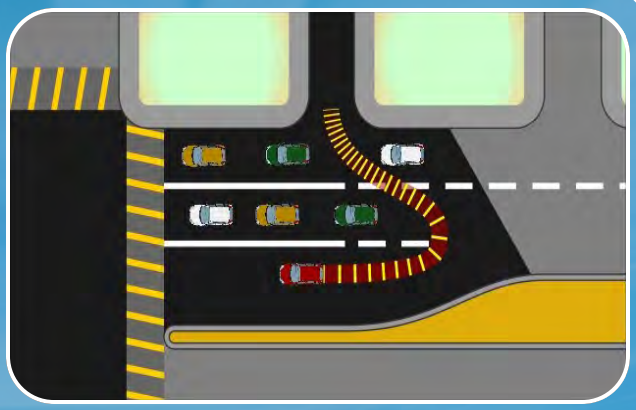
Source - "Access Management and the Relation to High-way Capacity and Level of Service. FDOT, 1996.

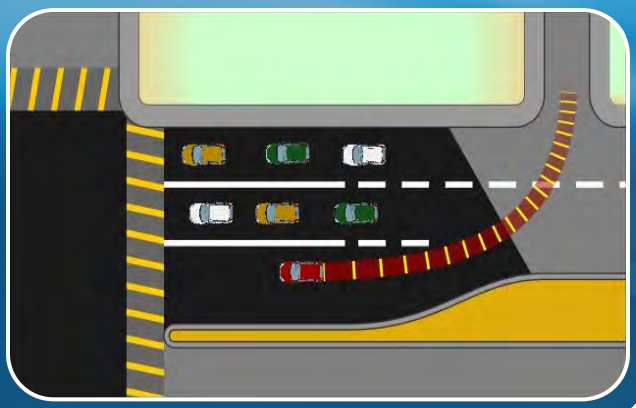
KEEP ACCESS CONFLICT POINTS OUT OF AN INTERSECTION

Poorly managed access in the functional area of an intersection can result in traffic-operation, safety, and capacity problems. These problems can be caused by blocked driveway ingress and egress movements, conflicting and confusing turns at intersections, insufficient weaving distances, and backups from far-side driveways into intersections. Specific operational and safety problems include:

- Through traffic is blocked by vehicles waiting to turn into a driveway.
- Right or left turns into or out of a driveway are blocked (both on arterial and crossroad) .
- Driveway traffic is unable to enter left-turn lanes.
- The weaving maneuvers for vehicles turning onto an arterial and then immediately turning left into a driveway are too short.

Source - "NCHRP Report 420, Impacts of Access Management Techniques", TRB, 1999.





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ROADWAY CLASSIFICATIONS

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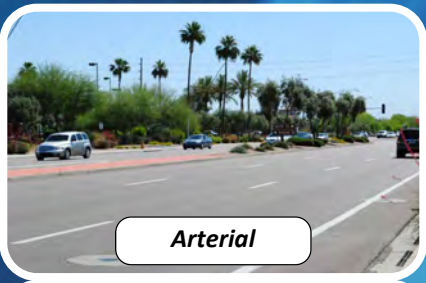
ROADWAY FUNCTIONAL CLASSIFICATION

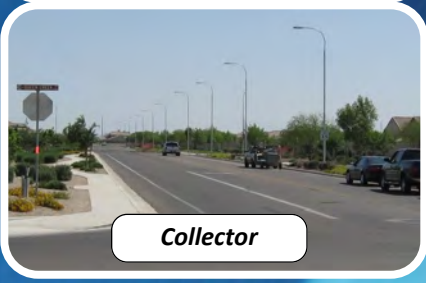
The roadway hierarchy is based on the premise that different roads serve different functions within the transportation network. One of the key principles of access management is that the level of access on roadways should be based on the intended function of a roadway. Freeways are at one end of the spectrum and are designed and constructed to accommodate large volumes of high-speed traffic with very little interference from traffic entering or leaving the roadway. At the other end of the spectrum, local/residential streets typically have very low traffic volumes and slow speeds while providing access to adjacent properties via separate driveways and/or on-street parking.

Source - FHWA Issue Brief FHWA-SA-10-005, 2009.

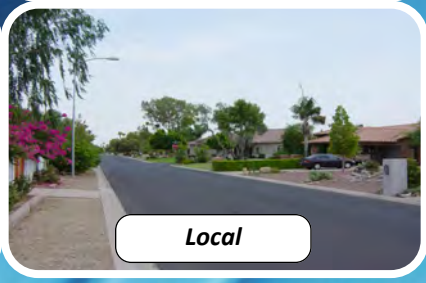
Freeway



Arterial



Collector



Local

IMPORTANCE OF A FUNCTIONAL CLASSIFICATION SYSTEM

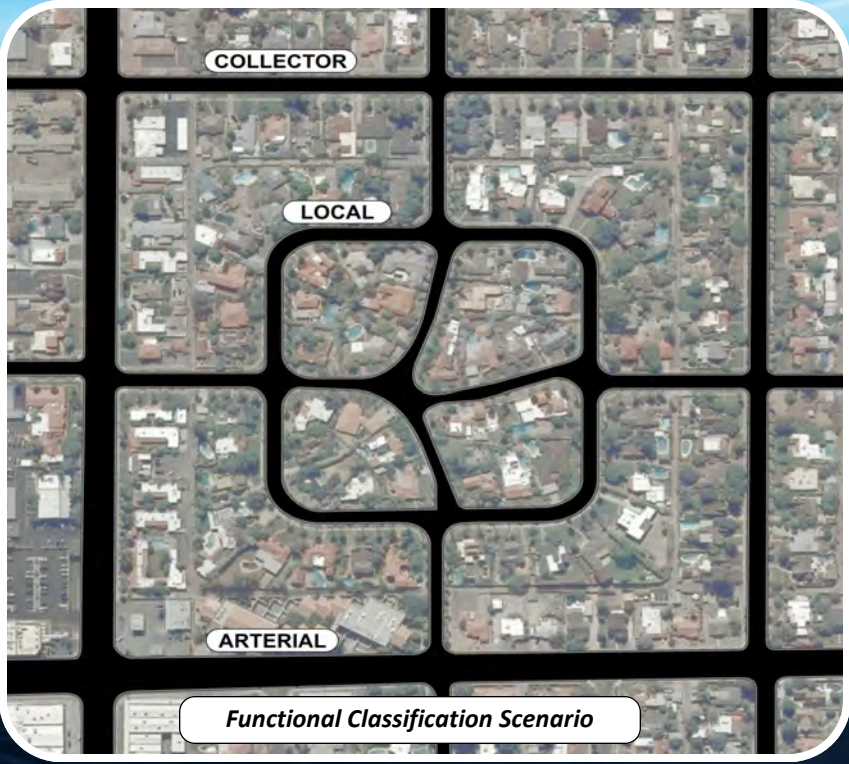
A roadway functional classification system is the foundation of an Access Management Program. Establishing guidelines or standards based on accepted access management principles helps maintain the regional roadway network and can result in improved safety and operational efficiencies.

Source - "Access Management Manual", TRB, 2003.

DEVELOPING A ROADWAY'S FUNCTIONAL CLASSIFICATION

When developing or updating a new or existing roadway's functional classification, evaluation of the following criteria is important:

- Typical travel distance of motorists (e.g., short versus long trips)
- Nature of the travel (e.g., through versus local)
- Travel speeds
- Existing and future nearby land use
- Location of the roadway (e.g., urban versus rural)
- Physical characteristics of the roadway (e.g., divided versus undivided)
- Current system-level access plans, policies, and classification systems against best practices



Functional Classification Scenario

ACCESS CLASSIFICATION SYSTEM

An access classification system establishes the level of access associated with a roadway or segment. It defines where access can be allowed, should be denied or discouraged, and/or should be limited. Each roadway classification should have an access classification that includes:

- Driveway Spacing and Design
- Signal Spacing, Location and Coordination
- Raised Median Installations
- Turn Lane Location and Design
- Corner Clearance Distance
- Frontage Road Location and Design
- Any Special Access Situations
- Pedestrian and Bicycle Modes can also be Included

RELATIONSHIP BETWEEN ACCESS AND ROADWAY FUNCTIONALITY

Agencies should develop and apply an access classification system that assigns access management standards to roadways in accordance with their functional classification hierarchy. Often, the access classification system parallels the roadway functional classification system because access and mobility are directly related. Level of access should be correlated to a roadway's purpose and importance, functional characteristics, design features, and access spacing criteria.

Source - "NCHRP 548", TRB, 2005.

Access Category	Functional Classification	Intended Function	Description of Allowable Access
1	Expressways/ Parkways	Serves high volumes of traffic traveling relatively long distances and is intended primarily to serve through traffic.	Access at public street intersections or at interchanges only.
2	Major Arterials	Carries medium to high traffic volumes, serves medium to long distance trips and provides a limited degree of property access to abutting properties.	Right turns permitted. Limited left turn movements. Left turn lane and median required. Restricted turning movements at some locations due to connection spacing and other safety issues.
3	Minor Arterials	Operates under lower traffic volumes, serves trips of shorter distances, and provides a higher degree of property access than major arterials.	Right and left turns permitted. Left turn lane required. Median encouraged.
4	Major Collectors	Provides for traffic movement between arterials and local streets and carries moderate traffic volumes over moderate distances. May also provide direct access to abutting properties, except individual residences.	Right and left turns permitted. Left turn lane encouraged. Median optional.
5	Minor Collectors	Carries lower traffic volumes over shorter distances and has a higher degree of property access than a major collector.	Right and left turns permitted. Left turn lane optional.
6	Local/Residential Roads	Provides access to abutting properties, tends to accommodate lower traffic volumes, serves short trips, and provides connection to collector streets.	Right and left turns permitted.

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JOINT AND CROSS ACCESS

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Joint and cross access are methods of allowing adjacent properties to share driveways and parking facilities. Joint access is where two adjacent property owners share a driveway along their common property line. Cross access is where traffic moves between adjacent properties without re-entering the public roadway.

Source - "Shared/Joint Driveways and/or Cross Access", Iowa State University, 2009.

Joint and Cross Access

IMPORTANCE OF JOINT AND CROSS ACCESS

Joint access enhances landowner development opportunities; improves roadway, pedestrian, and bicycle safety; reduces congestion; and supports multimodal travel.

Cross access supports developments and businesses as customers are encouraged to stay on-site and visit multiple businesses.

Source - "Reducing Traffic Congestion and Improving Traffic Safety in Michigan Communities: The Access Management Guidebook", Michigan Department of Transportation, Oct. 2001.

Cross Access Road

MULTIMODAL BENEFITS

Locating businesses together will promote the use of mass transit and multi-modal transportation. Bus stops can be located along on-site circulation roadways (cross access) that serve multiple retail shops, restaurants, and other entertainment destinations.

Drivers must yield to pedestrians at driveway-sidewalk crossings; however, this does not always happen. Minimizing the number of driveway-sidewalk crossings significantly improves pedestrian safety.

Source - "Designing Sidewalks and Trails for Access Part II of II: Best Practices Design Guide", FHWA, 2001 .

JOINT AND CROSS ACCESS INCREASES ROADWAY EFFICIENCY

"Driveway Hopping" is when vehicles are forced to go from one driveway to another, using a busy public street, to access the adjacent property. Slower vehicles that "driveway hop" then mix with higher speed vehicles traveling the street. This causes traffic to slow, sometimes very quickly, on the busy street.

This can also cause accidents and leads to driver frustration. With joint and cross access techniques in place, vehicles can very easily travel between adjacent properties without having to use the busy street.

SHARED ACCESS INCREASES SAFETY

Consolidating and using shared access points on a roadway lowers the number the accidents.

Driveways or access points without a traffic signal allow vehicles to enter or exit the roadway freely. This movement increases the potential for a conflict with vehicles in the traffic stream. When traffic volumes are high, the spacing between vehicles is smaller and drivers have less opportunity to safely enter or exit a driveway. A vehicle exiting the roadway will brake before turning, which can result in rear-end and lane-change collisions.

Encouraging adjacent properties on major roadways to share access improves safety by minimizing driveway conflict areas. Greater or longer spacing between access connections allows for the design of right-turn lanes that provide smooth traffic flow on the roadway, helping to reduce crashes.

Source - "Access Management Manual", TRB, 2003.

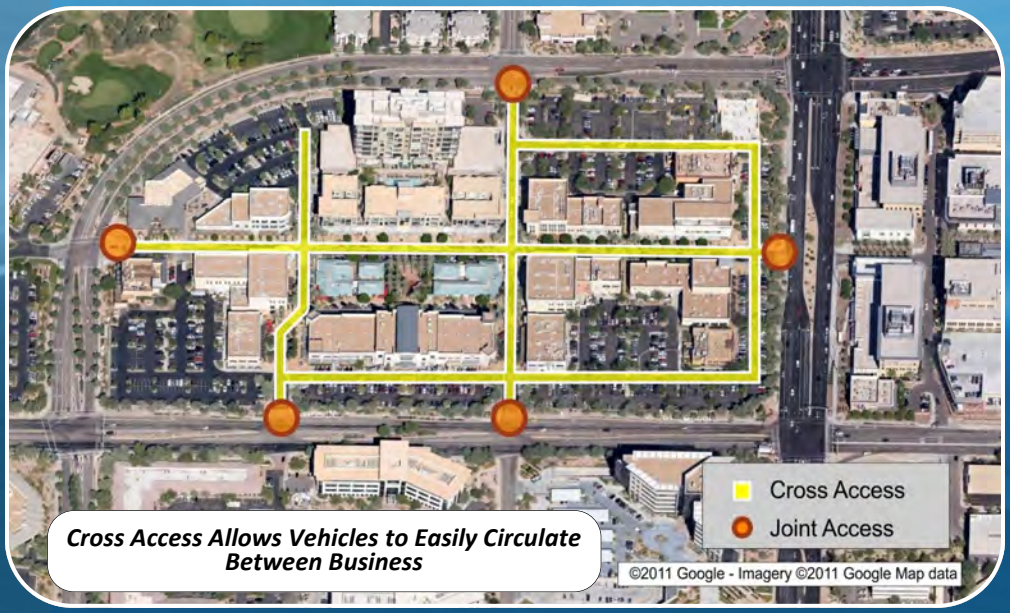
Joint Access with Right-Turn Lane

JOINT AND CROSS ACCESS WILL BENEFIT BUSINESSES

Properly designed driveways shared by multiple businesses allow more site area for parking and landscaping. Sites with landscaped areas and plenty of parking will attract customers and maintain or increase the property value of established businesses.

Cross access connections between adjacent commercial developments will improve customer shopping convenience. More businesses will be accessible to a customer without having to re-enter the arterial roadway system. Individual businesses will see more drive by traffic from adjacent businesses, and will have the benefit of better business exposure.

Source - "Safe Access is Good for Business", Federal Highway Administration, Washington, DC, 2006.



Cross Access Allows Vehicles to Easily Circulate Between Business

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ECONOMIC BENEFITS

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Access management helps preserve long-term property values and the economic viability of abutting development. According to the Urban Land Institute's Shopping Center Development Handbook, "poorly designed entrances and exits not only present a traffic hazard but also cause congestion that can create a negative image of the center." In contrast, well-designed circulation systems promote efficient travel and can improve the aesthetics of a corridor.

Source - "Shopping Center Development Handbook", Urban Land Institute, Washington, DC., 1985.

Corridor without Access Management

Corridor with Access Management

COMMERCIAL CORRIDOR BENEFITS

Motorists are more likely to travel a corridor that is aesthetically pleasing, has efficient traffic movement, and is safer to drive. This results in increased economic vitality for the area. Other access management benefits to commercial corridors include:

- **More attractive corridors increase property values and attract customers.**
- **The need for roadway widening is reduced, which minimizes construction blocking or restricting access.**
- **Service roads allow customers to enter and exit businesses more safely.**
- **Pedestrian and bicycle access is dramatically enhanced.**

Enhanced Access Management with Pedestrian Accommodations

PROPERTY VALUES

Access management improvements have a positive effect on surrounding property values.

A study of property values on Texas corridors with access management projects found that almost all land values stayed the same or increased.

Source - A Methodology for Determining Economic Impacts of Raised Medians: Data Analysis on Additional Case Studies; October, 1999.

"If crashes and congestion become frequent on your roadway, people will seek out other routes."

Source - "Safe Access is Good for Business", Federal Highway Administration, Washington DC, 2006.

ENHANCES BUSINESS DEVELOPMENTS

Efforts by government agencies to manage access in site development and road projects can help businesses, even those operating on older corridors. Specific benefits include:

- **Fewer delays and better traffic flow.**
- **Median installations provide safer approaches to businesses, and can also be landscaped to improve the image of the area.**
- **Properly designed entrances shared by multiple businesses allow more site area for parking, more customer options to access a site, improved landscaping, and/or other site amenities.**
- **Internal connections between businesses allow customers to circulate easily.**
- **Customers can avoid re-entering busy roadways.**
- **Driveways and service road entrances farther away from signalized intersections allow easier access for customers, even during times of peak congestion.**

Source - "Safe Access is Good for Business", Federal Highway Administration, Washington, DC, 2006.

Internal Circulation Road

Shared Entrance with Aesthetic Treatments

ADVANTAGES OF ACCESS MANAGEMENT TECHNIQUES

"Minimizing the number of curb cuts, consolidating driveways, constructing landscaped medians, and coordinating internal site circulation and parking among several businesses results in a visually pleasing and more functional corridor. It protects your investment in your business, the public investment in the roadway, and can even help attract new investment into the area."

Source - "Safe Access is Good for Business", Federal Highway Administration, Washington, DC, 2006.

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