

Broadway: Euclid to Country Club Roadway Improvement Project

Summary of Performance Highlights:

4-Lane, plus 2 Dedicated Transit Lanes Street Design Concept Alternative (118' Right of Way)

Description

All alternatives include:

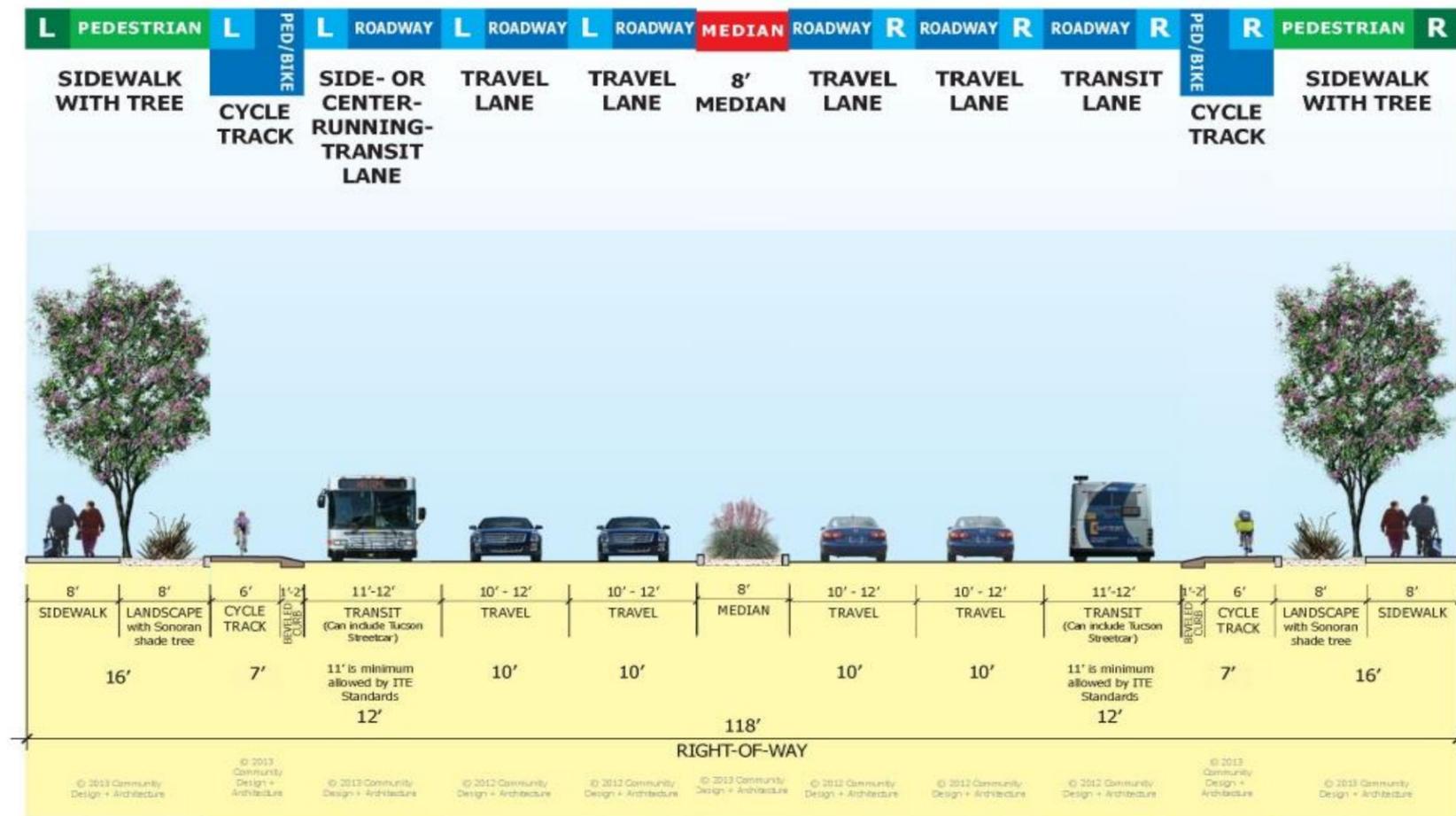
- 8' Sidewalks (limited narrowing to avoid impacts, 5' min.)
- 8' Landscaped areas roadside and in medians (limited narrowing to avoid impacts, 6' min. at roadside to allow for some landscape, 3' min. in median without landscape)
- 7'-8' wide cycle tracks with 6' bike lanes at vehicle crossings

4+2T Lane Alternatives include:

- Dedicated bus lanes
- Bus pullouts at all signals; not at midblock bus stops

Two alignment alternatives drawn for charrette; "Hybrid" alternative could be developed:

- **Minimizing Building Impacts** - preserves as many buildings as possible
- **Minimizing Property Impacts** - limits impacts (acquisitions and demolitions) to one side of the roadway



Broadway: Euclid to Country Club Roadway Improvement Project

**Summary of Performance Highlights:
4-Lane, plus 2 Dedicated Transit Lanes Street Design Concept Alternative (118' Right of Way)**

Cost Estimates (Same as the 6-Lane)

Alternative	Goal	Construction Estimates	Acquisition Estimates	Total	Potential Remnant Land Sq. Ft.	Potential Costs Recovered
Minimize Building Impacts	<i>Preserve buildings</i>	\$26.2 M	\$66.4 M	\$92.6 M	~892,637 sq. ft.	\$13.4 – \$35.7 M
Minimize Property Impacts	<i>Limit impacts to one side</i>	\$26.2 M	\$44.1 M	\$70.3 M	~713,665 sq. ft.	\$10.7 – \$28.5 M

Results of Transportation Analysis (Transportation Specific Measures)

Assumes a reduced growth rate (22%) from 2040 PAG Projections (33%)

Mode/Measure	Description	Performance Highlights
Vehicle	~4,166 vehicles (5,000 people)	<ul style="list-style-type: none"> - Vehicle travel time during peak hour EB travel increased by 122.5% (adds 8.7 mins) - Intersection delays are high for all movements, but the 4+2T results in queuing at intersections and multiple signal cycles for turn lanes to move through - This configuration performs worst for vehicles because the added lane is restricted only to buses, the wider pedestrian crossings increase signal timing and reduce the “green” time for vehicles - Signal timing creates delays due to wide crossings
Transit	500 total riders during PM peak hour, assuming local bus and limited stop bus running	<ul style="list-style-type: none"> - Bus travel during peak hour EB travel reduced by 1.4% (minus 0.2 mins.) - Local bus service performs well, in both peak and non-peak direction (EB and WB) - Results are comparable to those achieved in the 6+2T alternative, and better than the 4-lane - Accommodates future High Capacity Transit well, because of dedicated lanes
Bike	50 bikes	<ul style="list-style-type: none"> - All alternatives provide improved buffered facilities and reduced number of conflict points between vehicles and bicyclists - Travel time not impacted much across alternatives (assumed 9-11 mph) - Provides OK support for bike network connections. Crossings at key points are pretty wide – Campbell, Highland, Treat
Pedestrian		<ul style="list-style-type: none"> - All alternatives provide improved facilities - Reduced number of conflict points - Neutral performance for crossing times same as 6-Lane, compared to 4-lane performing best and 6+2T performing worst

Results of Additional Analysis (Non-Transportation Specific Measures)

Measure	Performance Highlights
Sense of Place: Impacts to Historic Resources	
Minimize Building Impacts	<ul style="list-style-type: none"> - 90 Historic Properties impacted of 143 total properties - 23 Historic Buildings directly impacted (of 37 buildings total)
Minimize Property Impacts	<ul style="list-style-type: none"> - 63 Historic Properties Impacted of 96 total properties - 26 Historic Buildings directly impacted (of 41 buildings total)
Sense of Place: Impacts to Significant Resources	
Minimize Building Impacts	- Total of 2 Significant (Not yet historic) Property (1 at High, 1 at Mod. Risk for Acquisition)
Minimize Property Impacts	- Total of 2 Significant (Not yet historic) Property (2 at Mod. Risk for Acquisition)
Environment & Public Health	
<ul style="list-style-type: none"> - More cars and vehicle delays lead to higher levels of Greenhouse Gases and other tailpipe emissions than existing - Vehicle delays and congestion are worse than 6-lane and 6+2T alternatives; however, performs better than 4-lane 	
Economic Vitality: Change in Economic Potential	
Minimize Building Impacts	<ul style="list-style-type: none"> - Leaves more existing structures in place compared with other 4+2T lane alternative, scoring second lowest for change in economic potential for near-term - Provides the most remnant property for long-term reuse and infill
Minimize Property Impacts	<ul style="list-style-type: none"> - Leaves less existing structures in place, second highest of all alternatives - Provides less remnant property for long-term reuse and infill, scoring slightly worse than other 4+2T lane

Considerations

- Meets County Bond Project Ordinance description as a 6-lane roadway (language does not specify cross section)
- Project does not meet the RTA Plan ballot language. Like the 6-lane, it has some potential to meet the policy “No Diminishment of Functionality” as originally envisioned by the original Technical Committee and Citizens Advisory Committee, however 6-lane has best chance because its performance in comparison to the 6+2T is better. 4+2T problems with intersection delay for vehicles would need to be mitigated through further design and operations studies; are indirect left turns feasible, for example.



Broadway: Euclid to Country Club Roadway Improvement Project

Summary of Performance Highlights:

4-Lane Street Design Concept Alternative (96' Right of Way)

Description

All alternatives include:

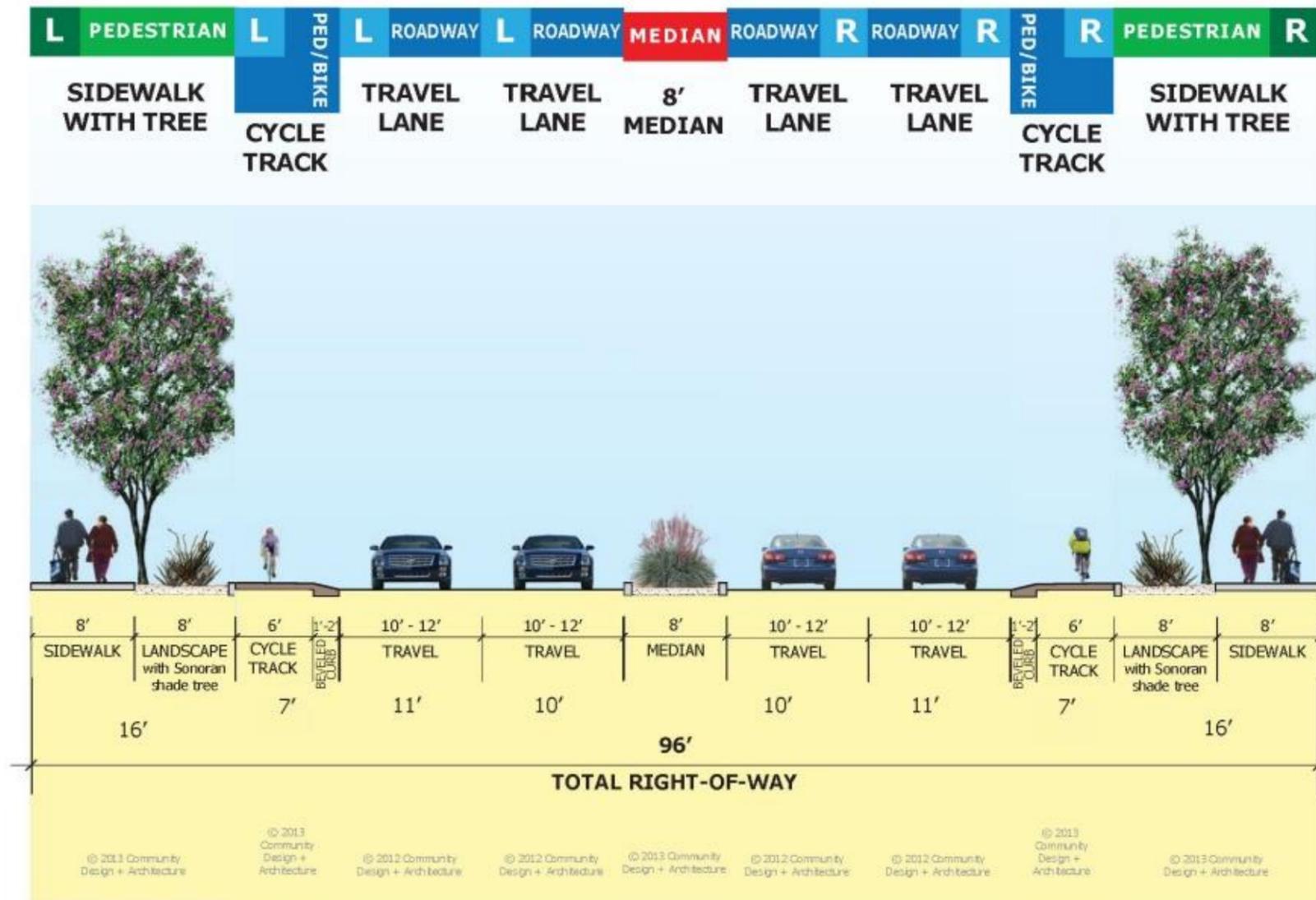
- 8' Sidewalks (limited narrowing to avoid impacts, 5' min.)
- 8' Landscaped areas roadside and in medians (limited narrowing to avoid impacts, 6' min. at roadside to allow for some landscape, 3' min. in median without landscape)
- 7' to 8' wide cycle track with 6' bike lanes at vehicle crossings

4-Lane Alternative includes:

- Bus pullouts at all signals; not at midblock bus stops

Two alignment alternatives drawn for charrette; additional "hybrid" option being developed:

- **Minimizing Building Impacts** – preserves as many buildings as possible
- **Minimizing Property Impacts** - limits impacts (acquisitions and demolitions) to one side of the roadway
- **"Hybrid** – reduces impacts to both buildings and properties



Broadway: Euclid to Country Club Roadway Improvement Project

Summary of Performance Highlights: 4-Lane Street Design Concept Alternative (96' Right of Way)

Cost Estimates

Alternative	Goal	Construction Estimates	Acquisition Estimates	Total	Potential Remnant Land Sq. Ft.	Potential Costs Recovered
Minimize Building Impacts	<i>Preserve buildings</i>	\$23.3 M	\$48.6 M	\$71.9 M	~748,171 sq. ft.	\$11.2 - 29.9 M
Minimize Property Impacts	<i>Limit impacts to one side</i>	\$22.6 M	\$35.0 M	\$57.6 M	~591,818 sq. ft.	\$8.9 – \$23.7 M

Results of Multimodal Transportation Analysis (Transportation Specific Measures)

Assumes a reduced growth rate (22%) from 2040 PAG Projections (33%)

Mode/Measure	Description	Performance Highlights
Vehicle	~4,166 vehicles (5,000 people)	- Vehicle travel time during peak hour EB travel increased by 46.5% (adds ~3 mins.) - Intersection delays are high during peak hour for all movements
Transit	500 total riders during PM peak hour, assuming local bus and limited stop bus running	- Bus and person travel delays during peak hour EB travel by 35.3% (adds ~5 mins.) - Does not help move local bus service through well; buses pulling into bus pullouts must wait for break in traffic to resume travel - Does not accommodate future High Capacity Transit well (not enough ROW)
Bike	50 bikes	- All alternatives provide improved buffered facilities and reduced number of conflict points between vehicles and bicyclists - Travel time not impacted much across alternatives (assumed 9-11 mph) - Provides best support for bike network connections due to less width, less intimidating crossings at key network links – Campbell, Highland, Treat
Pedestrian		- All alternatives provide improved facilities - Reduced number of conflict points - Pedestrian crossing times are better than 6+2T or 6/4+2T

Results of Additional Analysis (Non-Transportation Specific Measures)

Measure	Performance Highlights
Sense of Place: Impacts to Historic Resources	
Minimize Building Impacts	- 83 Historic Properties Impacted of 124 total properties - 4 Historic Buildings directly impacted (of 5 buildings total) fewest of all alternatives
Minimize Property Impacts	- 54 Historic Properties Impacted of 89 total properties - 17 Historic Buildings directly impacted (of 28 buildings total)
Sense of Place: Impacts to Significant Resources	
Minimize Building Impacts	- Total of 1 Significant (Not yet historic) Property (at High Risk for Acquisition)
Minimize Property Impacts	- Total of 1 Significant (Not yet historic) Property (at Mod. Risk for Acquisition)
Environment & Public Health	
Minimize Building Impacts	- Congestion leads to higher levels of Greenhouse Gases and other tailpipe emissions. - Less ROW given to asphalt reduced Urban Heat Island effect - Provides opportunities than enhance water harvesting and green streets
Minimize Property Impacts	- Congestion leads to higher levels of Greenhouse Gases and other tailpipe emissions. - Less ROW given to asphalt reduced Urban Heat Island effect - Provides opportunities than enhance water harvesting and green streets
Economic Vitality: Change in Economic Potential	
Minimize Building Impacts	- Leaves most existing structures in place, scoring neutral for change in parcel remnant sizes for near-term - Provides more remnant property for long-term reuse and infill compared with other 4-lane alternative
Minimize Property Impacts	- Leaves less existing structures in place than the other 4-lane alternative, scoring slightly worse - Provides less remnant property for long-term reuse/infill than other 4-lane alternative, but less overall property impact results in slightly better long-term potential

Considerations

- County Bond Project Ordinance would need to be amended, likely resulting in schedule delays. Process would require: 1 Mayor and Council public hearing; 1 public hearing with Pima County Board of Supervisors; and Approval by Pima County Bond Oversight Committee
- Construction must begin by May, 2016 (to ensure that the RTA project is being delivered as promised)
- Project does not meet the RTA Plan ballot language, nor the policy “No Diminishment of Functionality” as originally envisioned by the original Technical Committee and Citizens Advisory Committee

Broadway: Euclid to Country Club Roadway Improvement Project

Summary of Performance Highlights:

6-Lane, plus 2 Dedicated Transit Lanes Cross Section Street Design Concept (150' Right of Way)

Description

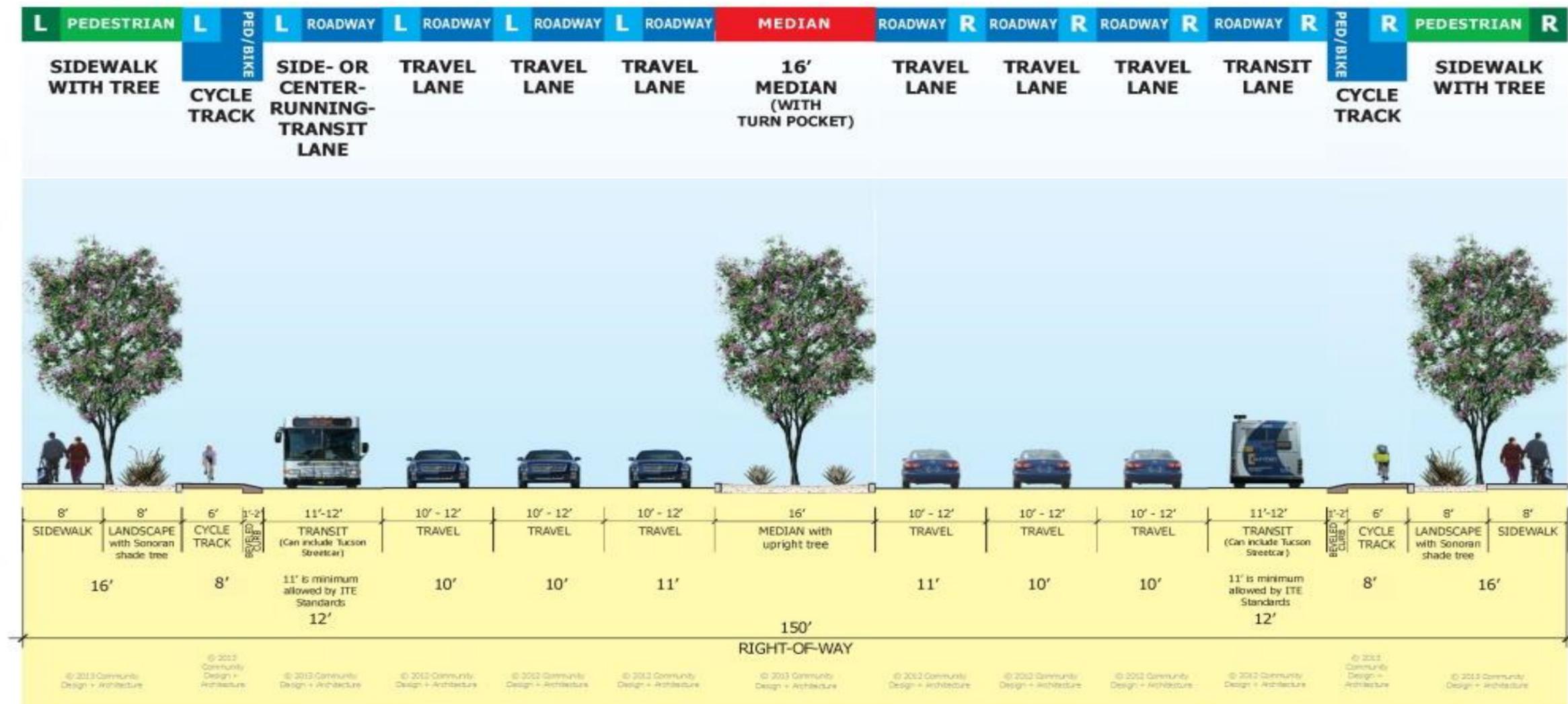
All alternatives include::

- 8' Sidewalks (limited narrowing to avoid impacts, 5' min.)
- 8' Landscaped areas roadside and in medians (limited narrowing to avoid impacts, 6' min. at roadside to allow for some landscape, 3' min. in median without landscape)
- 8' wide cycle tracks with 6' bike lanes at vehicle crossings

6-Lane, plus 2 Dedicated Transit Lanes Alternative includes:

- 2 dedicated transit lanes for local bus and limited stop bus
- Bus pullouts at all signals; not at midblock bus stops

NOTE: One alignment was drawn for charrette and Task Force has pulled the 6+2T from further study (a.k.a. – “taken off the table”)



Summary of Performance Highlights:

6-Lane, plus 2 Dedicated Transit Lanes Cross Section Street Design Concept (150' Right of Way)

Cost Estimates

Alternative	Construction Estimates	Acquisition Estimates	Total	Potential Remnant Land Sq. Ft.	Potential Costs Recovered
6-Lane, plus 2 Dedicated Transit Lanes	\$30.1 M	\$53.0 M	\$83.1 M	~812,406 sq. ft.	\$12.2 - 32.5 M

Results of Transportation Analysis (Transportation Specific Measures)

Assumes a reduced growth rate (22%) from 2040 PAG Projections (33%)

Mode/Measure	Description	Performance Highlights
Vehicle	~4,166 vehicles (5,000 people)	<ul style="list-style-type: none"> - Vehicle delay during peak hour EB travel by 14.1% (adds ~1 min.) from existing - Intersection delays are high for all movements - 6+2T does not perform significantly better (and in some measures, it performs worse) than the 6-lane alternative - Analysis shows that the additional vehicle lanes and transit lanes operate at 50% of their capacity, which suggests that a 6+2T configuration is overbuilt - Signal timing creates delays due to wide pedestrian crossings
Transit	500 total riders during PM peak hour, assuming local bus and limited stop bus running	<ul style="list-style-type: none"> - Bus travel time during peak hour EB travel is the shortest for all alternatives, reduced by 7.2% (minus 1 min.) from existing - Helps move local bus service through well - Additional lane will be used at less than 50% capacity (creates a low benefit to cost ratio) - Provides space for future High Capacity Transit
Bike	50 bikes	<ul style="list-style-type: none"> - All alternatives provide improved buffered facilities and reduced number of conflict points between vehicles and bicyclists, but this alternative provides an opportunity to create more uninterrupted lengths of cycle track facilities - Travel time not impacted much across alternatives (assumed 9-11 mph) - Provides least support for bike network connections because crossings are wide and intimidating at key network links – Campbell, Highland, Treat
Pedestrian		<ul style="list-style-type: none"> - All alternatives provide improved facilities - Reduced number of conflict points - Worst pedestrian crossing times because crossings are widest

Results of Additional Analysis (Non-Transportation Specific Measures)

Measure	Performance Highlights
Sense of Place: Impacts to Historic Resources	<ul style="list-style-type: none"> - 70 Historic Properties Impacted of 121 total properties - 44 Historic Buildings directly impacted (of 69 buildings total)
Sense of Place: Impacts to Significant Resources	<ul style="list-style-type: none"> - Total of 5 Significant (Not yet historic) Properties (at Risk for Acquisition)
Environment & Public Health	<ul style="list-style-type: none"> - Less congestion/vehicle delay, which means lesser levels of Greenhouse Gases and other tailpipe emissions - Worst for Urban Heat Island effect, because of total pavement area - Provides good opportunities for water harvesting and green streets
Economic Vitality: Change in Economic Potential	<ul style="list-style-type: none"> - Leaves less existing structures in place and reduces the amount of reusable remnant land, negatively impacting near-term economic development, and constraining future long-term economic potential

Considerations

- Meets County Bond Project Ordinance description
- Project meets the RTA Plan ballot language

Broadway: Euclid to Country Club Roadway Improvement Project

Summary of Performance Highlights:

6-Lane Street Design Concept Alternative (118' Right of Way)

Description

All alternatives include:

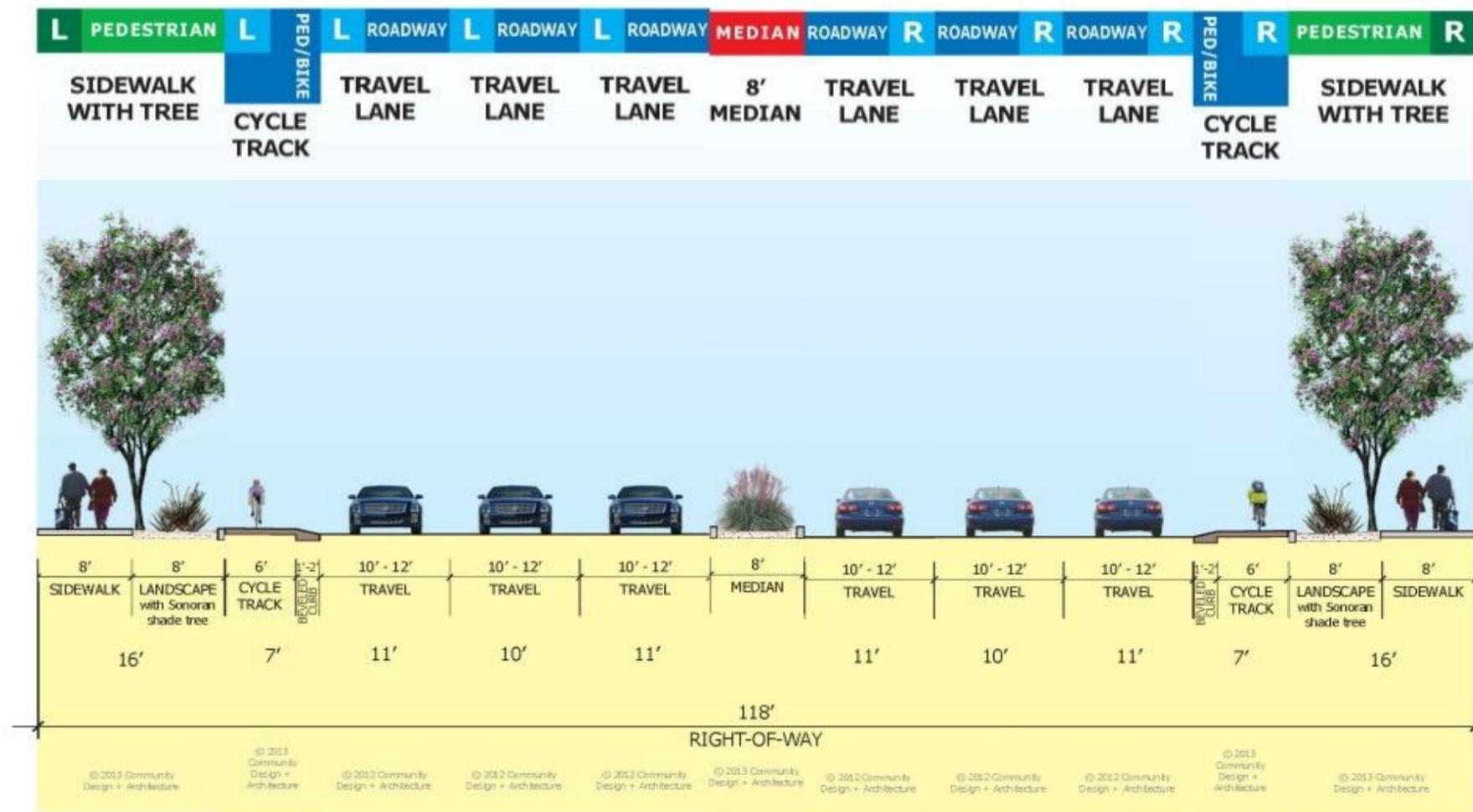
- 8' Sidewalks (limited narrowing to avoid impacts, 5' min.)
- 8' Landscaped areas roadside and in medians (limited narrowing to avoid impacts, 6' min. at roadside to allow for some landscape, 3' min. in median without landscape)
- 7'-8' wide cycle tracks with 6' bike lanes at vehicle crossings

6-Lane Alternatives include:

- Bus pullouts at all signals; not at midblock bus stops

Two alignment alternatives drawn for charrette; additional "hybrid" option being developed:

- **Minimizing Building Impacts** - preserves as many buildings as possible
- **Minimizing Property Impacts** - limits impacts (acquisitions and demolitions) to one side of the roadway
- **"Hybrid"** - reduces impacts to both buildings and properties



Broadway: Euclid to Country Club Roadway Improvement Project

Summary of Performance Highlights: 6-Lane Street Design Concept Alternative (118' Right of Way)

Cost Estimates (Same as the 4+2T)

Alternative	Goal	Construction Estimates	Acquisition Estimates	Total	Potential Remnant Land Sq. Ft.	Potential Costs Recovered
Minimize Building Impacts	<i>Preserve buildings</i>	\$26.2 M	\$66.4 M	\$92.6 M	~892,637 sq. ft.	\$13.4 – \$35.7 M
Minimize Property Impacts	<i>Limit impacts to one side</i>	\$26.2 M	\$44.1 M	\$70.3 M	~713,665 sq. ft.	\$10.7 – \$28.5 M

Results of Transportation Analysis (Transportation Specific Measures)

Assumes a reduced growth rate (22%) from 2040 PAG Projections (33%)

Mode/Measure	Description	Performance Highlights
Vehicle	~4,166 vehicles (5,000 people)	<ul style="list-style-type: none"> - Vehicle travel time during peak hour EB travel reduced by 1.4% (minus 0.1 min.) - Intersection delays are high for all movements, but the 6-lane continuous lanes perform better than the 6+2T alternative, which must narrow at both ends of the project area resulting in congestion that “backs into” rest of the study area - Results are comparable to those achieved in the 6+2T alternative, and better than 4-lane or 4+2T - Signal timing creates delays due to wide crossings
Transit	500 total riders during PM peak hour, assuming local bus and limited stop bus running	<ul style="list-style-type: none"> - Bus travel during peak hour EB travel reduced by 0.7% (minus 0.1 min.) - Local bus service performs well, although not as good as when there are dedicated lanes - Results are comparable to those achieved in the 6+2T alternative, and better than the 4-lane - Could accommodate future High Capacity Transit if it is acceptable to reduce the number of mixed flow lanes to 4
Bike	50 bikes	<ul style="list-style-type: none"> - All alternatives provide improved buffered facilities and reduced number of conflict points between vehicles and bicyclists - Travel time not impacted much across alternatives (assumed 9-11 mph) - Provides OK support for bike network connections. Crossings at key points are pretty wide – Campbell, Highland, Treat
Pedestrian		<ul style="list-style-type: none"> - All alternatives provide improved facilities - Reduced number of conflict points - Neutral performance for crossing times same as 4+2T lane, compared to 4-lane performing best and 6+2T performing worst

Results of Additional Analysis (Non-Transportation Specific Measures)

Measure	Performance Highlights
Sense of Place: Impacts to Historic Resources	
Minimize Building Impacts	<ul style="list-style-type: none"> - 90 Historic Properties impacted of 143 total properties - 23 Historic Buildings directly impacted (of 37 buildings total)
Minimize Property Impacts	<ul style="list-style-type: none"> - 63 Historic Properties Impacted of 96 total properties - 26 Historic Buildings directly impacted (of 41 buildings total)
“Hybrid”	- Likely impacts many fewer Historic Properties and Buildings
Sense of Place: Impacts to Significant Resources	
Minimize Building Impacts	- Total of 2 Significant (Not yet historic) Property (1 at High, 1 at Mod. Risk for Acquisition)
Minimize Property Impacts	- Total of 2 Significant (Not yet historic) Property (2 at Mod. Risk for Acquisition)
“Hybrid”	- Impact to Significant Properties still to be determined, likely similar to other
Environment & Public Health	
<ul style="list-style-type: none"> - More cars and vehicle delays lead to higher levels of Greenhouse Gases and other tailpipe emissions than existing; however, performs better than 4-lane or 4+2T, and comparably with the 6+2T - Has not been evaluated for opportunities for water harvesting and green streets, can be assessed for the “Hybrid” option as it is being designed at a detailed level 	
Economic Vitality: Change in Economic Potential	
Minimize Building Impacts	<ul style="list-style-type: none"> - Leaves more existing structures in place compared with other 6-lane alternative (note: “hybrid” performs even better), scoring second lowest for change in economic potential for near-term - Provides the most remnant property for long-term reuse and infill
Minimize Property Impacts	<ul style="list-style-type: none"> - Leaves less existing structures in place, second highest of all alternatives - Provides less remnant property for long-term reuse and infill, scoring slightly worse than other 6 lane

Considerations

- Meets County Bond Project Ordinance description
- Project does not meet the RTA Plan ballot language, but has more ability to meet the policy “No Diminishment of Functionality” as originally envisioned by the original Technical Committee and Citizens Advisory Committee, because its performance in comparison to the 6+2T is better.

Broadway: Euclid to Country Club Roadway Improvement Project

Summary of Performance Highlights:

Adding Sidewalk Only – No Widening (Right-of-Way Stays Between Existing Curbs)

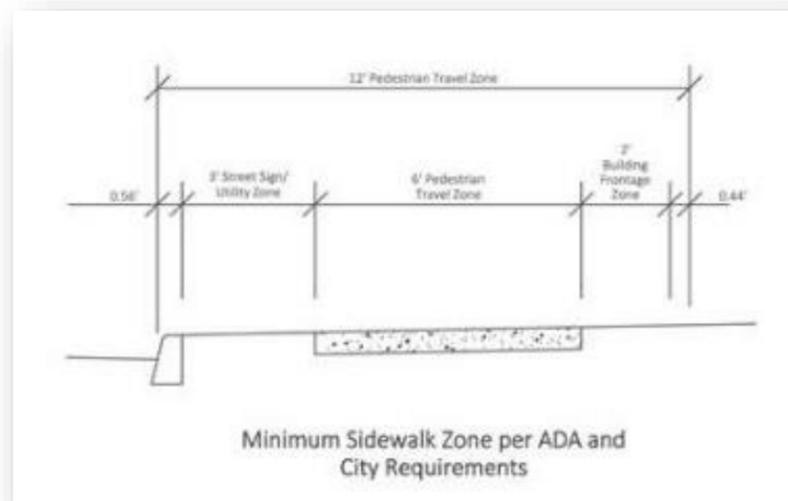
Description

Using ADA and City of Tucson guidelines, assumes the additions of:

- 6' Sidewalks
- 3' street sign/utilities zone between curb and sidewalk minimum
- 2' building/property frontage zone minimum

Maintains existing roadbed between curbs, including:

- 4 mixed flow travel lanes, with 1 center-turning lane
- 5' striped bike lane



Cost Estimates

Alternative	Goal	Construction Estimates	Acquisition Estimates	Total	Potential Remnant Land Sq. Ft.	Potential Costs Recovered
No widening for traffic or bicycles, adding sidewalks only	Meet ADA compliance requirements	~\$0.7 M	\$17 - \$24 M*	~\$18 - \$25 M	Not Estimated	Not Estimated

Results of Transportation Analysis (Transportation Specific Measures)

Mode/Measure	Description	Performance Highlights
Vehicle	~4,166 vehicles (5,000 people)	- Not assessed, would be worse than the 4-Lane alternative because of no intersection improvements
Transit	500 total riders during PM peak hour, assuming local bus and limited stop bus running	- Not assessed, would be worse than the 4-Lane alternative because of no intersection or signal improvements - Does not accommodate well future High Capacity Transit (not enough ROW)
Bike	50 bikes	- Does not provide an improved bicycle facility on the street - Travel time not impacted much across alternatives (assumed 9-11 mph) - Provides support for bike network connections due to less wide, less intimidating crossings at key network links – Campbell, Highland, Treat, but would not include signal improvements that could improve bicycle access across the street.
Pedestrian		- Provides ADA compliant access, but does not provide buffer or sidewalk width to allow pedestrians and wheelchairs to comfortably pass one another - Does not reduce number of conflict points - Pedestrian crossing times would likely be improved to be compliant with MUTCD and ADA better than 6+2T or 6/4+2T

Results of Additional Analysis (Non-Transportation Specific Measures)

Measure	Performance Highlights
Sense of Place: Impacts to Historic Resources	- 47 Historic Properties Impacted of 104 total properties - 0 Historic Buildings directly impacted (of 0 buildings total)
Sense of Place: Impacts to Significant Resources	- Total of 0 Significant (Not yet historic) Property (at High Risk for Acquisition)
Environment & Public Health	- Congestion leads to higher levels of Greenhouse Gases and other tailpipe emissions. - Less ROW given to asphalt reduced Urban Heat Island effect - Provides good opportunities for water harvesting and green streets
Economic Vitality: Change in Economic Potential	- Leaves most existing structures in place, scoring neutral for change in parcel remnant sizes for near-term - Provides the most remnant property for long-term reuse and infill

Considerations

- County Bond Project Ordinance would need to be amended, likely resulting in schedule delays. Process would require: 1 Mayor and Council public hearing; 1 public hearing with Pima County Board of Supervisors; and Approval by Pima County Bond Oversight Committee
- Project does not meet the RTA Plan ballot language, nor the policy “No Diminishment of Functionality” as originally envisioned by the original Technical Committee and Citizens Advisory Committee