Texas Department of Transportation

CommunityLinkHouston:

Ease congestion with connections.
Link Houston communities with opportunities.

Infrastructure for Rebuilding America (INFRA) Grant Application

March 2019

What is the Project Name?	CommunityLinkHouston SH 35 Project
Who is the Project Sponsor?	Texas Department of Transportation
Was an INFRA application for this project submitted previously? (if Yes, please include title)	No
INFRA Request Amount	$141.5 Million
Estimated Federal Funding (excluding INFRA)	$45.2 Million
Estimated Non-Federal Funding	$151.3 Million
Future Eligible Project Cost (Sum of Previous Three Rows)	$338.0 Million
Previously Incurred Project Costs (if Applicable)	$0
Total Project Cost (Sum of 'previous incurred' and 'future eligible')	$338.0 Million
Are matching funds restricted to a specific project component? If so, which one?	No
Approximately how much of the estimated future eligible project costs will be spent on components of the project currently located on National Highway Freight Network (NHFN)?	$160.0 Million
Approximately how much of the estimated future eligible project costs will be spent on components of the project currently located on the National Highway System (NHS)?	$160.0 Million
Approximately how much of the estimated future eligible project costs will be spent on components constituting railway-highway grade crossing or grade separation projects?	$0
Approximately how much of the estimated future eligible project costs will be spent on components constituting intermodal or freight rail projects, or freight projects within the boundaries of a public or private freight rail, water (including ports), or intermodal facility?	$0
State(s) in which project is located.	Texas
Small or large project	Large
Urbanized Area in which project is located, if applicable.	Houston
Population of Urbanized Area.	5,507,172
Is the project currently programmed in the:	
TIP?	No; will be included when approved in Regional Transportation Plan

STIP?	No; will be included when approved in Regional Transportation Plan
MPO Long Range Transportation Plan?	No
State Long Range Transportation Plan?	Yes
State Freight Plan?	No

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1 Project Summary

The Texas Department of Transportation (TxDOT) is pleased to submit this application for $141.5 million of INFRA grant funding to complete a critical missing link of the greater Houston region's highway network. The CommunityLinkHouston SH 35 Project will construct over three miles of new-location freeway and four direct connectors in southeast Houston to expand access, enhance economic vitality and revitalization efforts in the area, accommodate regional growth, and better manage north-south congestion.

As illustrated in Figure 1-1, the SH 35 corridor will serve as an alternate route to I-45 and SH 288 for people traveling between southeast Houston and the Houston Central Business District, University of Houston, Texas Southern University, and William P. Hobby Airport. This new location roadway will support the continued growth of the Houston economy and improve the effectiveness of the existing transportation network by better connecting major corridors in southeast Houston, including four roadways on the National Highway System: I-610, US 90A – Alternate 90, I-45, and SH 288.

CommunityLinkHouston SH 35

Project Highlights

- Construct 3.5 miles of new-location freeway
- Build direct-connect interchange with I-610
- Provide new railroad overpasses for improved neighborhood connectivity
- Link Downtown Houston with Hobby Airport
- Improve access to educational opportunities at the University of Houston and Texas Southern University

Figure 1-1 Project Location

The CommunityLinkHouston SH 35 Project represents a true collaboration between stakeholders at the local, regional, and state level to expedite the delivery of a priority project which meets key objectives of the INFRA grant program by:

- ✓ Connecting people to jobs
- ✓ Increasing the efficiency of goods delivery
- ✓ Decreasing the burden of commuting
- ✓ Reducing congestion
- ✓ Partnering with regional entities through both coordinated effort and financial contributions
- ✓ Enhancing safety, efficiency and performance through innovative strategies
- ✓ Holding TxDOT accountable for meeting milestones and identifying funds for continued operations and maintenance

Based on the results of a Benefit Cost Analysis (BCA) model, this project is anticipated to improve the local transportation network, with particular benefits to economic competitiveness thanks to improved speeds and decreased travel times. Including all merit criteria, the BCA indicates $1.3 in public benefits for every $1 spent on the SH 35 corridor. Due to these benefits, TxDOT is requesting $141.5 million in INFRA funding to supplement the $196.5 million which has already been committed to this project.

With state funding committed to this project and right-of-way acquisition along the corridor largely complete, the SH 35 project is ready to let for construction by January 2022. The project consists of three complementary elements: a new-location freeway corridor, a direct-connect interchange with the I-610 loop, and new grade separated railroad crossings. These elements are described in detail below.

1. SH 35 Main Lanes

The construction of 3.5 miles of new-location freeway will expand the hub-and-spoke network of the Houston freeway system and provide connectivity between I-45, I-610, and neighborhoods, communities, and attractions to the south. The freeway will have eight total main lanes (four in each direction, as shown in Error! Reference source not found.) along with continuous frontage roads south of I-610. The SH 35 freeway will serve residents and businesses in southeast Houston, provide a more direct route for goods movement, better connect important regional centers including the Houston Central Business District and major universities, and shift through-traffic off the local street network.

2. SH 35 at I-610 Direct Connectors

A fully grade-separated interchange at SH 35 and the I-610 loop will include the southbound to eastbound, southbound to westbound, eastbound to northbound, and westbound to northbound direct connector ramps. This interchange will ensure that SH 35 is fully integrated into the transportation network of southeast Houston, will reduce the circuity of trips, and allow travelers on I-610 to access SH 35 instead of the congested I-45 and SH 288 corridors.

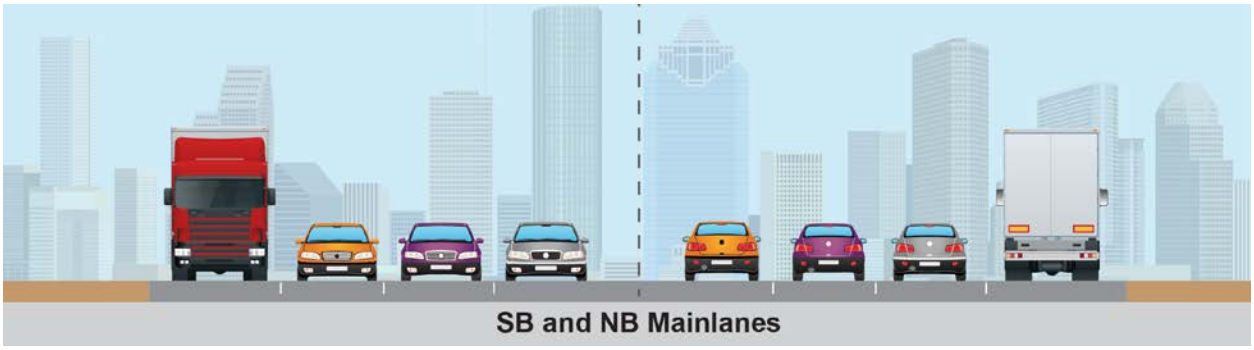
3. Railroad Overpass

The SH 35 project will cross main line BNSF and Union Pacific railroads near the roadway intersection of Mykawa Road, Long Drive and Griggs Road. Today, this triangular roadway intersection is complex due to at-grade rail crossings with these railroads. The SH 35 project will provide access ramps immediately north of the triangular intersection as well as provide a grade separated route for north-south traffic. Immediately north of Bellfort Street, the SH 35 project will also provide southbound connectivity to either side of main

line BNSF railroad, as well as provide new northbound connectivity east of the railroad.

Together, these additional crossings and enhanced access will improve freight and vehicular mobility. The SH 35 project will provide safe, reliable access to local neighborhoods adjacent to these railroads.

Figure 1-2 CommunityLinkHouston SH 35 Proposed Cross-Section



SH 35 and its interchange with I-610 are critical, long-planned pieces of Houston's transportation system. SH 35 has been identified by the City of Houston, the Houston-Galveston Area Council (H-GAC, Houston's metropolitan planning organization), TxDOT, and other agencies as a regional priority since the 1970s. The corridor's first segments, from I-45 to US 90A were completed in the late 1990s and TxDOT is ready to improve the next segments of SH 35 in collaboration with its regional partners.

The SH 35 project has been designated as a Texas Transportation Commission congestion relief priority through the *Texas Clear Lanes* initiative, a statewide strategy that ranks and addresses improvements to the most congested urban highways in Texas and provides congestion relief through non-tolled roads. In response to a call by Governor Greg Abbott for TxDOT to target the state's most congested locations, the Texas Transportation Commission created the program in 2015 to address Texas' most congested corridors in the state's five major metropolitan areas: Houston, Austin, Dallas, Fort Worth, and San Antonio. With this designation, $140 million in *Texas Clear Lanes* funding has been secured from the State for SH 35, indicating its high priority for statewide congestion relief.

Each year, the Texas A&M Transportation Institute identifies the 100 most congested roadways in Texas, with almost half of the current list located in greater Houston, including I-45, I-610, and SH 288.[1] By improving the transportation system in southeast Houston, the construction of SH 35 will help improve three of Texas' most critically congested roadways.

In addition, this project is also included in TxDOT's 10-year financial plan, the *Unified Transportation Program* (UTP). Inclusion in the UTP indicates that significant components of the project are funded and will be ready for letting. The current (2019) UTP ranks this project as a Tier 1 priority and designates $140 million in *Texas Clear Lanes* funding for the CommunityLinkHouston SH 35 Project.

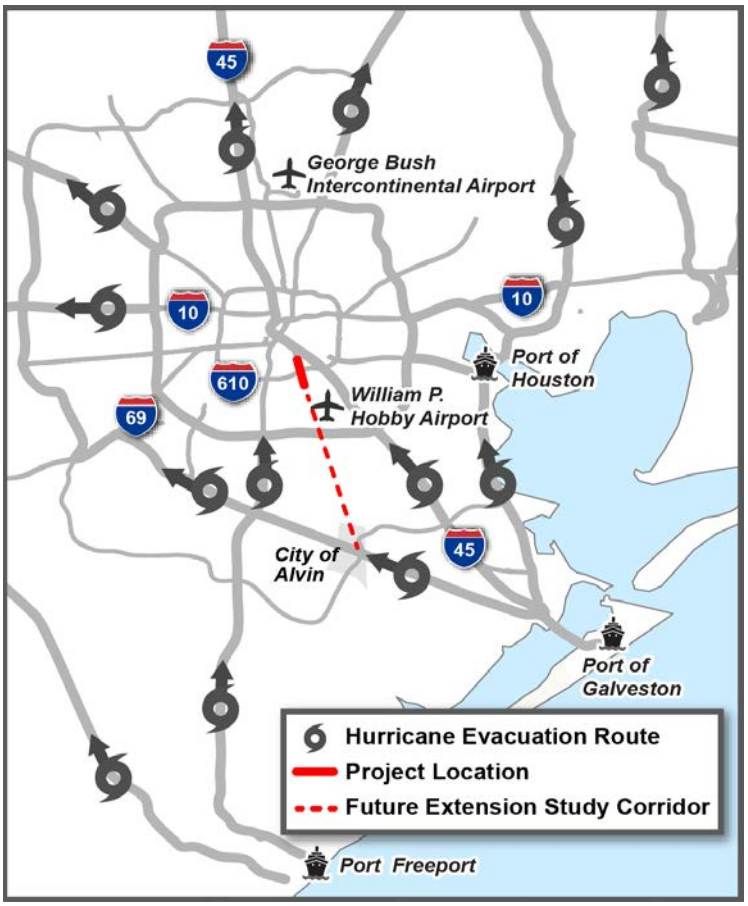
[1] https://mobility.tamu.edu/texas-most-congested-roadways/

H-GAC has pledged $58 million to fund two of the four direct connectors. H-GAC is currently developing the 2045 Regional Transportation Plan, which is expected to be adopted by the TPC in April of 2019. The SH 35 project is slated to be included in the 2045 financially-constrained plan and will subsequently be included in the Transportation Improvement Program (TIP).

On the local level, the City of Houston is undertaking the Southeast Mobility Plan, a year-long, multimodal mobility study in the area bounded by I-610 to the north, SH 288 to the west, Sam Houston Tollway (State Beltway 8) to the south, and I-45 and Galveston Road to the east. Planning documents include SH 35 as a planned highway investment, and part of the study area's mobility network. The City also produces the Major Thoroughfare and Freeway Plan (MTFP), which identifies SH 35 as a corridor for freeway and expressway construction.

The Hobby Area Management District was created in 2007 to help revitalize and spur economic investment and development in this underserved area. The District and H-GAC completed a Livable Centers Study in 2017. Key goals of the study included adding more transportation choices, supporting existing communities, enhancing economic competitiveness, leveraging federal investment, and bringing value to communities and neighborhoods.

Figure 1-3 SH 35 complements designated hurricane evacuation routes



The improvements outlined for SH 35 in this application are not being undertaken in isolation, but are pieces in a larger system of projects to improve the immediate project area and greater Houston's transportation network. At the northern end of the SH 35 project at the interchange with I-45, SH 35 will interface with the North Houston Highway Improvement Project improvements, an approximately $8 billion comprehensive evaluation and overhaul of Houston's downtown and northern highways, involving sections of I-10, I-45, I-69, I-610, US 59, Beltway 8, and the Hardy Toll Road.[2]

The SH 35 corridor is also being studied as a potential freeway south of this project's terminus at Bellfort Street. SH 35 has been studied for extension to SH 99 (Grand Parkway, greater Houston's outer loop) and beyond to the Brazoria County cities of Alvin and Pearland (Figure 1-3). This connection would provide a more direct route to the Gulf Coast, enhancing freight movements

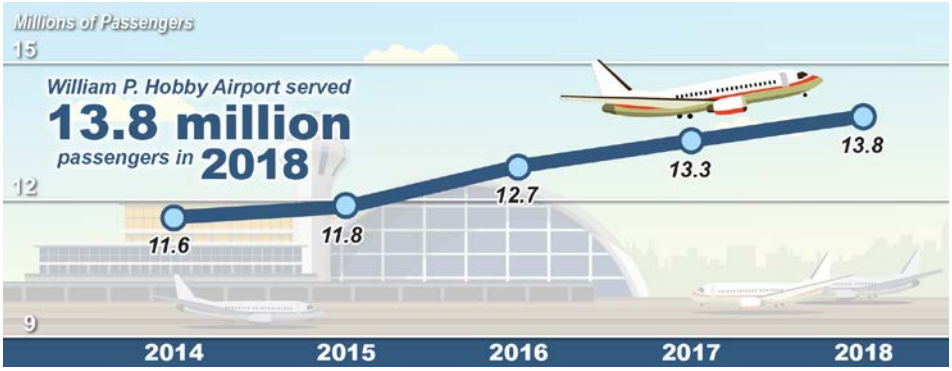
[2] http://www.ih45northandmore.com/docs8/NHHIP_Public_Hearing_presentation-20170511_Slides&Notes.pdf

from Port Freeport, Port of Texas City, and Port of Galveston, as well as the Denbury oil field and Brazoria County mining and industrial activities. Additionally, the project would accommodate growth and commuter traffic south of Houston and enhance transportation safety by providing additional capacity parallel to the designated hurricane evacuation routes of I-45 and SH 288. Study on this corridor extension is preliminary with no alignment determined.

SH 35 will serve as a regional freight corridor, moving goods and vehicles from southeast Texas' multiple ports, inland to urban markets and manufacturing centers. The corridor will improve goods movement on designated freight corridors including I-610, US 90A, and Mykawa Road. I-610 and US 90A are identified as part of the state's Primary Freight Network, while I-610 and Mykawa Road are on the National Highway Freight Network. Mykawa Road is also a designated Intermodal Connector on the National Highway System.

Improved connectivity to Hobby Airport will encourage continued economic activity and growth in passenger service at the closest commercial airport to downtown Houston (Error! Reference source not found.4). SH 35 will provide additional access for airport employees, tourists, and business travelers. Hobby is Houston's second-busiest airport, with domestic service by American Airlines, Delta, and JetBlue. Southwest Airlines operates a significant hub at Hobby Airport providing service to both domestic and international destinations. With this improved access, Hobby will continue to anchor regional economic development in southeast Houston.

Figure 1-3 Increases in William P. Hobby Airport Passengers



2 Project Location

Figure 2-1 SH 35 is located in Harris County, the most populous county in Texas

The SH 35 corridor is located in the City of Houston, the most populous city in Texas and fourth-largest in the United States. Census estimates for 2017 indicate that 2,312,717 residents populate the city alone.[3] Houston and Harris County are at the center of the Houston Urbanized Area (Figure 2-1). This metropolitan area had a 2010 Census population of over 5.5 million. The greater Houston region has been experiencing rapid population growth for decades and has the 7th largest gross metropolitan product in the United States, valued at over $500 billion in 2017.[4]

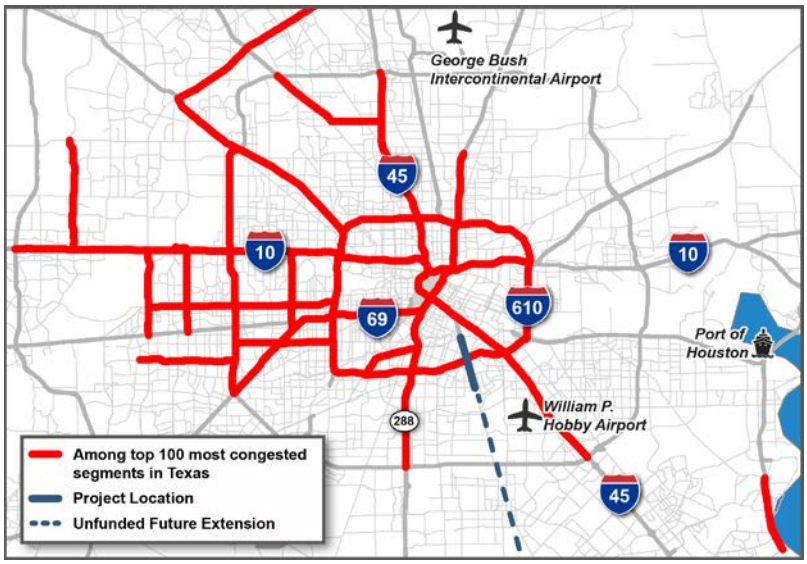
The SH 35 project is located near the core of the greater Houston area, southeast of downtown Houston and northwest of Hobby Airport. The project would begin just south of I-45 where the freeway main lanes of Spur 5 terminate in frontage roads just north of University Drive and adjacent to the University of Houston. From this point, freeway main lanes would be extended south over US 90A, or the Old Spanish Trail, and past the I-610 loop where a direct-connect interchange would be constructed as part of this project. South of I-610, freeway main lanes and frontage roads would be constructed to Bellfort Street. The construction of SH 35 will also provide new grade-separated crossings of BNSF and Union Pacific railroad lines, with ramps to and from SH 35 on both sides of the railroad, improving neighborhood connectivity and safety by separating vehicular and train traffic. The improvements from Spur 5 to Bellfort Street total 3.5 miles.

In the 2018 Texas A&M Transportation Institute ranking of Texas's most congested roadways, I-45 north of I-610 was the 11th most congested roadway in Texas, while SH 288 north of I-610 was the 12th most congested roadway in the state. South of I-610, I-45 is the 27th most congested roadway while SH 288 is the 38th most congested Texas roadway. SH 35's location between these highway corridors

[3] https://www.census.gov/quickfacts/fact/table/houstoncitytexas
[4] http://www.usmayors.org/wp-content/uploads/2018/06/Metro-Economies-GMP-June-2018.pdf

provides additional capacity in Houston's congested southeast neighborhoods and allows a more direct route for commuters and freight shipments in the region (Figure 2-2).

Figure 2-2 SH 35 will provide congestion relief to some of the most congested corridors in Texas.



In addition to SH 35's regional importance to the Houston transportation network, in its immediate vicinity are significant traffic generators including the University of Houston, Texas Southern University, and Hobby Airport. At its northern end, SH 35 is located along the eastern edge of the University of Houston, the third largest university in Texas with over 45,000 students and 2,600 faculty. The SH 35 project will improve access to the campus from both the north and south, enhancing regional access to the educational, employment, and recreational opportunities offered at Houston's largest university. SH 35 will also improve access to Texas Southern University (TSU). Enrolling nearly 8,000 students and home to over 1,400 faculty and staff, TSU is Texas' largest historically black university.

The SH 35 project also improves the connectivity between Hobby Airport and the greater Houston area. Hobby Airport, just east of the SH 35 corridor and south of I-610, is one of three airports in the City of Houston's Airport System.

The project also incorporates and allows access to areas of the Brays Bayou Greenway Trail, 30 miles of hike-and-bike recreational trails which connect public greenways, parks, and neighborhoods south of downtown Houston.

3 Project Parties

The SH 35 grant recipient will be the TxDOT Houston District, which is responsible for executing the regional responsibilities of TxDOT within the six-county Houston Gulf Coast region. TxDOT, in partnership with local and regional agencies, is responsible for planning, designing, building, operating, and maintaining the state's transportation system. TxDOT's mission is to deliver a safe, reliable, and integrated transportation system that enables the movement of people and goods. TxDOT has secured $140 million in Texas Clear Lanes funds for construction of the project.

The other major project party is the Houston-Galveston Area Council (H-GAC), the metropolitan planning organization for the region. Recognizing the importance of the project to regional connectivity and mobility, H-GAC's Transportation Policy Council (TPC) has committed $56.5 million for the SH 35 freeway direct connectors at I-610 (the TPC's formal resolution supporting the CommunityLinkHouston SH 35 Project is attached in Appendix D).

As shown in Figure 3.1, the CommunityLinkHouston SH 35 Project is supported by a strong alliance of regional partners that have worked together for decades to ready the area for this investment. The agencies include the City of Houston, the City of Alvin, Harris County, and the Metropolitan Transit Authority of Harris County (METRO), each of which have played a role in project development. Other local, regional and state partners from both the public and private sectors are supportive of the CommunityLinkHouston SH 35 Project, with all letters of support included in Appendix C.

Figure 3-1 CommunityLinkHouston SH 35 Project Parties

4 Grant Funds, Sources and Uses of All Project Funds

The CommunityLinkHouston SH 35 Project represents a significant surface transportation infrastructure investment to improve freight and passenger vehicle mobility. Accordingly, the requested INFRA grant funds will be utilized throughout construction to balance project needs against the broader fiscal constraints of TxDOT's statewide construction program.

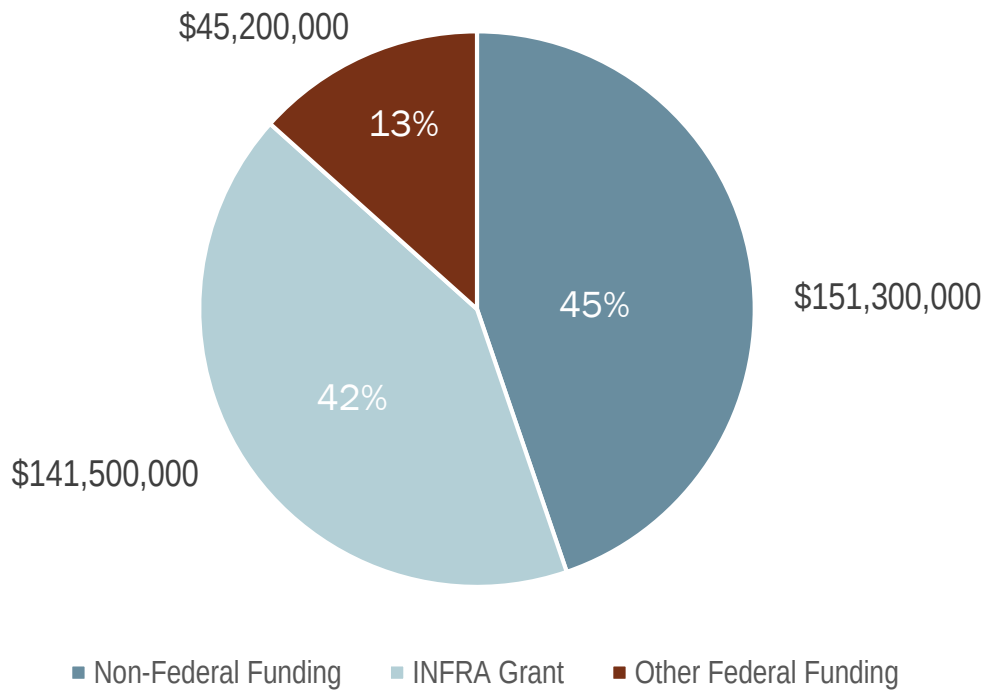
4.1 Previously Incurred Expenses

As stated earlier, SH 35 was conceived in the 1970s. In the 1990s, work began to develop and construct the SH 35 corridor. A portion of the corridor was designed, environmentally cleared, and a majority of the right-of-way was purchased. Three hundred and seventy one parcels were acquired in the 1990s, which represents approximately 80 percent of the total required right-of-way. The existing Spur 5 was constructed, but financial constraints prevented further construction. Because this work was performed decades ago, estimating the investments made by the State and locals to realize this corridor is challenging and as such, TxDOT is not requesting consideration of previously incurred costs.

4.2 Future Eligible Costs, Sources and Uses, and Budget

With nearly half of the project budget coming from state and local commitments, the SH 35 project represents a significant leveraging of INFRA funding. The $338 million in total project funding for the SH 35 project will be spent on construction activities. Table 4-1Error! Reference source not found. shows project budget sources, divided between non-federal funding, INFRA funding, and other federal sources. Non-federal funding includes $140 million from TxDOT and $11.3 million of the MPO's $56.5 million commitment.

Table 4-1 Project Budget Sources



4.3 Stable and Reliable Fund Commitments

TxDOT is a stable and reliable funding partner committed to maintaining the existing system and building new infrastructure to encourage economic growth. In 1946, language was added to the Texas Constitution requiring three-fourths of all net revenue generated by motor fuels taxes to be used only for acquiring right-of-way (ROW); constructing, maintaining, and policing public roadways; or for the payment of principal and interest on certain road district bonds or warrants.

For the FY2018-19 Biennium, TxDOT's sources of funding include:

- $8.8 billion in State Highway Funds (33 percent of agency budget);
- $5.4 billion in Proposition 1 and Proposition 7 funds (20 percent of agency budget);

- $1.9 billion in other funding mechanisms including bond proceeds, concession payments, and Texas Mobility Fund (7 percent of agency budget); and
- $10.5 billion in federal funds to construct, maintain and operate approximately 197,100 miles of state highway system (40 percent of agency budget).

4.4 Contingency Reserves

Despite the strong funding plan in place, TxDOT recognizes the need for contingency funding in the event of funding interruptions. The possibility of federal or state transportation dollars being unavailable for project expenditures is remote. Historically, periodic short-term interruptions in federal reimbursements have been successfully managed through cash management practices. In the unlikely event that federal and state dollars are both unavailable, Texas has contingency solutions in place ranging from short term cash management techniques to longer term access to credit and capital markets.

4.5 Amount of Requested Funds Subject to Federal Limits

No components of this project are subject to the FAST Act limits on freight, rail, port, and intermodal infrastructure.

5 Merit Criteria

5.1 National and Regional Economic Vitality

Given the sizable role Houston plays in the national economy, strategic expansion projects such as the SH 35 corridor benefit not only local commuters, but freight movements and the national economy as a whole.

Houston is the fourth largest city in the nation and one of America's strongest economic centers. As regional growth continues, infrastructure must keep up. Today, Houston's economic resiliency is apparent, notably against the backdrop of Hurricane Harvey recovery. In 2018, the year after the storm, Houston created over 108,000 jobs, with a total 3,178,700 nonfarm payroll jobs. The number of firms is also growing due to numerous corporate relocations; more than 103,000 firms operated in metro Houston in 2016, an increase from 97,000 in 2014. While this dynamic economy continues to expand, this level of growth also places additional strain on the region's transportation network, with congestion threatening not only Houston's economy, but also the nation's prosperity.

The strength of Houston's economy requires bold investments in infrastructure. To address these needs, SH 35 will increase access to some of the region's most significant employment and educational centers, namely the Houston Central Business District (CBD), University of Houston, Texas Southern University, and William P. Hobby Airport. Because these educational and employment centers are major economic drivers, they also contribute significantly to regional congestion. SH 35 will provide direct relief to these important regional destinations. These centers all represent major regional economic hubs, with 157,000 employees in the CBD[5]; 2,600 faculty at the University of

[5] https://www.downtownhouston.org/work/

Houston; and 1,400 faculty at Texas Southern University. As a key component of the City of Houston Airport System, Hobby Airport handled a record-breaking 13.8 million passengers in 2018.[6] A growth area contributing to that total is international service, which was inaugurated at Hobby Airport in 2015. This international service has grown considerably since then, topping the 1 million passenger mark for the first time in 2018.[7] With such significant destinations to connect and economic activity to support, this project will provide important north-south congestion relief, serving as an alternate route to I-45 and SH 288.

In addition to improved regional connectivity, this project will also provide important access to the area's ports, connecting Houston to national and international markets. The Port of Houston is a national and regional economic engine. One of the world's busiest ports, the Houston Ship Channel and its related businesses contribute 1.17 million jobs to Texas, supporting $264.9 billion of economic value.[8] The CommunityLinkHouston SH 35 Project will facilitate faster freight flows to and from southern Harris and Brazoria counties and improve connectivity to the Port of Houston and Port Freeport.

This project also bolsters freight mobility in the study area, as the CommunityLinkHouston SH 35 Project will be on the National Highway System (NHS) once complete. The corridor is denoted as a principal arterial, as it offers a direct connection to an NHS intermodal connector at BNSF's South and Pearland Railyards. This new roadway will close a critical gap between existing roadways and provide an important connection to I-610, I-45, and SH 288.

Beyond roadway congestion relief, this project will also add new grade-separated crossings (including ramps on both sides of the railroad tracks) which will increase the movement of goods by rail. Current activities in adjacent switching yards slows movement in this corridor, and these new crossings will increase vehicular movement over the tracks, resulting in a more efficient rail system, and even more importantly, a safer and less congested environment around rail crossings. These new railroad grade separations are the result of engagement with surrounding communities, whose input guided location and design of these new crossings. The proposed design also provides connectivity to the new highway facility from both sides of the tracks, improving local throughput.

Finally, this project will improve bicycle and pedestrian facilities near SH 35. By constructing new sidewalks for pedestrians, wide outside lanes on frontage roads for bicyclists, and connections to the Brays Bayou Greenway, this project will improve the safety and quality of active transportation in southeast Houston. This component of the CommunityLinkHouston SH 35 Project also aligns with the Hobby Area Management District's goal of promoting health and wellness through "attractive alternative transportation," as well as providing a direct connection and access to higher education in an underserved area. Housing costs in the Management District are 41 percent lower than average Houston housing costs, and higher proportions of at-risk populations, including minority, low-income, limited English proficiency populations, senior, and zero auto households, reside near the planned project. This project will provide a critical, multimodal connection to jobs and higher education.

[6] Houston Airport System, Statistical Report 2018 Fiscal Year Summary,

[7] https://www.fly2houston.com/newsroom/releases/houston-airports-set-records-passenger-numbers-2018/

[8] https://porthouston.com/about-us/economic-impact/

Without additional support through an INFRA grant, delivery of this project would be delayed. The overall scope of the project may likewise be scaled back, reducing the benefits of the project.

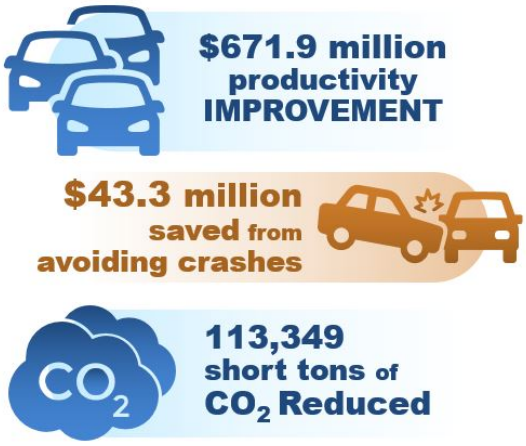
Benefit Cost Analysis

The CommunityLinkHouston SH 35 Project's Benefit Cost Analysis (BCA) ratio was determined to be 1.3:1, indicating the project has a positive return on investment. Discounted to 2017 dollars, overall the project's benefits of $270.6 million well exceed its costs of $214.1 million. Additional information on the input values and methodology used to develop the results of the BCA can be found in Appendix A. Appendix B provides a fully interactive BCA Excel worksheet.

The analysis shows that a reduction in fatalities, serious injuries, and other injuries can be expected with the construction of SH 35 based on its forecast reduction in vehicle miles of travel (VMT). This improvement to safety is a conservative estimate based on crash rates per VMT and does not include other proposed improvements associated with the project such as enhancements to pedestrian and bicycle infrastructure, which would further increase the safety benefits in the area of influence. As a non-attainment area, the environmental benefits of this project are critical. Based on changes in the VMT for this project, as well as an increase in vehicle speeds, emissions of carbon dioxide, nitrogen oxides, particulate matter, sulfur dioxide, and volatile organic compounds are found to decrease, and the greatest change is seen in carbon dioxide.

The greatest dollar benefit from CommunityLinkHouston SH 35 is found in the Economic Competitiveness merit criteria. By reducing congestion in the southeast Houston area, SH 35 lowers VMT as well as vehicle hours of travel (VHT). Combined, these factors result in both lower operating costs for vehicles and lower travel time cost for drivers (Figure 5-1).

Figure 5-1 CommunityLinkHouston SH 35 Project Benefits



5.2 Leveraging of Federal Funding

Activities to Maximize Non-Federal Funding

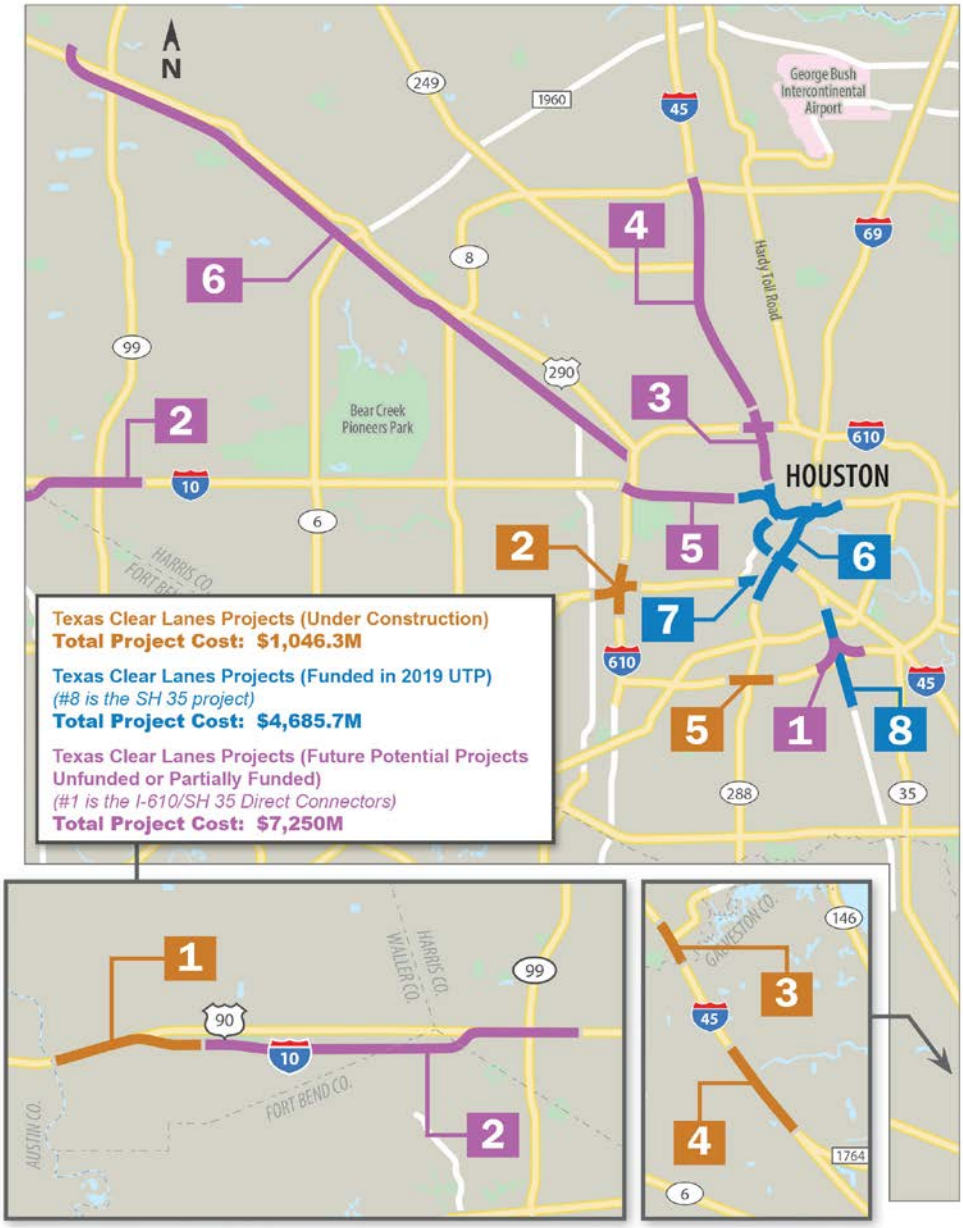
The state and local funding contributions by TxDOT and H-GAC comprise 45 percent of overall project costs, offering substantial leverage on this federal investment. The $141.5 million of

INFRA grant funding will leverage $196.5 million of committed funding for the CommunityLinkHouston SH 35 Project.

The CommunityLinkHouston SH 35 Project will maximize non-federal funding through an innovative funding program entitled *Texas Clear Lanes*, which began in 2015. On September 23, 2015, Texas Governor Greg Abbott issued a directive to the Texas Transportation Commission and TxDOT "to create a focused initiative to identify and address the state's most congested chokepoints and work with transportation planners to get new roads built swiftly and effectively."

The *Texas Clear Lanes* initiative was born out of this directive and is focused on finding the most effective and efficient ways to build non-tolled roadway projects in Houston and the state's other congested metropolitan regions. There are currently $1 billion of *Texas Clear Lanes* projects under construction in the Houston area, $4.7 billion of Houston projects funded in the 10-year UTP and an additional $7.3 billion of unfunded or partially funded projects identified in the plan (Figure 5-2).

Figure 5-2 *Texas Clear Lanes* projects in the Houston area



The revenue for the *Texas Clear Lanes* initiative is derived from two voter-approved sources, Proposition 1 and Proposition 7, and action taken by the Texas Legislature to end diversions from the State Highway Trust Fund (SHF). Combined, Proposition 1, Proposition 7, and the end of diversions from the SHF provide stable, dependable sources of state funding to contribute to

TEXAS CLEAR LANES

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the construction, maintenance, and operation of this project. The total estimated 10-year revenue from the three sources is $35.4 billion.[9]

Private Funding

No private funding has been identified for use on this project.

Any Fiscal Constraints Limiting Use Non-Federal Contributions

No fiscal constraints hinder the utilization of non-Federal contributions.

5.3 Potential for Innovation

Innovative Technology

Innovative technologies are interwoven into this project, including the installation of an expanded fiber network and Intelligent Transportation Systems components. Upon its completion, SH 35 traffic management and emergency response functions will take place at Houston's TranStar facility, a regional transportation coordination center, which uses innovative technology to monitor and manage the region's transportation system. As the first center in the nation to combine Transportation and Emergency Management centers, TranStar allows regional transportation agencies, including the City of Houston, Harris County, METRO, and TxDOT, to share resources and exchange information.

This project's integration with TranStar allows TxDOT to offer a breadth of information to the general public, including a real-time traffic application and personalized email or social media alerts. TranStar also pioneered the use of traffic monitoring using Anonymous Wireless Address Matching (AWAM), which uses anonymous data to calculate travel times and speeds on roadway segments such as SH 35. In addition, TranStar is the hub for the region's Incident Management Program and the Motorist Assistance Program, of which the H-GAC has committed more than $10 million a year toward operation of these two programs.

Innovative Permitting, Contracting, and Project Delivery Practices

- The TxDOT Houston District employs innovative as well as fiscally and environmentally responsible techniques for delivering construction projects. The TxDOT Houston District uses a variety of recycled aggregates, including recycled concrete aggregate (RCA), reclaimed asphalt pavement (RAP), and recycled asphalt shingles (RAS) as part of pavement design. Large amounts of recycled aggregate are used because the Houston region does not have good, native aggregate sources. It costs time and expense to import aggregates from other parts of the state, and recycling local concrete pavement at the end of its functional and structural life represents an alternative, sustainable source for pavement. For the SH 35 project, the TxDOT Houston District anticipates using the RAP in the base material and the RCA as the aggregate in the cement mix.

- In 2014, TxDOT became the second state to assume full NEPA assignment authority and it has become a best practice in streamlining the environmental review process. TxDOT has

[9] Texas Department of Transportation, *Texas Transportation Funding, Including Texas Clear Lanes and Congestion Relief Update: Presentation for Texas Transportation Commission*, March 28, 2018, http://ftp.dot.state.tx.us/pub/txdot/commission/2018/0328/2a-presentation.pdf.

averaged a start-to-completion time of 18 months for environmental assessment projects. Prior to NEPA assignment, environmental assessments took an average of 30 months to complete. NEPA assignment allows TxDOT to have greater control over project planning and scheduling and allows local governments and stakeholders better access to decision makers.

- Additionally, this project will employ an accelerated construction schedule, and include early completion incentives, described in further detail in Section 5.4.

Innovative Financing

As noted in Section 5.2 (Leveraging of Federal Funding), TxDOT will be utilizing new and innovative state revenue comprised of funds raised from Proposition 1 and Proposition 7. These voter approved ballot measures represent recent efforts by the State of Texas to raise significant revenue for transportation investment across the state.

Proposition 7 moves beyond the limitations of traditional bond funds by providing a predictable and continuous stream of alternative funding for transportation infrastructure. Proposition 7 required a constitutional amendment that mandates the Comptroller to deposit to the State Highway Fund (SHF) $2.5 billion of the net revenue from the state's sales and use tax in excess of the first $28 billion in state treasury revenue that fiscal year (beginning in FY 2018). The provision will not expire until FY 2032. In addition, if state motor vehicle sales and rental tax revenue exceeds $5 billion in a fiscal year, 35 percent of the amount (above $5 billion) will be directed to the SHF beginning in FY 2020; this provision expires in 2029. These revenue sources demonstrate the state's and voters' understanding of the important role transportation plays in economic vitality and growth. It represents a strong commitment to repair, rebuild, and revitalize the state and national economy.

5.4 Performance and Accountability

Plan to Address Full Lifecycle Costs

Based on soil properties, traffic load and spectrum, geographical location and construction constraints, TxDOT will be using Continuously Reinforced Concrete Pavement (rigid pavement) to construct SH 35. While rigid pavement has a higher up-front construction cost, the maintenance costs are lower than flexible pavement. On average in Texas, rigid pavement structures can last 35 years without major rehabilitation. Using a state average of $958 per lane mile for annual maintenance for the first 10 years, TxDOT estimates the pavement lifecycle costs of SH 35 will total approximately $26,824 per year.

TxDOT is prepared to ensure the continued operation and maintenance of the project through its useful life and has a history of fully funding maintenance on the Texas road system. TxDOT appropriates funds on a biennial basis. TxDOT's FY 2020 to 2021 Legislative Appropriations Request dedicates approximately 25 percent of its funding to the maintenance and replacement of state highway projects. The primary funding sources include gas tax revenues, vehicle registration fees, federal reimbursements, and local funding sources.

TxDOT submitted to FHWA in April 2018 the Texas Transportation Asset Management Plan (TAMP). The TAMP details the processes in which the state utilizes life-cycle planning to forecast network-level funding needs to sustain performance of the existing assets and recommend the most cost-effective

way to optimize its long-term condition. These methods include using semi-automated procedures for obtaining pavement condition information, forecasting future pavement conditions to recommend optimized pavement work plans, implementing four-year pavement management plans, and standardized and regularly-scheduled bridge inspections to assist in prioritization of structure rehabilitation and replacement.

Accountability Measures

In order to maximize public benefits from INFRA funds and to promote local activity that will provide benefits beyond the INFRA-funded project, TxDOT will utilize funds on specific, measurable outcomes, and provide accountability for project performance. Reaching the start and completion of construction in a timely manner will serve as a project success indicator for the CommunityLinkHouston SH 35 Project. Should TxDOT be awarded INFRA funds, TxDOT will condition $10 million of INFRA funding based on a project schedule which lets to construction in 2022 and reaches completion in 2026. Project milestones will track progress towards completion, which will include standards for individual project elements in addition to the overall timeline. An accelerated construction schedule, a value engineering workshop, and early completion incentives will also encourage timely construction.

6 Project Readiness

6.1 Technical Feasibility

The CommunityLinkHouston SH 35 Project is beginning final design and is anticipated to let for construction within 18 months of receipt of the INFRA grant funding. TxDOT has completed three preliminary schematic-level drawings (viewable in Schematic 1, Schematic 2, and Schematic 3) for this project, including the interchange with I-610.

The project design criteria for this project follows the TxDOT Roadway Design Manual, TxDOT Bridge Design Manual, Texas Manual on Uniform Traffic Control Devices, and other state and federally approved design standards.

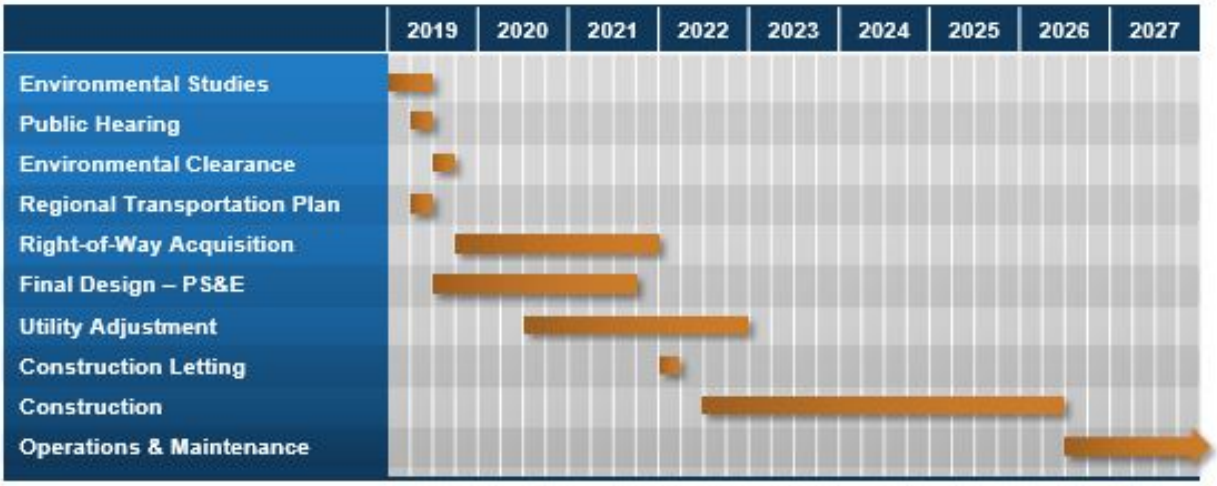
The cost estimate, which includes agency, financial, design, construction costs, and contingency, is based on a detailed review of the preliminary design drawings, experience on similar projects, and concessionaire information. The following elements demonstrate project readiness:

- A 10 percent project contingency is included in the cost estimate;
- Three hundred and seventy seven of the needed 448 right of way parcels have been acquired;
- The environmental assessment is on-going with the public hearing slated for late 2019;
- The project is included in the project listing for the 2045 Regional Transportation Plan, slated to be adopted in April 2019, with a conformity determination in August 2019; and
- The H-GAC Policy Council has already approved a resolution committing more than $56 million in funding, to be included in the Statewide TIP once the conformity determination is approved.

6.2 Project Schedule

With the preliminary design complete, final design will begin by mid-2019 and is scheduled to be completed in 2021. The project is scheduled to be let by TxDOT in the first quarter of 2022 with construction set to begin by the third quarter of 2022. Construction is estimated to take approximately four years. Construction activities for the INFRA grant meet all identified schedule requirements. Figure 6-1 provides a schedule for all major project milestones.

Figure 6-1 Project Schedule



6.3 Required Approvals

With environmental review already underway, few required approvals are needed for this project to proceed. The following section highlights potential project risks and the status of ongoing reviews and coordination.

Project Risks

Table 6-1 assesses the risks that may hinder the objectives and scheduled delivery of the SH 35 Project, along with proposed mitigation actions.

Table 6-1 Project Risks and Mitigation Strategies

1 =Low 2 =Minor 3 =Moderate 4 =Significant

Risk	Description	Likelihood of Not Completing	Impact: Schedule	Impact: Cost	Mitigation Strategy
Planning	Inclusion into Metropolitan Transportation Plan (MTP) & TIP/STIP	1	2	1	2045 MTP in progress. SH 35 is included in the project listing. Anticipate MTP approval April 2019, and conformity determination August 2019. Projects will be included in the TIP and STIP following the conformity determination. The H-GAC Policy Council has already passed a resolution committing funding for this project.
NEPA	Environmental clearance including NW 14 permitting.	1	2	1	Final environmental clearance depends upon inclusion in MTP and STIP. Permitting could delay clearance. Public Hearing is scheduled for 3rd quarter 2019. Early coordination with jurisdictional agencies already started.

Risk	Description	Likelihood of Not Completing	Impact: Schedule	Impact: Cost	Mitigation Strategy
Railroad Agreements	Agreements with both Union Pacific Railroad & BNSF Railroad for all crossings.	1	4	3	Early coordination is key. The State has already begun railroad coordination by providing the schematics. Once 30% PS&E is complete, a formal request will be submitted. The estimated timeframe is 1st quarter of 2020.
Utilities	Major transmission towers must be relocated and other existing utilities at the I-610 Interchange must be relocated.	1	3	4	Early coordination is key. The State is beginning subsurface utility engineering to identify utility conflicts. The State will coordinate with the owner of the major transmission towers to begin the multi-year process to adjust the towers.
Real Estate	371 of the 448 parcels have been acquired. There are 77 parcels needed including 25 relocations and a USACE Section 408 permit is required.	1	2	2	The State is updating the right-of-way maps to include the new parcels required. Continued right-of-way acquisition is contingent upon NEPA clearance.

Environmental Permits and Reviews

NEPA Status

At present, environmental analysis is ongoing, with anticipated completion by mid-2019 and environmental clearance by the end of 2019. To date, the findings show minimal impact on project development.

Reviews, Approvals, and Permits by Other Agencies

TxDOT Right of Way Acquisition and Relocation Assistance Program - Thus far, environmental justice analysis has determined that the project will displace 25 residential structures and one commercial structure. However, minority and low-income populations in these areas are comparable to surrounding census tracts. It is not anticipated that SH 35 will cause any disproportionately high or adverse effects to these groups.

U.S. Army Corps of Engineers - Streams (Waters of the U.S.) have been identified within the existing and proposed right of way, which may be jurisdictional under Section 404 of the Clean Water Act. This project would require US Army Corps of Engineer (USACE) authorization prior to discharging fill materials into Waters of the U.S., including wetlands. In addition, the CommunityLinkHouston SH 35 Project would require a Section 408 permit from USACE due to the project crossing of Brays Bayou; a federal flood control project.

Railroads - Coordination with the BNSF Railway and Union Pacific Railroad is necessary due to the proposed crossings of both railroads with the project. Railroad agreements must be executed between TxDOT and the individual railroads documenting any impact to the operation of the railroads with the project.

Utilities - Coordination with utility companies concerning potential contamination during underground utility adjustments may be required.

Environmental Studies or Other Documents

In developing the SH 35 Environmental Assessment, TxDOT has preliminary findings in the following areas:

Historic Preservation - The proposed project is not anticipated to have any impact or use of historic properties under Section 4(f).

Archaeology - 2018 background research and 2008 field work indicate the probability for cultural resources in the project area is very low. An archaeological survey is not warranted for this project prior to construction.

Sound - The proposed project is anticipated to require between one to three noise barriers. A complete noise analysis will be completed once updated traffic volumes have been developed.

7 Large Project Requirements

The CommunityLinkHouston SH 35 Project aligns with INFRA program priorities due to its emphasis on congestion reduction, freight movement and economic growth, improved mobility and system reliability, and highway safety. Table 7-1 describes how this application fulfills INFRA requirements for Large Projects.

Table 7-1 Alignment with INFRA Requirements for Large Projects

INFRA Large Project Requirements	CommunityLinkHouston SH 35 Project
Does the project generate national or regional economic, mobility, or safety benefits?	Economic Benefits: As described in Merit Criterion 1 (Section 5), this project furthers growth by connecting major economic engines, including Houston's largest university and second-busiest airport. Mobility Benefits: The project relieves congestion on adjacent and intersecting corridors (including Interstates, designated National Highway Freight Network, and National Highway System corridors), as described in Section 2 (Project Location). Safety Benefits: Section 5 (Benefit Cost Analysis) describes how this project reduces the likelihood of crashes. The project design incorporates non-motorized elements, adding cycling and pedestrian infrastructure to the corridor. Design standards adhere to best practices, access management, and manuals, and include elements such as central median barriers, shoulders, and auxiliary lanes.
Is the project cost effective?	Yes. As described in Section 5.2, this project successfully leverages federal investment, with 45 percent of total costs derived from non-federal sources including a state contribution of $140M in strategic discretionary funding through the *Texas Clear Lanes* initiative. The aggregated benefits generated by the project yield a benefit-cost ratio of 1.3 at the 7 percent discount rate.
Does the project contribute to safety by achieving a significant reduction in traffic fatalities and serious injuries on all public roads?	Yes. Safety benefits are described above in this table and in Section 5 (Benefit Cost Analysis). According to the project's Benefit Cost Analysis, $48.3 million will be realized in traffic safety benefits (at a 7 percent discount rate) from a reduction in crashes due to reduced vehicle miles traveled.

INFRA Large Project Requirements	CommunityLinkHouston SH 35 Project
Does the project maintain the highway infrastructure asset system in a state of good repair?	Yes. As part of both the National Highway Freight Network and National Highway System, this corridor will be maintained in a state of good repair. Using a state average of $958 per lane mile for annual maintenance for the first ten years, TxDOT estimates the pavement lifecycle costs of SH 35 will total approximately $26,824 per year.
Does the project achieve a significant reduction in congestion on the National Highway System?	Yes. The benefit-cost analysis summarized in Section 5 quantifies the project's impact on traffic, while Section 2 describes how the project relieves congestion on several of the state's most congested roadway segments.
Does the project improve the efficiency of the surface transportation system?	Yes. As described in Section 5.1, SH 35 improves system reliability by lowering the overall vehicle hours of travel (VHT). This lowers travel time and travel cost for drivers, improving efficiency systemwide.
Does the project improve freight movement and economic vitality?	Yes. The project provides a more direct route to the Gulf Coast, enhancing freight movements from Houston to coastal ports, oil fields and nearby mining and industrial activities. Nearly half of estimated future eligible project costs will be spent on components of the project currently located on the National Highway Freight Network (NHFN).
Does the project protect and enhance the natural environment?	Yes. As described in Section 5.1, the project reduces overall vehicle miles travelled, decreasing carbon dioxide and other volatile organic compounds. The project also improves bicycle and pedestrian facilities, providing additional access to local trails and improving active transportation choices.
Does this project reduce project delivery delays?	Yes. Section 5.3 describes TxDOT's innovative project delivery practices, including full NEPA assignment authority, employing an accelerated construction schedule, and including early completion incentives.
Is the project based on the results of preliminary engineering?	Yes. Preliminary schematics (viewable in Schematic 1, Schematic 2, and Schematic 3) for this project, including the interchange with I-610, have been completed. TxDOT is also beginning subsurface utility engineering to identify utility conflicts.
Does the project have one or more stable and dependable funding or	Yes. As described in Section 4.2, the SH 35 project has $196.5 million in committed funds, which is 58 percent of the total project cost. In August 2018, the Texas Transportation Commission approved $140 million of Texas Clear Lanes

INFRA Large Project Requirements	CommunityLinkHouston SH 35 Project
financing sources to construct, maintain, and operate the project?	funding for the project in the 2019 Unified Transportation Program. An additional $56.5 million has been committed by H-GAC's Transportation Policy Council (the formal resolution supporting the project is attached in Appendix D). Section 4.3 also highlights TxDOT's history and commitment as a stable and reliable funding partner, overseeing over $26.6 billion in state and federal funding for the FY2018-19 Biennium to construct, maintain, and operate approximately 197,100 miles of state highway system.
Are contingency amounts available to cover unanticipated cost increases?	Yes. As described in Section 6.1, a 10 percent project contingency is included in the cost estimate. Section 4.4 also describes TxDOT's contingency solutions, such as cash management techniques, in the unlikely event that federal and state dollars are both unavailable.
Is the project easily and efficiently completed without other Federal funding or financial assistance available to the project sponsor?	No. Without federal INFRA grant support, this project would need to be significantly scaled back and delayed in implementation.
Is the project reasonably expected to begin construction not later than 18 months after the date of obligation of funds for the project?	Yes. Section 5.3 describes TxDOT's innovative project delivery practices, which includes the state's ability to assume full NEPA assignment authority. TxDOT has averaged a start-to-completion time of 18 months for environmental assessment projects, allowing construction to begin by the third quarter of 2022. Figure 6.1 shows the project schedule.