



CTAC MEETING #7
DECEMBER 4, 2018

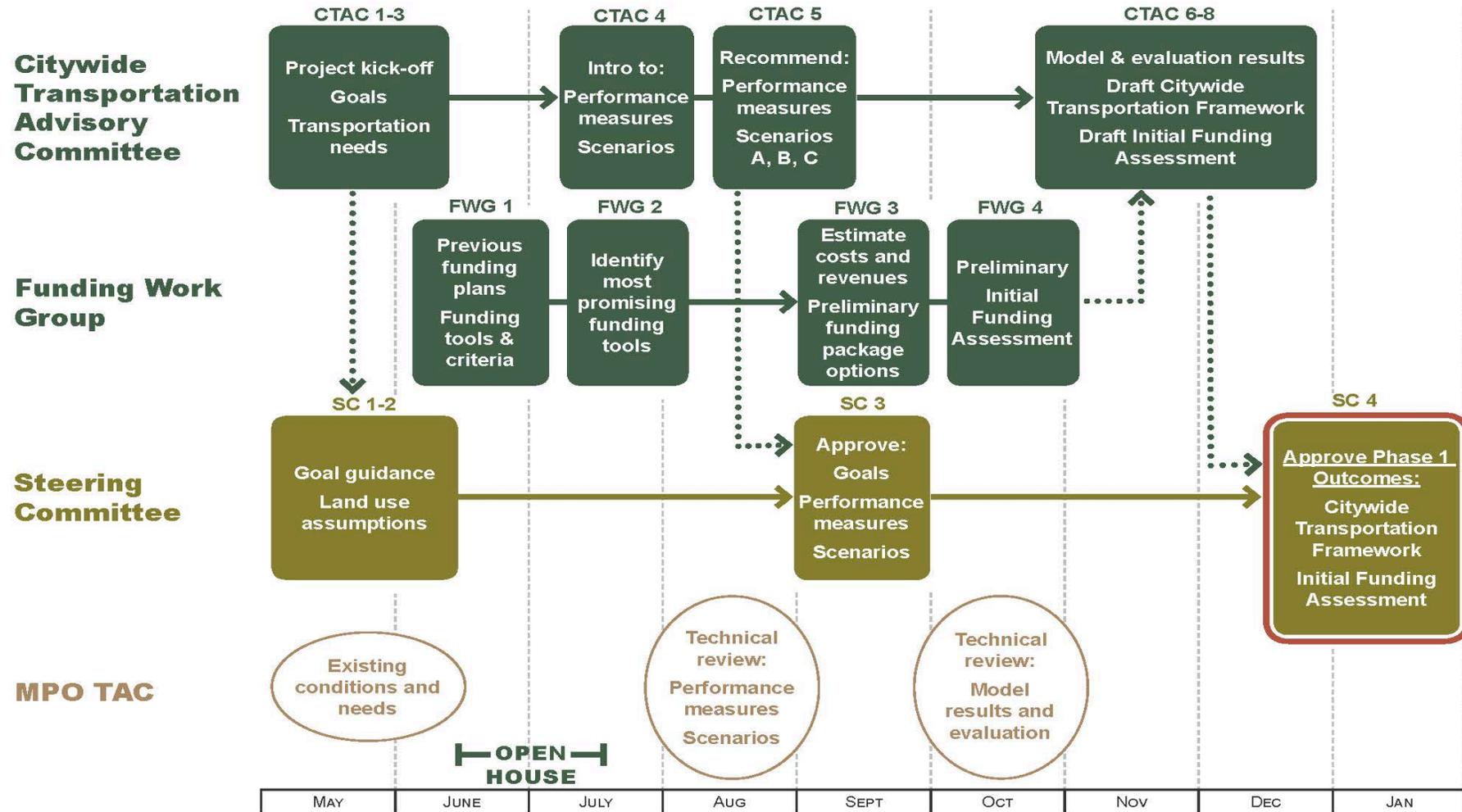


- Scenario evaluation results
 - ✓ Presentation and Q&A
 - ✓ *Desired outcome: shared understanding of high level findings*
- Projects to keep and set aside
 - ✓ Presentation, breakout and large group voting
 - ✓ *Desired outcome: agreement on foundational projects and projects to address outside of hybrid*
- Key Citywide needs
 - ✓ Presentation and breakout
 - ✓ Discuss pros/cons of different approaches for three key needs
 - ✓ *Desired outcome: direction on what to include in hybrid for discussion on Dec. 11*
- Public comment (10 minutes)



BEND TRANSPORTATION PLAN

Phase 1 Work Plan and Process



Updated: 11/8/2018

REMINDER: WE ARE WORKING TOWARD A HYBRID



August:

Do the scenarios include all the critical projects to evaluate?

Product: three distinct scenarios to test

Nov./Dec.:

Which projects/programs should be considered for inclusion in the TSP?

Product: a hybrid "Citywide Framework," (e.g., regional multi-modal transportation system)

Jan./ Feb. 2019:

Which neighborhood-level projects should be included in the Transportation Plan

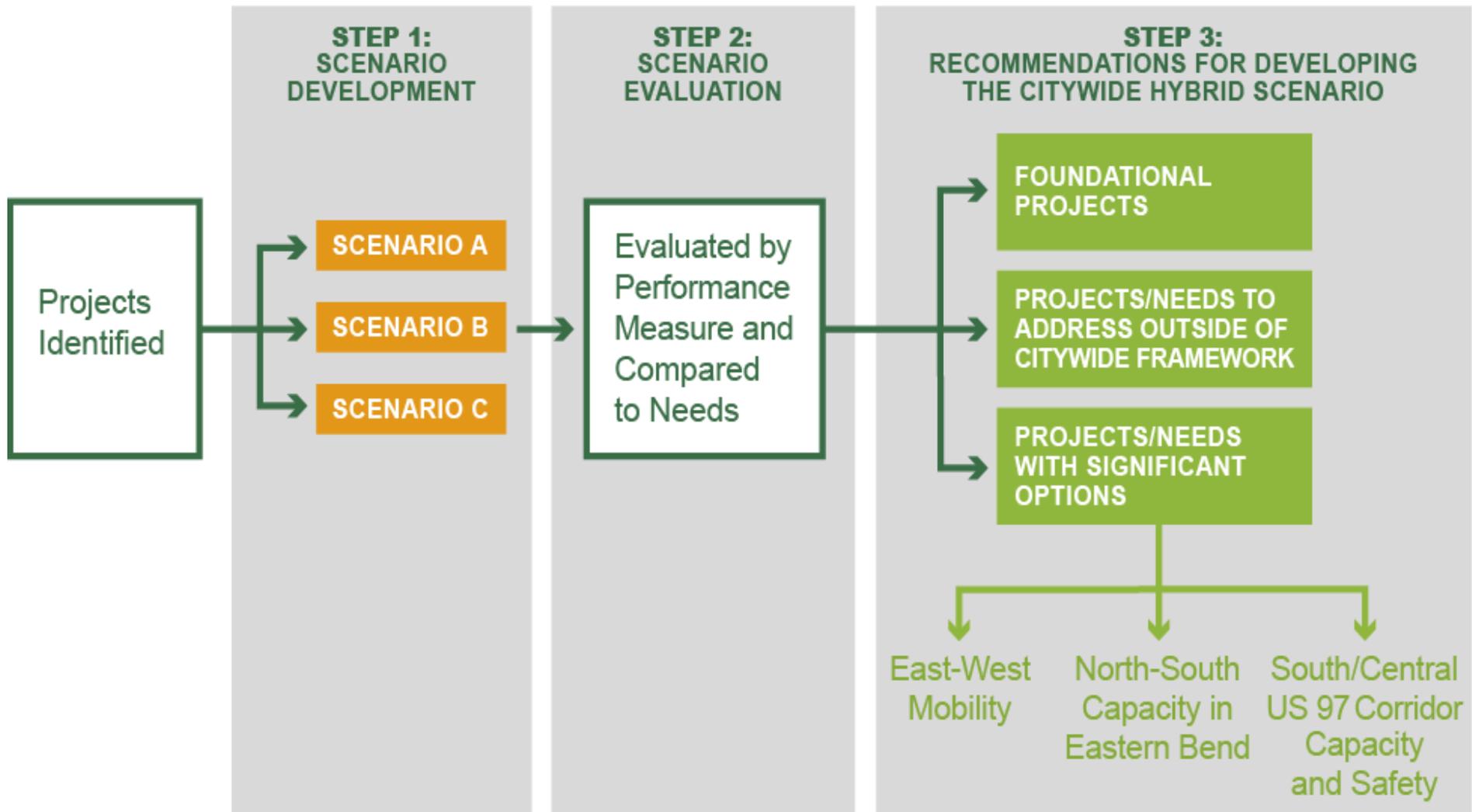
Product: neighborhood-level projects and program priorities

Summer 2019:

Which projects/programs are most important to implement?

Product: prioritized list of projects for funding and long-term unfunded projects

CITYWIDE HYBRID DEVELOPMENT STEPS





Any CTAC conflicts on:

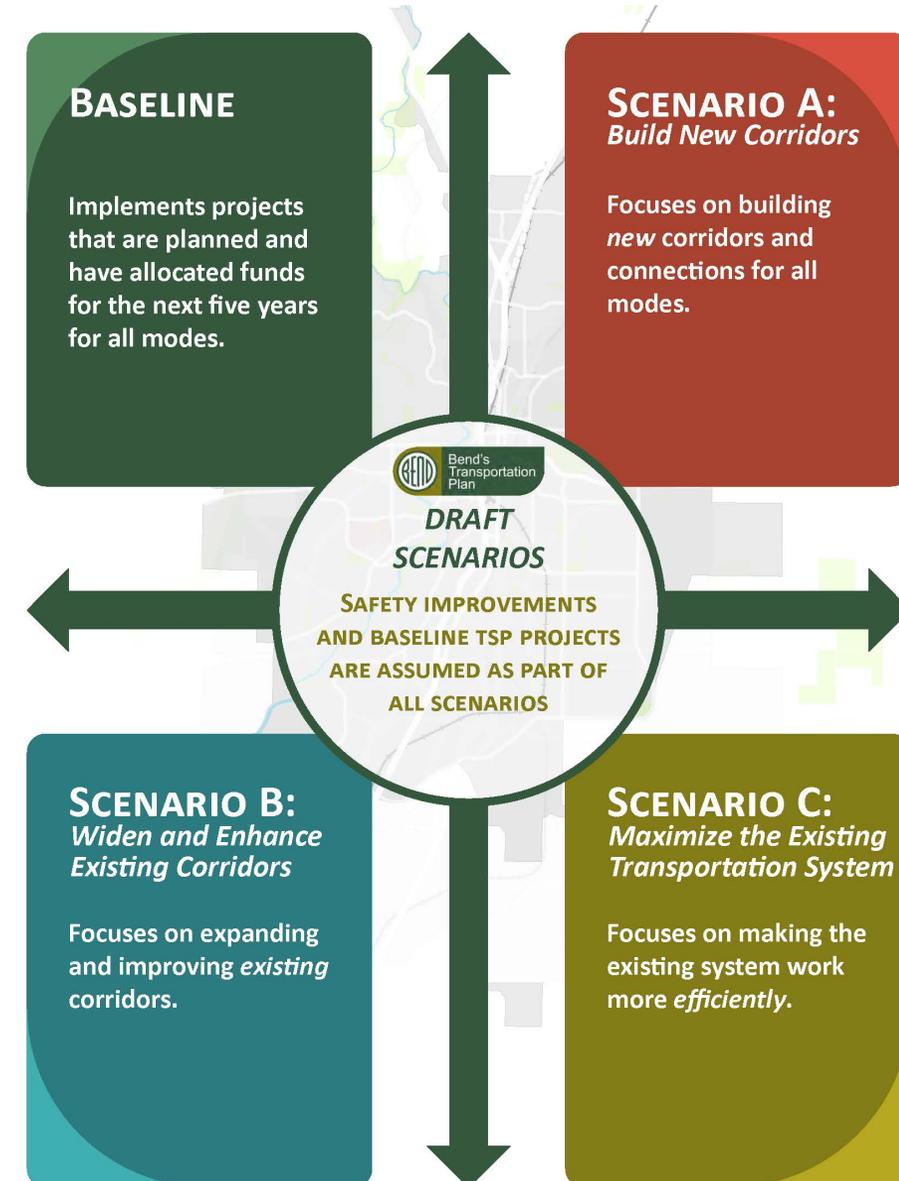
- Foundational Projects?
- Projects to address outside of the Citywide Framework?

SCENARIO EVALUATION: WHAT DID WE LEARN?

REMINDER: SCENARIOS DEVELOPED TO ADDRESS THE NEEDS



- **Scenarios** were developed and evaluated to:
 - *Learn* how different types projects and programs perform
 - *Inform* creation of a Citywide Framework (a hybrid scenario)

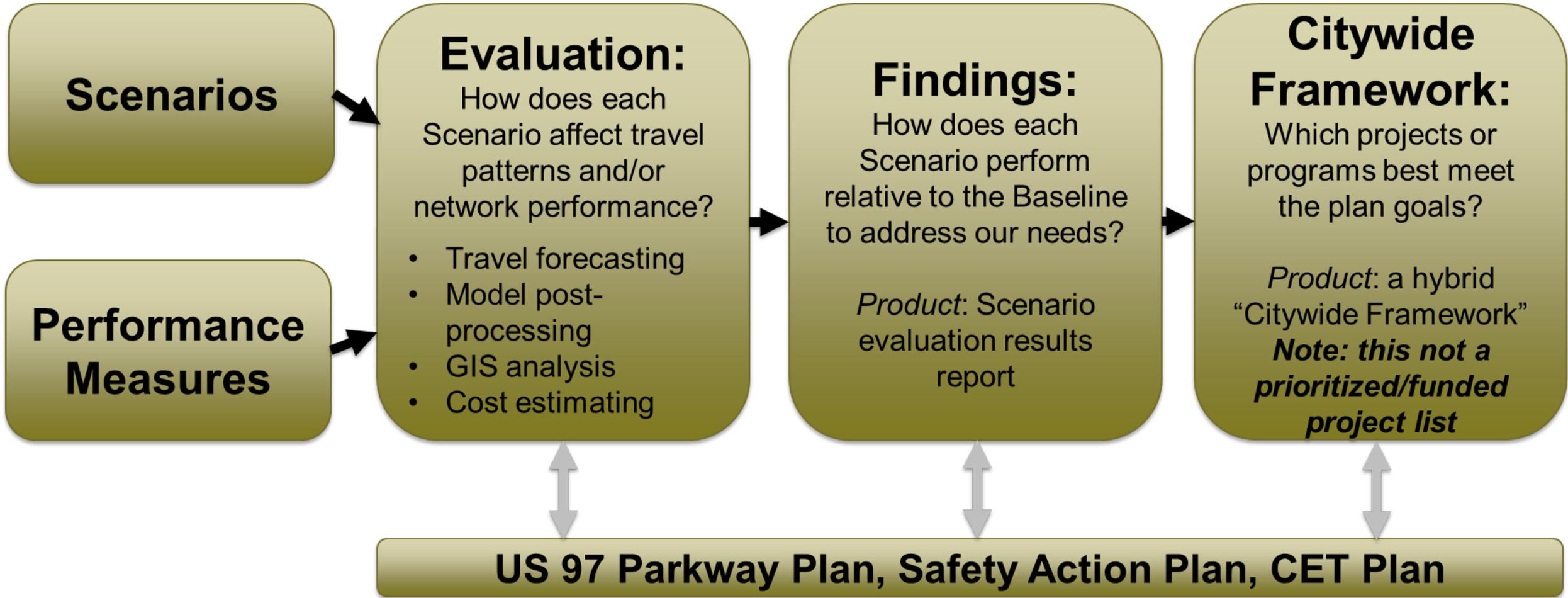


REMINDER: WHAT DID WE *MEASURE*?



Goal	Performance Measure
1: Increase System Capacity, Quality & Connectivity for All Users	<ul style="list-style-type: none"> • Demand-to-capacity ratio • Sidewalk system completeness • Bicycle system level of traffic stress • Completeness of low-stress network
2: Ensure Safety for All Users	<ul style="list-style-type: none"> • Qualitative assessment of predicted crash rates
3: Facilitate Housing Supply, Job Creation, & Economic Development to Meet Demand/Growth	<ul style="list-style-type: none"> • Vehicle hours of delay • Peak hour VMT on rural facilities (diversion) • Travel time reliability
4: Protect Livability & Ensure Equity & Access	<ul style="list-style-type: none"> • Transportation equity • Employment accessibility • Vulnerable populations within 0.25 mile of sidewalks, low-stress bicycle facilities, and transit • Percentage of collector roads with an ADT above 4,000
5: Steward the Environment	<ul style="list-style-type: none"> • VMT/capita
6: Have a Regional Outlook & Future Focus	<ul style="list-style-type: none"> • Arterial roadway miles with demand to capacity ratio deficiencies • Potential for alternative funding • Mode split
7: Implement a Comprehensive Funding & Implementation Plan	<ul style="list-style-type: none"> • Capital cost • Roadway lane miles

REMINDER: SCENARIO EVALUATION PROCESS



WHAT DID WE *LEARN*?



Scenario	Significant Positive Performance	Negative Performance
A: Build New Corridors	<ul style="list-style-type: none"> • Demand to capacity ratio (congestion) • Predicted crash rates (safety) • Vehicle hours of delay (congestion) • Travel Time Reliability (on some of the worst corridors) 	<ul style="list-style-type: none"> • Percentage of collector roads with Average Daily Traffic of more than 4,000 • Roadway miles (cost)
B: Widen & Enhance Existing Corridors	<ul style="list-style-type: none"> • Demand to capacity ratio (congestion) • Bicycle system Level of Traffic Stress • Vehicle hours of delay (congestion) • Travel time reliability (congestion) 	<ul style="list-style-type: none"> • Vehicle Miles Traveled (VMT) per capita • Roadway miles (cost) • Predicted crash rates (on widened roadways)
C: Maximize Existing System	<ul style="list-style-type: none"> • Predicted crash rates (safety) • Employment Accessibility • VMT per capita 	

KEY FINDING – INCREASING ROADWAY CAPACITY



- Both Scenario A (increased connectivity) and Scenario B (widening corridors) would significantly increase roadway capacity and reduce forecasted congestion*
 - Scenario A reduces congestion by spreading demand via new connections
 - Scenario B does the best job of reducing congestion on specific City arterials
 - Scenario C improves US 97, but has limited benefit to other corridors
- However, there are very different tradeoffs with major projects when thinking about connectivity vs. widening

* Congestion was measured using: demand to capacity ratio, vehicle hours of delay, & travel time reliability

KEY FINDING – INCREASING ROADWAY CAPACITY, CONT.

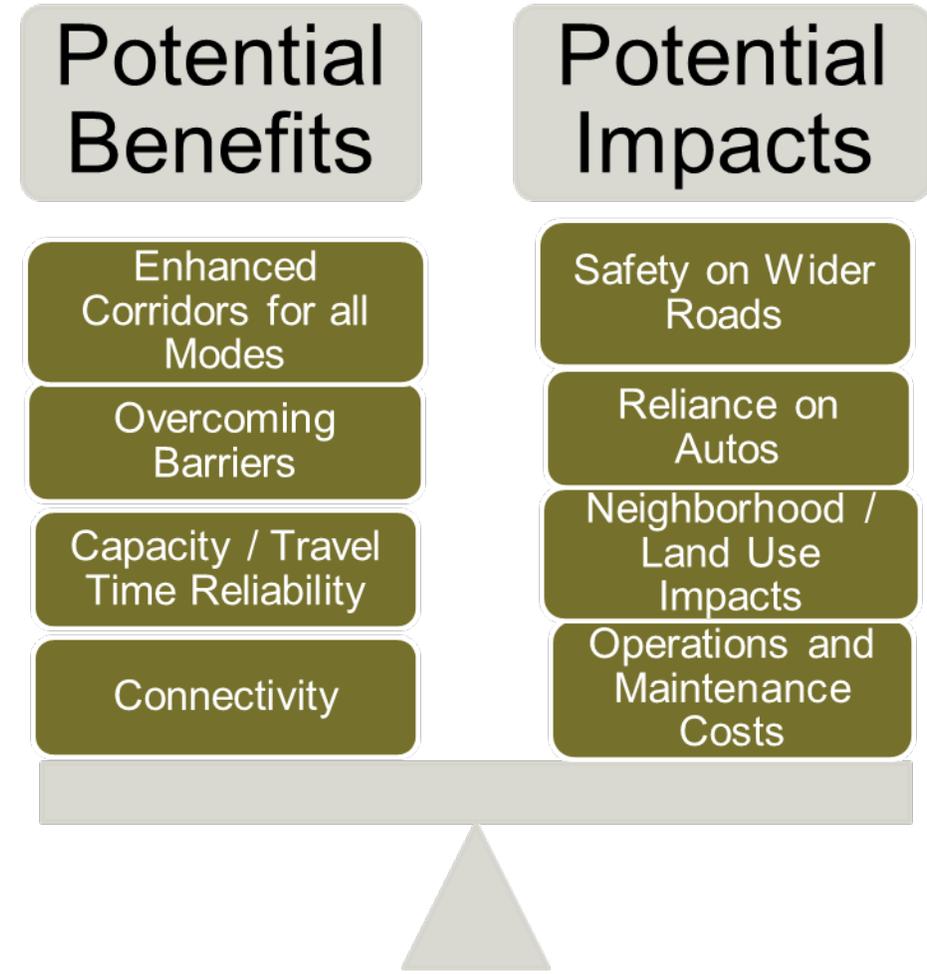


Major Project Improvement Type	Potential “Pros”	Potential “Cons”
Connectivity Projects	<ul style="list-style-type: none"> • Improve accessibility for walking and biking • Improve system safety by addressing barriers • Possible reduction in vehicle miles travelled (VMT) by reducing out-of-direction travel. 	<ul style="list-style-type: none"> • Costly and will increase operation and maintenance costs • Potential for neighborhood impacts (through traffic), which could impact livability in some areas
Widening Projects	<ul style="list-style-type: none"> • Enhance walking and bicycling facilities along improved roadways (safety and accessibility benefit) • Focus regional (through) traffic on arterial corridors 	<ul style="list-style-type: none"> • Costly and will increase operation and maintenance costs. • Possible increase in VMT • Possible impact to safety by creating higher volume/speed corridors that are difficult to cross

KEY FINDING – INCREASING ROADWAY CAPACITY KEY TAKEAWAY



- What's the takeaway?
- Use the right balance of tools:
 - When needed, major roadway connectivity or widening projects can significantly increase capacity and reduce congestion
 - But they are expensive and have significant other trade-offs
 - So consider them carefully in creating a balanced system that manages growth while preserving and enhancing Bend's character



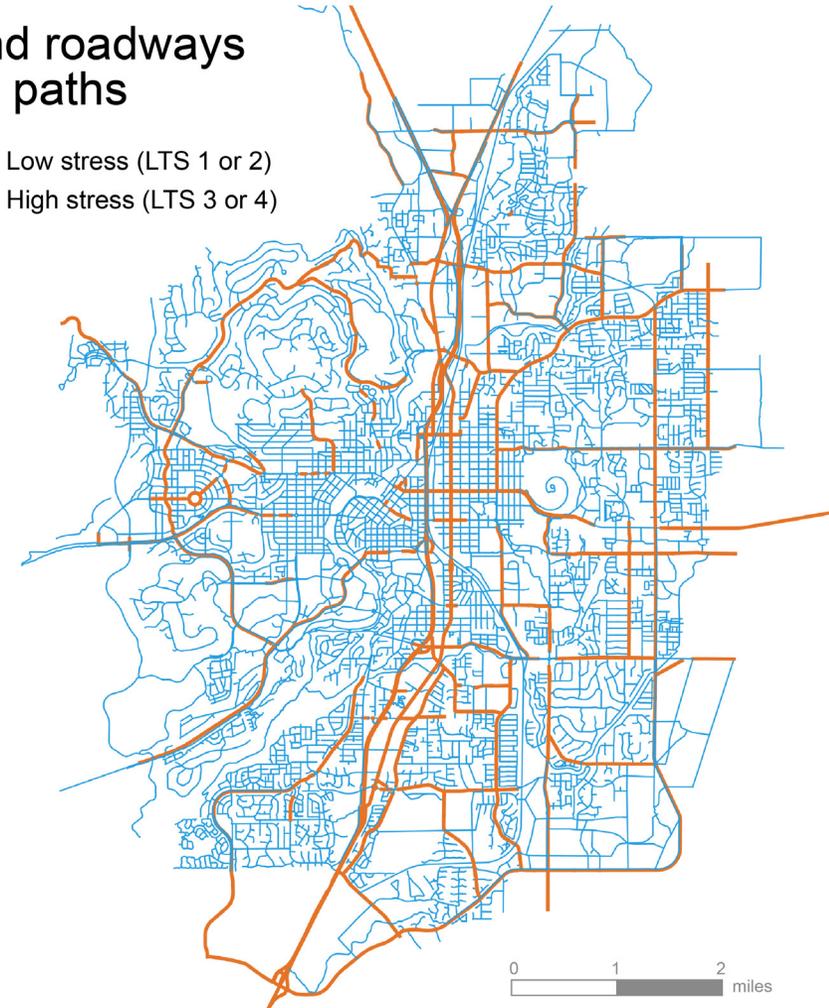
KEY FINDING – IMPROVING WALKING AND BIKING



- Improving walking and biking through Bend requires two related strategies:
 1. Filling key infrastructure gaps (sidewalks and bicycle facilities)
 2. Improving overall connectivity by developing complete, connected corridors throughout the City (both along and crossing corridors)

Bend roadways and paths

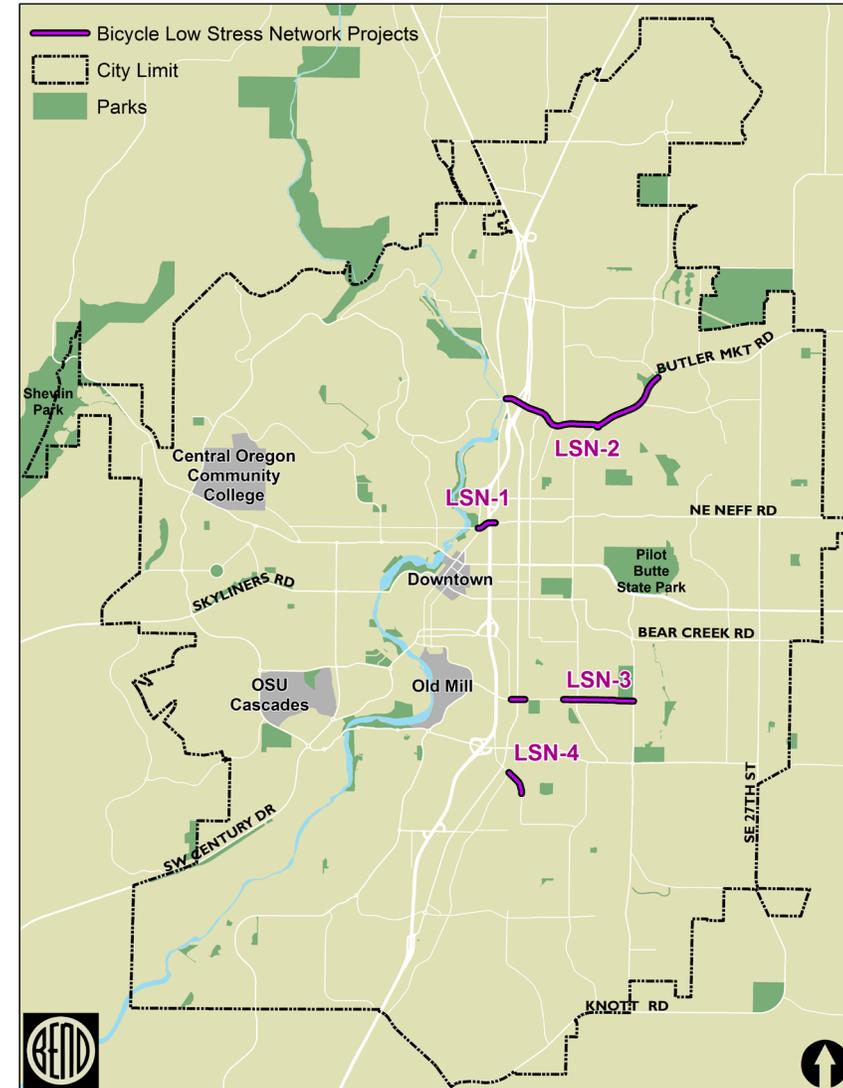
- Low stress (LTS 1 or 2)
- High stress (LTS 3 or 4)



KEY FINDING – IMPROVING WALKING AND BIKING, CONT.



- What's the takeaway?
- Consider different investment strategies:
 - Key projects that are part of the citywide (regional) framework
 - Annual programs to infill gaps in sidewalks, bicycle facilities, trails, and enhanced crossing



KEY FINDING – MOTOR VEHICLE DEMAND MANAGEMENT



Demand for motor vehicle trips can be reduced with:

- Transit service investment
- Service connections investment
 - Mobility Hubs to connect to first/last mile modes and services
- Policies and Programs to encourage carpooling and use of other modes
 - Parking pricing (evaluated downtown)
 - Major employment area commute options programs

KEY FINDING – DEMAND MANAGEMENT



- What's the takeaway?
- Demand reduction:
 - Can help manage roadway capacity/congestion needs
 - Is important to meet VMT/capita regulatory requirements
 - Can improve access to jobs (with transit and connecting service investment)



KEY FINDING – CAPACITY AND SAFETY ON US 97



- Ramp metering and closing at-grade connections could significantly improve congestion and safety on US 97
- Initial modeling indicates limited impacts to nearby City streets (traffic volume diversion)



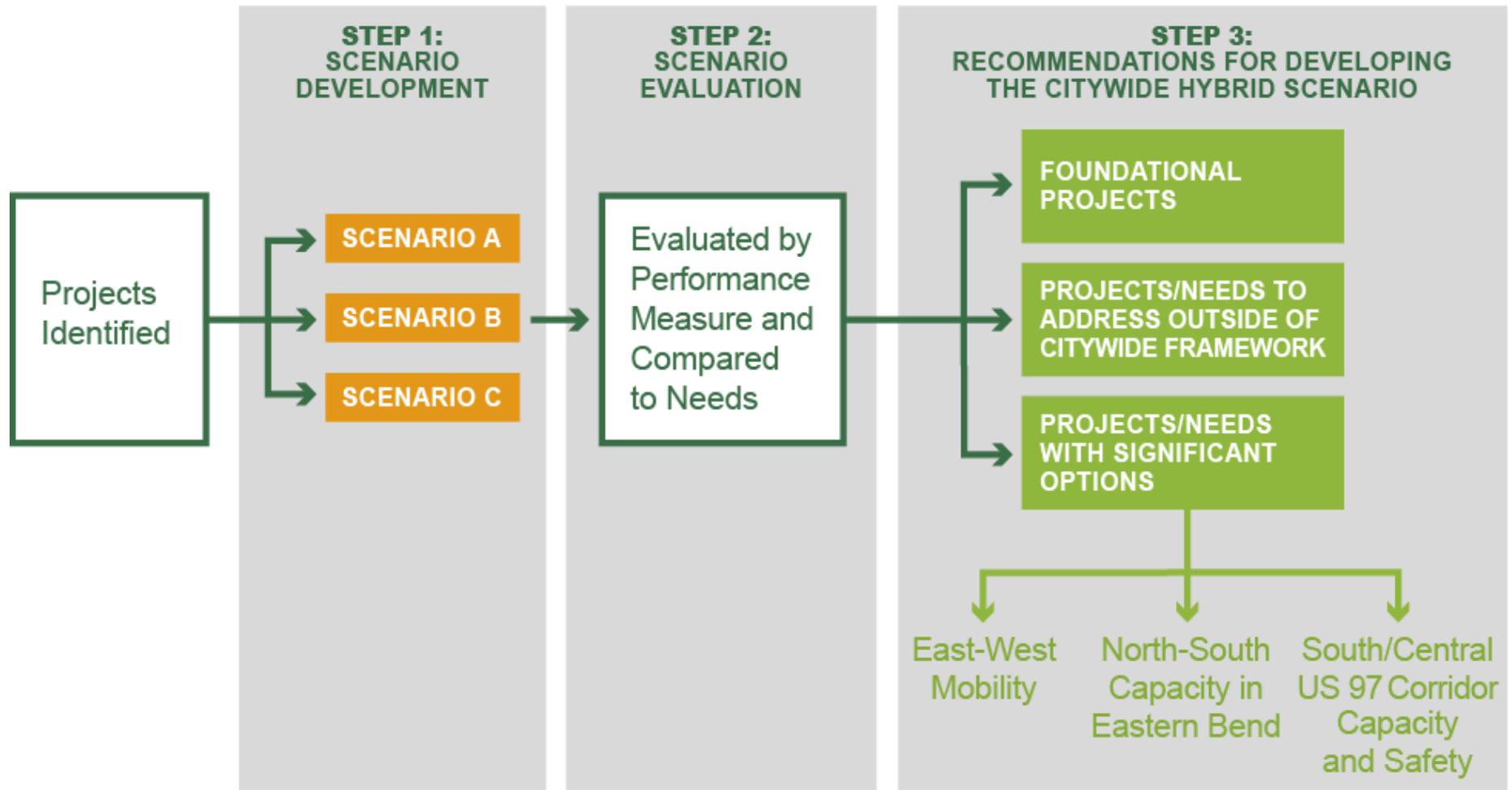
Source: © 2018 Google Maps Streetview

KEY FINDING – CAPACITY AND SAFETY ON US 97, CONT.



- What's the takeaway?
- US 97 Parkway Traffic Management:
 - Long-range forecasts have repeatedly indicated a future capacity issue on US 97
 - While access and on-ramp flow management appear to have significant benefits with the TSP performance measures, other factors may be as important to consider (business access, politics, etc.)
 - More detailed evaluation is underway with the US 97 Parkway Study

REMINDER: CITYWIDE HYBRID DEVELOPMENT STEPS



CITYWIDE FRAMEWORK: BUILDING TOWARDS A BALANCED SYSTEM



Baseline Project Types	Recommended Foundational Project Types
<p>Majority of Identified Projects:</p> <ul style="list-style-type: none">• Roadway widening• Roadway extensions• Intersection capacity and safety improvements• Upgrades of roads to "urban" standards <p>Other Types of Projects/Programs:</p> <ul style="list-style-type: none">• Bicycle greenways• Sidewalk infill• Citywide safety projects	<ul style="list-style-type: none">• Grade-separated crossings of barriers• US 97 interchanges<ul style="list-style-type: none">➤ Removal of signalized intersections➤ Added capacity with US 97 North Corridor FEIS• Protected bicycle facilities• Sidewalk and crossing improvements• Intersection capacity and safety improvements• Transit system investments<ul style="list-style-type: none">➤ Enhanced service on key corridors• Travel demand management<ul style="list-style-type: none">➤ TDM programs➤ Parking pricing• Technology investments<ul style="list-style-type: none">➤ Mobility hubs for first/last mile services connections➤ Traffic signal priority for freight and transit



Managing and Supporting Future Growth:

- The balance of investments in the Baseline + Foundational projects aligns with the approach in the Bend Integrated Land Use and Transportation Plan
- The balance of investments can help achieve the land use vision and projections in key areas with increasing density and mix of uses
- There are a few areas with significant capacity/congestion deficiencies that need further discussion to identify the right balance of improvements

PROJECTS RECOMMENDED AS FOUNDATIONAL



Foundational projects are recommended to advance as part of the Citywide Hybrid Scenario because they:

- Provide a clear benefit without disproportionate trade-offs
- Meet a number of needs
- Do well against the Performance Measures

**PROJECTS RECOMMENDED TO BE
ADDRESSED OUTSIDE OF CITYWIDE HYBRID**

ADDRESSED OUTSIDE OF HYBRID



Projects recommended to be addressed *outside* of the Citywide Hybrid Scenario because they are:

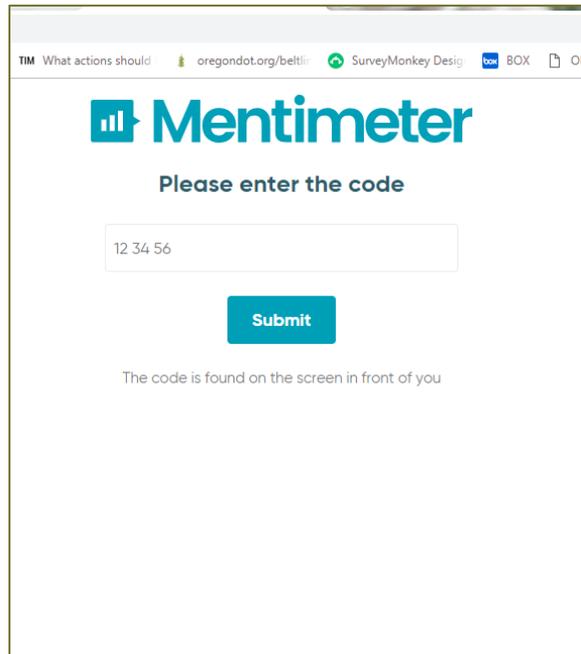
- Better addressed through policy or annual programmatic investments
- Neighborhood needs that should be considered in Phase 2
- Projects that do not address an identified transportation need

STRAW POLL VOTING: STEP 1



Go to: www.menti.com

Use code: 98 88 34



Voting is for CTAC members only!

- Click through questions about foundational projects and projects to set aside at your own pace
- Projects are presented on multiple slides for readability
 - Projects that should be addressed outside of the Citywide hybrid (set aside) are broken into three groups for voting:
 - ✓ Neighborhood level
 - ✓ Policy
 - ✓ Eliminated from future consideration
- Foundational projects are broken into four groups for voting:
 1. Projects from Scenario A
 2. Projects from Scenario B
 3. Projects from Scenario C
 4. Low Stress Network (LSN) Projects

NEEDS WITH SIGNIFICANT OPTIONS:

- 1. EAST-WEST CAPACITY IN CENTRAL BEND*
- 2. NORTH-SOUTH CONNECTIVITY IN EASTERN BEND*
- 3. SOUTH/CENTRAL US 97 CORRIDOR CAPACITY AND SAFETY NEED*

NEED #1:
EAST-WEST CAPACITY IN CENTRAL BEND:

- *CENTURY DRIVE TO 3RD STREET*
- *3RD STREET TO 27TH STREET*
- *RAILROAD SWITCHYARD*

EAST-WEST CAPACITY IN CENTRAL BEND NEED: CENTURY DRIVE TO 3RD STREET



OPTION 1	OPTION 2	OPTION 3
Colorado Avenue Widening (B-8) Powers River Crossing (A-4)	Reed Market Widening from Century to 3rd (B-7, B-15) Reconstruct US 97/Reed Market Interchange	Implement Baseline and Foundational projects and adopt policies that allow for more congested conditions in some locations

Century Drive to 3rd Street Options Performance			
PERFORMANCE INDICATORS	OPTION 1	OPTION 2	OPTION 3
Congestion ²			
Safety			
Travel Time Reliability			
Employment Accessibility			
VMT per Capita			
Roadway Lane Miles (O&M Cost)			
Capital Cost	\$\$\$\$\$\$\$\$	\$\$\$\$\$\$\$	\$\$\$

EAST-WEST CAPACITY IN CENTRAL BEND NEED: 3RD STREET TO 27TH STREET



OPTION 1	OPTION 2	OPTION 3
Wilson Road Extension (A-19)	Reed Market Widening (B-16)	Implement Baseline & Foundational projects & adopt policies that allow for more congested conditions in some locations

3rd Street to 27 th Street Options Performance ¹			
PERFORMANCE INDICATORS	OPTION 1	OPTION 2	OPTION 3
Congestion ²			
Safety			
Travel Time Reliability			
Employment Accessibility			
VMT per Capita			
Roadway Lane Miles (O&M Cost)			
Capital Cost ³	\$\$\$\$\$\$	\$\$\$\$\$	N/A

¹ Comparison against the Baseline

² Congestion summarizes the results from the following performance measures: demand-to-capacity ratio, vehicle hours of delay, and arterial roadway miles with demand-to-capacity ratio deficiencies.

³ The cost for Option 3 is listed as not applicable (N/A) for this need area, as there are no foundational projects with significant motor vehicle capacity benefit in this need area. Option 2 is identified as higher cost than Option 1 due to the longer length of the improvement and the right-of-way acquisitions that would be required along the corridor to widen to 5 lanes.

EAST-WEST CAPACITY IN CENTRAL BEND NEED: RAILWAY SWITCHYARD



OPTION 1	OPTION 2	OPTION 3
Relocate BNSF Switchyard (C-24)	Reed Market Road railroad overcrossing (A-16)	Do not implement a specific project and accept switchyard- related congestion

Railway Switchyard Performance ¹			
PERFORMANCE INDICATORS	OPTION 1	OPTION 2	OPTION 3
Congestion ²			
Safety			
Travel Time Reliability			
Employment Accessibility			
VMT per Capita			
Roadway Lane Miles (O&M Cost)			
Capital Cost ³	\$\$\$\$	\$\$\$\$\$\$	N/A

¹ Comparison against the Baseline

² Congestion summarizes the results from the following performance measures: demand-to-capacity ratio, vehicle hours of delay, and arterial roadway miles with demand-to-capacity ratio deficiencies.

³ The cost for Option 3 is listed as N/A for this need area, as there are no foundational projects with significant benefit to the railroad crossing need

STRAW POLL VOTING: EAST-WEST CAPACITY



Go to: www.menti.com

Use code: 79 19 46

Voting is for CTAC members only!

- Three questions:
 1. Century to 3rd
 2. 3rd to 27th
 3. Railway Switchyard

**NEED #2:
NORTH-SOUTH CONNECTIVITY IN EASTERN BEND**

NORTH-SOUTH CAPACITY IN EASTERN BEND NEED



OPTION 1	OPTION 2
Empire Boulevard/27th Street widening from Boyd Acres Road to Reed Market Road (<i>B-12, B-18b, B-22</i>)	Implement Baseline and Foundational projects and adopt policies that allow for more congested conditions in some locations

North-South Capacity in Eastern Bend Option Performance ¹		
PERFORMANCE INDICATORS	OPTION 1	OPTION 2
Congestion ²		
Safety		
Travel Time Reliability		
Employment Accessibility		
VMT per Capita		
Roadway Lane Miles (O&M Cost)		
Capital Cost ³	\$\$\$\$\$\$	\$\$\$\$\$\$

¹ Comparison against the Baseline

² Congestion summarizes the results from the following performance measures: demand-to-capacity ratio, vehicle hours of delay, and arterial roadway miles with demand-to-capacity ratio deficiencies.

³ The Capital Cost for Option 2 includes foundational projects that would add roadway capacity benefit to this area.

STRAW POLL VOTING: NORTH-SOUTH CAPACITY IN EASTERN BEND



Go to: www.menti.com

Use code: 74 48 42

Voting is for CTAC members only!

NEED #3:
**SOUTH/CENTRAL US 97 CORRIDOR CAPACITY &
SAFETY NEED:**

- *MAJOR CAPACITY OPTIONS*
- *OVERCROSSING*
- *ALTERNATE ROUTE OPTIONS*

SOUTH/CENTRAL US 97 CORRIDOR CAPACITY & SAFETY NEED: MAJOR CAPACITY OPTIONS



OPTION 1	OPTION 2	OPTION 3
Close at-grade US 97 access and add ramp metering (C-5, C-22)	Add auxiliary lanes to US 97 (B-10)	Implement Baseline and foundational projects and adopt policies that allow for more congested conditions in some locations

South/Central US 97 Corridor Capacity & Safety Major Capacity Options Performance ¹			
PERFORMANCE INDICATORS	OPTION 1	OPTION 2	OPTION 3
Congestion ²			
Safety			
Travel Time Reliability			
Employment Accessibility			
VMT per Capita			
Roadway Lane Miles (O&M Cost)			
Capital Cost ³	*	\$\$\$\$\$	\$\$\$\$\$

¹Comparison against the Baseline

²Congestion summarizes the results from the following performance measures: demand-to-capacity ratio and vehicle hours of delay.

³The Capital Cost for Option 3 includes foundational projects that would add roadway capacity benefit to this area.

*Note: The capital costs of ramp metering is not known until further evaluation is completed by US 97 Parkway Study.

SOUTH/CENTRAL US 97 CORRIDOR CAPACITY & SAFETY NEED: OVERCROSSING



OPTION 1	OPTION 2
Ponderosa Street/China Hat Road overcrossing (A-3)	Implement Baseline and Foundational projects

South/Central US 97 Corridor Capacity & Safety Overcrossing Option Performance ¹

PERFORMANCE INDICATORS	OPTION 1	OPTION 2
Congestion ²		
Safety		
Travel Time Reliability		
Employment Accessibility		
VMT per Capita		
Roadway Lane Miles (O&M Cost)		
Capital Cost ³	\$\$\$\$	N/A

¹ Comparison against the Baseline

² Congestion summarizes the results from the following performance measures: demand-to-capacity ratio, vehicle hours of delay, and arterial roadway miles with demand-to-capacity ratio deficiencies.

³ The cost for Option 2 is listed as N/A for this need area, as there are no foundational projects with significant benefit to the safety and connectivity need

SOUTH/CENTRAL US 97 CORRIDOR CAPACITY & SAFETY NEED: ALTERNATE ROUTE OPTION



OPTION 1	OPTION 2
3rd Street widening under the railroad (B-29)	Implement Baseline and Foundational projects and adopt policies that allow for more congested conditions in some locations

South/Central US 97 Corridor Capacity & Safety Alternate Route Option Performance ¹		
PERFORMANCE INDICATORS	OPTION 1	OPTION 2
Congestion ²		
Safety		
Travel Time Reliability		
Employment Accessibility		
VMT per Capita		
Roadway Lane Miles (O&M Cost)		
Capital Cost ³	\$\$\$\$\$	N/A

¹ Comparison against the Baseline

² Congestion summarizes the results from the following performance measures: demand-to-capacity ratio, vehicle hours of delay, and arterial roadway miles with demand-to-capacity ratio deficiencies.

³ The cost for Option 2 is listed as N/A for this need area, as there are no foundational projects with significant benefit to the safety and connectivity need

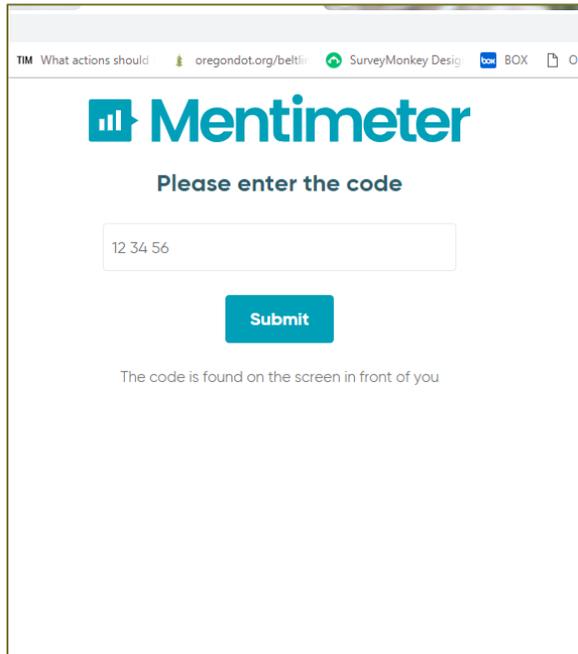
STRAW POLL VOTING: US 97 CAPACITY AND SAFETY NEED



Go to: www.menti.com

Use code: 80 77 6

- Three options:
 1. Major Capacity
 2. Overcrossing
 3. Alternate Route



Voting is for CTAC members only!

PUBLIC COMMENT

PUBLIC COMMENT REMINDER



- Up to 10 minutes
- Divide time evenly by those who wish to comment
- Must sign in before comment period begins
- Please line up in order that you've been assigned to ensure that we move smoothly through all commenters

CLOSE AND NEXT STEPS



- **December 11, 2018: Refine hybrid scenario**
- Neighborhood Outreach in late January
- Formation of policy working groups to initiate in January:
 1. *Pedestrian/bicycle/complete streets*
 2. *Technology/TDM (including parking pricing)/Transit*
 3. *Mobility/Accessibility*
 4. *Equity*
 5. *Safety*