LOS ALAMOS COUNTY, NEW MEXICO

PLANNING AND ENGINEERING SERVICES

nm502

COMPREHENSIVE TRANSPORTATION STUDY AND PLAN FOR NM502

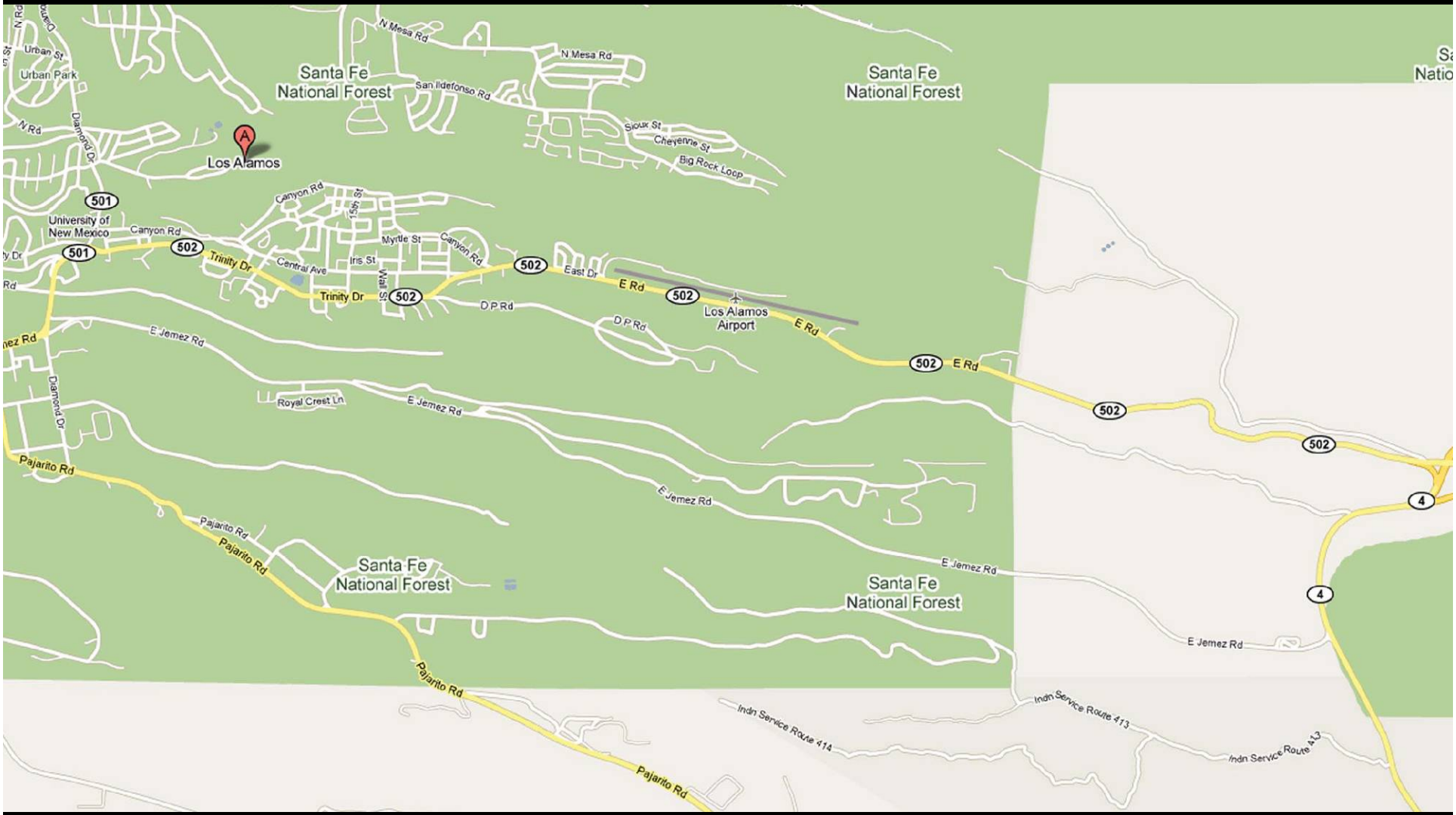
MIG

http://www.losalamosnm.us/projects/publicworks/Pages/NM502TrinityDriveCorridorStudy.aspx

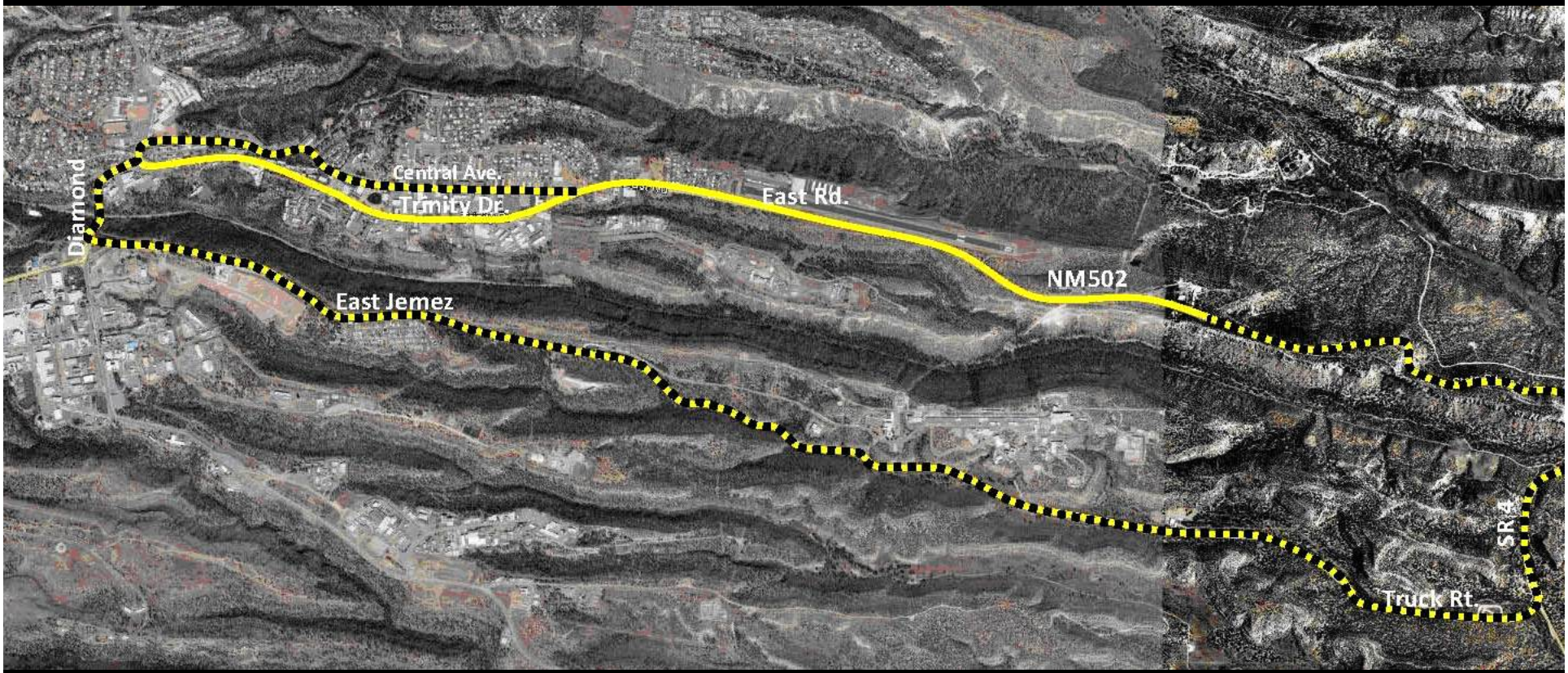
Project Goals

- Provide safety and comfort for all especially the most vulnerable such as children and the elderly within the public right of way.
- Improve modes of travel for all street users
- Support social and economic vitality in Los Alamos
- Work closely with business and residential community, stakeholders as well NMDoT
- Prepare schematic design for NMDoT to use for reconstruction of NM502 between Tewa Loop and Knecht Street

Regional Context



Local Context



Project Area

PLANNING PROCESS

Planning Process: Past & Current Efforts

Guiding Plans and Documents

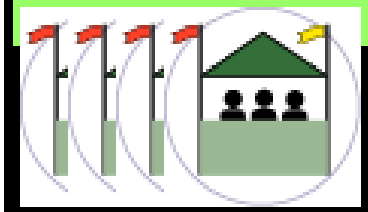
- Downtown Master Plan, 2002
- Transportation Plan Alternatives
- Revised Goals and Objectives for Downtown Streets, 2009
- Draft Federal Complete Streets Act, 2009
- Policies for the Design of Streets and Public Right-of Way, 2010

Concurrent Efforts

- NMDoT's NM502 Improvements (Tewa Loop to Knecht St) - 2012
- Various Development Projects Along Trinity

Planning Process: Current Process

Community Visioning & Focus Group



Sep 1-3, 2010

Oct 6, 2010

Preliminary Preferred Concepts Review

Nov 16, 2010

Jan 11-12, 2011

Refined Preferred Concept/s Review

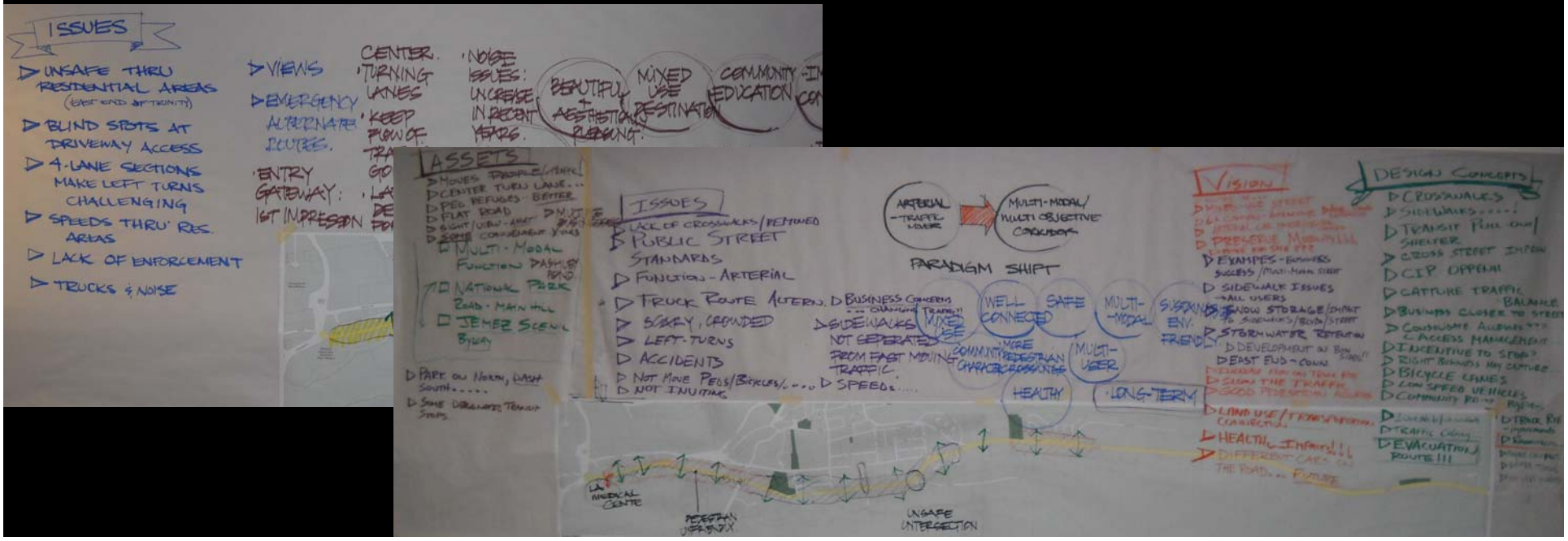
Jan 25, 2011

March 2011

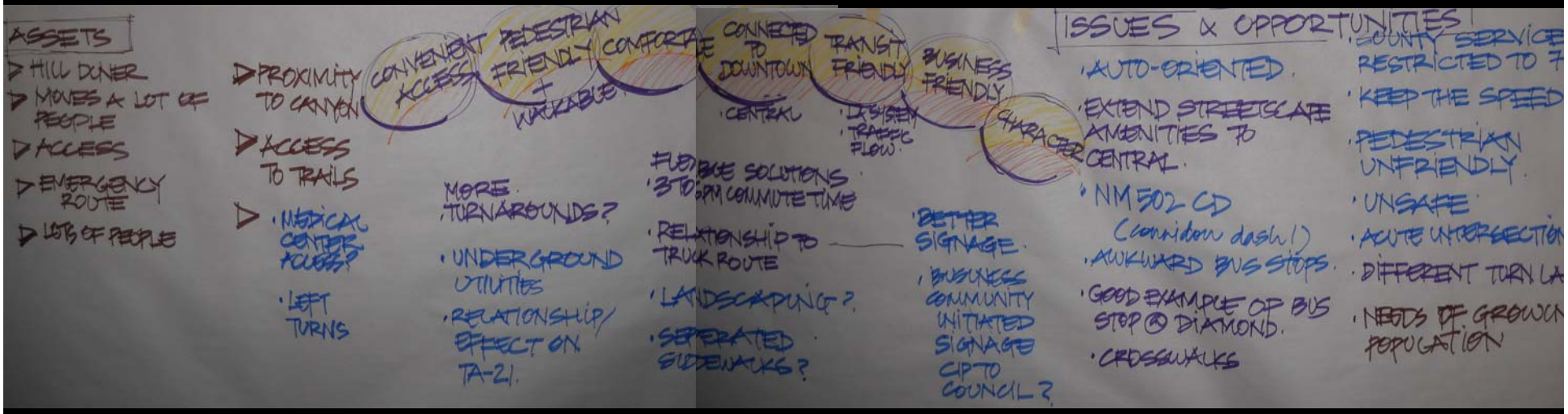
Final Report

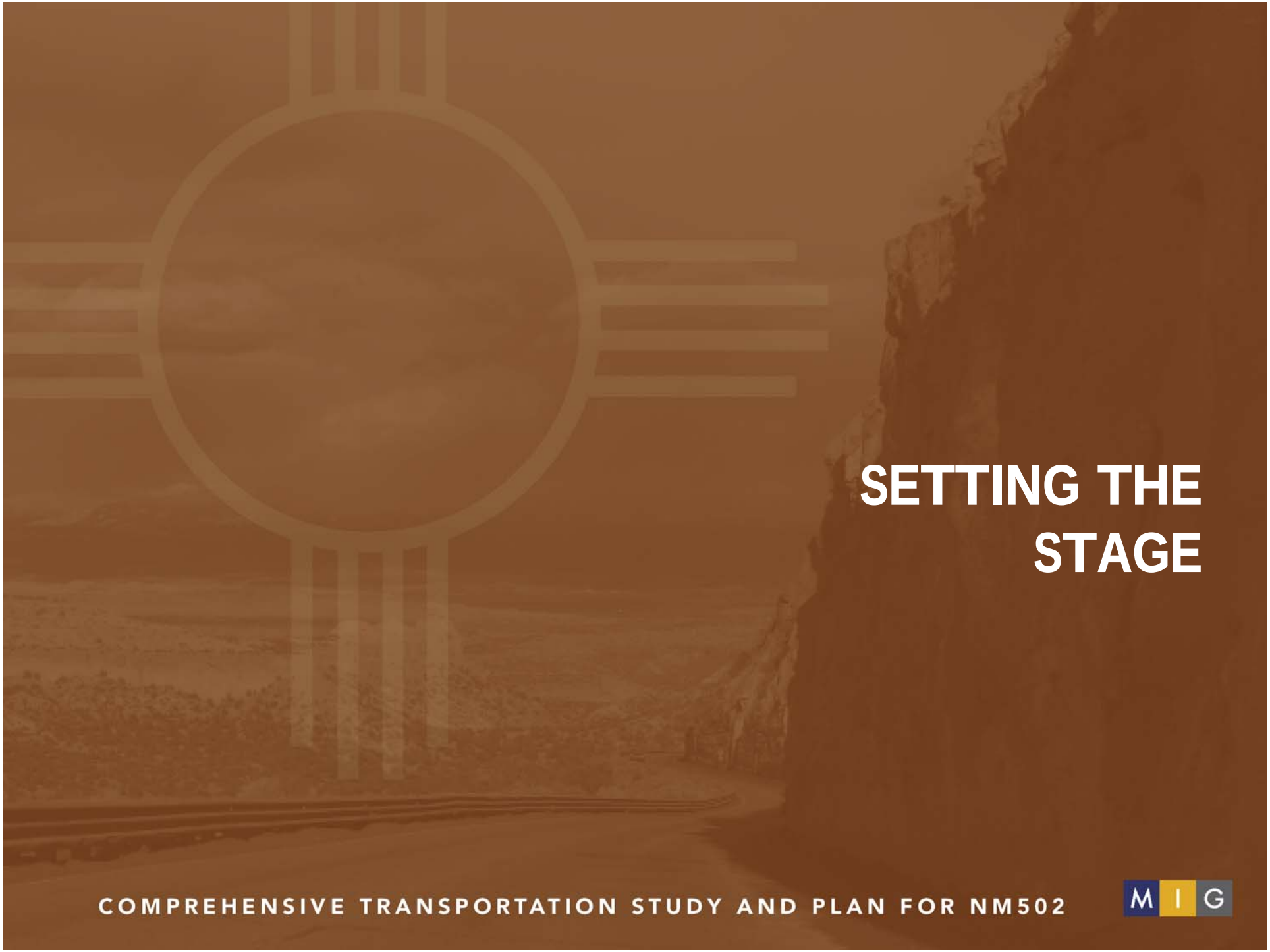
Summer 2011

Planning Process: Current Process



Planning Process: Current Process





SETTING THE STAGE

Natural Setting

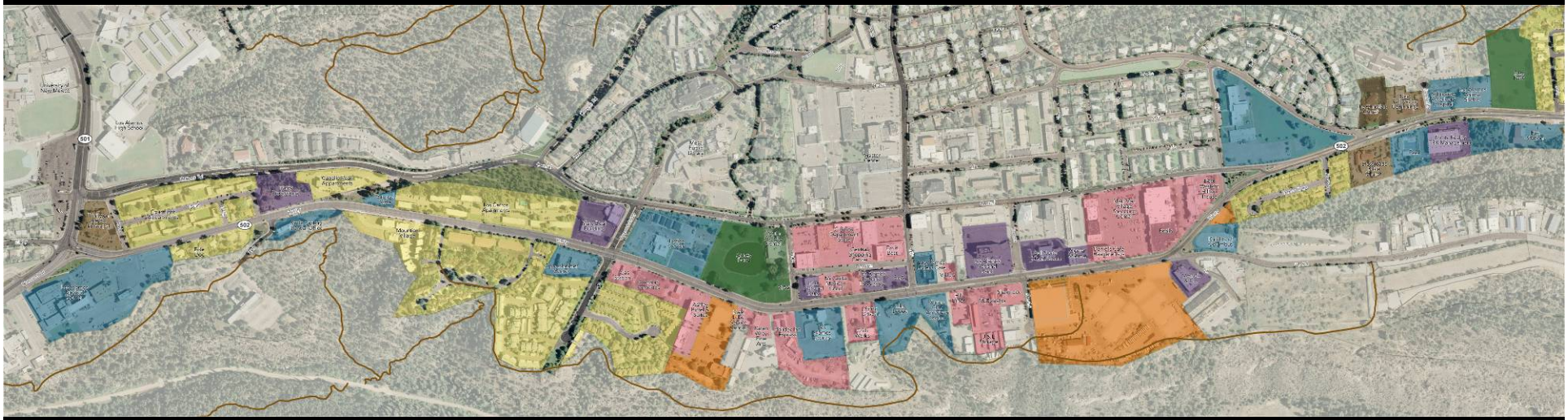
Views

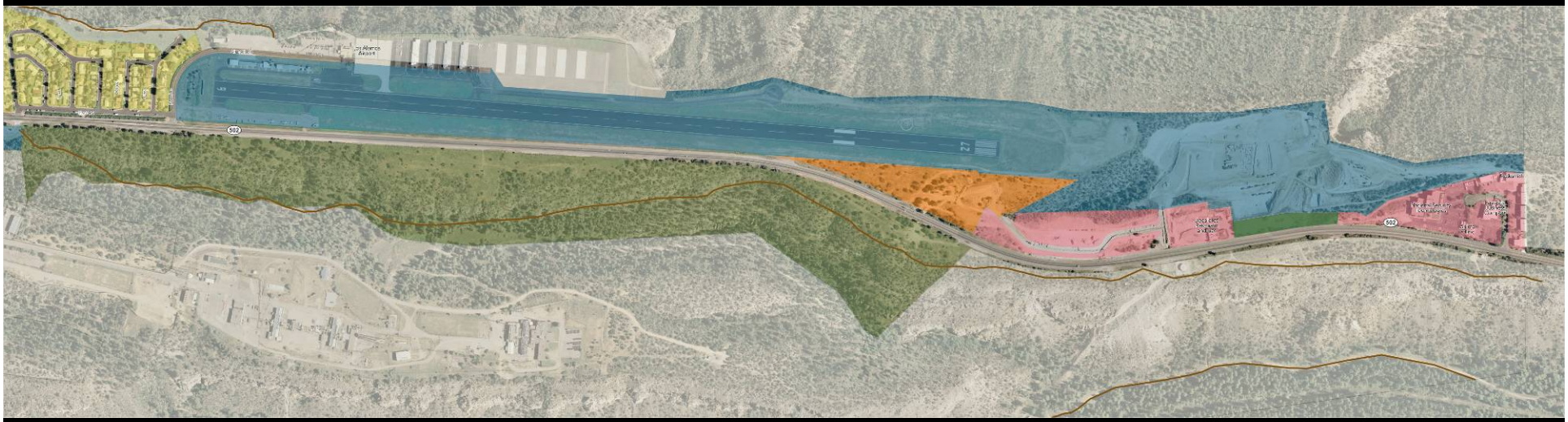
Diverse Mix of Uses

Diverse Mix of Uses

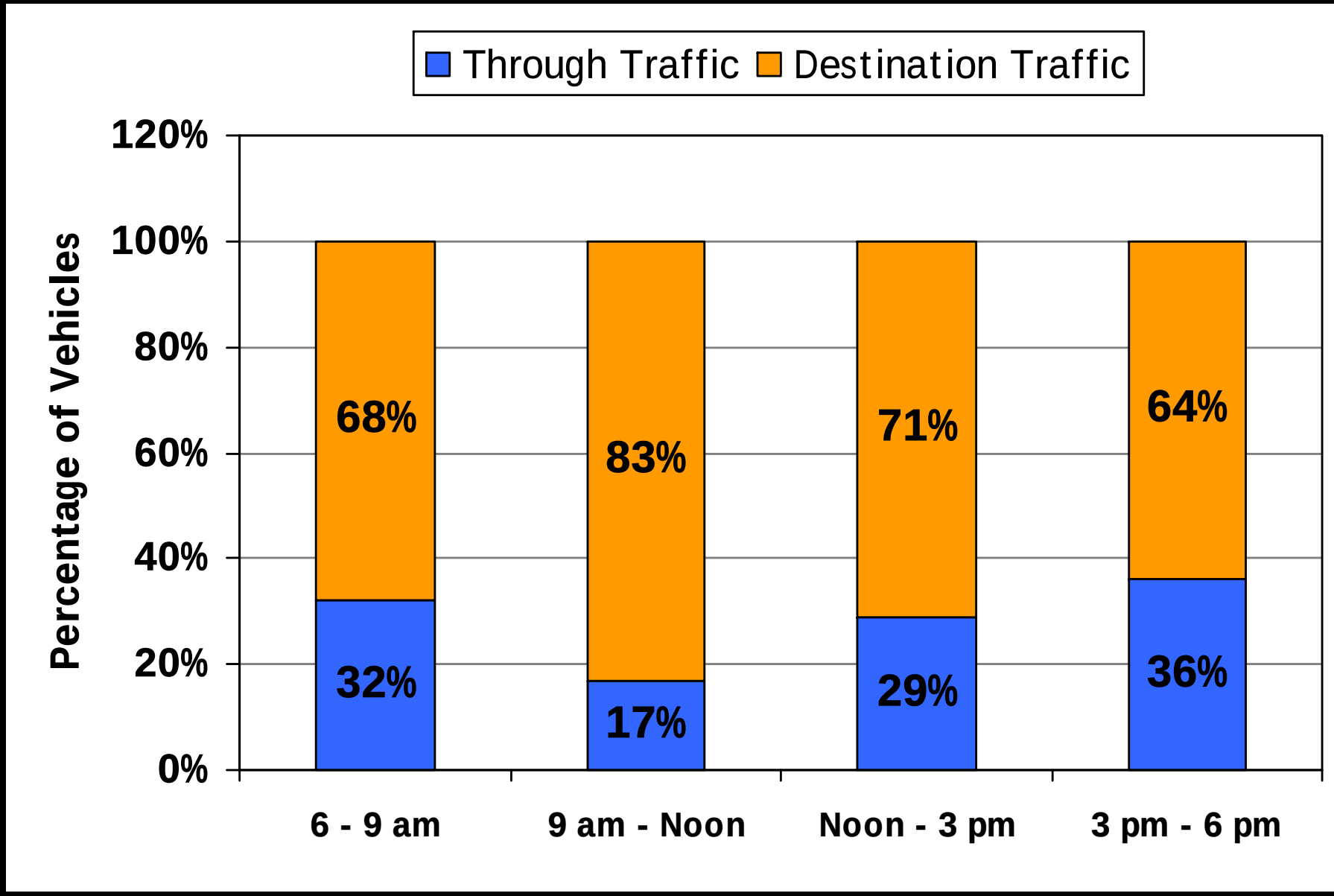
Diverse Mix of Uses

Diverse Mix of Uses

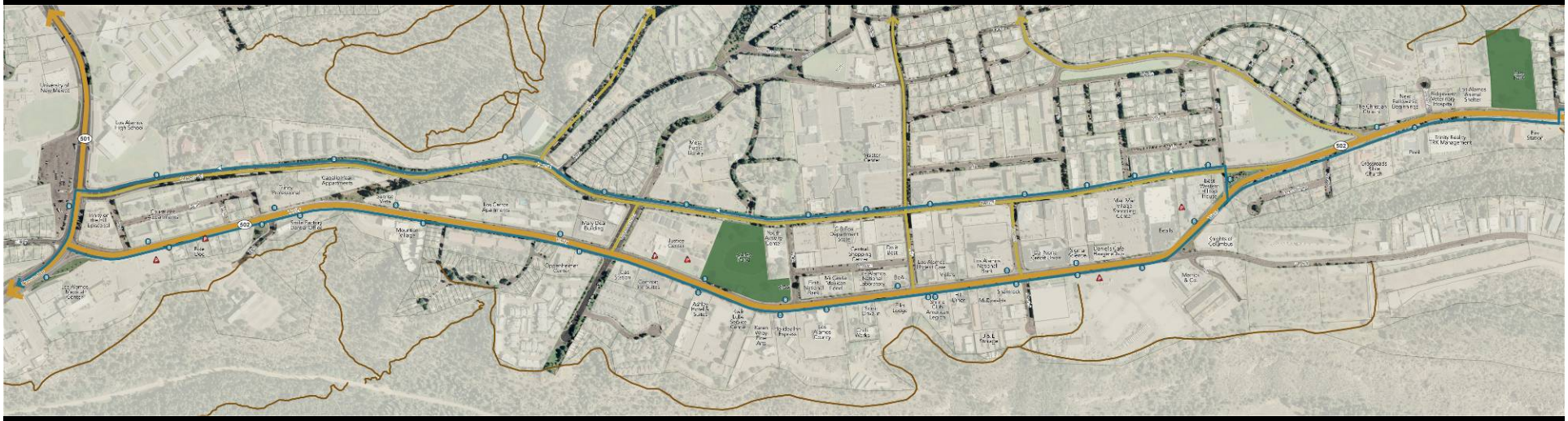




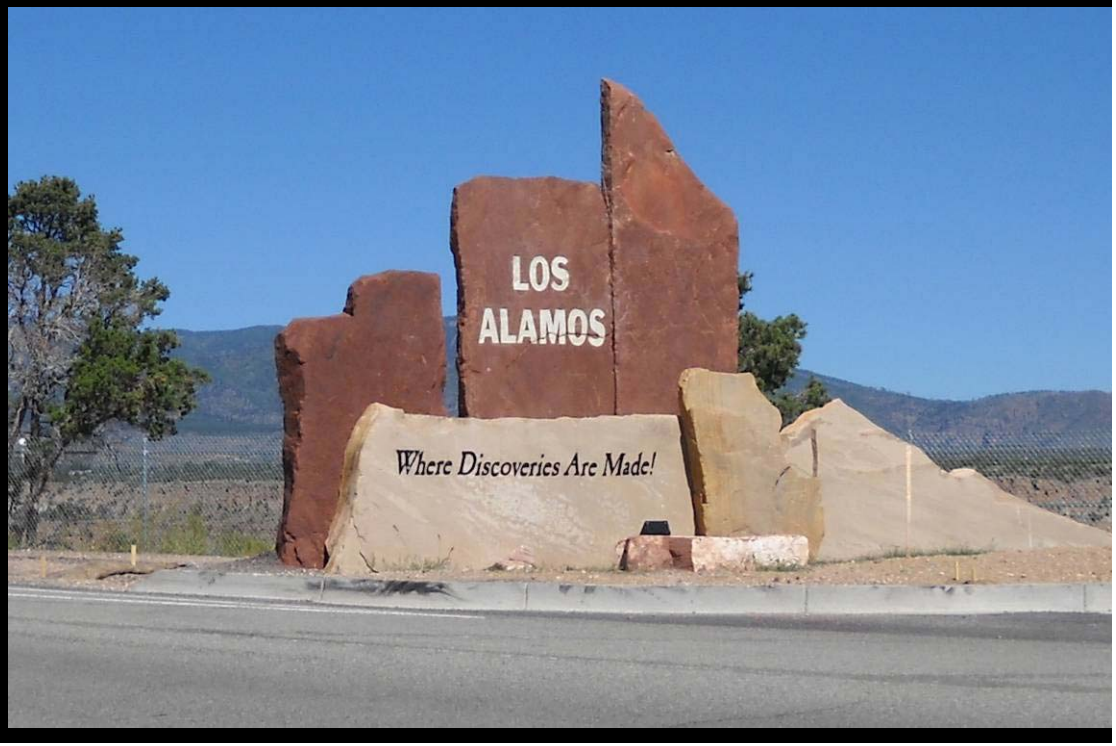
Diverse Mix of Uses



Multi-Modal Access



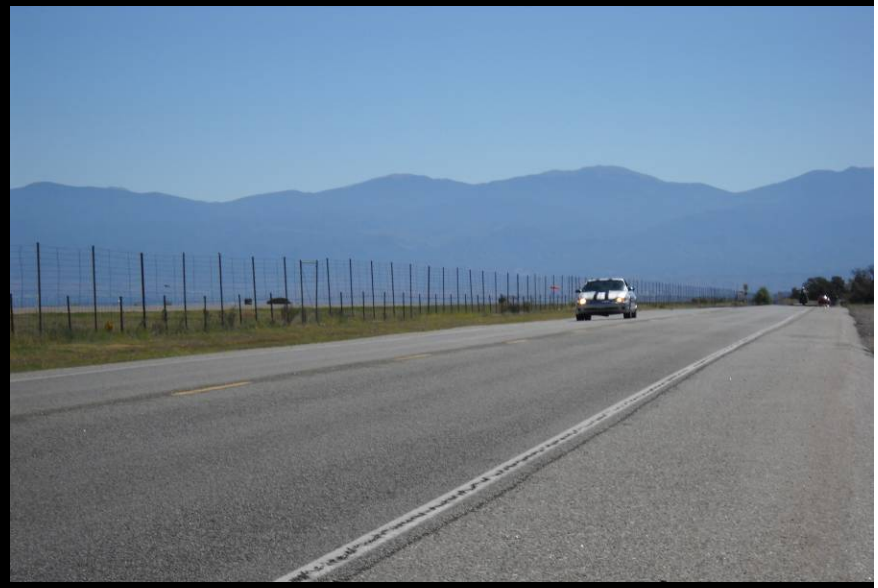
Multi-Modal Access & Gateway



Public Realm Environment

Connectivity - Pedestrian

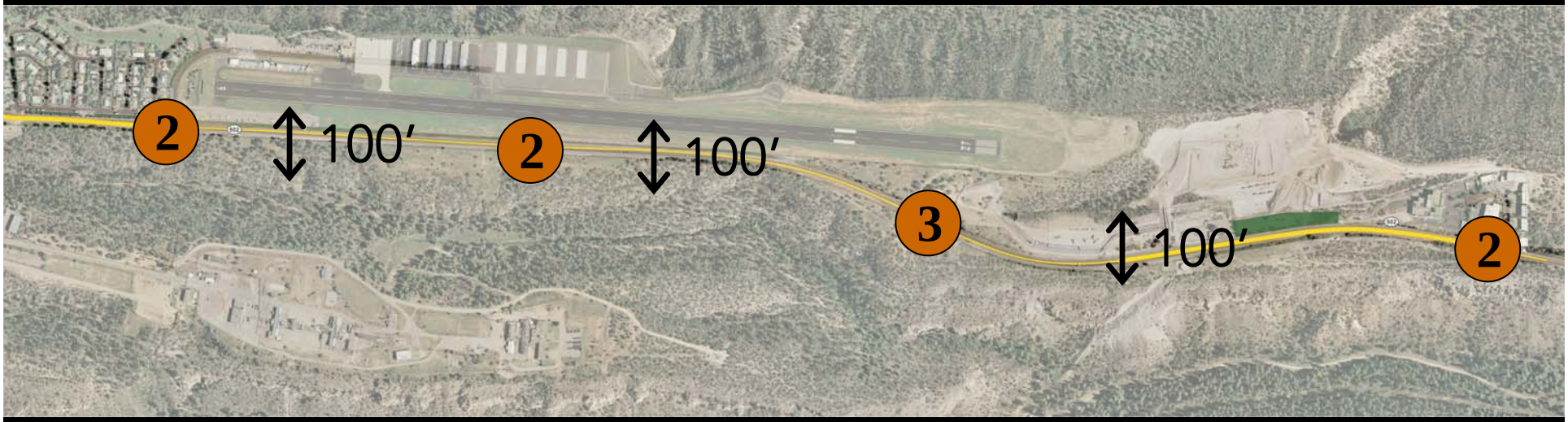
Overall Image & Identity



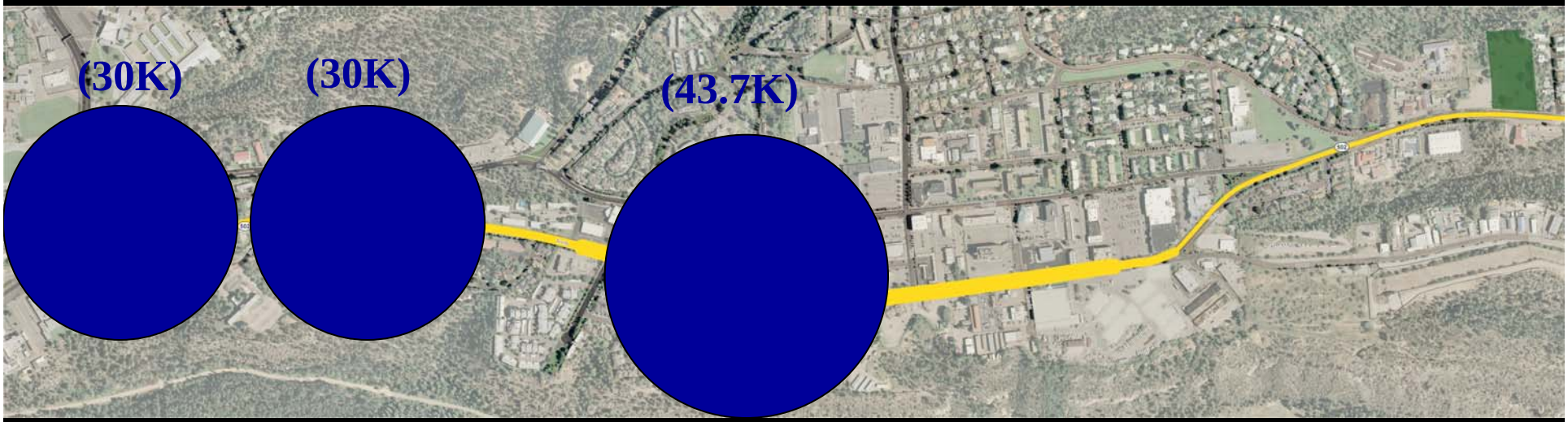
Recent & New Improvements

Planned Improvements

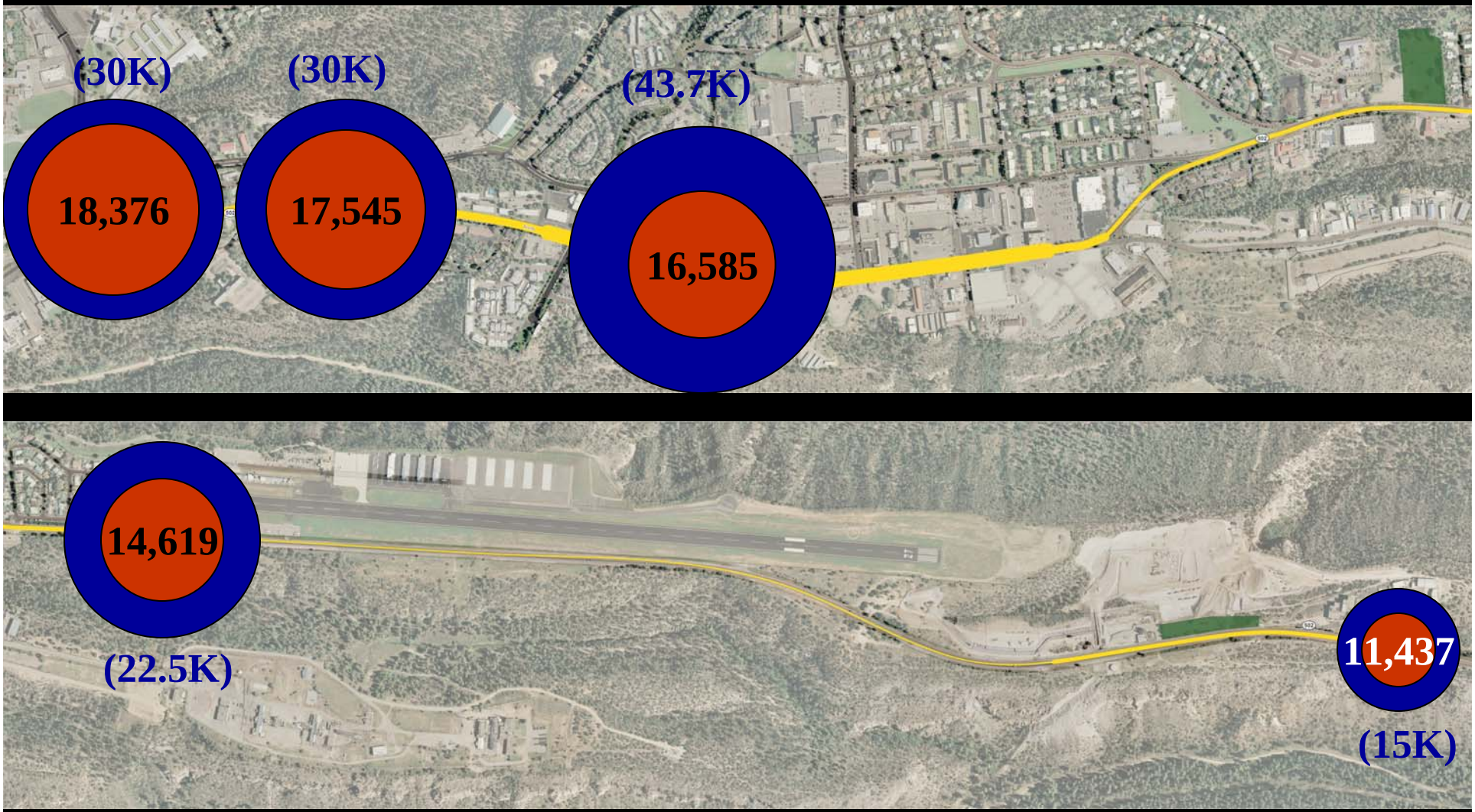
Traffic Flow – Number of Lanes



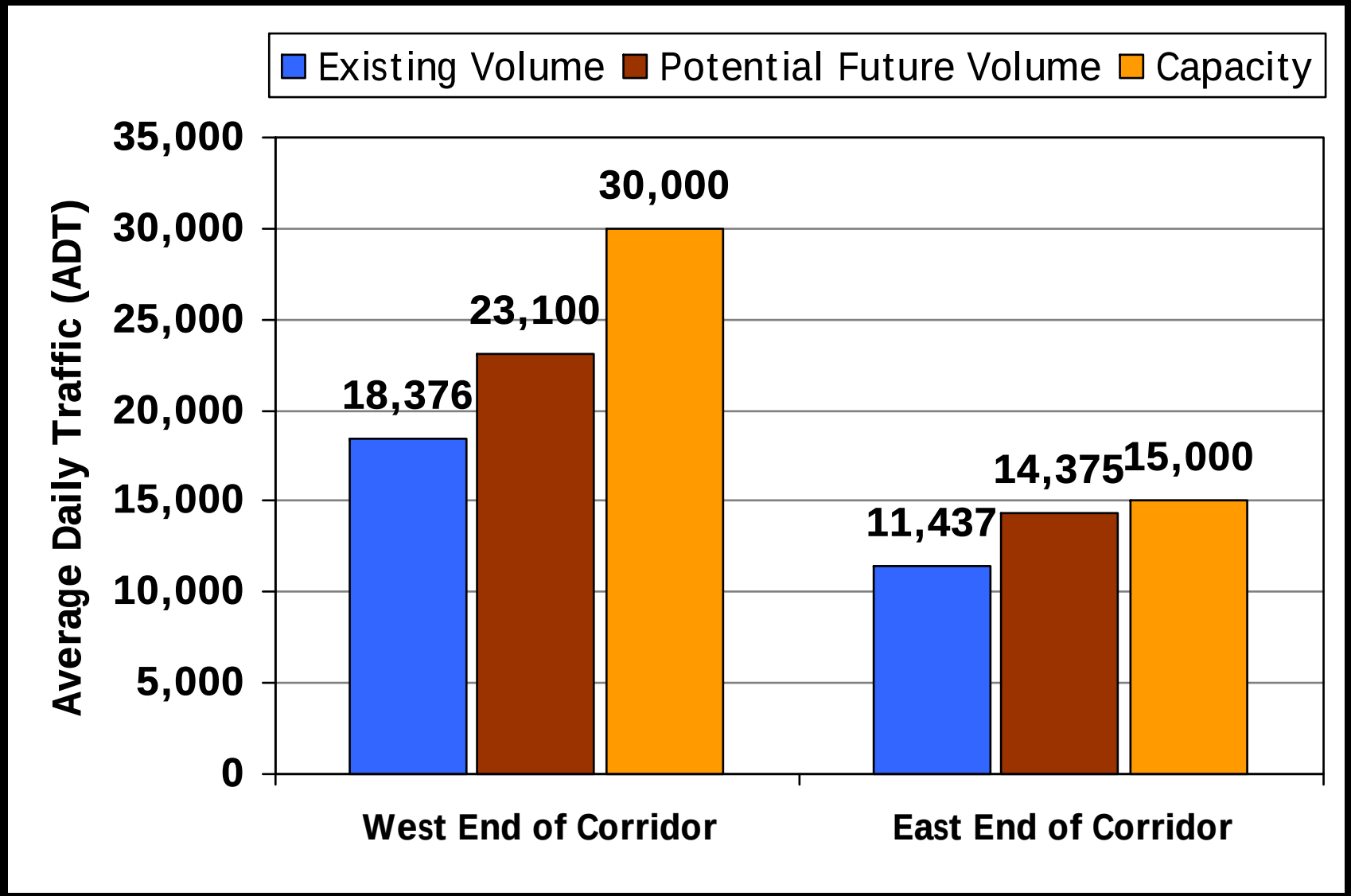
Traffic Volumes – Capacity



Traffic Volumes – Existing



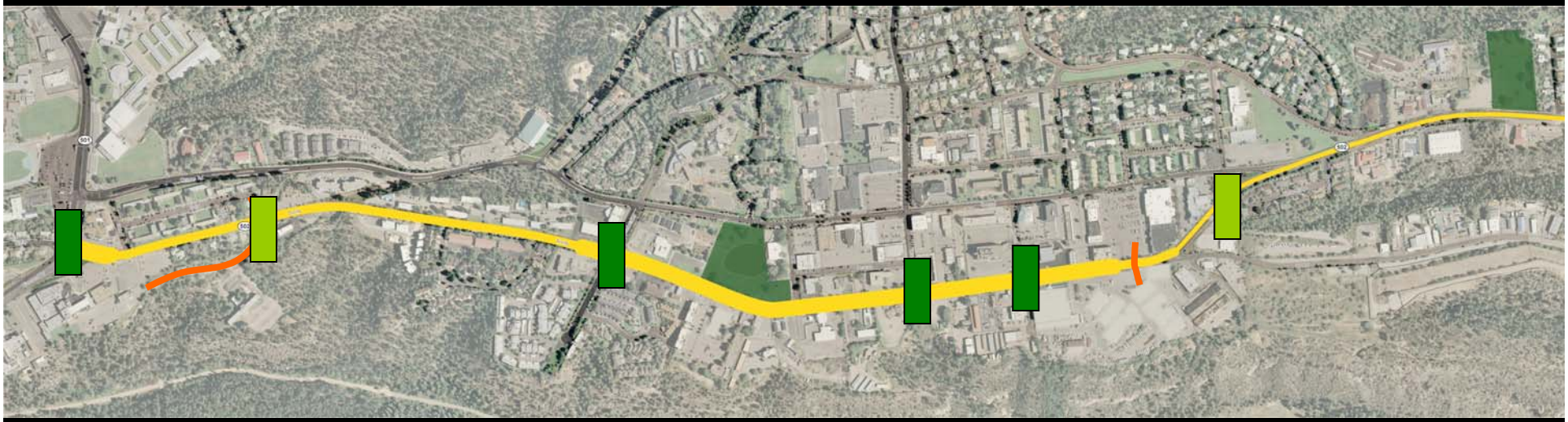
Volume and Capacity



Existing Levels of Service

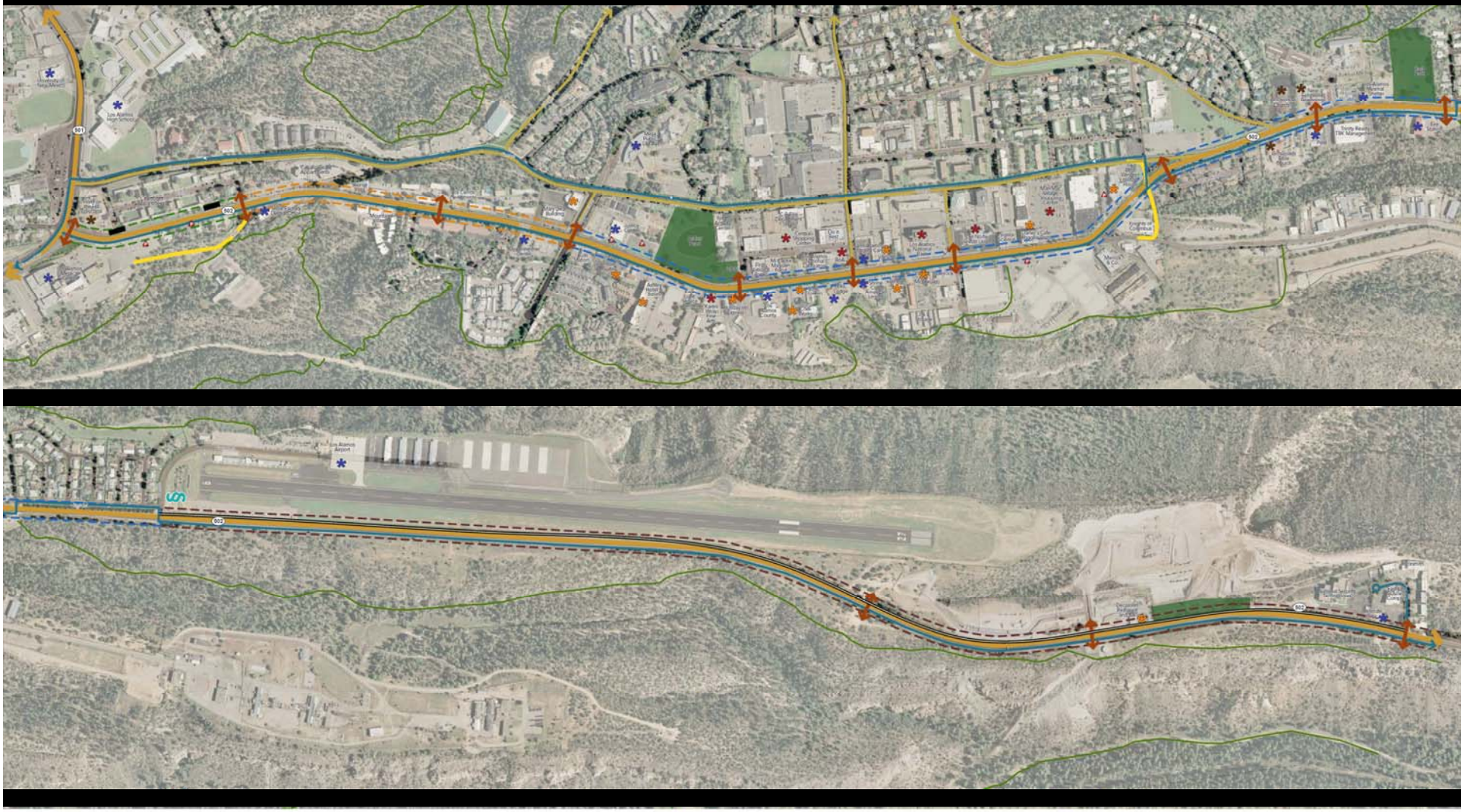
- Signalized intersections operate to acceptable standards
- Side street approaches do not
- Deterioration if growth in volume occurs

Existing and Potential Signalization



ALTERNATIVES ANALYSIS

Urban Design and Community Input



Residential and Business Community Desires:

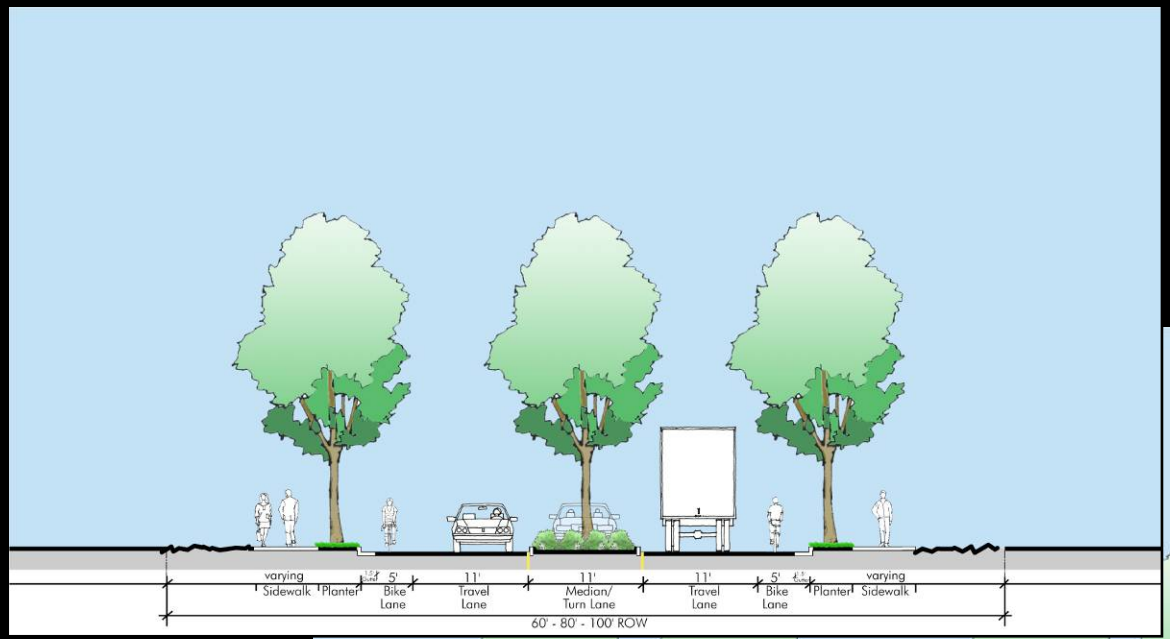
- Balance needs of all users
- Safer and easier ingress and egress for residents, businesses and hospital
- Better access to and from intersecting roadways
- Improved north and south connections to Central
- Gateways to a more connected downtown
- Contiguous sidewalks
- Safer pedestrian crossings
- More livable street (nicer to walk along, quieter, etc.)
- Beautification

Preliminary Design Alternatives

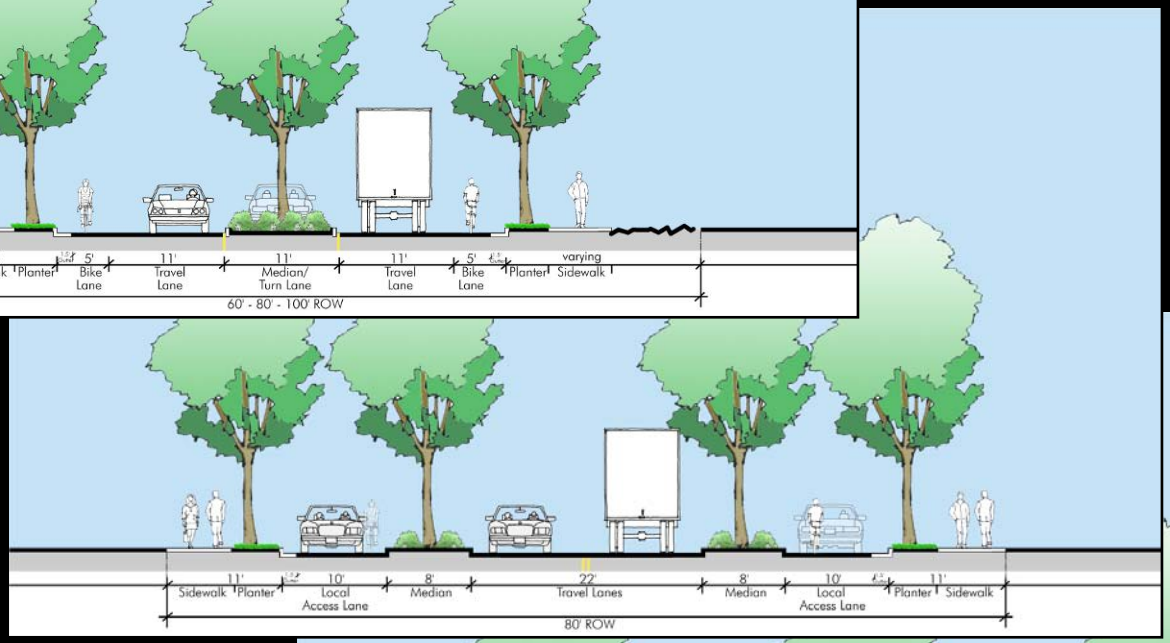
- Option A: Three Lane Typical Section
  - A1: Roundabouts throughout corridor
  - A2: Combination of roundabouts and signals
  - A3: A1 and/or A2 with left turn pockets
- Option B: Four Lane Typical Section
- Option C: Five Lane Typical Section

Design Alternatives

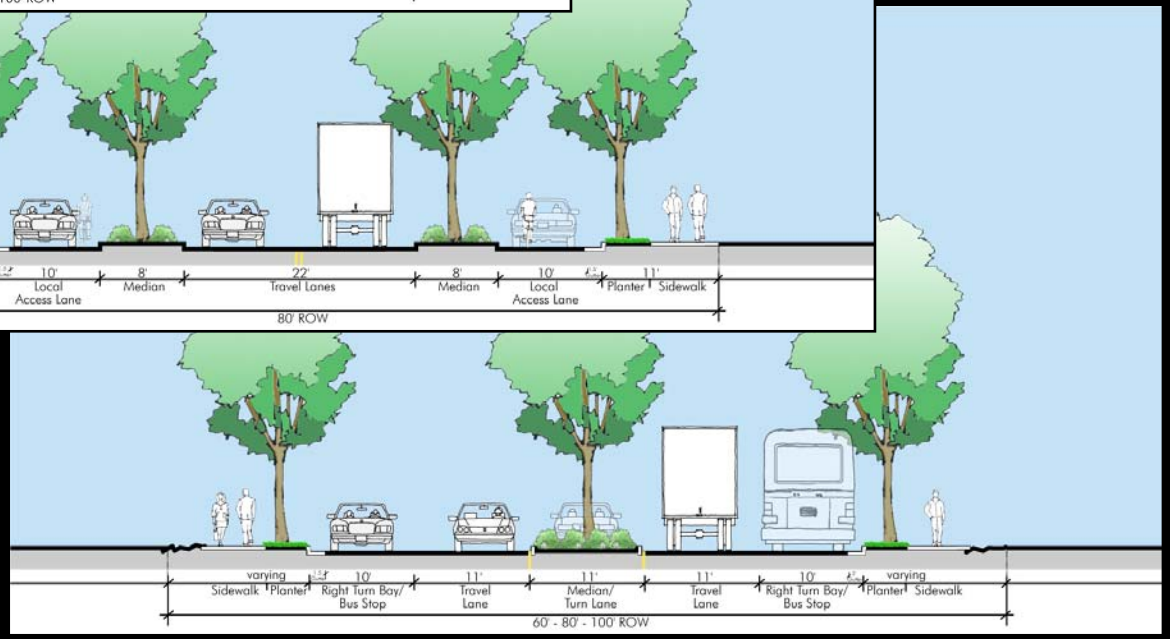
A1, A2 & A3



B



C



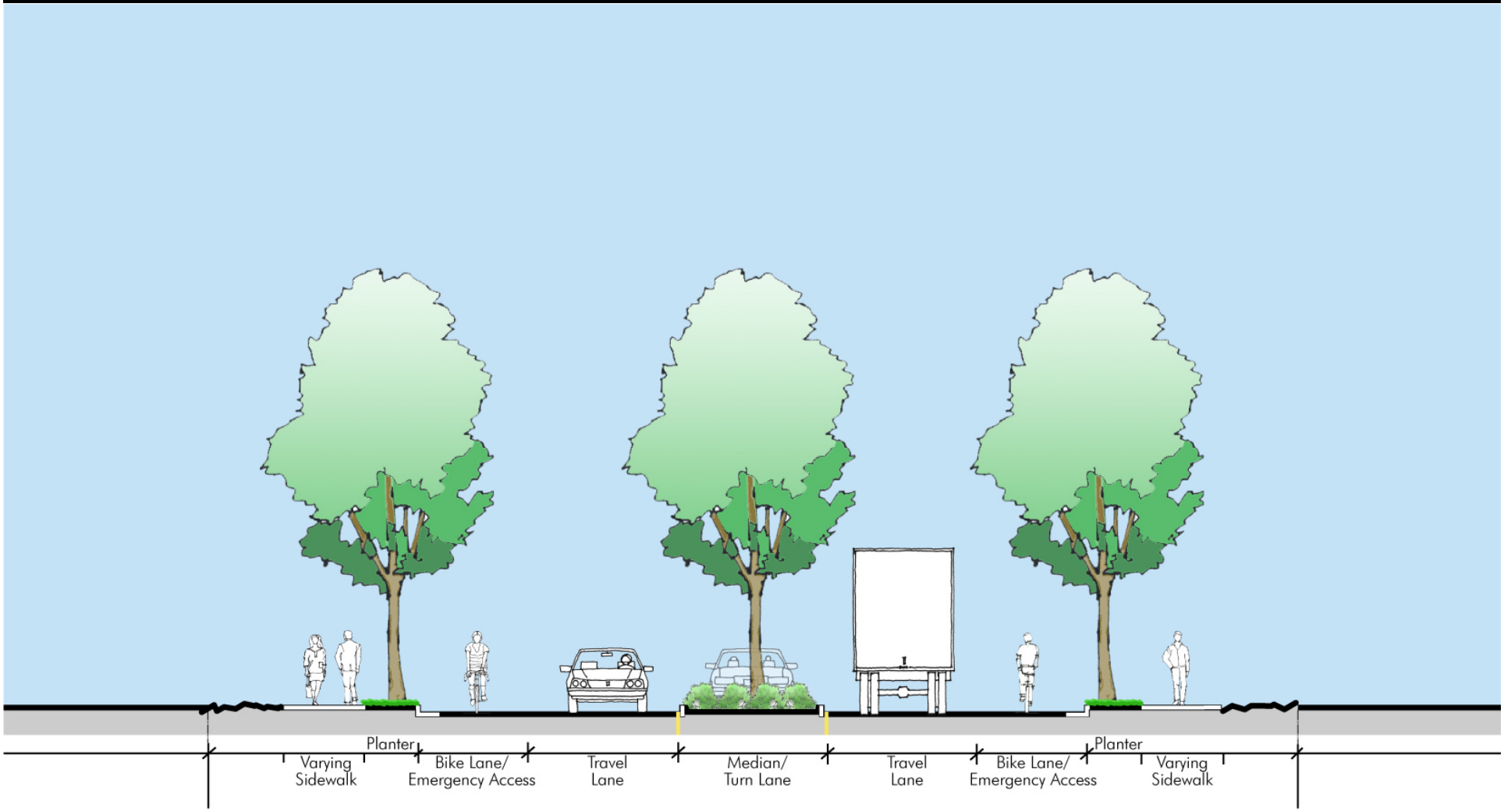
Common Elements Across All 4 Alternatives

- Existing configuration between Diamond Drive and 35th/36th Street
- Relocate hospital access to 35th/36th Street NEW access road
- Three lane roadway from 4th Street to airport road
- Gateway features at Airport Road
- Two lane roadway with turn pockets and multi-use pathway from airport road to East Gate Drive
- New pedestrian crossings throughout corridor
- Sidewalk between Clendenden Building and Caballo Peak Apartments

Airport Road to East Gate Drive

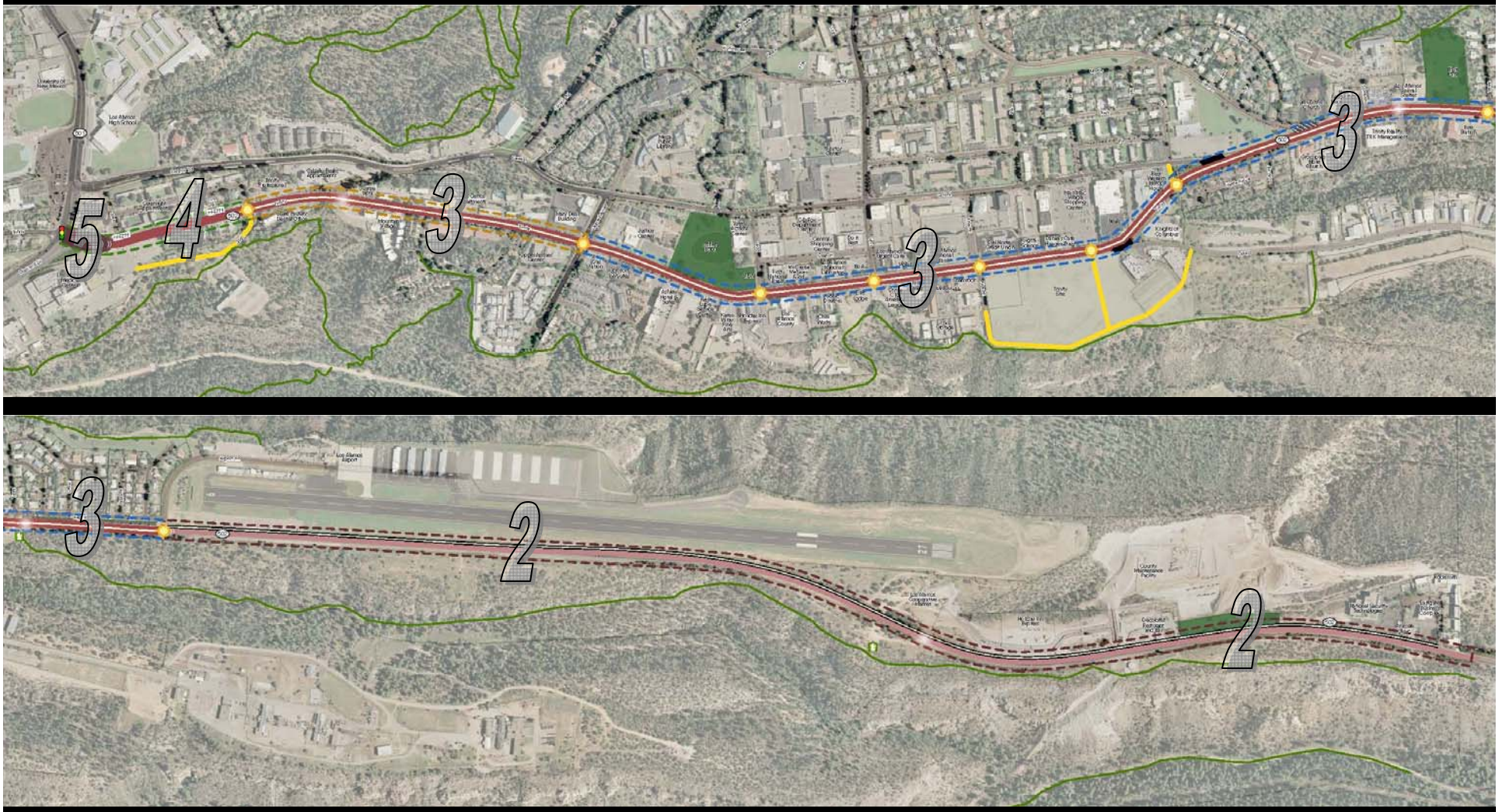
Alternative A: Three Lane Road with Roundabouts

“Three” Lane Section



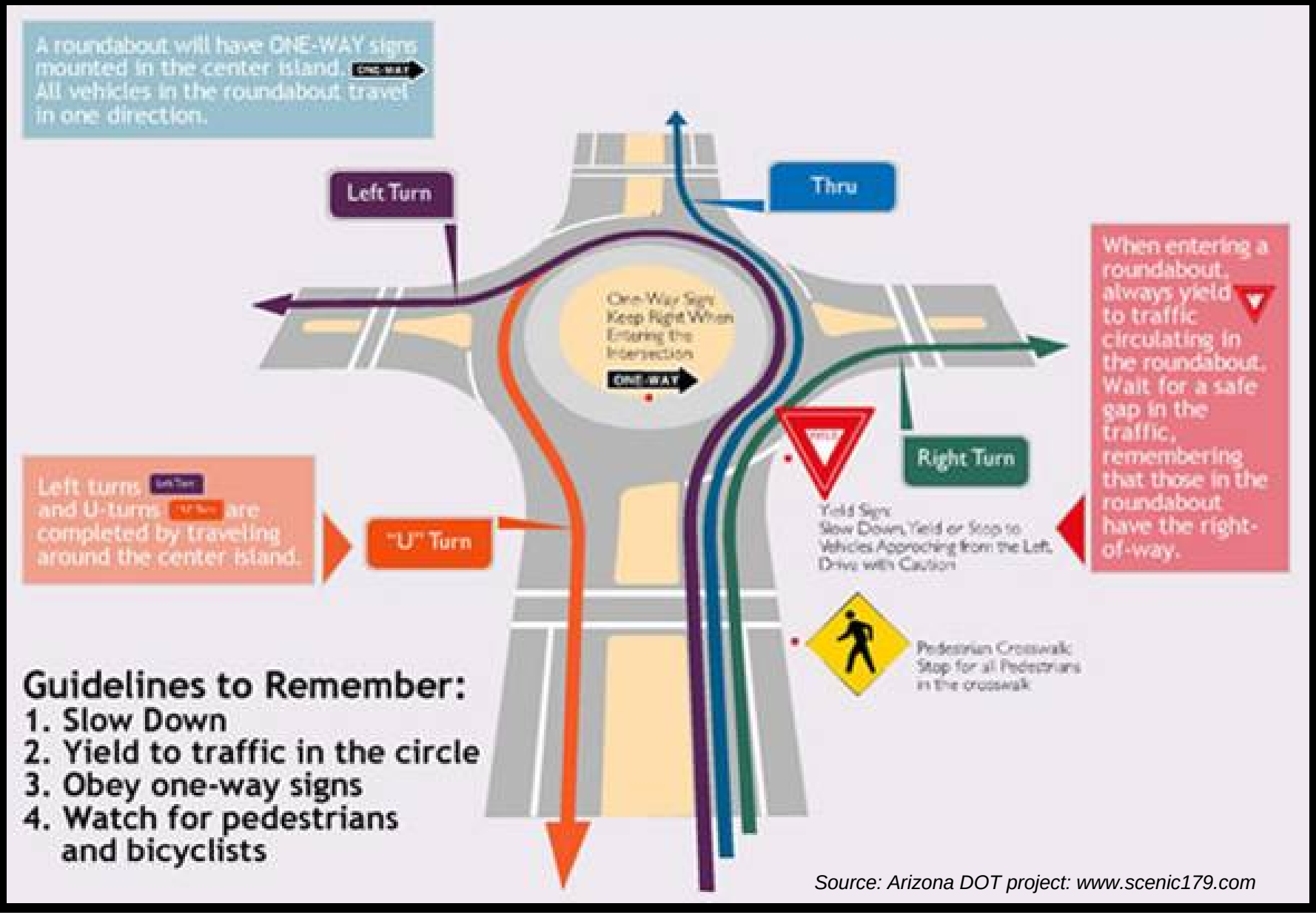
A1: Three Lane with All Roundabouts

A1: Three Lane with All Roundabouts



Roundabouts

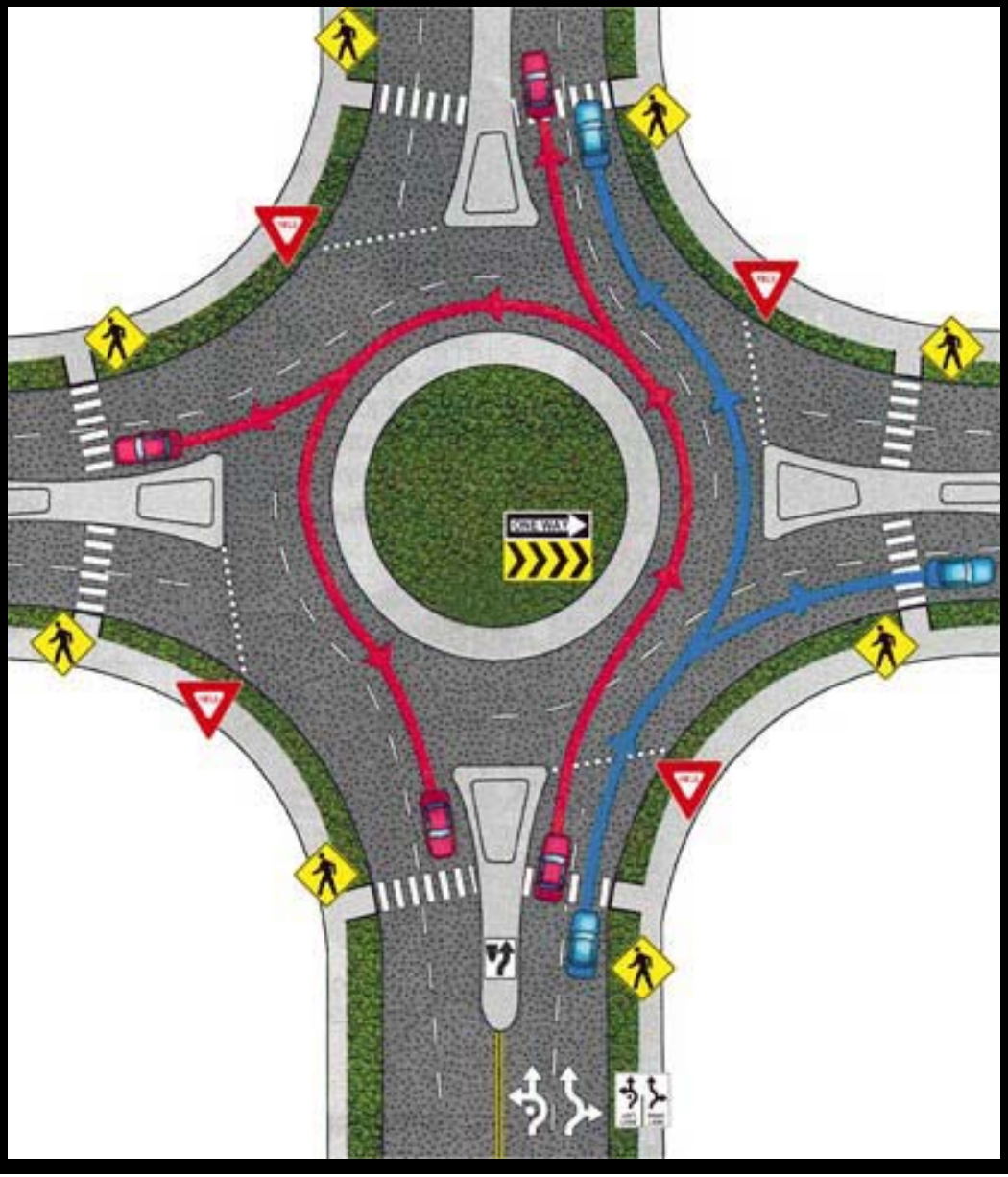
How to Drive



Source: Arizona DOT project: www.scenic179.com

Roundabouts

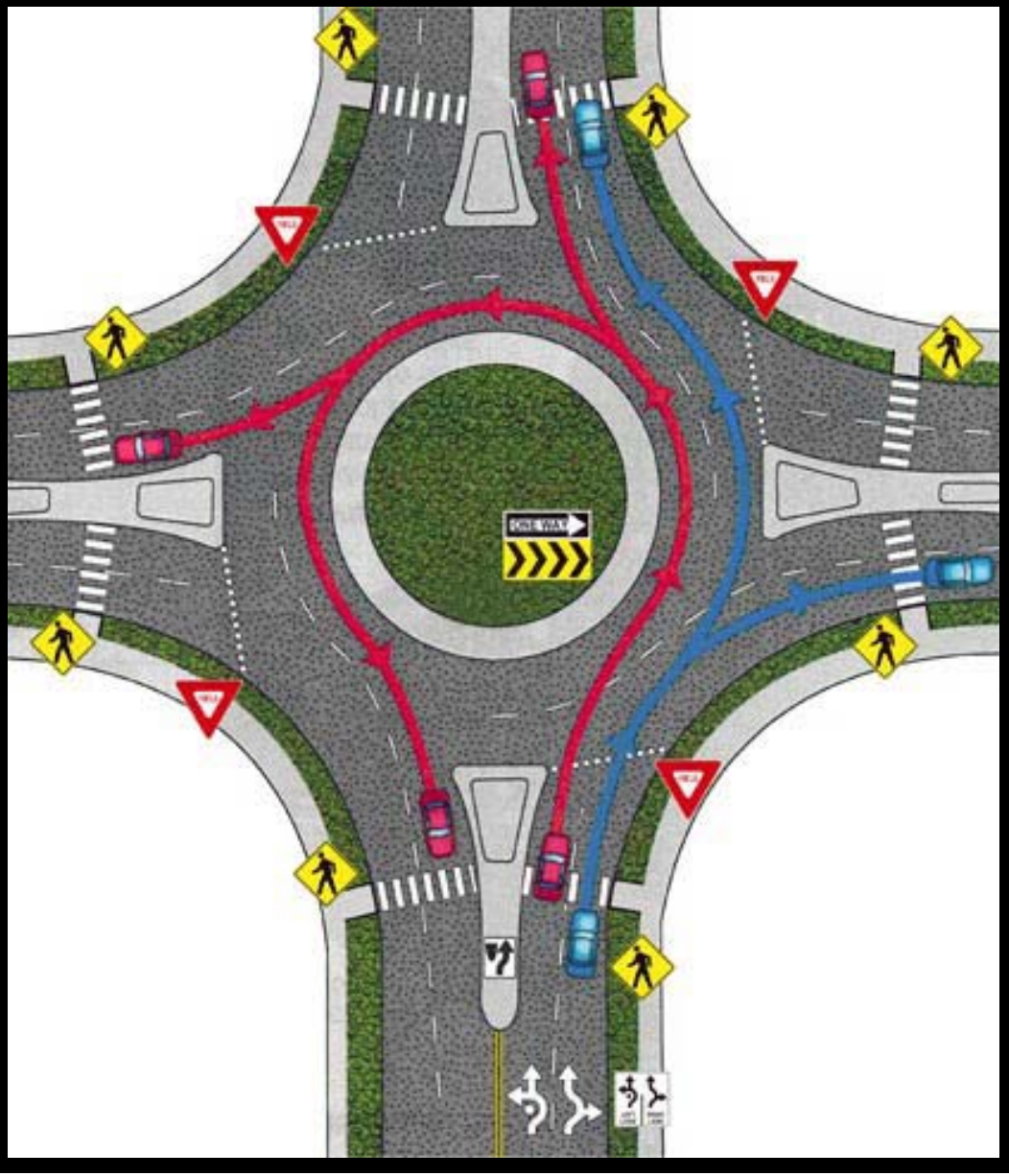
Charecteristics



- Safety: Roundabouts are proven safety solution that prevent and reduce the severity of intersection crashes (account for 45% of all crashes - 2.7M)
  - –Eliminates some of conflicting traffic, such as left turns
  - –Traffic enters and exits only through right turns
  - –Decrease traffic speed to approx. 30 miles/hr +

Roundabouts

Characteristics



- **Equal Access:** Meet the needs of all users: drivers, bicyclists, pedestrians, etc
- **Operational:** Increased traffic capacity & improved traffic flow
- **Cost Effective:** No signal equipment
- Aesthetically desirable

Roundabouts

Evaluation of Built Examples

- Examined “before and after” perceptions
- Assessed public perceptions of multiple single lane roundabouts in Kansas, Maryland and Nevada
- Telephone surveys were taken six weeks before and eight weeks after the roundabouts were constructed
- Total of 1,801 telephone interviews were completed

	Before Construction	After Construction
Strongly Favor	16%	32%
Somewhat Favor	15% (31%)	31% (63%)
Don’t Know	14%	9%
Somewhat Oppose	14%	13%
Strongly Oppose	41% (55%)	15% (28%)

Source: ITE Journal, Sept 2002. Retting, et al.

Source: ITE Journal, Sept 2002. Retting, et al

Potential Roundabouts on Trinity Drive

- All single lane roundabouts
- Planning level analysis – single lane roundabouts will work
- More analysis needed to evaluate treatment for unique turning movements
  - Additional right-turn “slip lane” for westbound Central?
  - Can gas delivery trucks be accommodated at Oppenheimer Drive due to access locations?
- NOT similar to Diamond Drive roundabouts
  - Well spaced
  - Single lane (not multi-lane)
  - Proportion of left-turns very different

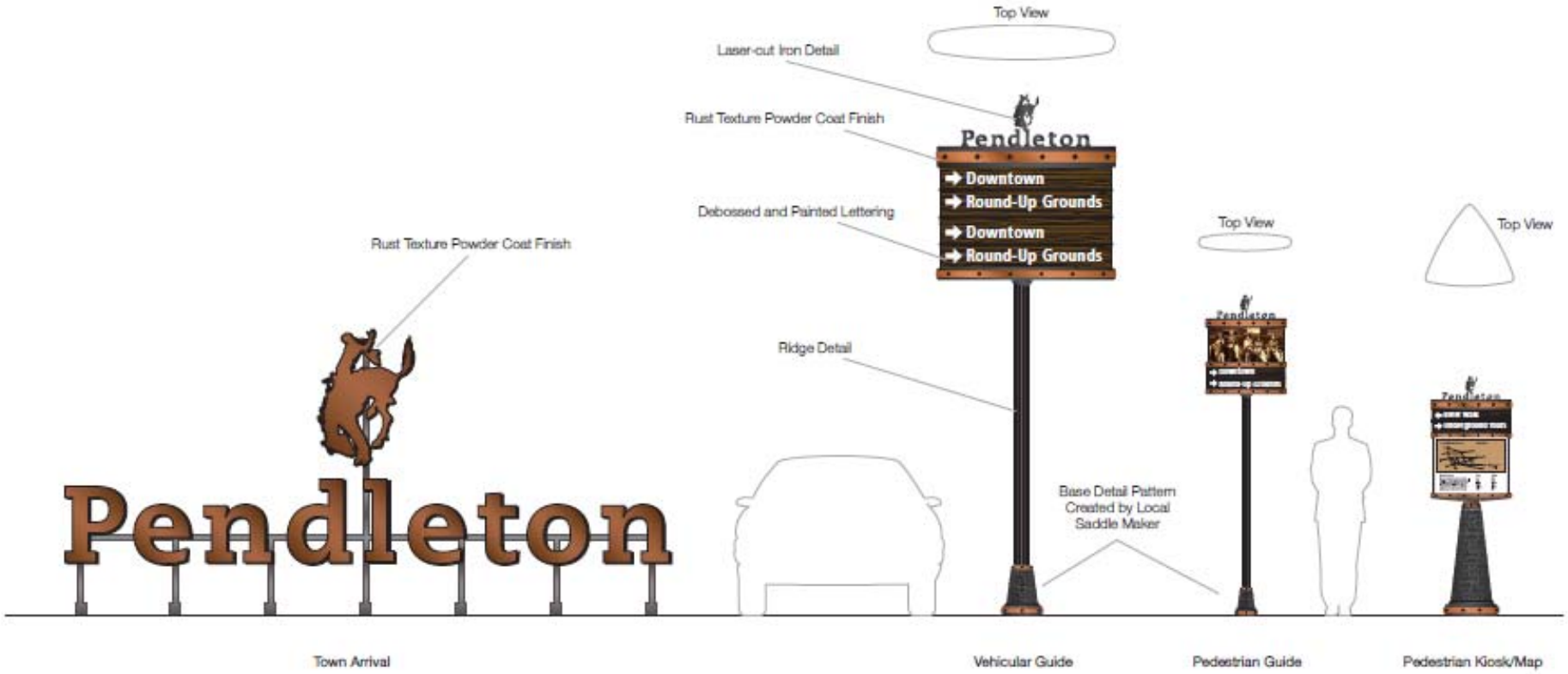

5709
ARTSY
5707
HALCYON
H&R BLOCK
AVEDA
CLEAN WATER
OPEN


BIRD ROCK HISTORY MUSEUM
A

BIRDROCK, CA

BIRDROCK, CA

AVON, CO

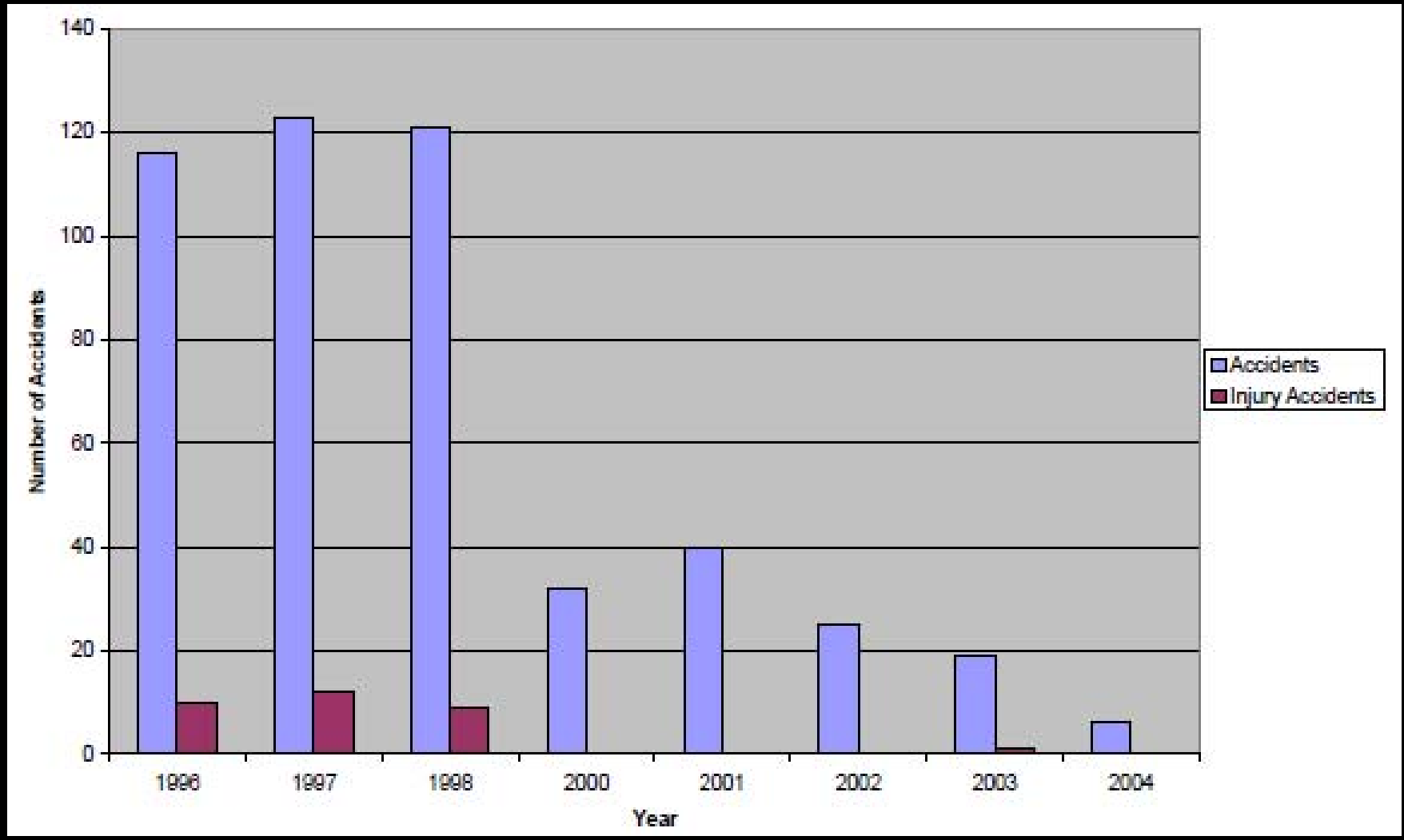

Top View
Laser-cut Iron Detail
Rust Texture Powder Coat Finish
Pendleton
Downtown
Round-Up Grounds
Downtown
Round-Up Grounds
Debossed and Painted Lettering
Rust Texture Powder Coat Finish
Top View
Top View
Ridge Detail
Pendleton
Base Detail Pattern Created by Local Saddle Maker
Pendleton
Town Arrival
Vehicular Guide
Pedestrian Guide
Pedestrian Kiosk/Map


Johnson Road
Lunnonhall's Drive
South Golden Road
Uta Street
Ulysses Street
©1997-2004 AirPhotoUSA

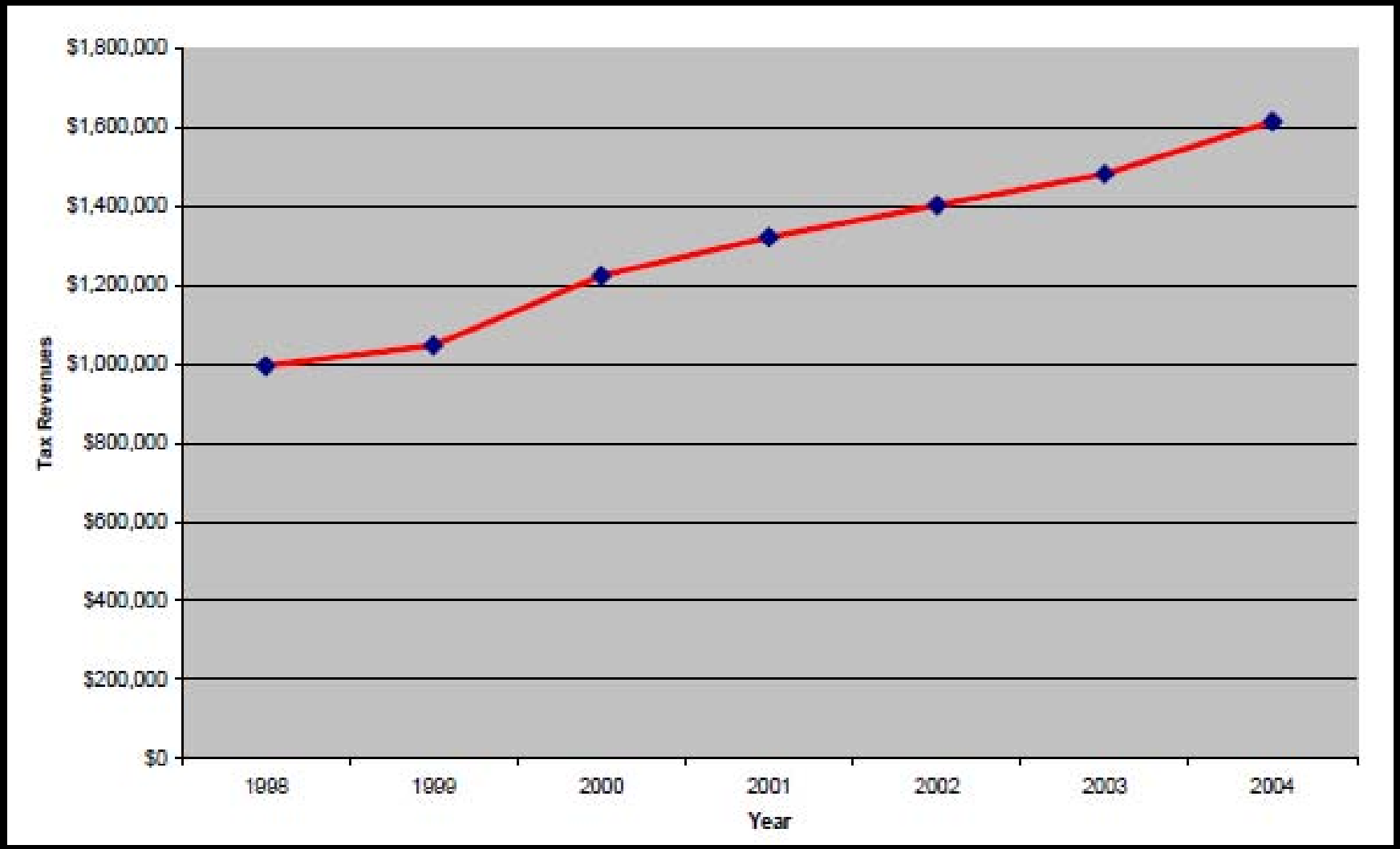
GOLDEN, CO

GOLDEN, CO

Accident History (South Golden Road)



Sales Tax Revenue (South Golden Road)



Three Lane with All Roundabouts

Advantages	Disadvantages
Continuous, uninterrupted traffic flow	PM peak hour approaches capacity
Reduced pedestrian crossing distances	Limited left turns into businesses
Dedicated bicycle facilities	Out of direction travel required
Larger pedestrian realm	Right of way acquisition required at roundabouts
Transit pull-outs	Long queue lengths
Increased safety	Potential traffic diversion
Reduced travel time	

Overall

CONCLUSIONS

	A1
Overall LOS	◖
Queuing	○
Travel Time (lower)	●
Business Access	◖
Pedestrian Crossing	●
Pedestrian Environ.	●
Bicycle Facilities	●
Transit Amenities	●
Sense of Place	●

Community Feedback

- Most community support (along with A2)
- Endorsement by Transportation and Sustainability Boards
- Support for:
  - Improved safety
  - Enhanced gateways and beautification
  - Improved pedestrian realm and bike facilities
  - Traffic control at 20th and other intersections
- Concerns about:
  - Business access
  - Roadway and intersection capacity
  - Number of roundabouts
  - Right-of-way acquisition
  - Emergency access
  - Snow removal

A2: Three Lane with Partial Roundabouts

A2: Three Lane with Partial Roundabouts

Parcel
Park
2 Travel Lanes
3 Travel Lanes
4 Travel Lanes
5 Travel Lanes
Change in Lanes
Proposed/Relocated Road
Proposed Bike Lane
Proposed Multi-Use Path
Trail
Trailhead
Corridor Character Segments
Street Closure
Potential Reconfiguration
Right In/Right Out
Proposed Roundabout
Modified Signal
Pedestrian Crossing Light

GILROY, CA

Three Lane with Partial Roundabouts

Advantages	Disadvantages
Reduced pedestrian crossing distances	PM peak hour approaches capacity
Dedicated bicycle facilities	Limited left turns into businesses
Larger pedestrian realm	Out of direction travel required (limited ability)
Transit pull-outs	Right of way acquisition required at roundabouts
Increased safety	Right of way acquisition
Reduced travel time	Potential traffic diversion
Maintains existing signal infrastructure	Long queue lengths

Overall

CONCLUSIONS

	A1	A2
Overall LOS	◖	◖
Queuing	○	◖
Travel Time (lower)	⬣	⬣
Business Access	◖	○
Pedestrian Crossing	⬣	⬣
Pedestrian Environ.	⬣	⬣
Bicycle Facilities	⬣	⬣
Transit Amenities	⬣	⬣
Sense of Place	⬣	⬣

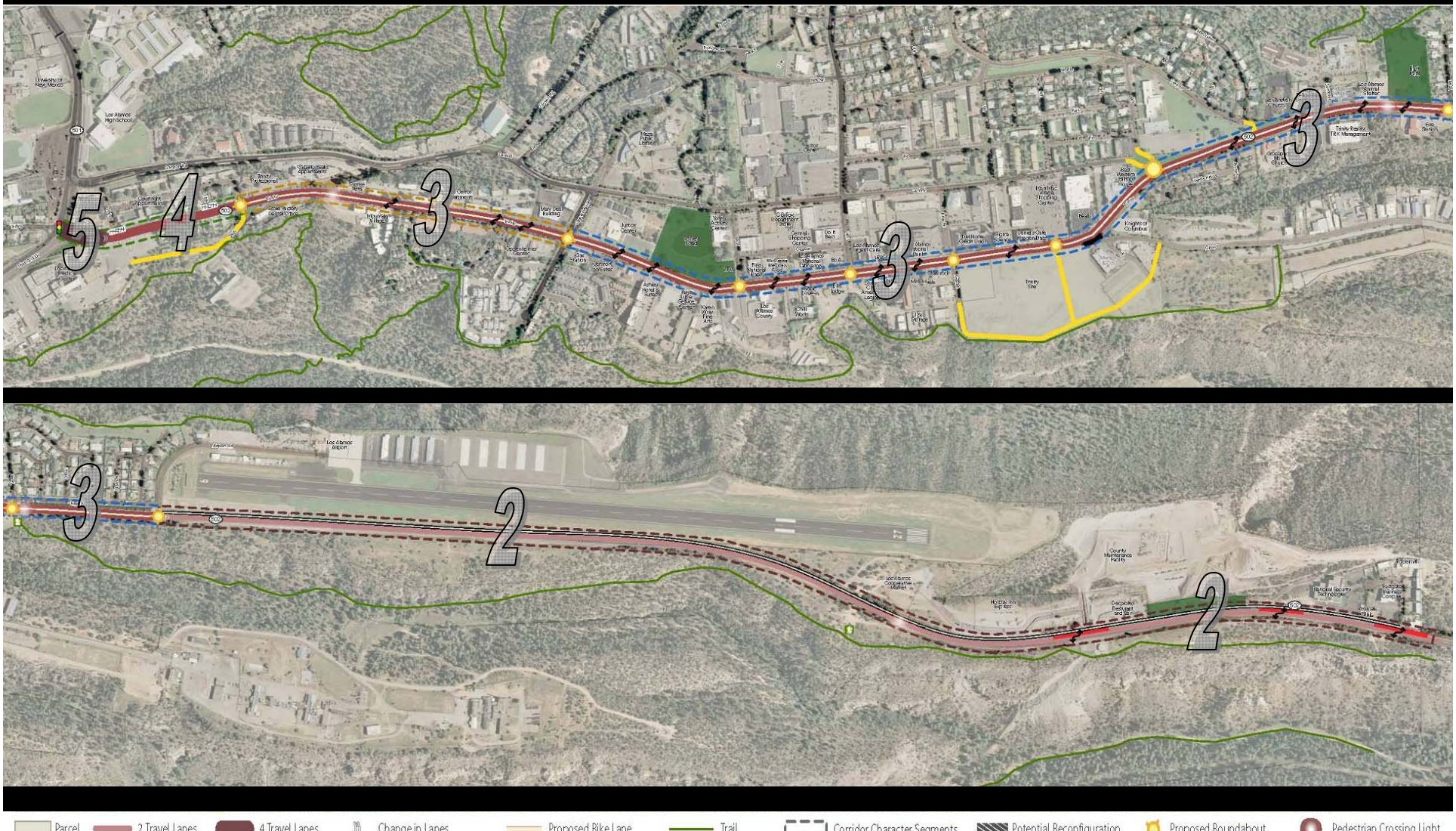
Community Feedback

- Most community support (along with A1)
- Endorsement by Transportation and Sustainability Boards

- Support for:
  - Improved safety
  - Enhanced gateways and beautification
  - Improved pedestrian realm and bike facilities
  - Traffic control at 20th and other intersections
  - Leveraging existing investment (signals)
- Concerns about:
  - Mix of roundabouts and signals
  - Business access
  - Roadway & intersection capacity (especially during peak traffic)
  - Right-of-way acquisition
  - Emergency access
  - Snow removal

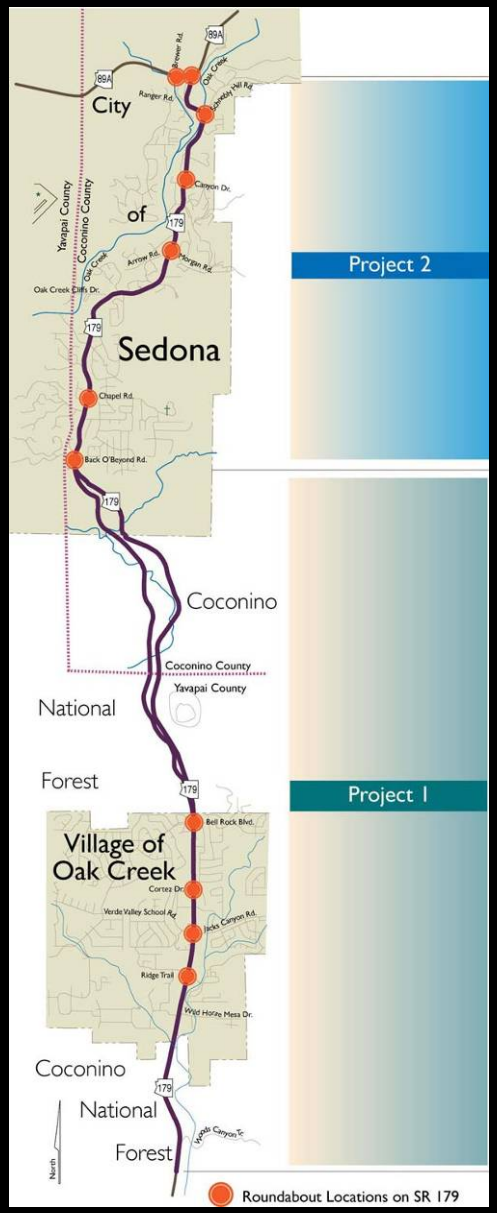
A3: Revised Three Lane with All Roundabouts (Based On Community Feedback)

A3: Revised Three Lane with All Roundabouts



Sedona, Arizona – SR169

- 2003 - Corridor Planning Study
- 2004 - Concept accepted by community
- August 2010 – Construction completed
- Resulting corridor truly multi-modal
  - Pedestrians
  - Bicyclists
  - Autos
  - Transit
  - Goods/Services



Source: www.scenic179.com

Sedona, Arizona – SR169

Sedona, Arizona – SR169 (Traffic Volumes)

Location	ADT	AM Peak Hour	PM Peak Hour
Indian Cliffs to Chapel	14,061	604 NB / 358 SB (63% / 37% split)	468 NB / 746 SB (39% / 61% split)
Chapel to Morgan	15,473	665 NB / 384 SB (63% / 37% split)	567 NB / 783 SB (42% / 58% split)
Morgan to Schnebly Hill	16,448	717 NB / 454 SB (61% / 39% split)	648 NB / 853 SB (43% / 57% split)
Schnebly Hill to SR89A	20,597	726 NB / 557 SB (57% / 43% split)	784 NB / 972 SB (45% / 55% split)

Source: www.scenic179.com

Overall

CONCLUSIONS

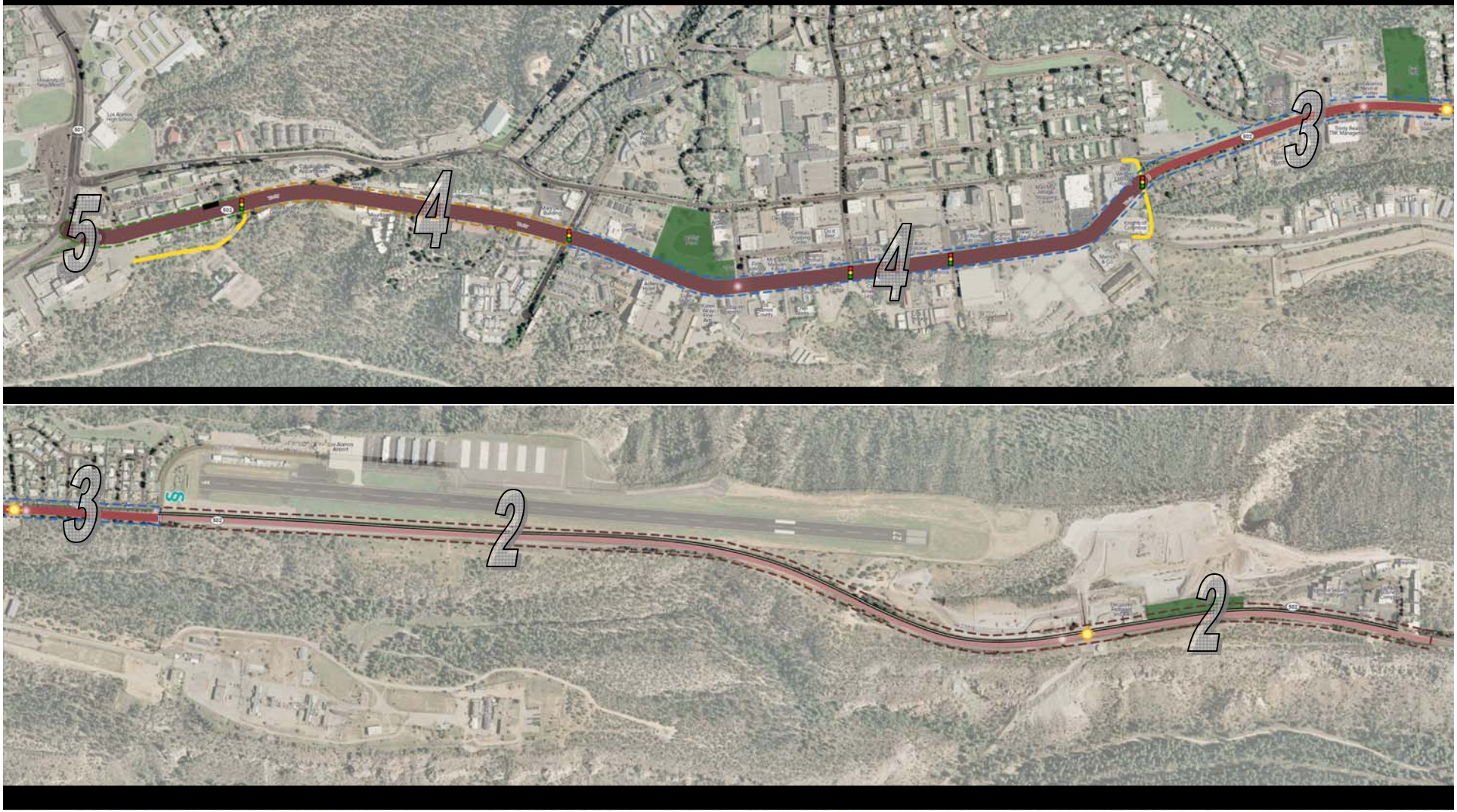
	A1	A2	A3
Overall LOS	◖	◖	◖
Queuing	○	◖	◖
Travel Time (lower)	⬢	⬢	⬢
Business Access	◖	○	⬢
Pedestrian Crossing	⬢	⬢	⬢
Pedestrian Environ.	⬢	⬢	⬢
Bicycle Facilities	⬢	⬢	⬢
Transit Amenities	⬢	⬢	⬢
Sense of Place	⬢	⬢	⬢

Community Feedback

- Support for:
  - Left hand turn pockets
  - Improved safety
  - Enhanced gateways and beautification
  - Signage and wayfinding opportunities
  - Improved pedestrian realm and bike facilities
  - Traffic control at 20th and other intersections
  - Travel lane with continuous flow
  - Connectivity to Central and rest of Downtown
- Concerns about:
  - Roadway and intersection capacity (especially during peak traffic)
  - Ability of largest trucks to navigate roundabouts
  - Diversion of traffic onto alternative routes
  - Right-of-way acquisition

Alternative B: Four-Lane Road with Various Intersection Treatments

Four Lane with Various Intersection Treatments



Parcel
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2 Travel Lanes
3 Travel Lanes
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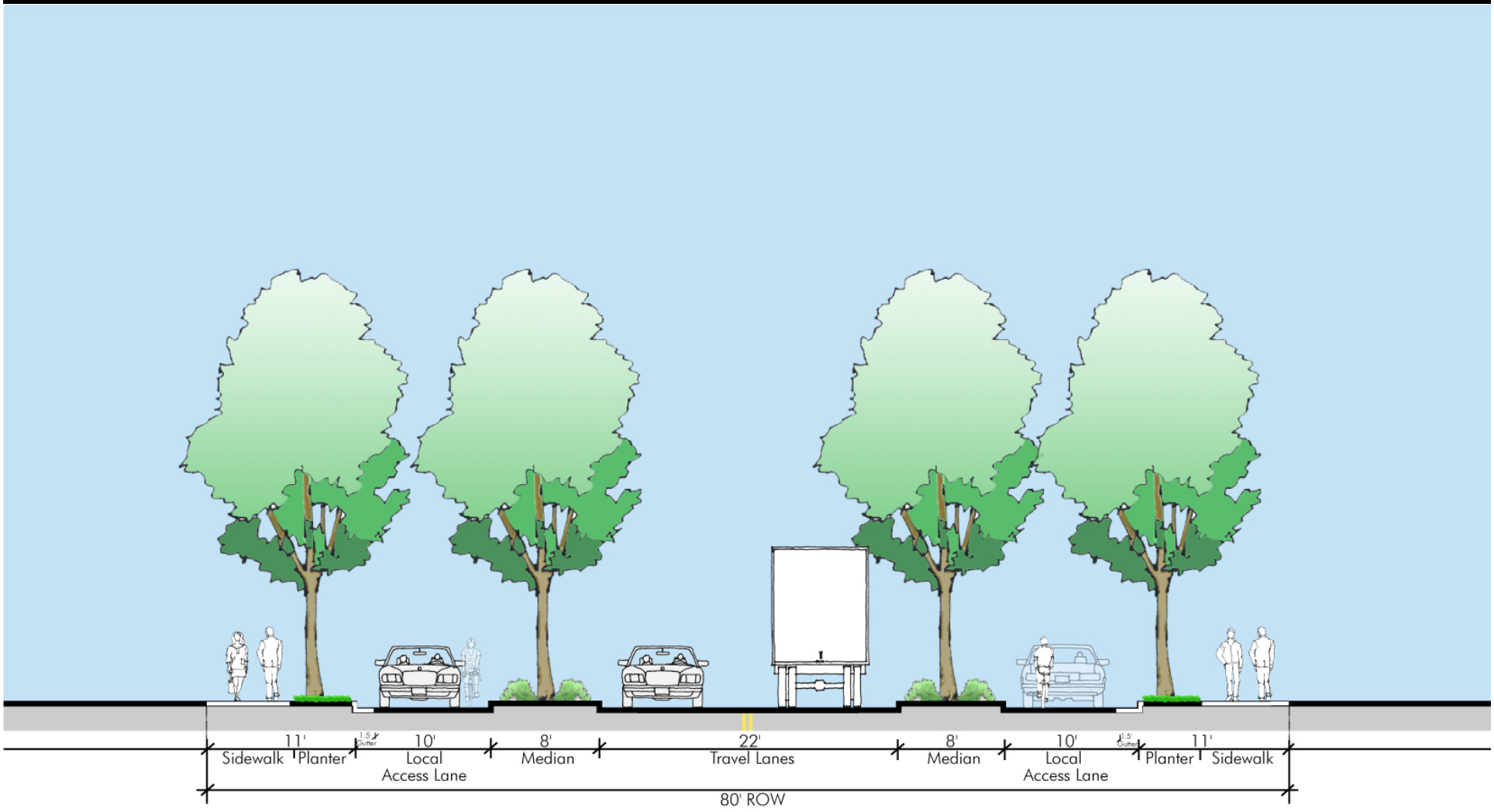
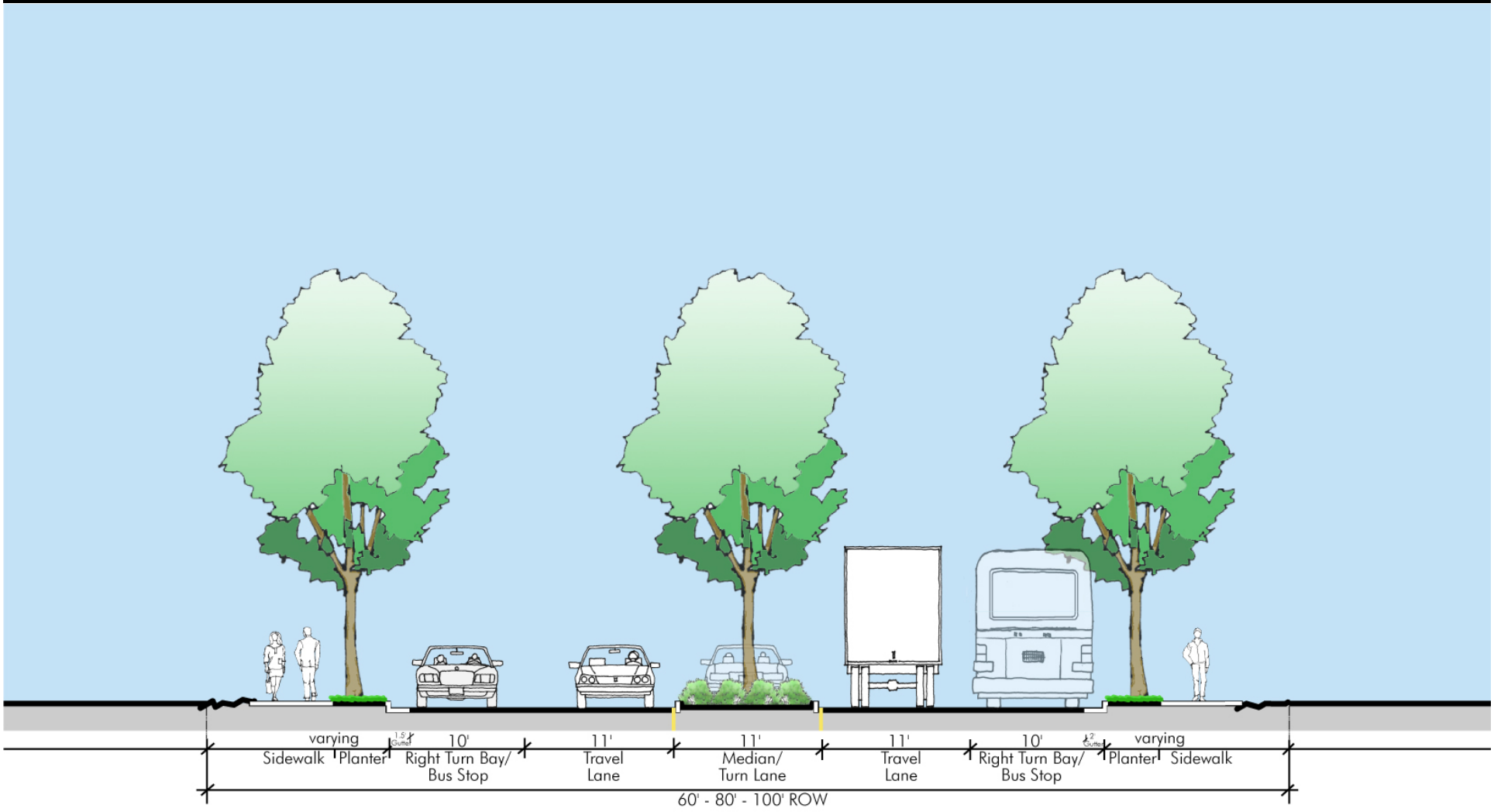
5 Travel Lanes
Change in Lanes
Proposed Relocated Access Road
Proposed Bike Lane
Proposed Multi-use Path
Proposed Roundabout
Proposed/Modified Signal
Street Closure
Gateway
Pedestrian Crossing Light
Corridor Character Segments

Four Lane with Various Intersection Treatments



Four Lane with Various Intersection Treatments




Oak

Four Lane with Various Intersection Treatments

Advantages	Disadvantages
Reduced pedestrian crossing distances	Limited left turns into businesses
Shared bicycle facilities	Out of direction travel required (limited ability)
Increased safety	Mix of autos, busses and bicyclists in outer lanes
Low friction lanes for through traffic	
Maintains existing signal infrastructure	
Accommodates mix of vehicles	

Overall

CONCLUSIONS

	A1	A2	A3	B
Overall LOS	◖	◖	◖	●
Queuing	○	◖	◖	●
Travel Time (lower)	●	●	●	◖
Business Access	◖	○	●	○
Pedestrian Crossing	●	●	●	●
Pedestrian Environ.	●	●	●	◖
Bicycle Facilities	●	●	●	◖
Transit Amenities	●	●	●	○
Sense of Place	●	●	●	●

Community Feedback

- Medium level of community support
- Support for:
  - Uninterrupted through lanes
  - Separation of local and commuter traffic
  - Enhanced landscaping
  - Addition of bike facilities
  - Shortened crossing distances

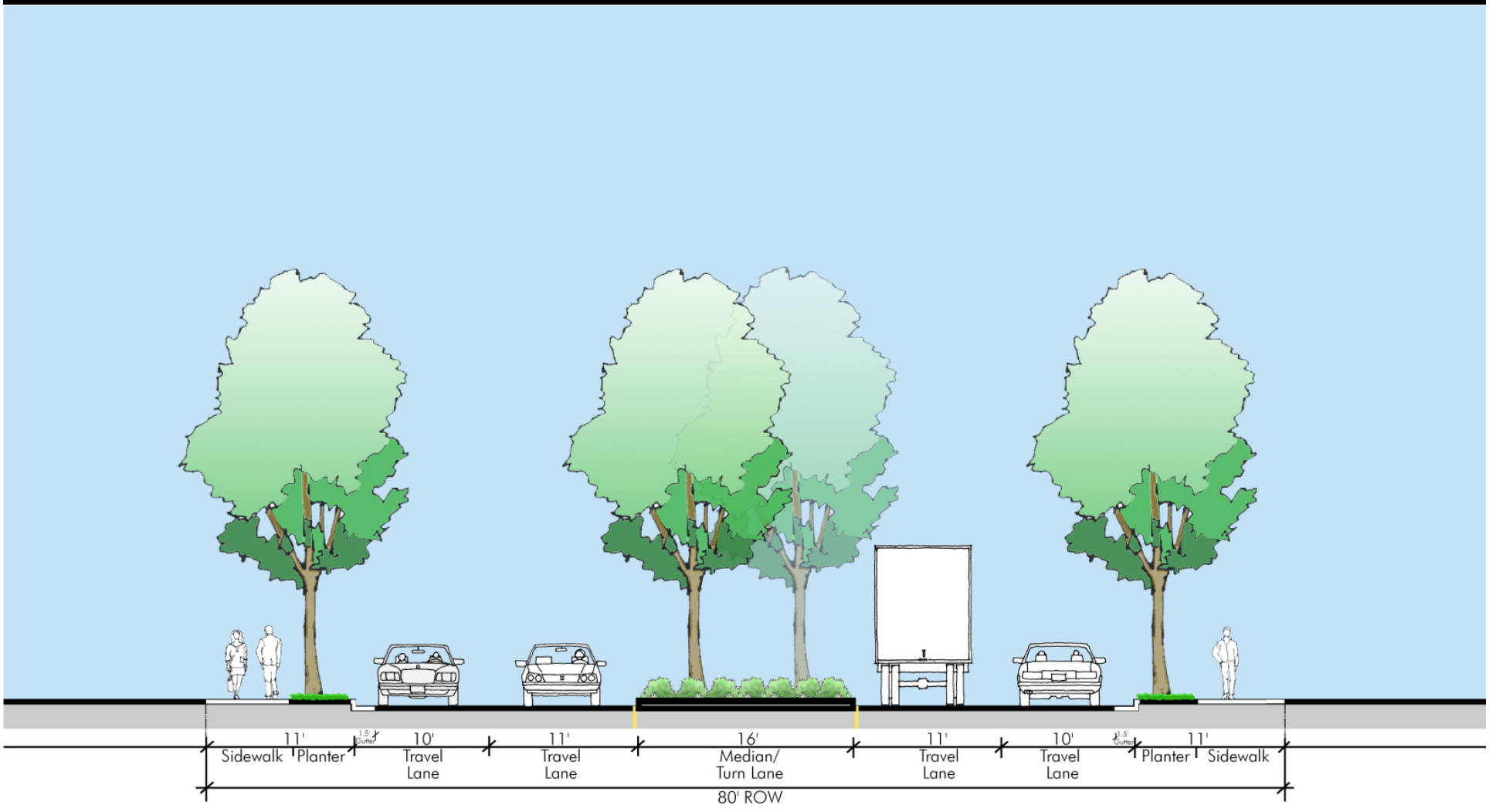
- Concerns about:
  - Snow removal
  - Transitions at intersections
  - Unsignalized intersections (e.g. 20th)
  - Bicycle safety
  - Ability of drivers to make unplanned turns into businesses

Alternative C: Five-Lane Road with Various Intersection Treatments

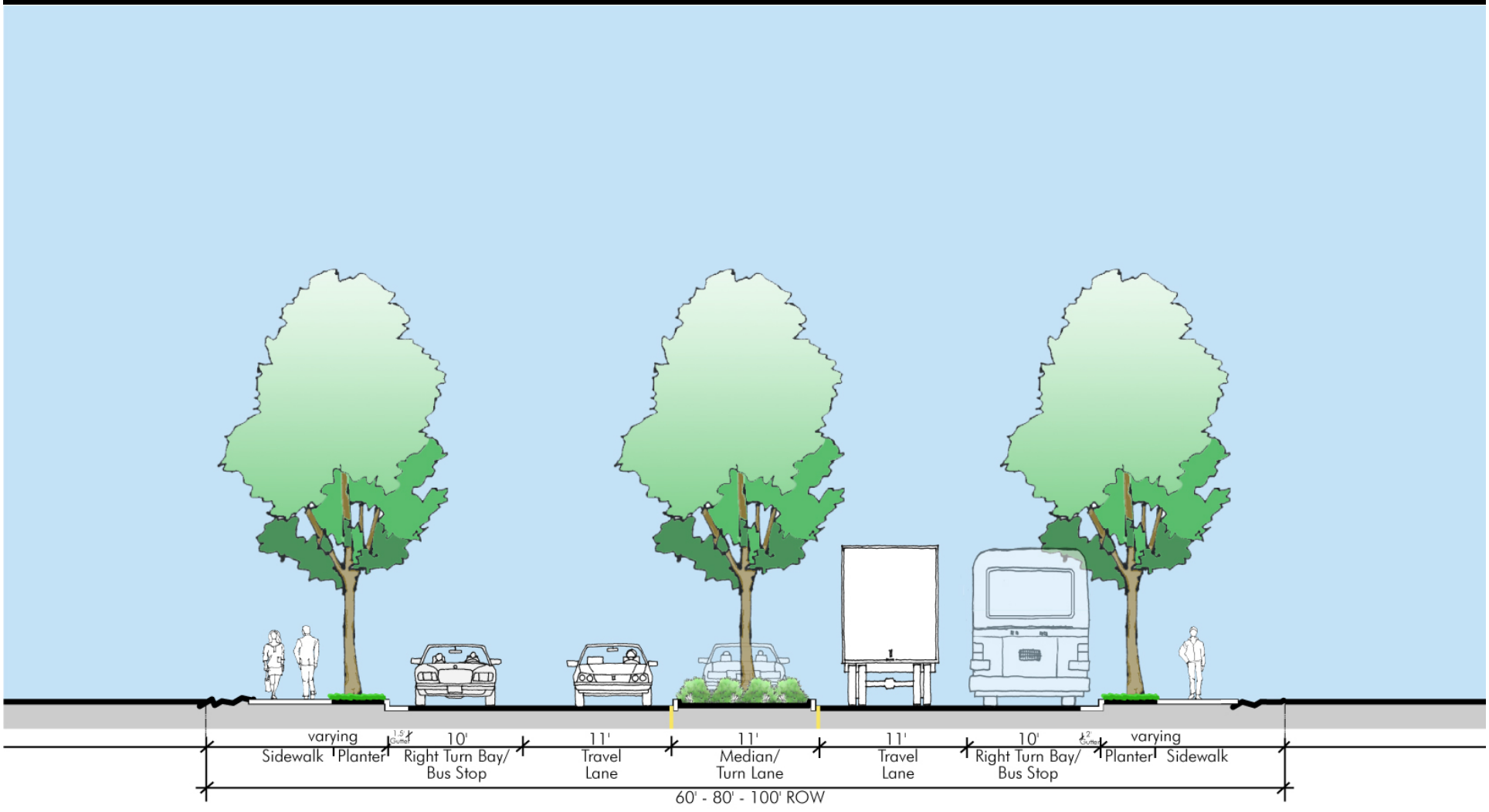
Five Lane with Various Intersection Treatments

Parcel
Park
2 Travel Lanes
3 Travel Lanes
4 Travel Lanes
5 Travel Lanes
Change in Lanes
Proposed Relocated Access Road
Proposed Bike Lane
Proposed Multi-use Path
Proposed Roundabout
Proposed/Modified Signal
Street Closure
Gateway
Pedestrian Crossing Light
Corridor Character Segments

Five Lane with Various Intersection Treatments



Five Lane with Various Intersection Treatments



SR 93, BOULDER, CO

Five Lane with Various Intersection Treatments

Advantages	Disadvantages
Pedestrian refuge islands	Limited left turns into businesses
Reserve capacity	Out of direction travel required (limited ability)
Maintains existing signal infrastructure	Limited pedestrian realm
Accommodates mix of vehicles	No bicycle facilities
Adequate LOS throughout	No bus pullouts
	Traffic weaving

Community Feedback

- Lowest level of community support
- Support for:
  - Increased roadway capacity
  - High speeds through corridor
  - Ability for some enhanced landscaping
  - Unimpeded/unaltered access to businesses
- Concerns about:
  - Narrow sidewalks
  - Right-of-way acquisition
  - Crossing distances
  - Unsignalized intersections (e.g. 20th)
  - Bicycle safety
  - Overemphasis on through traffic

Overall

CONCLUSIONS

	A1	A2	A3	B	C
Overall LOS	◖	◖	◖	●	●
Queuing	○	◖	◖	●	●
Travel Time (lower)	●	●	●	◖	◖
Business Access	◖	○	●	○	○
Pedestrian Crossing	●	●	●	●	◖
Pedestrian Environ.	●	●	●	◖	○
Bicycle Facilities	●	●	●	◖	○
Transit Amenities	●	●	●	○	○
Downtown Connectivity	●	●	●	○	○
Sense of Place	●	●	●	●	◖

Summary of Community Feedback

- Most support for three lane options (A)
- Growing support with several refinements:
  - Addition of left hand turn pockets
  - Inclusion of necessary right hand turn pockets
  - Wide enough to accommodate emergency vehicles
  - Major entries/monuments at Trinity/Central and Trinity/15th to improve connectivity to Central
  - Phased approach

- Remaining concerns about:
  - Roadway and intersection capacity (especially during peak traffic)
  - Ability of largest trucks to navigate roundabouts
  - Diversion of traffic onto alternative routes
  - Right-of-way acquisition

LOS ALAMOS COUNTY, NEW MEXICO

PLANNING AND ENGINEERING SERVICES

nm502

COMPREHENSIVE TRANSPORTATION STUDY AND PLAN FOR NM502

MIG

http://www.losalamosnm.us/projects/publicworks/Pages/NM502TrinityDriveCorridorStudy.aspx