

Stakeholder Meeting No. 4

I-45N: Beltway 8 North to Loop 336 South (Conroe)
Planning and Environmental Linkages (PEL) Study

Future NEPA studies, environmental review, consultation and other actions required by applicable Federal environmental laws for projects associated with the I-45N: Beltway 8 North to Loop 336 South (Conroe) Planning and Environmental Linkages Study are being, or have been carried out by TxDOT pursuant to 23 USC 327 and a MOU dated December 9, 2019 by FHWA and TxDOT.

February 3, 2020

Safety Moment



1 Study Overview & Process

2 Past Meetings

3 Public Engagement Outcomes

4 Alternative Evaluation

5 Next Steps

6 Discussion

Study Overview



I-45N PEL Study Area

STUDY LIMITS:

Beltway 8 North to Loop 336 South

PROJECT LENGTH:

24 Miles

COUNTIES:

Harris, Montgomery

PLACES:

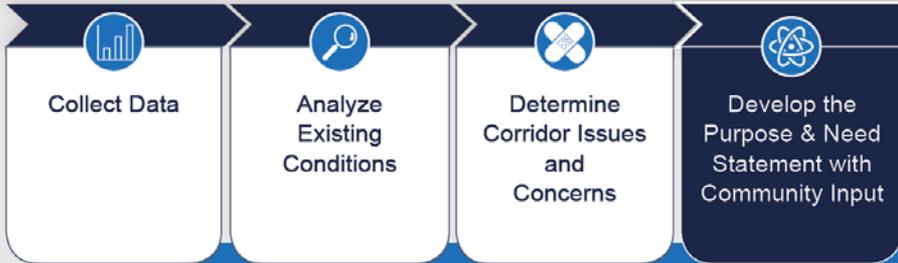
Houston, Aldine, Spring,
Oak Ridge North, The Woodlands,
Shenandoah, Conroe





PHASE I

Spring 2017 - Fall 2018

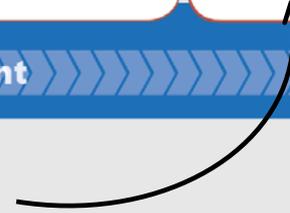


PHASE 2

Spring 2019 - Spring 2021



We are working on this step

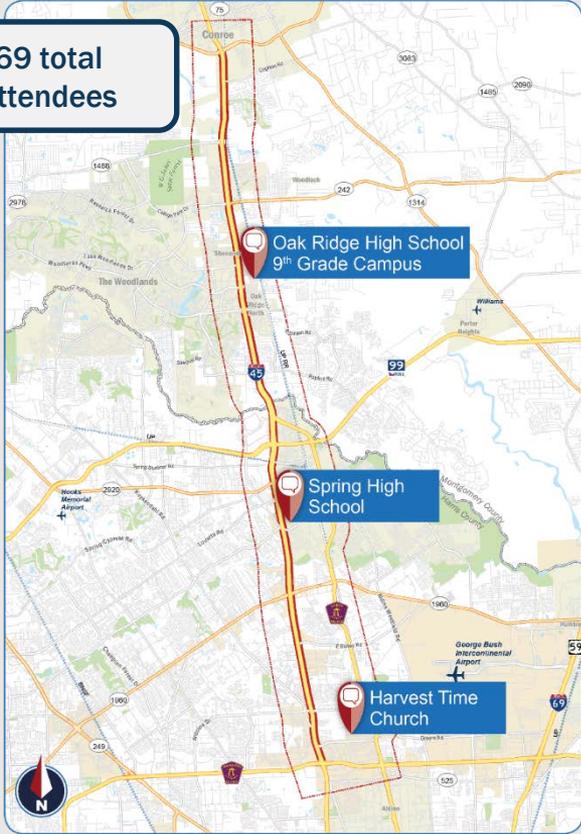




Public Engagement



69 total attendees



October 12, 2019

Harvest Time Church
11 attendees



October 15, 2019

Spring High School
17 attendees



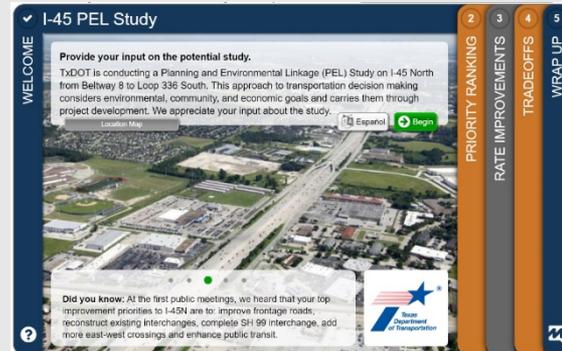
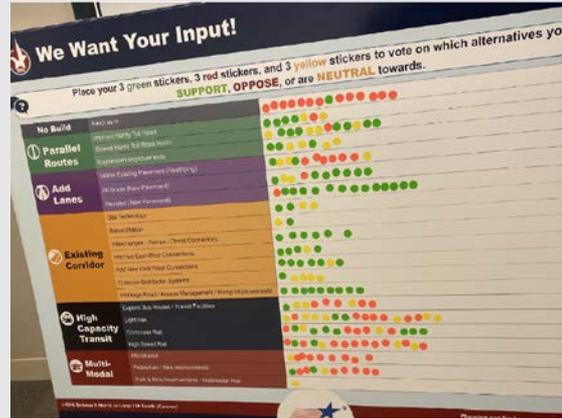
October 16, 2019

Oak Ridge High School 9th Grade Campus
41 attendees



Sources of Input:

- Public meetings
 - Interactive boards
 - Comment forms
- Stakeholder survey
- Online survey



Stakeholder Meeting Universe of Alternative Survey

TxDOT is seeking your input on which alternatives would best improve the I-45N corridor from Beltway 8 North to Loop 336 South (Conroe). Please review all alternatives and indicate with a check mark (✓) whether you support, oppose, or are neutral to each alternative.

Your Name: _____

Representing: _____

No Build	Add Lanes <ul style="list-style-type: none"> • Within Existing Pavement (Restricting) • At-Grade (New Pavement) • Elevated (New Pavement)
Existing Corridor <ul style="list-style-type: none"> • Use Technology • Rehabilitation • Interchanges / Ramps / Direct Connectors • Improve East-West Connections • Add New East-West Connections • Collector-Distributor Systems • Between Mainlines & Frontage Roads • Frontage Road Improvements / Access Management / Ramps 	High Capacity Transit <ul style="list-style-type: none"> • Expand Bus Routes / Transit Services • Light Rail • Commuter Rail • High Speed Rail
Parallel Routes <ul style="list-style-type: none"> • Improve Hardy Toll Road (including connections) • Extend Hardy Toll Road North • Kuykendahl Improvements 	Multimodal <ul style="list-style-type: none"> • Microtransit • Pedestrian / Bicycle Improvements • Park & Ride Improvements / Multimodal Hub

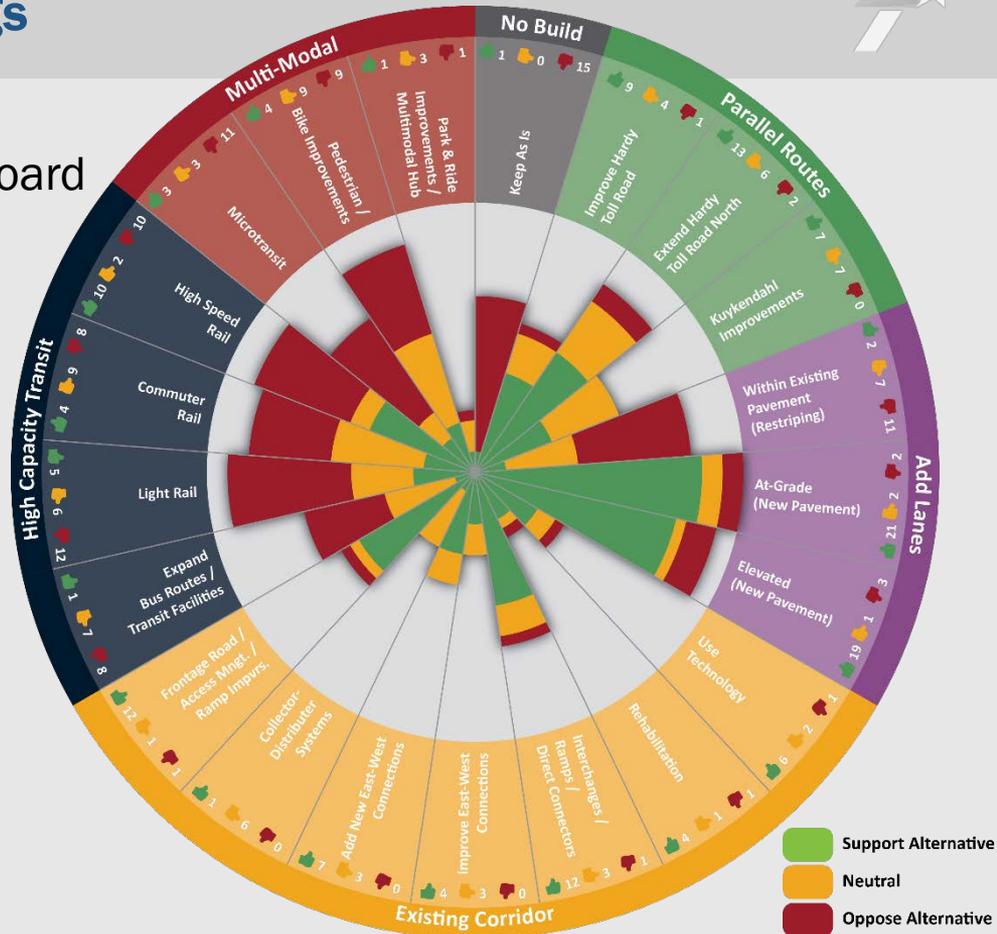
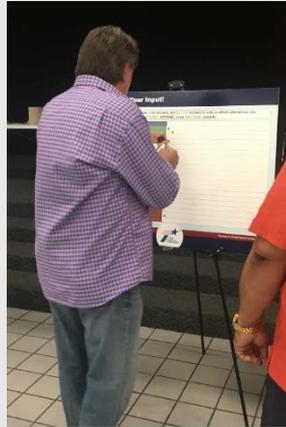
Existing Corridor

Use Technology Jurisdiction: TxDOT Check Box: <input type="checkbox"/> Support <input type="checkbox"/> Neutral <input type="checkbox"/> Oppose	Improve East-West Connections Jurisdiction: TxDOT Check Box: <input type="checkbox"/> Support <input type="checkbox"/> Neutral <input type="checkbox"/> Oppose
Frontage Road Improvements / Access Management / Ramps Jurisdiction: TxDOT Check Box: <input type="checkbox"/> Support <input type="checkbox"/> Neutral <input type="checkbox"/> Oppose	Add New East-West Connections Jurisdiction: Others Check Box: <input type="checkbox"/> Support <input type="checkbox"/> Neutral <input type="checkbox"/> Oppose
Rehabilitation Jurisdiction: TxDOT Check Box: <input type="checkbox"/> Support <input type="checkbox"/> Neutral <input type="checkbox"/> Oppose	Collector-Distributor Systems Jurisdiction: TxDOT Check Box: <input type="checkbox"/> Support <input type="checkbox"/> Neutral <input type="checkbox"/> Oppose
Interchanges / Ramps / Direct Connectors Jurisdiction: TxDOT Check Box: <input type="checkbox"/> Support <input type="checkbox"/> Neutral <input type="checkbox"/> Oppose	Interchanges / Ramps / Direct Connectors Jurisdiction: TxDOT Check Box: <input type="checkbox"/> Support <input type="checkbox"/> Neutral <input type="checkbox"/> Oppose

Public Engagement – Public Meetings



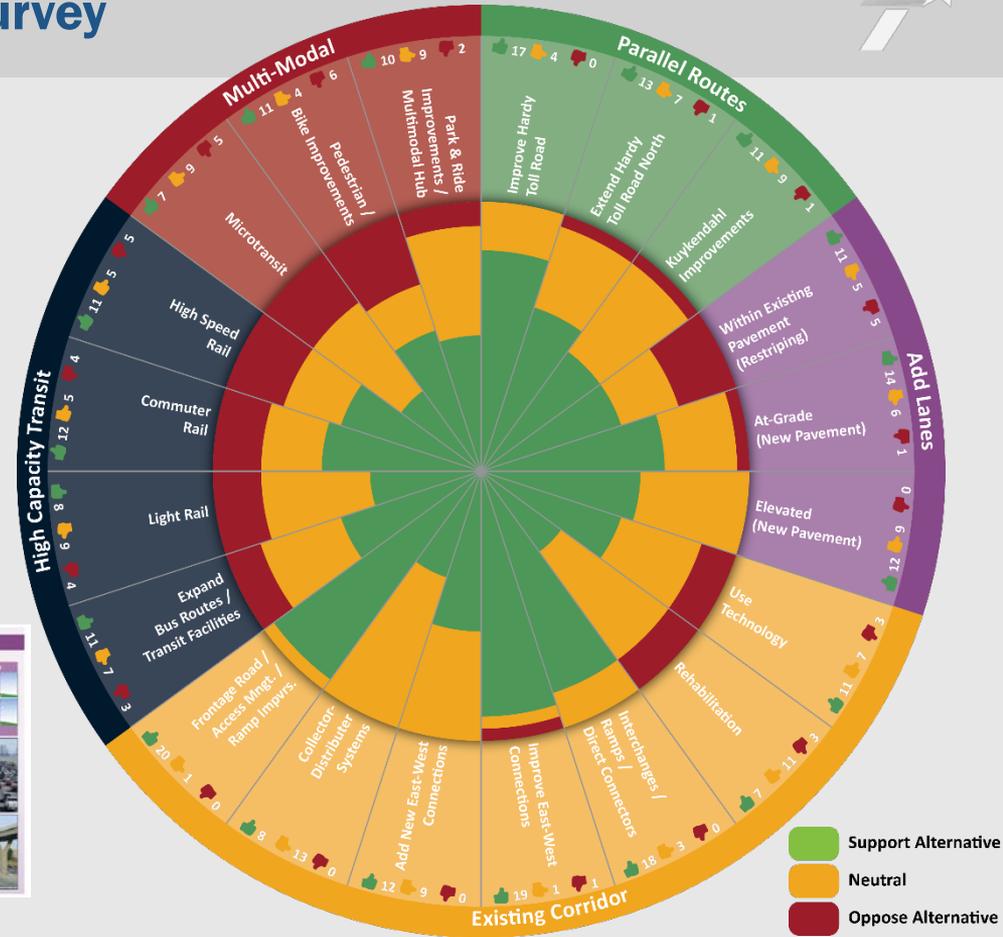
- Based on dot exercise from interactive board
- 328 responses
- Top choices:
 - At-Grade (New Pavement)
 - Elevated (New Pavement)
 - Extend Hardy Toll Rd North



Public Engagement – Stakeholder Survey



- 21 responses
- Top choices:
 - Frontage Road / Access Mgmt. / Ramp Improvements
 - Improve East-West Connections
 - Interchanges / Ramps / Direct Connectors
 - Improve Hardy Toll Road (including connections)

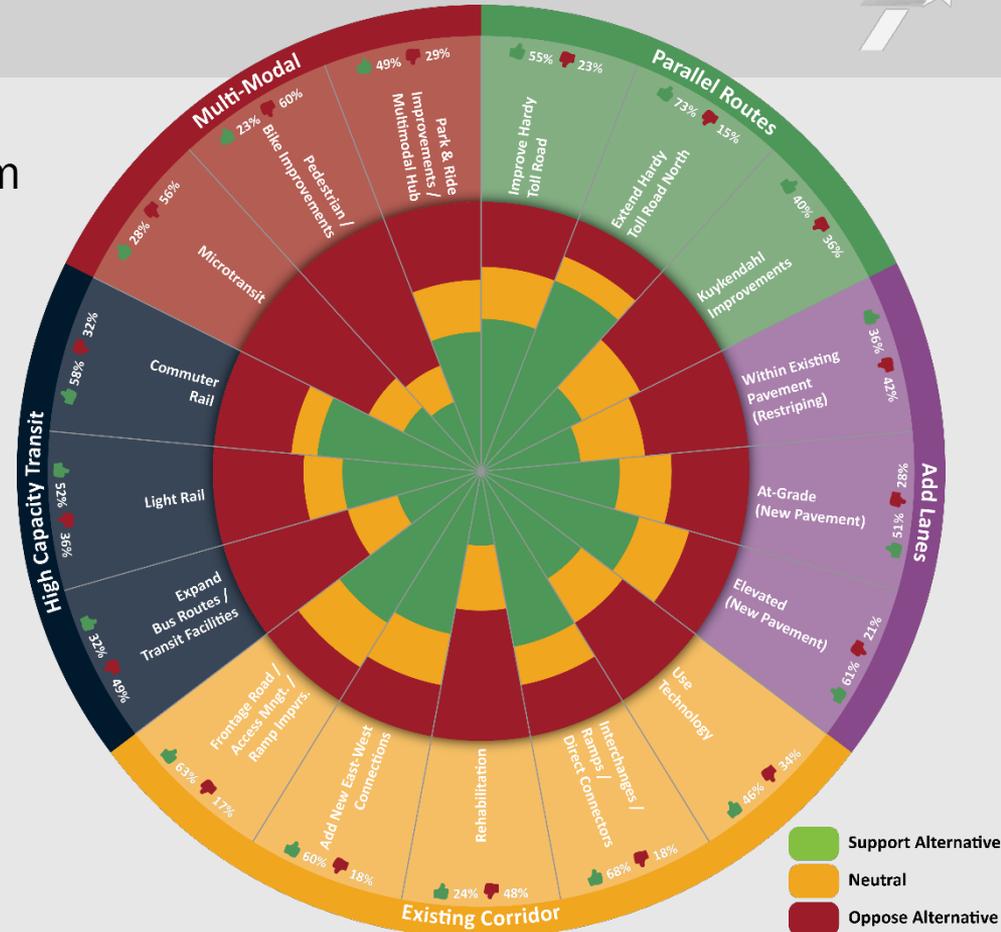


Existing Corridor			Parallel Routes			Added Capacity		
Use Technology Jurisdiction: TxDOT View Add Edit Delete	Improve East-West Connections Jurisdiction: TxDOT View Add Edit Delete		Improve Hardy Toll Road (including connections) Jurisdiction: TxDOT View Add Edit Delete	Within Existing Pavement (restriping) Jurisdiction: TxDOT View Add Edit Delete				
Frontage Road / Access Management / Ramps Jurisdiction: TxDOT View Add Edit Delete	Add New East-West Connections Jurisdiction: Others View Add Edit Delete		Extend Hardy Toll Road North Jurisdiction: Others View Add Edit Delete	At-Grade (new pavement) Jurisdiction: TxDOT View Add Edit Delete				
Rehabilitation Jurisdiction: TxDOT View Add Edit Delete	Collector-Distributor Systems Jurisdiction: TxDOT View Add Edit Delete		Kuykendahl Improvements Jurisdiction: Others View Add Edit Delete	Elevated (new pavement) Jurisdiction: TxDOT View Add Edit Delete				
	Interchanges / Ramps / Direct Connectors Jurisdiction: TxDOT View Add Edit Delete							

Public Engagement – Online Survey



- 640 participants on MetroQuest platform
- 8,907 data points
- Top choices:
 - Extend Hardy Toll Road North
 - Interchanges / Ramps / Direct Connectors
 - Frontage Road / Access Mgmt. / Ramp Improvements
 - Add New Elevated Lanes



Public Engagement – Combined Ratings



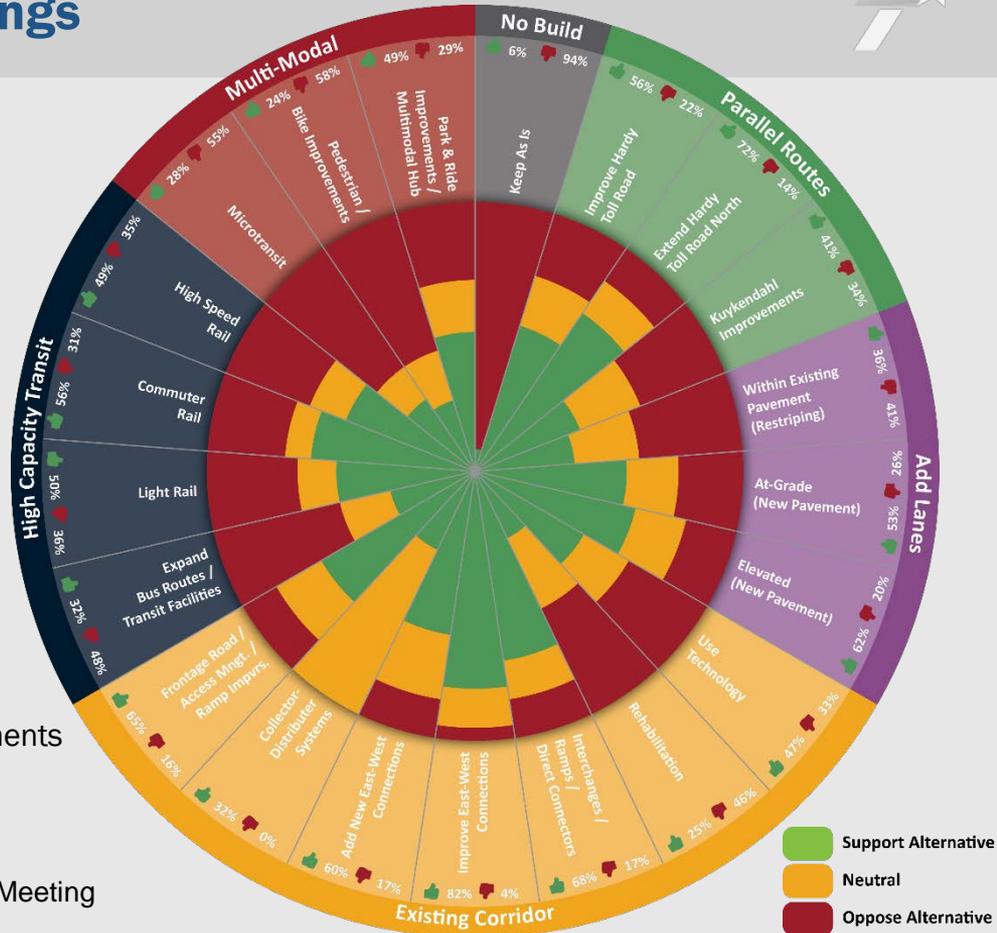
Combined public acceptance ratings* include:

- Stakeholder survey
- Public meetings
- Online survey

Top choices:

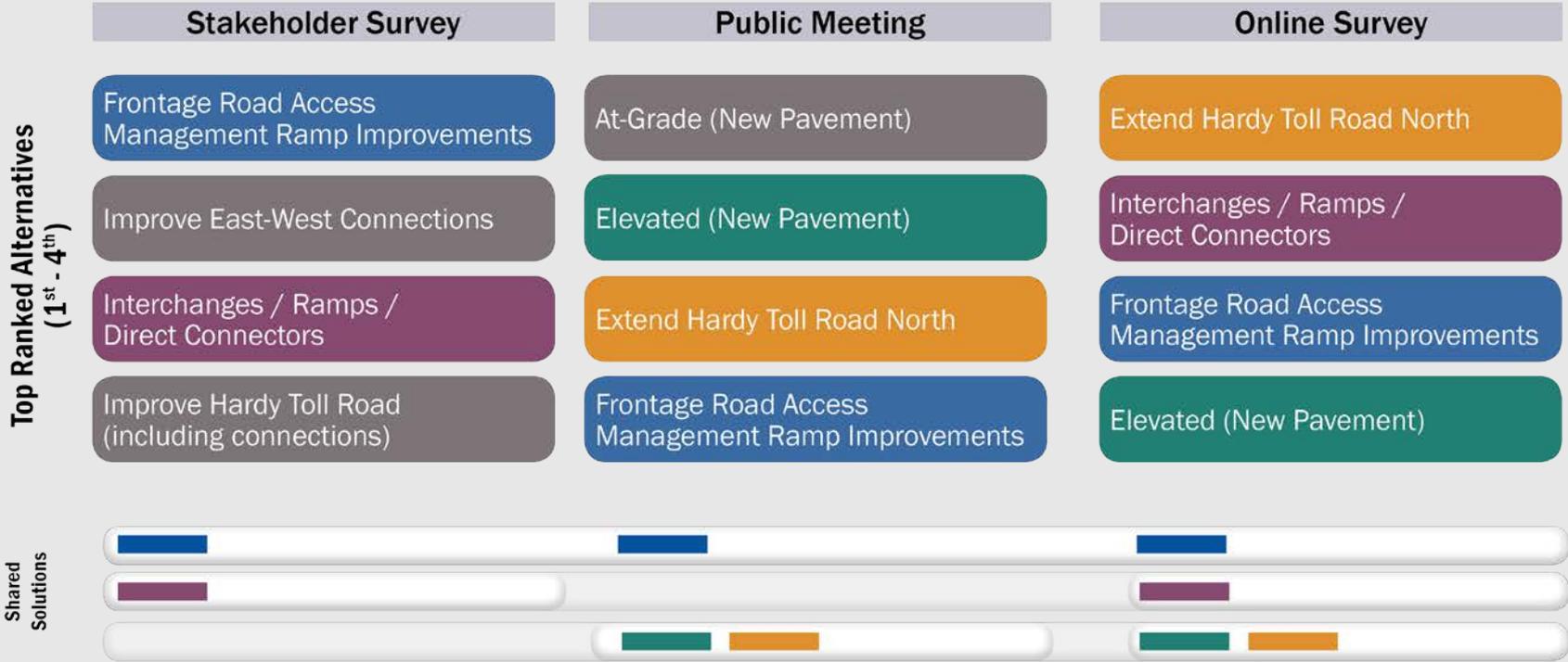
- Extend Hardy Toll Road North
- Frontage Road / Access Management / Ramp Improvements
- Interchanges / Ramps / Direct Connectors

*6,655 data points used in the combined rating summary from Public Meeting Series No. 2 held October 2019





Top choices for each outreach method, by order of preference:





Final ratings for fatal flaw analysis:

Positive

Extend Hardy Toll Rd North

Interchange / Ramps / Direct Connectors

Frontage Rd. / Access Mgmt. / Ramp Improvements

Add New Elevated Lanes

Add New East-West Connections

Improve Hardy Toll Road

Add New At-Grade Lanes

Commuter Rail

Light Rail

Neutral

Use Technology (TSM / ITS / TDM)

Kuykendahl Improvements

Improve East-West Connections

Collector-Distributor Systems

High Speed Rail

Negative

No Build

Add Lanes within Existing Pavement (re-stripping)

Expand Bus Routes / Transit Services

Rehabilitation

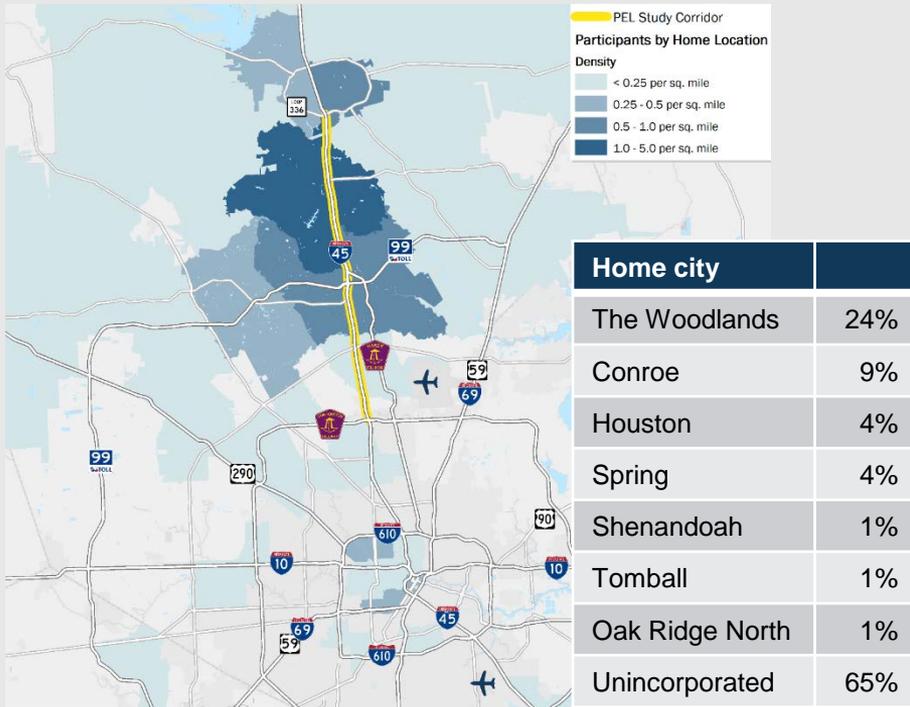
Microtransit

Pedestrian / Bicycle Improvements

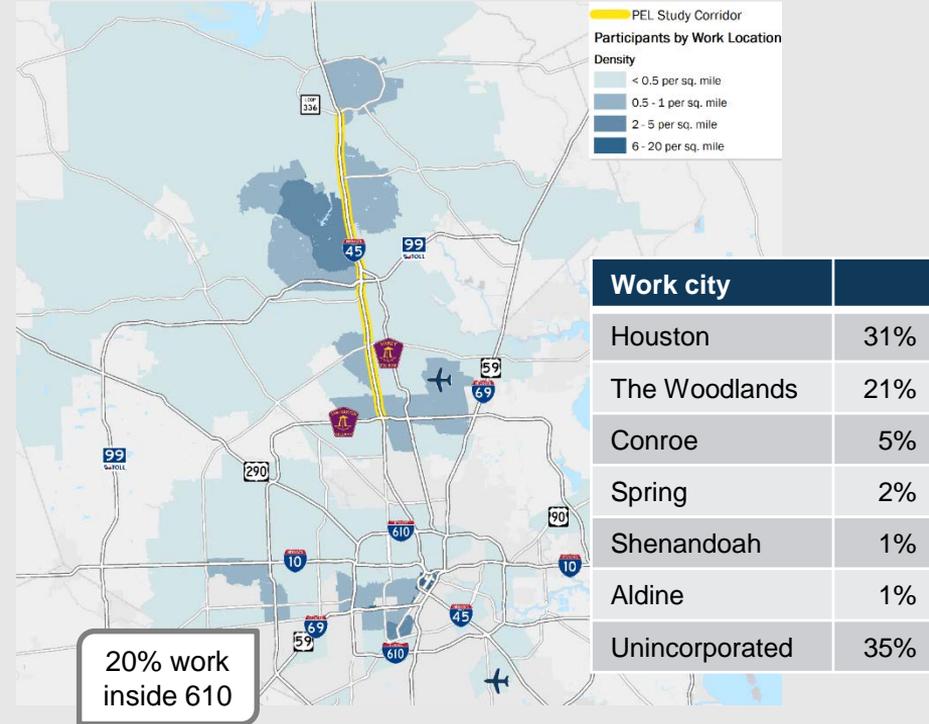
Online Survey Summary



Home Location Density



Work Location Density

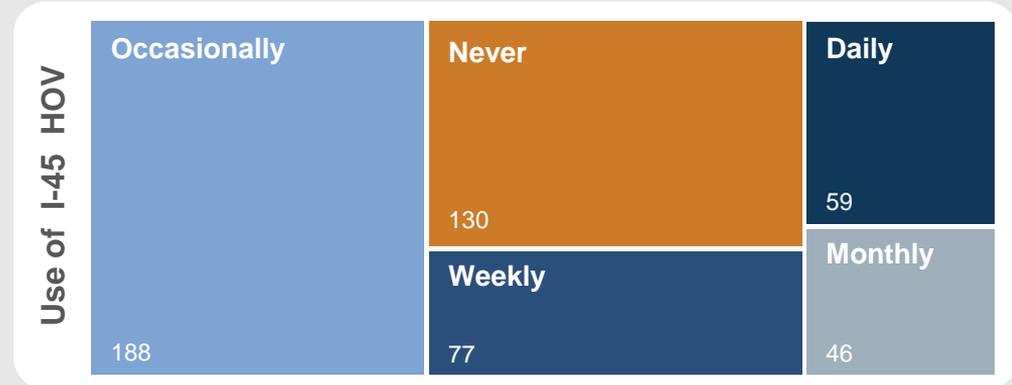




- Largest share of participants were daily users of I-45N, followed by weekly

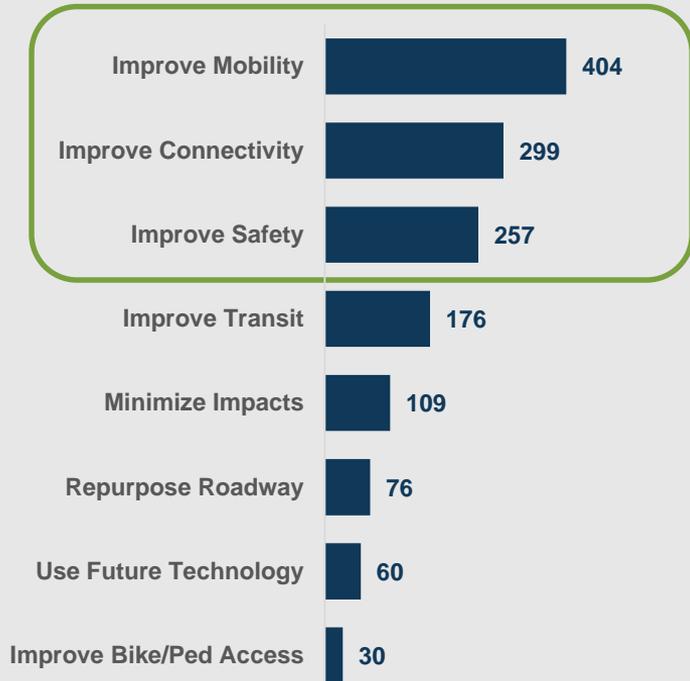


- Most common I-45N HOV use was “occasional,” followed by “never,” “weekly,” “daily”





Corridor Priority Preferences
(# of supporters)



Expressed top 3 priorities
were consistent with
Purpose and Need

2 Rank Study Priorities

PRIORITY RANKING

Order your top 3 items above this line

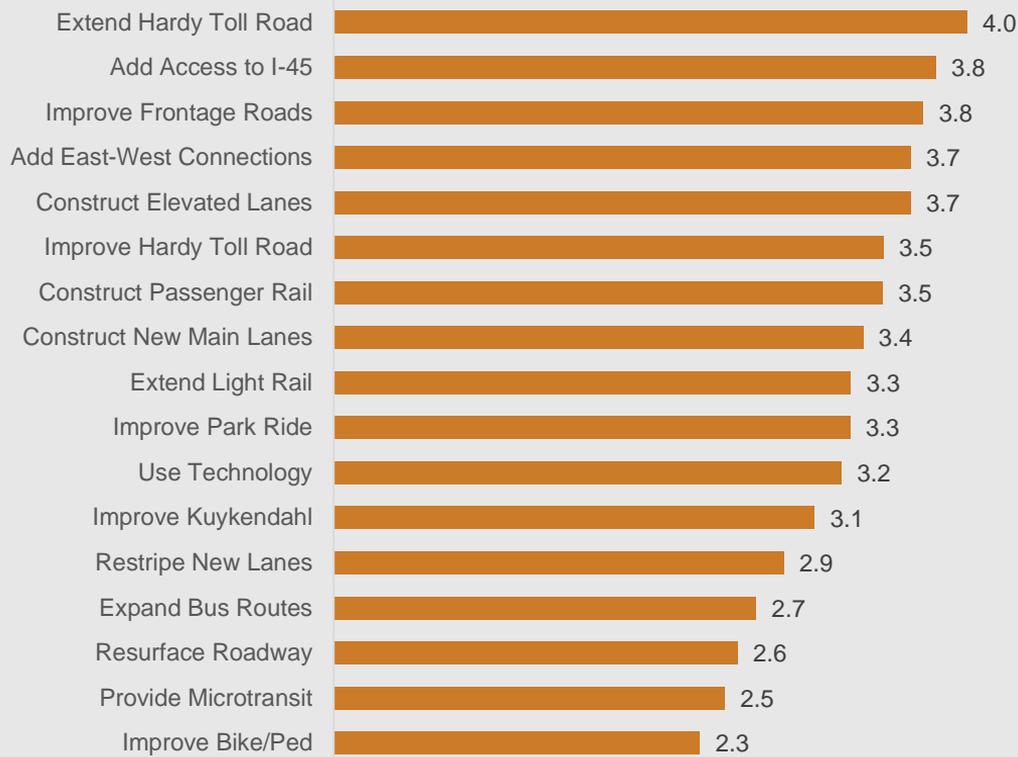
- Improve Connectivity
- Improve Bike/Ped Access
- Use Future Technology
- Improve Transit
- Improve Mobility
- Minimize Impacts
- Repurpose Roadway
- Improve Safety

To help us understand what is most important to you - we want to know your priorities to improve I-45 North. Please rank your top three roadway priorities.

Please drag 3 of the items above the line in your preferred order.

Suggest another

Public Engagement – Online Survey

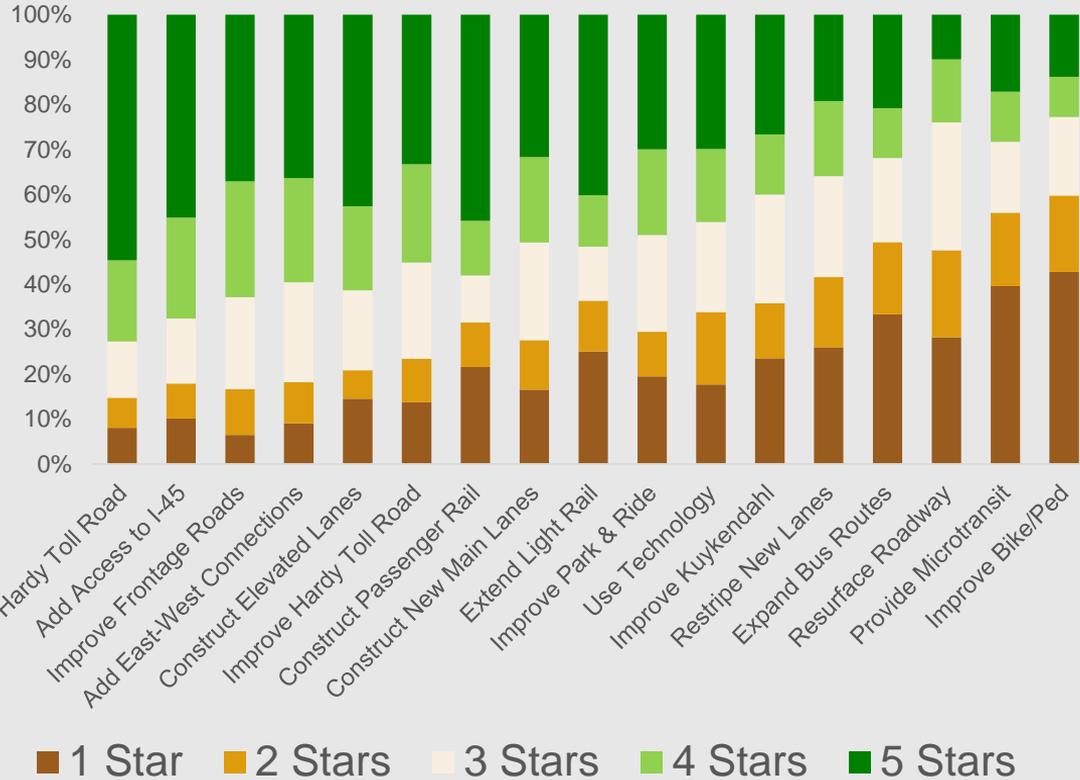


Respondents rated alternatives from



Chart shows the average star rating, ranking alternatives highest to lowest

Public Engagement – Online Survey

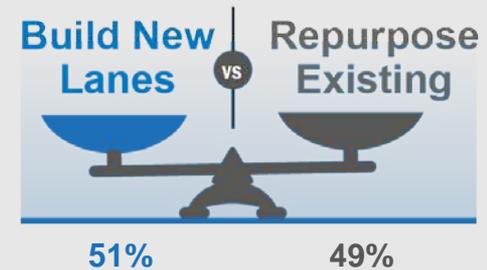
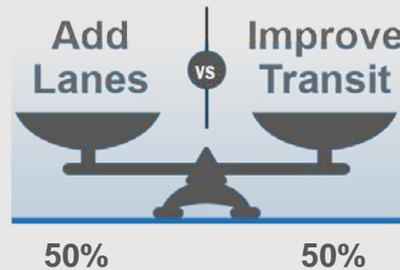
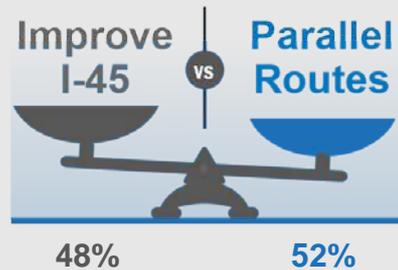
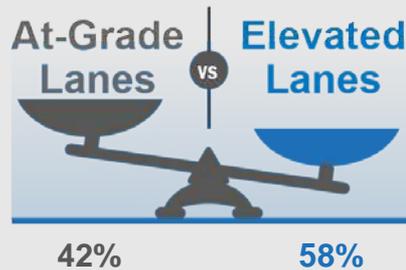


Respondents rated alternatives from  (low) to  (high)

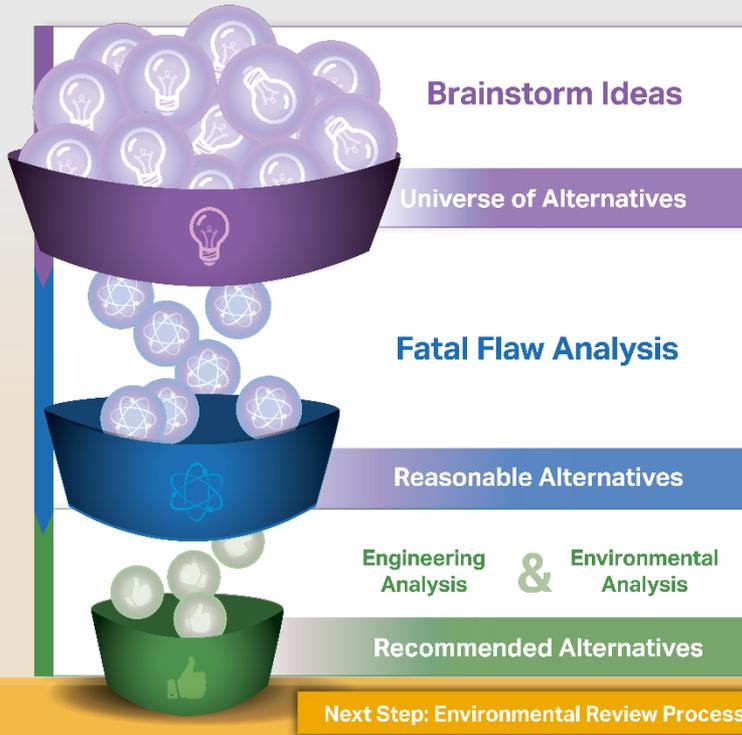
Chart shows the distribution of stars across alternatives



- Participants were asked to how much they supported one option vs. another
- Results were generally balanced, but preference was shown for **elevated lanes**, **improving parallel routes**, and **building new lanes**

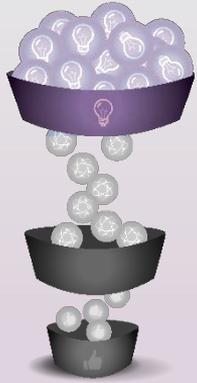


Alternative Evaluation



The only alternatives eliminated here are those shown to be not feasible based on the purpose and need or fatal flaws (i.e., features that would prohibit it from being built)

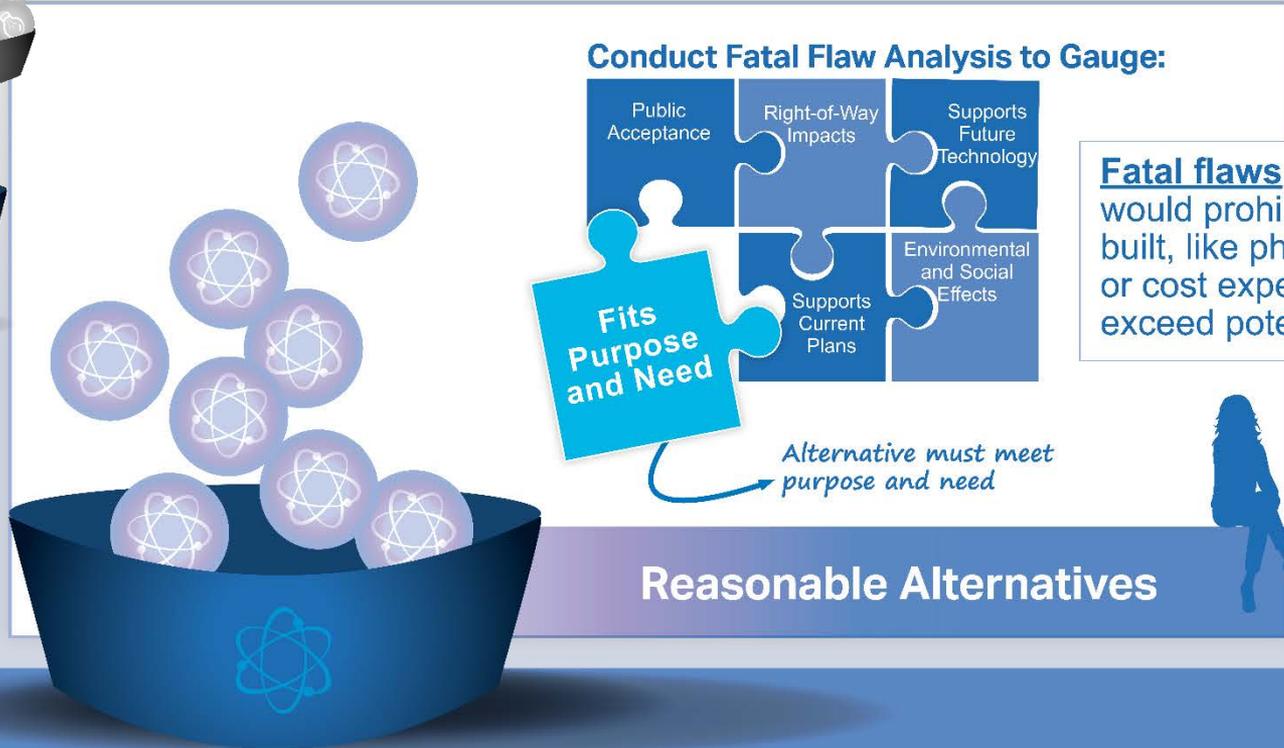




Who Contributes Ideas?

- The Public
- Study Team
- Stakeholders
- Elected Officials
- Planning Agencies
- Federal/State Agencies
- Local Governments
- TxDOT

Universe of Alternatives



Fatal flaws are features that would prohibit a project from being built, like physical inconstructibility or cost expectations that vastly exceed potential funding





This stage will include analysis that is both **quantitative** (i.e., data-driven) and **qualitative** (based on engineering experience)





Categories and Alternatives



The Universe of Alternatives is made up of options to improve conditions in the Study Area

X **No Build**

Existing Corridor

- Use Technology
- Rehabilitation
- Interchanges / Ramps / Direct Connectors
- Improve East-West Connections
- Add New East-West Connections
- Collector-Distributor Systems (between mainlanes & frontage roads)
- Frontage Road Improvements / Access Management / Ramps

Parallel Routes

- Improve Hardy Toll Road (including connections)
- Extend Hardy Toll Road North
- Kuykendahl Improvements

Add Lanes

- Within Existing Pavement (Restriping)
- At-Grade (New Pavement)
- Elevated (New Pavement)

High Capacity Transit

- Expand Bus Routes / Transit Services
- Light Rail
- Commuter Rail
- High Speed Rail

Multimodal

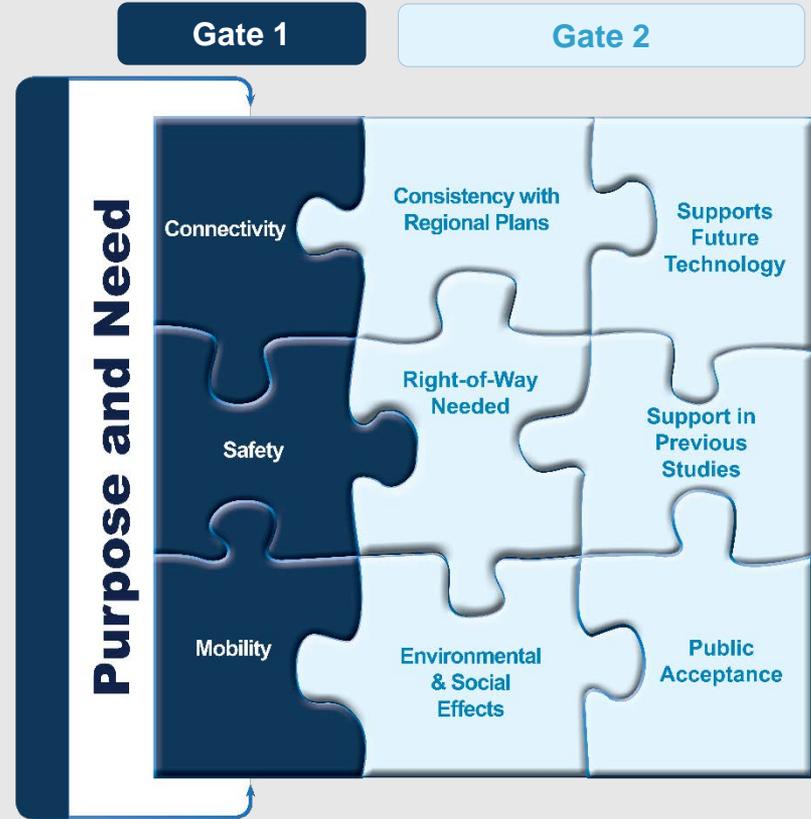
- Microtransit
- Pedestrian / Bicycle Improvements
- Park & Ride Improvements / Multimodal Hub



Nine evaluation criteria

Two-step process

- To pass Gate 1, alternative must score positive in *Purpose and Need* criteria
- To pass Gate 2, alternative is screened against remaining six criteria. Those with positive total scores advance as **Reasonable Alternatives**.





Purpose and Need

Any alternative that advances **MUST** meet the Purpose and Need



Connectivity



Safety



Mobility

Positive

Increases connectivity, be it east-west, interchange, transit, or bike/pedestrian

Expected to decrease vehicle and bike/pedestrian crash rates

Improves travel time and/or reliability, handles expected growth

Neutral

Neutral impact on connectivity

Neutral impact on crash rates

Neutral impact on travel time and reliability

Negative

Likely to decrease connectivity

Likely to increase crash rates

Alternative is insufficient to absorb expected growth

Gate 1 of Fatal Flaw Analysis requires that alternatives meet the Purpose and Need:

- Connectivity
- Safety
- Mobility

Fatal Flaw Analysis: Gate 1



● Negative ● Neutral ● Positive

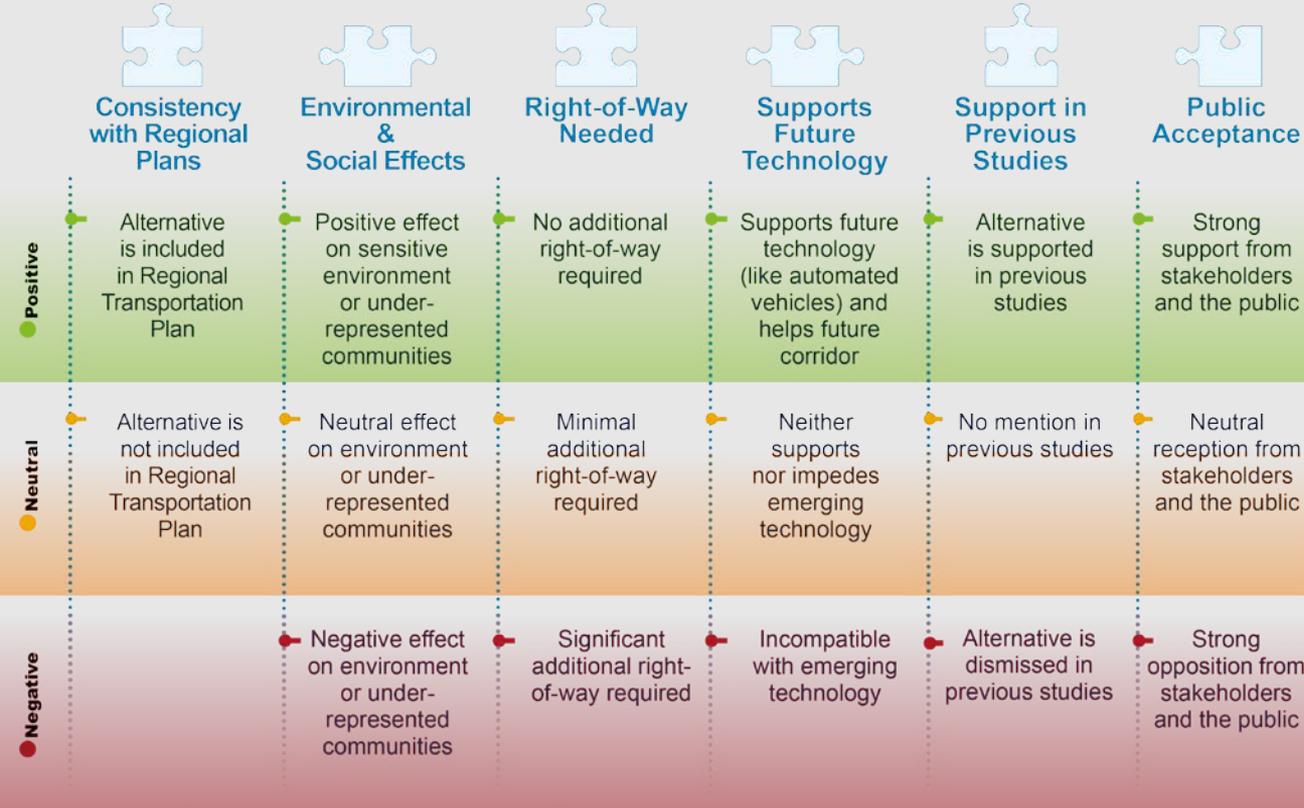
Category	Alternative	Purpose and Need			Gate 1: Purpose and Need
		Connectivity	Safety	Mobility	
No Build	Keep as is				
Parallel Routes	Improve Hardy Toll Road	●	●	●	YES
	Extend Hardy Toll Road North (New Alignment)	●	●	●	YES
	Kuykendahl Improvements	●	●	●	YES
Add Lanes	Within Existing Pavement (Restriping)	●	●	●	YES
	At-Grade (New Pavement)	●	●	●	YES
	Elevated (New Pavement)	●	●	●	YES
Existing Corridor	Use Technology (TSM / TDM / ITS)	●	●	●	YES
	Rehabilitation	●	●	●	NO
	Interchanges / Ramps / Direct Connectors	●	●	●	YES
	Improve East-West Connections	●	●	●	YES
	Add New East-West Connections	●	●	●	YES
	Collector-Distributor Systems	●	●	●	YES
	Frontage Road / Access Management / Ramp Improvements	●	●	●	YES
	Expand Bus Routes / Transit Services	●	●	●	YES
High Capacity Transit	Light Rail	●	●	●	NO
	Commuter Rail	●	●	●	NO
	High Speed Rail	●	●	●	NO
Multi-Modal	Microtransit	●	●	●	YES
	Pedestrian / Bicycle Improvements	●	●	●	YES
	Park & Ride Improvements / Multimodal Hub	●	●	●	YES

Purpose and Need requirements eliminate four alternatives:

- Rehabilitation
(will remain part of regular maintenance program)
- High speed rail
- Commuter rail
- Light rail

No Build Alternative will be carried forward through the evaluation as a baseline for comparison purposes.

Fatal Flaw Analysis: Gate 2



For an alternative to pass Gate 2, the number of positive ratings to equal or outnumber the number of negative ratings for these six criteria.

Fatal Flaw Analysis: Gate 1 & Gate 2



● Negative ● Neutral ● Positive

Category	Alternative	Purpose and Need				Consistency with Regional Plans	Environmental and Social Effect	Right-of-Way Needed	Supports Future Technology	Previous Studies	Public Acceptance	Gate 2: Reasonable Alternative
		Connectivity	Safety	Mobility	Gate 1: Purpose and Need							
No Build	Keep as is					NO RATINGS						
Parallel Routes	Improve Hardy Toll Road	●	●	●	YES	●	●	●	●	●	●	YES
	Extend Hardy Toll Road North (New Alignment)	●	●	●	YES	●	●	●	●	●	●	NO
	Kuykendahl Improvements	●	●	●	YES	●	●	●	●	●	●	YES
Add Lanes	Within Existing Pavement (Restriping)	●	●	●	YES	●	●	●	●	●	●	YES
	At-Grade (New Pavement)	●	●	●	YES	●	●	●	●	●	●	YES
	Elevated (New Pavement)	●	●	●	YES	●	●	●	●	●	●	YES
Existing Corridor	Use Technology (TSM / TDM / ITS)	●	●	●	YES	●	●	●	●	●	●	YES
	Rehabilitation	●	●	●	NO							
	Interchanges / Ramps / Direct Connectors	●	●	●	YES	●	●	●	●	●	●	YES
	Improve East-West Connections	●	●	●	YES	●	●	●	●	●	●	YES
	Add New East-West Connections	●	●	●	YES	●	●	●	●	●	●	YES
	Collector-Distributor Systems	●	●	●	YES	●	●	●	●	●	●	YES
	Frontage Road / Access Management / Ramp Improvements	●	●	●	YES	●	●	●	●	●	●	YES
High Capacity Transit	Expand Bus Routes / Transit Services	●	●	●	YES	●	●	●	●	●	●	YES
	Light Rail	●	●	●	NO							
	Commuter Rail	●	●	●	NO							
	High Speed Rail	●	●	●	NO							
Multi-Modal	Microtransit	●	●	●	YES	●	●	●	●	●	●	YES
	Pedestrian / Bicycle Improvements	●	●	●	YES	●	●	●	●	●	●	YES
	Park & Ride Improvements / Multimodal Hub	●	●	●	YES	●	●	●	●	●	●	YES

Extend Hardy Toll Road North (on new alignment) was removed from further consideration

15 alternatives passed Gate 2

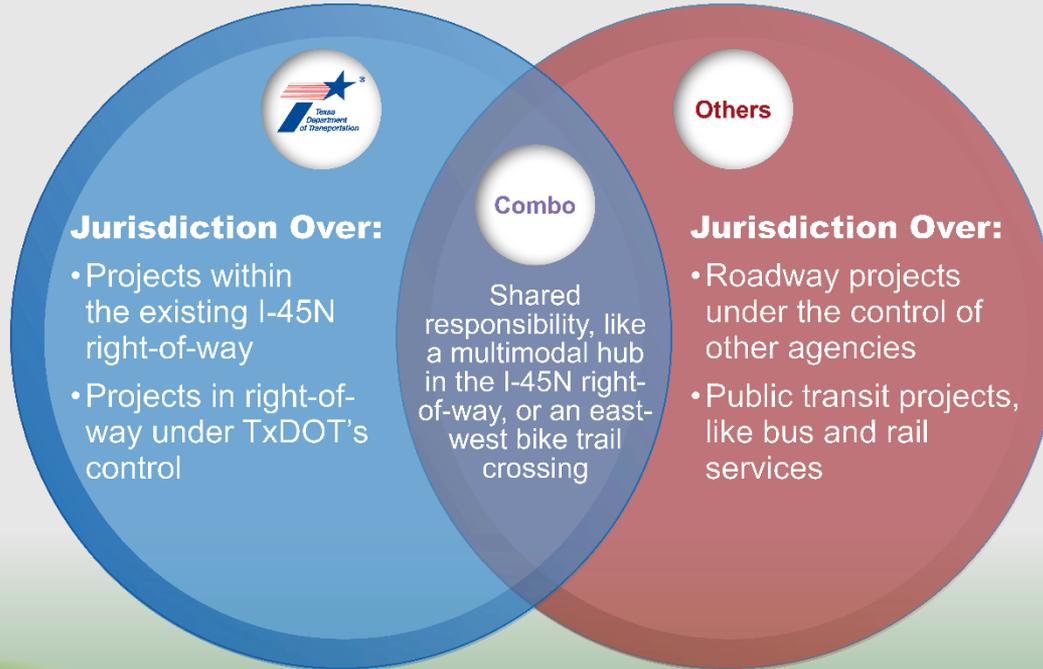


Who can implement these improvement projects?

Different agencies have jurisdiction over different types of projects



Project funding comes from the agency with jurisdiction—though other agencies can still support the project!





TxDOT or Multi- jurisdictional

Primary Alternatives:

Alternatives that can serve the corridor-wide purpose and need and are focused on the I-45N corridor.

Supplemental Alternatives:

Alternatives that only meet localized transportation needs and can supplement the proposed improvements in Primary Alternatives for the I-45N corridor.

Other jurisdiction

Alternatives by Others:

All alternatives that are outside TxDOT jurisdiction.

Reasonable Alternatives



Reasonable Alternatives		Categories			Jurisdiction		
		Primary	Supplemental	By Others	TxDOT	Multi-Jurisdictional	Others
No-Build	No-Build	•			•		
Parallel Routes	Improve Hardy Toll Road (including connections)	•				•	
	Kuykendahl Improvements			•			•
Add Lanes	Within Existing Pavement (re-striping)	•			•		
	At-Grade (new pavement)	•			•		
	Elevated (new pavement)	•			•		
Existing Corridor	Use Technology (TSM / TDM / ITS)		•		•		
	Interchanges / Ramps / Direct Connectors		•		•		
	Improve East-West Connections		•		•		
	Add New East-West Connections			•			•
	Collector-Distributor Systems		•		•		
	Frontage Road / Access Management / Ramp Improvements		•		•		
High Capacity Transit	Expand Bus Routes / Transit Services			•			•
Multi-Modal	Microtransit			•			•
	Pedestrian / Bicycle Improvements		•			•	
	Park & Ride Improvements / Multimodal Hub		•			•	

Next Steps



- **Alternative development**
 - Proposed typical sections
 - Anticipated right-of-way
 - Spot location improvements
 - Interchange reconfiguration, multi-modal hubs, new connections, etc.
- **Alternative evaluation**
 - Travel Demand Model updates
 - Traffic operational analysis
 - Built and natural environmental impacts evaluation
 - High-level cost estimate

Next Steps: Develop and Evaluate Reasonable Alternatives



- Develop screening methodology based on the study goals to evaluate alternatives

	Improve mobility and travel time reliability		Maximize use of existing right-of-way		Minimize impacts to natural and built environments
	Improve system connectivity and accessibility: <ul style="list-style-type: none">Enhance east-west connectionsImprove interchanges and access to/from the I-45N mainlanesImprove connections to parallel facilities		Reduce roadway flooding and improve roadway resiliency		Accommodate future technology to promote sustainability
			Maintain and preserve existing I-45N infrastructure		Improve functionality and resiliency of I-45N as a hurricane and emergency evacuation route
	Improve bicycle and pedestrian facilities		Incorporate cost-effective solutions		Identify and prioritize short-term solutions for quicker implementation of improvements
	Enhance economic development and strong regional economic competitiveness		Reduce frequency and severity of crashes		
			Improve transit accessibility and connections to I-45N		Achieve active stakeholder and public participation throughout study
			Improve accommodation of freight traffic		

Next Steps





- Hold one public meeting, centrally located along the corridor
 - Previous public meetings were held at three locations
- Outreach to constituents (see handout)
 - Management districts
 - Associations
 - Chamber of commerce
 - Neighborhood/community meetings
 - Civic clubs (e.g., Kiwanis, Rotary, etc.)
 - Civic/community events
 - City council meetings
 - Special interest groups
- Continue to use online survey
- Enhance online tools and information available to the public



Who can I contact?

Sofia Huang, PE
Project Development

7600 Washington Ave
Houston, TX 77007
Tel. 713-802-5233
Sofia.Huang@txdot.gov

Visit:

www.TxDOT.gov (keyword search I-45N PEL)