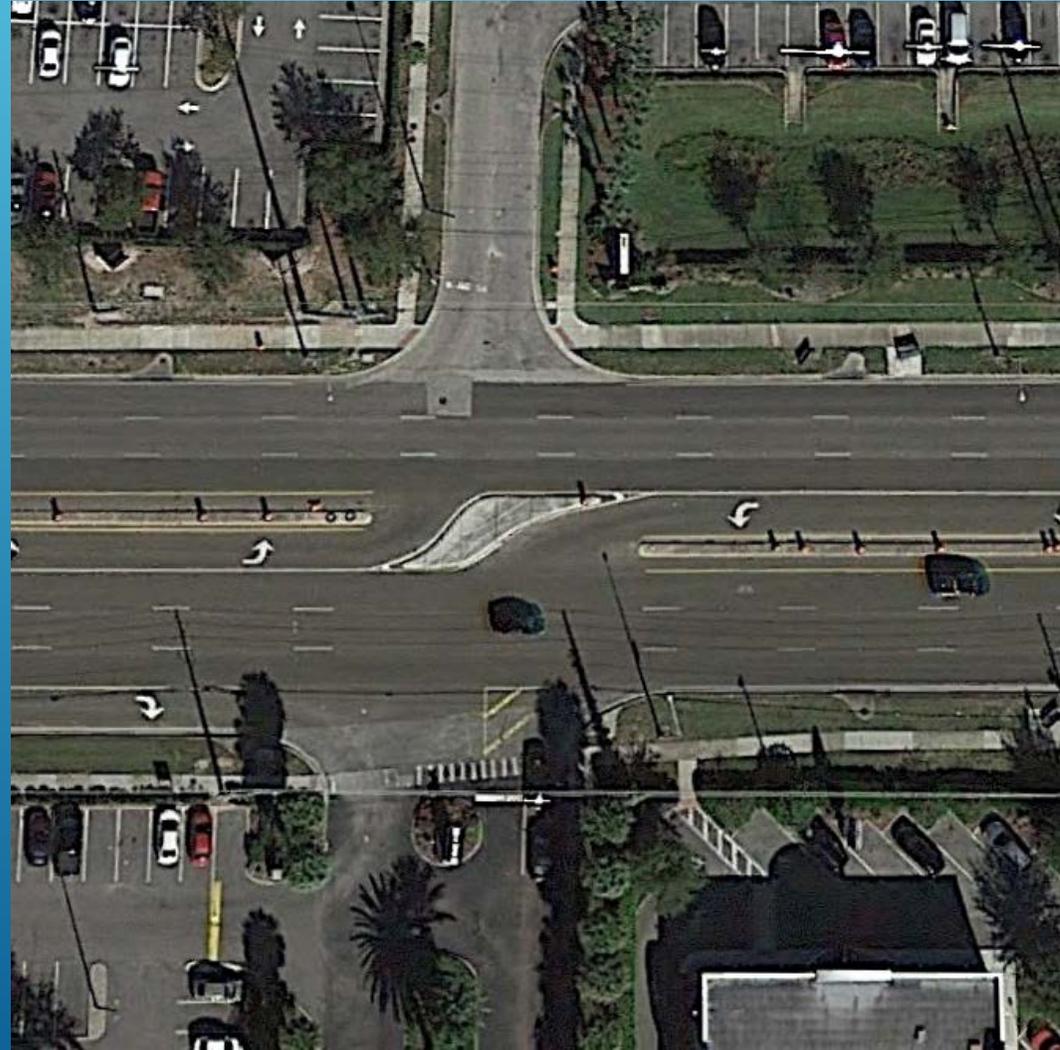


Access Management



What is Access Management?

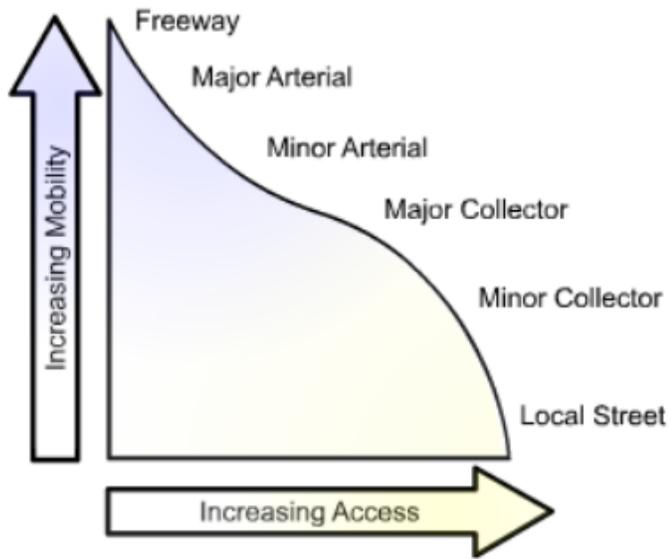
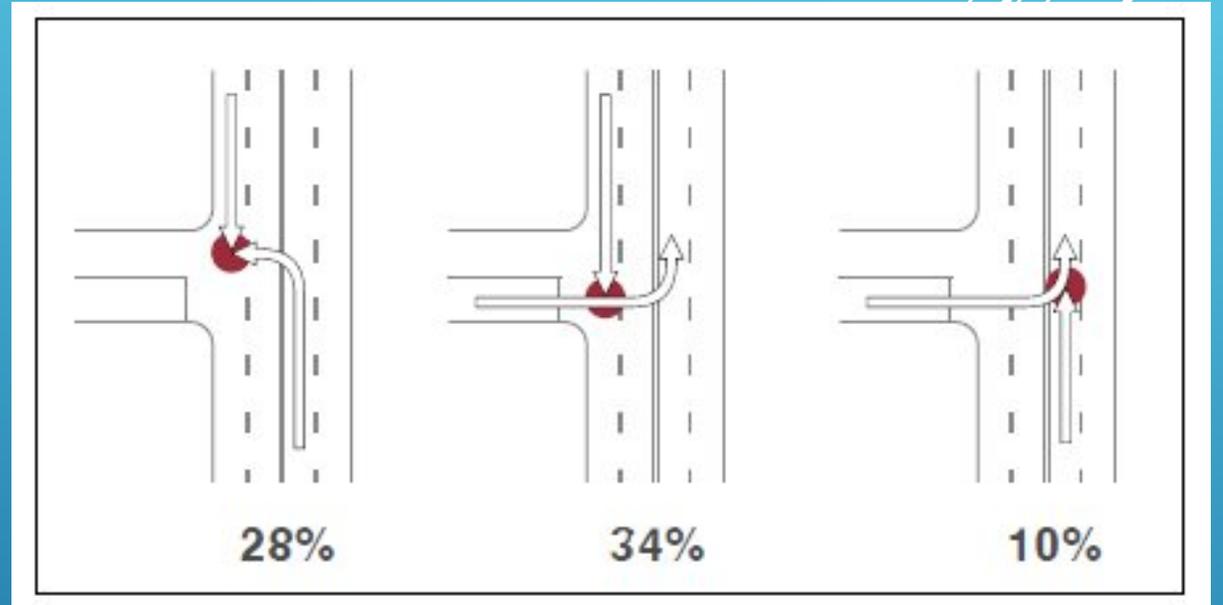
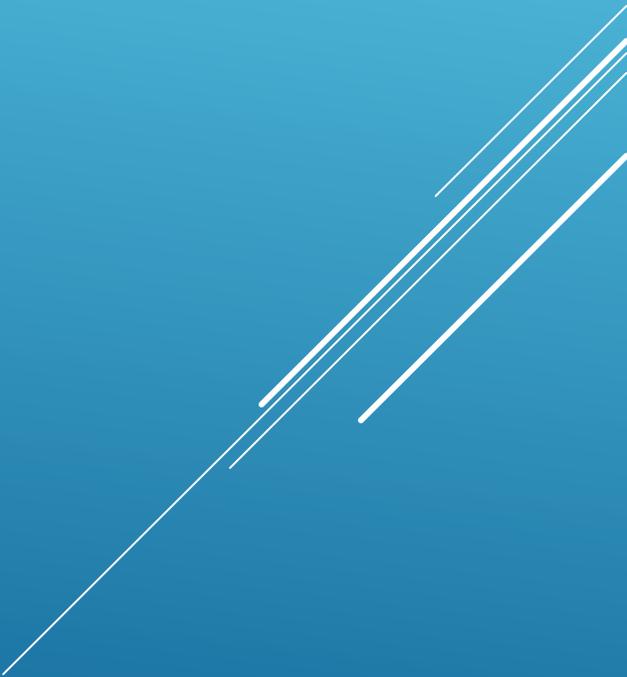
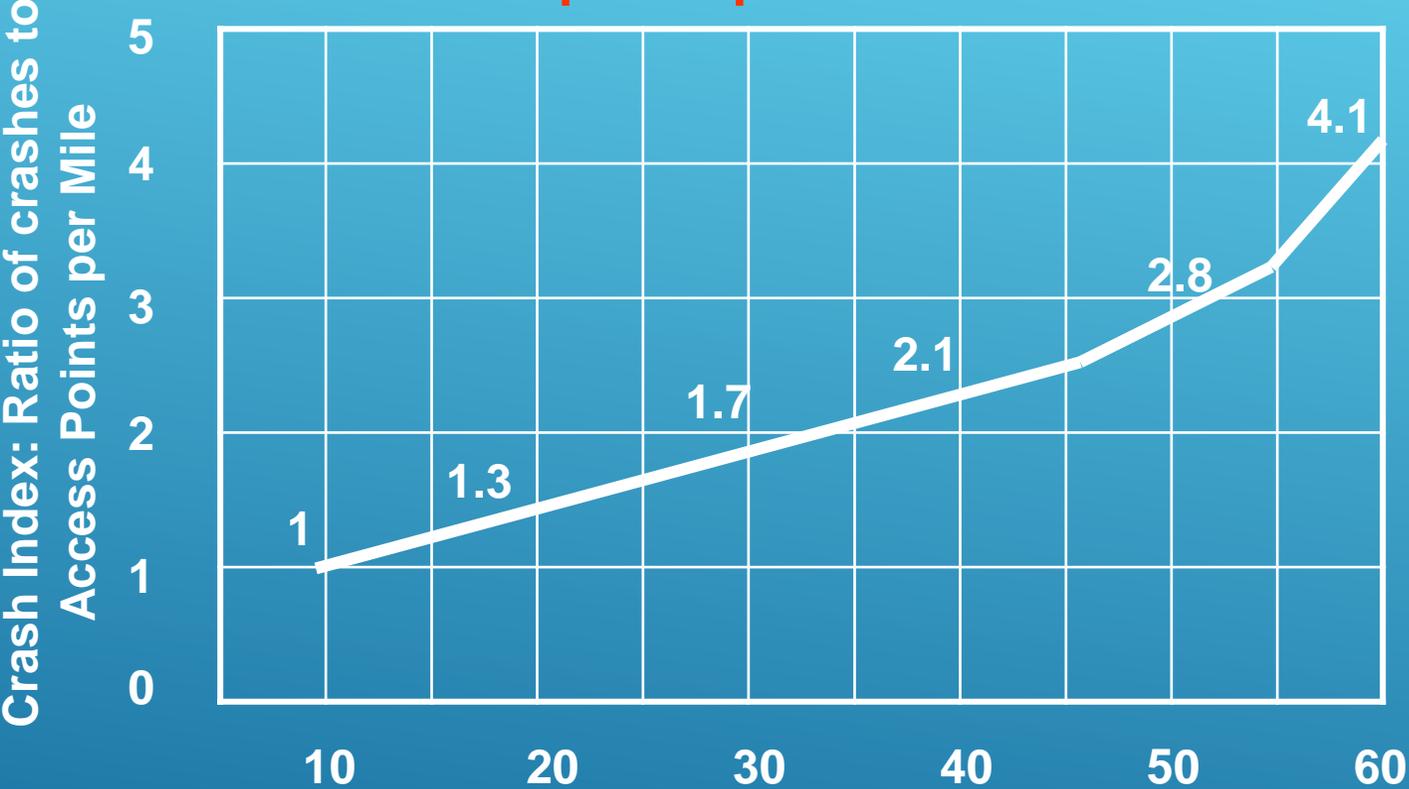


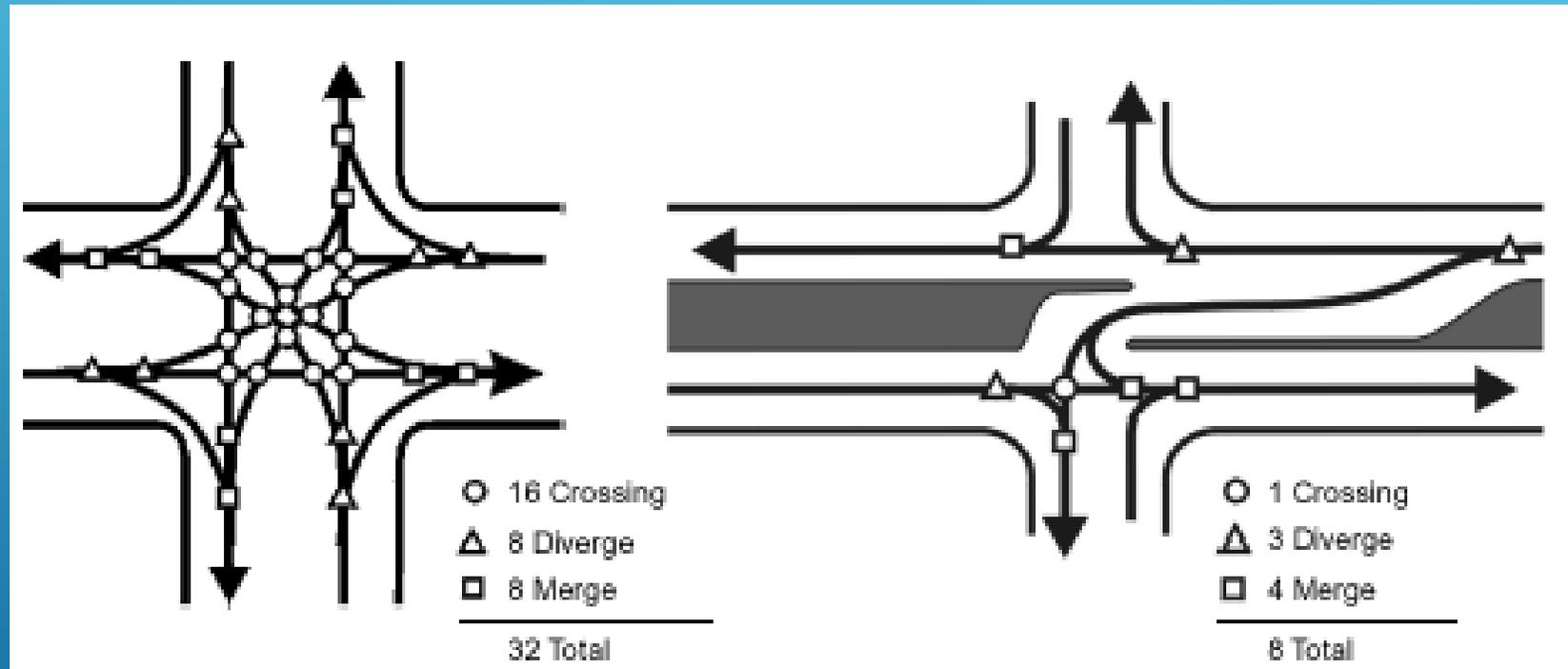
Figure 1: Conceptual Roadway Functional Hierarchy



Crash rate indices increase as # of access points per mile increases



CONFLICTS



(and don't forget pedestrian and bicycle movements too!)

What is Access Management?

Access Management is a proactive management of vehicular access points to land parcels adjacent to all manner of roadways.

- Access Spacing: Increasing distance between traffic signals improves Traffic flow on roads, reduces congestion, improves air quality and SAFETY.
- Driveway Spacing: Fewer driveways spaced further apart is good (less decisions)
- Safe Turning Lanes: Dedicated left & right-turn, indirect left-turns, U-Turns and roundabouts keep traffic flowing.
- Median Treatments: Two-Way Left-Turn Lanes (TWLTL) and non-traversable, raised medians are examples of effective means to regulate access and reduce crashes.
- Right-of-Way Management: R/W as it pertains to future widenings, good sight distance, access locations.

Relationships:

FHWA > NDOT (theory, guidance, implementation)

NDOT > NHP (practical, what works, what is enforceable)

NDOT > Local Partners (what's practical & what works)

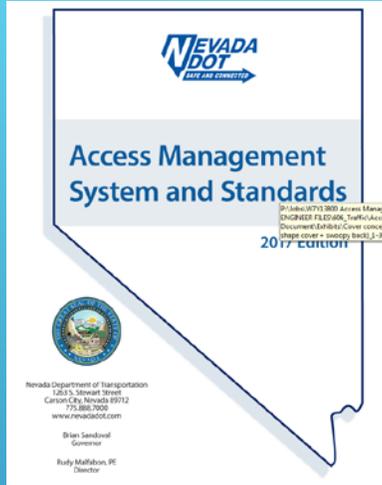


Table 3-1: Roadway Classification

Class	Roadway Classification	Function	General Design Features
1	Interstate Freeways	<ul style="list-style-type: none"> Primary: Interregional and interstate travel Secondary: Intrastate; intercity; and, in large urban areas, intracity travel 	<ul style="list-style-type: none"> Multilane with median Interchange access
2	Other Freeways	<ul style="list-style-type: none"> Interregional; interstate; intrastate; intercity; and, in large urban areas, intracity travel 	<ul style="list-style-type: none"> Multilane with median Interchange access
	Expressways	<ul style="list-style-type: none"> Intrastate, intercity, and intracity travel In some cases, provide interregional and interstate travel 	<ul style="list-style-type: none"> Multilane with median Very limited number of at-grade intersections High volume intersections may require an interchange
3	Other Principal Arterials	<ul style="list-style-type: none"> Primary: Through movement (intercity and intracity travel in urban areas and mobility in rural areas) Secondary: Land access 	<ul style="list-style-type: none"> May be multilane; should have median Multilane arterials should have a median wide enough to accommodate dual left turns of signalized intersections
4	Minor Arterials	<ul style="list-style-type: none"> Primary: Through movement (intercity, intracity, and intercommunity travel) Secondary: Land access 	<ul style="list-style-type: none"> May be multilane; should have median
5	Major Collectors	<ul style="list-style-type: none"> Balance traffic movement with land access Serve intracounty travel (rather than statewide) 	<ul style="list-style-type: none"> May be multilane May have median or Two-Way Left-Turn Lane (TWLTL)
6	Minor Collectors	<ul style="list-style-type: none"> Balance traffic movement with land access Serve intracounty travel (rather than statewide) 	<ul style="list-style-type: none"> May be multilane May have median or TWLTL
7	Frontage/Service/Local Roads	<ul style="list-style-type: none"> Primary: Land access (serve the origin or destination end of the trip) Secondary: Through movement 	<ul style="list-style-type: none"> Generally two lanes



Table 3-2: Types of Access Connections

Type of Connection	Use
Non-commercial	<ul style="list-style-type: none"> For access to single-family dwellings Multiple family dwellings of three or fewer dwelling units Agricultural land and field access Emergency gated access
Minor Commercial	<ul style="list-style-type: none"> Medium volume generator (fewer than 500 vehicles per day)
Major Commercial	<ul style="list-style-type: none"> High volume generators (500 or more vehicles per day) Provides access to shopping centers, industrial parks, office parks, colleges, residential complexes, and subdivisions, etc.
Public or Private Roads	<ul style="list-style-type: none"> New public or private roads or streets



Table 4-1: Access Spacing Standards

Roadway Class	Location/Posted Speed Limit	Full Access		Limited Access	
		Signalized Intersection Uniform ¹ Spacing	Unsignalized Intersection/Roundabout Minimum ² Spacing	Left-In/Right-In/Right-out only Minimum ² Spacing	Right-In/Right-out only ³ Minimum ² Spacing
1: Interstate Freeways	Urban/Suburban/Rural	<ul style="list-style-type: none"> Full control of access Access is available only via grade-separated interchanges All interchanges must meet public road spacing (1 mile in urban, 2 miles in suburban, and 3 miles in rural areas) and comply with FHWA Policy 			
2: Other Freeways	Urban/Suburban/Rural	<ul style="list-style-type: none"> Full control of access Access is available only via grade-separated interchanges All interchanges must meet public road spacing (1 mile in urban, 2 miles in suburban, and 3 miles in rural areas) Access to federal aid freeways must comply with federal regulations 			
2: Expressways	≤ 55 mph	5,280'		5,280'	1,320'
	≥ 60 mph	10,560'			
3: Other Principal Arterials	≤ 35 mph	1,320'		660'	350'
	40-55 mph	2,640'	1,320'	990'	660'
	≥ 60 mph	5,280'	2,640'	1,320'	800'
4: Minor Arterials	≤ 35 mph	1,320'		660'	300'
	≥ 40 mph	2,640'	1,320'	660'	350' – 600'
5: Major Collectors	≤ 35 mph	1,320'		440'	250'
	≥ 40 mph	2,640'	1,320'	660'	300' – 500'
6: Minor Collectors	≤ 30 mph	1,320'		440'	200'
	≥ 35 mph	1,320'	660'	440'	250' – 400'
7: Frontage/Service/Local Roads	-	As necessary for the safe operation and proper design of adjacent accesses		330'	200'

Notes:

All dimensions above are measured from center-to-center of accesses.

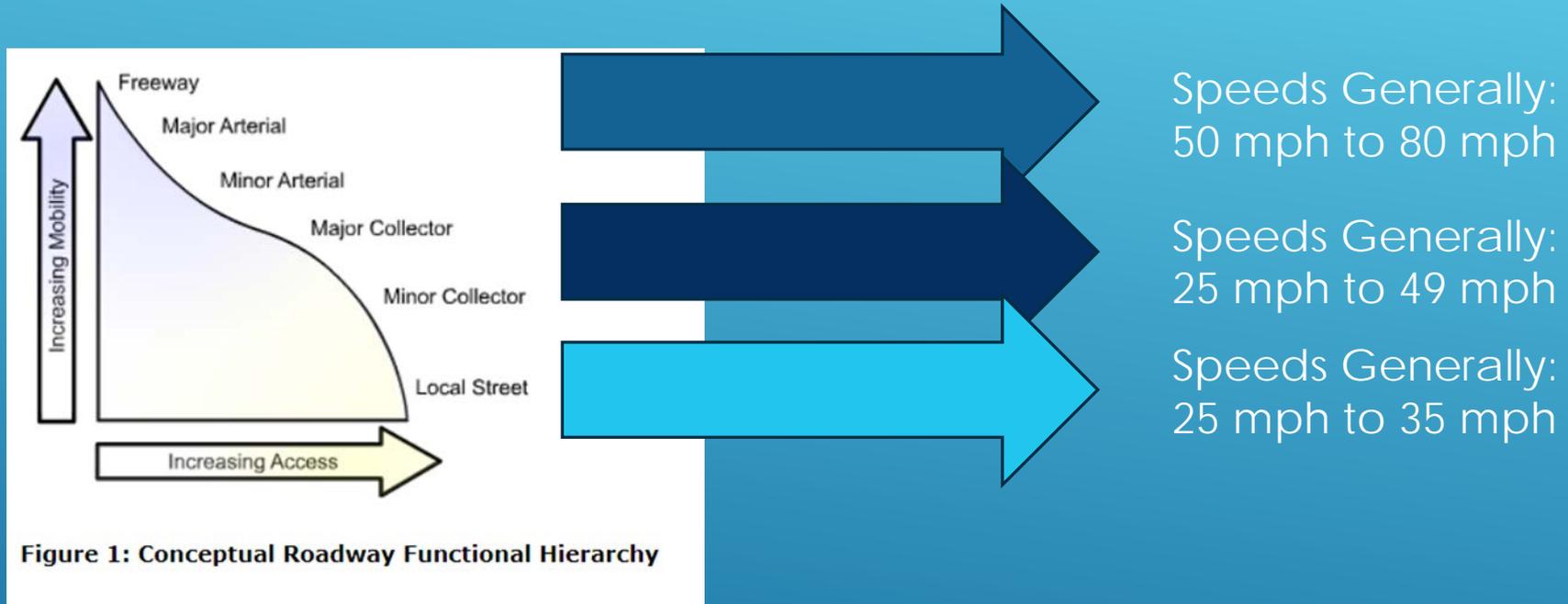
The spacing standards provided above also apply to private, direct access. Restrictions may be placed on the access permit. Refer to the rest of the document for additional information.

¹ Uniform spacing refers to the exact spacing to be achieved. Any spacing either greater or smaller than these standards is considered a deviation.

² Minimum spacing refers to the minimum spacing to be achieved between two adjacent accesses. However, greater spacing may be needed, depending on other requirements. Refer to the rest of Chapter Four for these standards.

³ Where applicable, the range of spacing values corresponds to a range of speeds. The greater spacing values will be required at higher speeds.

Other Considerations:



Speeds (Limits) are a major factor (design to slow folks down or enforcement)

Approved "Countermeasures"



FHWA Home / Safety / Proven Safety Countermeasures / Proven Safety Countermeasures - Corridor Access Management

Proven Safety Countermeasures

Corridor Access Management

U.S. Department of Transportation
Federal Highway Administration
FHWA-SA-17-052

[Printable Version \(PDF, 357 KB\)](#)
(You may need the [Adobe Reader](#) to view the PDFs on this page.)

For more information about this Proven Safety Countermeasure, visit the [Office of Safety's Intersection Corridor Access Management](#) web page.

Access management refers to the design, application, and control of entry and exit points along a roadway. This includes intersections with other roads and driveways that serve adjacent properties. Thoughtful access management along a corridor can simultaneously enhance safety for all modes, facilitate walking and biking, and reduce trip delay and congestion.

Every intersection, from a signalized intersection to an unimproved driveway, has the potential for conflicts between vehicles, pedestrians, and bicycles. The number and types of conflict points¹ at locations where the travel paths of two users intersect² influence the safety performance of the intersection or driveway.

The following access management strategies can be used individually or in combination with one another:

- Driveway closure, consolidation, or relocation.
- Limited-movement designs for driveways (such as right-in/right-out only).
- Raised medians that preclude across-roadway movements.
- Intersection designs such as roundabouts or those with reduced left-turn/conflicts (such as J-turns, median U-turns, etc.).
- Turn lanes (i.e., left-only, right-only, or interior two-way left).
- Lower speed one-way or two-way off-arterial circulation roads.

Successful corridor access management involves balancing overall safety and corridor mobility for all users along with the access needs of adjacent land uses.

Use of roundabouts, raised median, and right-in/right-out driveways can be an effective access management plan.

Source: FHWA-SA-15-005

Corridor Access Management

This intersection design restricts left-turn movements to improve safety.

Source: FHWA

SAFETY BENEFITS:

- 5-23%** Reduction in total crashes along 2-lane rural roads
- 25-31%** Reduction in injury and fatal crashes along urban/suburban arterials

Source: Highway Safety Manual

For more information on this and other FHWA Proven Safety Countermeasures, please visit <https://safety.fhwa.dot.gov/provencountermeasures/>.

U.S. Department of Transportation
Federal Highway Administration

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FHWA Home / Safety / Proven Safety Countermeasures / Proven Safety Countermeasures - Reduced Left-Turn Conflict Intersections

Proven Safety Countermeasures

Reduced Left-Turn Conflict Intersections

U.S. Department of Transportation
Federal Highway Administration
FHWA-SA-17-054

[Printable Version \(PDF, 464 KB\)](#)
(You may need the [Adobe Reader](#) to view the PDFs on this page.)

For more information about the Proven Safety Countermeasure, visit the [Office of Safety's U-Turn-based Intersections](#) web page.

Reduced left-turn conflict intersections are geometric designs that alter how left-turn movements occur in order to simplify decisions and minimize the potential for related crashes. Two highly effective designs that rely on U-turns to complete certain left-turn movements are known as the restricted crossing U-turn (RCUT) and the median U-turn (MUT).

Restricted Crossing U-turn (RCUT)

Example of RCUT intersection.
Source: FHWA

The RCUT intersection modifies the direct left-turn and through movements from cross-street approaches. Minor road traffic makes a right turn followed by a U-turn at a designated location¹, either signalized or unsignalized², to continue in the desired direction. The RCUT is suitable for a variety of circumstances, including along rural, high-speed, four-lane, divided highways or signalized routes. It also can be used as an alternative to signalization or constructing an interchange. RCUTs work well when consistently used along a corridor, but also can be used effectively at individual intersections.

Median U-turn (MUT)

Example of MUT intersection.
Source: FHWA

The MUT intersection modifies direct left turns from the major approaches. Vehicles proceed through the main intersection, make a U-turn a short distance downstream, followed by a right turn at the main intersection. The U-turns can also be used for modifying the cross-street left turns. The MUT is an excellent choice for heavily traveled intersections with moderate left-turn volumes. When implemented at multiple intersections along a corridor, the efficient two-phase signal operation of the MUT can reduce delay, improve travel times, and create more crossing opportunities for pedestrians and bicyclists.

MUT and RCUT Can Reduce Conflict Points by 50%

Source: FHWA

For more information on this and other FHWA Proven Safety Countermeasures, please visit <https://safety.fhwa.dot.gov/provencountermeasures/>.

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Federal Highway Administration

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Reduced Left-Turn Conflict Intersections

SAFETY BENEFITS:

- RCUT**
54% Reduction in injury and fatal crashes¹
- MUT**
30% Reduction in intersection-related injury crash rate²

¹ Egan et al., "Evaluation of U-Turn Intersection Design Performance in Missouri," December 2013.
² FHWA, Median U-Turn Intersection Informational Guide, FHWA-BAY-089 (Washington, DC 2014), pp. 41-42.

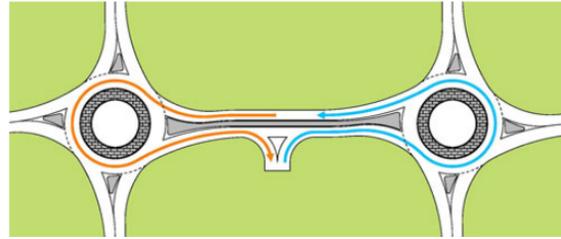
Vast Majority of Our “Countermeasures” Involve U-Turns:

Corridor Level

The Dog-Bone Concept

The Dog-Bone concept would apply regardless of the number of access points and side streets located within the segment, with all U-turn maneuvers being safely accommodated by the roundabouts.

Exhibit 17: Example of the Dog-Bone concept. A single access point lies on the segment between the two roundabouts. A raised median separates the opposing through lanes on the mainline, which serves to prohibit all left turns between the roundabouts. The blue arrow illustrates the path for a vehicle seeking to turn left from the driveway, while the orange arrow shows the path of a vehicle wishing to turn left into the driveway. (Source: VHB)



Intersection Level

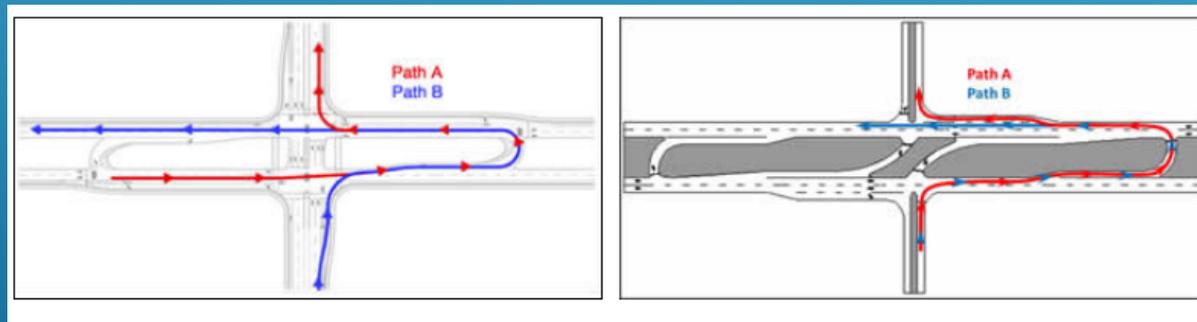
“Also Known As...”

Median U-Turn is sometimes called:

- Michigan Left or Michigan Loon
- Indirect Left
- Boulevard Turnaround
- Express Left
- Thru-Turn
- U-Turn Crossover

Restricted Crossing U-Turn is sometimes called:

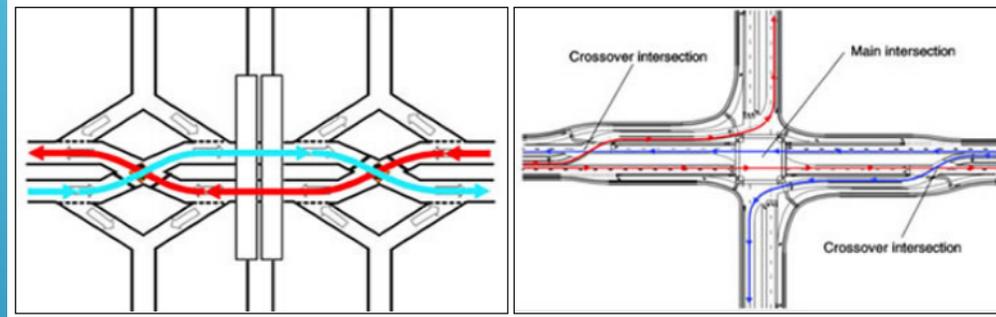
- J-Turn
- Reduced Conflict Intersection
- Superstreet Intersection
- Synchronized Street Intersection



Vast Majority of Our "Countermeasures" Involve U-Turns:

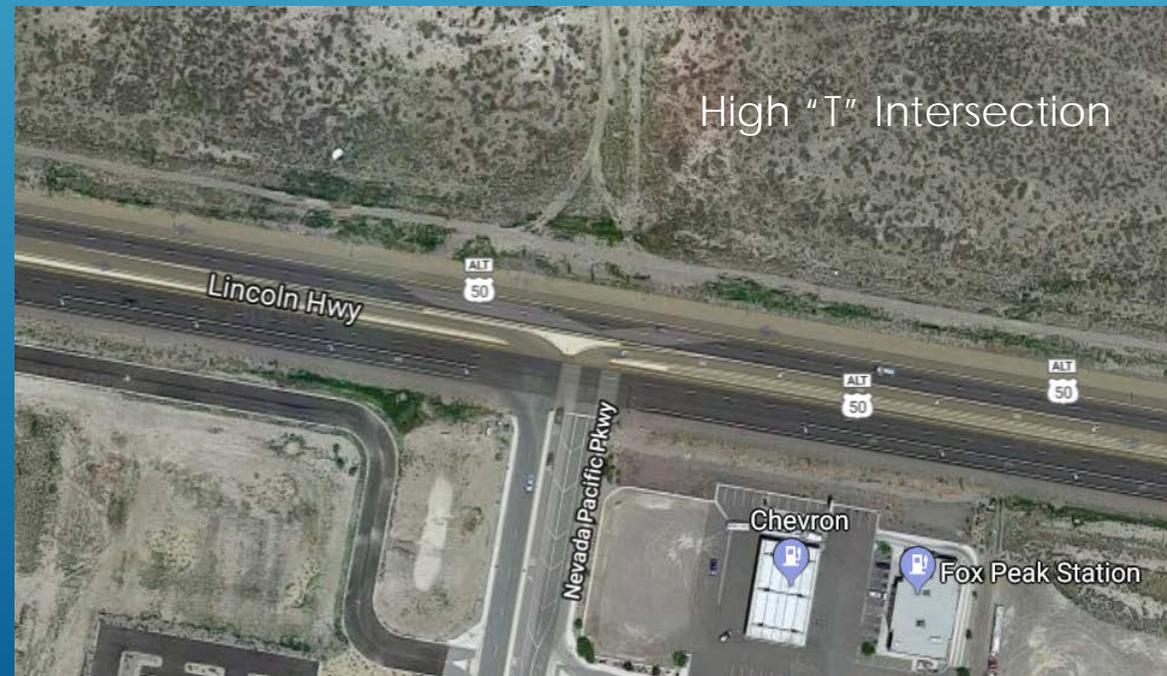
Intersection Level

Cross-Over Based:



Diverging Intersection

Crossover Intersection

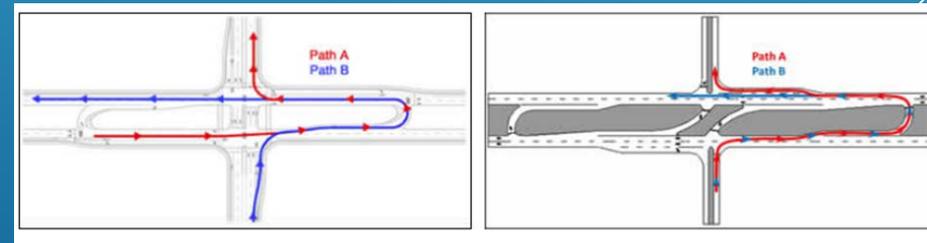
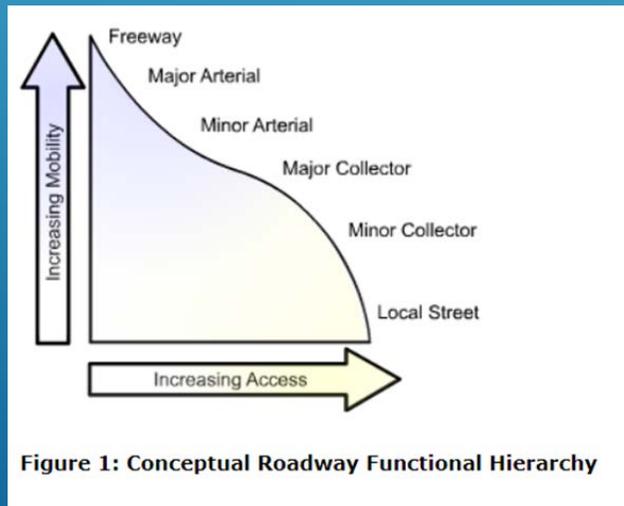
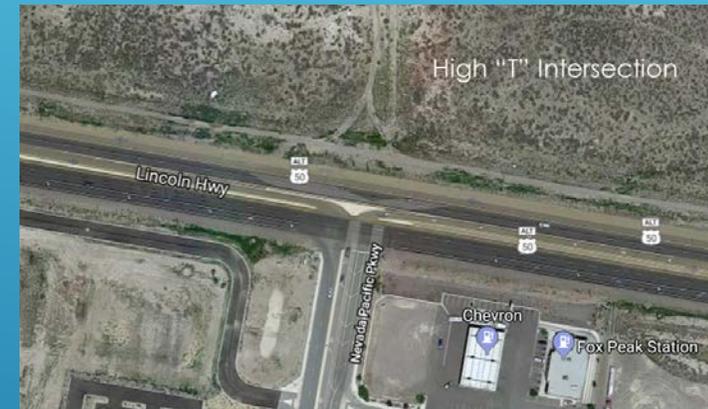


We need to work together on what works for us!

Discussions:

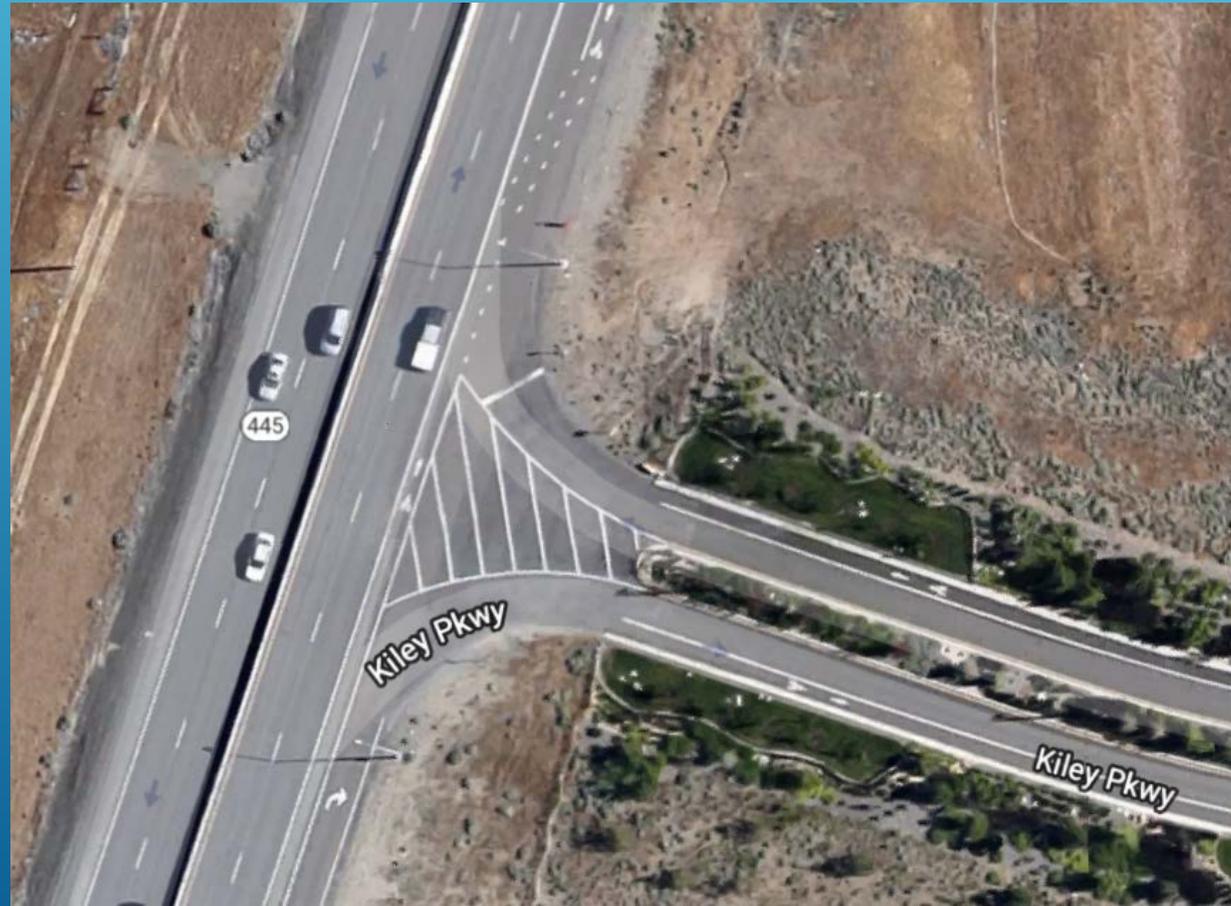
U-Turn Based Solutions

Cross-over Based Solutions



Pyramid Highway (SR 445)

Dolores Drive to La Posada Drive



Master Plan

Pyramid Highway Corridor Management Plan



Prepared for
Regional Transportation Commission

October 2001

CH2MHILL

Interim access control measures will be required as the Pyramid Highway transitions from highway to freeway. Interim access control shall adhere to the RTC's 2030 RTP *Daily LOS Thresholds for Roadway Planning*. Specific measures to be implemented include signal spacing at not less than ½-mile intervals, the construction of a raised median, and restrictions on turning movements and points of access. In the 2030 RTP, the Pyramid Highway, between McCarran Boulevard and Calle De La Plata Drive, is classified under "Facility Type" as "Arterial (high access control)". The access management information is reproduced in Table 2-4, the full document may be obtained from the RTC.

Additionally, the staffs of the Cities of Reno and Sparks, Washoe County, NDOT, and RTC should meet to review the vision for the Pyramid Highway and to coordinate and protect

\\SNOWBIRD\PROJ\148692\FINAL PYRAMID MASTER PLAN OCT 2001\PYRAMID FINAL REPORT_OCT 2001.DOC

2-24

PYRAMID CORRIDOR MANAGEMENT PLAN

the corridor from excessive access permits onto Pyramid Highway. They will also be tasked with developing a transition plan for converting the Pyramid Highway into a freeway with full control of access.

TABLE 2-4
Daily LOS Thresholds for Roadway Planning – Access Management

Facility Type	Recommended Access Management					
	Min. Signal Spacing	Median Type	Lt. From Major St.? (spacing from signal)	Lt. From Minor Street or Driveway	Rt. Decel. Lanes at Driveways	Driveway Spacing*
Arterial (high access control)	½ mile	raised with channelized turn pockets	yes (750' minimum)	only at signalized locations	yes**	250'/500'
Arterial (moderate access control)	¼ mile	raised or painted with turn pockets	yes (500' minimum)	not on 6 or 8 lane roadways w/o signal	yes***	200'/300'
Arterial (low access control)	1000'	painted turn pockets or two-way, left turn lane	yes (350' minimum)	yes	no	150'/200'
Collector	n/a	median optional	yes	yes	no	100'/100'

* spacing from signalized intersection/spacing from other driveways

** if they experience more than 30 inbound right-turn movements during peak hour

*** if they experience more than 60 inbound right-turn movements during peak hour

2.6 Bicycle and Pedestrian Facilities

Table 4-1: Access Spacing Standards

Roadway Class	Location/ Posted Speed Limit	Full Access		Limited Access	
		Signalized Intersection Uniform ¹ Spacing	Unsignalized Intersection/Roundabout Minimum ² Spacing	Left-in/Right-in/ Right-out only Minimum ² Spacing	Right-in/Right-out only ³ Minimum ² Spacing
1: Interstate Freeways	Urban/ Suburban/ Rural	<ul style="list-style-type: none"> • Full control of access • Access is available only via grade-separated interchanges • All interchanges must meet public road spacing (1 mile in urban, 2 miles in suburban, and 3 miles in rural areas) and comply with FHWA Policy 			
2: Other Freeways	Urban/ Suburban/ Rural	<ul style="list-style-type: none"> • Full control of access • Access is available only via grade-separated interchanges • All interchanges must meet public road spacing (1 mile in urban, 2 miles in suburban, and 3 miles in rural areas) • Access to federal aid freeways must comply with federal regulations 			
2: Expressways	≤ 55 mph	5,280'		5,280'	1,320'
	≥ 60 mph	10,560'			
3: Other Principal Arterials	≤ 35 mph	1,320'		660'	350'
	40-55 mph	2,640'	1,320'	990'	660'
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4: Minor Arterials	≤ 35 mph	1,320'		660'	300'
	≥ 40 mph	2,640'	1,320'		350' – 600'
5: Major Collectors	≤ 35 mph	1,320'		440'	250'
	≥ 40 mph	2,640'	1,320'	660'	300' – 500'

Final Environmental Impact Statement and Section 4(f) Evaluation

FHWA-NV-EIS-12-02-F

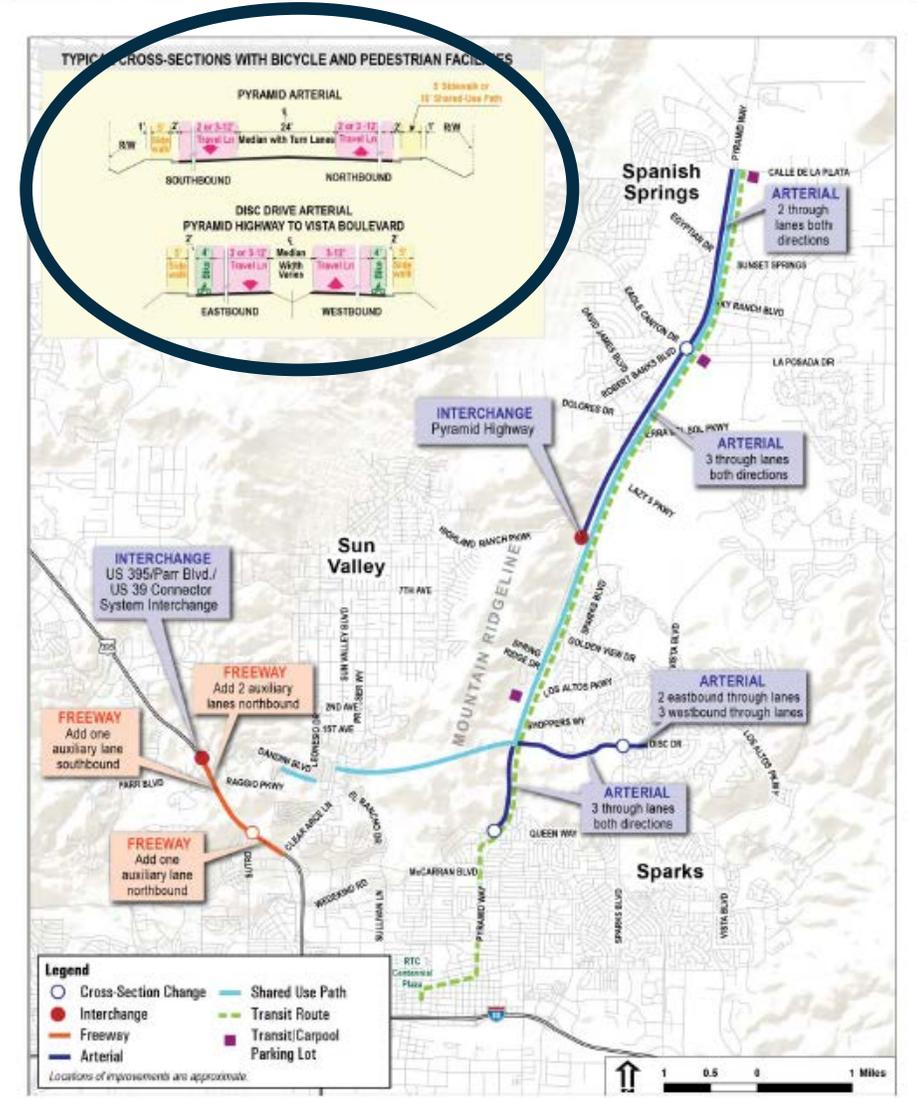
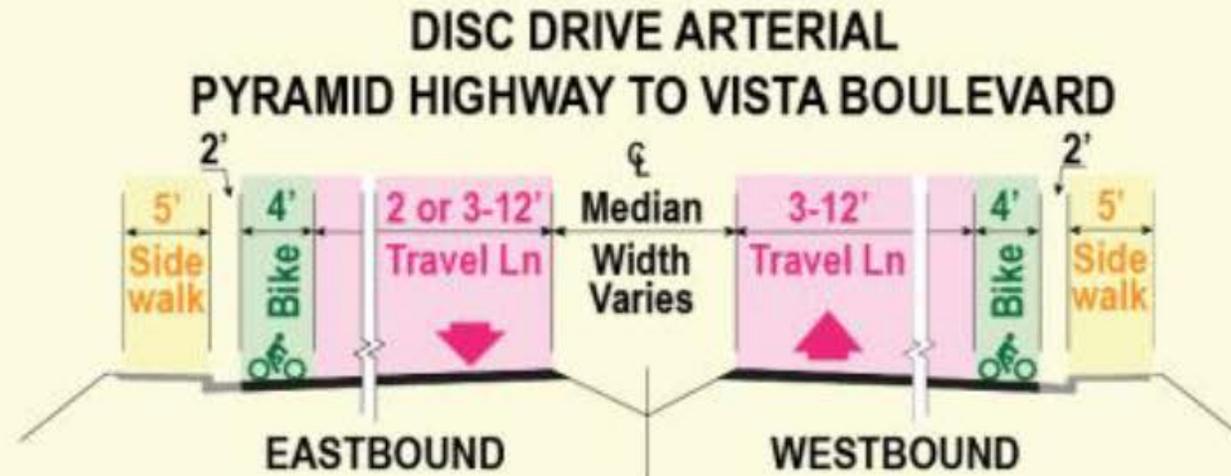
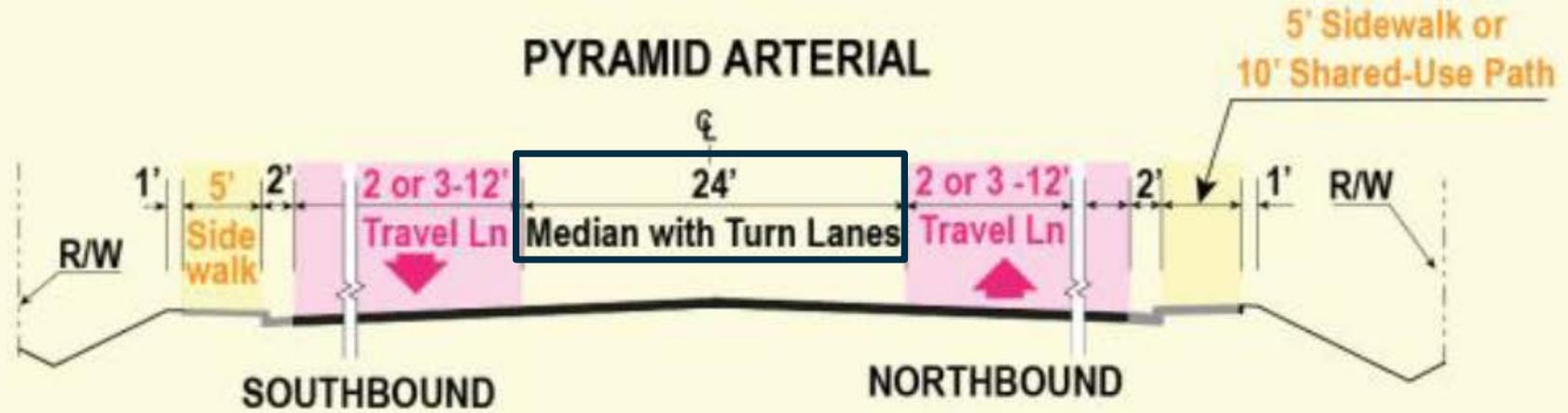


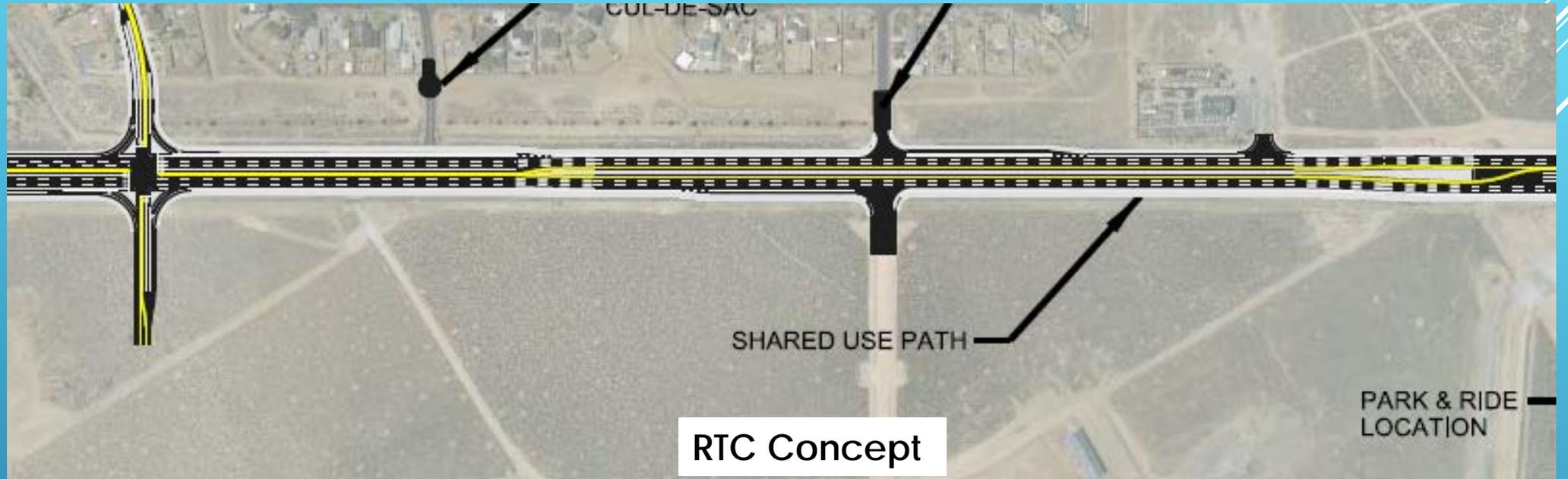
Figure 2-10. Elements Common to All Arterial Alternatives

TYPICAL CROSS-SECTIONS WITH BICYCLE AND PEDESTRIAN FACILITIES





Sample Arterial Highway With AADT 46,000 vpd in 2018 w/55 mph Speed Limit



SR 445 Pyramid Highway 2018 AADT 35,000 (current speed limit 55 mph)
Estimated 2040 AADT ~ 45,000 vpd