

### Call to the Audience Guidelines

- 2 Call to the Audience opportunities
- Must fill out participant card
- Participants called in the order cards are received
- 3 minutes allowed per participant
- CTF Facilitator will call on speakers and manage time
- CTF members cannot discuss matters raised
- CTF cannot take action on matters raised
- CTF members can ask project team to review an item





## BROADWAY BOULEVARD

EUCLID to COUNTRY CLUB

June 20, 2013  
Broadway Citizens Task Force Meeting

### Meeting Agenda

1. Call to Order/Agenda Review/Announcements	
2. 1 <sup>st</sup> Call to the Audience	15 min
3. Public Input Report, and Reports on Project Presentations & Outreach	5 min
4. Update and Discussion of Future Broadway Corridor High Capacity Transit Improvements	50 min
5. Review Potential Cross Sections and Performance Assessments, and Potentially Endorse a Representative Set of them to Move Forward into Review by Stakeholder Agencies	85 min
6. Considerations for September Public Meeting #3	10 min
7. 2 <sup>nd</sup> Call to the Audience	10 min
8. Next Steps/CTF Roundtable	15 min
9. Adjourn	



### Call to the Audience

**15 Minutes**

**Please limit comments to 3 minutes**

- Called forward in order received
- CTF members cannot discuss matters raised
- CTF cannot take action on matters raised
- CTF members can ask project team to review an item

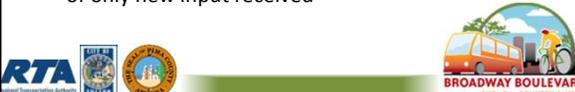


### Review Public Input Report

*Jenn Toothaker*

Public Input Report consists of a spreadsheet and attachments:

- **Spreadsheet** = Input received from 5/21/2013 - 6/9/2013
- **Attachments** = Documentation of only new input received

### Reports: Past and Upcoming Project Presentations & Outreach

- June 3, 2013 CTAC Meeting




## Update and Discussion of Future Broadway Corridor High Capacity Transit Improvements

**Carlos de Leon, Deputy Director**  
City of Tucson Department of Transportation



## Purpose of Presentation

To provide more information to the Broadway Citizens Task Force (CTF) for them to consider in determining how to accommodate HCT on Broadway during development of corridor concepts, including:

- Update the CTF on rough initial Bus Rapid Transit (BRT) modeling results
- Provide BRT design concept and best practices information for consideration during this Broadway segment's planning & design process



## Presentation Outline

- Brief Review of Current Bus Transit Services
- Brief Review of PAG's High Capacity Transit Plan (HCTP) Recommendations
- Overview of Bus Rapid Transit (BRT) and BRT Elements
- Results from Initial BRT Conceptual Analysis
- Considerations for How to Preserve the Opportunity to Implement Future HCT on Broadway

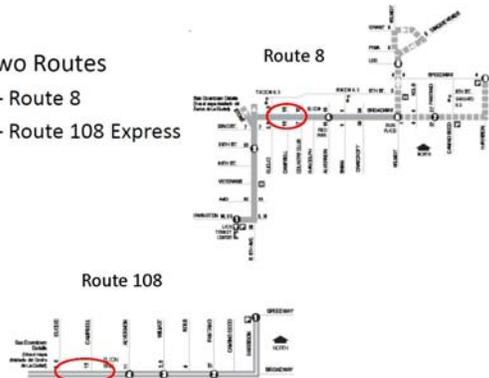


## Brief Review of Current Bus Transit Service



## Current Transit on Broadway

- Two Routes
  - Route 8
  - Route 108 Express



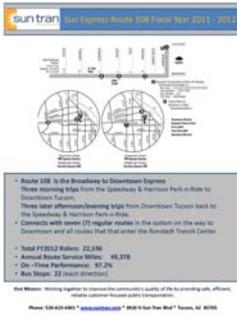
## Current Transit on Broadway

- **Route 8**
  - Runs Broadway Blvd. & S. 6<sup>th</sup> Ave. every 15 mins.; Branches at Broadway & Wilmot, every 30 mins.
  - 161 Bus Stops
  - Highest ridership route in Sun Tran system
    - 3,182,789 million boardings, FY11-12
    - About 55% (1,733,666) boardings along Broadway Blvd.
    - About 9% of total Sun Tran ridership



### Current Transit on Broadway

- **Route 108 Express**
  - 3 trips in A.M.,  
3 trips in P.M.
  - Limited stops, only 22 in each direction
  - 22,596 boardings, FY11-12
  - Performs at average of Sun Express system
  - The only express route with parallel Sun Tran service along entire route



**sun tran** Sun Express Route 108 Fiscal Year 2011 - 2012

• Route 108 is the Broadway to Downtown Express  
Three morning trips from the Speedway & Harrison Park-in-Ride to Downtown Transit.  
Three later afternoon/evening trips from Downtown Transit back to the Speedway & Harrison Park-in-Ride.  
• Connects with seven (7) regular routes in the system on the way to Downtown and all routes that serve the Broadway Transit Center

• Total FY2012 Riders: 22,596  
• Annual Route Service Miles: 48,878  
• On-Time Performance: 97.2%  
• Bus Stops: 22 each direction

Real Motion: Working together to improve the community's quality of life by providing safe, efficient, high capacity transit and public transportation.  
Phone: 520-625-6884 • [www.suntrans.com](http://www.suntrans.com) • 2008 "Go for Blue" Transit, AZ #2008

### Brief Review of PAG's 2009 High Capacity Transit Plan Recommendations




### 2009 High Capacity Transit Plan Recommendations

- 2009 Plan completed by Pima Association of Governments
- Provides a financially unconstrained menu of options, to be implemented based on funding availability
  - High Capacity Transit (HCT)
    - High volume of passengers
    - Fast and convenient service
  - Types
    - Express Bus
    - Modern Streetcar
    - Bus Rapid Transit
    - Light Rail
    - Commuter Rail




### 2009 High Capacity Transit Plan Recommendations

- 2009 High Capacity Transit System Plan performed initial evaluations and identified priority corridors
  - Sixteen Initial Corridors Identified
  - Eight Selected Corridors for Evaluation:
    - Ridership
    - Right of Way Availability
    - Potential Capital and Operating Costs
  - Two Priority Corridors Identified:
    - Broadway Blvd.
    - 6th Avenue/Nogales Highway




### 2009 High Capacity Transit Plan Recommendations

- Identified Broadway Corridor for BRT
  - Favorable future ridership projections
    - 3,887 daily riders (~ 120,497 monthly ridership)
    - In 2011-2012 counts, this would be the 4<sup>th</sup> highest ridership route in the system
  - Existing bus lanes
  - Planned expansion
  - Relative low cost
  - Conducive to Transit-Oriented Development (TOD)
  - Serves transit-dependant populations




### 2009 High Capacity Transit Plan Recommendations

“There do not appear to be any constraints to implementing BRT service on Broadway Boulevard in the near term. In fact, the existing transit facilities within this corridor, including dedicated transit lanes and the upcoming transit priority signal timing upgrade, make implementation of BRT relatively straightforward.”

*This statement is generally true of Broadway to the east of Alvernon, but within this Broadway: Euclid to Country Club project area, there are challenges.*




## Major Activity Centers Along Broadway



## Broadway HCT Options

- Bus Rapid Transit in Near Term, 0-10 years
- Streetcar between Downtown and El Con Mall in Mid Term, 10 to 20 Years
- Light Rail in Long Term > 20 years



## Overview of Bus Rapid Transit (BRT) and BRT Elements



## BRT Spectrum & Related Capital Costs



\* Likely overestimates Broadway's full cost, since much of the Right-of-Way on the corridor is already available.



## BRT Spectrum

BRT Attribute	BRT Spectrum		
	"Lite"	"Hybrid"	Full
	Basic Implementation	Intermediate Implementation	Full-Featured Implementation
Right-of-Way	Mixed Traffic	Designated/HOV/Barrier-Separated Lanes	Exclusive/Grade Separation
Stations	Improved Passenger Amenities	Enhanced Passenger Information & Fare Collection	Enhanced Loading
Service	Improved Service Frequency	Skip Stop & Express Service Options High Frequency & Reliability	Convenient Transfers
Route Structure	Single Route with Transfers, Color Coding	Multiple Route Operations with Transfer Facilities Integration with Regional Transit	One Seat Rides Transfer Reduction
Intelligent Transportation System	Signal Priority	Automated Passenger Information	Vehicle Location and System Surveillance

## Bus Rapid Transit

“Bus Rapid Transit can best be described as a combination of facility, systems, and vehicle investments that **convert conventional bus services into a fixed-facility transit service**, greatly increasing their efficiency and effectiveness to the end user.”

Federal Transit Administration, Bus Rapid Transit Demonstration Program, December 2002.



## BRT Benefits to Passengers

### User Experience

- Reduced transit travel time
- Increased trip reliability
- Improved transit connections and more direct service
- Decreased station stop dwell times and waiting times
- Enhanced system identity
- Increased travel comfort
- Enhanced safety and security

### Broad Benefits

- Capital Cost Effectiveness
- Operating Cost Efficiency
- Transit-supportive land development
- Environmental Quality



## BRT Systems

- Started in Curitiba, Brazil in 1974
- Applied world wide in major urban areas
- 20 systems in U.S., 1 systems rated as silver and 4 bronze by Institute of Transportation and Development Policy *Bus Rapid Transit Around the World*



**U.S. Silver Rated Systems**  
Cleveland, OH

**U.S. Bronze Rated Systems**  
Eugene, OR  
Los Angeles, CA  
Pittsburg, PA  
Las Vegas, NV

## Running Way

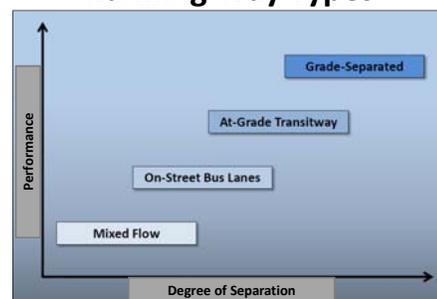
- Defines BRT travel parameters
- Most critical component in determining system performance
- Important to public perception and identity
- Characteristics of running ways
  - Running way type
  - Running way markings
  - Running way guidance

## BRT Elements

- Running ways
- Stations
- Vehicles
- Fare Collection
- Intelligent Transportation Systems (ITS)
- Service Structure & Relationship to Existing Bus Transit
- Branding



## Running Way Types



### Running Way – Mixed Flow




Mixed Flow






### Running Way – On Street Bus Lane





On-Street Bus Lanes






### Running Way – At Grade Separated









### Running Way – Grade Separated




Grade-Separated






### Stations

- Level boarding
- Real-time information
  - Arrival time
  - Route maps
  - Schedule
- Enhanced amenities
  - Increased comfort: shade, fare vending, other vending
  - Enhanced safety: lighting, emergency telephones, video cameras







### Vehicles



Conventional Standard



Stylized Standard



Conventional Articulated



Stylized Articulated (partial low floor)



Specialized BRT Vehicle (full low floor)






### Fare Collection

- On-Board, Driver-Validated System
- On-Board, Conductor-Validated System
- Off-Board Barrier System
- Off-Board, Barrier-Free, or Proof-of- Payment (POP) System
- Fare Medium
  - Cash
  - Magnetic Card
  - Smartcard



### Intelligent Transportation Systems (ITS)

- Transit Vehicle Prioritization
- Intelligent Vehicle Systems
- Operations Management Systems
- Passenger Information Systems
- Safety and Security Systems



### Service Structure & Relationship to Existing Bus Transit

- Route Length
- Route Structure
- Service Span
- Service Frequency
- Station Spacing
- Methods of Schedule Control



### Branding

- Provides system identity
- Creates impression of high quality
- Helps boost ridership



### Results from Initial BRT Conceptual Analysis

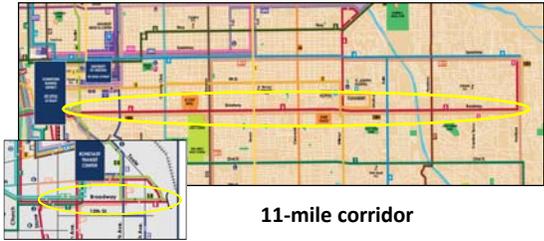


### PAG Initial BRT Alternatives Analysis

- “Sketch level” analysis provides very rough information; helps to guide focus of next level of analysis
- Coordinated by Pima Association of Governments (PAG) staff, in conjunction with the PAG Transit Working Group
- Performed as part of a partnership between PAG and University of Arizona
- To evaluate potential time savings of BRT and impact on existing traffic



### BRT Study Area



**11-mile corridor**



### BRT Initial Alternatives Analysis Modeling

- Model Inputs
  - Overall lane configuration:
    - Indirect left turns assumed at every intersection
    - Hybrid & Outside-running lane model:
      - Includes center-running lane in project area (Euclid-C. Club)
      - Reintegrate with outside-running traffic lanes from C. Club to Columbus
      - Diamond Lanes between Columbus and Camino Seco
      - Back to mixed traffic between Camino Seco and Houghton



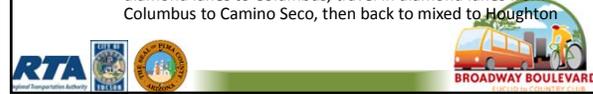
### BRT Initial Alternatives Analysis Modeling

- Model Inputs
  - 12 stops in each direction (approx. every 1 - 1½ miles)
    - 2 stops in project area: Euclid and Campbell; next stop El Con Mall
  - Interaction with other traffic
    - Center-running only interact with traffic at intersections (possible conflicts if traffic backs up in indirect cue lane as buses would need to wait until vehicles clear)
    - No bus pullouts
  - Bus operation frequency



### PAG Initial BRT Alternatives Analysis Alternatives Reviewed

- 1: Center Running Dedicated Lanes
  - Buses given signal priority and vehicle left-turns limited to major intersections
- 2: Outside Lane Mixed Traffic
  - Vehicles operate in diamond lanes or mixed traffic
  - Some use of BRT elements
- 3: Hybrid Center Lane and Outside Lane/Mixed Traffic
  - Dedicated median running way along Broadway Euclid to Country Club expansion
  - After Country Club, reintegrate with traffic and travel in diamond lanes to Columbus, travel in diamond lanes from Columbus to Camino Seco, then back to mixed to Houghton



### PAG Initial BRT Alternatives Analysis Alternative 1

#### Center Running Dedicated Lanes

Buses given signal priority and vehicle left-turns limited to major intersections



Image credit: San Francisco County Transportation Authority

### PAG Initial BRT Alternatives Analysis Alternative 2

#### Outside Lane Mixed Traffic

Vehicles operate in diamond lanes or mixed traffic; Some use of BRT elements



Image credit: San Francisco County Transportation Authority

## PAG Initial BRT Alternatives Analysis Alternative 3

Hybrid Center Lane and Outside Lane/Mixed Traffic

- Dedicated median running way along Broadway Euclid to Country Club expansion
- After Country Club, reintegrate with traffic and travel in diamond lanes to Columbus, travel in diamond lanes from Columbus to Camino Seco, then back to mixed to Houghton

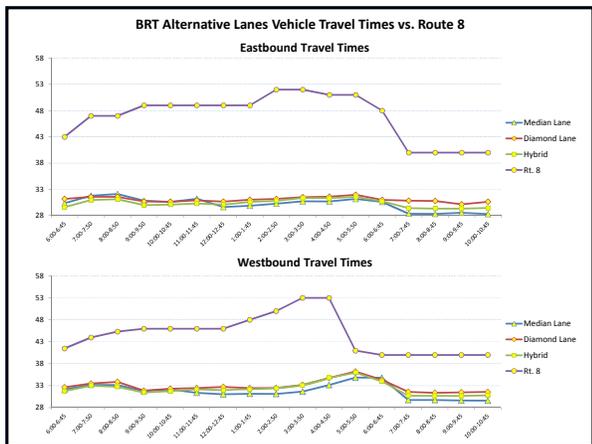
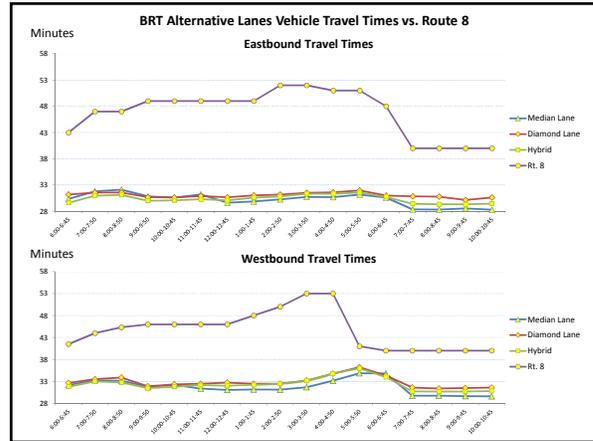


## PAG Initial BRT Alternatives Analysis BRT Alternatives Descriptions

BRT Element	Alternative 1 Dedicated Center	Alternative 2 Outside Busway	Alternative 3 Mixed Center/Outside
Running Way	Dedicated Center	On-street Bus/Shared Turning	Mix Alt 1/Alt 2
Stations	Level Boarding/Real Time Info	Unique Bus Shelter	Mix Alt 1/Alt 2
Vehicles	Specialized BRT	Specialized Articulated	Specialized BRT
Fare Collection	Off-Board, Smart Card	On-Board, Smart Card	Mix Alt 1/Alt 2
Intelligent Transportation System (ITS)	Transit Priority/Cue Jump	None	Transit Priority/Cue Jump
Branding	Unique Branding	Unique Branding	Unique Branding

## PAG Initial BRT Alternatives Analysis Travel Time Comparison

- Modeling assumed one-way trips between Ronstadt TC and Harrison
- Estimated total travel time based on departure time
- Travel times compared between alternatives and against current Route 8
- Route 8 trip times represent Ronstadt to/from Harrison only, no S. 6<sup>th</sup> or Wilmot legs

## BRT vs. Rt. 8 Travel Time Comparison

Route 8 corridor trip	45 minutes
BRT corridor trip	31 minutes
BRT savings over Rt. 8	14 minutes
BRT savings per mile	1.2 minutes per mile

\*All calculations represent average trip times over total 11-mile corridor length



## Running Way

- Defines BRT travel parameters
- Most critical component in determining system performance
- Important to public perception and identity
- Characteristics of running ways
  - Running way type
  - Running way markings
  - Running way guidance



## Summary of Results

- Broadway BRT ridership would be 4<sup>th</sup> highest in the region
- Separated/dedicated lanes provide the most significant time savings
- Hybrid model is an improvement over outside-running only lanes

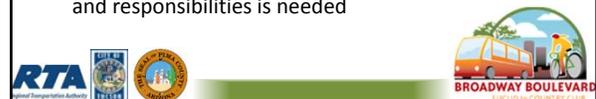


## Considerations for How to Preserve the Opportunity to Implement Future HCT on Broadway



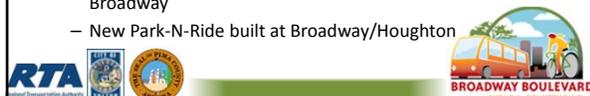
## Realities of Implementing HCT on Broadway

- Additional planning and analysis required to select a preferred service system (costs money; takes time)
- Funding source(s) need to be identified and committed before HCT can be implemented
  - Federal funds require local match
  - Local funding requires finding funding streams
- Commitment to Operations and Maintenance Costs and responsibilities is needed



## Realities of Implementing HCT on Broadway

- Schedule/timing of implementation is uncertain until key decisions made and funding identified
- Current activities are conducive to continued, accelerated BRT planning efforts:
  - Downtown development (and related construction, population, and jobs which has created congestion)
  - Convenient circulation once passengers are downtown, particularly once Streetcar is built
  - Additional population and jobs in other centers along Broadway
  - New Park-N-Ride built at Broadway/Houghton



## Design Considerations for Broadway Planning & Design

- Broadway Roadway Project funding does not include money to implement BRT service, but can support facility construction that works today and could accommodate BRT in the future
  - Potential to use as cost match for Federal funding in the future
- RTA Plan includes funding for transit enhancements on Broadway, but not BRT
  - Supports incremental improvements of existing bus service, and potential future BRT



## Design Considerations for Broadway Planning & Design

**Bottom Line:**  
**Allow enough Right-of-Way in improved roadway to accommodate future HCT (“preserve the opportunity”)**



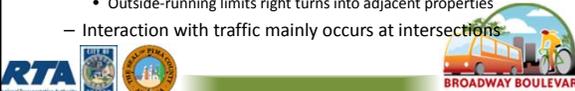
## Design Considerations for Broadway Planning & Design

- **Relationship to Existing Local Bus Service**
  - BRT would operate at higher frequencies (for example, every 10-15 mins.)
  - Local bus could be reduced in frequency (for example, from every 10-15 mins. to every 30 mins.)
  - With pullouts for local bus service and reduced frequency of local bus service, vehicular flow can continue to move quickly



## Design Considerations for Broadway Planning & Design

- **Dedicated lanes**
  - Center-running performed the best in the initial modeling (with 30% time-savings)
  - Center-running lanes assumed for project area for Hybrid model
  - Removal of traffic lanes in the future could be very challenging
  - Access to roadway’s adjacent properties
    - Center-running limits left turns
    - Outside-running limits right turns into adjacent properties
  - Interaction with traffic mainly occurs at intersections



## Design Considerations for Broadway Planning & Design

- **Intersection design**
  - Indirect left was assumed at all major intersections
  - Center-running lanes
    - No left turns permitted on any section
    - Transit stations built in center median, on far side of intersection



## Design Considerations for Broadway Planning & Design

- **Station design**
  - Bus pullouts are better for vehicular flow, NOT transit
  - Relationship to existing bus transit stops
  - Platforms
  - Bike lanes



## LA Metro Rapid: Incremental BRT

- Simple route layout: easy to find/use
- Frequent: 3-10 minutes during peak
- Fewer stops: ¼ mile apart
- Level boarding (LB buses speed-up dwell times)
- Enhanced stations: maps, lighting, canopies, “Next Bus” displays
- Same fare
- Minimal investment:
  - Signal priority
  - Passenger information
  - Strong branding (buses, stations etc.)



**Results after demonstration:**

- 23-29% reduction in travel times
- 38-42% increase in riders/weekday
- 1/3 of total choice riders,
- Same cost \*Cliff Henke, PB TR&S, Inc.

## Next Steps for PAG and COT for Transit Improvements/Enhancements

- Utilize results from Comprehensive Operational Analysis currently underway to identify opportunities for existing enhancements and/or BRT system funding
  - Incremental system enhancements for bus transit overall
  - Potential local funding of incremental BRT implementation
- Pursue initiating an application for the Federal Small Starts Program funding program
  - Alternatives analysis (would look at BRT, Streetcar extension, and Light Rail Transit)
  - Efforts to commence sometime after SunLinks (Streetcar) is operational



## Thank you

## Questions?



## Review Cross Sections and Performance Assessments

**Phil Erickson**  
Community Design + Architecture



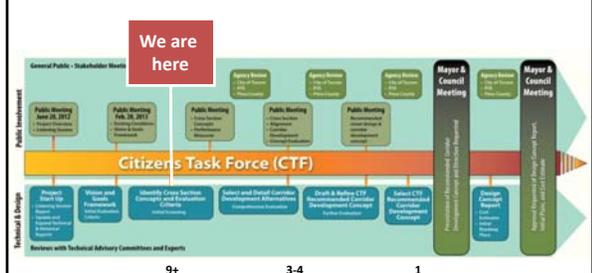
## Agenda for this item

- Introduction
  - Schedule
    - Not likely to have an endorsement of all cross sections and performance assessment tonight
    - Will talk about options for meetings between now and the Public Workshop during Next Steps agenda item
  - CTF Feedback and Questions
    - Process
    - Schedule
    - Questions regarding Performance Measure assessments
- How does current work fit into the overall process?
- Overview of new and updated materials
- Small group session
- Report out and discussion
- Discuss specific concepts, performance measures, and assessments



## Planning and Design of Broadway

We are here



**9+ Design Concepts**      **3-4 Design Concepts + Alignment Variations**      **1 Design Concept and Alignment**



## Building from Needs & Desires to Performance Measures



**PERFORMANCE MEASURES**

Pedestrian Access & Mobility    Bicycle Access & Mobility    Transit Access & Mobility    Vehicle Access & Mobility  
 Sense of Place    Environmental / Public Health    Economic Vitality    Project Cost









### Linking Goals and Performance Measures

Goal/Topic/	Potential Goal/Statements/	Related Performance Measures/
<b>Buildings and Site Development/Continued/</b>		
<b>Consider Impacts of Building Height and Density/</b>	<ul style="list-style-type: none"> <li>Consider height and density of buildings in relation to surrounding context and building height limits.</li> </ul>	<ul style="list-style-type: none"> <li>Building height and density.</li> </ul>
<b>Multimodal Street Design/</b>		
<b>Balance Pedestrian and Bicycle Complete Street/</b>	<ul style="list-style-type: none"> <li>Design streets to be safe and comfortable for all users, including pedestrians, bicyclists, and transit users.</li> </ul>	<ul style="list-style-type: none"> <li>Number of pedestrian and bicycle accidents.</li> <li>Number of pedestrian and bicycle fatalities.</li> <li>Number of pedestrian and bicycle injuries.</li> <li>Number of pedestrian and bicycle complaints.</li> <li>Number of pedestrian and bicycle fatalities.</li> <li>Number of pedestrian and bicycle injuries.</li> <li>Number of pedestrian and bicycle complaints.</li> <li>Number of pedestrian and bicycle fatalities.</li> <li>Number of pedestrian and bicycle injuries.</li> <li>Number of pedestrian and bicycle complaints.</li> </ul>
<b>Reduce Vehicle Miles Traveled/</b>	<ul style="list-style-type: none"> <li>Reduce vehicle miles traveled (VMT) by providing alternative transportation options.</li> </ul>	<ul style="list-style-type: none"> <li>Vehicle miles traveled (VMT).</li> </ul>
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### Linking Goals and Performance Measures

Goal/Topic/	Potential Goal/Statements/	Related Performance Measures/
<b>Multimodal Street Design/Continued/</b>		
<b>Transit/</b>	<ul style="list-style-type: none"> <li>Improve transit service and accessibility.</li> </ul>	<ul style="list-style-type: none"> <li>Transit ridership.</li> <li>Transit service quality.</li> <li>Transit accessibility.</li> </ul>
<b>Complete Streets/</b>	<ul style="list-style-type: none"> <li>Design streets to be safe and comfortable for all users, including pedestrians, bicyclists, and transit users.</li> </ul>	<ul style="list-style-type: none"> <li>Number of pedestrian and bicycle accidents.</li> <li>Number of pedestrian and bicycle fatalities.</li> <li>Number of pedestrian and bicycle injuries.</li> <li>Number of pedestrian and bicycle complaints.</li> <li>Number of pedestrian and bicycle fatalities.</li> <li>Number of pedestrian and bicycle injuries.</li> <li>Number of pedestrian and bicycle complaints.</li> <li>Number of pedestrian and bicycle fatalities.</li> <li>Number of pedestrian and bicycle injuries.</li> <li>Number of pedestrian and bicycle complaints.</li> </ul>
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### Linking Goals and Performance Measures

Goal Topics/	Potential Goal Statements/	Related Performance Measures/
<b>Multimodal Street Design - continued</b>		
<b>Asset Management / Storm Water</b>	<ul style="list-style-type: none"> <li>Design improvements to roadway to encourage runoff to infiltrate the ground.</li> </ul>	<ul style="list-style-type: none"> <li>Storm water runoff.</li> <li>Storm water infiltration.</li> </ul>
<b>Landuse / Streetcar / Transit</b>	<ul style="list-style-type: none"> <li>Increase the amount and quality of landuse and lighting along the streetcar through an approach that is efficient in terms of landuse and transportation costs.</li> </ul>	<ul style="list-style-type: none"> <li>Landuse density.</li> <li>Landuse quality.</li> <li>Landuse efficiency.</li> </ul>
<b>Public Art</b>	<ul style="list-style-type: none"> <li>Provide opportunities for public art that complement the aesthetic and landscaping goals for Broadway.</li> </ul>	<ul style="list-style-type: none"> <li>Public art installations.</li> <li>Public art quality.</li> </ul>
<b>Light-of-day Impacts</b>	<ul style="list-style-type: none"> <li>Reduce light pollution and glare from buildings and streetlights.</li> </ul>	<ul style="list-style-type: none"> <li>Light pollution.</li> <li>Glare.</li> </ul>
<b>Reduce Vehicle Miles Traveled</b>	<ul style="list-style-type: none"> <li>Reduce vehicle miles traveled (VMT) by providing alternative transportation options.</li> </ul>	<ul style="list-style-type: none"> <li>Vehicle miles traveled (VMT).</li> </ul>
<b>Sustainability</b>	<ul style="list-style-type: none"> <li>Design streets to be safe and comfortable for all users, including pedestrians, bicyclists, and transit users.</li> </ul>	<ul style="list-style-type: none"> <li>Number of pedestrian and bicycle accidents.</li> <li>Number of pedestrian and bicycle fatalities.</li> <li>Number of pedestrian and bicycle injuries.</li> <li>Number of pedestrian and bicycle complaints.</li> <li>Number of pedestrian and bicycle fatalities.</li> <li>Number of pedestrian and bicycle injuries.</li> <li>Number of pedestrian and bicycle complaints.</li> <li>Number of pedestrian and bicycle fatalities.</li> <li>Number of pedestrian and bicycle injuries.</li> <li>Number of pedestrian and bicycle complaints.</li> </ul>
<b>Environment</b>	<ul style="list-style-type: none"> <li>Reduce environmental impacts from buildings and streetlights.</li> </ul>	<ul style="list-style-type: none"> <li>Environmental impacts.</li> <li>Energy efficiency.</li> </ul>
<b>Water use and stormwater management</b>	<ul style="list-style-type: none"> <li>Design streets to be safe and comfortable for all users, including pedestrians, bicyclists, and transit users.</li> </ul>	<ul style="list-style-type: none"> <li>Water use.</li> <li>Stormwater management.</li> </ul>
<b>Quality</b>	<ul style="list-style-type: none"> <li>Design streets to be safe and comfortable for all users, including pedestrians, bicyclists, and transit users.</li> </ul>	<ul style="list-style-type: none"> <li>Street quality.</li> <li>Street safety.</li> </ul>
<b>Transit</b>	<ul style="list-style-type: none"> <li>Improve transit service and accessibility.</li> </ul>	<ul style="list-style-type: none"> <li>Transit ridership.</li> <li>Transit service quality.</li> <li>Transit accessibility.</li> </ul>

### Linking Goals and Performance Measures

Goal Topics/	Potential Goal Statements/	Related Performance Measures/
<b>Design - continued</b>		
<b>Complete Streets</b>	<ul style="list-style-type: none"> <li>Design improvements to roadway to encourage runoff to infiltrate the ground.</li> </ul>	<ul style="list-style-type: none"> <li>Storm water runoff.</li> <li>Storm water infiltration.</li> </ul>
<b>Landuse / Streetcar / Transit</b>	<ul style="list-style-type: none"> <li>Increase the amount and quality of landuse and lighting along the streetcar through an approach that is efficient in terms of landuse and transportation costs.</li> </ul>	<ul style="list-style-type: none"> <li>Landuse density.</li> <li>Landuse quality.</li> <li>Landuse efficiency.</li> </ul>
<b>Public Art</b>	<ul style="list-style-type: none"> <li>Provide opportunities for public art that complement the aesthetic and landscaping goals for Broadway.</li> </ul>	<ul style="list-style-type: none"> <li>Public art installations.</li> <li>Public art quality.</li> </ul>
<b>Light-of-day Impacts</b>	<ul style="list-style-type: none"> <li>Reduce light pollution and glare from buildings and streetlights.</li> </ul>	<ul style="list-style-type: none"> <li>Light pollution.</li> <li>Glare.</li> </ul>
<b>Reduce Vehicle Miles Traveled</b>	<ul style="list-style-type: none"> <li>Reduce vehicle miles traveled (VMT) by providing alternative transportation options.</li> </ul>	<ul style="list-style-type: none"> <li>Vehicle miles traveled (VMT).</li> </ul>
<b>Sustainability</b>	<ul style="list-style-type: none"> <li>Design streets to be safe and comfortable for all users, including pedestrians, bicyclists, and transit users.</li> </ul>	<ul style="list-style-type: none"> <li>Number of pedestrian and bicycle accidents.</li> <li>Number of pedestrian and bicycle fatalities.</li> <li>Number of pedestrian and bicycle injuries.</li> <li>Number of pedestrian and bicycle complaints.</li> <li>Number of pedestrian and bicycle fatalities.</li> <li>Number of pedestrian and bicycle injuries.</li> <li>Number of pedestrian and bicycle complaints.</li> <li>Number of pedestrian and bicycle fatalities.</li> <li>Number of pedestrian and bicycle injuries.</li> <li>Number of pedestrian and bicycle complaints.</li> </ul>
<b>Environment</b>	<ul style="list-style-type: none"> <li>Reduce environmental impacts from buildings and streetlights.</li> </ul>	<ul style="list-style-type: none"> <li>Environmental impacts.</li> <li>Energy efficiency.</li> </ul>
<b>Water use and stormwater management</b>	<ul style="list-style-type: none"> <li>Design streets to be safe and comfortable for all users, including pedestrians, bicyclists, and transit users.</li> </ul>	<ul style="list-style-type: none"> <li>Water use.</li> <li>Stormwater management.</li> </ul>
<b>Quality</b>	<ul style="list-style-type: none"> <li>Design streets to be safe and comfortable for all users, including pedestrians, bicyclists, and transit users.</li> </ul>	<ul style="list-style-type: none"> <li>Street quality.</li> <li>Street safety.</li> </ul>
<b>Transit</b>	<ul style="list-style-type: none"> <li>Improve transit service and accessibility.</li> </ul>	<ul style="list-style-type: none"> <li>Transit ridership.</li> <li>Transit service quality.</li> <li>Transit accessibility.</li> </ul>

### Linking Goals and Performance Measures

Goal/Topic/	Potential Goal/Statements/	Related Performance Measures/
<b>Planning and Design/Process/</b>		
<b>Public Art/</b>	<ul style="list-style-type: none"> <li>Provide opportunities for public art that complement the aesthetic and landscaping goals for Broadway.</li> </ul>	<ul style="list-style-type: none"> <li>Public art installations.</li> <li>Public art quality.</li> </ul>
<b>Light-of-day Impacts/</b>	<ul style="list-style-type: none"> <li>Reduce light pollution and glare from buildings and streetlights.</li> </ul>	<ul style="list-style-type: none"> <li>Light pollution.</li> <li>Glare.</li> </ul>
<b>Reduce Vehicle Miles Traveled/</b>	<ul style="list-style-type: none"> <li>Reduce vehicle miles traveled (VMT) by providing alternative transportation options.</li> </ul>	<ul style="list-style-type: none"> <li>Vehicle miles traveled (VMT).</li> </ul>
<b>Reduce Vehicle Miles Traveled/</b>	<ul style="list-style-type: none"> <li>Reduce vehicle miles traveled (VMT) by providing alternative transportation options.</li> </ul>	<ul style="list-style-type: none"> <li>Vehicle miles traveled (VMT).</li> </ul>

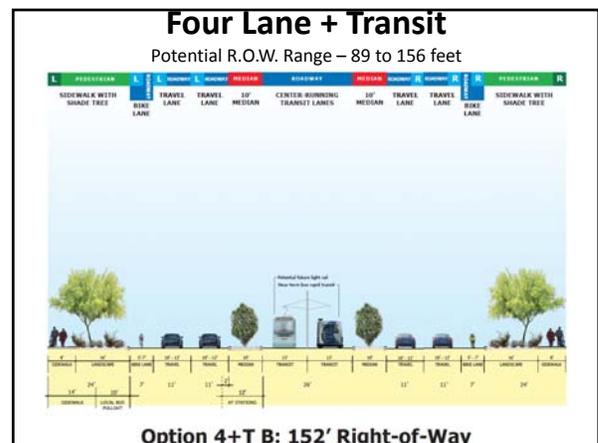
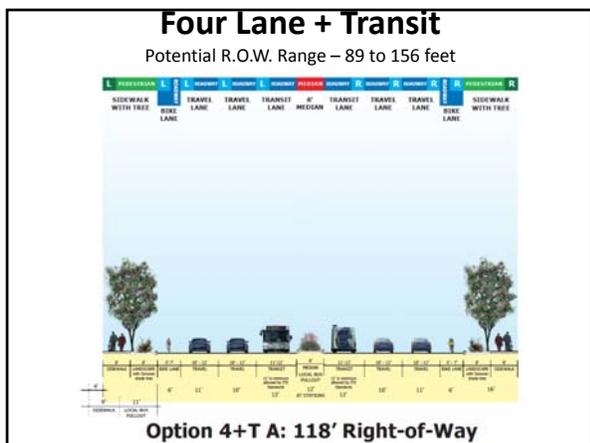
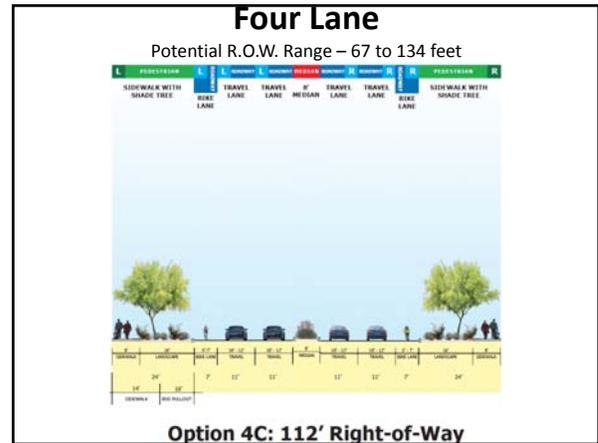
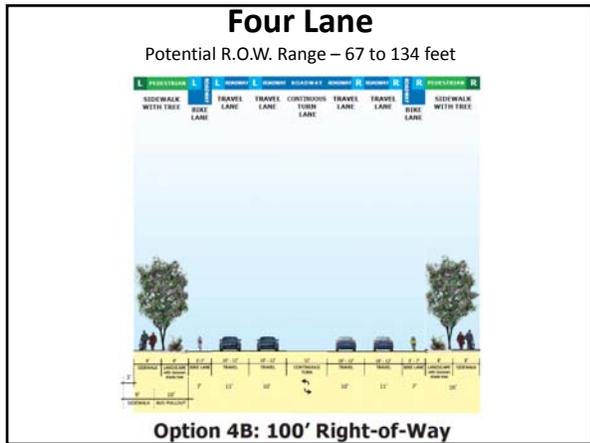
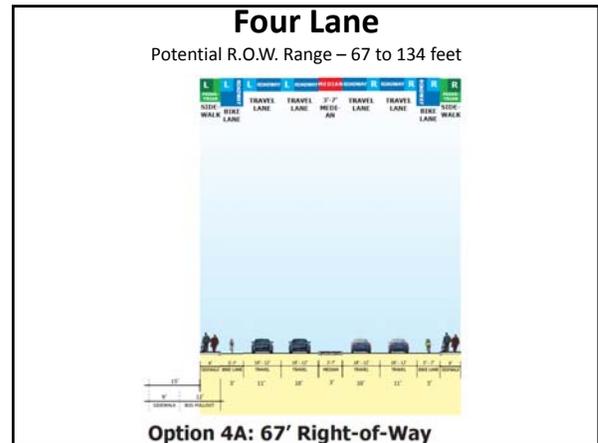
### Linking Goals and Performance Measures

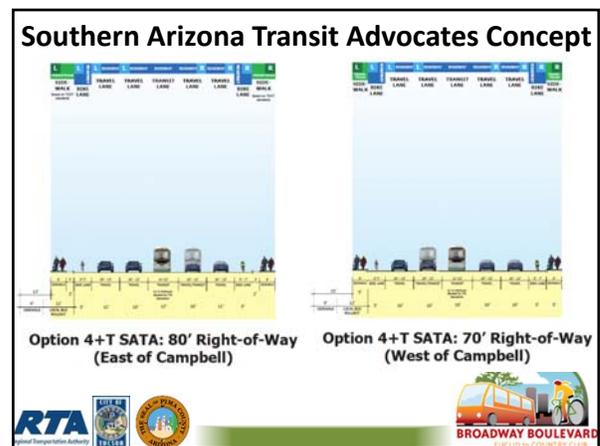
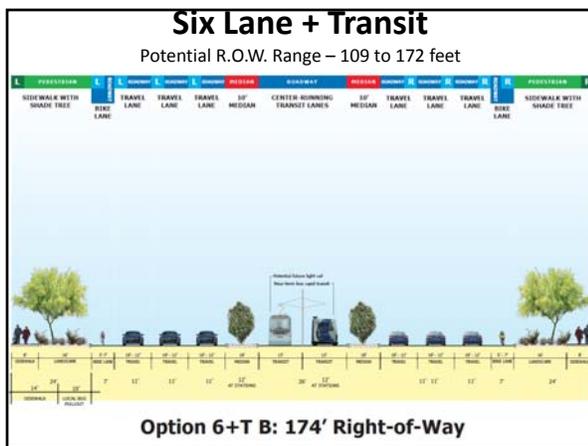
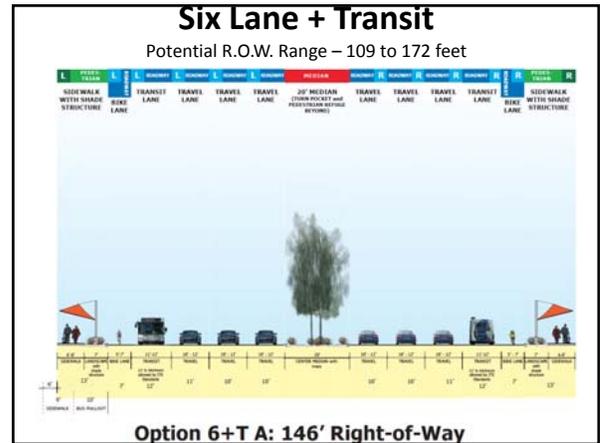
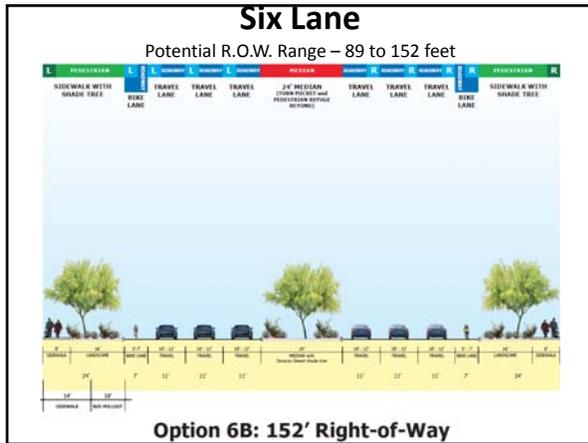
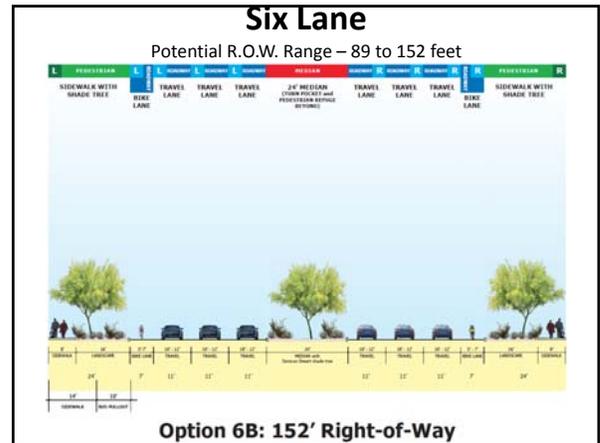
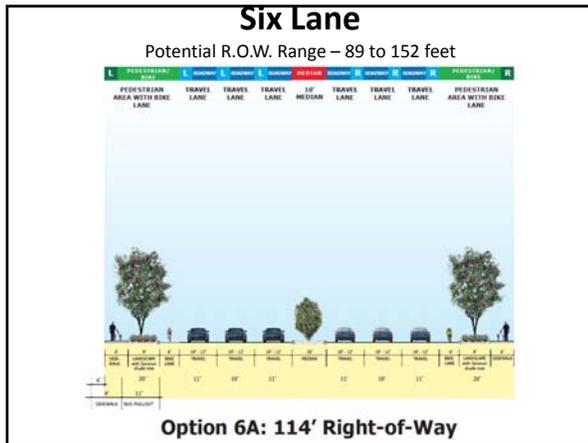
Potential Goal/Statements/	Related Performance Measures/
<ul style="list-style-type: none"> <li>Design improvements to roadway to encourage runoff to infiltrate the ground.</li> </ul>	<ul style="list-style-type: none"> <li>Storm water runoff.</li> <li>Storm water infiltration.</li> </ul>
<ul style="list-style-type: none"> <li>Increase the amount and quality of landuse and lighting along the streetcar through an approach that is efficient in terms of landuse and transportation costs.</li> </ul>	<ul style="list-style-type: none"> <li>Landuse density.</li> <li>Landuse quality.</li> <li>Landuse efficiency.</li> </ul>
<ul style="list-style-type: none"> <li>Provide opportunities for public art that complement the aesthetic and landscaping goals for Broadway.</li> </ul>	<ul style="list-style-type: none"> <li>Public art installations.</li> <li>Public art quality.</li> </ul>
<ul style="list-style-type: none"> <li>Reduce light pollution and glare from buildings and streetlights.</li> </ul>	<ul style="list-style-type: none"> <li>Light pollution.</li> <li>Glare.</li> </ul>
<ul style="list-style-type: none"> <li>Reduce vehicle miles traveled (VMT) by providing alternative transportation options.</li> </ul>	<ul style="list-style-type: none"> <li>Vehicle miles traveled (VMT).</li> </ul>
<ul style="list-style-type: none"> <li>Reduce vehicle miles traveled (VMT) by providing alternative transportation options.</li> </ul>	<ul style="list-style-type: none"> <li>Vehicle miles traveled (VMT).</li> </ul>



### Draft Cross Section Concept Options

- Four families of section concept types
  - 4 mixed-flow travel lanes (3 concepts)
  - 4 mixed-flow travel lanes + transit (2 concepts)
  - 6 mixed-flow travel lanes (2 concepts)
  - 6 mixed-flow travel lanes + transit (2 concepts)
- Range of concepts
  - Include different facilities for pedestrians, bicycles, transit, and vehicles
  - In response to input from the public, stakeholder agencies, and the CTF
    - Evolving Goals and definition of “functionality”
  - Evolving set of design parameters and criteria (i.e.; min. lane widths, target speed, landscape maintenance requirements, etc.)





### Exploration of "Fitting" Cross Section Concepts in Existing Conditions

- Illustrate prototypical conditions along Broadway
- How Cross Section Concepts can be integrated to
  - Avoid potential impacts to parking and buildings
  - Reduce potential for property acquisition
  - Maximize positive impacts to character of the street and its context
  - Maximize support for walking, biking, and transit
- Begins to illustrate positive and negative impacts that will be more fully assessed during the alignment design process
- Range of design parameters related to context and particular street elements
  - Commercial building frontages
    - Visibility
    - Parking and access
    - Walkways and sidewalks
  - Residential building frontages
    - Privacy
    - Landscaped yard setback
  - Flexibility in width for various street design elements - "section cards"
  - Potential to enhance some elements of Cross Section Concepts if space allows (i.e., additional landscape, sidewalk, or other space within the cross section)

**BROADWAY BOULEVARD**

### Existing Prototypical West of Campbell

**Existing Condition: 90' Right-of-Way**

### Four Lane Prototypical West of Campbell

**Option 4A: Modified 90' Right-of-Way (matching existing R.O.W)**

### Four Lane + Transit Prototypical West of Campbell

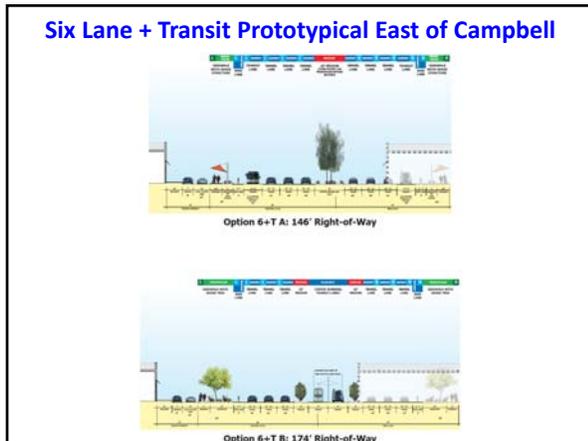
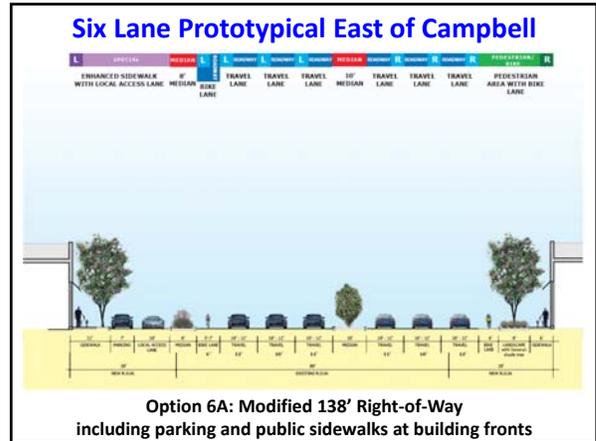
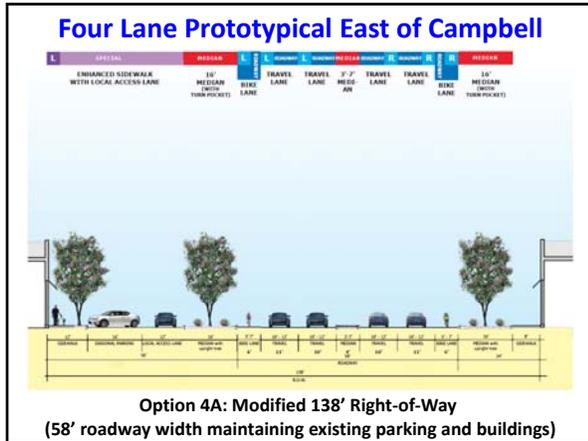
**Option 4+T A: Modified 112' Right-of-Way**

### Six Lane + Transit Prototypical West of Campbell

**Option 6+T A: 146' Right-of-Way**

### Existing Prototypical East of Campbell

**Existing Condition: 80' Right-of-Way**



### Overview Performance Measures

- Reflective of
  - Public input and discussions with CTF to date
  - Guidance from US EPA's *Guide to Sustainable Transportation Performance Measures*
  - Other best practices research including:
    - ITE, *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*
    - NACTO, *Urban Bikeway Design Guide*
    - US Access Board *Public Right-of-Way Accessibility Guidelines*
    - AASHTO *Green Book*
- Starting point for selecting and further developing "Transportation" and "Non-transportation" measures for Broadway

### Updated Performance Assessment

STREET CROSS SECTION CONCEPT	PEDESTRIAN ACCESS AND MOBILITY				BICYCLE ACCESS AND MOBILITY				TRANSIT ACCESS AND MOBILITY			
	Walkability	Accessibility	Connectivity	Comfort	Separation	Connectivity	Comfort	Separation	Connectivity	Comfort	Separation	Connectivity
Existing Conditions	---	---	---	---	---	---	---	---	---	---	---	---
Option 4A (138' r.o.w.)	---	---	---	---	---	---	---	---	---	---	---	---
Option 4B (138' r.o.w.)	---	---	---	---	---	---	---	---	---	---	---	---
Option 4C (138' r.o.w.)	---	---	---	---	---	---	---	---	---	---	---	---
Option 6+T A (146' r.o.w.)	---	---	---	---	---	---	---	---	---	---	---	---
Option 6+T B (174' r.o.w.)	---	---	---	---	---	---	---	---	---	---	---	---

LEGEND: Best Performance +++ Neutral 0 Worst Performance --- Highest Cost (---) Lowest Cost (-) Note: Shaded cells cannot be assessed or scored due to change in road conditions and/or data. JUNE 11, 2013 RHODS DRAFT Page 1 of 3

### Updated Performance Assessment

STREET CROSS SECTION CONCEPT	PEDESTRIAN ACCESS AND MOBILITY				BICYCLE ACCESS AND MOBILITY				TRANSIT ACCESS AND MOBILITY				ENVIRONMENTAL / PUBLIC HEALTH				ECONOMIC VITALITY		PROJECT COST	
	Walkability	Accessibility	Connectivity	Comfort	Separation	Connectivity	Comfort	Separation	Connectivity	Comfort	Separation	Connectivity	Greenhouse Gas Emissions	Local Air Quality	Local Noise	Local Water Quality	Local Economic Vitality	Local Job Creation		
Existing Conditions	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Option 4A (138' r.o.w.)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Option 4B (138' r.o.w.)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Option 4C (138' r.o.w.)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Option 6+T A (146' r.o.w.)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Option 6+T B (174' r.o.w.)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	

LEGEND: Best Performance +++ Neutral 0 Worst Performance --- Highest Cost (---) Lowest Cost (-) Note: Shaded cells cannot be assessed or scored due to change in road conditions and/or data. JUNE 11, 2013 RHODS DRAFT Page 2 of 3



## Pedestrian Access and Mobility

**1b. Separation from Vehicular Traffic**

Description	<ul style="list-style-type: none"> <li>Width and design character of area between outside edge of vehicle lane and sidewalk</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Width meets or exceed ITE Walkable Thoroughfare Manual guidance</li> <li>Frequency and quality of street trees or other large landscape</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Width of landscape area</li> <li>Width of bicycle lane</li> <li>Frequency and quality of large landscape</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>

## Performance Assessment

STREET CROSS-SECTION CONCEPT	PEDESTRIAN ACCESS AND MOBILITY									
	No. Pedestrians/Min. Walkable Thoroughfare									
Existing Conditions	---	---	---	---	---	---	---	---	---	---
Option 4A (97' r.o.w.)	---	---	---	---	---	---	---	---	---	---
Option 4B (100' r.o.w.)	++	++	0	++	+					
Option 4C (112' r.o.w.)	+++	+++	++	+++	++					
Option 4-T A (118' r.o.w.)	+	+	0	+	+					
Option 4-T B (132' r.o.w.)	+++	+++	++	+++	++	0	++			
Option 6A (114' r.o.w.)	0	0	0	0	0	+	+			
Option 6B (132' r.o.w.)	++	++	0	++	++	0	++			
Option 6-T A (140' r.o.w.)	---	---	---	---	---	0	0			
Option 6-T B (134' r.o.w.)	++	++	++	++	++	0	++			
Option 4-T DATA (Existing r.o.w.)	---	---	---	---	---	---	---	---	---	---

- 1b. Separation from Vehicular Traffic
  - Similar to 1a as buffer guidance is included in ITE Manual recommendations
  - Possibly combine 1a, 1b, and 1c into one Performance Measure

## Functionality of Streetside for Pedestrian Activity

## Pedestrian Access and Mobility

**1c. Pedestrian-oriented Facilities or Improvements**

Description	<ul style="list-style-type: none"> <li>Extent of shade, lighting, seating, drinking fountains and other features to serve pedestrian needs and provide for visual interest</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>% shade, lighting levels and consistency, number/frequency of design features</li> <li>Qualitative evaluation</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Provision for and increase in number of features</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>Minimal at the cross section and alignment level, beyond provision of enough pedestrian area to allow for detailed facilities. Evaluation of space is generally covered by measures 1a and 1b.</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Moderate at this level of design</li> <li>Design does not currently include details for streetscape design, but lower cost cross section concepts may allow more budget to be spent on pedestrian facilities</li> </ul>

## Performance Assessment

STREET CROSS-SECTION CONCEPT	PEDESTRIAN ACCESS AND MOBILITY									
	No. Pedestrians/Min. Walkable Thoroughfare									
Existing Conditions	---	---	---	---	---	---	---	---	---	---
Option 4A (97' r.o.w.)	---	---	---	---	---	---	---	---	---	---
Option 4B (100' r.o.w.)	++	++	0	++	+					
Option 4C (112' r.o.w.)	+++	+++	++	+++	++					
Option 4-T A (118' r.o.w.)	+	+	0	+	+					
Option 4-T B (132' r.o.w.)	+++	+++	++	+++	++	0	++			
Option 6A (114' r.o.w.)	0	0	0	0	0	+	+			
Option 6B (132' r.o.w.)	++	++	0	++	++	0	++			
Option 6-T A (140' r.o.w.)	---	---	---	---	---	0	0			
Option 6-T B (134' r.o.w.)	++	++	++	++	++	0	++			
Option 4-T DATA (Existing r.o.w.)	---	---	---	---	---	---	---	---	---	---

- 1c. Pedestrian Oriented Facilities or Improvements
  - Similar to 1a and 1b
  - Influenced more by extent of shade and space for amenities
  - Possibly combine 1a, 1b, and 1c into one Performance Measure

## Pedestrian Access and Mobility

**1d. Walkable Network/Neighborhood Connections**

Description	<ul style="list-style-type: none"> <li>Ability for pedestrians to access neighborhoods and pedestrian network</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Number, length, and quality of connections</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Likely varies by quality of environment on Broadway and frequency of crossings</li> <li>Frequency and quality of connections to adjacent pedestrian network</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High to Moderate</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Low</li> <li>Quality of environment along Broadway is measured through #1a and #1b</li> <li>Other factors require alignment and crossing design</li> </ul>

STREET CROSS-SECTION CONCEPT	PEDESTRIAN ACCESS AND MOBILITY										
	1. No Interference of Pedestrian Access	2. No Interference of Pedestrian Access	3. No Interference of Pedestrian Access	4. No Interference of Pedestrian Access	5. No Interference of Pedestrian Access	6. No Interference of Pedestrian Access	7. No Interference of Pedestrian Access	8. No Interference of Pedestrian Access	9. No Interference of Pedestrian Access	10. No Interference of Pedestrian Access	
Existing Conditions	---	---	---	---	---	---	---	---	---	---	
Option 4A (97' r.o.w.)	---	---	---	---	---	---	---	---	---	---	
Option 4B (100' r.o.w.)	++	++	0	++	++	0	++	++	0	++	++
Option 4C (112' r.o.w.)	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
Option 4-T A (118' r.o.w.)	+	+	0	+	+	0	+	+	0	+	+
Option 4-T B (122' r.o.w.)	+++	+++	+++	0	++	0	0	++	0	0	++
Option 6A (114' r.o.w.)	0	0	0	0	0	0	0	0	0	0	0
Option 6B (122' r.o.w.)	++	++	++	++	++	++	++	++	++	++	++
Option 6-T A (140' r.o.w.)	---	---	---	---	---	---	---	---	---	---	---
Option 6-T B (124' r.o.w.)	++	++	++	++	++	++	++	++	++	++	++
Option 6-T SATA (Existing r.o.w.)	---	---	---	---	---	---	---	---	---	---	---

**Performance Assessment**

- 1d. Walkable Network / Neighborhood Connection
  - Frequency of connections to neighborhoods likely consistent across concepts
  - 1e. Quality of pedestrian crossings will contribute to assessment
  - Potential for property reuse could change connections between Broadway and neighborhoods



### Pedestrian Access and Mobility

#### 1e. Pedestrian Crossings

Description	<ul style="list-style-type: none"> <li>Ease of crossing Broadway</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Frequency, length, and quality of pedestrian crossings</li> <li>Time needed to cross street</li> <li>Signal timing for pedestrian phase (VISSIM analysis)</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Width and number of lanes (through and turn)</li> <li>Width and number of medians</li> <li>Level of pedestrian comfort in medians</li> <li>Frequency of crossings</li> <li>Signal timing design</li> <li>Wait time for crossing signal (including time in median if two or more light cycles are required to cross)</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Moderate at this phase – several factors are directly related to cross section design, several are not</li> </ul>




STREET CROSS-SECTION CONCEPT	PEDESTRIAN ACCESS AND MOBILITY										
	1. No Interference of Pedestrian Access	2. No Interference of Pedestrian Access	3. No Interference of Pedestrian Access	4. No Interference of Pedestrian Access	5. No Interference of Pedestrian Access	6. No Interference of Pedestrian Access	7. No Interference of Pedestrian Access	8. No Interference of Pedestrian Access	9. No Interference of Pedestrian Access	10. No Interference of Pedestrian Access	
Existing Conditions	---	---	---	---	---	---	---	---	---	---	
Option 4A (97' r.o.w.)	---	---	---	---	---	---	---	---	---	---	
Option 4B (100' r.o.w.)	++	++	0	++	++	0	++	++	0	++	++
Option 4C (112' r.o.w.)	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
Option 4-T A (118' r.o.w.)	+	+	0	+	+	0	+	+	0	+	+
Option 4-T B (122' r.o.w.)	+++	+++	+++	0	++	0	0	++	0	0	++
Option 6A (114' r.o.w.)	0	0	0	0	0	0	0	0	0	0	0
Option 6B (122' r.o.w.)	++	++	++	++	++	++	++	++	++	++	++
Option 6-T A (140' r.o.w.)	---	---	---	---	---	---	---	---	---	---	---
Option 6-T B (124' r.o.w.)	++	++	++	++	++	++	++	++	++	++	++
Option 6-T SATA (Existing r.o.w.)	---	---	---	---	---	---	---	---	---	---	---

**Performance Assessment**

- 1e. Pedestrian Crossings

Assume that number of crossings is equal (except that existing conditions would have fewer than any future option); therefore current assessment is about the quality and distance of the crossing



### Pedestrian Access and Mobility

#### 1f. Vehicle/Pedestrian Conflicts at Driveways

Description	<ul style="list-style-type: none"> <li>Conflicts between pedestrians and vehicles exist at driveways for site access; strongly related to #2b</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Provision of level pedestrian crossings</li> <li>Travel speed to vehicles</li> <li>Frequency of driveways</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Width of roadside to accommodate level pedestrian crossings</li> <li>Target speed and roadway design's support of speed management</li> <li>Frequency and width of driveways</li> <li>Visibility (landscaping, site lines, signage)</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Moderate – some factors are directly related to cross section design, several are not</li> </ul>




STREET CROSS-SECTION CONCEPT	PEDESTRIAN ACCESS AND MOBILITY										
	1. No Interference of Pedestrian Access	2. No Interference of Pedestrian Access	3. No Interference of Pedestrian Access	4. No Interference of Pedestrian Access	5. No Interference of Pedestrian Access	6. No Interference of Pedestrian Access	7. No Interference of Pedestrian Access	8. No Interference of Pedestrian Access	9. No Interference of Pedestrian Access	10. No Interference of Pedestrian Access	
Existing Conditions	---	---	---	---	---	---	---	---	---	---	
Option 4A (97' r.o.w.)	---	---	---	---	---	---	---	---	---	---	
Option 4B (100' r.o.w.)	++	++	0	++	++	0	++	++	0	++	++
Option 4C (112' r.o.w.)	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++
Option 4-T A (118' r.o.w.)	+	+	0	+	+	0	+	+	0	+	+
Option 4-T B (122' r.o.w.)	+++	+++	+++	0	++	0	0	++	0	0	++
Option 6A (114' r.o.w.)	0	0	0	0	0	0	0	0	0	0	0
Option 6B (122' r.o.w.)	++	++	++	++	++	++	++	++	++	++	++
Option 6-T A (140' r.o.w.)	---	---	---	---	---	---	---	---	---	---	---
Option 6-T B (124' r.o.w.)	++	++	++	++	++	++	++	++	++	++	++
Option 6-T SATA (Existing r.o.w.)	---	---	---	---	---	---	---	---	---	---	---

**Performance Assessment**

- 1f. Vehicle / Pedestrian Conflicts at Driveways

Rated Option 4A, and SATA concept, as negative because the sidewalk would be sloped or go down to street grade at the drive access points because of the narrowness of the sidewalk, landscape width and sidewalk width determines ranking of other concepts – more width provides more ability for vehicles to slow and see pedestrians.



### Pedestrian Access and Mobility

#### 1g. Universal Design

Description	<ul style="list-style-type: none"> <li>Going beyond base requirements of access (ADA) design for people of all ages and abilities</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Provision of access and mobility design elements that achieve Universal Design</li> </ul>
Factors	<ul style="list-style-type: none"> <li>All other pedestrian access and mobility factors measure performance related to aspects of universal design</li> <li>Likely that other factors will be most affected by details of design</li> <li>Potential to implement design details likely affected by width of roadside and cost of other project elements (lower cost for other elements may allow more budget for Universal Design)</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Low</li> <li>Details are not provided by current level of design</li> </ul>




STREET CROSS-SECTION CONCEPT	PEDESTRIAN ACCESS AND MOBILITY									
	1a. Non-motorized/Shared Modes	1b. Pedestrian Access	1c. Pedestrian Safety	1d. Pedestrian Comfort	1e. Pedestrian Convenience	1f. Pedestrian Information	1g. Pedestrian Wayfinding	1h. Pedestrian Destinations	1i. Ease of Transition to Walking	1j. Pedestrian Wayfinding
Existing Conditions	---	---	---	---	---	---	---	---	---	---
Option 4A (87' r.o.w.)	---	---	---	---	---	---	---	---	---	---
Option 4B (100' r.o.w.)	++	++	0	++	+					
Option 4C (112' r.o.w.)	+++	+++	++	++	++					
Option 4-T A (118' r.o.w.)	+	+	0	+	+					
Option 4-T B (132' r.o.w.)	+++	+++	++	0	++					
Option 6A (114' r.o.w.)	0	0	0	+	+					
Option 6B (132' r.o.w.)	++	++	++	+	++					
Option 6-T A (140' r.o.w.)	---	---	---	---	0					
Option 6-T B (114' r.o.w.)	++	++	++	+	++					
Option 4-T DATA (Existing r.o.w.)	---	---	---	---	0					

### Performance Assessment

- 1g. Universal Design
  - Primarily relates to design details and intersection design
  - Related & assessed Performance Measures
    - Sidewalk width is covered by 1a & 1b
    - 1e Pedestrian Crossings
    - 1f Driveway conditions



### Universal Design

RTA  
BROADWAY BOULEVARD

### Pedestrian Access and Mobility

1h. Walkable Destinations	
Description	<ul style="list-style-type: none"> <li>Presence and access to jobs, homes, shopping, etc.</li> <li>Presence of sufficient density of other uses and access from other uses to support market for employment, shopping, etc.</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Determine density of households and jobs within walkable distance of uses along Broadway</li> </ul>
Factors	<ul style="list-style-type: none"> <li>#1d Walkable Network/Neighborhood Connections</li> <li>Potential for jobs, commercial uses, and homes along Broadway</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High for #1d</li> <li>Uncertain for land use related factors (#5c Broadway as a Destination, #6f Land Use Mix, and other non-transportation performance measures)</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Same as #1d</li> <li>Low to Moderate for non-transportation performance measures (to be discussed further on Thursday)</li> </ul>

STREET CROSS-SECTION CONCEPT	PEDESTRIAN ACCESS AND MOBILITY									
	1a. Non-motorized/Shared Modes	1b. Pedestrian Access	1c. Pedestrian Safety	1d. Pedestrian Comfort	1e. Pedestrian Convenience	1f. Pedestrian Information	1g. Pedestrian Wayfinding	1h. Pedestrian Destinations	1i. Ease of Transition to Walking	1j. Pedestrian Wayfinding
Existing Conditions	---	---	---	---	---	---	---	---	---	---
Option 4A (87' r.o.w.)	---	---	---	---	---	---	---	---	---	---
Option 4B (100' r.o.w.)	++	++	0	++	+					
Option 4C (112' r.o.w.)	+++	+++	++	++	++					
Option 4-T A (118' r.o.w.)	+	+	0	+	+					
Option 4-T B (132' r.o.w.)	+++	+++	++	0	++					
Option 6A (114' r.o.w.)	0	0	0	+	+					
Option 6B (132' r.o.w.)	++	++	++	+	++					
Option 6-T A (140' r.o.w.)	---	---	---	---	0					
Option 6-T B (114' r.o.w.)	++	++	++	+	++					
Option 4-T DATA (Existing r.o.w.)	---	---	---	---	0					

### Performance Assessment

- 1h. Walkable Destinations
  - Related to 1d and Economic Vitality Performance Measures all of which cannot be assessed at current level of design

### Pedestrian Access and Mobility

1i. Ease of Transition to Walking	
Description	<ul style="list-style-type: none"> <li>The ability of users to become pedestrians</li> </ul>
Measurement	
Factors	<ul style="list-style-type: none"> <li>Proximity and number of parking lots</li> <li>Proximity and number of bicycle parking/lockers</li> <li>Number of bus stops/transit stations</li> <li>Number and type of comfort and safety features (lighting, seats, shade)</li> <li>Number of attractions/commercial uses</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Not at this level of design</li> </ul>

STREET CROSS-SECTION CONCEPT	PEDESTRIAN ACCESS AND MOBILITY									
	1a. Non-motorized/Shared Modes	1b. Pedestrian Access	1c. Pedestrian Safety	1d. Pedestrian Comfort	1e. Pedestrian Convenience	1f. Pedestrian Information	1g. Pedestrian Wayfinding	1h. Pedestrian Destinations	1i. Ease of Transition to Walking	1j. Pedestrian Wayfinding
Existing Conditions	---	---	---	---	---	---	---	---	---	---
Option 4A (87' r.o.w.)	---	---	---	---	---	---	---	---	---	---
Option 4B (100' r.o.w.)	++	++	0	++	+					
Option 4C (112' r.o.w.)	+++	+++	++	++	++					
Option 4-T A (118' r.o.w.)	+	+	0	+	+					
Option 4-T B (132' r.o.w.)	+++	+++	++	0	++					
Option 6A (114' r.o.w.)	0	0	0	+	+					
Option 6B (132' r.o.w.)	++	++	++	+	++					
Option 6-T A (140' r.o.w.)	---	---	---	---	0					
Option 6-T B (114' r.o.w.)	++	++	++	+	++					
Option 4-T DATA (Existing r.o.w.)	---	---	---	---	0					

### Performance Assessment

- 1i. Ease of Transition to Walking
  - Related to physical design factors outside of the street right of way which cannot be assessed at current level of design

## Bicycle Access and Mobility

- 2a. Separation of Bikes and Arterial Traffic
- 2b. Bike Conflicts with Crossing Vehicles
- 2c. ~~Vehicle/Bike Conflicts at Side Streets~~ (combined into 2b)
- 2d. Pavement Condition
- 2e. Bike Facility Improvements
- 2f. Bike Network Connections
- 2g. Corridor Travel Time
- 2h. Bike Crossings

## Bicycle Access and Mobility

STREET CROSS-SECTION CONCEPT	BICYCLE ACCESS AND MOBILITY					
	2a. Separation of Bikes and Arterial Traffic	2b. Bike Conflicts with Crossing Vehicles	2c. Vehicle/Bike Conflicts at Side Streets	2d. Pavement Condition	2e. Bike Facility Improvements	2f. Bike Network Connections
Existing Conditions	-	+	0	0	0	0
Option AA (32' r.o.w.)	-	0	+	+	+	+
Option AB (300' r.o.w.)	+	0	+	+	+	+
Option AC (112' r.o.w.)	+	0	0	0	0	0
Option 4-T A (118' r.o.w.)	0	+	0	0	0	0
Option 4-T B (132' r.o.w.)	+	+	0	0	0	0
Option 6A (114' r.o.w.)	0	0	0	0	0	0
Option 6B (132' r.o.w.)	+	0	0	0	0	0
Option 6-T A (140' r.o.w.)	+	0	0	0	0	0
Option 6-T B (114' r.o.w.)	+	+	0	0	0	0
Option 6-T SATA (existing r.o.w.)	-	0	+	+	+	+

## Bicycle Access and Mobility

### 2a. Separation of Bikes and Arterial Traffic

Description	<ul style="list-style-type: none"> <li>Greater separation is a factor related to bicyclist safety and comfort, and therefore likely bicycle use of Broadway</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Relationship of proposed separation compared to ITE Walkable Thoroughfares Manual recommendation of 6 feet</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Bike lane is a legal bike lane (as opposed to a "striped shoulder")</li> <li>Combination of bike lane and buffer (painted line or other) width</li> <li>Buffer other than painted line</li> <li>Location of transit stops (street side or median)</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>High for cross section and location of transit stops</li> <li>Low for intersections (crossings of bike lane for right turns)</li> </ul>

## Performance Assessment

- 2a. Separation of Bikes and Arterial Traffic

**Bike lane width**

- 5 ft. width negative (-)
- 6 ft. width neutral (ITE Manual recommendation)
- 7 ft. width positive (+)

STREET CROSS-SECTION CONCEPT	BICYCLE ACCESS AND MOBILITY					
	2a. Separation of Bikes and Arterial Traffic	2b. Bike Conflicts with Crossing Vehicles	2c. Vehicle/Bike Conflicts at Side Streets	2d. Pavement Condition	2e. Bike Facility Improvements	2f. Bike Network Connections
Existing Conditions	-	+	0	0	0	0
Option AA (32' r.o.w.)	-	0	+	+	+	+
Option AB (300' r.o.w.)	+	0	+	+	+	+
Option AC (112' r.o.w.)	+	0	0	0	0	0
Option 4-T A (118' r.o.w.)	0	+	0	0	0	0
Option 4-T B (132' r.o.w.)	+	+	0	0	0	0
Option 6A (114' r.o.w.)	0	0	0	0	0	0
Option 6B (132' r.o.w.)	+	0	0	0	0	0
Option 6-T A (140' r.o.w.)	+	0	0	0	0	0
Option 6-T B (114' r.o.w.)	+	+	0	0	0	0
Option 6-T SATA (existing r.o.w.)	-	0	+	+	+	+

## Bicycle Access and Mobility

### 2b. Bike Conflicts with Crossing Vehicles (note this includes the 2c perf. measure)

Description	<ul style="list-style-type: none"> <li>Vehicles cross bike lanes for a variety of reasons, the design and frequency of these crossings can effect bicyclist safety and comfort</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Frequency and type of traffic crossing bike lanes</li> <li>Length of uninterrupted bike lane</li> <li>Design details of crossing area</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Reducing number and length of crossing points</li> <li>Design details of crossing area</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Moderate at current level of design (location of transit stops and use of local access lanes)</li> <li>Design does not include current details of site access or intersections</li> </ul>

## Performance Assessment

- 2b. Bike Conflicts with Crossing Vehicles

- Assume all options are neutral for vehicles crossing bike lane to get to curb cuts or dedicated right turn lanes
- Options that require buses to cross over to bus pull outs are neutral.
- Options with dedicated transit lanes in the middle get a single + for that, still would have local buses pulling into bus pull outs.

STREET CROSS-SECTION CONCEPT	BICYCLE ACCESS AND MOBILITY					
	2a. Separation of Bikes and Arterial Traffic	2b. Bike Conflicts with Crossing Vehicles	2c. Vehicle/Bike Conflicts at Side Streets	2d. Pavement Condition	2e. Bike Facility Improvements	2f. Bike Network Connections
Existing Conditions	-	+	0	0	0	0
Option AA (32' r.o.w.)	-	0	+	+	+	+
Option AB (300' r.o.w.)	+	0	+	+	+	+
Option AC (112' r.o.w.)	+	0	0	0	0	0
Option 4-T A (118' r.o.w.)	0	+	0	0	0	0
Option 4-T B (132' r.o.w.)	+	+	0	0	0	0
Option 6A (114' r.o.w.)	0	0	0	0	0	0
Option 6B (132' r.o.w.)	+	0	0	0	0	0
Option 6-T A (140' r.o.w.)	+	0	0	0	0	0
Option 6-T B (114' r.o.w.)	+	+	0	0	0	0
Option 6-T SATA (existing r.o.w.)	-	0	+	+	+	+

## Bicycle Access and Mobility

**2d. Pavement Condition**

Description	<ul style="list-style-type: none"> <li>Smooth pavement is a priority for bicyclist comfort</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Input from TDOT and Bicycle Advisory Committee</li> <li>Best practice guidance, possibly including elements of NACTO Bike Guide</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Concrete with proper joint design versus asphalt</li> <li>Gutter design</li> <li>Landscaping palette</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Low to none</li> <li>Pavement type not dependent on cross section design, except for potential for lower cost cross section concepts to allow for more budget to be spent on bike lane pavement</li> </ul>

STREET CROSS-SECTION CONCEPT	BICYCLE ACCESS AND MOBILITY					
	Ability to Effect	Ability to Evaluate	Cost	Quality	Frequency	Consistency
Existing Conditions	-	0	0	0	0	0
Option AA (30' r.o.w.)	-	0	+	+	+	+
Option AB (300' r.o.w.)	+	0	+	+	+	+
Option AC (152' r.o.w.)	+	0	0	0	0	+
Option 4-T A (152' r.o.w.)	+	0	+	+	+	+
Option 4-T B (152' r.o.w.)	+	0	0	0	0	+
Option 6A (154' r.o.w.)	0	0	0	0	0	+
Option 6B (152' r.o.w.)	+	0	0	0	0	+
Option 6-T A (148' r.o.w.)	+	0	0	0	0	0
Option 6-T B (14' r.o.w.)	+	0	+	+	+	-
Option 6-T SARTA (existing r.o.w.)	-	0	+	+	+	+

### Performance Assessment

- 2d. Pavement Conditions
  - Detailed design issues effect assessment

## Bicycle Access and Mobility

**2e. Bike Facility Improvements**

Description	<ul style="list-style-type: none"> <li>Extent of bike racks, shade, drinking fountains, green pavement (bike boxes, etc.) and other features to serve bicyclists needs</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>% shade, number/frequency of design features</li> <li>Qualitative evaluation</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Increase in number of features</li> <li>Continuity of bike treatments through project area</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>Minimal at the cross section and alignment level, beyond provision of enough area in streetside to allow for facilities. Evaluation of space is generally covered by measures 1a and 1b.</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Moderate at this level of design</li> <li>Design does not currently include this level of design, but lower cost cross section concepts may allow more budget to be spent on bike facilities</li> </ul>

STREET CROSS-SECTION CONCEPT	BICYCLE ACCESS AND MOBILITY					
	Ability to Effect	Ability to Evaluate	Cost	Quality	Frequency	Consistency
Existing Conditions	-	0	0	0	0	0
Option AA (30' r.o.w.)	-	0	+	+	+	+
Option AB (300' r.o.w.)	+	0	+	+	+	+
Option AC (152' r.o.w.)	+	0	0	0	0	+
Option 4-T A (152' r.o.w.)	+	0	+	+	+	+
Option 4-T B (152' r.o.w.)	+	0	0	0	0	+
Option 6A (154' r.o.w.)	0	0	0	0	0	+
Option 6B (152' r.o.w.)	+	0	0	0	0	+
Option 6-T A (148' r.o.w.)	+	0	0	0	0	0
Option 6-T B (14' r.o.w.)	+	0	+	+	+	-
Option 6-T SARTA (existing r.o.w.)	-	0	+	+	+	+

### Performance Assessment

- 2e. Bike Facility Improvements
  - Mainly design details
  - Concepts with otherwise low construction cost get a + for ability to invest more budget in bike facilities

## Bicycle Access and Mobility

**2f. Bike Network Connections**

Description	<ul style="list-style-type: none"> <li>Convenience and safety of access to surrounding bike network</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Number, length, and quality of connections to bike network</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Allowing bikes through any side street closures for vehicles</li> <li>Provision of bike crossings and proximity to bike network</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Low at this level of design</li> <li>Quality of environment along Broadway and crossings are measured through #2a, #2b, and #2h</li> <li>Other factors require alignment and crossing design</li> </ul>

STREET CROSS-SECTION CONCEPT	BICYCLE ACCESS AND MOBILITY					
	Ability to Effect	Ability to Evaluate	Cost	Quality	Frequency	Consistency
Existing Conditions	-	0	0	0	0	0
Option AA (30' r.o.w.)	-	0	+	+	+	+
Option AB (300' r.o.w.)	+	0	+	+	+	+
Option AC (152' r.o.w.)	+	0	0	0	0	+
Option 4-T A (152' r.o.w.)	+	0	+	+	+	+
Option 4-T B (152' r.o.w.)	+	0	0	0	0	+
Option 6A (154' r.o.w.)	0	0	0	0	0	+
Option 6B (152' r.o.w.)	+	0	0	0	0	+
Option 6-T A (148' r.o.w.)	+	0	0	0	0	0
Option 6-T B (14' r.o.w.)	+	0	+	+	+	-
Option 6-T SARTA (existing r.o.w.)	-	0	+	+	+	+

### Performance Assessment

- 2f. Bike Network Connections
  - Frequency of connections to neighborhoods likely consistent across concepts
  - 2h. Quality of bike crossings will contribute to assessment

## Bicycle Access and Mobility

**2g. Corridor Travel Time**

Description	<ul style="list-style-type: none"> <li>The time it takes for average and advanced riders to travel the length of Broadway</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>VISSIM analysis of travel time and signal delay</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Signal timing</li> <li>#2b Bike Conflicts with Crossing Vehicles</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Not viable at current level of design</li> <li>Requires alignment and intersection design</li> </ul>

STREET CROSS-SECTION CONCEPT	BICYCLE ACCESS AND MOBILITY					
	2a. Distance to Transit Stops	2b. Transit Stop Facilities	2c. Corridor Travel Time	2d. Schedule Adherence	2e. Frequency and Hours of Service	2f. Accommodation of Future High Capacity Transit
Existing Conditions	-	-	-	-	-	-
Option 4A (87' r.o.w.)	-	0	+	0	0	++
Option 4B (100' r.o.w.)	-	0	+	0	0	++
Option 4C (112' r.o.w.)	+	0	0	0	0	++
Option 4-T A (118' r.o.w.)	+	+	0	0	0	+
Option 4-T B (132' r.o.w.)	+	+	0	0	0	+
Option 6A (134' r.o.w.)	0	0	0	0	0	+
Option 6B (132' r.o.w.)	+	0	0	0	0	+
Option 6-T A (148' r.o.w.)	+	0	0	0	0	0
Option 6-T B (174' r.o.w.)	+	+	0	0	0	0
Option 6-T SATX (existing r.o.w.)	-	0	+	+	+	++

### Performance Assessment

- 2g. Corridor Travel Time
  - Needs detailed design and VISSIM analysis to make assessment

## Bicycle Access and Mobility

**2h. Bike Crossings**

Description	<ul style="list-style-type: none"> <li>Convenience and safety of bike crossings will support bike use</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Frequency and length of crossings</li> <li>Average signal delay at crossings (VISSIM analysis)</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Width and number of lanes (through and turn)</li> <li>Width and number of medians</li> <li>Level of bicycle comfort in medians</li> <li>Frequency of crossings</li> <li>Signal timing design (VISSIM analysis)</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Moderate at this phase – several factors are directly related to cross section design, several are not</li> </ul>

STREET CROSS-SECTION CONCEPT	BICYCLE ACCESS AND MOBILITY					
	2a. Distance to Transit Stops	2b. Transit Stop Facilities	2c. Corridor Travel Time	2d. Schedule Adherence	2e. Frequency and Hours of Service	2f. Accommodation of Future High Capacity Transit
Existing Conditions	-	-	-	-	-	-
Option 4A (87' r.o.w.)	-	0	+	0	0	++
Option 4B (100' r.o.w.)	-	0	+	0	0	++
Option 4C (112' r.o.w.)	+	0	0	0	0	++
Option 4-T A (118' r.o.w.)	+	+	0	0	0	+
Option 4-T B (132' r.o.w.)	+	+	0	0	0	+
Option 6A (134' r.o.w.)	0	0	0	0	0	+
Option 6B (132' r.o.w.)	+	0	0	0	0	+
Option 6-T A (148' r.o.w.)	+	0	0	0	0	0
Option 6-T B (174' r.o.w.)	+	+	0	0	0	0
Option 6-T SATX (existing r.o.w.)	-	0	+	+	+	++

### Performance Assessment

- 2h. Bike Crossings
  - Assume some basic improvements at crossings and more crossings for all concept options, so this gives:
    - four lane options 1 plus
    - six lane options 1 plus (regardless of median width as street crossings will likely be at least 18 ft. wide given turn lane and 7 ft. refuge island width.
  - Eight lane options are neutral, except for 6+T B given its large width.

## Transit Access and Mobility

- 3a. Distance to Transit Stops
- 3b. Transit Stop Facilities
- 3c. Corridor Travel Time
- 3d. Schedule Adherence
- 3e. Frequency and Hours of Service
- 3f. Accommodation of Future High Capacity Transit
- 3g. Riders per Vehicle

STREET CROSS-SECTION CONCEPT	TRANSIT ACCESS AND MOBILITY					
	3a. Distance to Transit Stops	3b. Transit Stop Facilities	3c. Corridor Travel Time	3d. Schedule Adherence	3e. Frequency and Hours of Service	3f. Accommodation of Future High Capacity Transit
Existing Conditions	-	-	-	-	-	-
Option 4A (87' r.o.w.)	-	-	-	-	-	-
Option 4B (100' r.o.w.)	-	-	-	-	-	-
Option 4C (112' r.o.w.)	++	+	+	+	+	+
Option 4-T A (118' r.o.w.)	++	+	+	+	+	++
Option 4-T B (132' r.o.w.)	++	+	+	+	+	++
Option 6A (134' r.o.w.)	0	+	+	+	+	+
Option 6B (132' r.o.w.)	+	+	+	+	+	+
Option 6-T A (148' r.o.w.)	++	+	+	+	+	++
Option 6-T B (174' r.o.w.)	++	+	+	+	+	++
Option 6-T SATX (existing r.o.w.)	++	+	+	+	+	0

### Transit Access and Mobility

## Transit Access and Mobility

### 3a. Distance to Transit

Description	<ul style="list-style-type: none"> <li>Number and location of transit stops and the number of households, jobs, and services within walking distance has an relationship to transit ridership</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Number of households, jobs, and square feet of commercial use within walking distance of transit stops</li> </ul>
Factors	<ul style="list-style-type: none"> <li>1d. Walkable Network/Neighborhood Connections</li> <li>1h. Walkable Destinations</li> <li>Several non-transportation performance measures</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>Low to Moderate</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Low to None</li> <li>Other factors require alignment and crossing design</li> <li>Land use policies related to non-transportation measures are not part of this project</li> </ul>

## Performance Assessment

STREET CROSS-SECTION CONCEPT	TRANSIT ACCESS AND MOBILITY					
	Distance to Transit	Transit Stop Facilities	Corridor Travel Time	Transit Stop Facilities	Transit Stop Facilities	Transit Stop Facilities
Existing Conditions	---	---	---	---	---	---
Option 4A (BTP r.o.w.)	---	---	---	---	---	---
Option 4B (BTP r.o.w.)	---	---	---	---	---	---
Option 4C (BTP r.o.w.)	---	---	---	---	---	---
Option 4-T A (BTP r.o.w.)	---	---	---	---	---	---
Option 4-T B (BTP r.o.w.)	---	---	---	---	---	---
Option 4A (BTP r.o.w.)	---	---	---	---	---	---
Option 4B (BTP r.o.w.)	---	---	---	---	---	---
Option 4-T A (BTP r.o.w.)	---	---	---	---	---	---
Option 4-T B (BTP r.o.w.)	---	---	---	---	---	---
Option 4-T SATA (Existing r.o.w.)	---	---	---	---	---	---

- 3a. Distance to Transit Stops
  - Cannot assess at current level of design as transit stops are not located

## Transit Access and Mobility

### 3b. Transit Stop Facilities

Description	<ul style="list-style-type: none"> <li>Design qualities of transit stops can support transit use</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>% shade, lighting levels and consistency, number/frequency of other design features</li> <li>Qualitative evaluation by designers and users</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Provision for and increase in number of features</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Low to Moderate at this level of design, right of way could be increased at transit stops to provide space for facilities</li> <li>Design does not currently include details for streetscape design, but lower cost cross section concepts may allow more budget to be spent on transit facilities</li> </ul>

## Performance Assessment

STREET CROSS-SECTION CONCEPT	TRANSIT ACCESS AND MOBILITY					
	Distance to Transit	Transit Stop Facilities	Corridor Travel Time	Transit Stop Facilities	Transit Stop Facilities	Transit Stop Facilities
Existing Conditions	---	---	---	---	---	---
Option 4A (BTP r.o.w.)	---	---	---	---	---	---
Option 4B (BTP r.o.w.)	---	---	---	---	---	---
Option 4C (BTP r.o.w.)	---	---	---	---	---	---
Option 4-T A (BTP r.o.w.)	---	---	---	---	---	---
Option 4-T B (BTP r.o.w.)	---	---	---	---	---	---
Option 4A (BTP r.o.w.)	---	---	---	---	---	---
Option 4B (BTP r.o.w.)	---	---	---	---	---	---
Option 4-T A (BTP r.o.w.)	---	---	---	---	---	---
Option 4-T B (BTP r.o.w.)	---	---	---	---	---	---
Option 4-T SATA (Existing r.o.w.)	---	---	---	---	---	---

- 3b. Transit Stop Facilities
  - Existing facilities are generally poor, although there are a few bus pull outs
    - Four lanes get + when have pull outs (except those with wider pedestrian areas get ++) because of lower construction cost may be more budget to improve transit stops; SATA also gets a ++ because of transit platforms for streetcar.
    - Six lanes get neutral with pull outs as this is now the regional standard
    - BRT in middle of roadway gets ++ because it is assumed that this investment in roadway infrastructure for BRT would mean commitment to high-level of improvements on the platforms

## Transit Access and Mobility

### 3c. Corridor Travel Time

Description	<ul style="list-style-type: none"> <li>Time for traveling the length of the corridor affects transit ridership</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>VISSIM results accounting for signal timing, transit priority treatments, traffic delay, merges, and boarding time at transit stops</li> <li>Initial assessment based on traffic assessment of current PAG projections and 30% reduced traffic growth option, with qualitative comparisons based on professional experience and judgment of relationship between transit and vehicular travel time</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Dedicated lanes, transit priority treatments at intersections, level boarding, off-vehicle ticketing, and other measures</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>Moderate to High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Low to Moderate at current level of design (presence of transit only lanes)</li> <li>Other factors require higher level of design and commitments from Sun Tran</li> </ul>

## Performance Assessment

STREET CROSS-SECTION CONCEPT	TRANSIT ACCESS AND MOBILITY					
	Distance to Transit	Transit Stop Facilities	Corridor Travel Time	Transit Stop Facilities	Transit Stop Facilities	Transit Stop Facilities
Existing Conditions	---	---	---	---	---	---
Option 4A (BTP r.o.w.)	---	---	---	---	---	---
Option 4B (BTP r.o.w.)	---	---	---	---	---	---
Option 4C (BTP r.o.w.)	---	---	---	---	---	---
Option 4-T A (BTP r.o.w.)	---	---	---	---	---	---
Option 4-T B (BTP r.o.w.)	---	---	---	---	---	---
Option 4A (BTP r.o.w.)	---	---	---	---	---	---
Option 4B (BTP r.o.w.)	---	---	---	---	---	---
Option 4-T A (BTP r.o.w.)	---	---	---	---	---	---
Option 4-T B (BTP r.o.w.)	---	---	---	---	---	---
Option 4-T SATA (Existing r.o.w.)	---	---	---	---	---	---

- 3c. Corridor Travel Time
  - Existing corridor travel time is lower than existing vehicular traffic travel time, so two negatives rather than the one negative for 4a. Movement of Through Traffic
    - Four and six lanes with pull outs, signal prioritization, etc. are assumed to be slower than vehicular movement, because all buses must pull into bus pull outs and this slows the bus travel time.
    - Dedicated transit lanes with accompanying signal prioritization, etc. are assumed to have roughly the same corridor travel time as vehicles, except for where the dedicated lane is outside lane (Option 6+TA), because it would have issues with right turning vehicles and the BRT may need to use the bus pullouts. Also, SATA is one minus sign less than the vehicular through movement performance measure because at least a portion of the service is in a dedicated lane

## Transit Access and Mobility

### 3d. Schedule Adherence

Description	<ul style="list-style-type: none"> <li>Ridership is encouraged by transit that is on time. Some elements of project design can support schedule adherence.</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Variation in travel time across a sampling of VISSIM modeling runs</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Level boarding, off-vehicle ticketing, and other station improvement</li> <li>Dedicated transit lanes and other transit priority features</li> <li>Other factors related to scheduling and transit driver practices are under the purview of Sun Trans and cannot be evaluated by this project</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>Moderate</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Low to Moderate at current level of design (presence of transit only lane; likely combine with 3c)</li> <li>Other factors require higher level of design and commitments from Sun Tran</li> </ul>

## Performance Assessment

- 3d. Schedule Adherence

Rough combining of 3b and 3c with a bit more weight to 3c.

## Transit Access and Mobility

### 3e. Frequency and Hours of Service

Description	<ul style="list-style-type: none"> <li>How frequently transit vehicles arrive at a stop and the hours of service can affect transit ridership levels</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>This is a Sun Trans operations issue for the most part</li> <li>Potential service efficiencies related to other transit performance measures could provide Sun Trans the opportunity to increase service levels along Broadway</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Service efficiencies related to other transit performance measures</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>Low</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>None</li> </ul>

## Performance Assessment

- 3e. Frequency and Hours of Service
  - Mainly a Sun Trans operation issue
  - Potential relationship to other Performance Measures
    - Transit
    - Walkability
    - Economic Vitality

## Transit Access and Mobility

### 3f. Accommodation of Future High Capacity Transit

Description	<ul style="list-style-type: none"> <li>The ability of the roadway and roadside design to accommodate future high capacity transit can ultimately improve performance of design concepts in relation to other transit performance measures</li> <li>Also affects long term viability of the design concept, see 5g Certainty</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Provision of dedicated transit lanes</li> <li>Roadside or median width allows for future transit improvements</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Provision of dedicated transit lanes</li> <li>Roadside or median width allows for future transit improvements</li> <li>Potential for future resistance to conversion of mixed flow lane to transit lane</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Low to Moderate at this level of design                     <ul style="list-style-type: none"> <li>Provision of dedicated lanes</li> <li>Right of way could be increased at transit stops to provide space for facilities</li> </ul> </li> <li>Design does not currently include details of intersection design</li> </ul>

## Performance Assessment

- 3f. Accommodation of Future High Capacity Transit
  - Existing and 4 lanes get -, because they would end up having one lane in each direction for vehicular traffic if dedicated transit lanes were provided
  - Six lane options get - because even though these could be converted to 4+T with dedication of lanes, there would likely be resistance to reducing traffic lanes once they are in place and construction would need to occur to make the conversion.
  - 6+T A has right turning vehicle issues so ++
  - 4+T and 6+T B gets +++, because they provide for high-quality high capacity transit with implementation of the concept
  - SATA is rated neutral because only one direction is in a dedicated lane while the service levels are reduced by the other direction running in a shared lane.

## Transit Access and Mobility

**3g. Riders per Vehicle**

<b>Description</b>	<ul style="list-style-type: none"> <li>Efficiencies in number of riders per vehicle, while avoiding overcrowded, improve cost performance of service and potentially cost to riders (also can reduce pollution per person trip)</li> </ul>
<b>Measurement</b>	<ul style="list-style-type: none"> <li>Average daily rider per transit vehicle</li> <li>Average riders per peak hour transit vehicle</li> <li>Using transportation model and transit service assumptions</li> </ul>
<b>Factors</b>	<ul style="list-style-type: none"> <li>Other transit performance measures that effect transit ridership and service efficiencies</li> <li>Service planning by Sun Trans</li> </ul>
<b>Ability to Effect</b>	<ul style="list-style-type: none"> <li>Low to Moderate</li> </ul>
<b>Ability to Evaluate</b>	<ul style="list-style-type: none"> <li>Cannot be measured at current level of design</li> </ul>

## Performance Assessment

STREET CROSS SECTION CONCEPT	TRANSIT ACCESS AND MOBILITY					
	3g. Riders per Vehicle	4a. Movement of Through Traffic	4b. Intersection Delay - Overall Intersection Performance	4c. Intersection Delay - Worst Movement	4d. Accident Potential	4e. Lane Continuity
Existing Conditions	---	---	---	---	---	---
Option 4A (817' r.o.w.)	---	---	---	---	---	---
Option 4B (1007' r.o.w.)	---	---	---	---	---	---
Option 4C (1137' r.o.w.)	---	---	---	---	---	---
Option 4-T A (1137' r.o.w.)	---	---	---	---	---	---
Option 4-T B (1137' r.o.w.)	---	---	---	---	---	---
Option 6A (1147' r.o.w.)	---	---	---	---	---	---
Option 6B (1137' r.o.w.)	---	---	---	---	---	---
Option 6-T A (1147' r.o.w.)	---	---	---	---	---	---
Option 6-T B (1147' r.o.w.)	---	---	---	---	---	---
Option 6-T SATA (existing r.o.w.)	---	---	---	---	---	---

- 3g. Riders per Vehicle
  - Service planning for the type of transit investments in concepts has not been developed
  - Need further definition of design and BRT service

## Vehicular Access and Mobility

- 4a. Movement of Through Traffic
- 4b. Intersection Delay – Overall Intersection Performance
- 4c. Intersection Delay – Worst Movement
- 4d. Accident Potential
- 4e. Lane Continuity
- 4f. Persons per Vehicle or Person Trips
- 4g. Access Management Management for Adjacent Properties

## Vehicular Access and Mobility

STREET CROSS SECTION CONCEPT	VEHICULAR ACCESS AND MOBILITY					
	4a. Movement of Through Traffic	4b. Intersection Delay - Overall Intersection Performance	4c. Intersection Delay - Worst Movement	4d. Accident Potential	4e. Lane Continuity	4f. Persons per Vehicle or Person Trips
Existing Conditions	---	---	---	---	---	---
Option 4A (817' r.o.w.)	---	---	---	---	---	---
Option 4B (1007' r.o.w.)	---	---	---	---	---	---
Option 4C (1137' r.o.w.)	---	---	---	---	---	---
Option 4-T A (1137' r.o.w.)	---	---	---	---	---	---
Option 4-T B (1137' r.o.w.)	---	---	---	---	---	---
Option 6A (1147' r.o.w.)	---	---	---	---	---	---
Option 6B (1137' r.o.w.)	---	---	---	---	---	---
Option 6-T A (1147' r.o.w.)	---	---	---	---	---	---
Option 6-T B (1147' r.o.w.)	---	---	---	---	---	---
Option 6-T SATA (existing r.o.w.)	---	---	---	---	---	---

## Vehicular Access and Mobility

**4a. Movement of Through Traffic**

<b>Description</b>	<ul style="list-style-type: none"> <li>A range of corridor and intersection evaluations can measure effectiveness of moving through traffic which can have an affect on a variety of other transportation, environment, and economic factors.</li> </ul>
<b>Measurement</b>	<ul style="list-style-type: none"> <li>Using VISSIM modeling can measure:                     <ul style="list-style-type: none"> <li>Average corridor travel time</li> <li>Average speed</li> <li>Average 95 percentile queue length</li> <li>Average delay Average corridor travel time</li> <li>Volume to Capacity Ratio (V/C)</li> </ul> </li> <li>Travel time reliability</li> <li>Initial assessment based on assessment of current PAG projections and 30% reduced traffic growth option, with qualitative comparisons based on professional experience and judgment</li> </ul>
<b>Factors</b>	<ul style="list-style-type: none"> <li>Number of traffic lanes</li> <li>Signal design</li> <li>Intersection design</li> <li>Access management</li> <li>Transit service design</li> </ul>
<b>Ability to Effect</b>	<ul style="list-style-type: none"> <li>High</li> </ul>
<b>Ability to Evaluate</b>	<ul style="list-style-type: none"> <li>Moderate at current level of design as only number of traffic lanes and presence of transit only lanes are defined</li> </ul>

## Performance Assessment

STREET CROSS SECTION CONCEPT	VEHICULAR ACCESS AND MOBILITY					
	4a. Movement of Through Traffic	4b. Intersection Delay - Overall Intersection Performance	4c. Intersection Delay - Worst Movement	4d. Accident Potential	4e. Lane Continuity	4f. Persons per Vehicle or Person Trips
Existing Conditions	---	---	---	---	---	---
Option 4A (817' r.o.w.)	---	---	---	---	---	---
Option 4B (1007' r.o.w.)	---	---	---	---	---	---
Option 4C (1137' r.o.w.)	---	---	---	---	---	---
Option 4-T A (1137' r.o.w.)	---	---	---	---	---	---
Option 4-T B (1137' r.o.w.)	---	---	---	---	---	---
Option 6A (1147' r.o.w.)	---	---	---	---	---	---
Option 6B (1137' r.o.w.)	---	---	---	---	---	---
Option 6-T A (1147' r.o.w.)	---	---	---	---	---	---
Option 6-T B (1147' r.o.w.)	---	---	---	---	---	---
Option 6-T SATA (existing r.o.w.)	---	---	---	---	---	---

- 4a Movement of Through Traffic
  - Existing section with current volumes - impacts of buses stopping in through lanes and high number of HAWK signals (that are not synchronized with other signals), through traffic flow is less than desirable; increased traffic demand for either growth scenario without adding intersection capacity will result in long travel times and excessive delay.
  - 4 lane options w/o exclusive transit lanes – do not provide sufficient through capacity at the signalized intersections for either growth scenario. These options assume that additional turning lanes are provided at the key intersections (Euclid, Campbell, Country Club) and bus pullouts and coordinated pedestrian HAWK signals are provided.
  - 4-lane options with exclusive transit lanes – through traffic operations will be improved assuming that a sufficient modal shift from car to transit (BRT) occurs to reduce vehicular demand.
  - 6 lane options w/o exclusive transit lanes – fair to good through traffic operations depending upon growth scenario; assumed bus pull outs and coordinated pedestrian HAWK signals.
  - 6 lane options with exclusive transit lanes – good to very good through traffic operations depending upon growth scenario and assuming that a sufficient modal shift from car to transit (BRT) occurs to reduce vehicular demand.
  - The SATA concept is rated lower than the 4 lane mixed flow options because the streetcar shared lanes are estimated to reduce performance for those lanes



## Vehicular Access and Mobility

### 4g. Access Management for Adjacent Properties

Description	<ul style="list-style-type: none"> <li>Changes to curb-cut/driveway access from Broadway to parking and loading for adjacent business to improve traffic flow, reduce conflicts with pedestrians and bicycles, and generally reduce potential for accidents.</li> <li>Can require shared access with adjacent properties</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Quantitative and qualitative evaluation by planning team of reduced conflicts and quality of site access</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Reduction in number and width of curb-cut/driveway access</li> <li>Maintenance of site functionality</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Not viable at current level of design</li> <li>Requires alignment design</li> </ul>

## Sense of Place

- 5a. Historic Resources
- 5a'. Significant Resources
- 5b. Visual Quality
- 5c. Broadway as a Destination
- 5d. Gateway to Downtown
- 5e. Conduciveness to Business
- 5f. Walkable Community
- 5g. Certainty

## Sense of Place

STREET CROSS SECTION CONCEPT	SENSE OF PLACE							
	5a. Historic Resources	5a'. Significant Resources	5b. Visual Quality	5c. Broadway as a Destination	5d. Gateway to Downtown	5e. Conduciveness to Business	5f. Walkable Community	5g. Certainty
Existing Conditions	+++	+++	0	0	0	0	0	0
Option 4A (B7' r.o.w.)	+++	+++	0	0	0	0	0	0
Option 4B (100' r.o.w.)	++	++	0	0	0	0	0	0
Option 4C (112' r.o.w.)	+	+	0	0	0	0	0	0
Option 4-T A (118' r.o.w.)	0	0	0	0	0	0	0	0
Option 4-T B (118' r.o.w.)	0	0	0	0	0	0	0	0
Option 6A (114' r.o.w.)	0	0	0	0	0	0	0	0
Option 6B (112' r.o.w.)	0	0	0	0	0	0	0	0
Option 6-T A (146' r.o.w.)	0	0	0	0	0	0	0	0
Option 6-T B (124' row)	0	0	0	0	0	0	0	0
Option 6-T SARTA (existing r.o.w.)	+++	+++	0	0	0	0	0	0

## Sense of Place

### 5a. Historic Resources

Description	<ul style="list-style-type: none"> <li>The number of historic structures lost due to direct impact</li> <li>The number of historic structures with limited usefulness as a result of loss of parking, setback, site access, and other conditions</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Count of historic structures lost by category</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Roadway width</li> <li>Streetside area width</li> <li>Alignment placement</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Moderate to High at current level of design</li> <li>More definitive as intersections and alignment are designed</li> </ul>

## Performance Assessment

STREET CROSS SECTION CONCEPT	SENSE OF PLACE							
	5a. Historic Resources	5a'. Significant Resources	5b. Visual Quality	5c. Broadway as a Destination	5d. Gateway to Downtown	5e. Conduciveness to Business	5f. Walkable Community	5g. Certainty
Existing Conditions	+++	+++	0	0	0	0	0	0
Option 4A (B7' r.o.w.)	+++	+++	0	0	0	0	0	0
Option 4B (100' r.o.w.)	++	++	0	0	0	0	0	0
Option 4C (112' r.o.w.)	+	+	0	0	0	0	0	0
Option 4-T A (118' r.o.w.)	0	0	0	0	0	0	0	0
Option 4-T B (118' r.o.w.)	0	0	0	0	0	0	0	0
Option 6A (114' r.o.w.)	0	0	0	0	0	0	0	0
Option 6B (112' r.o.w.)	0	0	0	0	0	0	0	0
Option 6-T A (146' r.o.w.)	0	0	0	0	0	0	0	0
Option 6-T B (124' row)	0	0	0	0	0	0	0	0
Option 6-T SARTA (existing r.o.w.)	+++	+++	0	0	0	0	0	0

Based on review of relationship to future ROW to existing ROW and distance between building facades.

## Sense of Place

### 5a'. Significant Resources

Description	<ul style="list-style-type: none"> <li>The number of significant structures lost due to direct impact</li> <li>The number of significant structures with limited usefulness as a result of loss of parking, setback, site access, and other conditions</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Count of significant structures lost by category</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Roadway width</li> <li>Streetside area width</li> <li>Alignment placement</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Moderate to High at current level of design</li> <li>More definitive as intersections and alignment are designed</li> </ul>

### Performance Assessment

• 5a. Significant Resources

Based on review of relationship to future ROW to existing ROW and distance between building facades.

STREET CROSS SECTION CONCEPT	SENSE OF PLACE					
	Visual Resources	Visual Quality	Visual Impact	Visual Context	Visual Character	Visual Identity
Existing Conditions	+++	+++	++	++	++	++
Option 4A (87' r.o.w.)	+++	+++	++	++	++	++
Option 4B (100' r.o.w.)	++	++	++	++	++	++
Option 4C (112' r.o.w.)	+	+	++	++	++	++
Option 4+1 A (118' r.o.w.)	0	0	++	++	++	++
Option 4+1 B (112' r.o.w.)	0	0	++	++	++	++
Option 4A (114' r.o.w.)	0	0	++	++	++	++
Option 4B (112' r.o.w.)	0	0	++	++	++	++
Option 4+1 A (140' r.o.w.)	0	0	++	++	++	++
Option 4+1 B (114' row)	0	0	++	++	++	++
Option 4+1 SARTA (existing r.o.w.)	+++	+++	++	++	++	++



### Sense of Place

#### 5b. Visual Quality

Description	• Ability of the roadway design to enhance visual quality using a mix of features
Measurement	• Qualitative assessment (project team and input from CTF)
Factors	• Design of median and streetside landscaping • Number and location of placemaking features (including public art, wayfinding, lighting, furniture, etc.) • Width of roadside areas for streetscape elements and landscaping
Ability to Effect	• High
Ability to Evaluate	• Moderate at current level of design • Design does not currently include details for streetscape design, but lower cost cross section concepts may allow more budget to be spent on visual quality



### Performance Assessment

• 5b. Visual Quality

- Needs further CTF input
- Factors:
  - Design of median and streetside landscaping
  - Number and location of placemaking features (including public art, wayfinding, lighting, furniture, etc.)
  - Width of roadside areas for streetscape elements and landscaping

STREET CROSS SECTION CONCEPT	SENSE OF PLACE					
	Visual Resources	Visual Quality	Visual Impact	Visual Context	Visual Character	Visual Identity
Existing Conditions	+++	+++	++	++	++	++
Option 4A (87' r.o.w.)	+++	+++	++	++	++	++
Option 4B (100' r.o.w.)	++	++	++	++	++	++
Option 4C (112' r.o.w.)	+	+	++	++	++	++
Option 4+1 A (118' r.o.w.)	0	0	++	++	++	++
Option 4+1 B (112' r.o.w.)	0	0	++	++	++	++
Option 4A (114' r.o.w.)	0	0	++	++	++	++
Option 4B (112' r.o.w.)	0	0	++	++	++	++
Option 4+1 A (140' r.o.w.)	0	0	++	++	++	++
Option 4+1 B (114' row)	0	0	++	++	++	++
Option 4+1 SARTA (existing r.o.w.)	+++	+++	++	++	++	++



### Sense of Place

#### 5c. Broadway as a Destination

Description	• Promote development and civic spaces that would be attractive to users from surrounding neighborhoods, the city, and the region • Provide visual quality, access, and other features that make Broadway appealing to development and customers
Measurement	• Qualitative evaluation
Factors	• Factors related to 5b Visual Quality • Coordinate façade improvement, parking management, and other programs and improvements • Land use regulations supporting development sought
Ability to Effect	• Moderate
Ability to Evaluate	• Low for current level of design and planning



### Performance Assessment

• 5c. Broadway as a Destination

- Need further
  - Development of street design and its potential impact on future character of uses along the street
  - Understanding of economic vitality
- Review definitions and factors with CTF

STREET CROSS SECTION CONCEPT	SENSE OF PLACE					
	Visual Resources	Visual Quality	Visual Impact	Visual Context	Visual Character	Visual Identity
Existing Conditions	+++	+++	++	++	++	++
Option 4A (87' r.o.w.)	+++	+++	++	++	++	++
Option 4B (100' r.o.w.)	++	++	++	++	++	++
Option 4C (112' r.o.w.)	+	+	++	++	++	++
Option 4+1 A (118' r.o.w.)	0	0	++	++	++	++
Option 4+1 B (112' r.o.w.)	0	0	++	++	++	++
Option 4A (114' r.o.w.)	0	0	++	++	++	++
Option 4B (112' r.o.w.)	0	0	++	++	++	++
Option 4+1 A (140' r.o.w.)	0	0	++	++	++	++
Option 4+1 B (114' row)	0	0	++	++	++	++
Option 4+1 SARTA (existing r.o.w.)	+++	+++	++	++	++	++



### Sense of Place

#### 5d. Gateway to Downtown

Description	• Visual quality, ease of mobility, and similar features that improve connection to downtown
Measurement	• Qualitative evaluation
Factors	• To be determined through discussions with CTF
Ability to Effect	• Moderate
Ability to Evaluate	• Low to Moderate at current level of design



### Performance Assessment

STREET CROSS SECTION CONCEPT	SENSE OF PLACE						
	St. Transit Resources	St. Transit Quality	St. Transit Quantity	St. Transit Accessibility	St. Transit Connectivity	St. Transit Safety	St. Transit Comfort
Existing Conditions	+++	+++	0	0	0	0	0
Option 4A (87' r.o.w.)	+++	+++	0	0	0	0	0
Option 4B (100' r.o.w.)	++	++	0	0	0	0	0
Option 4C (112' r.o.w.)	+	+	0	0	0	0	0
Option 4+1 A (118' r.o.w.)	0	0	0	0	0	0	0
Option 4+1 B (112' r.o.w.)	--	--	+	+	0	0	0
Option 4A (114' r.o.w.)	0	0	+	+	0	0	0
Option 4B (112' r.o.w.)	--	--	++	++	0	0	0
Option 4+1 A (140' r.o.w.)	--	--	0	0	+	+	++
Option 4+1 B (114' row)	--	--	0	0	++	++	+++
Option 4+1 SARTA (existing r.o.w.)	+++	+++	0	0	0	0	0

- 5d. Gateway to Downtown
  - Review description and discuss factors with CTF

Roughly combination of transit and vehicular access and mobility with community character



### Sense of Place

#### 5e. Conduciveness to Business

Description	<ul style="list-style-type: none"> <li>The type and size of businesses that would be drawn to the corridor under various development approaches</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Qualitative evaluation</li> </ul>
Factors	<ul style="list-style-type: none"> <li>To be determined through discussions with CTF and professional experience                             <ul style="list-style-type: none"> <li>Site access and parking location</li> <li>Building size and design accommodated</li> <li>Other TBD</li> </ul> </li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>Moderate</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Low at this level of design</li> </ul>



### Performance Assessment

STREET CROSS SECTION CONCEPT	SENSE OF PLACE						
	St. Transit Resources	St. Transit Quality	St. Transit Quantity	St. Transit Accessibility	St. Transit Connectivity	St. Transit Safety	St. Transit Comfort
Existing Conditions	+++	+++	0	0	0	0	0
Option 4A (87' r.o.w.)	+++	+++	0	0	0	0	0
Option 4B (100' r.o.w.)	++	++	0	0	0	0	0
Option 4C (112' r.o.w.)	+	+	0	0	0	0	0
Option 4+1 A (118' r.o.w.)	0	0	0	0	0	0	0
Option 4+1 B (112' r.o.w.)	--	--	+	+	0	0	0
Option 4A (114' r.o.w.)	0	0	+	+	0	0	0
Option 4B (112' r.o.w.)	--	--	++	++	0	0	0
Option 4+1 A (140' r.o.w.)	--	--	0	0	+	+	++
Option 4+1 B (114' row)	--	--	0	0	++	++	+++
Option 4+1 SARTA (existing r.o.w.)	+++	+++	0	0	0	0	0

- 5e. Conduciveness to Business
  - Need further design of
    - Site access and parking
    - Site revitalization and reuse
    - Others...
  - Review definitions and factors with CTF



### Sense of Place

#### 5f. Walkable Community

Description	<ul style="list-style-type: none"> <li>How well the improvements and land use plan place businesses within walking distance for a viable number of residences</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>See measures under "1. Pedestrian Access and Mobility"</li> </ul>
Factors	<ul style="list-style-type: none"> <li>See measures and factors under "1. Pedestrian Access and Mobility"</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>Varies</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Varies</li> </ul>



### Performance Assessment

STREET CROSS SECTION CONCEPT	SENSE OF PLACE						
	St. Transit Resources	St. Transit Quality	St. Transit Quantity	St. Transit Accessibility	St. Transit Connectivity	St. Transit Safety	St. Transit Comfort
Existing Conditions	+++	+++	0	0	0	0	0
Option 4A (87' r.o.w.)	+++	+++	0	0	0	0	0
Option 4B (100' r.o.w.)	++	++	0	0	0	0	0
Option 4C (112' r.o.w.)	+	+	0	0	0	0	0
Option 4+1 A (118' r.o.w.)	0	0	0	0	0	0	0
Option 4+1 B (112' r.o.w.)	--	--	+	+	0	0	0
Option 4A (114' r.o.w.)	0	0	+	+	0	0	0
Option 4B (112' r.o.w.)	--	--	++	++	0	0	0
Option 4+1 A (140' r.o.w.)	--	--	0	0	+	+	++
Option 4+1 B (114' row)	--	--	0	0	++	++	+++
Option 4+1 SARTA (existing r.o.w.)	+++	+++	0	0	0	0	0

- 5f. Gateway to Downtown
  - Review description and discuss factors with CTF

Roughly a combination of pedestrian access and mobility and 5a which is impact on properties



### Sense of Place

#### 5g. Certainty

Description	<ul style="list-style-type: none"> <li>Relates to comments received, "Do it right this time so it doesn't have to be done again."</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Qualitative evaluation</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Capacity projections</li> <li>Ridership projections (bus transit; BRT)</li> <li>Flexibility to meet changing transportation needs</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>Moderate to High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Moderate to High at current level of design</li> <li>See also performance measures –                             <ul style="list-style-type: none"> <li>1a Functionality of Streetside for Pedestrian Activity</li> <li>1c Pedestrian-Oriented Facilities or Improvements</li> <li>1g Universal Design</li> <li>2e Bike Facility Improvements</li> <li>3f Accommodation of Future High Capacity Transit</li> <li>4a Movement of Through Traffic</li> <li>4f Persons Trips</li> </ul> </li> </ul>



STREET CROSS SECTION CONCEPT	SENSE OF PLACE						
	1a. Functional Street	1b. Pedestrian-Oriented	1c. Pedestrian-Oriented	2a. Bike Facility	2b. Bike Facility	3a. Future High Capacity Transit	3b. Future High Capacity Transit
Existing Conditions	0	0	0	0	0	0	0
Option 4A (107' r.o.w.)	+++	+++	++	++	++	++	++
Option 4B (100' r.o.w.)	++	++	++	++	++	++	++
Option 4C (112' r.o.w.)	+	+	+	+	+	+	+
Option 4-T A (118' r.o.w.)	0	0	0	0	0	0	0
Option 4-T B (112' r.o.w.)	---	---	+	+	+	+	+
Option 6A (114' r.o.w.)	0	0	0	0	0	0	0
Option 6B (112' r.o.w.)	---	---	++	++	++	++	++
Option 6-T A (140' r.o.w.)	---	---	0	0	0	0	0
Option 6-T B (114' row)	---	---	0	++	++	++	++
Option 6-T SARTA (existing r.o.w.)	+++	+++	0	0	0	0	0

### Performance Assessment

- 5g. Certainty
  - Consider moving this out of Sense of Place and making it a stand alone Performance Measure
  - Ability to accommodate foreseeable transportation demand into the future

Roughly a combination of:  
 1a. Functionality of Streetside for Pedestrian Activity,  
 1c. Pedestrian-Oriented Facilities or Improvements,  
 2e. Bike Facility Improvements,  
 3f. Accommodation of Future High Capacity Transit, and  
 4a. Movement of Through Traffic

### Environment/Public Health

- 6a. Greenhouse Gases
- 6b. Other Tailpipe Emissions
- 6c. Heat Island
- 6d. Water Harvesting
- 6e. Walkability/Bikability
- 6f. Land Use Mix
- 6g. Affordability



STREET CROSS SECTION CONCEPT	ENVIRONMENTAL / PUBLIC HEALTH				
	6a. Greenhouse Gases	6b. Other Tailpipe Emissions	6c. Heat Island	6d. Water Harvesting	6e. Walkability/Bikability
Existing Conditions	0	---	---	0	0
Option 4A (107' r.o.w.)	0	---	---	0	0
Option 4B (100' r.o.w.)	+	---	0	0	0
Option 4C (112' r.o.w.)	++	++	+	0	0
Option 4-T A (118' r.o.w.)	+	+	+	0	0
Option 4-T B (112' r.o.w.)	++	++	+	0	0
Option 6A (114' r.o.w.)	+	0	0	0	0
Option 6B (112' r.o.w.)	++	++	0	0	0
Option 6-T A (140' r.o.w.)	0	0	0	0	0
Option 6-T B (114' row)	+	+	0	0	0
Option 6-T SARTA (existing r.o.w.)	0	---	---	0	0

### Environment and Public Health

### Environment/Public Health

6a. Greenhouse Gases	
Description	Corridor design features that can reduce CO <sub>2</sub> emission
Measurement	Quantitative analysis
Factors	Proportion alternative modes of transportation Level of congestion Quality of vehicle fleet, fuel, etc.
Ability to Effect	Moderate
Ability to Evaluate	Not at current level of design Some factors ultimately not effected by this project



STREET CROSS SECTION CONCEPT	ENVIRONMENTAL / PUBLIC HEALTH				
	6a. Greenhouse Gases	6b. Other Tailpipe Emissions	6c. Heat Island	6d. Water Harvesting	6e. Walkability/Bikability
Existing Conditions	0	---	---	0	0
Option 4A (107' r.o.w.)	0	---	---	0	0
Option 4B (100' r.o.w.)	+	---	0	0	0
Option 4C (112' r.o.w.)	++	++	+	0	0
Option 4-T A (118' r.o.w.)	+	+	+	0	0
Option 4-T B (112' r.o.w.)	++	++	+	0	0
Option 6A (114' r.o.w.)	+	0	0	0	0
Option 6B (112' r.o.w.)	++	++	0	0	0
Option 6-T A (140' r.o.w.)	0	0	0	0	0
Option 6-T B (114' row)	+	+	0	0	0
Option 6-T SARTA (existing r.o.w.)	0	---	---	0	0

### Performance Assessment

- 6a. Greenhouse Gases
  - Requires more detailed
    - Design
    - Technical analysis

### Environment/Public Health

6b. Other Tailpipe Emissions	
Description	Identification and reduction of other important tailpipe emissions, such as particulates
Measurement	Quantitative evaluation
Factors	Proportion alternative modes of transportation Level of congestion Quality of vehicle fleet, fuel, etc.
Ability to Effect	Moderate
Ability to Evaluate	Not at current level of design Some factors ultimately not effected by this project



### Performance Assessment

STREET CROSS SECTION CONCEPT	ENVIRONMENTAL / PUBLIC HEALTH				
	Soil Contamination / Erosion	Soil Loss / Sediment	Air Water Pollution	Soil Stability / Erosion	Soil Compaction
Existing Conditions	0	---	---	---	---
Option 4A (87' r.o.w.)	0	---	---	---	---
Option 4B (100' r.o.w.)	+	---	---	---	---
Option 4C (112' r.o.w.)	++	++	+	+	+
Option 4+1 A (118' r.o.w.)	+	+	+	+	+
Option 4+1 B (112' r.o.w.)	++	++	+	+	+
Option 6A (114' r.o.w.)	+	+	0	0	0
Option 6B (112' r.o.w.)	++	++	0	0	0
Option 6+1 A (140' r.o.w.)	0	0	0	0	0
Option 6+1 B (114' row)	0	0	+	0	0
Option 6+1 SATA (existing r.o.w.)	0	---	---	---	---

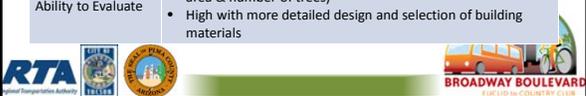
- 6b. Other Tailpipe Emissions
  - Requires more detailed
    - Design
    - Technical analysis



### Environment/Public Health

#### 6c. Heat Island

Description	<ul style="list-style-type: none"> <li>Determine comparative heat island effect of various alternatives</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Qualitative and quantitative evaluation</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Reduce roadway and sidewalk pavement contribution to heat gain through a combination of shade, solar reflectivity (high albedo) of materials, and area of pavement</li> <li>Increase landscaped area</li> <li>Increase amount of shade</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Moderate at current level of design (amount of landscaped area &amp; number of trees)</li> <li>High with more detailed design and selection of building materials</li> </ul>



### Performance Assessment

STREET CROSS SECTION CONCEPT	ENVIRONMENTAL / PUBLIC HEALTH				
	Soil Contamination / Erosion	Soil Loss / Sediment	Air Water Pollution	Soil Stability / Erosion	Soil Compaction
Existing Conditions	0	---	---	---	---
Option 4A (87' r.o.w.)	0	---	---	---	---
Option 4B (100' r.o.w.)	+	---	---	---	---
Option 4C (112' r.o.w.)	++	++	+	+	+
Option 4+1 A (118' r.o.w.)	+	+	+	+	+
Option 4+1 B (112' r.o.w.)	++	++	+	+	+
Option 6A (114' r.o.w.)	+	+	0	0	0
Option 6B (112' r.o.w.)	++	++	0	0	0
Option 6+1 A (140' r.o.w.)	0	0	0	0	0
Option 6+1 B (114' row)	0	0	+	0	0
Option 6+1 SATA (existing r.o.w.)	0	---	---	---	---

Assume existing condition is the base "neutral" condition. Slight penalty for more R.O.W. paving with assumption that much of existing area outside of R.O.W. is hardscaped and that new paving could be high albedo and consideration of shade from landscape



### Heat Island Effect




### Environment/Public Health

#### 6d. Water Harvesting

Description	<ul style="list-style-type: none"> <li>Retain rainfall onsite to benefit project landscaping</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>TDOT Active Practice Guideline "Green Streets" (draft)</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Width and depth of median and streetside areas</li> <li>Amount of reduction in runoff on paved areas</li> <li>Types of materials used (pervious pavement)</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Moderate at current level of design</li> <li>High as design is developed further</li> </ul>



### Performance Assessment

STREET CROSS SECTION CONCEPT	ENVIRONMENTAL / PUBLIC HEALTH				
	Soil Contamination / Erosion	Soil Loss / Sediment	Air Water Pollution	Soil Stability / Erosion	Soil Compaction
Existing Conditions	0	---	---	---	---
Option 4A (87' r.o.w.)	0	---	---	---	---
Option 4B (100' r.o.w.)	+	---	---	---	---
Option 4C (112' r.o.w.)	++	++	+	+	+
Option 4+1 A (118' r.o.w.)	+	+	+	+	+
Option 4+1 B (112' r.o.w.)	++	++	+	+	+
Option 6A (114' r.o.w.)	+	+	0	0	0
Option 6B (112' r.o.w.)	++	++	0	0	0
Option 6+1 A (140' r.o.w.)	0	0	0	0	0
Option 6+1 B (114' row)	0	0	+	0	0
Option 6+1 SATA (existing r.o.w.)	0	---	---	---	---

Ratio of landscaped to pavement width



## Environment/Public Health

6e. Walkability/Bikeability	
Description	<ul style="list-style-type: none"> <li>Design elements that will encourage biking and walking over driving</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>See 1. Pedestrian and 2. Bicycle Access and Mobility performance measures</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Number of bike and pedestrian facilities and features</li> <li>Continuity of treatments</li> <li>Comfort and security features</li> <li>5f. Walkable Community</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High to Moderate depending on performance measure</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>High to not viable at current level of design depending on performance measure</li> <li>High to Low depending on performance measure</li> </ul>






## Performance Assessment

STREET CROSS SECTION CONCEPT	ENVIRONMENTAL / PUBLIC HEALTH				
	GHG Emissions/CO <sub>2</sub> e				
Existing Conditions	0	---	---	---	---
Option 4A (BRT r.o.m.)	0	---	---	---	---
Option 4B (BRT r.o.m.)	+	---	---	---	---
Option 4C (BRT r.o.m.)	++	++	+	+	+
Option 4-T A (BRT r.o.m.)	+	---	---	---	---
Option 4-T B (BRT r.o.m.)	++	++	+	+	+
Option 6A (BRT r.o.m.)	+	0	0	0	0
Option 6B (BRT r.o.m.)	++	++	0	0	0
Option 6-T A (BRT r.o.m.)	0	0	0	0	0
Option 6-T B (BRT r.o.m.)	+	+	0	0	0
Option 6-T SA/TA (Existing r.o.m.)	0	---	---	---	---

- 6e. Walkability / Bikeability

Roughly combination of Bicycle Access and Mobility with 5f Walkable Community (which considers all Pedestrian Access and Mobility Performance Measures)






## Environment/Public Health

6f. Land Use Mix	
Description	<ul style="list-style-type: none"> <li>Ability to accommodate mixed use development within walking and biking distance of the Broadway corridor, and to support transit ridership</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Qualitative analysis</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Support of mixed use by current/future zoning</li> <li>Determine if, and what type of policy and procedural changes are needed</li> <li>Count and size of parcels conducive to accommodate desired land use mix</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>Low to indirect</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Not at current level of design</li> <li>Moderate as design is developed in more detail (i.e.; alignment) and policy issues are discussed</li> </ul>






## Performance Assessment

STREET CROSS SECTION CONCEPT	ENVIRONMENTAL / PUBLIC HEALTH				
	GHG Emissions/CO <sub>2</sub> e				
Existing Conditions	0	---	---	---	---
Option 4A (BRT r.o.m.)	0	---	---	---	---
Option 4B (BRT r.o.m.)	+	---	---	---	---
Option 4C (BRT r.o.m.)	++	++	+	+	+
Option 4-T A (BRT r.o.m.)	+	---	---	---	---
Option 4-T B (BRT r.o.m.)	++	++	+	+	+
Option 6A (BRT r.o.m.)	+	0	0	0	0
Option 6B (BRT r.o.m.)	++	++	0	0	0
Option 6-T A (BRT r.o.m.)	0	0	0	0	0
Option 6-T B (BRT r.o.m.)	+	+	0	0	0
Option 6-T SA/TA (Existing r.o.m.)	0	---	---	---	---

- 6f. Land Use Mix
  - Requires more detailed
    - Alignment and intersection design for extent of impact to existing parcels






## Environment/Public Health

6g. Affordability	
Description	<ul style="list-style-type: none"> <li>Combined housing and transportation costs for users of the Broadway corridor</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Qualitative evaluation</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Relates to other measures:                             <ul style="list-style-type: none"> <li>1, 2, &amp; 3 – Pedestrian, Bicycle, and Transit Access &amp; Mobility</li> <li>5f Walkable Community</li> <li>6b Other Tailpipe Emissions</li> <li>7g Job Impacts</li> </ul> </li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>Low</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Not at current level of design and planning</li> </ul>






## Performance Assessment

STREET CROSS SECTION CONCEPT	ENVIRONMENTAL / PUBLIC HEALTH				
	GHG Emissions/CO <sub>2</sub> e				
Existing Conditions	0	---	---	---	---
Option 4A (BRT r.o.m.)	0	---	---	---	---
Option 4B (BRT r.o.m.)	+	---	---	---	---
Option 4C (BRT r.o.m.)	++	++	+	+	+
Option 4-T A (BRT r.o.m.)	+	---	---	---	---
Option 4-T B (BRT r.o.m.)	++	++	+	+	+
Option 6A (BRT r.o.m.)	+	0	0	0	0
Option 6B (BRT r.o.m.)	++	++	0	0	0
Option 6-T A (BRT r.o.m.)	0	0	0	0	0
Option 6-T B (BRT r.o.m.)	+	+	0	0	0
Option 6-T SA/TA (Existing r.o.m.)	0	---	---	---	---

- 6g. Affordability
  - Pedestrian, Bicycle, and Transit Access and Mobility provide some indication, but more detailed technical analysis would allow for better understanding
  - Other related Performance Measures cannot be assessed at current level of design and analysis






## Economic Vitality

- 7a.-7b. Change in Economic Potential
- 7c.-7d. Change in Business Revenue
- 7e.-7f. Change in Sales Tax Revenue
- 7g.-7h. Change in Property Tax Revenue
- 7i. Business Impacts
- 7j. Job Impacts

**BROADWAY BOULEVARD**

## Economic Vitality

STREET CROSS SECTION CONCEPT	Economic Vitality
Existing Conditions	
Option 4A (137' c.w.)	
Option 4B (139' c.w.)	
Option 4C (137' c.w.)	
Option 4T A (137' c.w.)	
Option 4T B (137' c.w.)	
Option 4A (139' c.w.)	
Option 4B (139' c.w.)	
Option 4T A (139' c.w.)	
Option 4T B (139' c.w.)	
Option 4T A (137' c.w.)	
Option 4T B (137' c.w.)	
Option 4T A (139' c.w.)	
Option 4T B (139' c.w.)	
Option 4T A (137' c.w.)	
Option 4T B (137' c.w.)	

**BROADWAY BOULEVARD**

## Economic Vitality

- Ability to Evaluate
  - Not at current level of design and planning (cross section width is an indicator, but in some cases remnant parcels may have more economic potential than existing parcels)

**BROADWAY BOULEVARD**

## Economic Vitality

- Impacts to parking, access, and ultimately buildings all affect viability of existing businesses and development
- Future development potential needs to be assessed
- Real estate and business market potential also needs to be assessed

**BROADWAY BOULEVARD**

## Economic Vitality

RTA and Franklin County are not responsible for the accuracy of the data presented in this report. The user assumes all responsibility for the accuracy of the data presented in this report.

Block	Street Name	Block Length (ft)	Existing Conditions		Option 4A (137' c.w.)		Option 4B (139' c.w.)		Option 4C (137' c.w.)		Option 4T A (137' c.w.)		Option 4T B (137' c.w.)		Total Change
			Area (sq ft)	Value (\$)	Area (sq ft)	Value (\$)	Area (sq ft)	Value (\$)	Area (sq ft)	Value (\$)	Area (sq ft)	Value (\$)	Area (sq ft)	Value (\$)	
1000	Broadway	100	1000	100000	1000	100000	1000	100000	1000	100000	1000	100000	1000	100000	0

**BROADWAY BOULEVARD**

## Economic Vitality

Block	Street Name	Block Length (ft)	Existing Area (sq ft)	Existing Value (\$)	Option 4A (137' c.w.)		Option 4B (139' c.w.)		Option 4C (137' c.w.)		Option 4T A (137' c.w.)		Option 4T B (137' c.w.)		Total Change
					Area (sq ft)	Value (\$)	Area (sq ft)	Value (\$)	Area (sq ft)	Value (\$)	Area (sq ft)	Value (\$)	Area (sq ft)	Value (\$)	
1000	Broadway	100	1000	100000	1000	100000	1000	100000	1000	100000	1000	100000	1000	100000	0

**BROADWAY BOULEVARD**

### Economic Vitality

Block	Block/Street	Existing Area (sq ft)	Existing Area (sq ft)	Building Height (ft)	Option 4A		Option 4B		Option 4C		Option 4T A		Option 4T B	
					2012-15	2015-20	2012-15	2015-20	2012-15	2015-20	2012-15	2015-20	2012-15	2015-20
144	144	80	95	129	10	13	12	10	29	2	103	12	103	129
145	145	80	124	162	10	27	10	27	10	10	103	10	103	129
146	146	80	102	102	10	10	10	10	10	10	103	10	103	102
147	147	80	137	137	10	10	10	10	10	10	103	10	103	137
148	148	80	148	148	10	10	10	10	10	10	103	10	103	148
149	149	145	145	145	10	10	10	10	10	10	103	10	103	145
150	150	145	145	145	10	10	10	10	10	10	103	10	103	145

### Economic Vitality

### Economic Vitality

#### 7a. – 7b. Change in Economic Potential

Description	<ul style="list-style-type: none"> <li>Suitability of parcels along Broadway to provide for current commercial or residential use, repurposed, or adaptive reuse, or to provide future mix of commercial and residential uses, and open space</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Qualitative analysis by economic and other planning team members to estimate use potential of existing and remnant land</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Possibly new land use policy and strategic planning for the disposition of remnant parcels (not part of current project scope of work)</li> <li>Roadway alignment and width</li> <li>Access management plan</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>Moderate</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Not at current level of design and planning (cross section width is an indicator, but in some cases remnant parcels may have more economic potential than existing parcels)</li> </ul>

### Economic Vitality

#### 7c.–7d. Change in Business Revenue

Description	<ul style="list-style-type: none"> <li>Determine current and potential amounts of revenue generated by businesses along the corridor (by segments/not parcel-specific)</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Analysis by economic and other planning team members                             <ul style="list-style-type: none"> <li>City data (confidentiality will be respected)</li> <li>InfoUSA</li> <li>Standard &amp; Poor's</li> </ul> </li> </ul>
Factors	<ul style="list-style-type: none"> <li>Possibly new land use policy and strategic planning for the disposition of remnant parcels (not part of current project scope of work)</li> <li>See 7a-7b Change in Economic Potential</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>To be determined</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Not at current level of design and planning (see 7a-7b Change in Economic Potential)</li> </ul>

### Economic Vitality

#### 7e. – 7f. Change in Sales Tax Revenue

Description	<ul style="list-style-type: none"> <li>The amount of existing and anticipated sales tax generated from the businesses on the corridor</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>City collected data (confidentiality will be respected)</li> <li>Qualitative evaluation</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Revenues collected on businesses currently in corridor</li> <li>Anticipated revenues for businesses that would remain in corridor after construction</li> <li>Possibly new land use policy and strategic planning for the disposition of remnant parcels (not part of current project scope of work)                             <ul style="list-style-type: none"> <li>Width of roadway</li> <li>Placement of alignment</li> <li>Access management plan</li> </ul> </li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>To be determined</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Not at current level of design and planning (see 7a-7b Change in Economic Potential)</li> </ul>

### Economic Vitality

#### 7g. – 7h. Change in Property Tax Revenue

Description	<ul style="list-style-type: none"> <li>Amount of current and anticipated future property tax generated from the properties along the corridor</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>County Assessor data</li> <li>Qualitative evaluation</li> </ul>
Factors	<ul style="list-style-type: none"> <li>New land use policy and strategic planning for the disposition of remnant parcels (not part of current project scope of work)                             <ul style="list-style-type: none"> <li>Width of roadway</li> <li>Placement of alignment</li> </ul> </li> <li>See 7a-7b Change in Economic Potential</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>To be determined</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Not at current level of design and planning (see 7a-7b Change in Economic Potential)</li> </ul>

## Economic Vitality

### 7i. Business Impacts

Description	<ul style="list-style-type: none"> <li>The absolute number and size in terms of annual revenue</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Quantitative assessment based on InfoUSA data and alignment impact evaluation</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Limit impacts to businesses/properties to one side of roadway at any particular location</li> <li>See 7a-7b Change in Economic Potential</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>To be determined</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Not at current level of design and planning (see 7a-7b Change in Economic Potential)</li> </ul>



## Economic Vitality

### 7j. Job Impacts

Description	<ul style="list-style-type: none"> <li>Potential change in number of jobs</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Estimate of current and potential future employment in project area (may be challenging to track given business relocations and/or job creation under various alternatives)</li> </ul>
Factors	<ul style="list-style-type: none"> <li>To be determined</li> <li>See 7a-7b Change in Economic Potential</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>To be determined</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Not at current level of design and planning (see 7a-7b Change in Economic Potential)</li> </ul>



## Project Cost

- 8a. Construction Cost
- 8b. Acquisition Cost
- 8c. Income for Reuse of City-owned Property



## Project Cost

STREET CROSS SECTION CONCEPT	PROJECT COST	
	\$M. Construction Cost	\$M. Acquisition Costs (City-owned Property)
Existing Conditions	\$	\$
Option 4A (18' r.o.w.)	\$5	\$5
Option 4B (100' r.o.w.)	\$5	\$5
Option 4C (112' r.o.w.)	\$5	\$55
Option 4-T A (118' r.o.w.)	\$55	\$55
Option 4-T B (112' r.o.w.)	\$55	\$55
Option 6A (114' r.o.w.)	\$55	\$55
Option 6B (112' r.o.w.)	\$55	\$55
Option 6-T A (114' r.o.w.)	\$55	\$55
Option 6-T B (112' r.o.w.)	\$55	\$55
Option 4-T 5A/TA (existing r.o.w.)	\$55	\$

## Project Cost

### 8a. Construction Cost

Description	<ul style="list-style-type: none"> <li>Cost of construction</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Approximate quantity takeoffs of major cost items (pavement, curb)</li> <li>Approximate typical unit costs (landscaping, bus stop/station improvements, lighting, signals)</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Width of roadway cross-section</li> <li>Scale and quantity of streetside improvements</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High (ROW acquisition is also a significant cost)</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Moderate at current level of design (estimates made based on cross sections)</li> <li>High as intersections and other design elements are established</li> </ul>



## Performance Assessment

- 8a. Construction Cost

Extent of improvements and investment in transit facilities for dedicated transit lane options

STREET CROSS SECTION CONCEPT	PROJECT COST	
	\$M. Construction Cost	\$M. Acquisition Costs (City-owned Property)
Existing Conditions	\$	\$
Option 4A (18' r.o.w.)	\$5	\$5
Option 4B (100' r.o.w.)	\$5	\$5
Option 4C (112' r.o.w.)	\$5	\$55
Option 4-T A (118' r.o.w.)	\$55	\$55
Option 4-T B (112' r.o.w.)	\$55	\$55
Option 6A (114' r.o.w.)	\$55	\$55
Option 6B (112' r.o.w.)	\$55	\$55
Option 6-T A (114' r.o.w.)	\$55	\$55
Option 6-T B (112' r.o.w.)	\$55	\$55
Option 4-T 5A/TA (existing r.o.w.)	\$55	\$

## Project Cost

8b. Acquisition Cost	
Description	<ul style="list-style-type: none"> <li>Cost to acquire needed ROW, including the cost of the property, relocation, and other qualified costs</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Quantitative and qualitative evaluation</li> <li>Federal and State relocation requirements</li> <li>Potential return on excess/remnant ROW</li> </ul>
Factors	<ul style="list-style-type: none"> <li>Number and size of property acquisitions</li> <li>Street width and alignment</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>High</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Low to Moderate at current level of design and planning (estimates made based on cross sections)</li> <li>Moderate as intersections and other design elements are established, and impacts and ability to maintain use of properties can be estimated</li> </ul>

## Performance Assessment

- 8b. Acquisition Cost

Width of future r.o.w. and relationship to segment by segment potential for possible acquisition

## Project Cost

8c. Income for Reuse of City-Owned Parcels	
Description	<ul style="list-style-type: none"> <li>Income from sale or lease of remnant City-owned properties not needed for the project</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>Qualitative and quantitative analysis by economic and other planning team members to estimate use potential of existing and remnant land</li> </ul>
Factors	<ul style="list-style-type: none"> <li>See 7a-7b Change in Economic Potential</li> </ul>
Ability to Effect	<ul style="list-style-type: none"> <li>To be determined</li> </ul>
Ability to Evaluate	<ul style="list-style-type: none"> <li>Not at current level of design and planning</li> <li>Moderate at future point in design and planning</li> <li>See 7a-7b Change in Economic Potential</li> </ul>

## Performance Assessment

- 8c. Income for Reuse of City-Owned Parcels
  - Requires assessment of Economic Potential which cannot be done at current level of design

## Considerations for September Public Meeting #3

**Jenn Toothaker, Project Manager**  
City of Tucson Department of Transportation

## Broadway's Planning & Design Phase

**We are here**

9± Design Concepts

3± Design Concepts + Alignment Variations

1 Design Concept and Alignment

### Initial Discussion of Public Meeting #3 September 5, 2013

**Public Meeting Agency Review**

- Design Concepts
- Performance Measures
- Assessment

↓

**2-3 CTF Meetings**

Drafting and refinement

↻

**UNDERSTANDING OF TRADE-OFFS IN RELATION TO VISION & GOALS**

- What is desired emphasis?
- What is the desired balance?

**Task-Related Goals:**

- Present Initial Draft Cross Sections and Performance Measures
- Obtain public input on:
  - Cross-sections to move into next task/analysis
  - Performance measures/evaluation criteria







### Initial Discussion of Public Meeting #3 September 5, 2013

#### Distilling Concepts, Performance Measures, and Assessments

- Cross Section Concepts
  - Focus on 4 functional families with variations on organization and design of elements within the functional families
- Performance Measures
  - Compile some into combined measures






### Distilling Cross Section Concepts

4 Lanes	4 Lanes plus Transit Lanes	6 Lanes	6 Lanes plus Transit Lanes
Option 4A (67' r.o.w.) 	Option 4+T A (118' r.o.w.) 	Option 6A (114' r.o.w.) 	Option 6+T A (142' r.o.w.) 
Option 4B (100' r.o.w.) 	Option 4+T B (152' r.o.w.) 	Option 6B (152' r.o.w.) 	Option 6+T B (174' r.o.w.) 
Option 4C (112' r.o.w.) 	Option 4+T SATA (existing r.o.w.) 		






### Distilling Performance Measures

CTF Assessment of Initial Concepts	Present at Public Workshop
<b>Pedestrian Access and Mobility</b> 1a. Functionality of Streetside for Pedestrian Activity 1b. Separation from Vehicular Traffic 1c. Pedestrian-Oriented Facilities or Improvements 1e. Pedestrian Crossings 1f. Vehicle/Pedestrian Conflicts at Driveways	Pedestrian Access and Mobility
<b>Bicycle Access and Mobility</b> 2a. Separation of Bikes and Arterial Traffic 2b. Bike Conflicts with Crossing Vehicles 2e. Bike Facility Improvements 2h. Bike Crossings	Bicycle Access and Mobility
<b>Transit Access and Mobility</b> 3b. Transit Stop Facilities 3c. Corridor Travel Time 3d. Schedule Adherence 3f. Accommodation of Future High Capacity Transit	Transit Access and Mobility
<b>Vehicular Access and Mobility</b> 4a. Movement of Through Traffic	Vehicular Through Movement

### Distilling Performance Measures

CTF Assessment of Initial Concepts	Present at Public Workshop
<b>Sense of Place</b> 5a. Historic Resources 5a'. Significant Resources 5b. Visual Quality 5d. Gateway to Downtown 5f. Walkable Community 5g. Certainty	Historic and Significant Resources Visual Quality Long Term Certainty
<b>Environmental / Public Health</b> 6c. Heat Island 6d. Water Harvesting 6e. Walkability/Bikability	Heat Island and Water Harvesting Walkability/Bikability
<b>Economic Vitality</b>	
<b>Project Cost</b> 8a. Construction Cost 8b. Acquisition Cost	Project Cost

### Initial Discussion of Public Meeting #3 September 5, 2013

- Are there any specific ideas about you have about:
  - CTF roles in the event?
  - Format of the event or table activities?
  - Overall content and discussion?






## Call to the Audience

**10 Minutes**

**Please limit comments to 3 minutes**

- Called forward in order received
- CTF members cannot discuss matters raised
- CTF cannot take action on matters raised
- CTF members can ask project team to review an item






## Next Steps/Roundtable

*Jenn Toothaker*

- Schedule Leading up to Public Meeting
  - July 25
    - Informational Presentations
      - Update on Downtown Links and Ronstadt Transit Center
    - Continued Discussion of cross sections, performance assessments
    - Potential endorsement of content for September Public Meeting
    - Discussion/Endorsement of September Public Meeting Format
  - Is there a need for an additional meeting?






July 25, 2013	#17 (Action Mtg 2) - Stakeholder Agency Review, and finalize initial cross sections and performance assessment for public review
September 5, 2013	Public Meeting #1 - Present final cross sections and performance measures/assessment
September 10, 2013	#18 (Action Mtg 2) - Review Input from Public Mtg, #1. Start identification of Street Cross Section, Alignment, and Corridor Development Elements
October 8, 2013	#19 (Action Mtg 2) - 2ND MEETING to Review Street Cross Section, Alignment, and Corridor Development Elements
October and November 2013	Design development and evaluation
December 5, 2013	#20 (Action Mtg 2) - Street Design Concepts and Public Participation, direction on refinements
December 2013 and early January 2014	Design refinements and analysis, prepare for Stakeholder Review
January and February 2014	Stakeholder Agency Review #2 - details TBD
February 27, 2014	#21 (Action Mtg 2) - Finalize for public presentation
March 10, 2014	Public Meeting #2 - Cross section, alignment, and corridor development concepts, performance evaluation, and preliminary design approach
April 8, 2014	#22 (Action Mtg 2) - Public Input and Street Design and Corridor Development Concept
April 24, 2014*	#23 (Action Mtg 2) - 2nd Recommendation on Street Design and Corridor Development Concept
April 24, 2014*	* Review that this date is reserved for the final design meeting in #27 and #28
April 27, 2014	#24 (Action Mtg 2) - 2ND MEETING to Review CTF Draft Recommended Street Design and Corridor Development Concept
Mid April, May, and mid June 2014	Detail and evaluate draft recommended concept
June 18, 2014	#25 (Action Mtg 2) - CTF Draft Recommended Street Design and Corridor Development Concept Evaluation
June and July 2014	Stakeholder Agency Review #3 - details TBD
August 7, 2014	#26 (Action Mtg 2) - Finalize for public workshop
September 2, 2014	Public Meeting #3 - Draft Recommended Street Design and Corridor Development Concept Evaluation
September 22, 2014, Monday	#27 (Action Mtg 2) - CTF Recommended Broadway Design Concept (P2C) in order scheduling the final design discussion
September 29, 2014	#28 (Action Mtg 2) - 2ND MEETING CTF Recommended Broadway Design Concept
October 6, 2014	#29 (Action Mtg 2) - Finalize CTF Recommended Broadway Design Concept
October 16 or November 2014	Street and Corridor Meeting - Action on CTF Recommended Broadway Design Concept

## Next Steps/Roundtable

- Set an additional CTF Meeting
  - Options:
    - CTF Meeting in early August, Public Meeting in September
    - CTF Meeting in late August or early September, Public Meeting in late September or October






## CTF Next Steps / Roundtable






## Thank You for Coming – Please Stay in Touch!

**Broadway: Euclid to Country Club**

Web: [www.tucsonaz.gov/broadway](http://www.tucsonaz.gov/broadway)

Email: [broadway@tucsonaz.gov](mailto:broadway@tucsonaz.gov)

Info Line: 520.622.0815

**RTA Plan**

[www.rtamobility.com](http://www.rtamobility.com)

