BROADWAY BOULEVARD
EUCLID to COUNTRY CLUB

RTA Regional Transportation Authority

MEMORANDUM

To: Broadway Citizen Task Force
From: City of Tucson Department of Transportation and Broadway Project Design Team
Subject: Broadway Baseline Alignment: Considerations regarding CTF Recommendations to Mayor and Council
Date: March 5, 2015

At the Citizens Task Force (CTF) meeting March 19, we will be asking you to make a recommendation to Mayor and Council regarding the "Staff-Recommended 6-Lanes Including Transit Alignment" posted on the project website on February 20, 2015. That alignment is the configuration that TDOT and the project team believes best reflects the vision and goals of the project, as well as the feedback received from the CTF at the meeting of October 24, 2014. The alignment that is adopted by the Mayor and Council following the March 19 CTF meeting is not the final layout. It is rather a baseline for the engineering design and to inform the property acquisition processes.

The staff-recommended alignment generally includes an 8' sidewalk, separated from the roadway by an 8' landscape buffer, to provide an environment that encourages pedestrian activity. We believe a robust pedestrian environment contributes to the commercial viability of the corridor, is supportive to future transit, and is more conducive to making Broadway a destination where people will want to come and stay rather than simply pass through. However, narrowing the pedestrian environment may be advantageous in certain cases to avoid historic and other buildings and to provide flexibility in designing solutions for maintaining a parcel's functionality.

The staff-recommended alignment demonstrates such an approach in the 1400 E block (between Highland to Vine) where the landscape buffer is not included on the south side of the street, leaving a condition along Miles School that is similar to what exists today. On the north side of the street the landscape buffer has been narrowed to 4-feet with a 6-foot sidewalk, and the roadway shifted southward, to reduce the impact to the north side. Doing so avoids severing several buildings and leaves parcels of greater depth.

We have attached an example of how the pedestrian environment could be narrowed for a longer reach of Broadway, to the west and east of the 1400 E. block, to get some sense of the difference to property impacts. In this example, the narrowed pedestrian area extends roughly between Fremont to Warren/Martin. The sidewalks have been narrowed to 6', and the landscape buffers to 4', though in practice it may become a 10' sidewalk. The narrowed pedestrian environment, together with shifting the roadway southward, results in approximately five buildings no longer being severed by the proposed improvements. That drawing, attached to this memorandum has been posted on the project website as of today. The project team is not certain that this configuration will be found workable when the elevations of the roadway,

driveway connections, utility relocations, goals of individual property owners, and other design factors are taken into account. As the project progresses into more advanced design, several points need to be remembered:

1) **Adopting a baseline alignment does not mean the current process is over; the DCR still needs to be written.**
   - The alignment that is adopted by the Mayor and Council following the March 19 CTF meeting is not the final layout. It is rather a baseline for the engineering design and to inform the property acquisition processes.
   - A Design Concept Report (DCR) will be prepared in the upcoming months which will include this baseline alignment. The DCR will codify the work and decisions made to date on determining the baseline alignment and provide direction for the detailed engineering in relation to drainage, landscaping, cycle track details, and many other design details. The CTF will continue to be involved in that process.
   - The Mayor and Council will ultimately approve and adopt the DCR which will guide future design decisions as construction documents are prepared.

2) **A continuum of decision-making regarding the design remains.**
   - **March 19 CTF Recommendations.** The decisions made by the CTF March 19th will serve as the starting point for preliminary engineering and design, preparation of the DCR, and acquisition of obviously impacted parcels. The CTF could choose to recommend design decision priorities, such as whether to pursue an approach that emphasizes the pedestrian realm as the staff-recommended alignment does, or provide guidance to the acceptable trade-offs to the pedestrian realm in order to preserve buildings and property as the narrowed example does.

     Appendix A provides a comparison using 3D visual stills to compare the pedestrian realm. Appendix B is a partially filled out performance measure template for your review and use. These tools could help frame CTF discussion and recommendations related to the trade-offs you would find acceptable.
   - **Road Safety Audit (RSA).** A road safety audit (RSA) will be performed in March 2015 by a team of outside specialists formed by RTA to provide suggestions on design revisions that may make the design safer for all modes of transportation. This is a process that RTA undertakes on all RTA funded projects, and has proven to be productive for projects that have received this audit. The findings of this audit will provide useful guidance for all phases of the roadway design.
   - **Relocation Plan.** The Real Estate Division will begin meeting with affected property owners to prepare a relocation plan. At this point, property owners' desire to find a possible cure to allow them to stay on Broadway will be gathered. Owners wishing to be acquired will also be identified.

- **Initial 30% Plans and Design Adjustments.** When the DCR is underway, initial design and "30% Plans" will also be prepared. Those plans (considered 30% complete) will define the overall design approach. The 30% plans will be the first formal submittal to the City. During this phase:
  - The project team will be able to utilize the input received from the Real Estate Division to implement creative solutions for access, shared parking, and easements to further refine the alignment.
  - With the input from property owners, the priorities expressed by the CTF's recommendations, and direction provided by Mayor and Council, design adjustments will be made by multi-disciplinary team of City staff and the design team.
  - The CTF will have the opportunity to provide input on the 30% plans.
  - The CTF will be kept apprised of the progress on the design process. Should any significant changes be necessary to the proposed alignment during the design of the 30% plans, the CTF will be given the opportunity to review and comment.
  - Further milestones in the design process will be 60%, 90% and 100% plans. At each of these milestones, the roadway design gets increasingly detailed until it is 100% complete, and ready for construction.
- **Public Meetings.** Two CTF meetings are envisioned through the DCR/30% plan process. An Open House for presentation to the public is anticipated at the 30% plan stage. Fewer meetings are envisioned to be needed during subsequent design stages because design work takes more time.

3) Elements that factor into the decision-making regarding narrowing or not narrowing

- The ability to accommodate existing or relocated utilities. This applies to above as well as below ground facilities.
- Elevation differential between the roadway and adjacent property, particularly where buildings are very near the sidewalk.
- The choices made by affected property owners regarding the ability to achieve agreements on joint access and/or parking agreements, whether they wish to remain on the site, and so forth.
- Meeting ADA requirements for sidewalks, traffic signals, crossings and connections to adjacent property.
- What extent of the narrower sidewalk and landscape design is seen as being acceptable given the lesser benefit of the narrower treatment to pedestrian and other goals of the Broadway project.

4) **Adoption of the baseline alignment allows property owners to get engaged, ends the uncertainty for both property owner and business owners, allows creative conversations to begin involving the right decision-makers, and design adjustments to be made accordingly.**
   - More detailed design work is now needed to evaluate where further narrowing is feasible and/or desirable.
   - Once a general approach is adopted by the Mayor and Council, City Real Estate can begin working with property owners with plans for acquisition and determining whether acquisitions are partial or full.
   - At locations where narrowing is found feasible, the tradeoffs can be weighed and informed decisions made.
   - Other options may be found to avoid acquisitions during design. In a particular one mile stretch of Grant Road, the City was able to avoid six previously anticipated acquisitions. Buildings, businesses, and project cost were all saved.
   - The CTF could express a general preference in the tradeoff of pedestrian realm versus reducing property impact to guide the design team moving forward.
   - Adopting the staff recommended alignment allows design and acquisition activities to proceed. Those activities will provide the detail needed to determine the actual impacts to affected properties, and allow both the design team and the property owners to better plan for the future.

Attachments:

1. **Attachment 1 –** Narrowed Sidewalk Zone Concept in West Mile
2. **Attachment 2 –** Narrowed Sidewalk Zone Concept in West Mile, Includes color-coding of sidewalks, landscaping, and medians to show different depths, and to show lengths where cycle tracks could be included
3. **Appendix A –** Visual Simulation of Design Concepts from Fremont Ave to Warren/Martin Ave
4. **Appendix B –** Performance Assessments of Design Concepts from Fremont Ave to Warren/Martin Ave

Attachment 1 – Narrowed Sidewalk Zone Concept in West Mile

Fremont to Vine

Notes Regarding this Example Narrowing

1. The extent of the narrowing considered here is indicated by the green lines across the street alignment at the east and west ends of the portion of the street that is narrowed. Those represent tie-in points to the staff- recommended alignment.
2. To reduce impacts to the north side, the staff-recommended 8' landscape buffer and 8' sidewalk have been replaced with a 4' landscape buffer and a 6' sidewalk.
3. The narrowed landscape buffer/sidewalk combination allows the overall roadway to be shifted southward, further reducing the impact to the north side. The southward shift of the centerline is nominally 4' west of Highland and 2' east of Highland.
4. Impact to several parcels on the north side has been further reduced by moving the bus platforms closer to Highland and extending the bike bypass approaches into the Highland intersection.
5. The narrowing shown here reduces the number of "directly impacted" buildings - or assumed demolitions - as follows:

Historic Contributors (red):	2
Potential Contributors (orange):	1
Non-Contributors (gray):	2

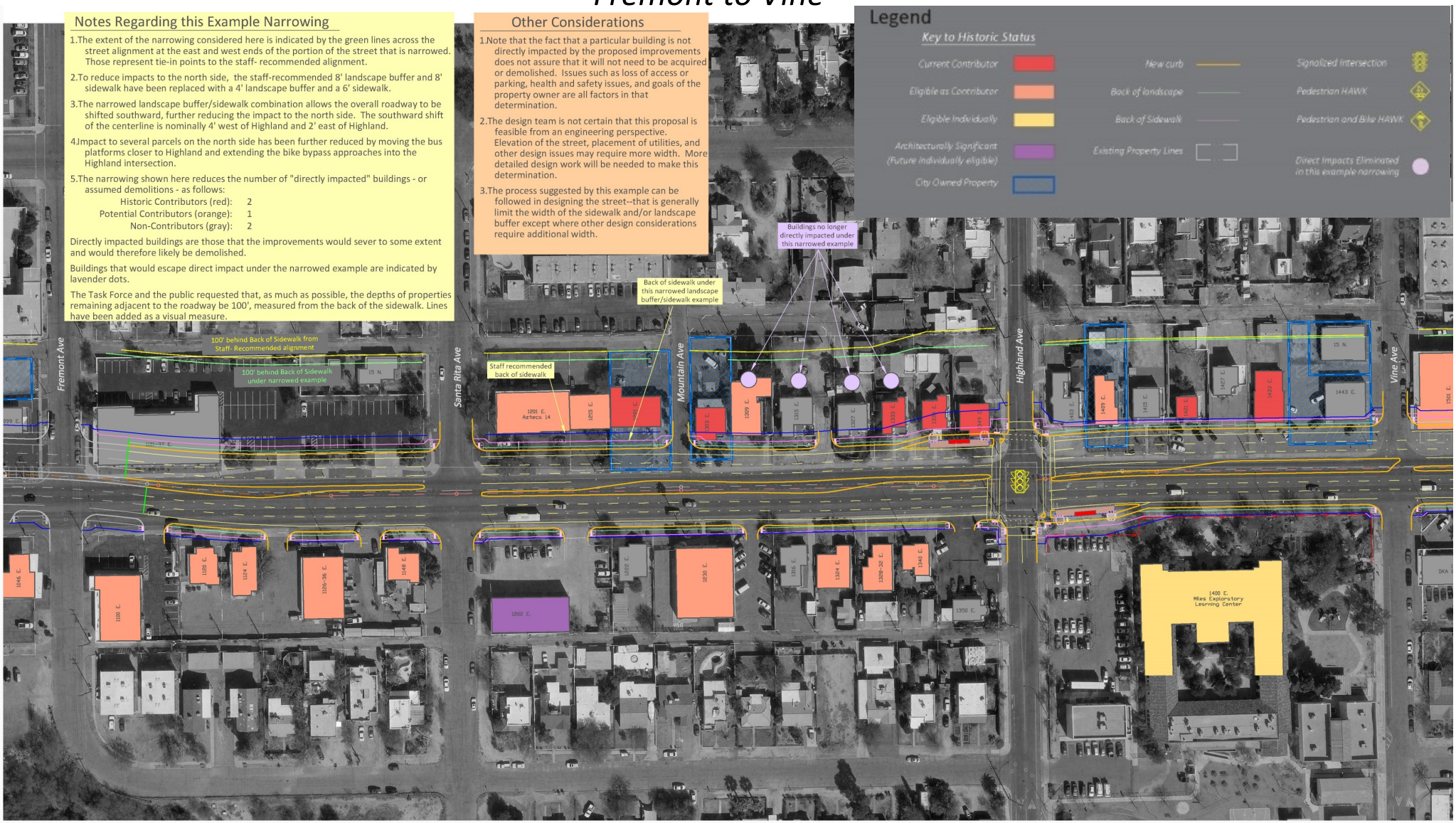
Directly impacted buildings are those that the improvements would sever to some extent and would therefore likely be demolished.

Buildings that would escape direct impact under the narrowed example are indicated by lavender dots.

The Task Force and the public requested that, as much as possible, the depths of properties remaining adjacent to the roadway be 100', measured from the back of the sidewalk. Lines have been added as a visual measure.

Other Considerations

1. Note that the fact that a particular building is not directly impacted by the proposed improvements does not assure that it will not need to be acquired or demolished. Issues such as loss of access or parking, health and safety issues, and goals of the property owner are all factors in that determination.
2. The design team is not certain that this proposal is feasible from an engineering perspective. Elevation of the street, placement of utilities, and other design issues may require more width. More detailed design work will be needed to make this determination.
3. The process suggested by this example can be followed in designing the street--that is generally limit the width of the sidewalk and/or landscape buffer except where other design considerations require additional width.



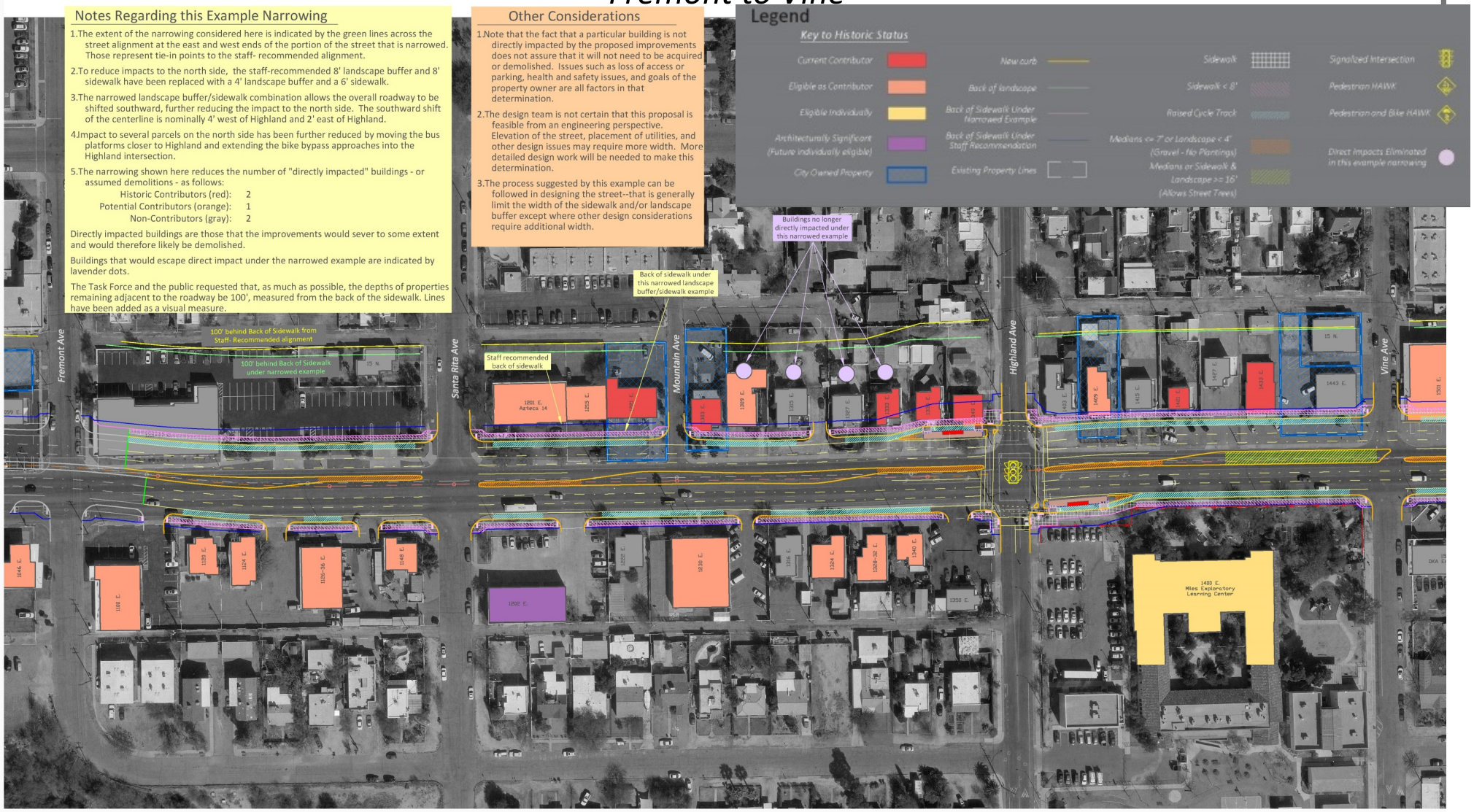
Attachment 1 – Narrowed Sidewalk Zone Concept in West Mile

Vine to Campbell

Attachment 2 – Narrowed Sidewalk Zone Concept in West Mile

Includes color-coding of sidewalks, landscaping, and medians to show different depths, and to show lengths where cycle tracks could be included

Fremont to Vine



Attachment 2 – Narrowed Sidewalk Zone Concept in West Mile

Includes color-coding of sidewalks, landscaping, and medians to show different depths, and to show lengths where cycle tracks could be included

Vine to Campbell

Appendix A

Visual Simulation of Design Concepts from Fremont Ave. to Warren/Martin Ave.

In order to provide a better understanding of the physical differences in the redesign of Broadway between the Staff-Recommended and the Narrowed concepts, the Project Team has prepared a set of visual simulations from view point of various users for both of the concepts which are included on the following sheets.

First, a plan view of the simulation model is provided for each concept with the view points for the "scenes" noted on the plans. The yellow shaded buildings are those that are "severed" by the future street right of way. The landscape that is illustrated is sized to represent approximately 8 years of growth after planting. The street trees have a height and width scaled to what could be expected from planting Desert Willows, the current recommended tree for planting within the project area.

Descriptions of View Point Scenes

Scene 1 - View from sidewalk

This is the view that a pedestrian would see while walking along the sidewalk. The main difference is how the combination of a sense of enclosure and human-scale of the presence or absence of trees and the width of the landscape buffer provides. This is the physical and visual buffering between pedestrians and vehicles. Appendix B includes a calculation of the Pedestrian Level of Service that results from the different design treatments of the landscape buffer in which the presence of trees and the increased width of the landscape buffer, as well as the 2 foot wider sidewalk results in a better Pedestrian LOS for the Staff-Recommended concept. The presence of trees also has an effect on the overall character of the street as being less expansive in the Staff-Recommended Concept; even as buildings on both sides of the street would be visible. Both concepts can use the same landscape in the median and organ pipe cacti, illustrated in the simulations, or saguaro can be used to provide some vertical relief to break up the visual width of the street.

Scene 2 - View from cycle track

This is the view that a cyclist would see from a location about parallel with the pedestrian view in Scene 1. Given that this view point is on the south side of Broadway, the cyclist gets some shade from the street trees and similar to Scene 1 the street trees frame the view while still allowing for views through to adjacent buildings.

Scene 3 - View from cycle track

This is the view that a driver of a car would see travelling in the outside lane about parallel with the cyclist and pedestrian views in Scenes 1 and 2. The characteristics of the view are similar to those in Scene 2.

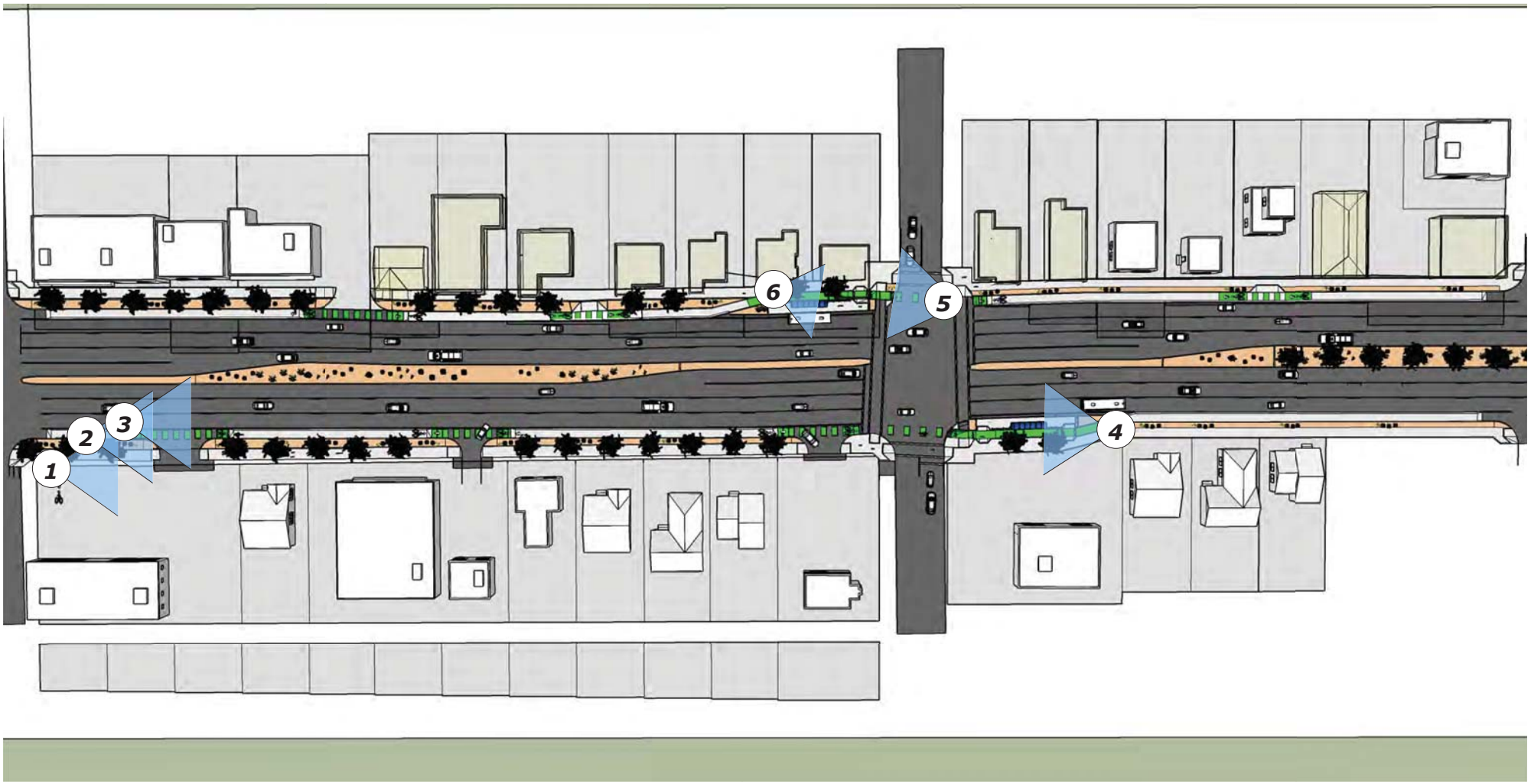
Appendix A

Scene 4 - View from bus island

This is the view that a transit rider would see looking back down the street for the next bus that would arrive at the stop. This illustrates how the cycle track passes behind the bus island and shelter. There is not a significant difference in how this area would be experienced in the two concepts with the exception that the Staff-Recommended Concept provides enough space for trees to be planted in the adjacent sidewalk area. This being a south side bus stop, the trees would provide some additional shade for waiting transit riders.

Scene 5 - View from bus island crosswalk

This is the view that a pedestrian would see when approaching one of the crosswalks across the cycle bypass to the bus island. Similar to Scene 4 the view is not that different between the two concepts. But note the additional sidewalk width of the Staff-Recommended concept does allow for street trees “behind” the shelter and bypass providing shade.



Staff Recommended Six-Lane Including Refined Transit Alignment

Broadway Boulevard
Tucson, Arizona

Visual Simulation of Design Concepts from Fremont Ave. to Warren/Martin Ave.

March 4, 2015

DRAFT FOR REVIEW

Staff-Recommended Six-Lane Including Transit Refined Alignment
Scene 1 - View from sidewalk

DRAFT FOR REVIEW
March 4, 2015

Staff-Recommended Six-Lane Including Transit Refined Alignment
Scene 2 - View from cycle track

DRAFT FOR REVIEW
March 4, 2015

Staff-Recommended Six-Lane Including Transit Refined Alignment
Scene 3 - View from driving lane

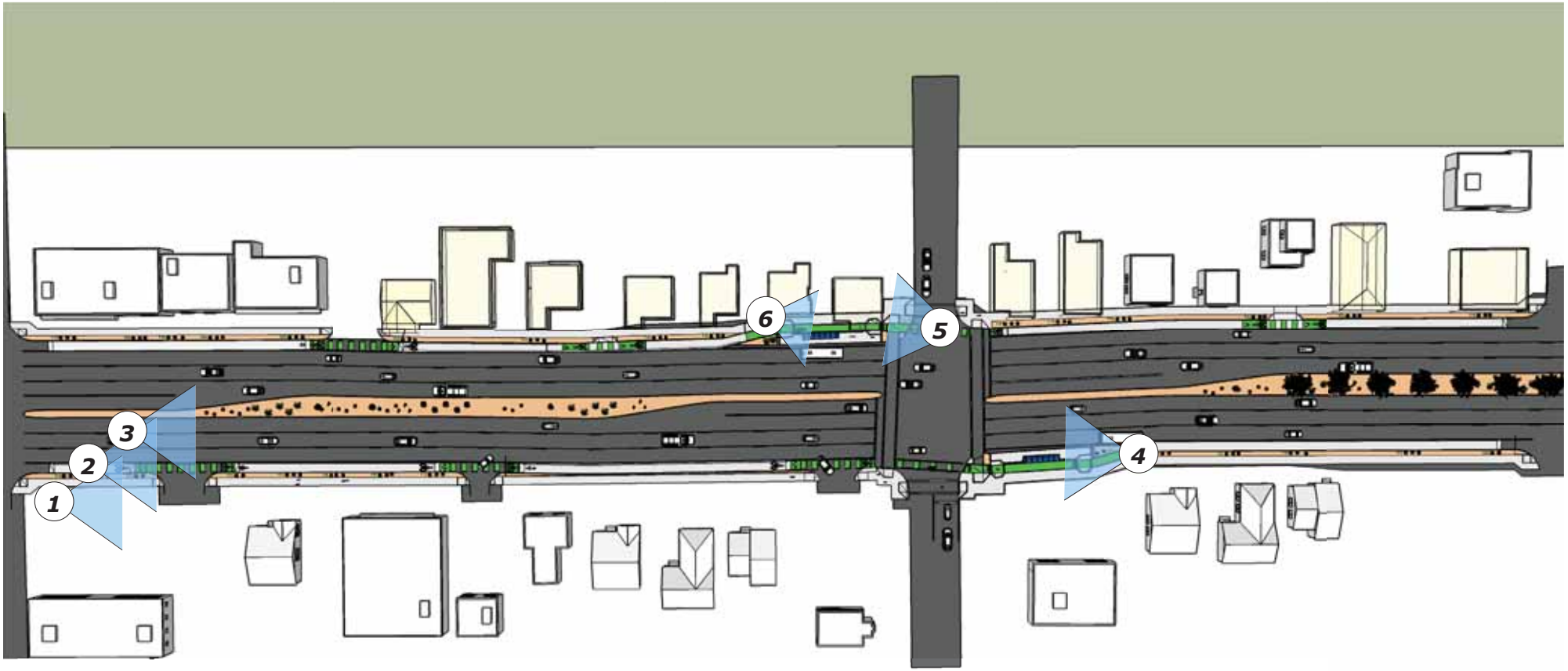
DRAFT FOR REVIEW
March 4, 2015

Staff-Recommended Six-Lane Including
Transit Refined Alignment
Scene 4 - View from bus island
* Encroaching property improvements shown in
transparent yellow
DRAFT FOR REVIEW
March 4, 2015

Staff-Recommended Six-Lane Including Transit
Refined Alignment
Scene 5 - Bicyclist's view entering cycle bypass approaching bus stop
* Encroaching property improvements shown as transparent yellow
DRAFT FOR REVIEW
March 4, 2015

Staff-Recommended Six-Lane Including Transit Refined Alignment
Scene 6 - View from bus island crosswalk
****Encroaching property improvements shown as transparent yellow***

DRAFT FOR REVIEW
March 4, 2015



Narrowed Sidewalk Zone Concept in West Mile

Broadway Boulevard
Tucson, Arizona

Visual Simulation of Design Concepts from Fremont Ave. to Warren/Martin Ave.

March 4, 2014

DRAFT FOR REVIEW

Narrowed Sidewalk Zone Concept in West Mile
Scene 1 - View from sidewalk

DRAFT FOR REVIEW
March 4, 2015

Narrowed Sidewalk Zone Concept in West Mile
Scene 2 - View from cycle track

DRAFT FOR REVIEW
March 4, 2015

Narrowed Sidewalk Zone Concept in West Mile
Scene 3 - View from driving lane

DRAFT FOR REVIEW
March 4, 2015

Narrowed Sidewalk Zone Concept in West Mile
Scene 4 - View from bus island
* Encroaching property improvements shown in transparent yellow
DRAFT FOR REVIEW
March 4, 2015

Narrowed Sidewalk Zone Concept in West Mile
Scene 5 - Bicyclist's view entering cycle bypass approaching bus stop
* Encroaching property improvements shown as transparent yellow
DRAFT FOR REVIEW
March 4, 2015

Narrowed Sidewalk Zone Concept in West Mile
Scene 6 - View from bus island crosswalk

****Encroaching property improvements shown as transparent yellow***

DRAFT FOR REVIEW
March 4, 2015

Appendix B

Performance Assessments of Design Concepts from Fremont Ave. to Warren/Martin Ave.

The Project Team has prepared the attached performance assessment that compares the Staff-Recommended and Narrowed Sidewalk Zone concepts from Fremont Avenue to Warren and Martin Avenues based on the set of performance objectives that was most recently used in the CTF meetings leading up to the initial identification of the 6 Lane including Transit Alignment concept. The following two-page 11x17 table presents the Project Team's assessment and provides space for CTF members, and community stakeholders, to note their comments regarding the assessments and their own assessment of the comparison of the concepts' performance for the objectives.

The most notable differences in performance related to building impacts and pedestrian related performance objectives.

Performance Objective	Factors	Staff-Recommended Six-Lane Including Transit Refined Alignment		Example of Narrowed Sidewalk Zone in West Mile		Project Team Notes
		Project Team Assessment	Your Assessment	Project Team Assessment	Your Assessment	
Community Character and Economic Performance						
Avoid Historic/Significant Building Impacts	- Width of right of way (minimizing can negatively or positively affect other performance measures) - Alignment of street: Choice/balancing of potential impacts to different sides of the street - Design of parking impact avoidance or replacement	Current Historic Contrib. 13 Potential Contrib. 6 Other Non-Contrib. Bldg. 8 Total Bldg. 27 Buildings with active businesses (North Side): 9 of 10 Front Pkg. 5		Current Historic Contrib. 11 (less 2) Potential Contrib. 5 (less 1) Other Non-Contrib. Bldg. 6 (less 2) Total Bldg. 22 (less 5) Buildings with active businesses: (North Side): 7 of 10 (less 2) Front Pkg. 5 (no change)		15% change in direct impacts to Current Historic Contributors and 18.5% change in direct impacts to all buildings There are a total of 33 total buildings on the north side between Fremont and Warren
Avoid Potential for Acquisition						Impact on Acquisition Cost not estimated at this time
Minimize Business Impacts						22% change in business impacts and no change in impacts to parking
Change in Economic Potential	- Combination of Minimizing Business Impacts, potential for reuse of remnant parcels and revitalization of existing development	Open to interpretation?		Open to interpretation?		Open to interpretation depending on expectations of value of preservation and what may be future for private reuse of properties
Visual Quality	- Preservation and enhancement of historic/significant bldgs. - Street design to enhance visual quality	- More building impacts than Narrowed Sidewalk - More landscape than Narrowed Sidewalk		- Less building impacts than Staff-Recommended - Less landscape than Staff-Recommended		Change in direct building impacts does not out way loss of landscape
Walkable Community	- Combination of pedestrian conditions, mix and quality of land use	- Street design more supportive of walking - Development support of walking open to interpretation?		- Street design less supportive of walking - Development support of walking open to interpretation?		Colors based on walkability of the street design
Transportation Performance						
Pedestrian Access and Mobility	- Width of sidewalk - Buffering from traffic – width and characteristics - Shade - Street crossings width and design - Universal Design and ADA - Driveway access frequency/size (*Drawings of two alignments indicate where sidewalk width is less than 8', areas where medians, and pedestrian and landscape area are wide enough for trees and areas where landscape area is too narrow for any plantings*)	- Sidewalk generally 8' wide with 8' landscape buffer, some areas with 6' sidewalk and 4' landscape - Street design more supportive of walking - Sidewalk width and buffering more supportive of Universal Design - No difference in street crossings distance		- Sidewalk generally 6' wide with 4' landscape buffer, some areas with 6' sidewalk as 2' to 3' buffer no landscape - Street design less supportive of walking - Sidewalk width and buffering less supportive of Universal Design - No difference in street crossings distance		- Both alignments meet requirements of ADA, at a minimum - Pedestrian Level of Service for different sidewalk and landscape buffer combinations: • 8' SW/8'L 2.06 B • 6' SW/4'L 2.69 C • 6' SW/3'-2''L 2.72 to 2.75 C
Bicycle Access and Mobility	- Separation from vehicle lanes – generally include 7' wide partially raised cycle track - Crossing conflicts with autos and buses - Consider bicycle network access	- Cycle track generally provided - Cycle bypasses at bus stops		- Cycle track generally provided - Cycle bypasses at bus stops		Little variation between alignments
Transit Access and Mobility	- Travel time *(Not known prior to modeling update)* - Station facilities - Potential for high capacity transit – space for dedicated lanes, stations, etc. in right-of-way	- Provides three far-side and one near-side bus stops - All bus stops are in travel lane - Cycle bypasses at bus stops		- Provides three far-side and one near-side bus stops - All bus stops are in travel lane - Cycle bypasses at bus stops - Sidewalk behind stops at Highland is too narrow to allow for tree planting		No difference in bus stop design, with exception of narrower sidewalks at Highland which precludes the planting of trees and reduction of shade at these stops
Vehicular Access and Mobility	- Travel time - Lane continuity - Accessibility to businesses and neighborhoods	- No meaningful difference in design or performance		- No meaningful difference in design or performance		Minimal variation in lane curvature

Performance Objective	Factors	Staff-Recommended Six-Lane Including Transit Refined Alignment		Example of Narrowed Sidewalk Zone in West Mile		Project Team Notes
		Project Team Assessment	Your Assessment	Project Team Assessment	Your Assessment	
Cost/Funding Viability						
Construction Cost	- $29.3 budgeted per RTA 2005 Plan *(Full potential for variation not known until cost estimate made)*	- Minimally more concrete for sidewalks - More trees - Likely less lower plantings		- Minimally less concrete for sidewalks - Less trees - Likely more lower plantings		Differences are likely minimal material amounts, labor likely only varies to a minimal degree
Acquisition Cost	- $44.0 budgeted per RTA 2005 Plan	- Variation uncertain?		- Variation uncertain?		While narrowed sidewalk zone concept directly impacts 5 fewer buildings the extent that this reduces full acquisitions cannot be known at this time.
Fundability	- Ability to maintain county and RTA funding	- Appears to be fundable		- Appears to be fundable		Based on most recent input from the RTA Board, both concepts appear to be fundable
Sustainability Performance						
Provide for Changing Transportation Needs	- Ability to adapt to changing multimodal transportation demands over time - Support for mix and vitality of land use supporting transportation choice	- Better support for pedestrians - Provides space for future high capacity transit		- Less support for pedestrians - Provides space for future high capacity transit		Staff-Recommended alignment provides a better pedestrian environment, and when high capacity transit is implemented a better pedestrian environment supports increased ridership and pedestrian activity
Health Benefits of Walking and Biking	- Combination of pedestrian and bicycling performance and Walkable Community measure	- More benefit for pedestrian		- Less benefit for pedestrians		See related measures for more information
Water Harvesting and Green Streets	- Meet or exceed City's Green Streets Active Practice Guidelines (*Drawings of two alignments indicate where sidewalk width is less than 8', areas where medians, and pedestrian and landscape area are wide enough for trees and areas where landscape area is too narrow for any plantings)*	- More landscape area that could accommodate green infrastructure and water harvesting		- Less landscape area that could accommodate green infrastructure and water harvesting		
Reduce Heat Island	- Use of shade and other improvements to reduce the heat created by the sun shining on Broadways road pavement and sidewalks. (*Drawings of two alignments indicate where sidewalk width is less than 8', areas where medians, and pedestrian and landscape area are wide enough for trees and areas where landscape area is too narrow for any plantings)*	- More landscape area - More area that can accommodate trees - More sidewalk area		- More landscape area - More area that can accommodate trees - Less sidewalk area		- More trees creates more shade - Potential for shade structures is being studied, likely result in less shade with more capital cost - Difference in sidewalk area likely have a marginal effect as concrete can be designed to reduce heat island effect
Air Quality / Greenhouse Gas Reduction	- Vehicular congestion *(Not known prior to modeling update)* - Mode split to non-single-occupant vehicle	- More supportive environment for walking and high capacity transit - Less heat island effect		- Less supportive environment for walking and high capacity transit - More heat island effect		Requires more evaluation
Manageable Operations and Maintenance Costs	*Operations and maintenance costs for pavement, signals, transit, and landscape are yet to be determined*	- Little difference in what would need to be maintained		- Little difference in what would need to be maintained		Landscape will be designed to meet a maintenance budget, and budget independent of width of street