

# Snowflake/Taylor Multijurisdictional Transportation Plan

## Final Report: APPENDIX A – CONCEPT ALIGNMENTS

Prepared for:



**Town of Snowflake, Arizona**  
81 West 1<sup>st</sup> South  
Snowflake, AZ 85937



**Town of Taylor, Arizona**  
P.O. Box 158  
Taylor, AZ 85939



**Arizona Department of Transportation**  
Multi-Modal Planning Division  
206 S. 17<sup>th</sup> Avenue  
Phoenix, Arizona 85007

Prepared by:



**Wilson & Company, Inc., Engineers and Architects**  
410 N. 44<sup>th</sup> Street, Suite 460  
Phoenix, Arizona 85008

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## INTRODUCTION

This Snowflake-Taylor Multi-Jurisdictional Transportation Plan under the ADOT Planning Assistance for Rural Areas (PARA) will seek to define an optimal multi-modal transportation network that balances local and regional multi-modal transportation needs with available investment funds, while addressing environmental and area goals. This Plan will provide a common direction for the community, agencies and funding partners towards implementation of safe and efficient multi-modal mobility elements. Ultimately, this guiding document will provide direction for future infrastructure investments in both Snowflake and Taylor.

The Town of Snowflake and the Town of Taylor are primarily residential areas located in central Navajo County. These two communities host residents, businesses and land owners that are very passionate about where they live, the quality of life that they enjoy and the environment that surround them. Both towns are historic in nature, and are located in a pristine area of Arizona. The transportation system must work in conjunction with the varying environmental and cultural resources in the area, while protecting the long standing heritage that Snowflake and Taylor are known for.

## PROJECT OVERVIEW

Navajo County is located in northeastern Arizona. This region of the State includes one of Arizona's major destinations – the White Mountains. This area has historically experienced rapid population and employment growth. Snowflake and Taylor are located within the White Mountains and are preparing for future growth. This Plan will allow the Town of Snowflake and the Town of Taylor to better provide coordinated planning activities as they relate to transportation and future growth. This planning process will help to prioritize already identified future transportation corridors, establish probable alignments and identify right-of-way needs for future improvements. This document provides centerline probable alignments for the two Snowflake and Taylor to use for future planning purposes.

## TRANSPORTATION SYSTEM DEFINITION

The Long-Term Study Area roadway network is defined by the existing roadway system plus any improvements supported by authorized funding – committed improvements – and improvements identified in adopted plans that ultimately will be implemented. Improvements identified in adopted plans are considered, for purposes of this regional transportation plan, to be committed, because they have been identified and adopted/approved through a formal long-range planning process. Nevertheless, it is not certain the planned improvements will be implemented nor is the precise timing of implementation known. The Existing plus Committed roadway network provides the basis for examining the future adequacy of the primary transportation facilities in the Study Area and identifying potential deficiencies based on the anticipated travel demands from the forecasted socioeconomic conditions. No additional roadways beyond those that are already constructed will be included in the Existing plus Committed roadway network. The principal components of the existing plus committed roadway system are described in the following sections.

## ROADWAY FUNCTIONAL CLASSIFICATION

Roads are classified according to specific design and traffic characteristics. The functional classification process categorizes roads by how they perform in regard to providing access and mobility within the

community. A principal arterial, for example, typically provides mobility for longer distance trips with higher speeds and less access to adjoining properties. Conversely, the function of a local street is to provide direct access to neighborhoods with lower speeds. The Sub-Region's roadway network includes four roadway functional classifications.

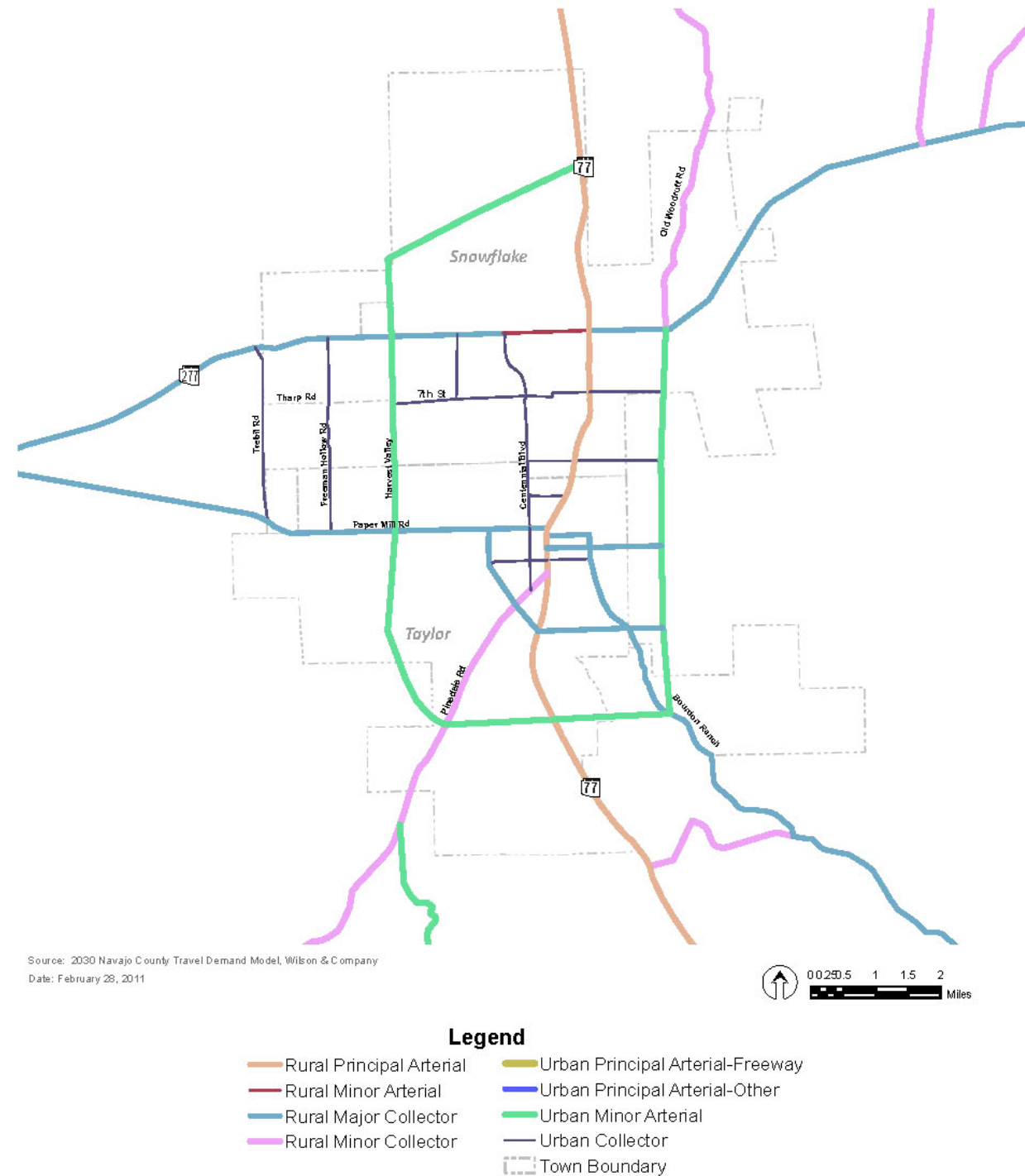
- **Principal Arterial:** This facility serves regional circulation needs. It moves traffic at moderate speeds while providing limited access to adjacent land. Access is controlled through raised medians and through spacing and location of driveways and intersections. In the Sub-Region, a principal arterial is a two- or four-lane state highway.
- **Minor Arterial:** The general purpose of a Minor Arterial is to serve regional/sub-regional traffic circulation needs by moving traffic at moderate speeds, while providing limited access to adjacent land. Access to minor arterial streets is limited to intersections at quarter-mile spacing and to driveways of major developments, such as large commercial, industrial, or office complexes, or master-planned communities. On-street parking is not allowed.
- **Major Collector:** This class of roadway provides for shorter distance trips, generally less than three miles, and primarily serves to collect and distribute traffic between key traffic generators, local streets, and arterial streets. Design guidelines for this roadway classification provide for direct access to abutting land. Access to major collector streets is limited to intersections at eighth-mile spacing and to driveways to adjacent developments. All vehicles entering the traffic stream must be driving forward; no backing into traffic is allowed. On-street parking is not allowed.
- **Minor Collector:** Minor Collectors serve shorter distance trips than the Major Collector, generally less than one mile. This class of roadway provides direct access to adjacent land and collects and distributes traffic between key traffic generators, local streets, and arterial streets. Access to Minor Collector streets should be restricted except for large contiguous lots.

Figure A-1 depicts the long-term functional classification of roadways serving as a build-out network. This reflects the needs identified in the Future Land Use Plans/Development Plans for Snowflake and Taylor. As illustrated, the state highways and proposed roadways that surround the communities are shown as Principal Arterial and Minor Arterial roadways. Harvest Valley Road in Taylor, also known as Porter Road in Snowflake, is proposed to be upgraded to a Minor Arterial roadway. This is very significant as it provides an additional higher capacity north/south oriented roadway to serve local community travel needs, compliment the capacity of SR-77 and potentially reduce the travel demand at the SR-77/SR-277 intersection.

As the Future Land Use Plans are refined, and as the communities actively anticipate activities associated with the proposed Aztec developments in the immediate vicinity, additional roadways providing connectivity to SR-277 and SR-77 will be planned. These new roadways may provide additional refinements to those future roadways in this Plan. As such, ultimately the transportation system and the proposed area land uses must coincide with each other so that roadway functional classification properly accommodates the type and amount of traffic from future proposed development plans.

Within Snowflake and Taylor, most of the roadways are two-lanes and undivided. Two-lane, undivided roadways typically have the lowest capacities due to left-turn movements. A key point in Table A-2.1 is the difference in capacity between a major collector two-lane roadway with a continuous two-way left-turn lane and a four-lane roadway without any left-turn lanes. The capacities are very similar due to the inside lanes of the four-lane roadway typically being used as a left-turn lane. Where there are several driveway accesses, a four-lane roadway can lead to increased safety and capacity issues.

Figure A-1 Long-Term Roadway Functional Classification



The capacities presented in Table A.1 were used to calculate future year roadway segment volume-to-capacity ratios. The computed volume-to-capacity ratios identifies those roadway segments that are anticipated to have congestion issues due to the roadway not having enough capacity to meet the anticipated travel demands either borne from surrounding land uses or the roadway functioning as a through route for regional travel.

Table A.1 Roadway Capacity Guidelines

Functional Classification	Number of Lanes	Divided/Undivided	Left-Turn Lane	Description	Capacity Threshold (LOS D)
Principal Arterial	2	Undivided	Yes	State Class 1	15,500
	4	Undivided	No	Arterials	23,940
	4	Divided	Yes		34,200
	6	Divided	Yes		51,400
Minor Arterial	2	Undivided	No	State Class 2	11,600
	2	Undivided	Yes	Arterials	14,500
	4	Undivided	No		22,900
	4	Divided	Yes		30,600
Major Collector	2	Undivided	No		10,800
	2	Undivided	Yes		13,600
	3	Continuous LTL	Yes		15,000
	4	Undivided	No		15,200
Minor Collector	2	Undivided	No		7,500
	2	Undivided	Yes		9,400
	3	Continuous LTL	Yes		12,000

Source: Florida Department of Transportation *Quality Level of Service Handbook*, 2002

### ROADWAY CROSS SECTIONS

Roadway cross sections provide the framework for a community to understand how to move people from their travel origins to their destinations. Several factors are balanced when developing cross sections to best manage future traffic demand based on existing and future land uses. Typical factors will include:

- Amount of traffic (high volume versus low volume)
- Type of traffic (large vehicles, heavy vehicles, buses)
- Level of pedestrian activity
- Level of bicyclist activity
- Density of driveways
- Turning traffic volume (driveways, street intersections, offset versus aligned intersections)
- Surrounding land uses (schools, residential, industrial, commercial)
- Regional mobility corridors (through route, established bicycle route, snow route)

In communities across the nation, transportation system investments have strived to better accommodate multiple travel modes. Whether it is providing sidewalks for pedestrians, shared-use paths or shoulders for bicyclists, wide outside travel lanes to allow a safe area for cyclists to ride either in the shoulder or in a signed bicycle lane, bus pull-outs for transit stops or trails for equestrians, communities are making the investments to provide safe mobility options to their residents, employers and visitors.

Each proposed cross section includes a shared-use path that would be wide enough for more than two people to walk side-by-side, bicycle use and/or equestrian use. The path could be constructed with material other than concrete or asphalt. Each cross section also includes a detached sidewalk that is at least 5-feet wide, and is separated from the roadway by at least 5 feet as indicated in the ADOT *Roadway Design Guidelines*. All sidewalks would be constructed of either concrete or asphalt material. Detaching the sidewalk and path from the curb and gutter can offer several advantages, including:

- Increased safety for the pedestrian;
- Lower cost for maintenance since the sidewalk and curb/gutter are not monolithic;
- Pedestrians would potentially not be impacted by roadway and curb/gutter maintenance activities;
- Improved ability to maintain sidewalk use during/after a snow event because plowed snow would have a lower chance of building up on the detached sidewalk; and
- Improved ADA accessibility, particularly during roadway maintenance activities.

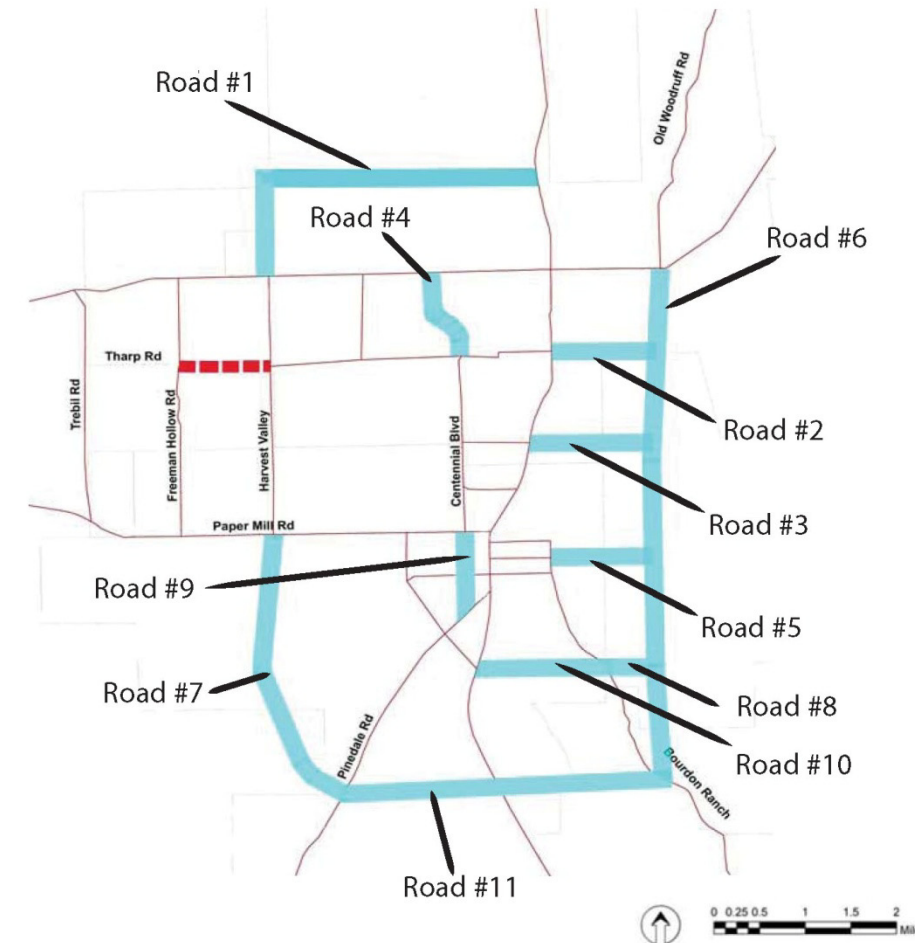
Each proposed cross section includes a wide outside travel lane or paved shoulder for bicycle use. The ADOT *Bicycle Policy* states:

"Provide shared roadway cross-section templates as a minimum condition with new major construction and major reconstruction projects, regardless of the presence of a shared use path" where "shared roadway" is defined as "a roadway which is open to both bicycle and motor vehicle travel. This may be an existing roadway, street with wide curb lanes, or road with paved shoulders," and "Consider, as a part of major new construction and major reconstruction in urban areas, wide curb lanes up to 15 ft in width (exclusive of gutter pan) and placement of a stripe at the vehicle lane edge where appropriate" (paragraph 1.e.).

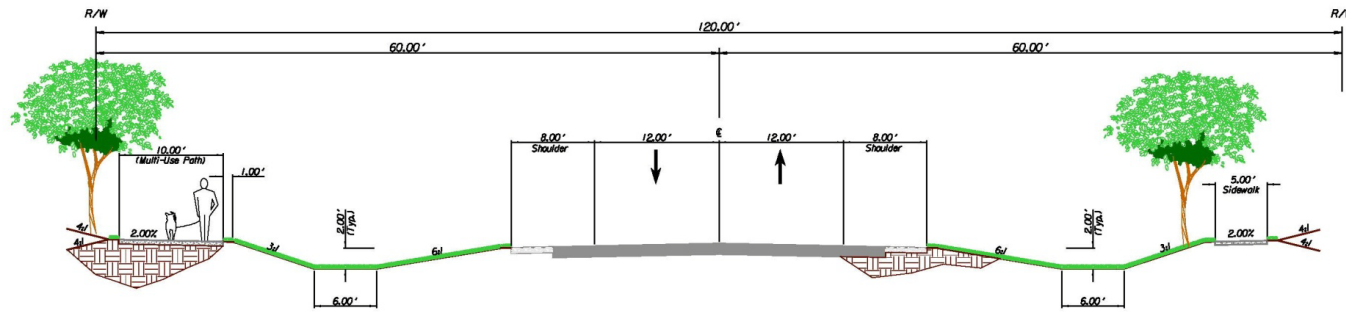
Conceptual cross section drawings were developed that integrated the above factors to represent the needs for the Functional Classifications.

The future roads illustrated as Figure A-2 are illustrative and conceptual future roadways for the Snowflake and Taylor area. Roads 1 through 11 were conceptually examined to determine a possible and probable alignment, and to determine a possible extent of impact and identification of structured roadway. The concept layouts are all conceptual in nature and do not identify a preferred alignment or actual alignment of a future roadway. The concept layouts were developed to identify fatal flaws of a future roadway alignment for planning purposes, and to illustrate the potential for future structure needs for spanning streams, washes and other known geographic elements. Future work efforts will be required to accurately design any future roadway. These illustrative roadway alignments are a first-step towards identifying probable alignments based on the limited topographic and environmental sensitivity information used in this study. As new development occurs, it is anticipated that the developer will work with the City to work towards a common goal of economic development coupled with a viable and safe transportation system. The cross sections below represent the anticipated right-of-way and improvement needed on the future roadways for the functional classifications illustrated in Figure A-1, A-2 and the detailed alignment figures for Road 1 through Road 11.

Figure A-2 Planned Road Connections



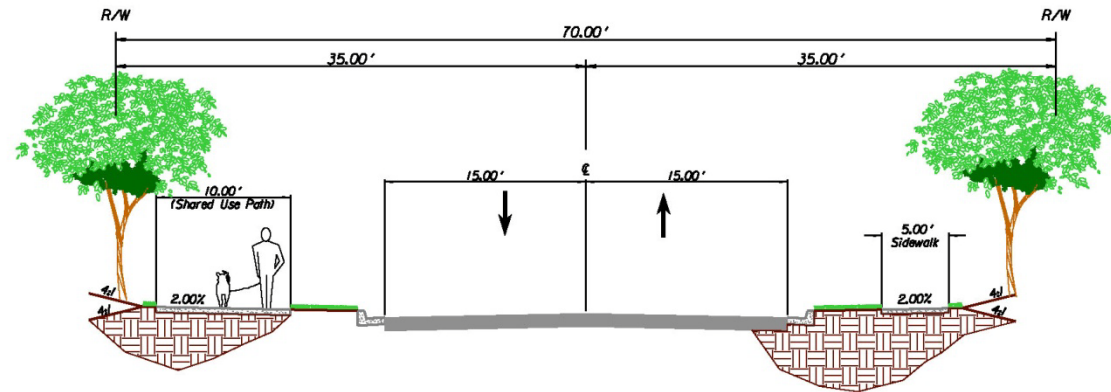
2-Lane Collector Roadway (rural section without curb and gutter)



Key Elements

- 2 travel lanes
- Turn lanes at intersections can be provided
- Single family residential driveways are not recommended
- Multi-family residential driveways are permitted
- Commercial driveways are permitted
- 5' sidewalks minimum
- Wide paved shoulder to accommodate bicycle use

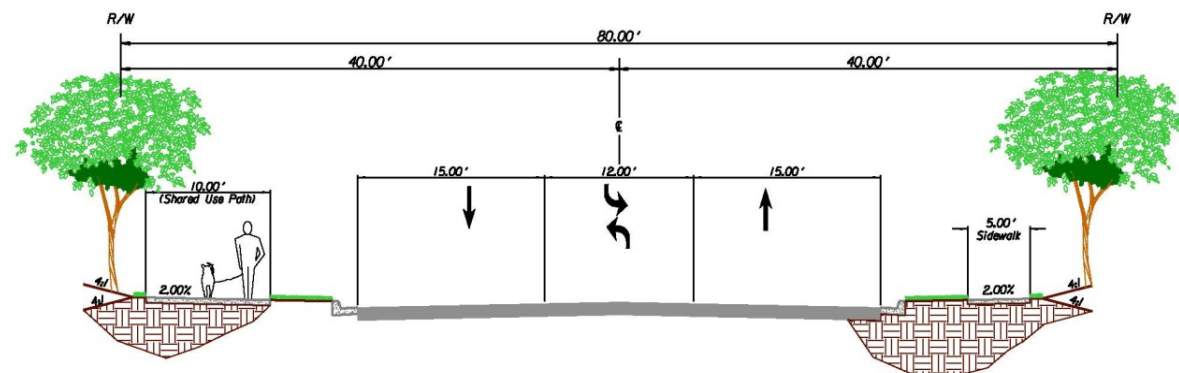
2-Lane Collector Roadway (Minor Collector)



Key Elements

- 2 travel lanes
- Turn lanes at intersections can be provided
- Single family residential driveways are not recommended
- Multi-family residential driveways are permitted
- Commercial driveways are permitted
- Minimum distances between accesses (this needs to be determined if not already in place)
- 5' sidewalks minimum
- Wide lanes to accommodate bicycle use

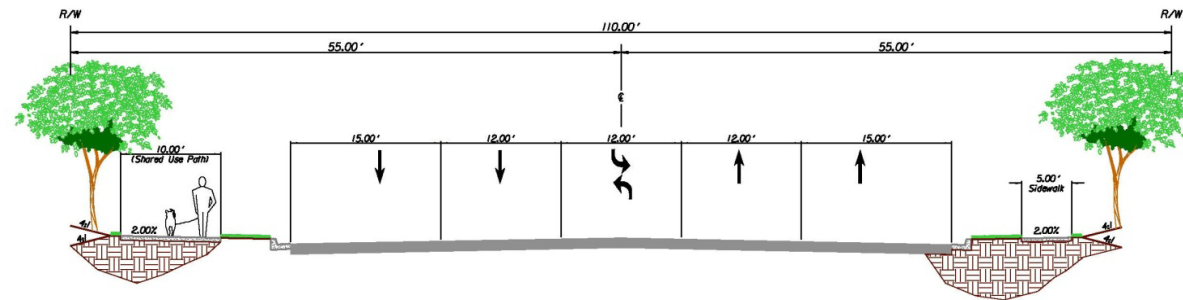
3-Lane Collector Roadway (includes center left-turn lane) (Major Collector)



Key Elements

- 2 travel lanes
- Left-turn lanes at intersections
- Continuous two-way left-turn lanes can be provided
- Right-turn lanes at intersections can be provided
- Parking is prohibited
- Residential driveways are not recommended
- Commercial driveways are permitted
- Cross access for commercial driveways is strongly encouraged
- Minimum distances between accesses (this needs to be determined if not already in place)
- 5' sidewalks minimum
- Wide outside lanes to accommodate bicycle use

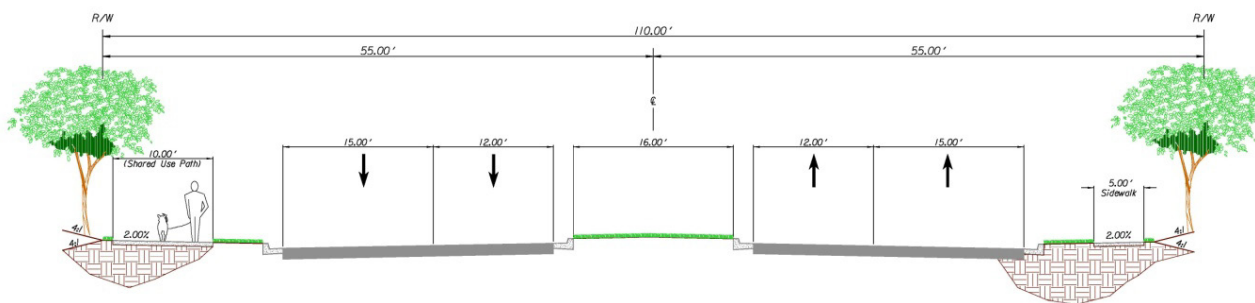
5-Lane Arterial Roadway (with center left-turn lane)



Key Elements

- 4 travel lanes
- Left-turn lanes at intersections
- Right-turn lanes at intersections
- Parking is prohibited
- Residential driveways are prohibited
- Commercial driveways are permitted
- Cross access for commercial driveways is strongly encouraged
- Minimum distances between accesses (this needs to be determined if not already in place)
- Traffic signals are permitted with spacing greater than 1320'
- 5' sidewalks minimum
- Wide outside lanes to accommodate bicycle use

4-Lane Arterial Roadway (with median)



Key Elements

- 4 travel lanes
- Left-turn lanes at intersections
- Right-turn lanes at intersections
- Right-turn auxiliary lanes are permitted
- Raised median
- Residential driveways are prohibited
- Parking is prohibited
- Commercial driveways are permitted
- Cross access for commercial driveways is strongly encouraged
- Minimum access distances are required (this needs to be developed if not already in place)
- Traffic signals are permitted with spacing greater than 1320'
- 5' sidewalks minimum
- Wide lanes to accommodate bicycle use