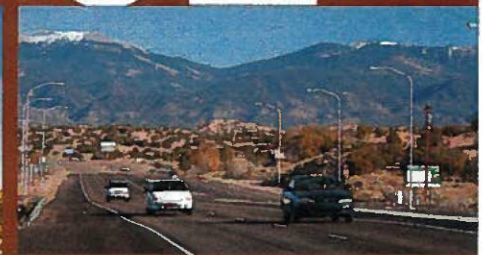
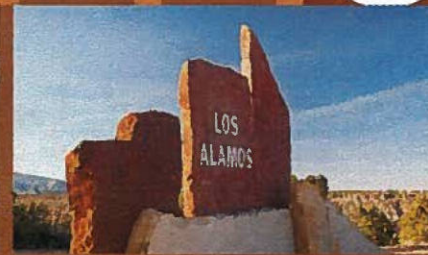
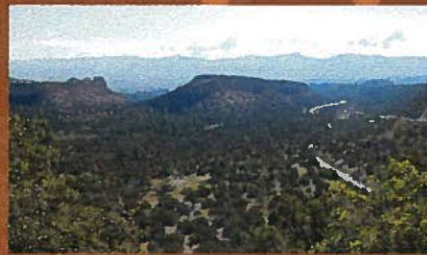


LOS ALAMOS COUNTY, NEW MEXICO
PLANNING AND ENGINEERING SERVICES

nm502



COMPREHENSIVE TRANSPORTATION STUDY AND PLAN FOR NM502

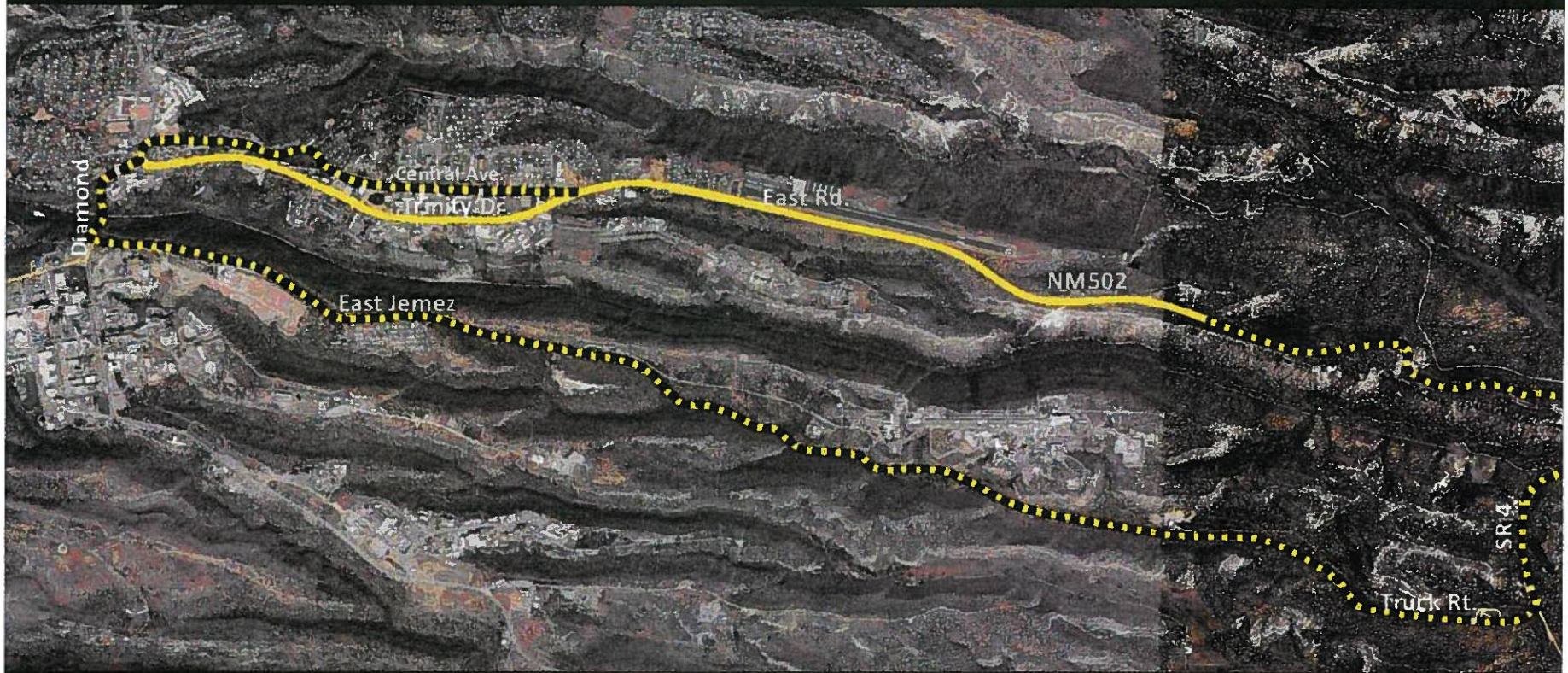


<http://www.losalamosnm.us/projects/publicworks/Pages/NM502TrinityDriveCorridorStudy.aspx>

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 as LANL and NMDOT
- **Prepare schematic design** for NMDOT to use for reconstruction of NM502 between Tewa Loop and Knecht Street

Regional & Local Context



Project Area





PLANNING PROCESS

COMPREHENSIVE TRANSPORTATION STUDY AND PLAN FOR NM502



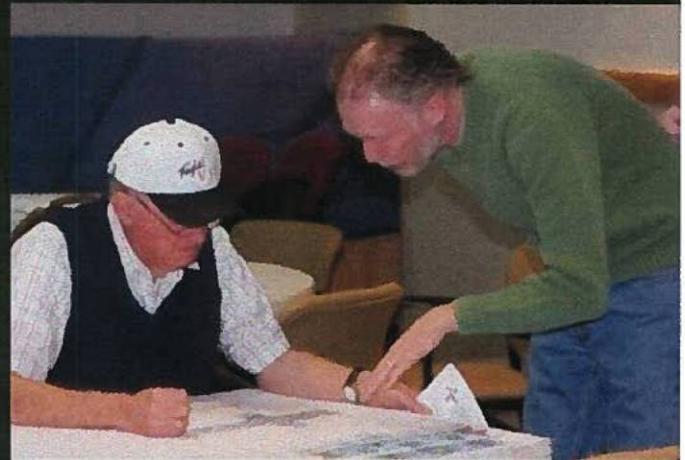
Planning Process: Past & Current Efforts

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



Jan 25, 2011

**Refined
Preferred
Concepts
Review**



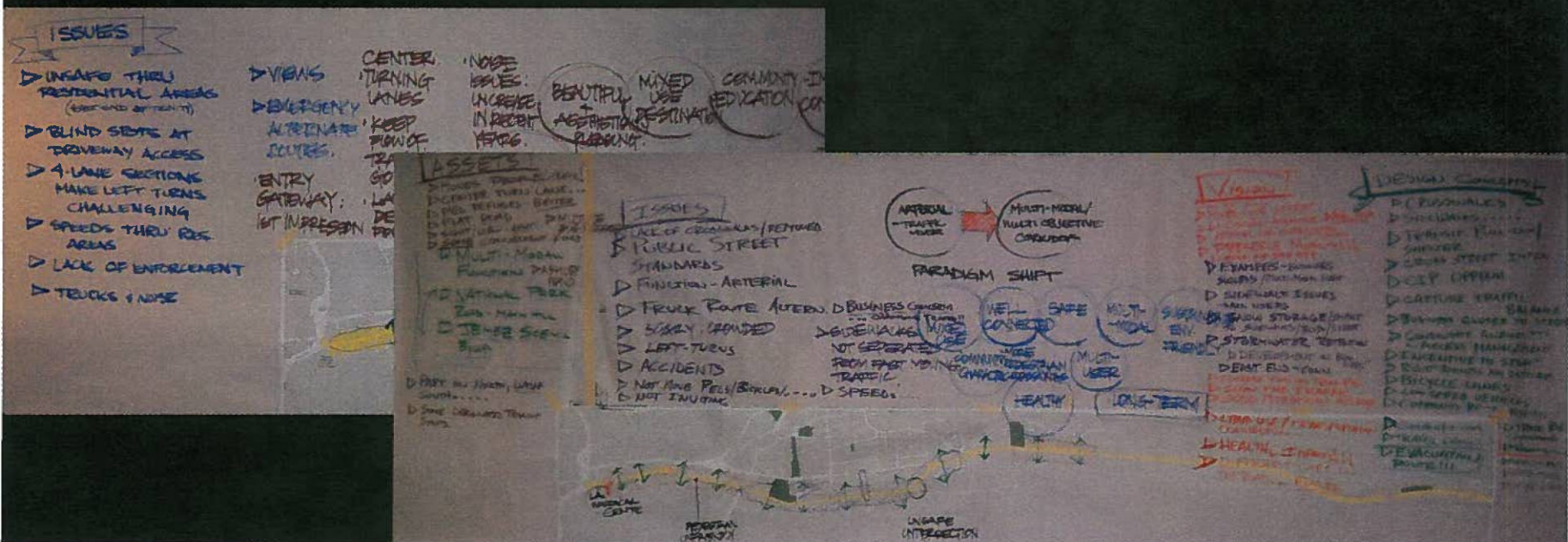
April 7, 2011



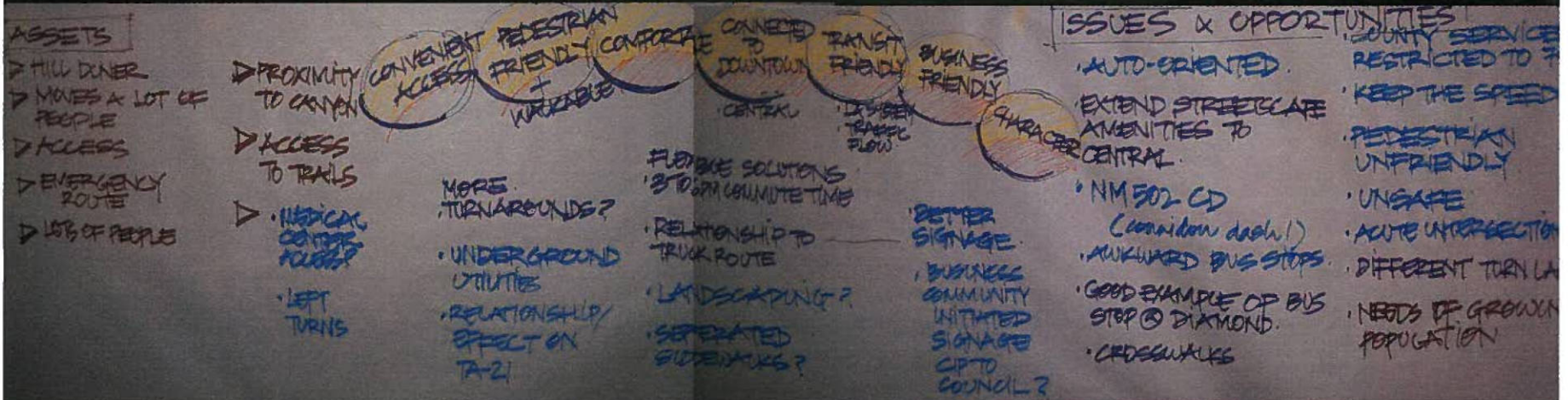
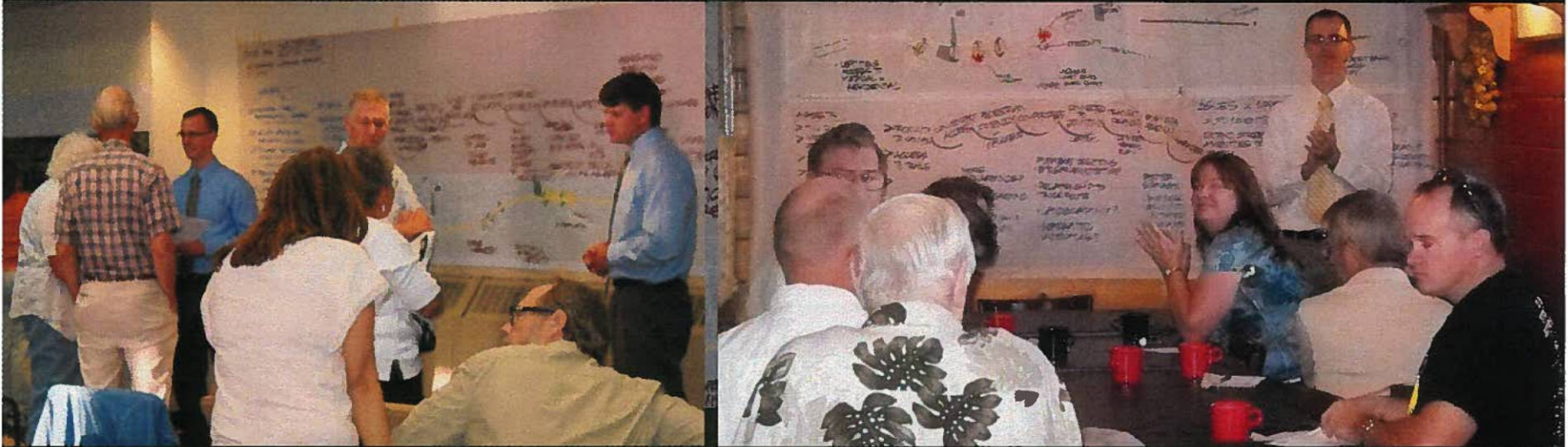
**Final
Report**

Summer 2011

Planning Process: Current Process



Planning Process: Current Process





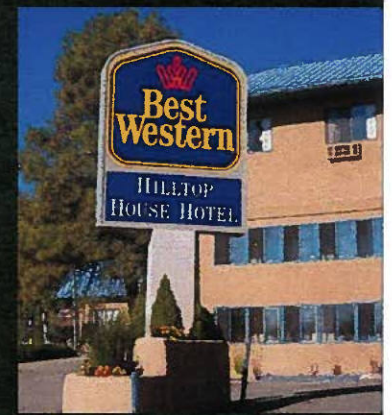
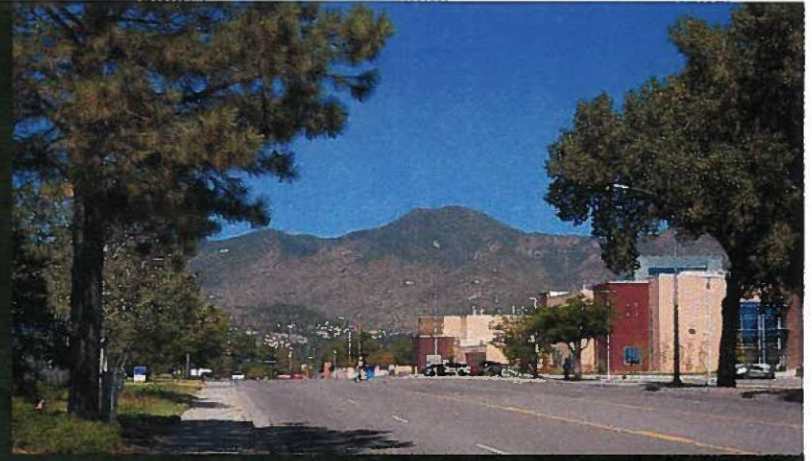
SETTING THE STAGE

COMPREHENSIVE TRANSPORTATION STUDY AND PLAN FOR NM502



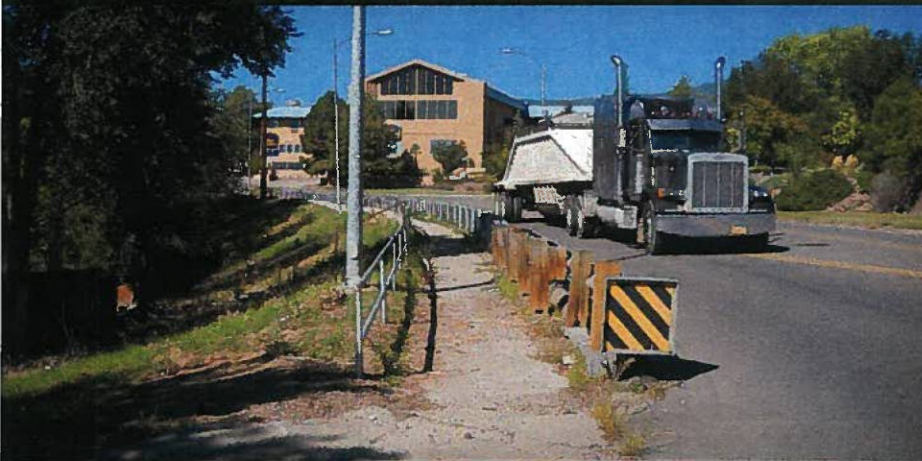
Assets

- Distinctive natural setting including views
- Diverse mix of uses
- Multi-modal access
- Gateway

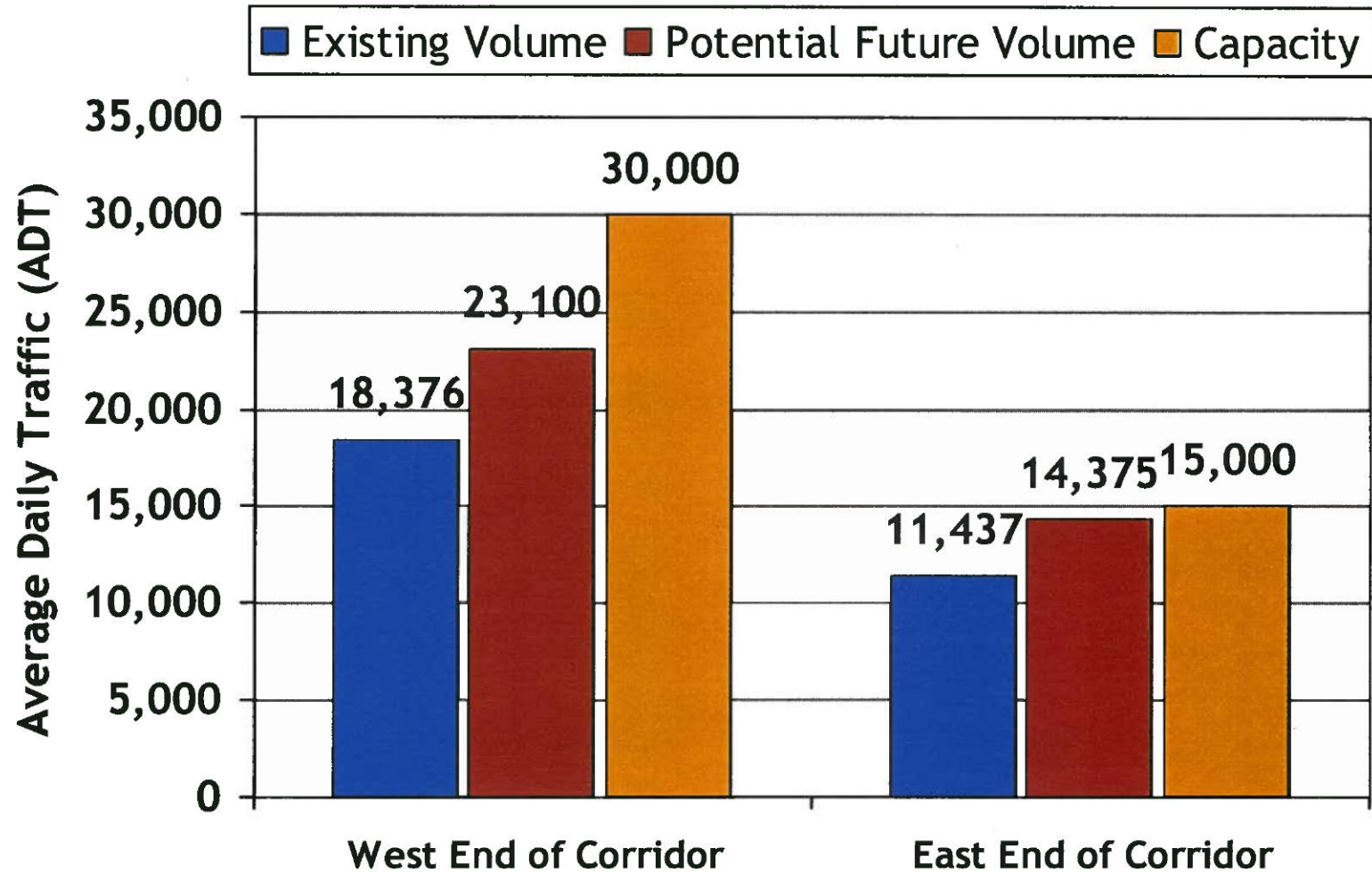


Issues & Opportunities

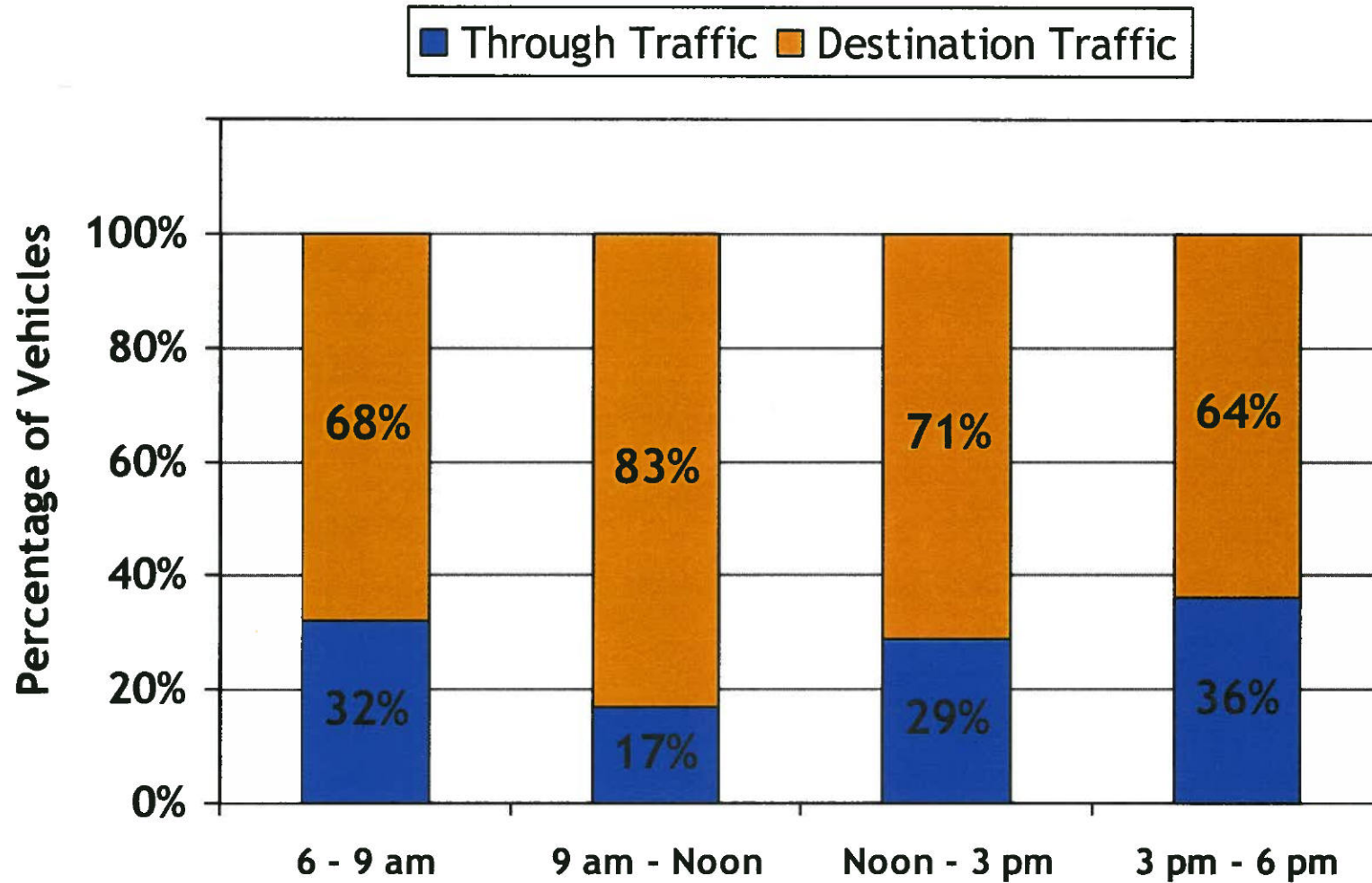
- Connectivity for ALL users
- Overall Image & Identity
- Connection to Downtown
- SAFETY!
- Volume and Capacity



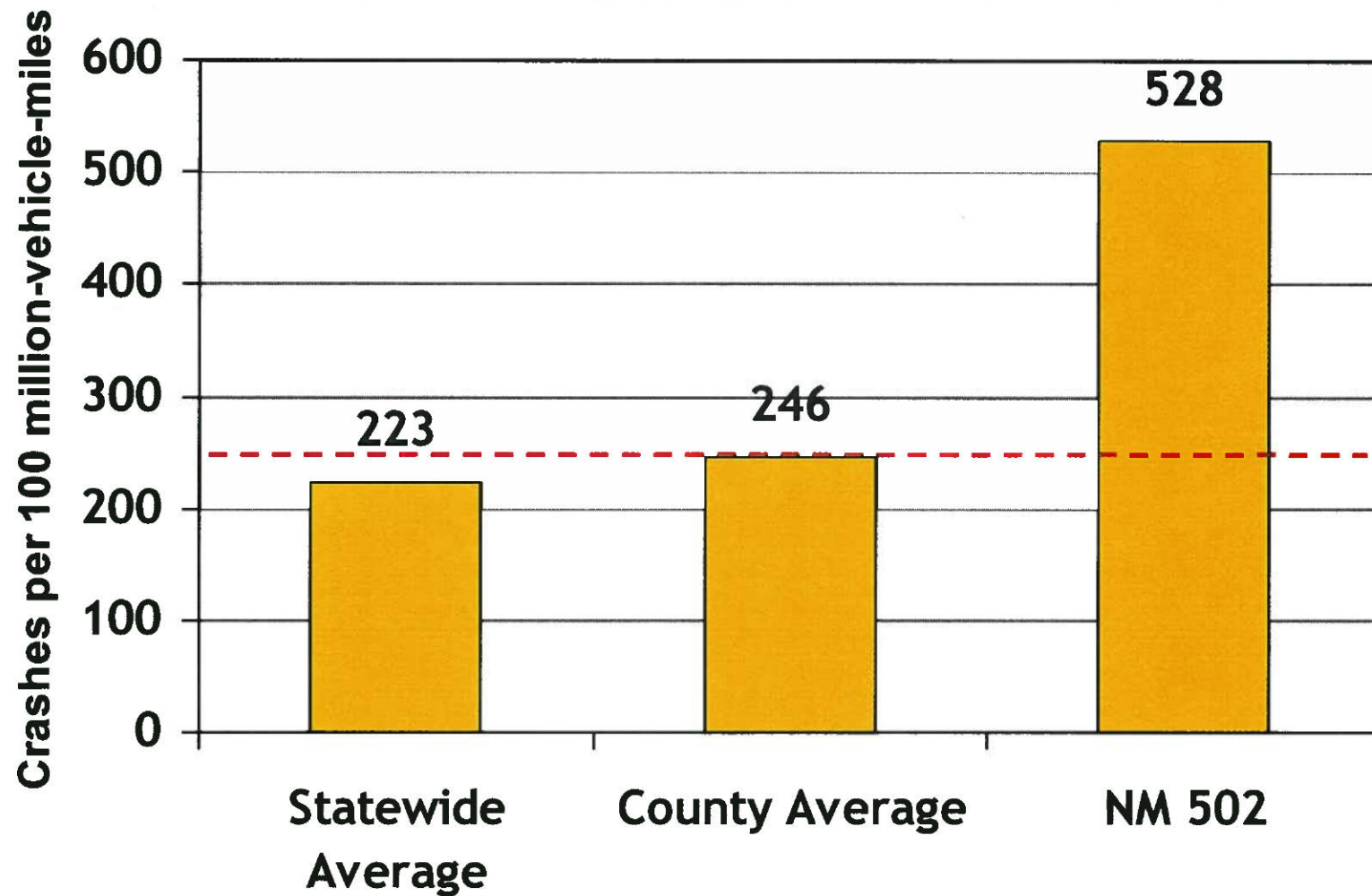
Volume and Capacity



Nature of Automobile Traffic

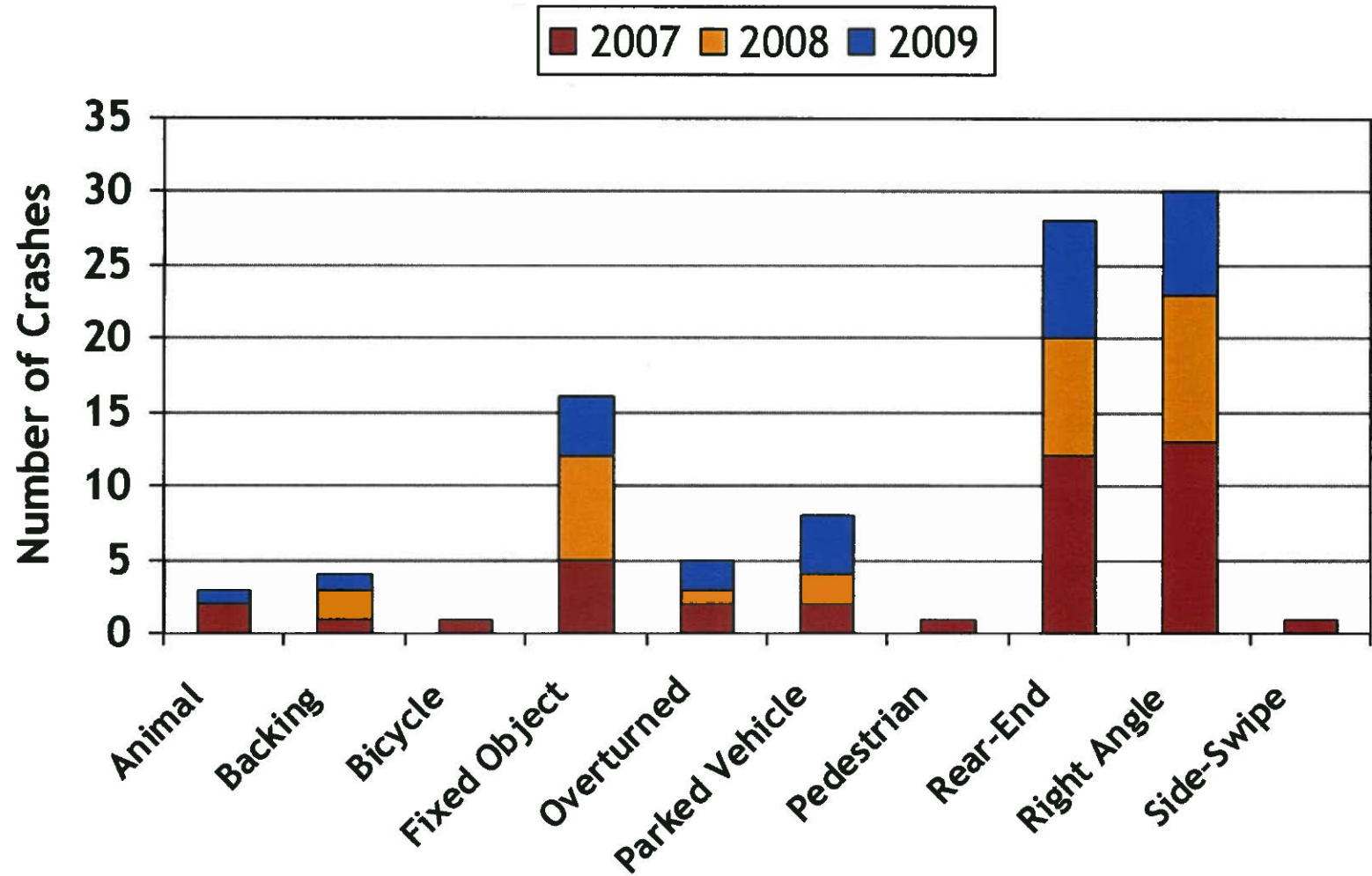


Accident / Crash Analysis



Source: NMDOT Environmental Assessment for NM502 Improvement Project (Knecht to Tewa Loop)

Accident / Crash Analysis



Level of Service (LOS) Explained

- A scale for rating roadway and intersection performance and efficiency
- Rating scale A through F

LOS	Delay (sec)
A	≤ 10
B	10 – 15
C	15 – 25
D	25 – 35
E	35 – 50
F	≥ 50

Existing Levels of Service

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

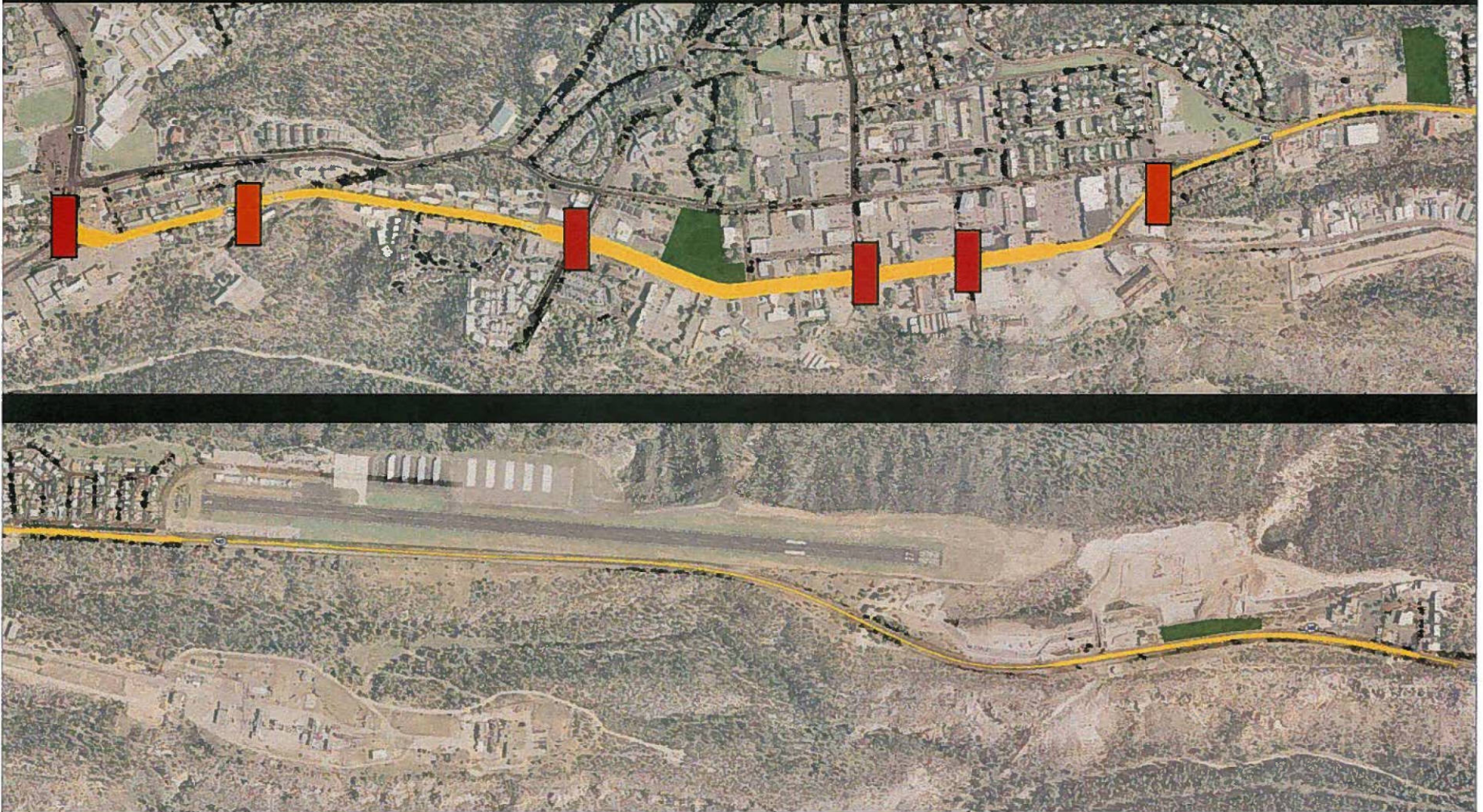
Intersection	AM Peak Hour			Mid-Day Peak Hour			PM Peak Hour		
	Delay (sec.)	V/C	LOS	Delay (sec.)	V/C _x	LOS	Delay (sec.)	V/C	LOS
NM 502 & Diamond Drive <i>(See Note 1)</i>	49.9	0.60	D	55.1	0.64	E	78.9	0.71	E
NM 502 & Oppenheimer <i>(See Note 2)</i>	12.6	0.53	B	12.9	0.55	B	11.6	0.49	B
NM 502 & 15th <i>(See Note 2)</i>	9.0	0.39	A	13.6	0.53	B	14.4	0.57	B
NM 502 & Knecht <i>(See Note 3)</i>	10.4	0.37	B	12.3	0.43	B	16.6	0.58	B

Traffic Flow – Unsignalized Intersection

Intersection	AM Peak Hour			Mid-Day Peak Hour			PM Peak Hour		
	Delay (sec.)	V/C	LOS	Delay (sec.)	V/C	LOS	Delay (sec.)	V/C	LOS
NM 502 & 20th (See Note 1)									
EB Left	9.3	0.10	A	11.1	0.18	B	9.1	0.07	A
SB Left/Right	27.1	0.36	D	59.8	0.75	F	15.4	0.19	C
NM 502 & DP Road (See Note 2)									
WB Left	8.3	0.08	A	8.7	0.03	A	10.2	0.00	B
NB Left/Right	38.2	0.42	E	29.0	0.56	D	35.1	0.58	E
NM 502 & 4th (See Note 1)									
EB Left	9.0	0.03	A	7.8	0.03	A	7.6	0.03	A
SB Left/Right	14.1	0.11	B	10.2	0.7	B	35.3	0.47	E
NM 502 & Central (See Note 3)									
EB Left	11.5	0.00	B	8.5	0.00	A	33.9	0.95	D
SB Left/Right	21.9	0.27	C	22.5	0.52	C	>200	139.5	F
NM 502 & Canyon (See Note 4)									
EB Left	11.9	0.02	B	8.5	0.01	A	8.1	0.01	A
SB Left/Right	37.1	0.15	E	17.0	0.14	C	74.9	0.52	F
NM 502 & Camino Entrada (See Note 3)									
EB Left	11.9	0.08	B	8.2	0.08	A	8.2	0.03	A
SB Left	36.3	0.12	E	19.5	0.05	C	66.4	0.25	F
SB Right	25.3	0.31	D	11.0	0.14	B	11.1	0.07	B



Existing and Potential Signalization



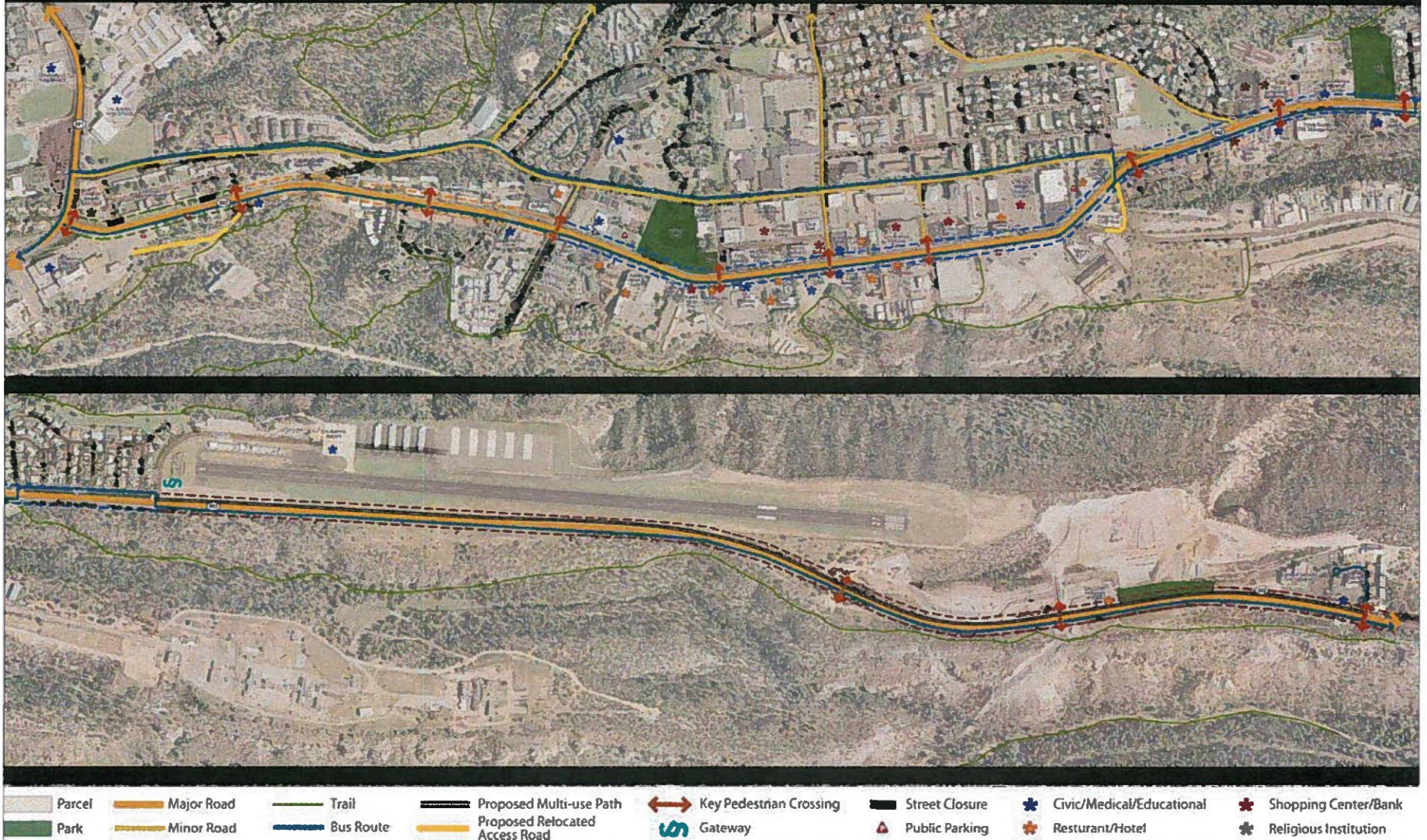


INITIAL ALTERNATIVES

COMPREHENSIVE TRANSPORTATION STUDY AND PLAN FOR NM502



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
- Contiguous sidewalks
- Safer pedestrian crossings
- More livable street (nicer to walk along, quieter, etc.)
- Gateways to a more connected downtown
- Beautification

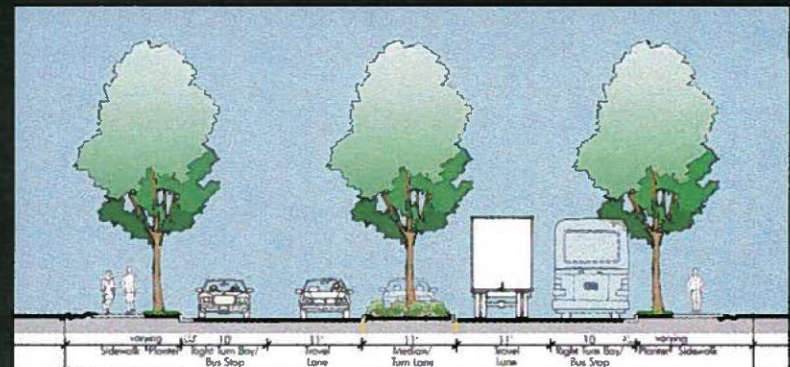
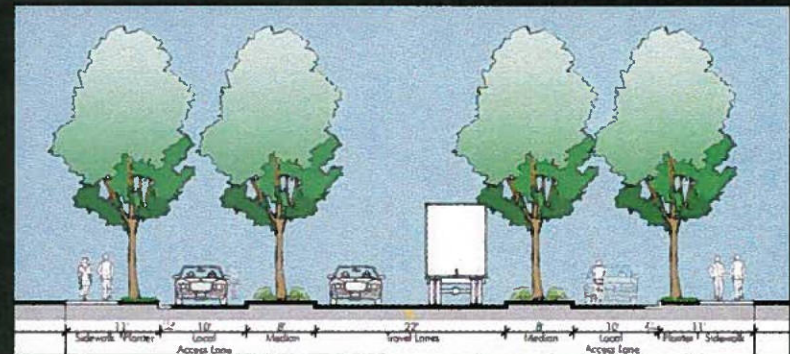
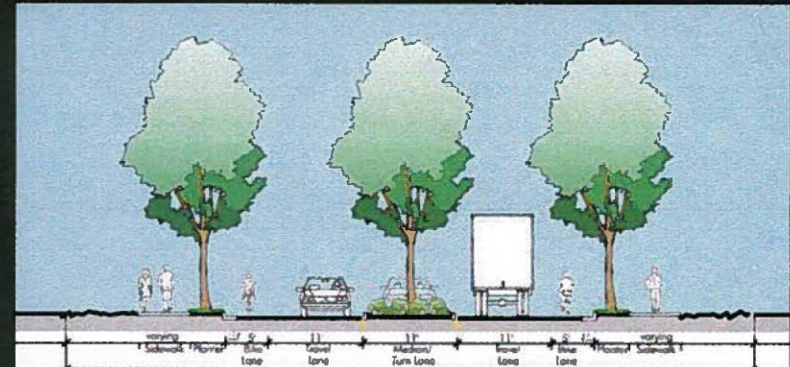
Preliminary Design Alternatives

• Option A: Three Lane

- A1: Roundabouts throughout area
- A2: Combination of roundabouts and signals
- A3: A1 or A2 with left turn pockets

• Option B: Four Lane

• Option C: Five Lane



Preferred County Council Direction

- Move forward with NM502 Study and Plan Alternates A for further study
- Key council comments for Preferred Alternate included:
 - More effective and attractive corridor
 - Greater access & safety for pedestrians, cyclists & autos
 - Land acquisition for roundabouts and associated costs
 - Bicycle safety and truck mobility at roundabouts
 - Sound concerns
 - Left turn pockets for businesses
 - Pedestrian refuge at left turn lanes
 - Landscaping along airport fence
 - State funding for construction
 - Impacts during construction
 - Mitigations after construction

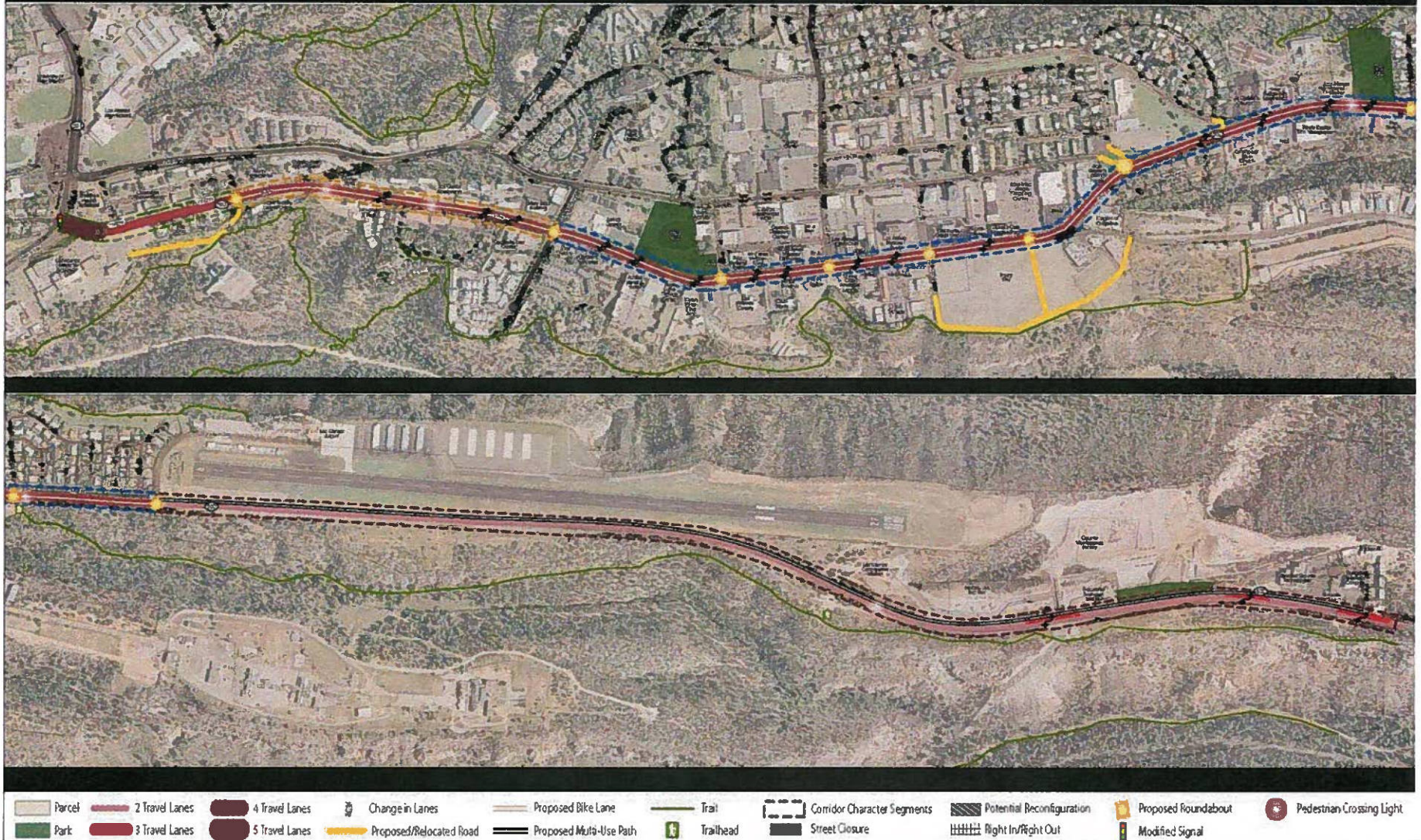


Preferred Alternative Analysis

COMPREHENSIVE TRANSPORTATION STUDY AND PLAN FOR NM502



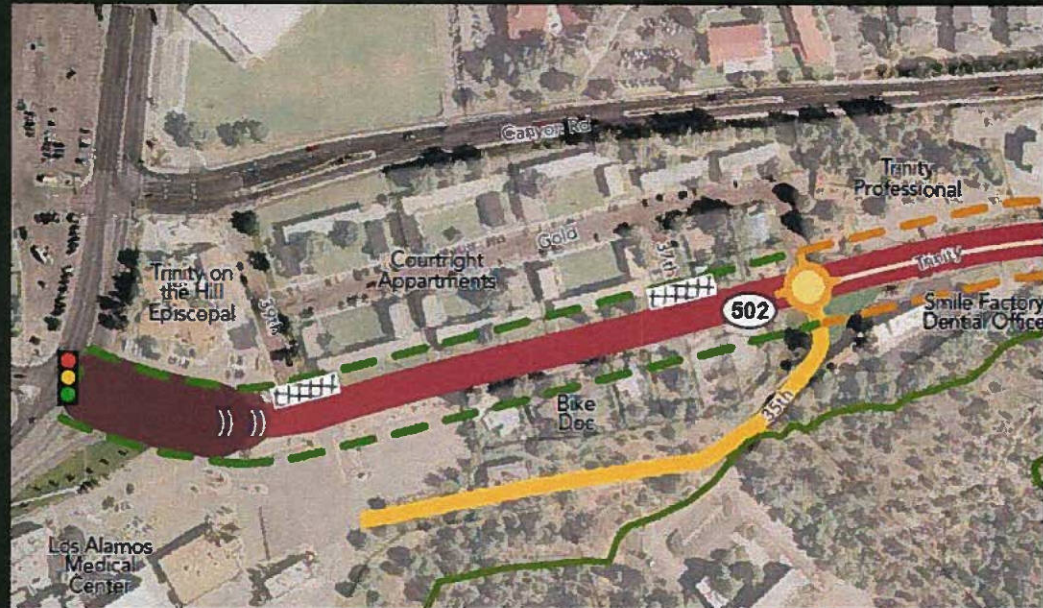
Preferred Alternative



Overarching Elements

- Safe and efficient traffic flow

- Two through lane roadway with turn pockets
- Relocate hospital access to 35th/36th Street
- Relocate DP Road access
- Realign Canyon Road



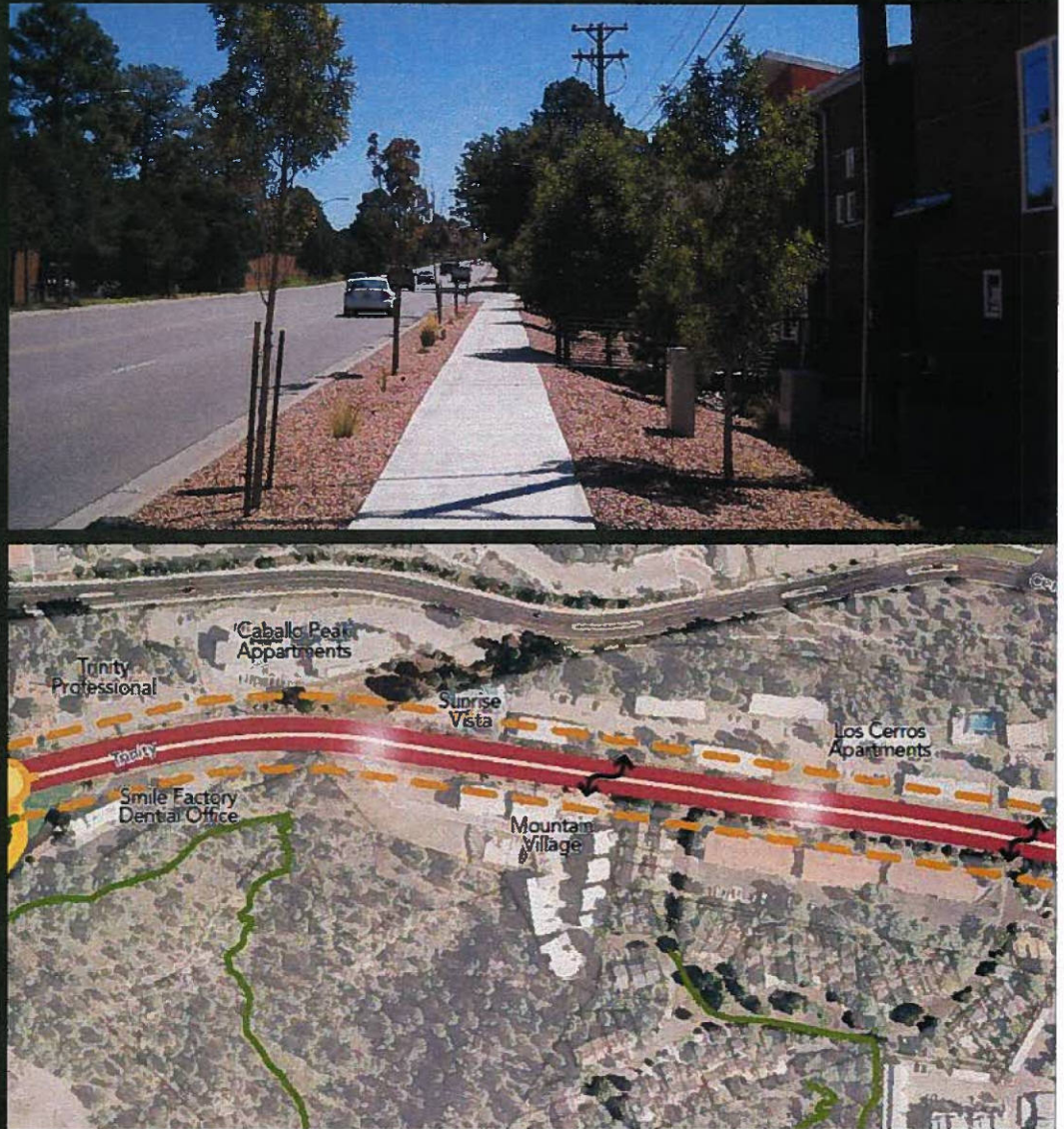
Overarching Elements

- **Safe and efficient traffic flow**
 - The directional volumes traveling NM 502 can be accommodated in a single lane
 - Stop controlled and signalized intersections require additional lanes for storage
 - Because roundabout traffic keeps moving, storage lane capacity is not necessary
 - Ideal traffic flow is approximately 1,800 vehicles per lane
 - Most directional approaches on NM 502 carry only 800-1,100 vehicles in the 2030 future peak hour volumes
 - East of NM 502 at Central in the 2030 projections, the directional peak hour volume approaches 1,400

Overarching Elements

- **Enhanced pedestrian connectivity**

- Contiguous ADA accessible pedestrian sidewalks along the entire corridor
- New sidewalk between Clendenen Building and Caballo Peak Apartments



Overarching Elements

- **Enhanced pedestrian connectivity**

- Safer crosswalks at intersections, trail heads and other key mid-block locations



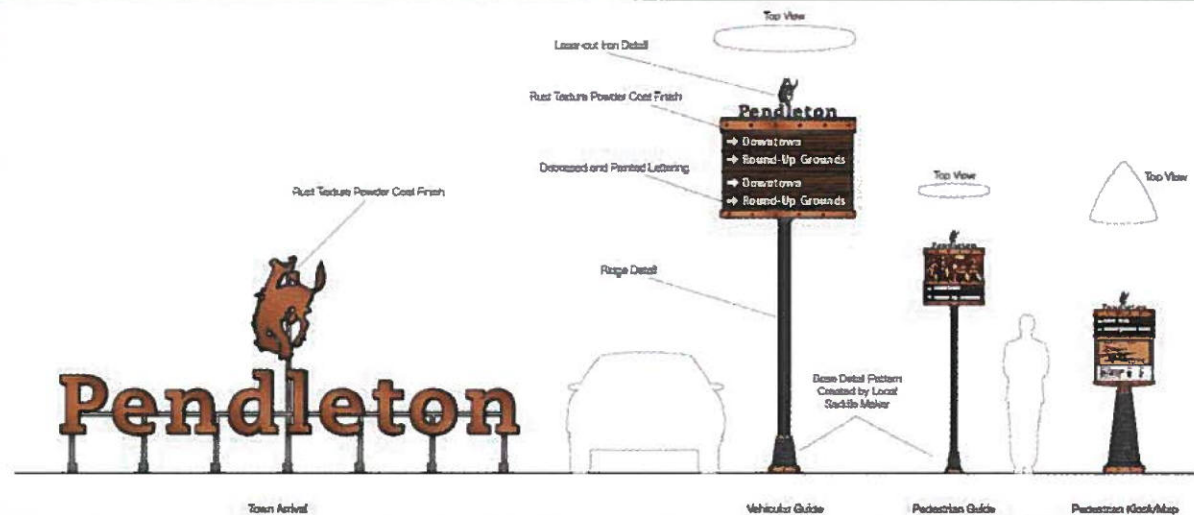
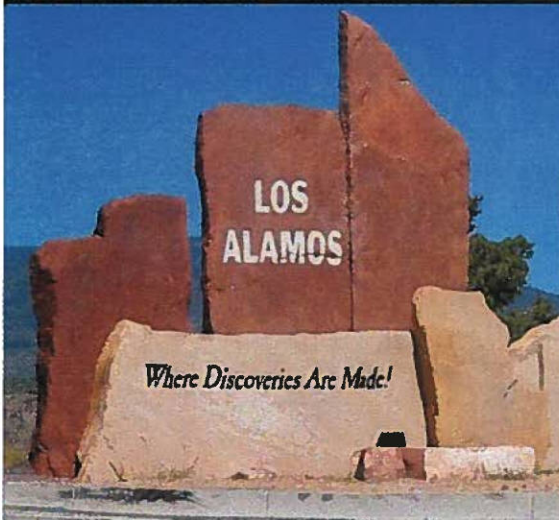
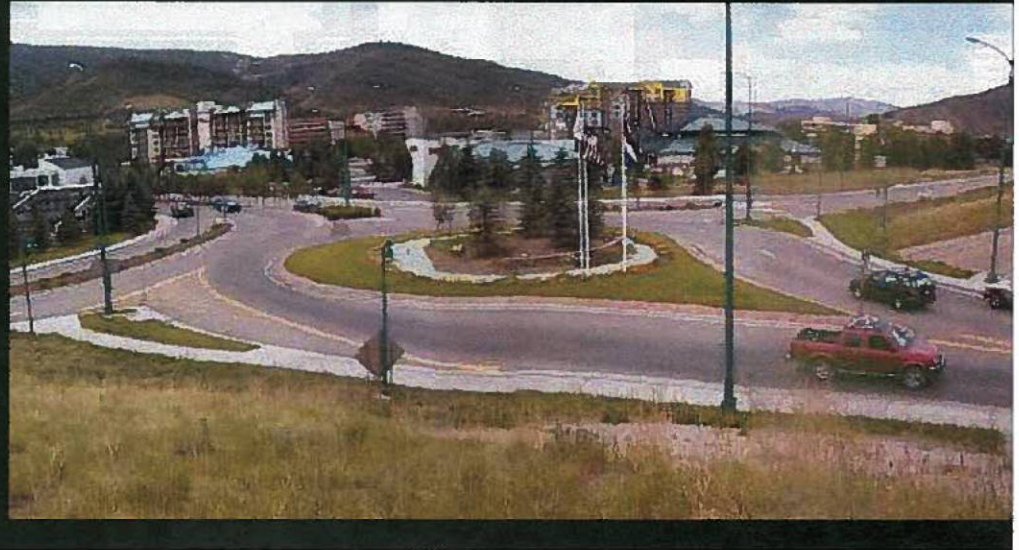
Overarching Elements

- **New bicycle connections**
 - Dedicated bike lanes between 35/36th to Tewa Loop
 - Multi-use pedestrian bicycle trails east of Tewa Loop



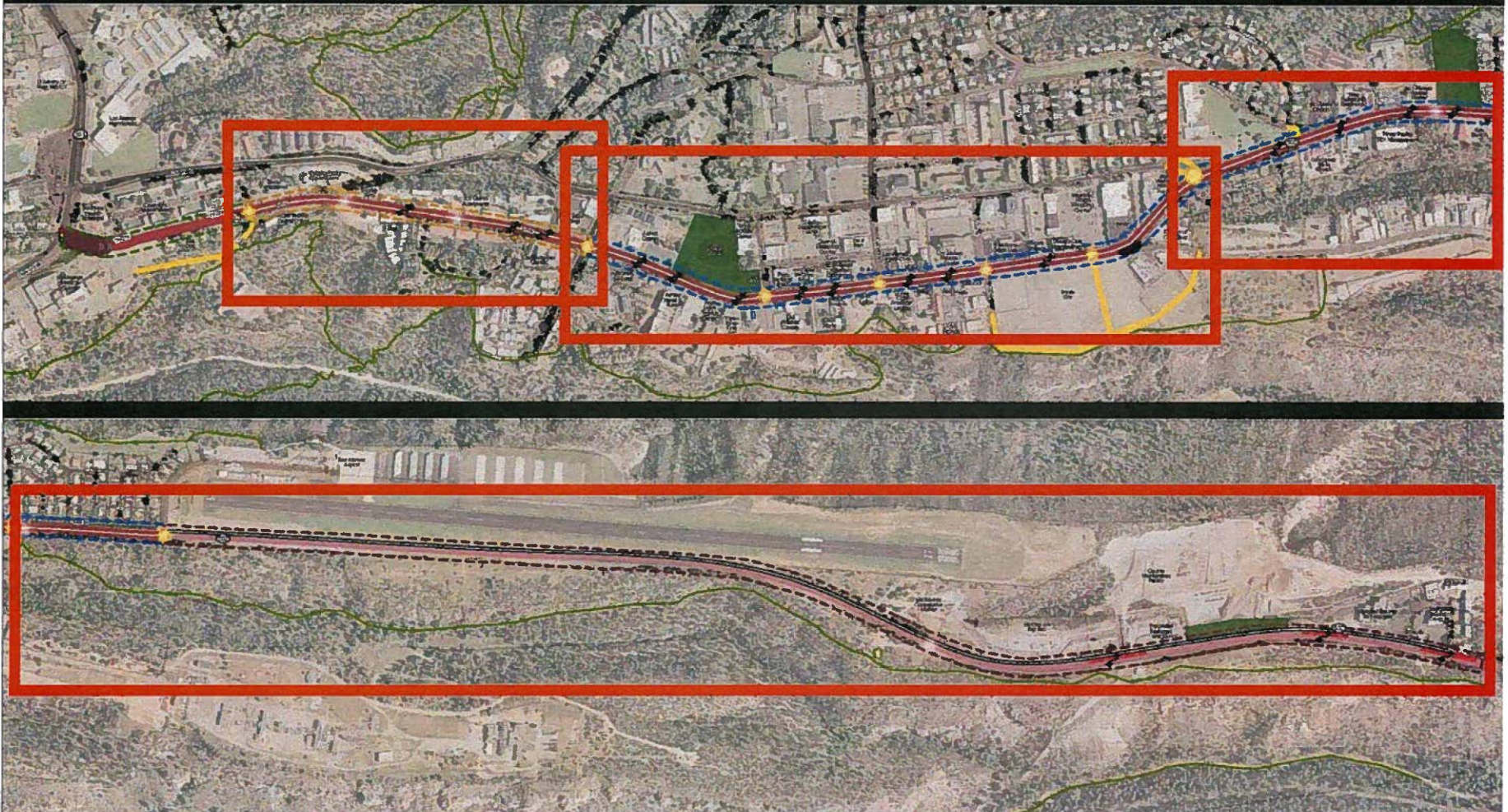
Overarching Elements

- Improved connections to Downtown:
 - Gateway feature to community at Airport Road
 - Gateways & signage to Downtown

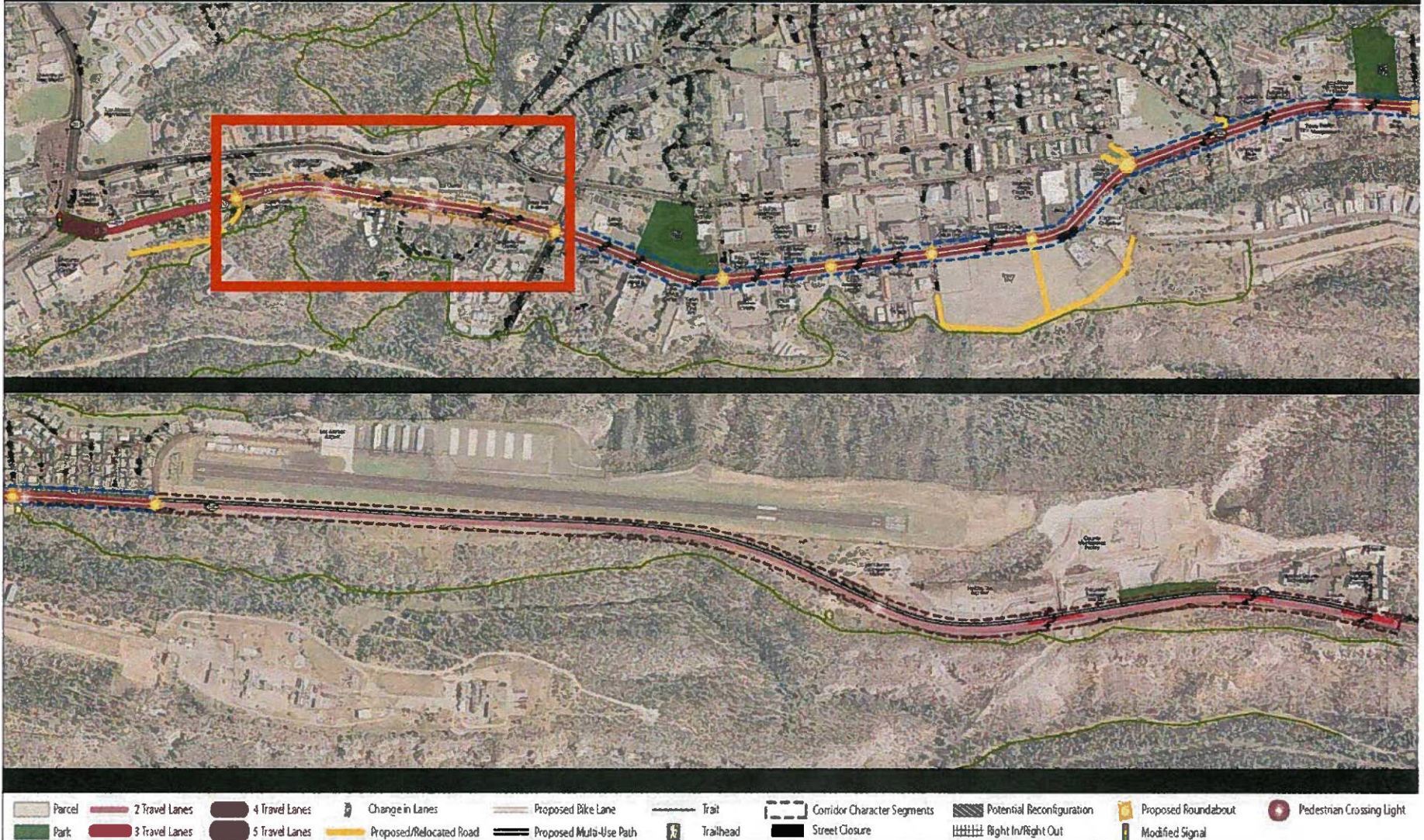


Key Sections

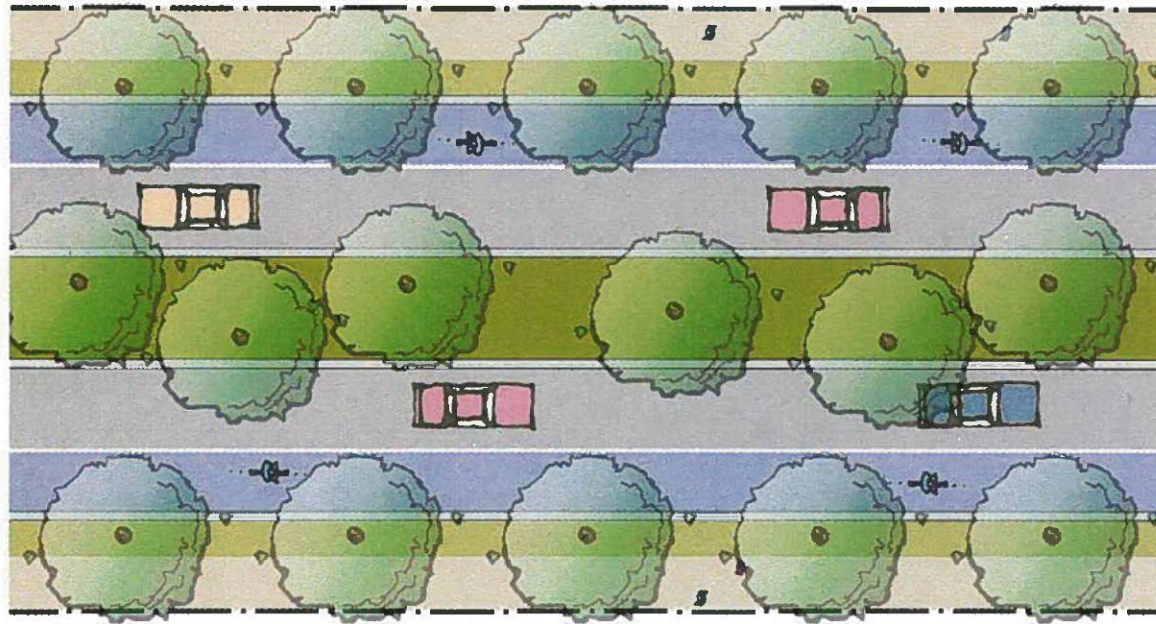
- 35th / 36th to Oppenheimer
- Oppenheimer to 4th/Central
- 4th/Central to Tewa Loop
- Tewa Loop to County Line



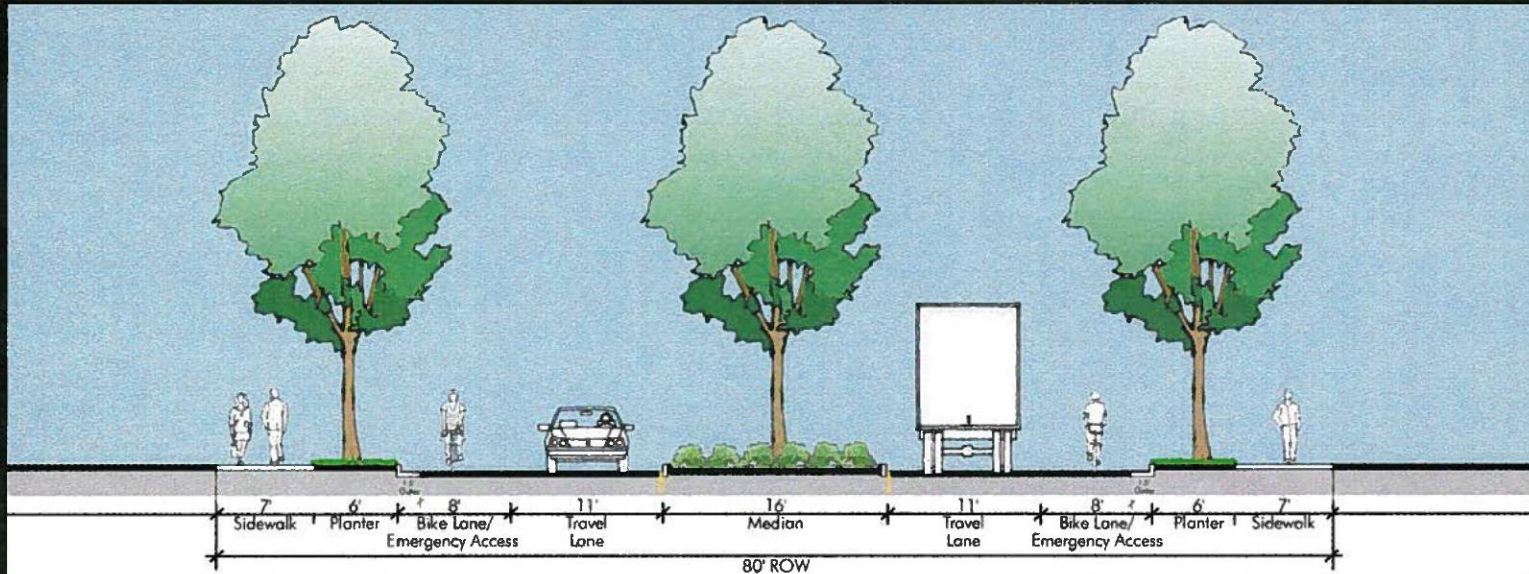
Preferred Alternative



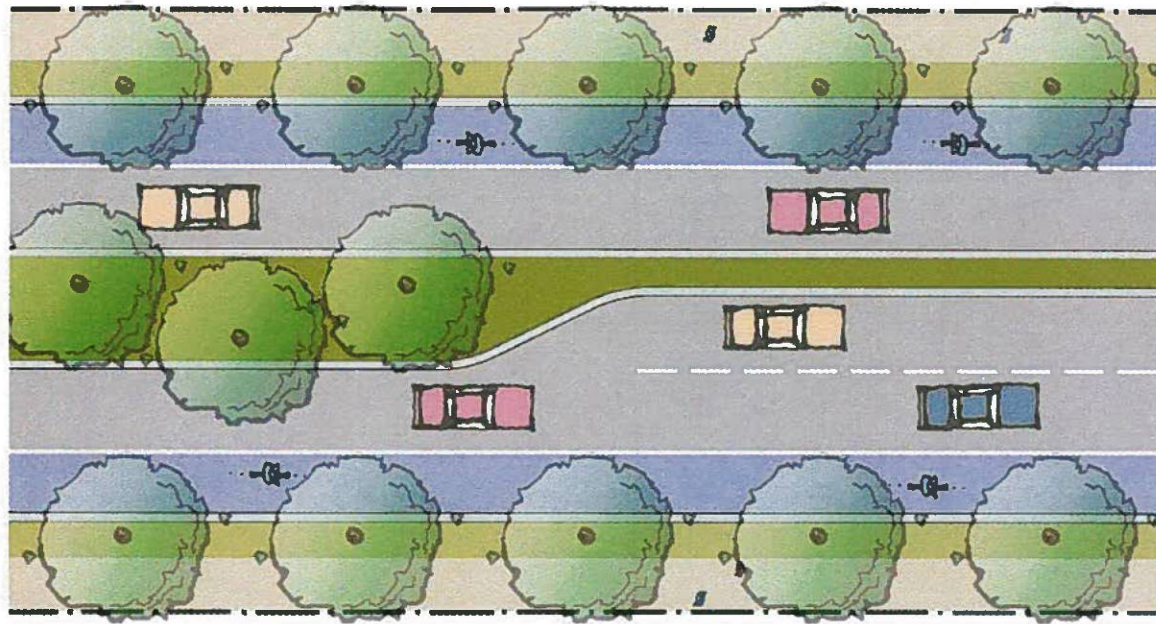
35th / 36th to Oppenheimer



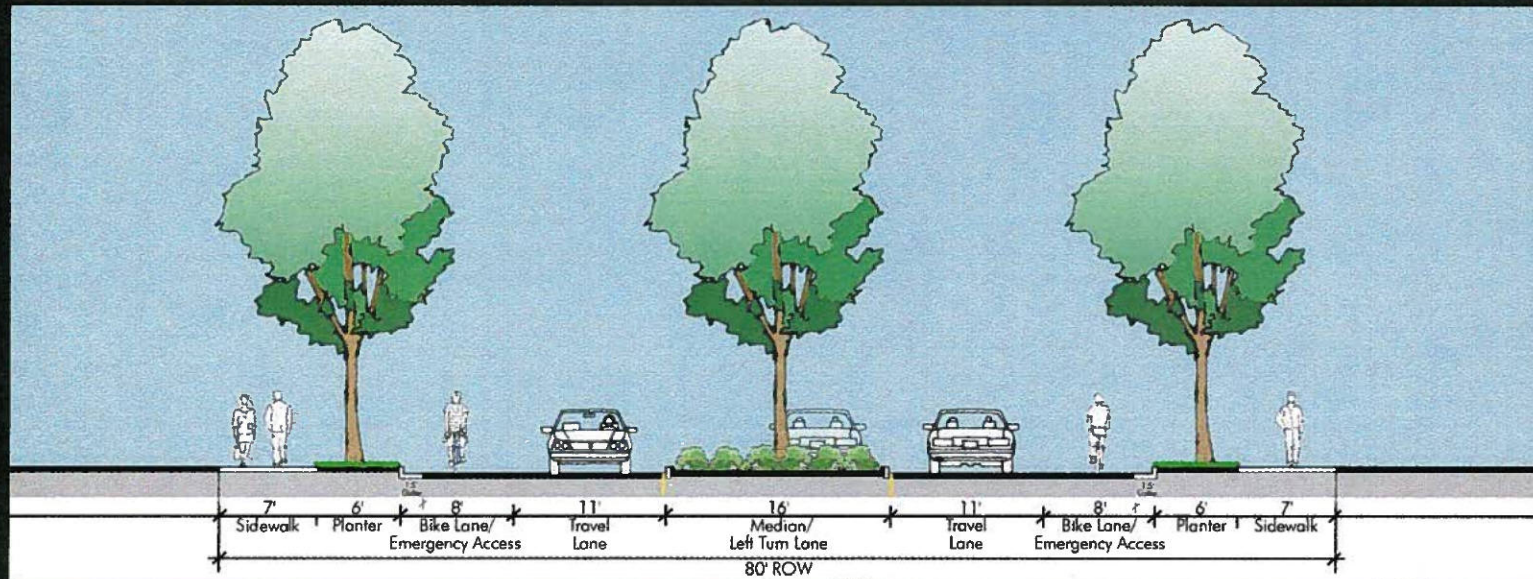
7'	Sidewalk	80' ROW
6'	Planter Strip	
8'	Bike Lane/ Right Turn	
11'	Travel Lane	
16'	Median	80' ROW
11'	Travel Lane	
8'	Bike Lane/ Right Turn	
6'	Planter Strip	
7'	Sidewalk	



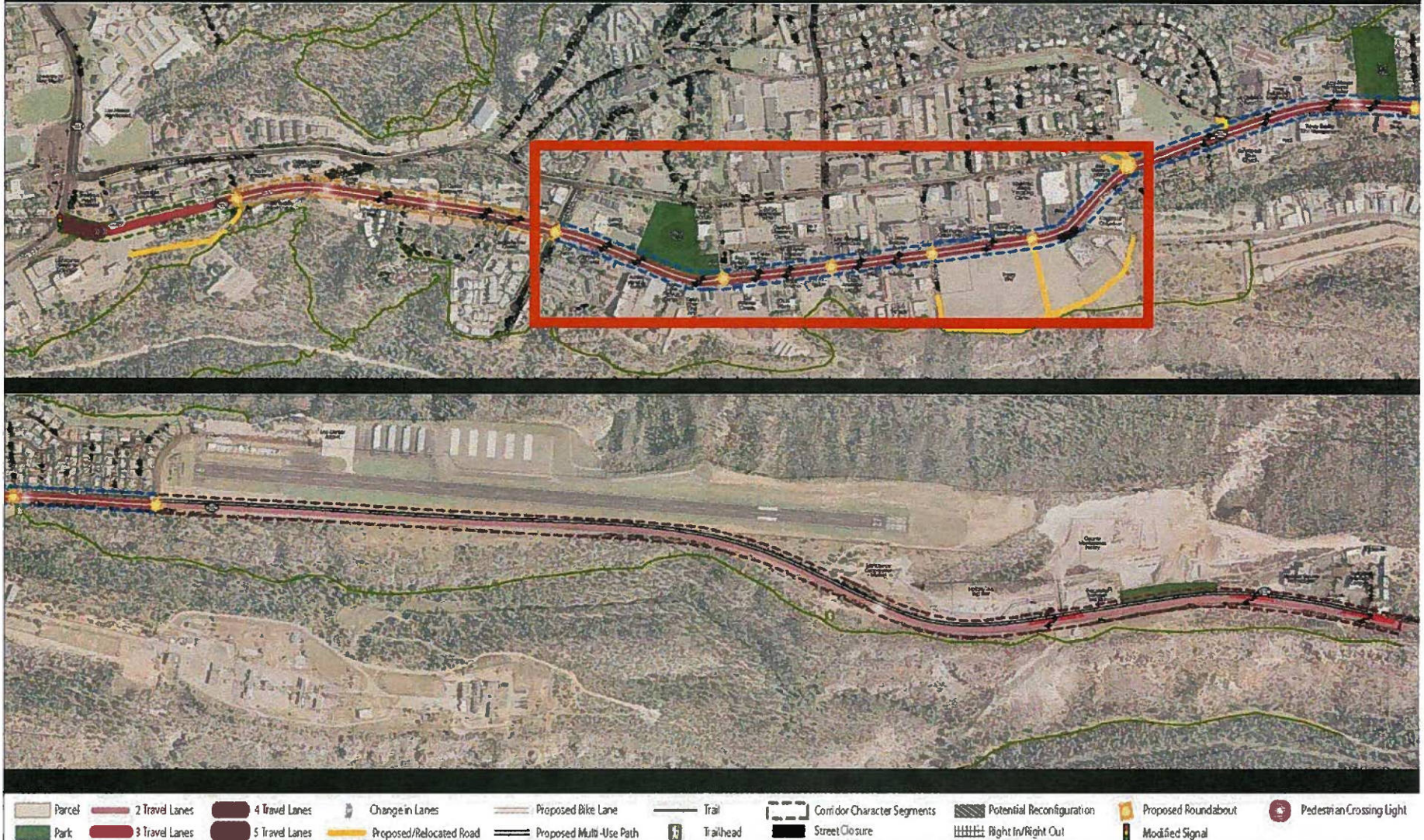
35th / 36th to Oppenheimer



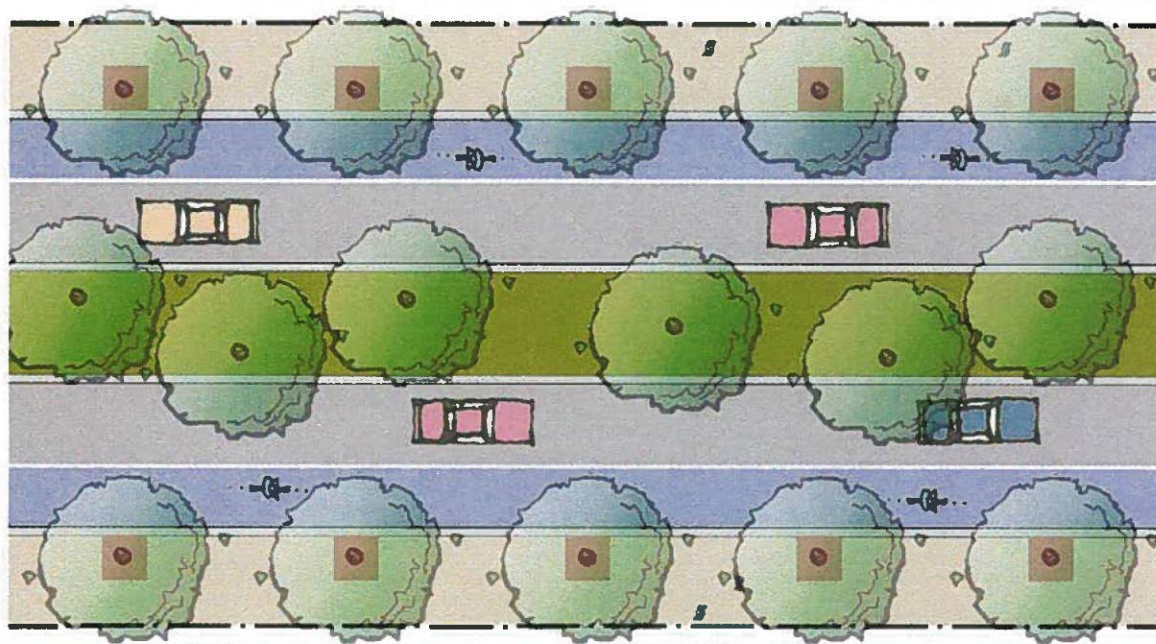
7'	Sidewalk	80' ROW
6'	Planter Strip	
8'	Bike Lane/ Right Turn	
11'	Travel Lane	
16'	Median/ Left Turn	
11'	Travel Lane	
8'	Bike Lane/ Right Turn	
6'	Planter Strip	
7'	Sidewalk	



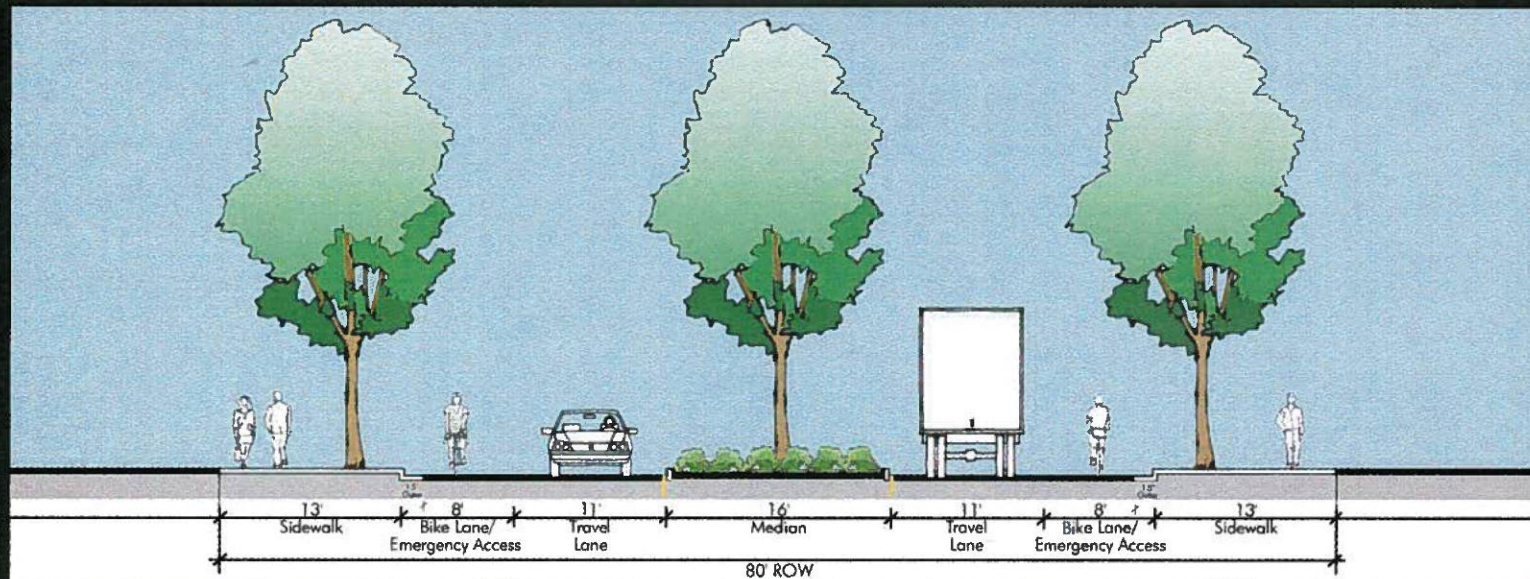
Preferred Alternative



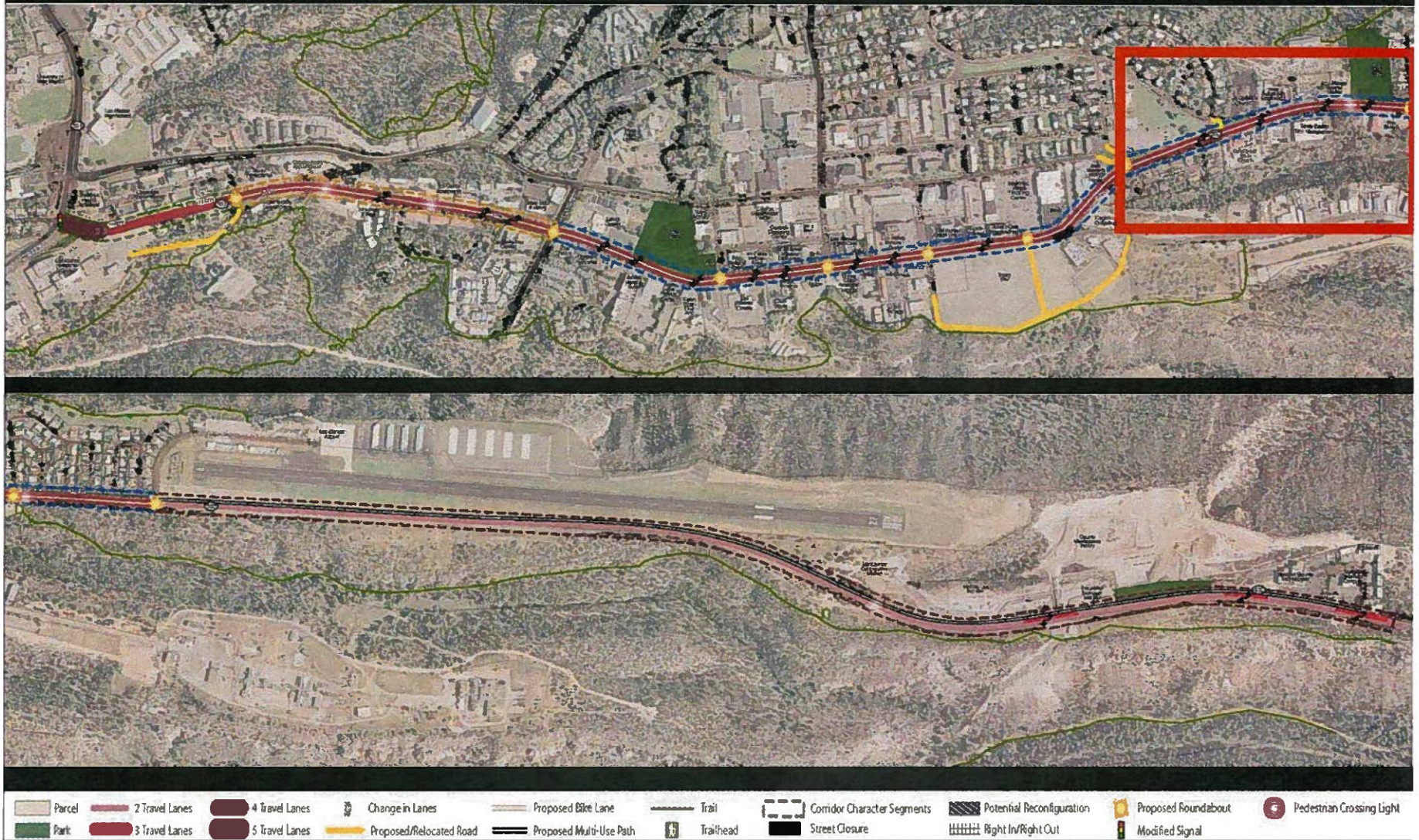
Oppenheimer to 4th / Central



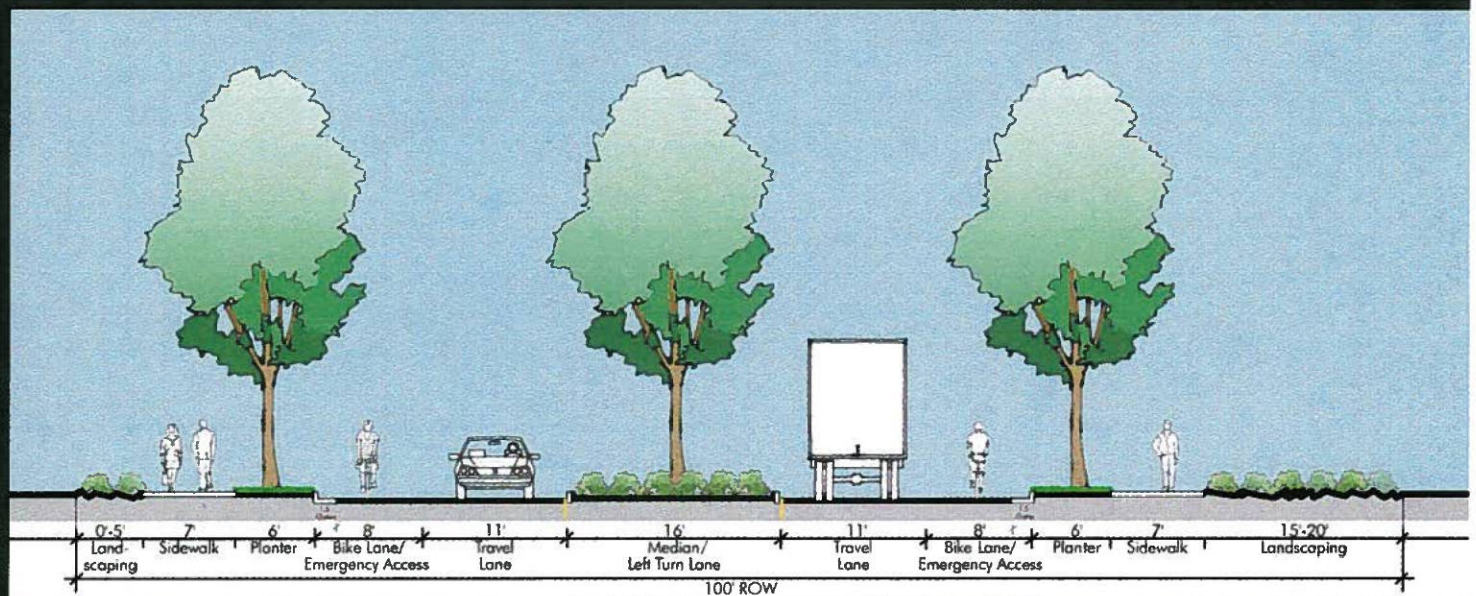
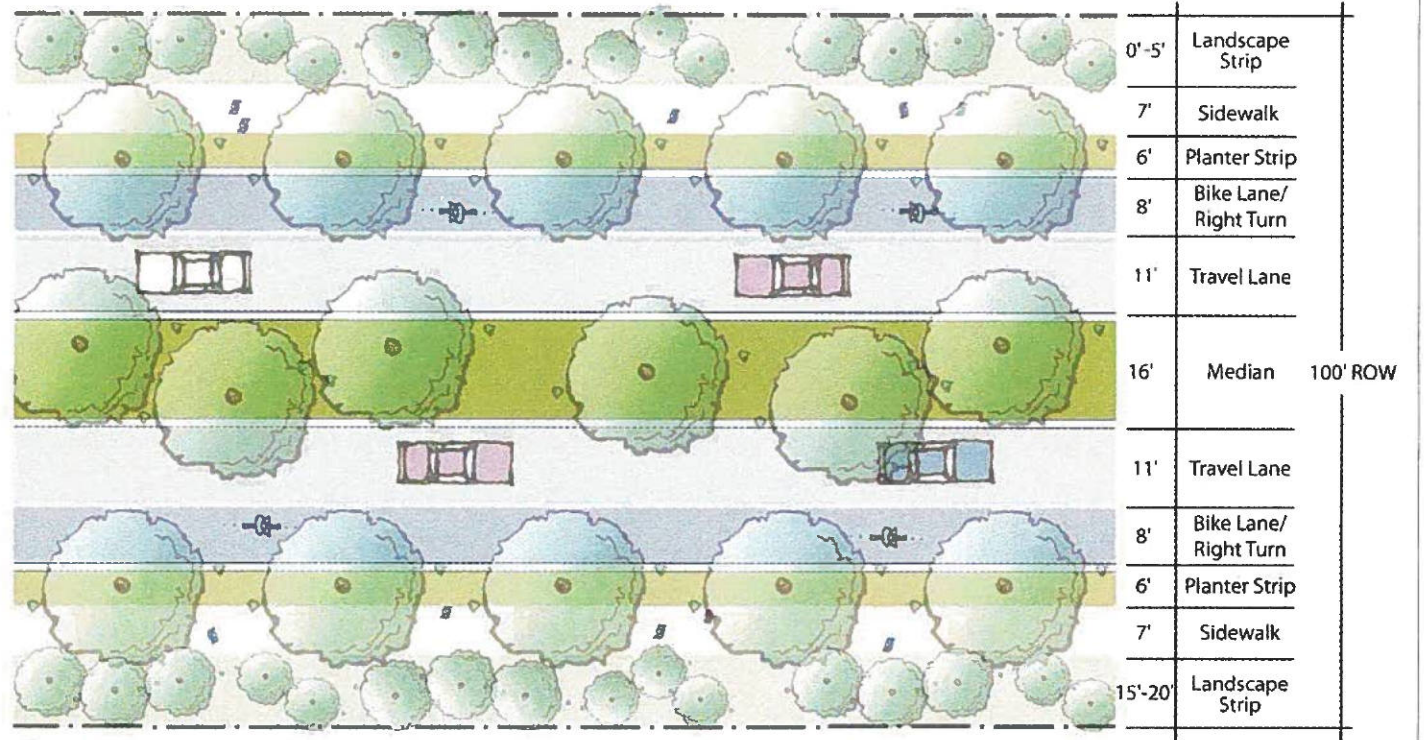
13'	Sidewalk	80' ROW
8'	Bike Lane	
11'	Travel Lane	
16'	Median	
11'	Travel Lane	
8'	Bike Lane	
13'	Sidewalk	



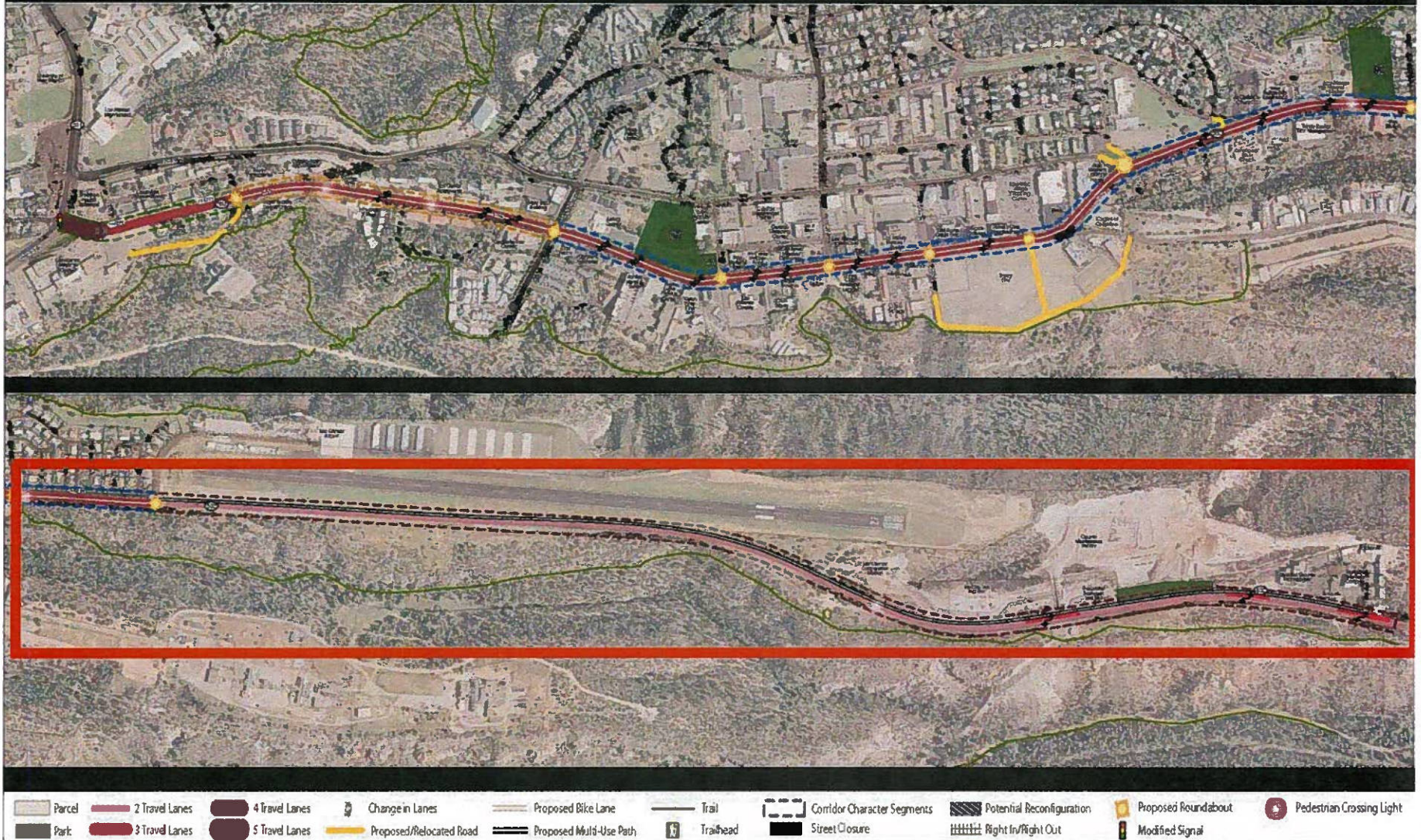
Preferred Alternative



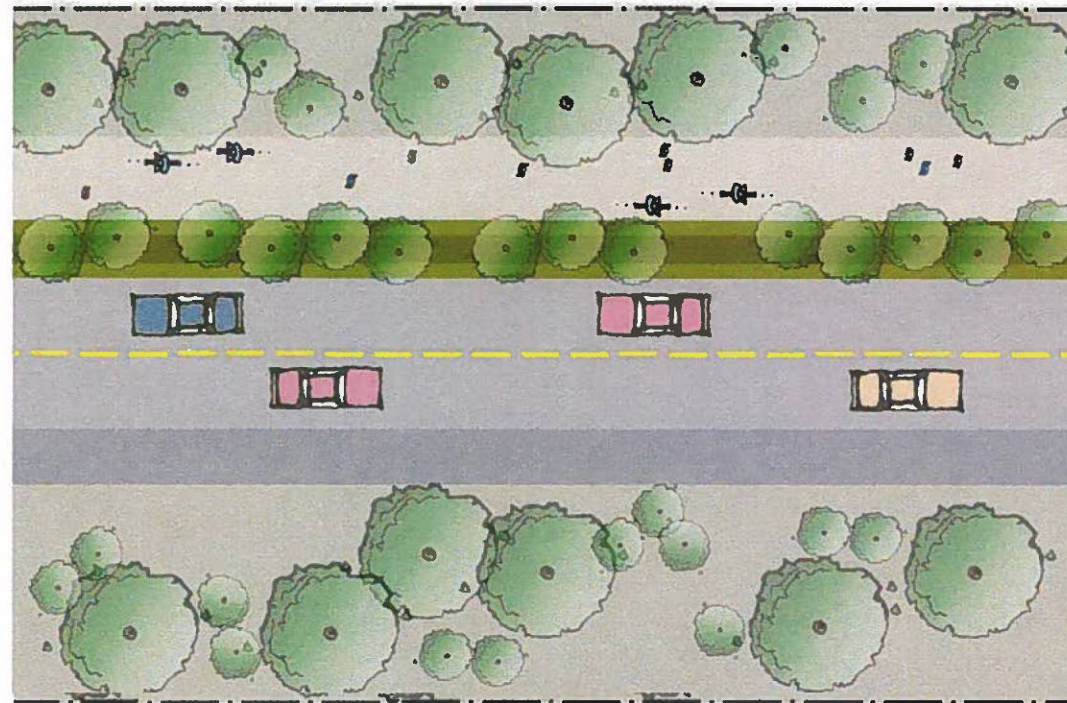
4th/ Central to Tewa Loop



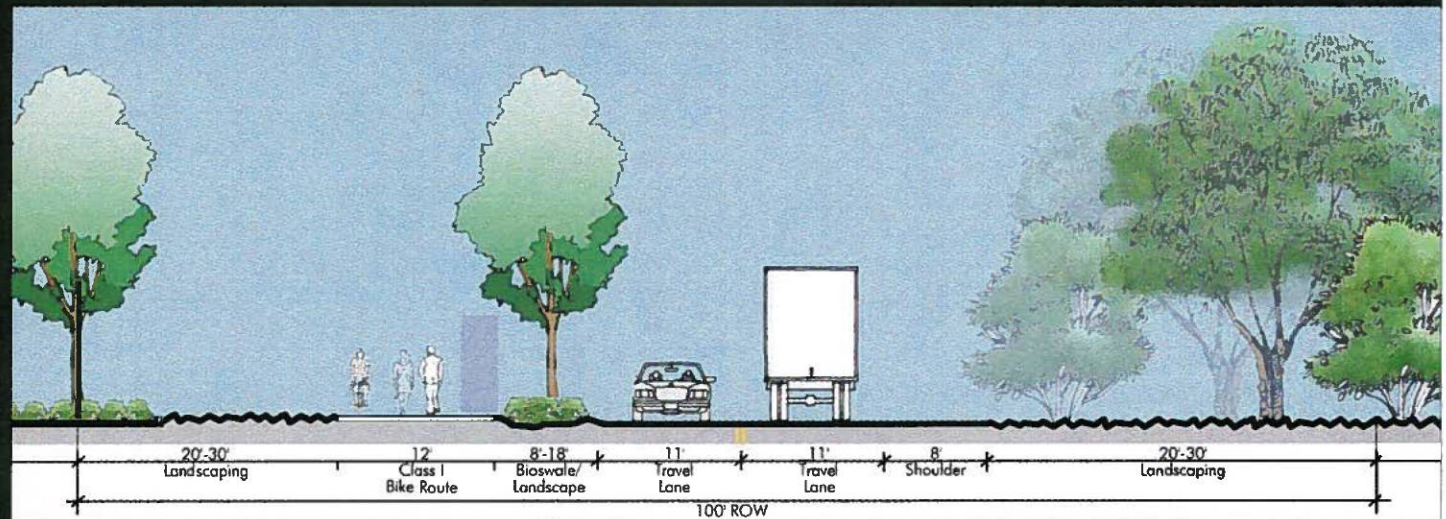
Preferred Alternative



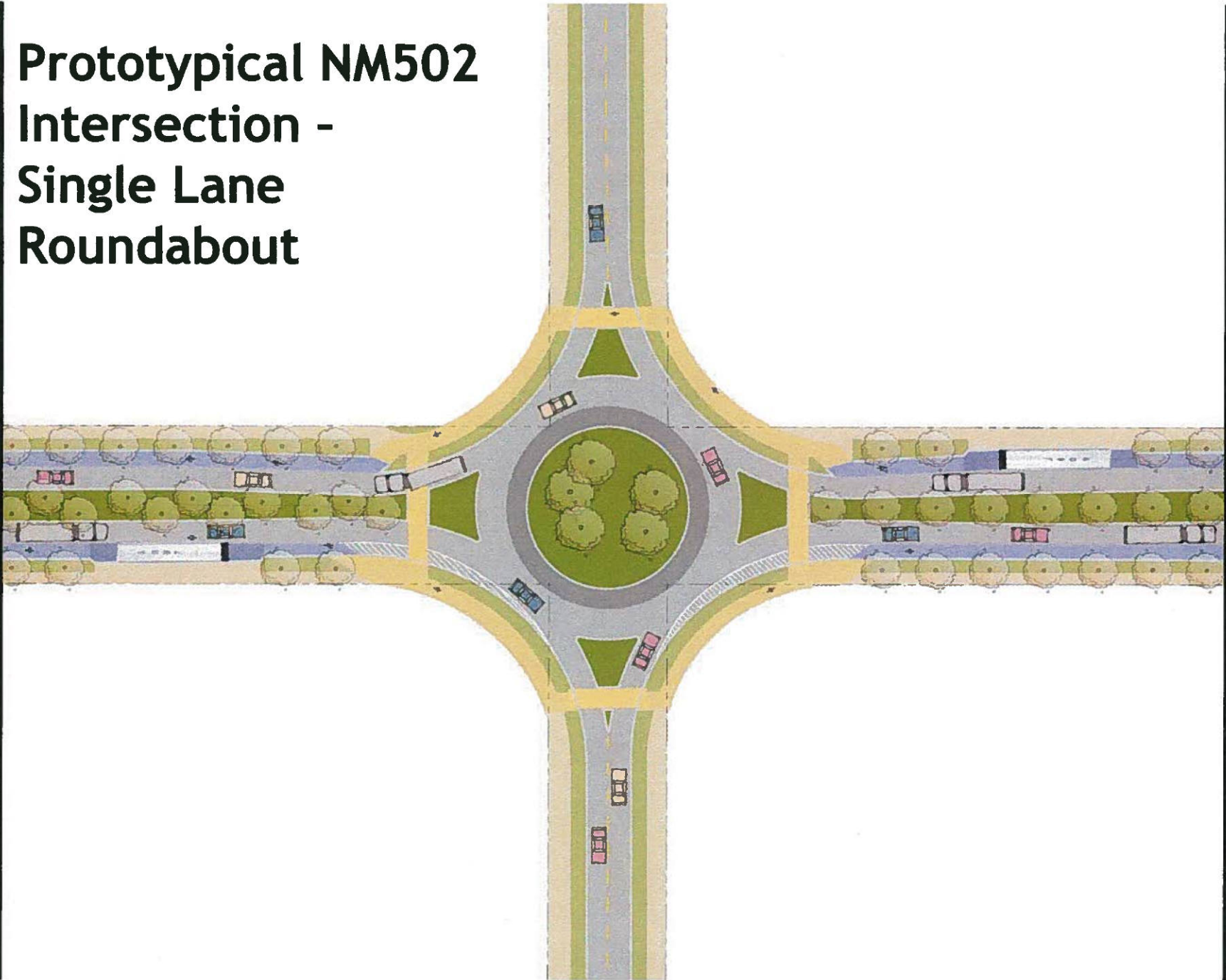
Tewa Loop to County Line



20'	20'-30' Landscaped Strip	100' ROW
12'	Class I Bike Route	
8'	8'-18' Bioswale/ Landscaped	
11'	Travel Lane	
11'	Travel Lane	
8'	Shoulder	
30'	20'-30' Landscaped Strip	



Prototypical NM502 Intersection - Single Lane Roundabout

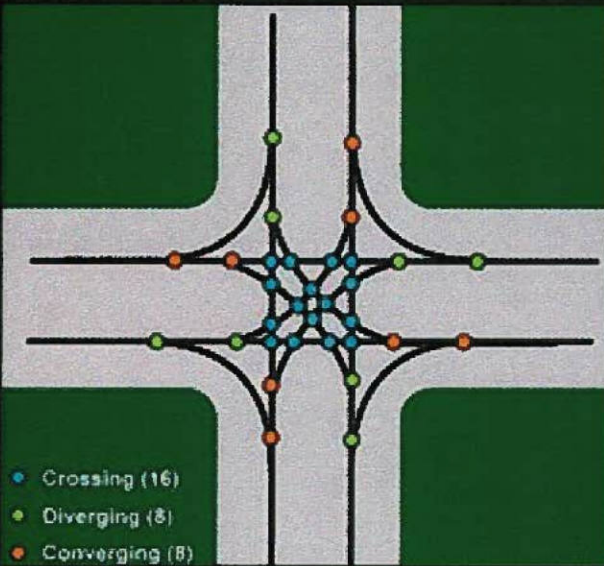
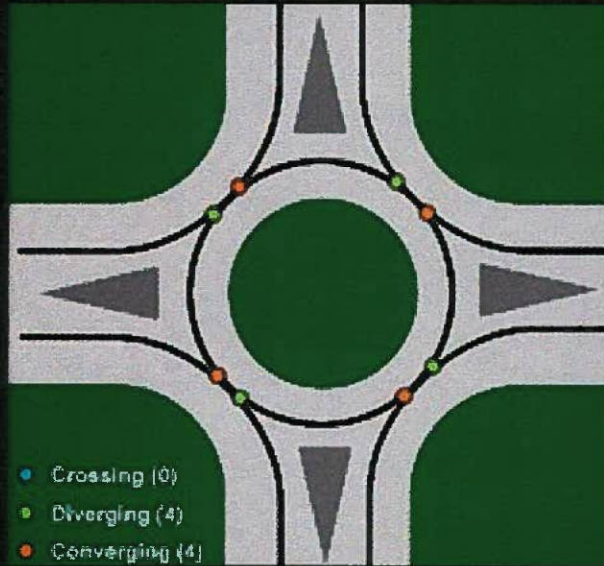


Prototypical NM502 Intersection - Potential Right Hand “Slip” Lanes



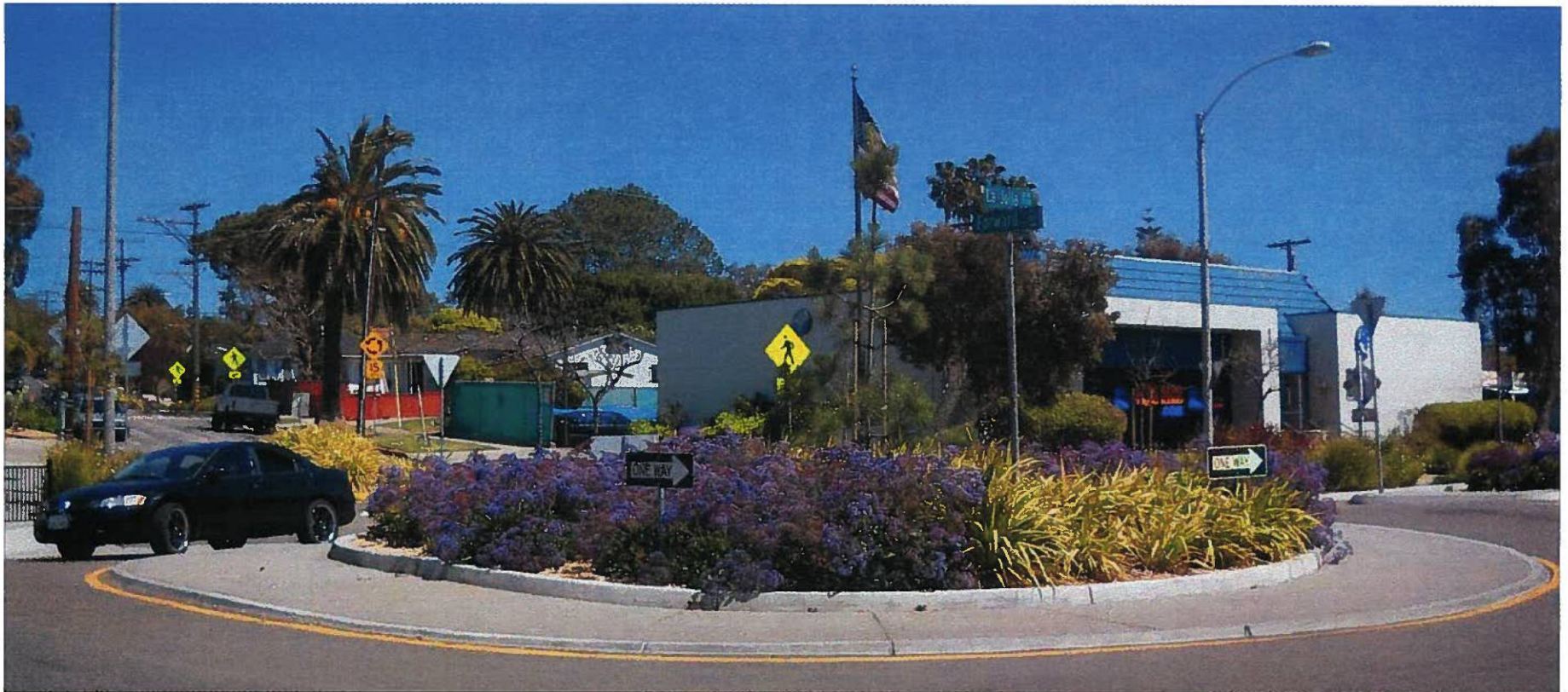
Roundabout

Characteristics



- **Safety:** Proven safety solution that prevents & reduces severity of intersection crashes (account for 45% of all crashes)
 - Eliminates some of conflicting traffic, such as left turns
 - Traffic enters & exits only through right turns
 - Decrease traffic speed to approx. 30 miles/hr





BIRDROCK, CA

Roundabouts

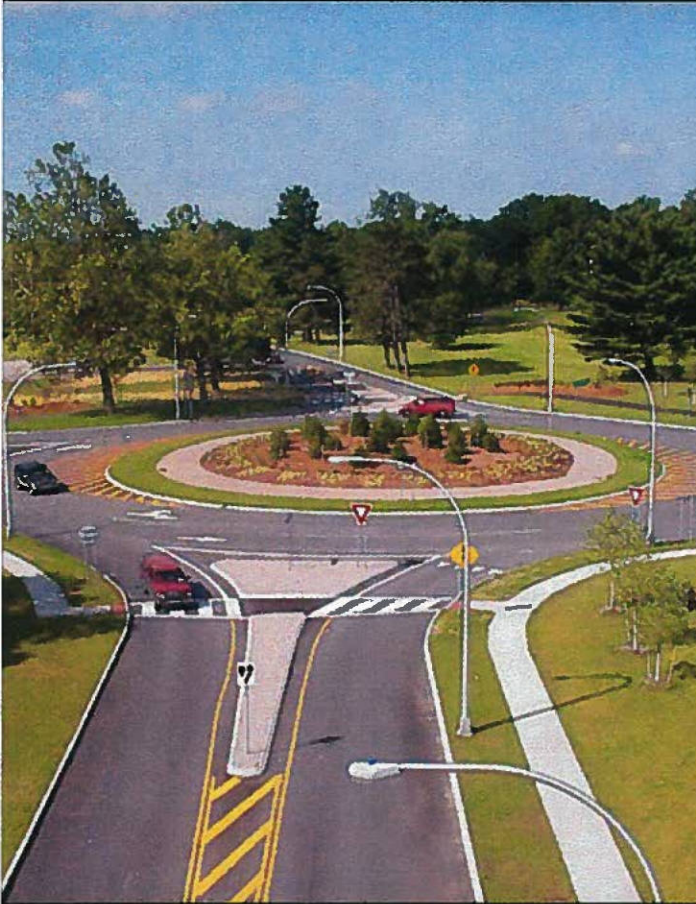
Characteristics



- **Equal Access:** Meet the needs of all users: drivers, bicyclists, pedestrians, etc
- **Operational:** Increased traffic capacity & improved traffic flow
- **Sustainable:** Reduce vehicle emissions and fuel consumption
- **Aesthetically desirable**

Roundabouts

Pedestrian Crossings



Roundabouts

Pedestrian Crossings



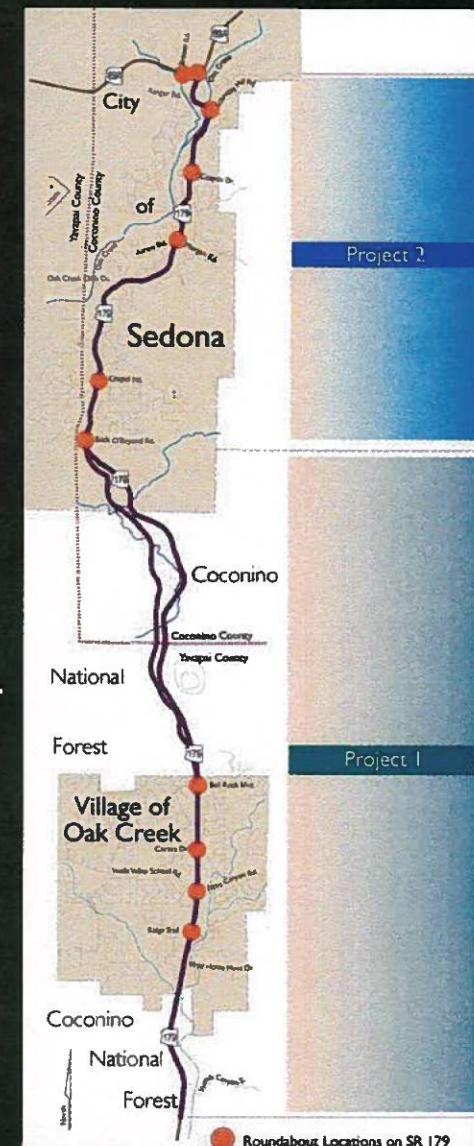
Roundabouts

Options for Bicyclists



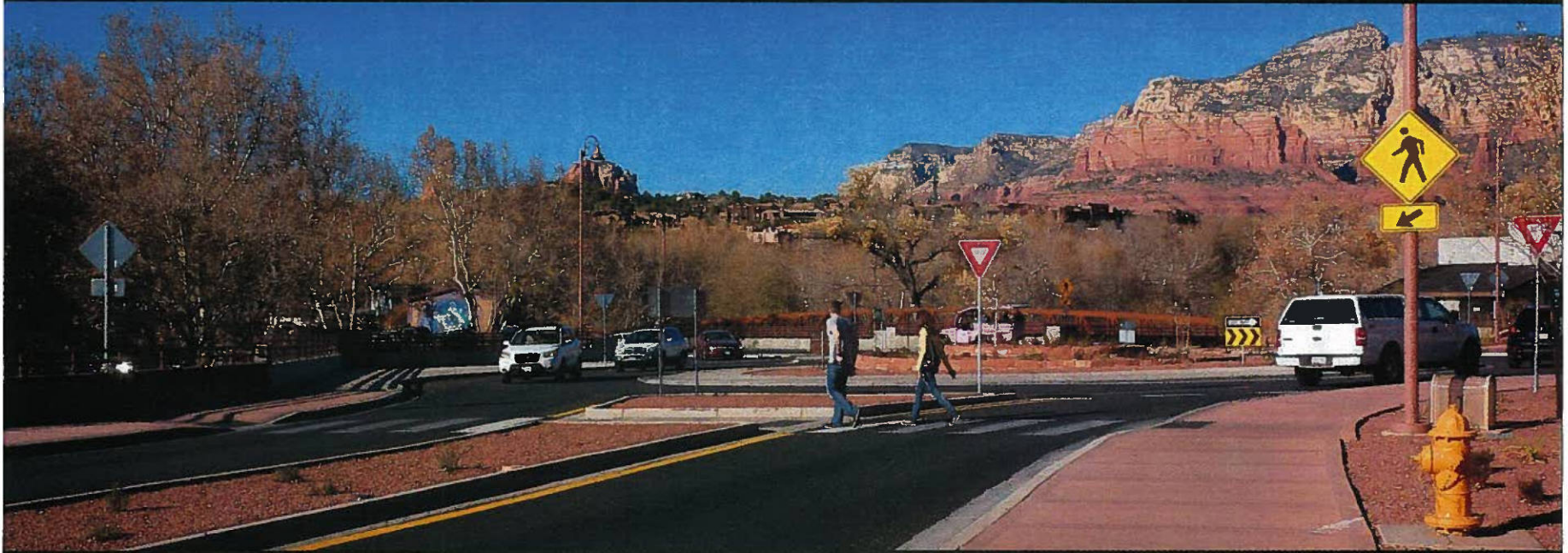
Sedona, Arizona - SR169

- 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



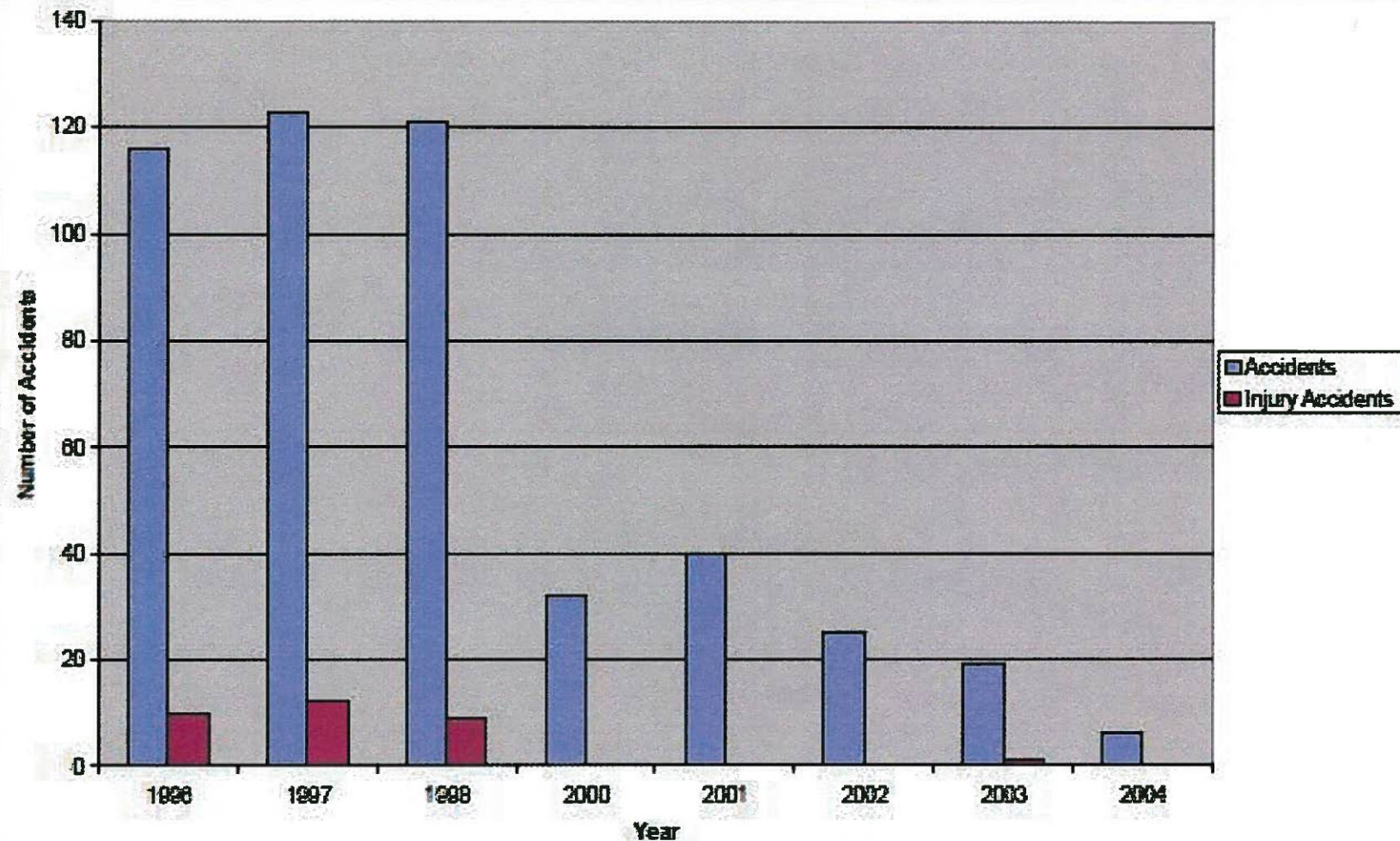


GOLDEN, CO

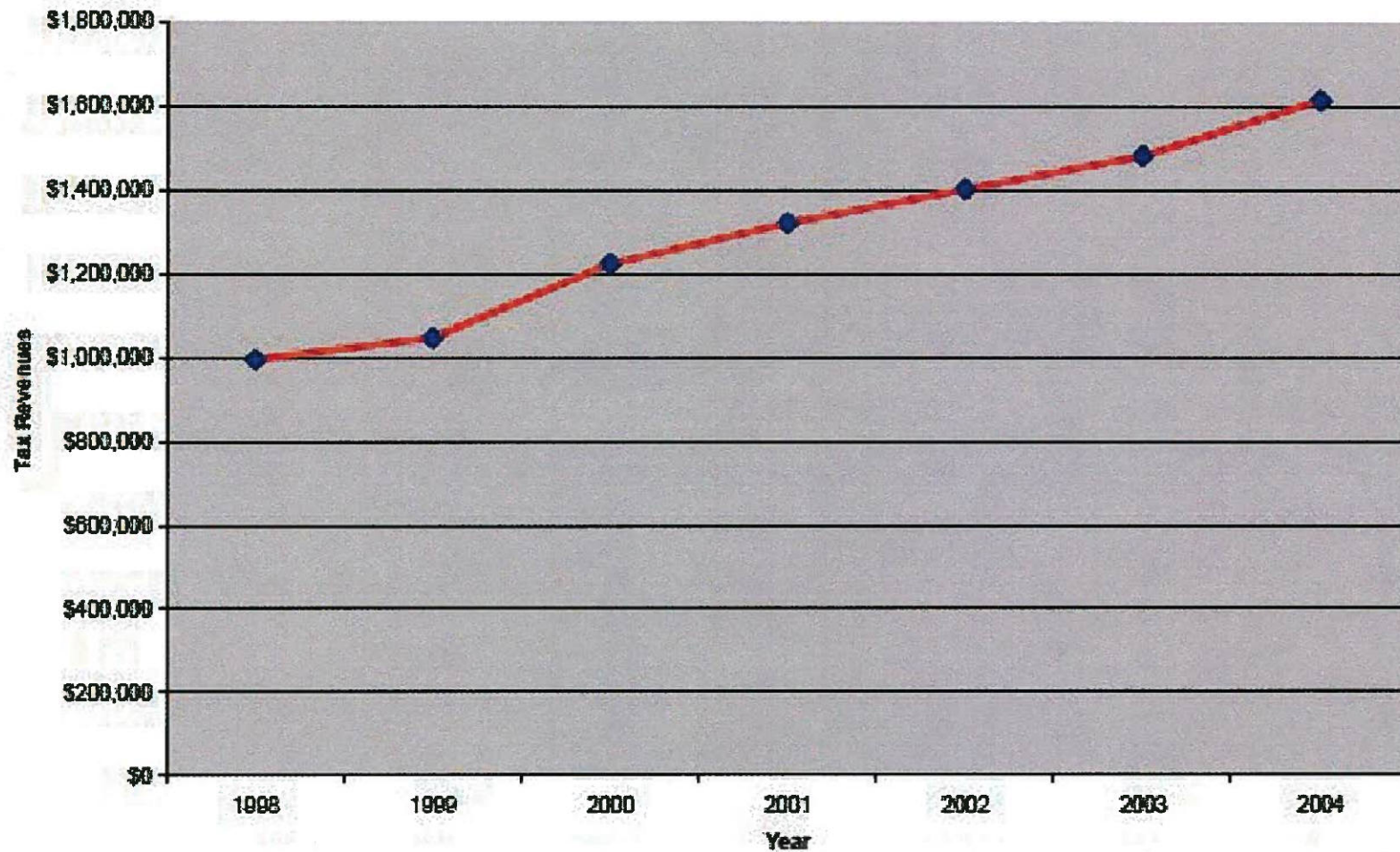
Golden, Colorado - South Golden Road



Accident History (South Golden Road)



Sales Tax Revenue (South Golden Road)



Roundabouts in New Mexico

- Roswell
- Clovis
- Rio Rancho
- Taos
- Santa Fe
- Albuquerque
- Los Alamos

Roundabout Analysis

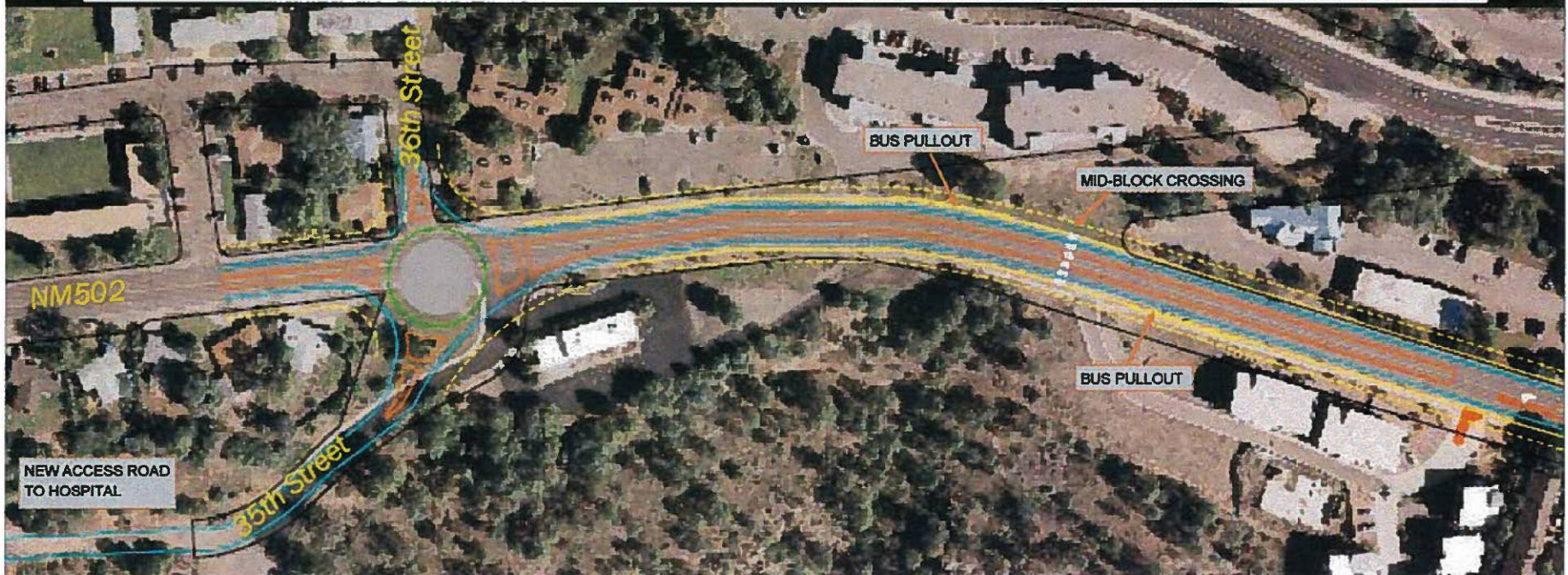
- Analyzed using SIDRA Intersection software
- Future volumes based on a very aggressive growth rate of 1% per year
- Single lane roundabout with:
 - Single lane approach
 - 18' circulatory lanes
 - 17' entry width

LOS at Proposed Roundabouts

	AM Peak		PM Peak	
	2010	2030	2010	2030
36th/35 th Street	A	A	A	A
Oppenheimer	A	A	A	A
20th	A	A	A	A
15th	A	A	B	C
Knecht	A	A	B	B
6th	A	A	A	A
4 th /Central	A	A	B	C
Tewa Loop	A	A	A	A
Airport Road	A	A	A	A

NM 502 & 36th/35th

	AM 2010		AM 2030		PM 2010		PM 2030	
	DEL (s)	LOS	DEL (s)	LOS	DEL (s)	LOS	DEL (s)	LOS
	2.0	A	7.0	A	7.3	A	7.8	A
WB	5.9	A	6.1	A	6.0	A	5.8	A
EB	5.3	A	5.3	A	5.3	A	5.5	A
SB	18.7	B	26.0	C	19.7	B	19.3	B
NB	13.8	B	17.2	B	21.1	C	36.0	D



NM 502 & Oppenheimer

	AM 2010		AM 2030		PM 2010		PM 2030	
	DEL (s)	LOS	DEL (s)	LOS	DEL (s)	LOS	DEL (s)	LOS
	6.5	A	6.4	A	7.2	A	7.6	A
WB	5.8	A	5.7	A	6.3	A	6.2	A
EB	5.6	A	5.5	A	6.6	A	7.0	A
SB	12.3	B	13.6	B	11.8	B	11.6	B
NB	11.7	B	12.6	B	17.4	B	24.4	C



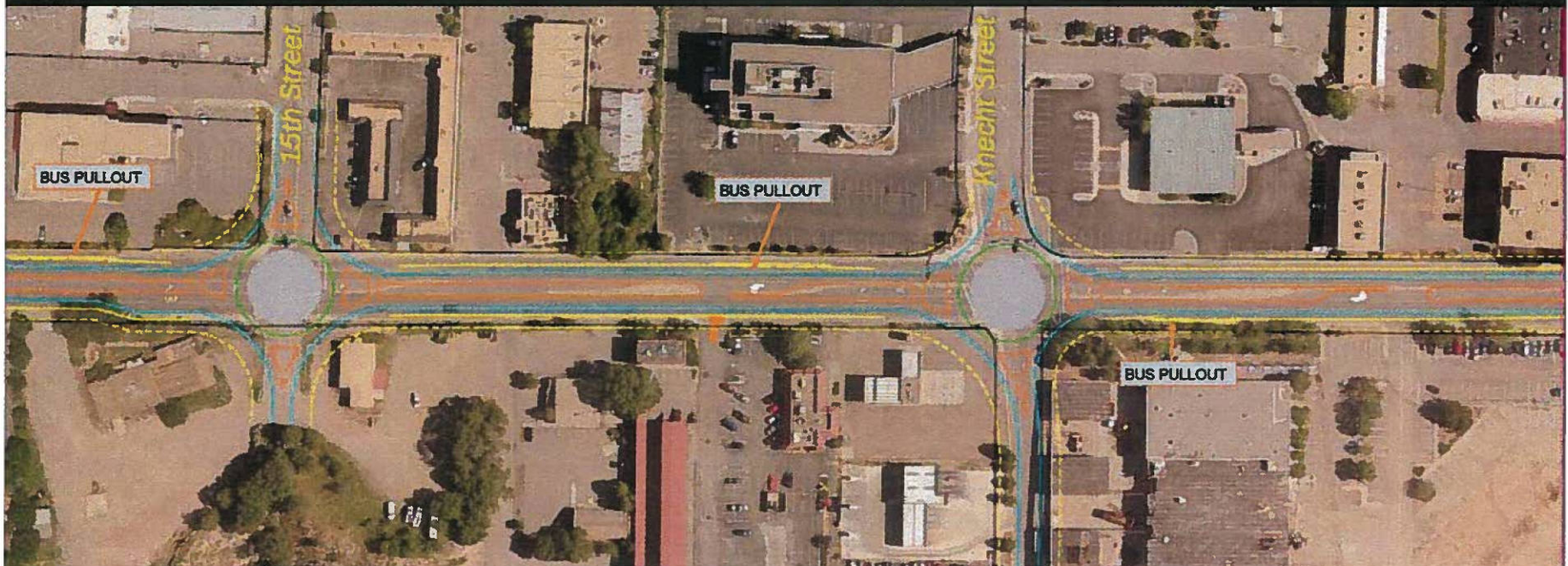
NM 502 & 20th Street

	AM 2010		AM 2030		PM 2010		PM 2030	
	DEL (s)	LOS	DEL (s)	LOS	DEL (s)	LOS	DEL (s)	LOS
	5.9	A	5.8	A	6.0	A	6.0	A
WB	5.4	A	5.4	A	5.5	A	5.5	A
EB	6.0	A	5.8	A	5.9	A	5.8	A
SB	9.9	A	11.1	B	11.4	B	11.7	B



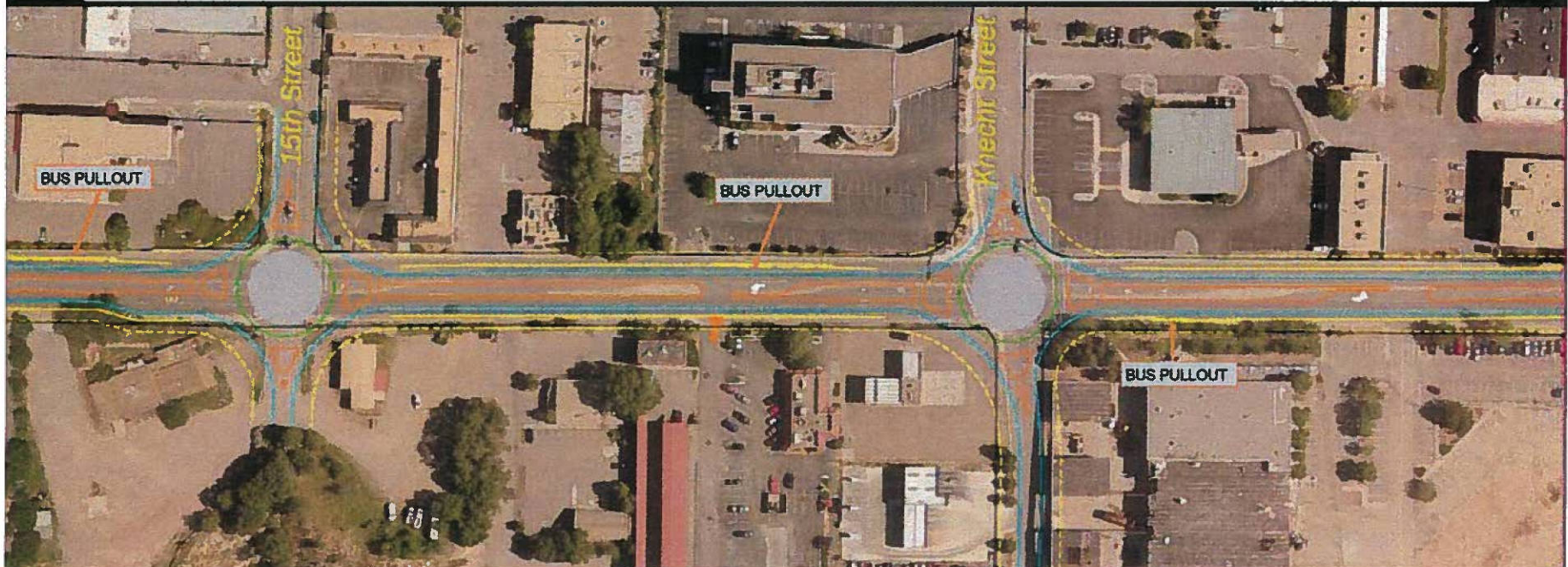
NM 502 & 15th Street

	AM 2010		AM 2030		PM 2010		PM 2030	
	DEL (s)	LOS	DEL (s)	LOS	DEL (s)	LOS	DEL (s)	LOS
	7.0	A	6.8	A	12.5	B	22.8	C
WB	5.5	A	5.6	A	6.0	A	6.1	A
EB	7.0	A	6.4	A	15.1	B	32.7	C
SB	11.5	B	12.0	B	13.4	B	13.7	B
NB	11.4	B	12.5	B	29.6	C	41.1	D



NM 502 & Knecht Street

	AM 2010		AM 2030		PM 2010		PM 2030	
	DEL (s)	LOS	DEL (s)	LOS	DEL (s)	LOS	DEL (s)	LOS
	7.0	A	7.0	A	12.9	B	17.2	B
WB	6.0	A	6.3	A	6.1	A	6.3	A
EB	7.0	A	7.0	A	13.5	B	20.9	C
SB	10.6	B	11.4	B	12.6	B	13.1	B
NB	10.3	B	11.7	B	36.1	D	47.1	D



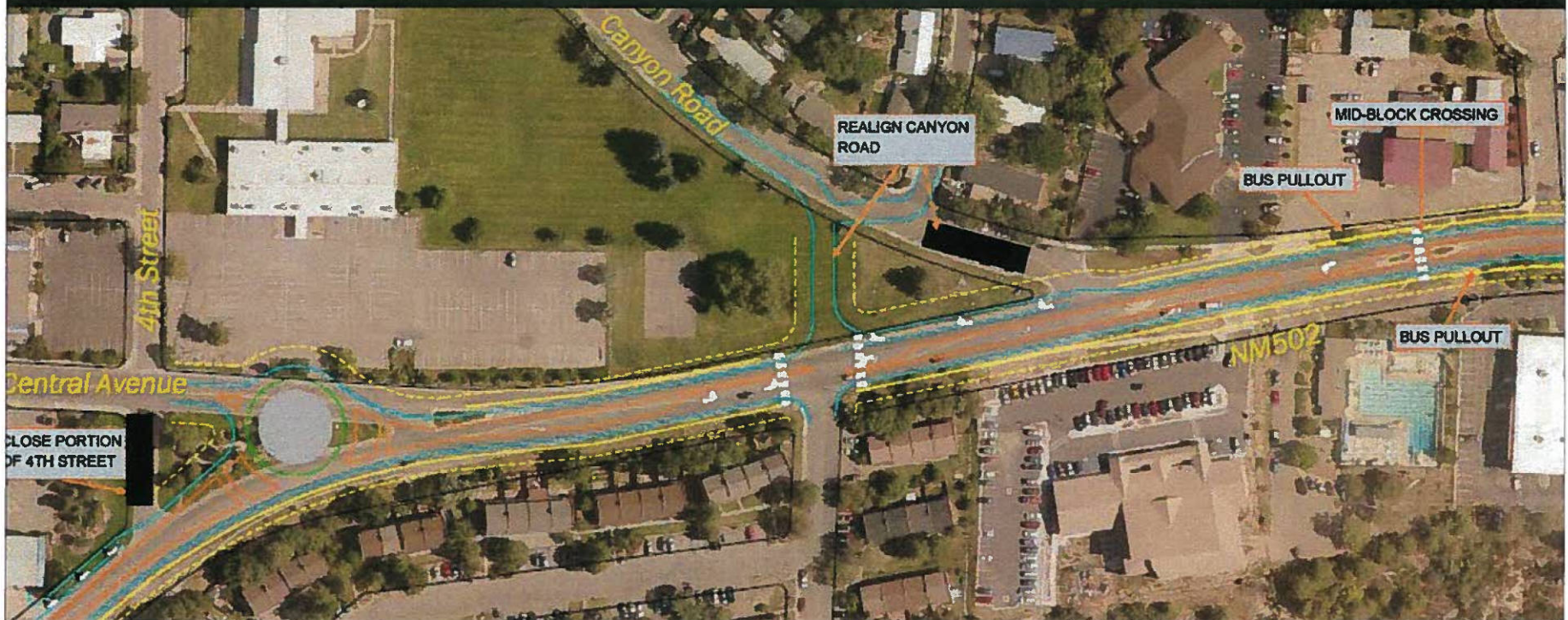
NM 502 & 6th Street

	AM 2010		AM 2030		PM 2010		PM 2030	
	DEL (s)	LOS	DEL (s)	LOS	DEL (s)	LOS	DEL (s)	LOS
	7.2	A	6.8	A	7.3	A	8.5	A
WB	6.7	A	6.4	A	5.6	A	5.8	A
EB	6.0	A	6.0	A	5.4	A	5.5	A
SB	13.1	B	15.4	B	8.6	A	9.0	A
NB	11.5	B	11.7	B	20.3	C	21.6	C



NM 502 & 4th/Central

	AM 2010		AM 2030		PM 2010		PM 2030	
	DEL (s)	LOS	DEL (s)	LOS	DEL (s)	LOS	DEL (s)	LOS
	6.4	A	6.4	A	10.9	B	23.4	C
WB	5.8	A	5.8	A	5.9	A	5.9	A
EB	5.9	A	5.6	A	12.2	B	32.8	C
SB	13.4	B	14.7	B	12.3	B	12.7	B



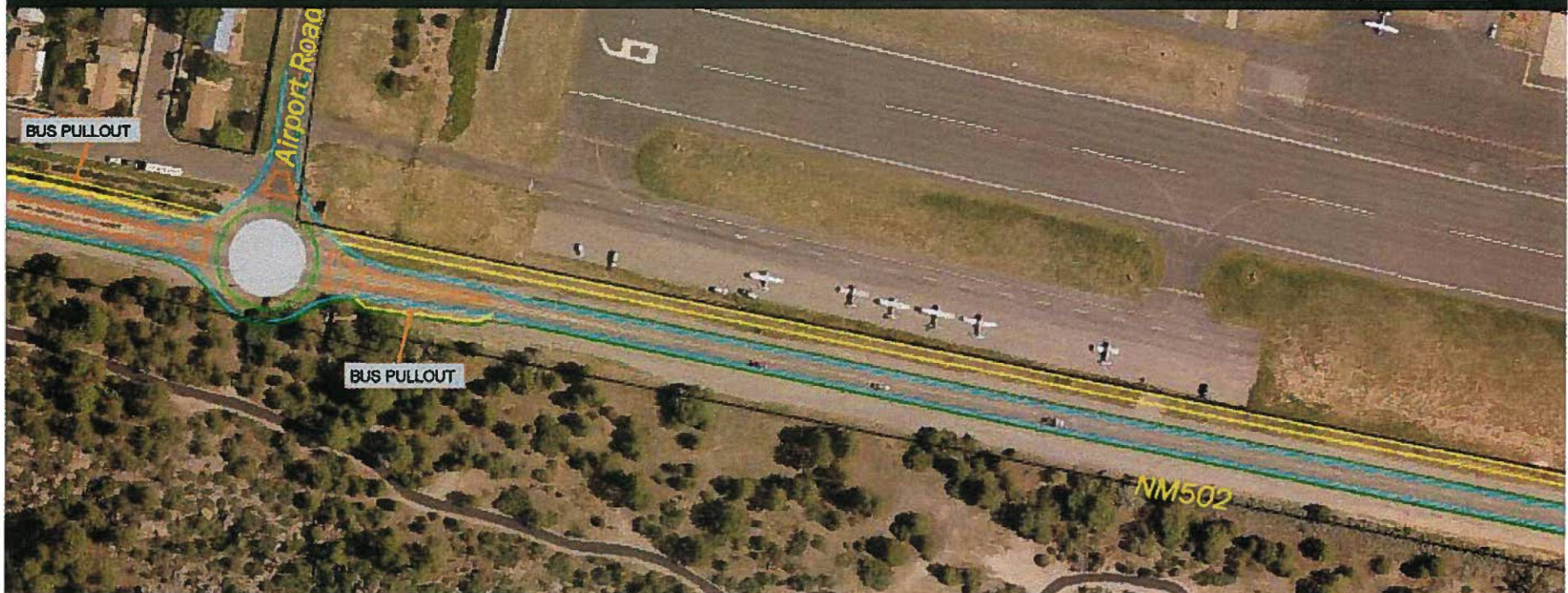
NM 502 & Tewa Loop

	AM 2010		AM 2030		PM 2010		PM 2030	
	DEL (s)	LOS	DEL (s)	LOS	DEL (s)	LOS	DEL (s)	LOS
	5.5	A	5.9	A	5.3	A	5.5	A
WB	5.2	A	5.5	A	5.2	A	5.2	A
EB	5.5	A	5.5	A	5.2	A	5.3	A
SB	18.8	B	33.0	C	9.2	A	9.6	A
NB	9.6	A	10.0	B	22.5	C	47.1	D

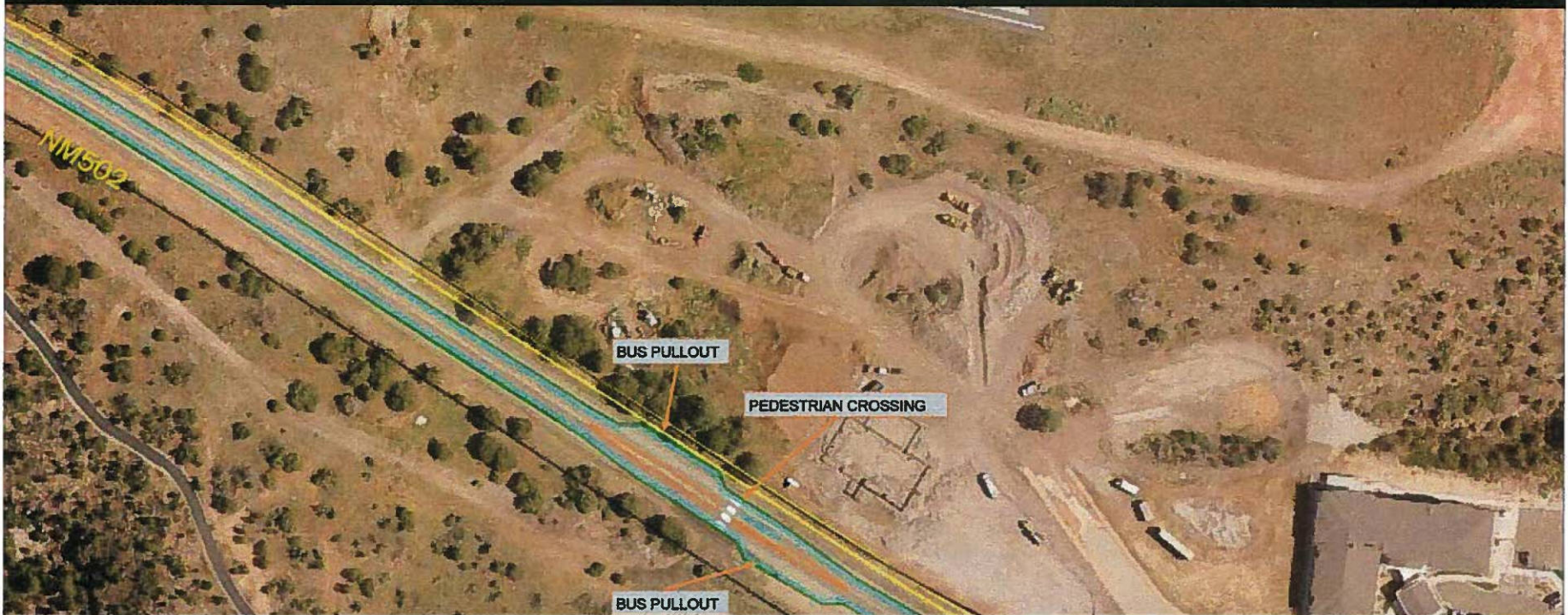


NM 502 & Airport Road

	AM 2010		AM 2030		PM 2010		PM 2030	
	DEL (s)	LOS	DEL (s)	LOS	DEL (s)	LOS	DEL (s)	LOS
	5.4	A	5.7	A	5.3	A	5.5	A
WB	5.1	A	5.3	A	5.1	A	5.1	A
EB	5.4	A	5.4	A	5.2	A	5.5	A
SB	21.3	C	35.4	D	12.2	B	12.6	B



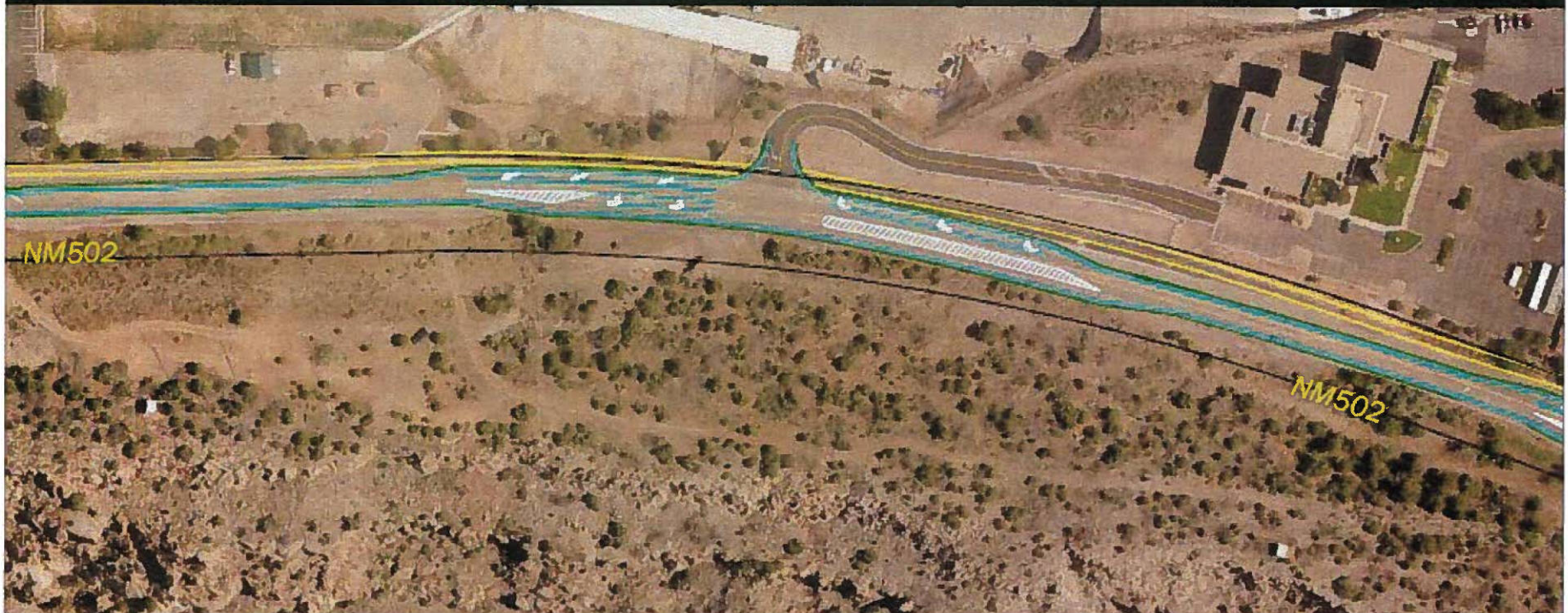
NM 502 & Canyon Rim Trail



NM 502 & Camino Entrada



NM 502 at Hytec Building



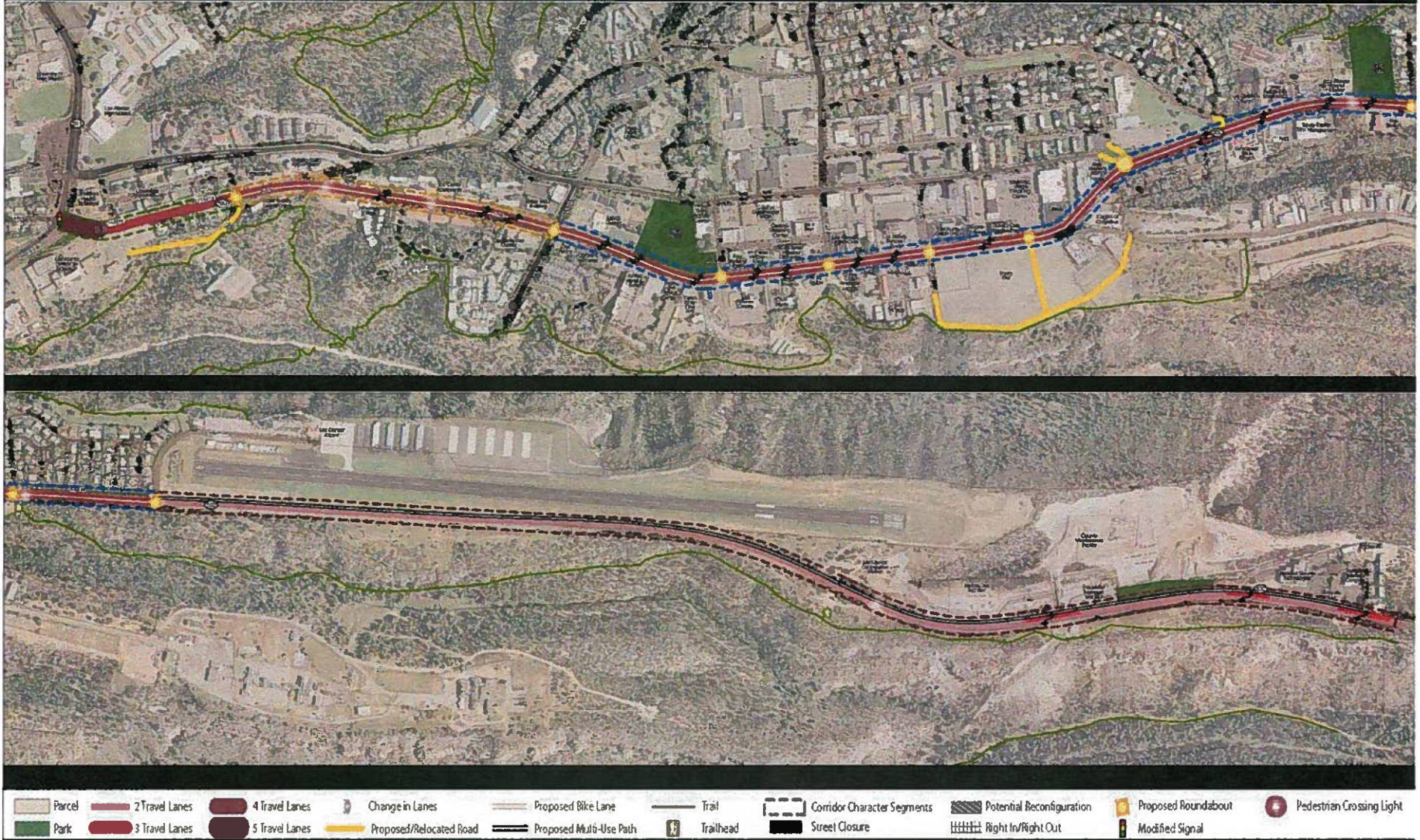
NM 502 & Eastgate Drive



Phasing Criteria

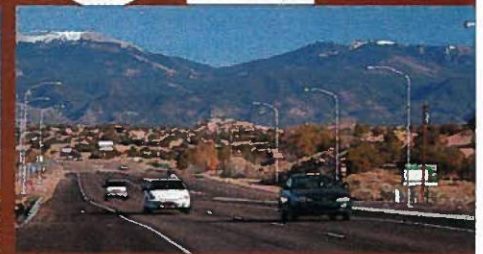
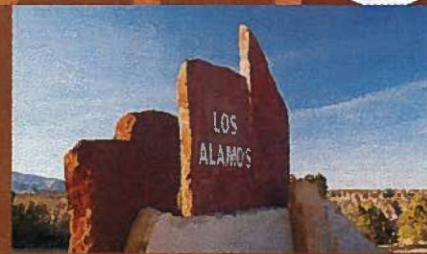
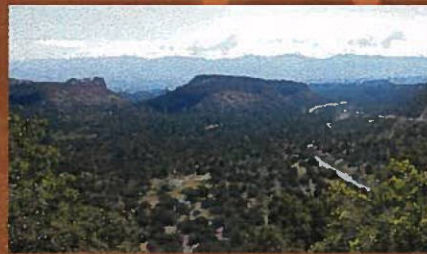
- Cost / Availability of Funding
 - Temporary condition between phases
- Utility Coordination
- Traffic Operations
 - Performance
 - Temporary condition between phases
 - Compatibility with traffic control at adjacent intersections
- Safety
- Development of Adjacent Properties
- Community and Political Will

Phasing



LOS ALAMOS COUNTY, NEW MEXICO
PLANNING AND ENGINEERING SERVICES

nm502



COMPREHENSIVE TRANSPORTATION STUDY AND PLAN FOR NM502



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