

# Call to the Audience Guidelines

*(Call to audience will be at 8 p.m.)*

- Must fill out participant card
- Participants called in the order cards are received
- 2 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

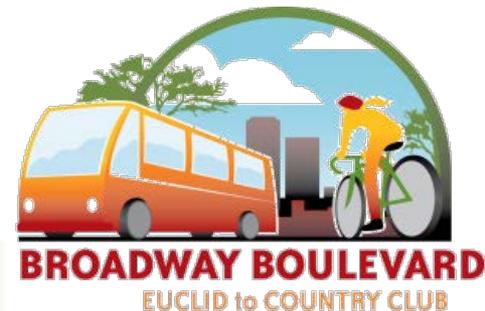
# Meeting Agenda

1. Call to Order/Agenda Review
2. Update: Process for Defining Functionality *15 min*
3. Framing the Discussion on Functionality and Performance Measures *20 min*
4. Presentation and Discussion of Broadway Traffic Studies and Analyses *45 min*
5. Introduction to Transit, PAG's High Capacity Transit Study, and Bus Rapid Transit (BRT) *40 min*
6. Discussion of Transportation 'Functionality' Performance Measures *25 min*
7. **Call to the Audience (At 8 P.M.)** *10 min*
8. CTF Roundtable *20 min*
9. Adjourn

# Update on the Process for Defining Functionality

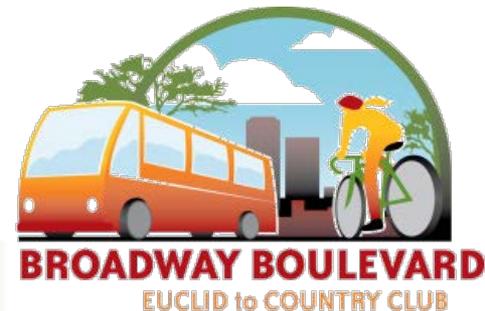
**Jim DeGroot, Director of Transportation Services  
Regional Transportation Authority**

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



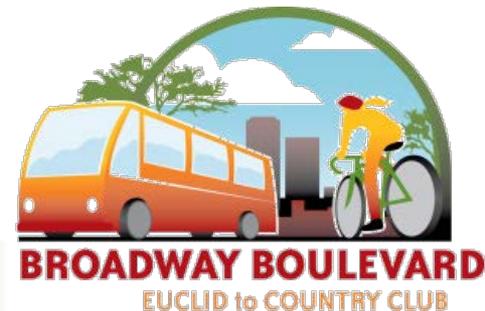
# Framing the Discussion on Functionality and Performance Measures

Phil Erickson, AIA, President  
Community Design + Architecture



# Role of Functionality in Roadway Design

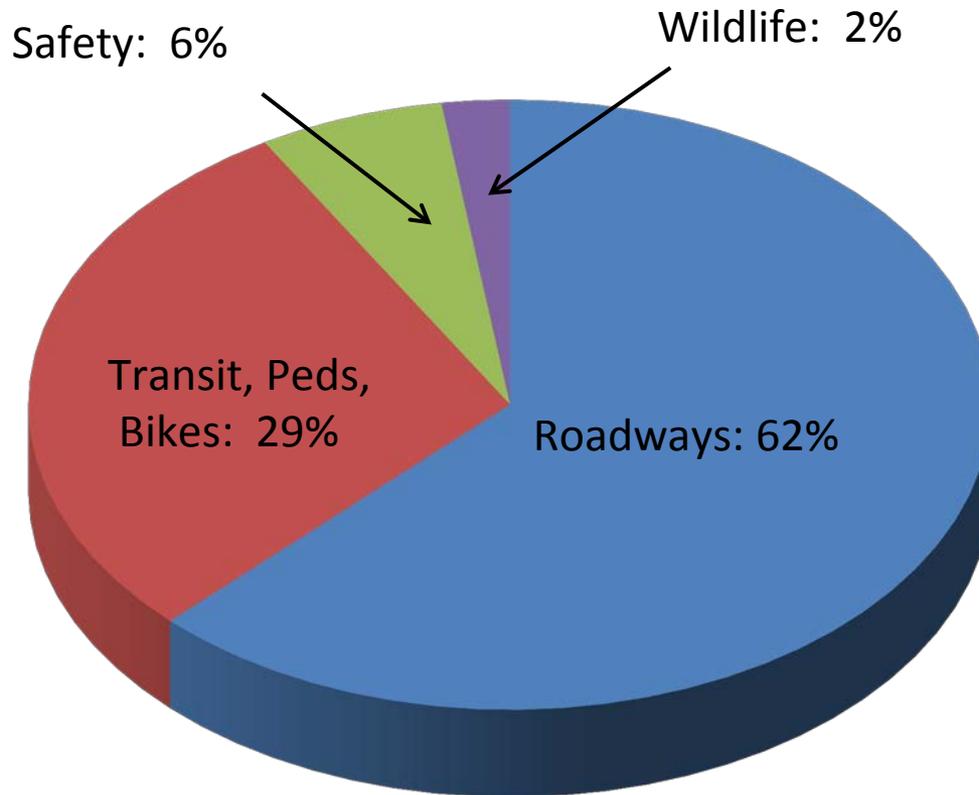
- Defining “Functionality”– What is it? And for whom?
- Vision and Goals: reflect community’s definition of functionality
- Select evaluation criteria related to Broadway’s functionality
- Apply performance measures to assess performance of existing conditions and proposed design alternatives



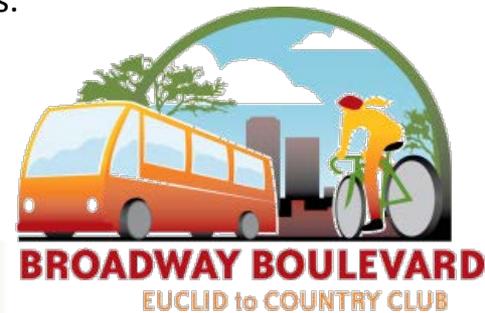
# Functionality

- RTA's adopted policy:
  - the “functionality should not and cannot be diminished” for voter-approved roadway and transit improvement projects
- Definition of Functionality:
  - How well does Broadway perform for its users
  - 1987 Study was focused on vehicular and transit function
  - City of Tucson and Broadway stakeholders interested in
    - Making sure transportation functionality is multi-modal
    - Adding non-transportation functionality

# Allocation of RTA Plan Funds

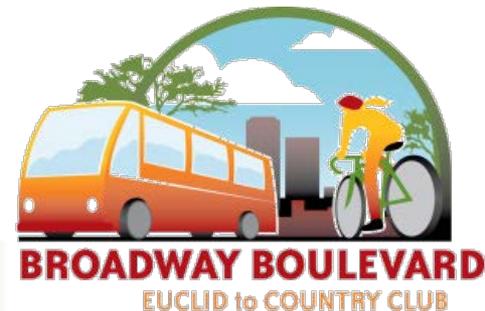


Note: Additional transit, ped, bike improvements included in roadway projects.



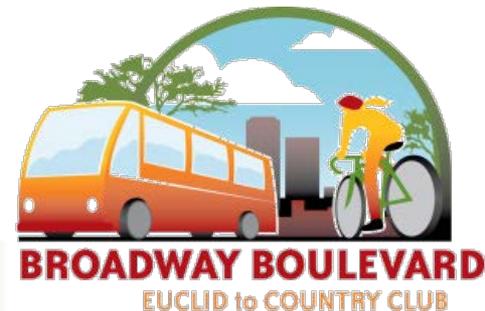
# Tonight's Focus on **Multi-Modal** Transportation Functionality

- Mobility – ability to travel
- Access – ability to reach destinations
- Safety – number and severity of accidents and personal safety
- Convenience – time, cost, and ease of travel
- Environmental – air quality and noise



# Multi-Modal Functionality

- Mobility
  - Balancing local and regional mobility (both a vehicular and a transit issue)
  - Balancing different modes
  - Potential for modal emphasis
  - Other...



# Multi-Modal Functionality

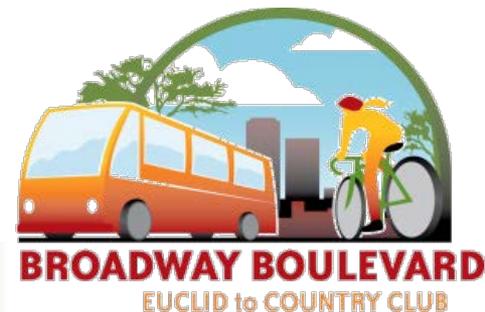
- Access
  - Balancing mobility along Broadway with access to uses and neighborhoods
  - Balancing access with safety across modes
  - Other...

# Multi-Modal Functionality

- Safety
  - Balancing mobility for vehicles with safety for bicycles and pedestrians
  - Access management to improve safety
  - Other...

# Multi-Modal Functionality

- Convenience
  - Providing effective modal choice
  - Minimizing time cost of travel
  - Minimizing cost of travel to users
  - Improving the experience of travel
  - Other...



# Multi-Modal Functionality

- Environmental
  - Minimizing or improving air quality impacts
  - Minimizing or improving noise impacts
  - Other...

# Measuring Functionality

- **Later Agenda Item**

- Evaluation Criteria

- Address Areas of Concern – mobility, access, safety, convenience, air quality,...
    - These will build from the Vision and Goals for Broadway

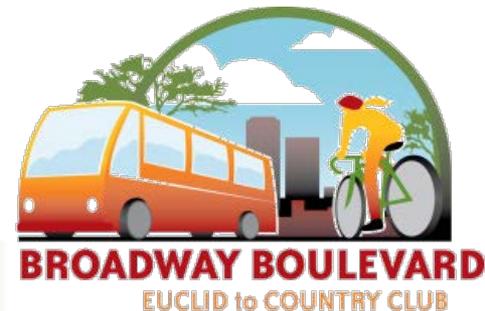
- Performance Measures

- Measuring the success in meeting evaluation criteria
    - Possible thresholds
    - Use for comparison between design alternatives

# CTF Discussion

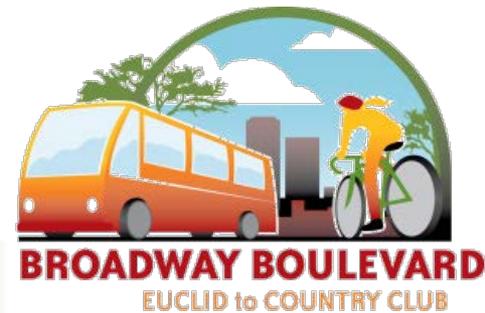
## Role of Functionality in Roadway Design

- Defining “Functionality”– What is it? And for whom?
- Vision and Goals: reflect community’s definition of functionality
- Select evaluation criteria related to Broadway’s functionality
- Apply performance measures to assess performance of existing conditions and proposed design alternatives



# Broadway Project Area Traffic Analysis Summary Presentation

Jim Schoen, PE, Principal  
Kittelson & Associates

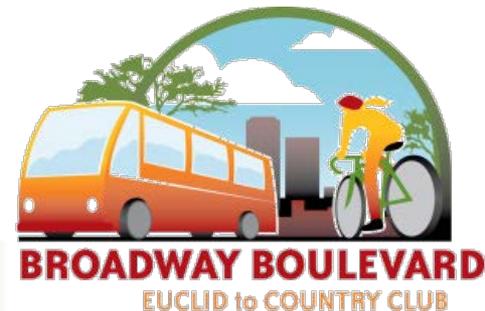


# Traffic Overview

- Corridor Traffic Planning & Studies
- Roadway Classification and Function
- Existing Conditions
- Future Needs

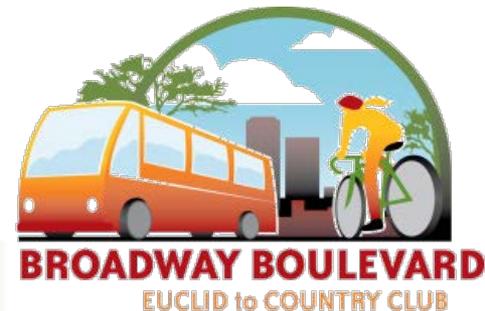
# Corridor Studies

- Broadway Corridor Plan (1987)
  - Transit focus
  - Defined current adopted cross section and alignment
- PAG High Capacity Transit System Plan (2009)
  - Identified Broadway as primary HCT candidate route
- Euclid to Country Club Traffic Study (On-going)

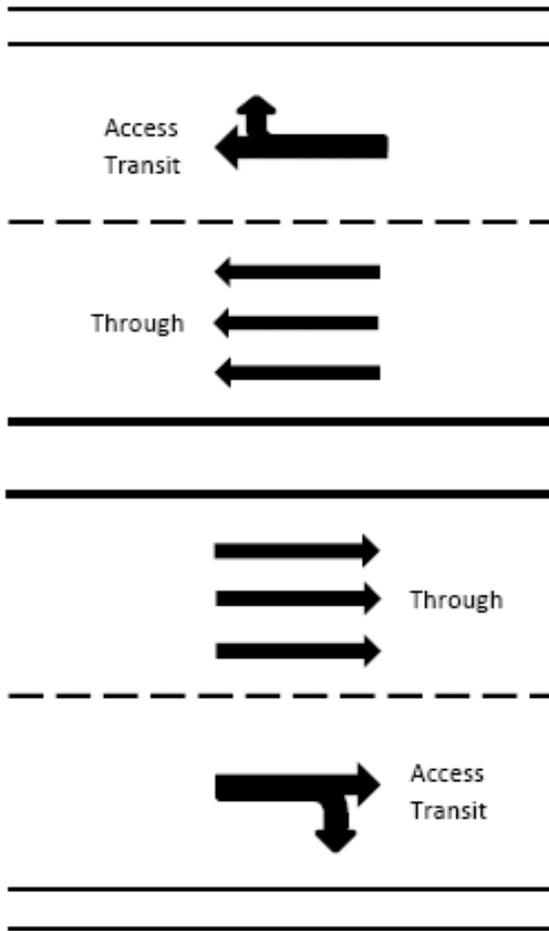


# On-Going Study Purpose

- Support design decisions that address:
  - Safety
  - Capacity (lanes, turn-lane storage)
  - Traffic control, signal operations
  - Access
  - Multi-modal facilities
  - Neighborhood protection



# Roadway Classification and Function



- Principal Urban Arterial
  - Backbone of urban system
  - Provide regional mobility
  - Connect major employment and activity centers
  - Provide high capacity
  - Allow limited access to adjacent properties

# Major Activity Centers



# Physical Features



- 4 travel lanes with continuous left turn lane
- 5 foot bike lanes
- Continuous sidewalk/paved surface (ADA deficiencies)
- 16 transit stops

# Physical Features

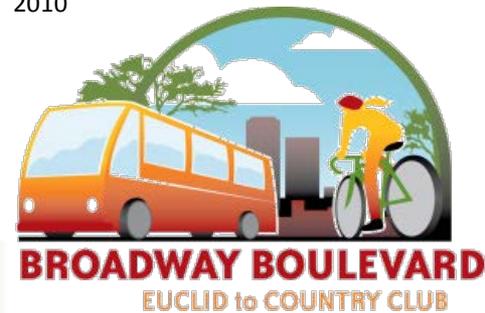
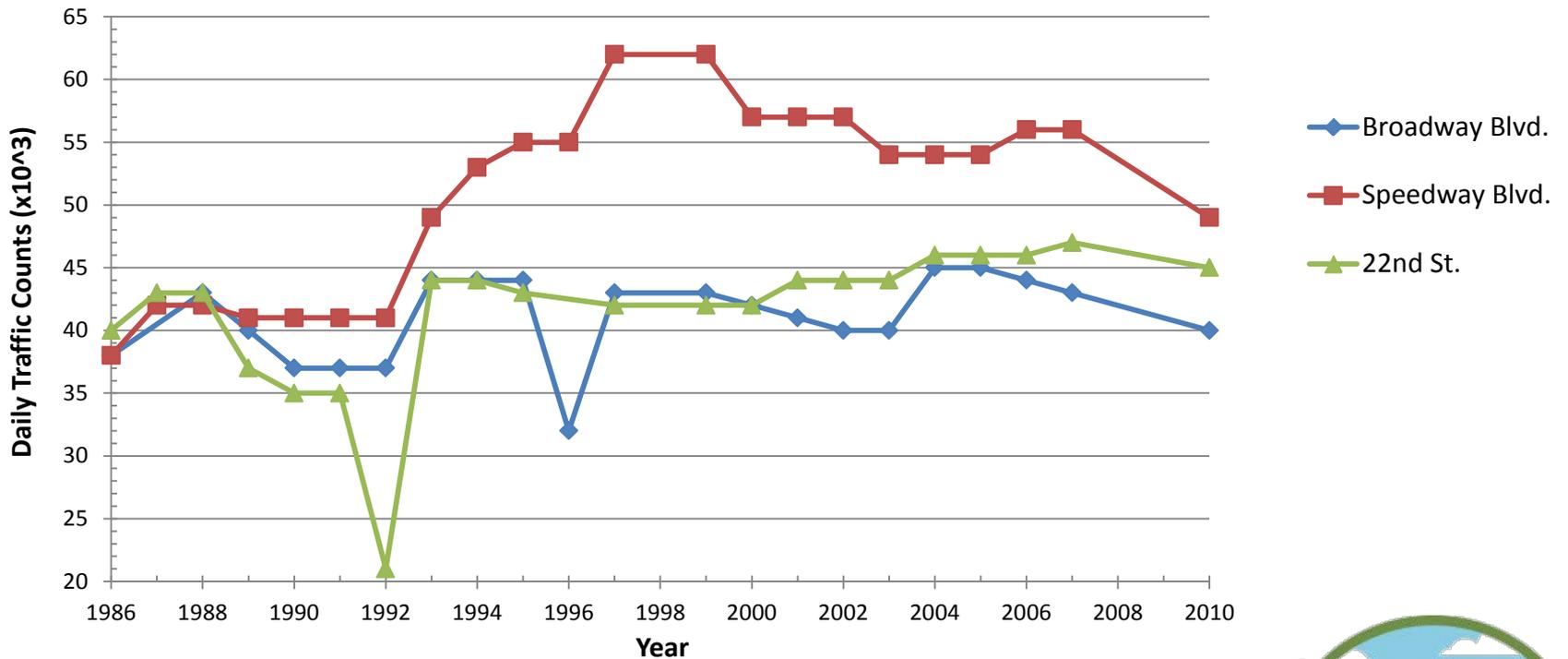


- 5 signalized intersections
- 4 pedestrian HAWK signals, 1 planned
- 200 access points (driveways & side-streets)
  - 100 ft spacing

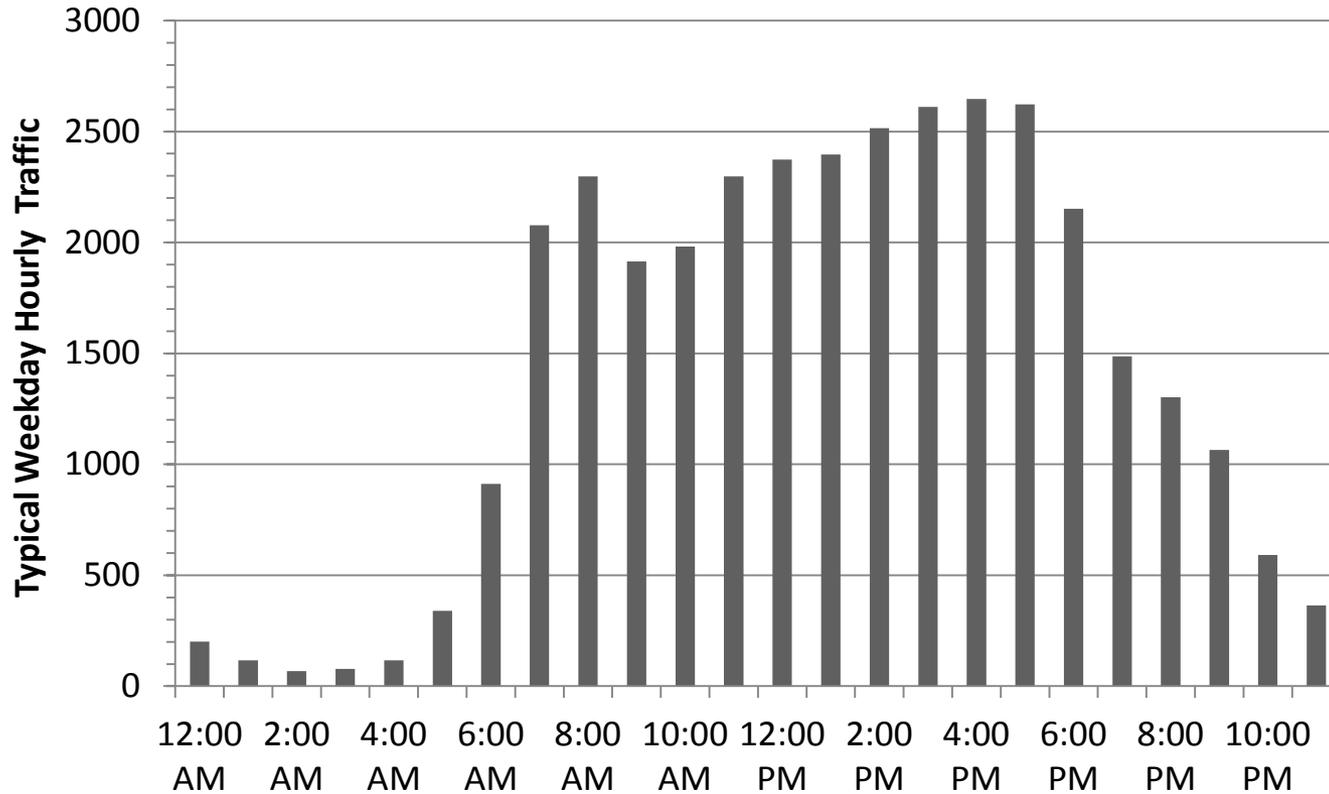


# Traffic Volumes

Daily Traffic Counts on Major Arterials by Year  
(from Campbell Ave. to Country Club Rd.)

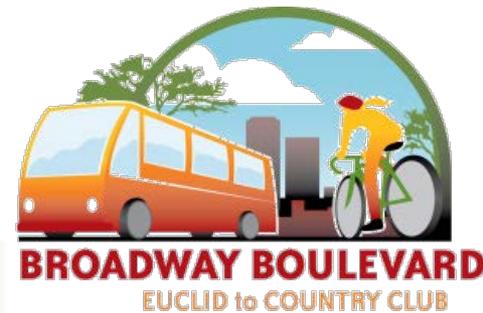


# Average Weekday Hourly Traffic



Feb 2009 Count

Time



# Transit Ridership

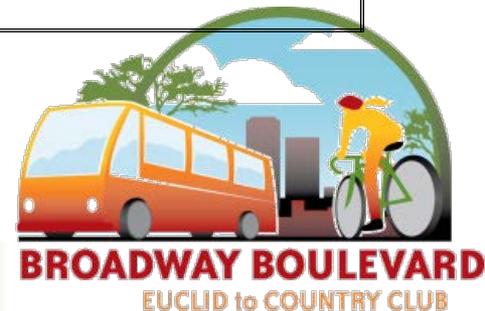


Route	Annual Ridership (2011/2012)
<b>8 - Broadway/6<sup>th</sup> Ave</b>	<b>3,182,789</b>
16 - Oracle/12 <sup>th</sup> Ave	1,919,850
4 - Speedway	1,614,785
11 - Alvernon Way	1,339,851
6 - S. Park/N. First Ave	1,283,986
108 Broadway Express	22,596

# Pedestrian Activity

Intersection	2011 Pedestrian Volumes (Signal Activations)		
	During Peak Hours on Broadway		Peak Pedestrian Crossing Activity
	AM	PM	
Park Ave./Broadway Blvd. (HAWK)	22 (18)	11 (9)	41 (15); 9:15-10:15 AM
Cherry Ave./Broadway Blvd. (HAWK)	19 (11)	14 (12)	21 (9); 7:45-8:45
Norris Ave./Broadway Blvd. (HAWK)	3 (3)	6 (5)	15 (9); 3:15-4:15 PM
Plumer Ave./Broadway Blvd. (HAWK)	17 (12)	14 (13)	27 (12); 3:15-4:15 PM
Treat Ave./Broadway Blvd. (marked crosswalk)	1 (NA)	1 (NA)	6 (NA); 9:45-10:45

\* Does not include peds crossing at signalized intersections



# Traffic Operations Measure: Level of Service

## Signalized Intersection LOS

1 cycle      2 cycles      3 cycles

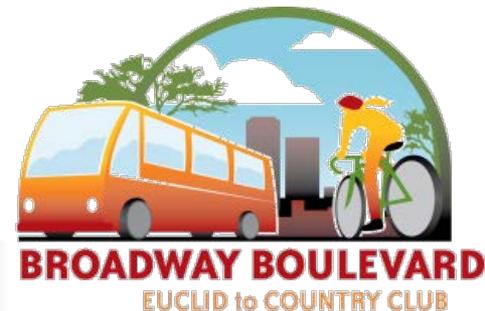
Intersection LOS	A	B	C	D	E	F
Delay (s/veh)	≤10	10-20	20-35	35-55	55-80	≥80

## Arterial LOS, Speed Limit = 35mph

Standard      Maximum  
(Peak Hours)

Segment LOS	A	B	C	D	E	F
Travel Speed (mph)	≥30	23-30	18-23	14-18	10-14	≤10

7.5 min      10 min      >12 min



# Existing Peak Hour Traffic Operations

Intersection		Euclid	Highland	Campbell	Tucson	Country Club
AM	LOS	D	B	D	C	C
	Movements LOS > D	EBL, SBL		EBL, NBT		SBL
PM	LOS	C	A	D	C	D
	Movements LOS > D	SBL		EBL, WBL, SBL		SBL

Arterial		Euclid	Highland	Campbell	Tucson	Country Club
AM	Travel Speed	←		C	←	
	LOS			20 mph		
PM	Travel Speed	→			C	→
	LOS				19 mph	

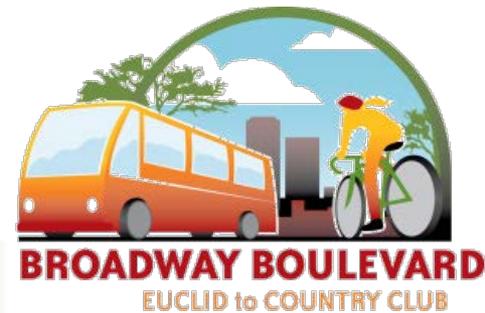
# Multi-Modal Operations

Existing MMLOS	Transit	Bicycle	Pedestrian
Score	1.3	4.56	3.17 - 3.75
LOS	A	<b>E</b>	<b>C - E</b>
MMLOS Criteria	<ul style="list-style-type: none"> <li>• Frequency</li> <li>• Perceived Wait/Travel Time</li> <li>• Speed</li> <li>• Seating/Shelter</li> </ul>	<ul style="list-style-type: none"> <li>• % Heavy Vehicle</li> <li>• Vehicle Speed/Volume</li> <li>• Lane Width</li> <li>• Pavement Quality</li> <li>• #Driveways/Sidestreets</li> </ul>	<ul style="list-style-type: none"> <li>• Vehicle Speed/Volume</li> <li>• Sidewalk Presence/Width</li> <li>• Lateral Separation</li> </ul>

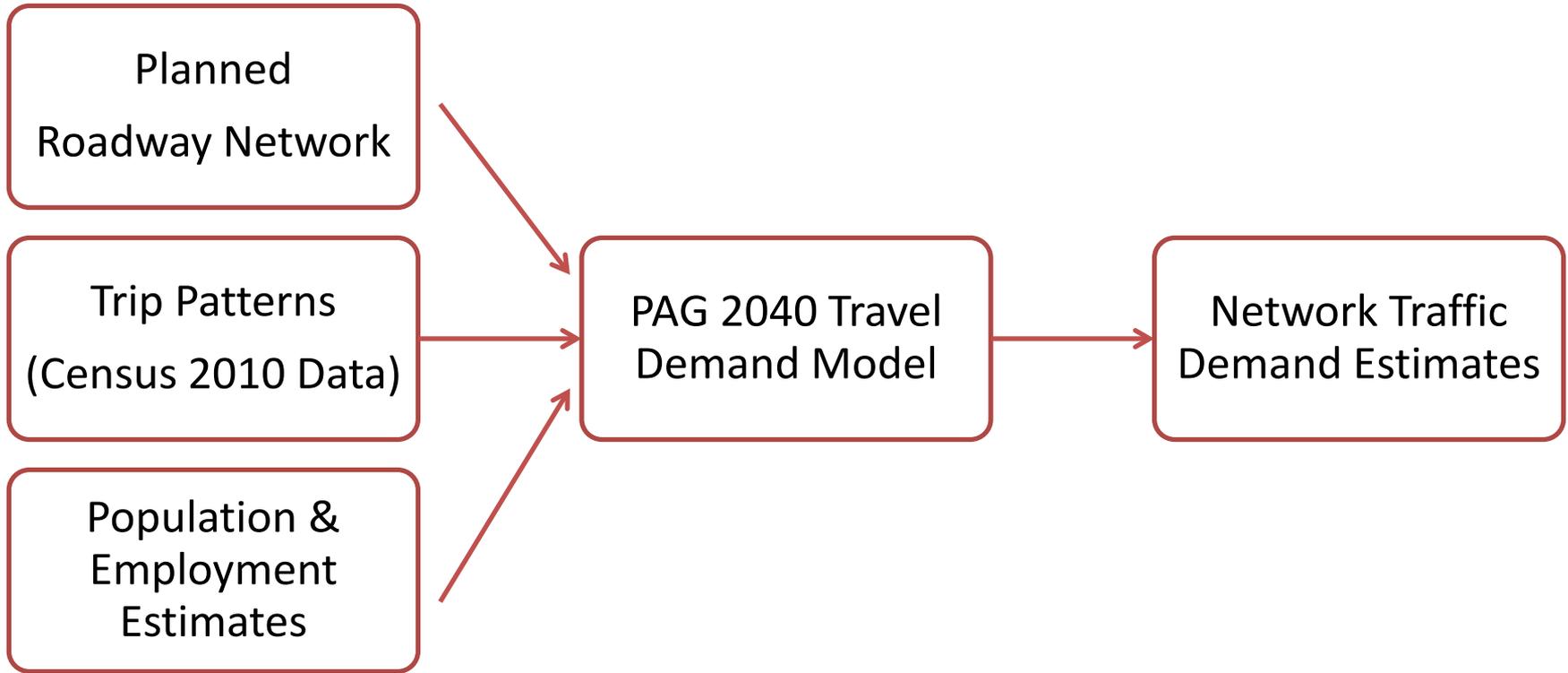
# Crash History

Crash data for the 3-year period from January 1, 2008 to December 31, 2010:

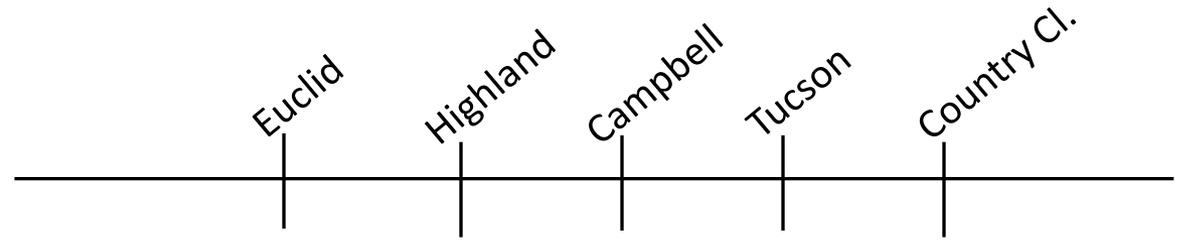
Crashes	Euclid	Highland	Campbell	Tucson	Country Cl.	Total
Intersection	67	12	101	51	70	301
Segment		27	26	59	21	133
						<b>434</b>



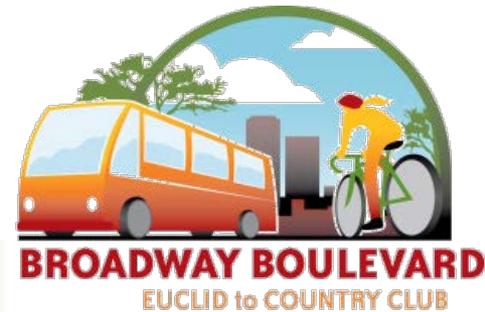
# Future Traffic Demand



# Traffic Projections

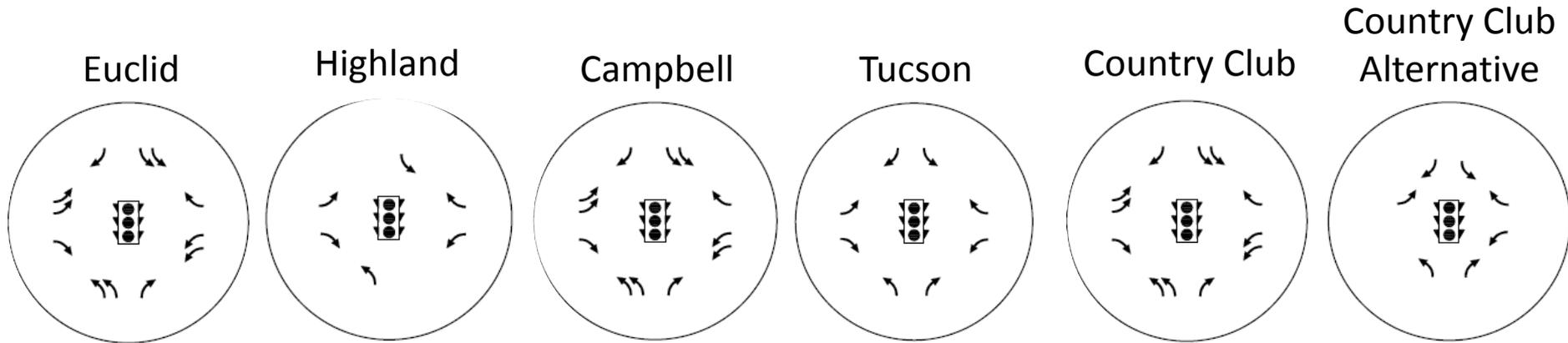


		Euclid	Highland	Campbell	Tucson	Country Cl.	
Existing	Volume (1000's)	35	34	34	40	40	41
PAG 2040	Volume (1000's)	41	45	46	56	47	52
	% Increase	18%	33%	36%	39%	18%	27%
PAG Reduced Growth	Volume (1000's)	39	41	42	50	45	48
	% Increase	12%	22%	24%	26%	12%	18%



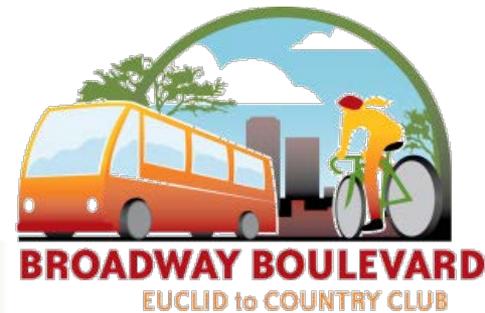
# Cross Section Alternatives

- 4 and 6 through lanes
- Exclusive turn lanes at signalized intersections

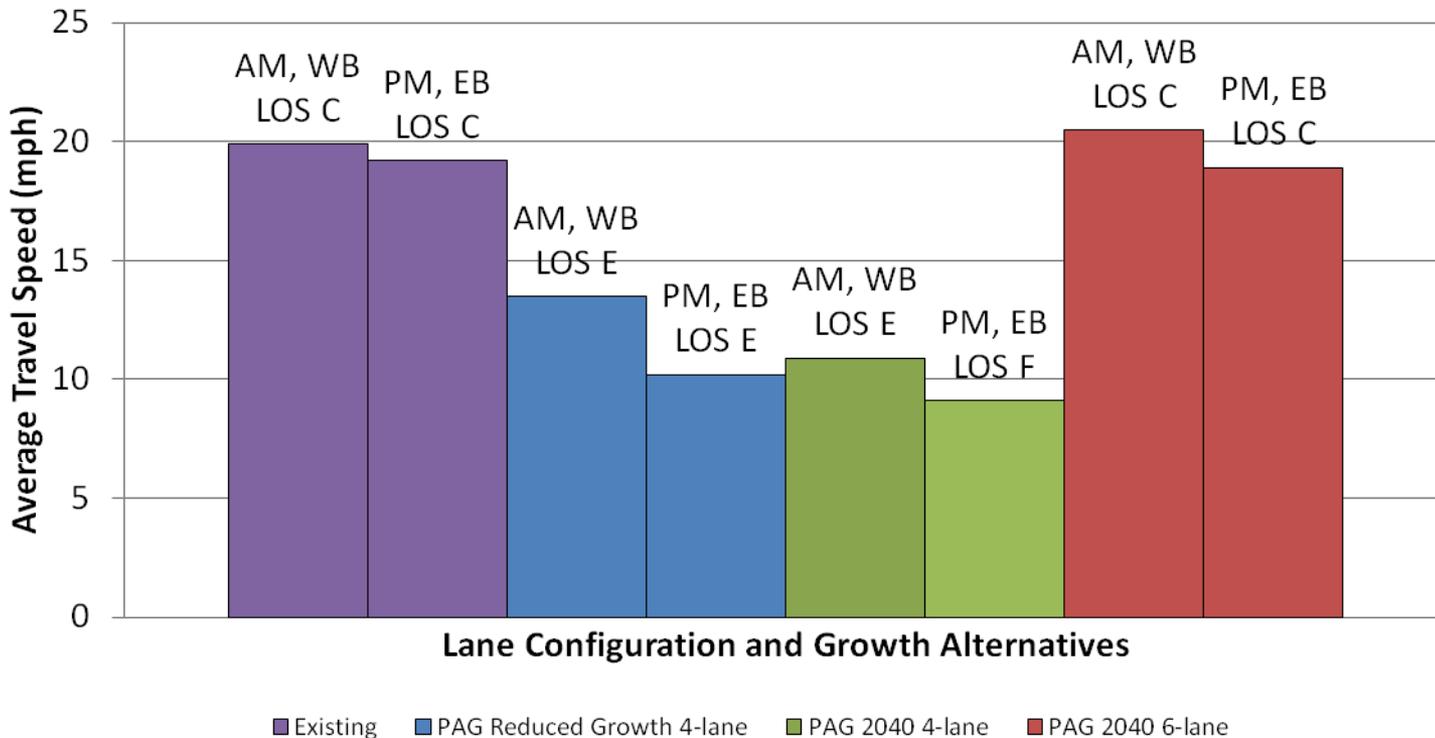


# Capacity Needs

Overall Intersection LOS							
Alternative		Euclid	Highland	Campbell	Tucson	Country Cl.	Country Cl. Alt.
4-lane PAG 2040 (30%)	AM	E	B	F	D	C	D
	PM	D	B	F	E	E	F
4-lane PAG Reduced Growth (20%)	AM	D	B	E	C	C	C
	PM	D	B	F	D	E	F
6-lane PAG 2040 (30%)	AM	C	B	D	B	C	C
	PM	C	A	D	C	C	D



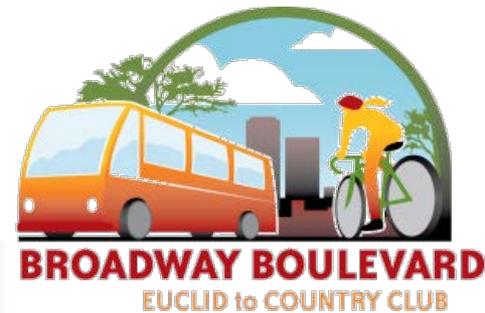
# Arterial Travel Speed



\* Does not account for impacts of driveways or HAWKS

# Multi-Modal Facilities

Cross Section	Results	Transit	Bicycle	Pedestrian
6 lane divided w/ 12 ft multi-use lanes & 6ft sidewalk	Score	0.25	3.55	3.02
	LOS	A	D	C
6 lane divided w/ 5 ft bike lanes & 6ft sidewalk	Score	1.27	4.37	3.10
	LOS	A	E	C
4 lane divided w/ 5 ft bike lanes & 6ft sidewalk	Score	1.31	4.65	3.33
	LOS	A	E	D

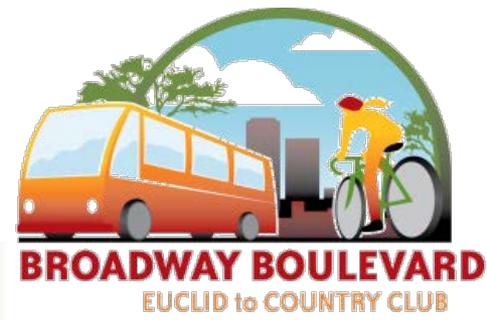


# High Capacity Transit

- Bus Rapid Transit (BRT) most feasible
- PAG evaluating implementation alternatives

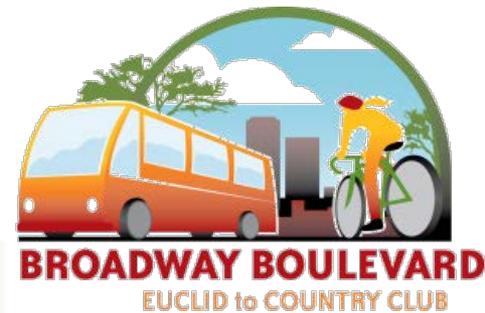


# Questions?



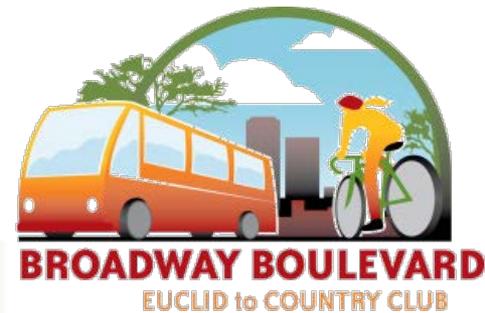
# Introduction to Transit, PAG's High Capacity Transit Study & Bus Rapid Transit (BRT)

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



# Transportation Functionality Performance Measures

Phil Erickson, AIA, President  
Community Design + Architecture



# Measuring Functionality

- **Later Agenda Item**

- Evaluation Criteria

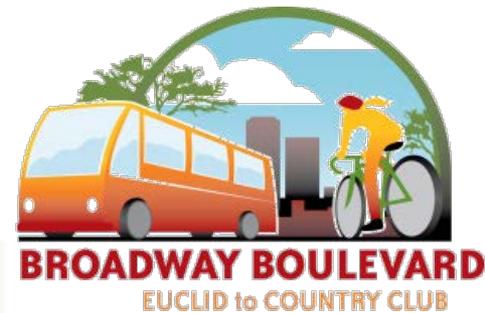
- Address Areas of Concern – mobility, access, safety, convenience...
    - These will build from the Vision and Goals for Broadway

- Performance Measures

- Measuring the success in meeting evaluation criteria
    - Possible thresholds
    - Use for comparison between design alternatives

# EPA Guide to Sustainable Transportation Measures

“many transportation agencies are now being called upon by their stakeholders to plan, build, and operate transportation systems that – **in addition to achieving the important goals of mobility and safety for all modes** – support a variety of **environmental, economic, and social objectives.**”



# EPA Guide to Sustainable Transportation Measures

- Performance Measures for different stages of transportation planning:
  - Land use visioning
  - Long-range transportation plans
  - **Corridor Studies (Broadway Boulevard Project)**
  - Programming
  - Environmental Review
  - Performance Monitoring

# 12 EPA Guide Performance Measures Applicability to Corridors

1. **Transit Accessibility**
2. **Bicycle and Pedestrian Mode Share**
3. VMT per Capita
4. Carbon Intensity
5. Mixed Land Uses
6. **Transportation Affordability**
7. **Benefits by Income Group**
8. **Land Consumption**
9. **Bicycle and Pedestrian Activity and Safety**
10. **Bicycle and Pedestrian Level of Service**
11. **Average Vehicle Occupancy**
12. **Transit Productivity**

# 12 EPA Guide Performance Measures

## Applicability to Broadway

- 1. Transit Accessibility**
- 2. Bicycle and Pedestrian Mode Share**
- VMT per Capita
- Carbon Intensity
- Mixed Land Uses
- Transportation Affordability (not directly affected by Broadway project)
- Benefits by Income Group (data not readily available at study area geography)
- 8. Land Consumption**
- Bicycle and Pedestrian Activity and Safety (alternative measures Bicycle and Ped LOS)
- 10. Bicycle and Pedestrian Level of Service**
- Average Vehicle Occupancy (alternative measure – Person Travel Time)
- 12. Transit Productivity**

# Possible Additional Measures for Broadway

- 13. Vehicular Intersection Level of Service
- 14. Vehicular Corridor Level of Service
- 15. Transit Level of Service
- 16. Suitability for Future High Capacity Transit
- 17. Access Management Improvement
- 18. Mixed Use Accessibility
- 19. Person Travel Time

# Possible **Transportation-related** Performance Measures

- 1. Transit Accessibility**
- 2. Bicycle & Pedestrian Mode Share**
- 3. VMT per Capita**
- 4. Carbon Intensity**
- 5. Mixed Land Uses**
6. Transportation Affordability
7. Benefits by Income Group
- 8. Land Consumption**
9. Bicycle and Pedestrian Activity and Safety
- 10. Bicycle and Pedestrian Level of Service**
11. Average Vehicle Occupancy
- 12. Transit Productivity**
- 13. Vehicular Intersection Level of Service**
- 14. Vehicular Corridor Level of Service**
- 15. Transit Level of Service**
- 16. Suitability for Future High Capacity Transit**
- 17. Access Management Improvement**
- 18. Mixed Use Accessibility**
- 19. Person Travel Time**

# Discussion of Example Performance Measures

Performance Measure	EPA Guide Possible Metric	Planning Team Possible Metric
<b>Possible EPA Guide Transportation Performance Measures</b>		
1. <b>Transit Accessibility</b> - the ability of people to reach destinations using public transportation in a convenient way. (Transportation Measure)	<ul style="list-style-type: none"> <li>• Amount of population and jobs within walking distance of transit stops.</li> <li>• Amount of jobs or services available within a certain travel time for residents.</li> <li>• Amount of housing or services available within a certain travel time for workers.</li> </ul>	<ul style="list-style-type: none"> <li>• Transit frequency and dependability.</li> <li>• Transit travel time along the corridor.</li> </ul>
2. <b>Bicycle and Pedestrian Mode Share</b> - the proportion of trips taken by walking or bicycling. (Transportation Measure)	<ul style="list-style-type: none"> <li>• Proportion of total trips that are walking or bicycling trips - for all trips or work trips only during peak-period or average daily travel.</li> <li>• May also include transit trips, depending if exact modes are identifiable by model or a significant number.</li> </ul>	<ul style="list-style-type: none"> <li>• Data and modeling tools are not available to estimate future pedestrian mode share, but it appears that the bicycle mode share that PAG models <u>could</u> be used for the project.</li> <li>• For development along Broadway and in adjacent neighborhoods.</li> <li>• For total trips along Broadway.</li> </ul>
3. <b>Vehicle Miles Traveled (VMT) per Capita</b> - measures the amount of vehicle activity normalized to population. (Transportation Measure) <i>(Not identified as applicable to corridor projects)</i>	<ul style="list-style-type: none"> <li>• VMT per capita.</li> <li>• Light-duty VMT per capita.</li> <li>• VMT per employee.</li> </ul>	<ul style="list-style-type: none"> <li>• For development along Broadway and in adjacent neighborhoods.</li> </ul>
4. <b>Carbon Intensity</b> - measures CO <sub>2</sub> emissions normalized to population. (Transportation Measure) <i>(Not identified as applicable to corridor projects)</i>	<ul style="list-style-type: none"> <li>• Total transportation CO<sub>2</sub> emissions per capita.</li> </ul>	<ul style="list-style-type: none"> <li>• Total transportation CO<sub>2</sub> emissions per corridor person trip.</li> <li>• Total transportation emission of other pollutants per corridor person trip.</li> <li>• Total transportation particulate emissions per corridor person trip.</li> </ul>

# Discussion of Example Performance Measures

Performance Measure	EPA Guide Possible Metric	Planning Team Possible Metric
5. <b>Mixed Land Uses</b> - measure of the ratio of jobs to housing. (Non-Transportation Measure) ( <i>not identified as applicable to corridor projects</i> )	<ul style="list-style-type: none"> <li>Ratio of jobs to housing at a regional, city, or neighborhood level.</li> </ul>	<ul style="list-style-type: none"> <li>While measuring the ratio of jobs to housing is relatively unimportant in terms of performance for a corridor segment, the provision of services within walking distance can be a benefit to local residents and jobs.</li> <li>It is not clear that the Broadway project will establish new land use regulations for the area so this measure is not applicable at this point in the process.</li> <li><i>See 18 - Mixed Use Accessibility.</i></li> </ul>
6. <b>Transportation Affordability</b> - measures the cost of transportation relative to income. (Transportation Measure)	<ul style="list-style-type: none"> <li>Annual cost of transportation relative to annual income for overall population adjacent to corridor or for those traveling the corridor segment.</li> <li>Alternatively measure annual cost of transportation relative to annual income for different income groups.</li> </ul>	<ul style="list-style-type: none"> <li>It is difficult to estimate the cost of future trips along Broadway.</li> <li>Could be measured for residents and workers in the study area, but not clear that changes to Broadway would significantly affect their transit costs with the exception of transit improvements that are evaluated through other performance measures.</li> </ul>
7. <b>Benefits by Income Group</b> - measures benefits for range of income and minority groups. (Transportation and Non-Transportation Measures)	<ul style="list-style-type: none"> <li>Performance measures can be analyzed for different population groups to illustrate how decisions will affect disadvantaged communities compared to others. Performance measures that may be appropriate include:               <ul style="list-style-type: none"> <li>1 - Transit Accessibility</li> <li>3 - Vehicle Miles Traveled</li> <li>6 - Transportation Affordability</li> <li>18 - Mixed Use Accessibility</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>It is difficult to estimate the proportion of future trips along Broadway that are made by people of different income and racial groups.</li> <li>It is not clear that design alternative would change these characteristics with the exception of transit improvements that are evaluated through other performance measures.</li> </ul>

# Discussion of Example Performance Measures

Performance Measure	EPA Guide Possible Metric	Planning Team Possible Metric
8. <b>Land Consumption</b> - measures amount of land consumed by new transportation infrastructure and/or new development served by the infrastructure. (Non-Transportation Measure)	<ul style="list-style-type: none"> <li>• Number of lane miles of roadway.</li> <li>• <i>(Majority of metrics are related to greenfield/suburban development, not an urban project like Broadway.)</i></li> </ul>	<ul style="list-style-type: none"> <li>• Square feet or acres of new right-of way.</li> <li>• Square feet or acres of new paved right-of-way.</li> <li>• Square feet of private land acquired for new right-of-way.</li> <li>• Additional metrics, such as businesses and residences lost will be identified in later memo.</li> </ul>
9. <b>Bicycle and Pedestrian Activity and Safety</b> - measures bicycle and pedestrian activity and safety in specific locations. (Transportation Measure)	<ul style="list-style-type: none"> <li>• Bicycles per day.</li> <li>• Pedestrians per day.</li> <li>• Bicycle crashes per 1,000 cyclists.</li> <li>• Pedestrian crashes per 1,000 pedestrians.</li> <li>• <i>(Difficulty in modeling bicycle and pedestrian trips, no modeling of crashes, and no information is available regarding historic pedestrian and bicycle accidents in this section of Broadway).</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Level of Bicycle and Pedestrian Activity is difficult to model in relationship to benefits of physical infrastructure.</i></li> <li>• <i>See Measure 10 - Bicycle and Pedestrian Level of Service for potential metrics related to bicycle and pedestrian infrastructure.</i></li> <li>• Frequency of protected crossings of Broadway.</li> <li>• Travel time across Broadway, considering distance and average delay waiting for signal.</li> </ul>
10. <b>Bicycle and Pedestrian Level of Service</b> - measures quality of service from the perspective of a bicyclist or pedestrian. (Transportation Measure)	<ul style="list-style-type: none"> <li>• Bicycle LOS - safety and comfort from an adult cyclist perspective combined measure of roadway width, bike lane widths and striping combinations, traffic volume, pavement surface conditions, motor vehicle speed and type, and on-street parking.</li> <li>• Pedestrian LOS - similar to bicycle LOS, a combined measure of roadway/street width and striping combinations, presence of a sidewalk, presence and spacing of street trees, traffic volumes, motor vehicles speed, and on-street parking.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>(Bicycle and Pedestrian LOS combine measurement of physical improvements, traffic conditions and other metrics that are not actually direct trade-offs).</i></li> <li>• Measure the individual metrics rather than combine them into one “score” of LOS.</li> <li>• Also see, <i>18 - Mixed Use Accessibility.</i></li> </ul>

# Discussion of Example Performance Measures

Performance Measure	EPA Guide Possible Metric	Planning Team Possible Metric
11. <b>Average Vehicle Occupancy</b> - measures the average number of people per vehicle. (Transportation Measure)	<ul style="list-style-type: none"> <li>• Average number of occupants per vehicle.</li> <li>• Average number of occupants per private vehicle.</li> <li>• Can be measured as daily average or as peak-hour average.</li> </ul>	<ul style="list-style-type: none"> <li>• The PAG model's projection of vehicle occupancy is not sensitive to variations at the scale of the Broadway Boulevard alternatives.</li> <li>• See also, 19 - <i>Person Travel Time</i>.</li> </ul>
12. <b>Transit Productivity</b> - measures the average number of people per transit vehicle. (Transportation Measure)	<ul style="list-style-type: none"> <li>• Average weekday transit boardings per vehicle revenue hour.</li> <li>• Average transit boardings per vehicle revenue mile</li> <li>• Average annual transit boardings per route mile.</li> <li>• Passenger miles traveled per vehicle revenue mile.</li> </ul>	<ul style="list-style-type: none"> <li>• Average number of transit riders per vehicle weekday average.</li> <li>• Average number of transit riders per vehicle weekday peak hour average.</li> <li>• See also Possible Additional Measure 15 - Transit Level of Service.</li> </ul>
Possible Additional Measures	Planning Team Possible Metric	
13. <b>Vehicular Intersection Level of Service</b> - measures average time that vehicles wait at an intersection. (Transportation Measure)	<ul style="list-style-type: none"> <li>• Intersection LOS is typically measured for the peak traffic level for one hour in the morning and one hour in the afternoon/evening.</li> <li>• Alternative Metrics: <ul style="list-style-type: none"> <li>○ Average number of minutes a motorist waits at intersection during the 8 am to 8 pm time period; and during morning and afternoon/evening peak hour.</li> <li>○ Average number of minutes a pedestrian waits at an intersection, assuming arrive halfway through signal cycle and including crossing time.</li> <li>○ Average number of minutes a bicyclist waits at an intersection, assuming arrive halfway through signal cycle and including crossing time.</li> <li>○ Average number of minutes a bus waits at intersection during the 8 am to 8 pm time period; and during morning and afternoon/evening peak hour.</li> </ul> </li> </ul>	
14. <b>Vehicular Corridor Level of Service</b> - measures average speed of a motorist over a roadway segment. (Transportation Measure)	<ul style="list-style-type: none"> <li>• Corridor LOS is typically measured for the peak traffic level for one hour in the morning and one hour in the afternoon/evening.</li> <li>• Alternative Metrics (note - the following can also be expressed at the ratio of the actual travel time to the free flow travel time): <ul style="list-style-type: none"> <li>○ Average number of minutes it takes a motorist to travel the length of the corridor during the 8 am to 8 pm time period; and during morning and afternoon/evening peak hour.</li> <li>○ Average number of minutes it takes a cyclist to travel the length of the corridor during the 8 am to 8 pm time period; and during morning and afternoon/evening peak hour.</li> <li>○ Average number of minutes it takes a transit rider to travel the length of the corridor during the 8 am to 8 pm time period; and during morning and afternoon/evening peak hour.</li> </ul> </li> </ul>	

# Discussion of Example Performance Measures

Performance Measure	EPA Guide Possible Metric	Planning Team Possible Metric
Possible Additional Measures	Planning Team Possible Metric	
15. <b>Transit Level of Service</b> - measures quality of transit service more than roadway design factors. (Transportation Measure)	<ul style="list-style-type: none"> <li>• Transit LOS is typically measured at peak hours or on average for a weekday service period, and includes factors such as: transit vehicles per hour (headway), hours of service per day, vehicle area per passenger and passengers per seat, on-time percentage, headway dependability or adherence, etc.</li> <li>• Alternative Metrics: <ul style="list-style-type: none"> <li>○ Report the individual metrics that go into the Transit LOS measure that are most related to roadway design rather than transit service levels (because service levels cannot be directly influenced by the Broadway study), such as: on-time percentage and headway dependability or adherence.</li> </ul> </li> </ul>	
16. <b>Suitability for Future High Capacity Transit</b> - ability of the street design to accommodate future HCT. (Transportation Measure)	<ul style="list-style-type: none"> <li>• Likely focus on the ability of the street design to accommodate improvements that are being defined through the PAG Broadway BRT Study, such as dedicated lanes and stations, without further right-of-way acquisition.</li> </ul>	
17. <b>Access Management Improvement</b> - reduction in the amount of Broadway access points from properties. (Transportation Measure)	<ul style="list-style-type: none"> <li>• Total number of curb cuts on each side of Broadway.</li> <li>• Average curb cut spacing on each side of Broadway.</li> </ul>	
18. <b>Mixed Use Accessibility</b> - mix of uses within walking, bicycle, or transit accessible distance. (Transportation Measure)	<ul style="list-style-type: none"> <li>• Retail/service use within 10 minute walking, bicycling, or transit distance of a residence along the corridor or within adjacent neighborhoods.</li> <li>• Retail/service use within 10 minute walking, bicycling, or transit distance of an employment use along the corridor or within adjacent neighborhoods.</li> </ul>	
19. <b>Person Travel Time</b> - measures multi-modal travel time. (Transportation Measure)	<ul style="list-style-type: none"> <li>• Average corridor travel time per person for all modes.</li> </ul>	

# Possible **Transportation-related** Performance Measures

1. **Transit Accessibility**
2. **Bicycle** & Pedestrian **Mode Share**
3. **VMT per Capita**
4. **Carbon Intensity**
5. **Mixed Land Uses**
6. Transportation Affordability
7. Benefits by Income Group
8. **Land Consumption**
9. Bicycle and Pedestrian Activity and Safety
10. **Bicycle and Pedestrian Level of Service**
11. Average Vehicle Occupancy
12. **Transit Productivity**
13. **Vehicular Intersection Level of Service**
14. **Vehicular Corridor Level of Service**
15. **Transit Level of Service**
16. **Suitability for Future High Capacity Transit**
17. **Access Management Improvement**
18. **Mixed Use Accessibility**
19. **Person Travel Time**

# Call to the Audience

10 minutes

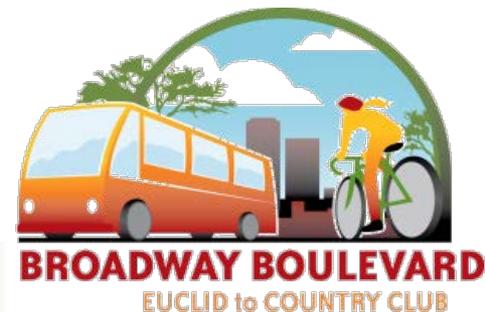
**Please limit comments to 2 minutes**

- 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

# CTF Roundtable

*Nanci Beizer*

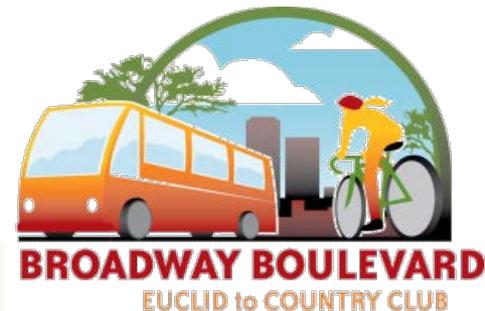
- Each CTF member gets a chance to share
- Feel free to share anything you want
- Feel free to ask any questions you want answered by staff



# Next Steps

*Nanci Beizer*

- Next CTF Meeting: **Thursday, 11/8/2012**  
5:30-8:30 p.m., Child & Family Resources
- Proposed Agenda:
  - Welcome / Agenda Review
  - Results of Historic Buildings Inventory
  - Results of Land Use, Urban Form, and Significant Structures Report
  - Introduction to Multi-modal Street Cross Section Elements and CTF Hands on Session
  - Roundtable
  - Call to the Audience



# 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)

