Port of Houston Authority
FY 2022 Consolidated Rail Infrastructure and Safety Improvements (CRISI)

# COVER PAGE

Project Title:
**Grade Separation to Improve Safety and Mobility of Goods and People: Port Road Design**

| Applicant Name | UEI# |
|---|---|
| **Port of Houston Authority** | **JNGVKR5UVAM5** |

| | |
|---|---|
| **Federal Funding Requested Under this NOFO** | $1,840,000 |
| **Proposed Non-Federal Match** | $460,000 |
| **Does some or all of the proposed Non-Federal Match for the total project cost consist of preliminary engineering costs associated with a Highway-rail Grade Crossing Improvement Project or a trespassing prevention project incurred before project selection?** | No |
| **Other Sources of Federal funding, if applicable** | None |
| **Total Project Cost** | $2,300,000 |
| **Was a Federal Grant Application Previously Submitted for this Project?** | Yes, Railroad Crossing Elimination grant with the same title |
| **City(-ies), State(s) Where the Project is Located** | Seabrook, TX |
| **Congressional District(s) Where the Project is Located** | 36th |
| **Is this a project eligible under 49 U.S.C. 22907(c)(2) that supports the development of new intercity passenger rail service routes including alignments for existing routes?** | No |
| **Is this a Rural Project? What percentage of the project cost is based in a Rural Area?)** | No |
| **Is this a project eligible under 49 U.S.C. 22907(c)(11) that supports the development and implementation of measures to prevent trespassing and reduce associated injuries and fatalities?** | No |
| **Is the application seeking consideration for funding under the Maglev Grants Program?** | No |
| **Is the project currently programmed in: State rail plan, State Freight Plan, TIP, STIP, MPO Long Range Transportation Plan, State Long Range Transportation Plan?** | Yes, in general, Grade separations (in/around, and east of Houston) is discussed in the Texas Rail plan. It is also part of the Port Area Mobility Study done by the Harris-Galveston Area Council (Metropolitan Planning Organization) |

## Table of Contents

## Project Summary

**Figure 1: November 16, 2022, Railroad Blockage at the Bayport Container Terminal**

***The "Grade Separation to Improve Safety and Mobility of Goods and People: Port Road Design" project will enable prompt construction to reduce delay of movement of goods at the Bayport Container Terminal.***

Port Road is the main roadway that connects the Bayport Container Terminal to the nearest highway (Hwy 146). This road is crossed by a Union Pacific private railroad. When the rail line is operational during gate hours, it causes significant delays in goods movement and increases traffic congestion and the potential for safety incidents. The design and environmental analysis in this project will allow Port of Houston Authority of Harris County, Texas (the "Port Authority") to move to the construction phase without delay. Once construction is complete, the grade separation will improve safety and provide emission reduction benefits while maintaining significant economic benefits including job creation and support of international trade, petrochemical, manufacturing, and agricultural logistics. The total estimated cost for Track 2 design and environmental analysis is $2,300,000 and will be supported by this request of $1,840,000. The proposed local cost share is 20 percent of the total, with 80 percent federal support requested.

## Project Funding

### A. Project Cost

| Project Funding Source | Estimated $ | % Total |
|---|---|---|
| Port of Houston Authority | $460,000 | 20% |
| CRISI | $1,840,000 | 80% |
| **Total** | **$2,300,000** | **100%** |

## B. Source and Amount of Funds

The future cost of the "***Grade Separation to Improve Safety and Mobility of Goods and People: Port Road Design***" project is estimated to total $2,300,000.

The Port Authority respectfully requests a grant of $1,840,000 (80 percent of the estimated project cost) to support the design and environmental analysis of the project. The Port Authority will provide $460,000 (20 percent of the estimated project cost) in matching funds, sourced from the net revenues generated from Port Authority operations, to support this project. Match contributions meet the requirements in 2 CFR 200.306.

The Port Authority has also submitted this request in the 2022 Railroad Crossing Elimination Program.

## C. Funding Commitments

In recent years, the Port Authority has generated between $379 million and $506 million in annual operating revenues from vessel and cargo services and equipment and facility rentals. Though a large percentage of this revenue is expected to be reinvested in facility improvement and maintenance, the Port Authority fully expects to have the amount of its funding commitment – $460,000 – available during 2023 to 2024 to use as local matching funds for this project. The Port Authority is now seeking funding, as the recent increase in demand of cargo has emphasized the need to advance the project.

The Port Authority's Letter of Commitment is attached as Appendix 1 of this application.

## D. Project Funding Table

| Task No. | Task Name/Project Component | Cost | Percent of Total Cost |
|---|---|---|---|
| **1.** | Design | $2,100,000 | 91% |
| **2.** | Environmental Analysis | $200,000 | 9% |
| **TOTAL** | | $2,300,000 | 100% |
| **Federal Funding Request Under this NOFO** | Future funding | $1,840,000 | 80% |
| **Non-Federal Funding/Match** | Future cash match | $460,000 | 20% |
| **Pending Federal Funding Requests** | Railroad Crossing Elimination Program | $1,840,000 | 80% |

## Applicant Eligibility

***The Port of Houston Authority of Harris County, Texas (the "Port Authority") is a public port authority. The Port Authority owns and operates a diverse group of facilities handling general cargo, containers, grain, coal, dry and liquid bulk, and project and heavy-lift cargo. Bayport Container Terminal, the premier intermodal facility on the U.S. Gulf Coast, keeps the supply chain moving by optimizing productivity and providing fast turnaround for container vessels.***

The Port Authority would be the sole grant recipient and will provide the cash match of future funds as detailed in Sections B and C. The Port Authority is an independent governmental entity governed by a Port Commission composed of seven commissioners. Two are appointed by Harris County Commissioners Court, two by the Houston City Council, one by the Pasadena, Texas City Council, and one by the Harris County Mayors and Councils Association, a group comprised of representatives of other county municipalities. The Chairman of the Port Commission is jointly appointed by Harris County Commissioner's Court and the Houston City Council.

The Port Authority has more than 700 employees and has successfully managed millions of dollars in federal and state grants. Last year alone, the Port Authority managed more than $79 million in grants from organizations such as the U.S. Department of Homeland Security, U.S. Department of Transportation, and the U.S. Environmental Protection Agency.

## Project Eligibility

The Port Authority does not own the roadway or rail that is associated with the project. The Port Authority's role in the project is permitted in an agreement with Harris County to improve the roadway. Communication with Union Pacific regarding this project has resulted in the review schedule included in this application.

The proposed project is in direct alignment with CRISI Track 2—Project Development. Track 2 consists of projects for eligible Project Development activities. PE examples include: PE drawings and specifications (scale drawings at the 30 percent design level, including track geometry as appropriate); design criteria, schematics and/or track charts that support the development of PE; and work that can be funded in conjunction with developing PE, such as operations modeling, surveying, project work/management plans, preliminary cost estimates, and preliminary project schedules.

This track will design and complete the environmental analysis necessary to obtain NEPA compliance to move the project to construction.

## Detailed Project Description

Bayport Container Terminal provides 4,000 linear feet of berthing space for vessels, with projects underway to expand this to 7,000 feet of berthing space. When fully developed, the terminal will have a total of nine container berths totaling 10,500 feet, with the capacity to handle 4 million Twenty-foot Equivalent Units (TEUs; the standard container measure) for a complex that includes 376 acres of container yard and a 123-acre intermodal facility.

The recent explosive demand of cargo underscores that development and deconflicting the main corridor (Port Road) for optimum cargo movement is imperative.

> President Biden's statement on October 13, 2021 drives and supports this Port Authority request for funding. "***The bill would also make investments in our supply chains and manufacturing and strengthening our ability to make more goods, from the beginning to end, right here in America. The bottom line: We've***

***seen the cost of inaction in the pandemic in the delays and the congestion that affect every American."***[1]

The Port Authority has also seen increased demand of cargo and has made extraordinary efforts to address the resulting challenges. With over 9,000 truck moves a day on Port Road just from the Bayport Container Terminal, one train moving during high capacity once a week would result in: (Appendix 2: Benefit Cost Analysis)

- An average of 237 hours of delay per blockage. This delay is just to the trucks and not the residential traffic as trucks will back up onto Highway 146 and block all movement.
- The potential delay cost to truckers of $17,786,000 over the lifetime of the construction project from a once-a-week train movement during operational hours.
- The following emission impacts:
    - 592,611 tons of $CO_2$ at a cost of $43,881,044
    - 4.89 ton of NOx at a cost of $88,050
    - 18.36 tons of $PM_{2.5}$ at a cost of $15,748,166
    - 4.95 SO2 at a cost of $242, 292

The impacts described above would increase with each additional train and roadway blockage.

The scope of the work required for design and environmental analysis of the grade separation on Port Road near the Bayport Container Terminal includes the following:

1. The consultant will use Port Road Grade Separation Schematics and other information developed by Port Authority and the engineering consultant in the design. Current schematic shows road expansion from SH-146 to Cruise Street with a road rail overpass option.

2. Design and coordinate with the Port Authority and contractors currently working on various Bayport Projects such as the Electrical and Telecommunications Bore at Port Road, Container Yard 7 Construction and East End development. Prevention and mitigation of construction and/or operational delays is critical.

3. Design and obtain approval from Union Pacific at 30, 60, and 100 percent completion of the design.

4. Develop and submit to completion the environmental analysis required for this project. This will require coordination with the Federal Railroad Administration, the community, local businesses, and Union Pacific.

Preliminary drawings below (Appendix 3)

Figure 2: Preliminary Drawing

Further, the Port Authority has taken affirmative steps to employ small businesses and historically underutilized businesses. The Port Authority's mission is to "move the world and drive regional prosperity," and it exists to create a positive economic impact in our region that equates to a positive social impact for people. For many residents, that means delivering goods and creating jobs to support their lives. For many business owners, that means supporting their success by providing opportunities to do business with the Port Authority and efficiently move their goods.

Small, Minority- and Woman-owned Business Enterprises (S/MWBEs) support thousands of employees in our region, boost local economies, and provide meaningful services and goods in our communities, and since 2002, the Port Authority has awarded more than $600 million in contracts to many of these businesses in a race- and gender-neutral program.

Recent work at the Port Authority provided metrics to support implementation of a race- and gender-conscious procurement program to further honor the diversity of the region through Port Authority procurement and contracting. In July of 2021, the Port Authority launched its Minority- and Woman-Owned Business Enterprise Program which exists alongside the Small Business Development Program, under the Business Equity umbrella. In 2022, the Port Authority continued to demonstrate its commitment to invest in and grow the program with its strategic target to *Execute the Business Equity Plan with increased S/MWBE enrollment and participation.*

This design and eventual construction will complement current infrastructure investments at Bayport Container Terminal that are intended to grow the Port Authority's ability to handle increased cargo without adding to congestion. These include:

- Construction of Container Yard 6, 48 acres ($49.9 million, completed);
- Construction of Container Yard 7 ($49.5 million, completed; applied for funding and not awarded);
- Construction of a public transportation project to expand Port Road from four to six lanes, including drainage improvements ($16.5 million, under construction; Texas Department of Transportation grant funding);
- Rail Spur construction ($13.5 million, under construction);
- Widening of the Bayport Container Terminal gate turn lane ($39,000, designed);

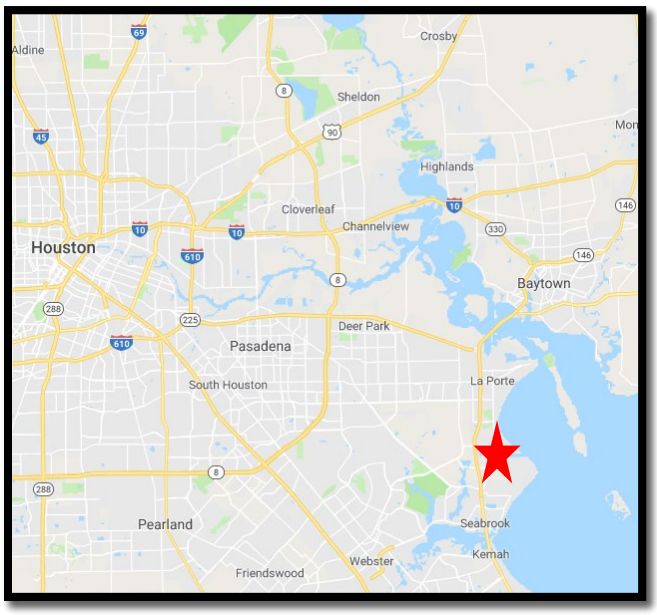
- Construction of Wharf 6 ($94 million, under construction; funded 23 percent with PIDP FY19);
- Construction of Wharf 7 (estimated $102 million, under design);
- Construction of Container Yard 2 South ($18.75 million, under construction);
- Construction of Container Yard 1 North and Middle, 42 Acres (estimated $63 million, design on-going, construction anticipated in 2022);
- Construction of Container Yard East End North, 50 Acres (estimated $101.7 million, design completion anticipated in late 2022, construction start anticipated in 2023; funded with $18.3 million PIDP FY21 award); and
- This project, **"*Grade Separation to Improve Safety and Mobility of Goods and People: Port Road Design*"** (estimated $2,300,000, with a request of $1,840,000, 80 percent of the overall project cost).

**The "*Grade Separation to Improve Safety and Mobility of Goods and People: Port Road Design*" project merits approval for a Rail Crossing Elimination Grant Program award because it demonstrates:**

- **Strong economic impacts**
- **Good-paying job growth, both union and non-union**
- **Sustainable long-term benefits:**
    - **Maintains the reliability of and improves the movement of goods through the Bayport Container Terminal and the entire supply chain; and**
    - **Contributes to economic growth and mitigates emissions in surrounding communities, including historically disadvantaged communities.**

## Project Location

Figure 3: Project location map




The "***Grade Separation to Improve Safety and Mobility of Goods and People: Port Road Design***" project is located on Port Road which is the main thoroughfare for the Port Authority's Bayport Container Terminal in east Harris County, Texas, Congressional District 36. The Port Authority is a navigation district, a political subdivision of the State of Texas with boundaries that are generally coterminous with Harris County. Harris County includes close to 5 million people with 295 Census tract areas of persistent poverty, as listed in the table provided by U.S. Department of Transportation. The project is also located in the Census-designated Urbanized Area of Houston.

The Port Authority owns and operates multiple terminals in Houston and Harris County. Its Barbours Cut and Bayport Container Terminals are the premier container facilities serving the region. The Port Authority is the 6th largest container port in the nation.

The Port Authority also owns and operates other terminals and related facilities in the region, including a 315-acre industrial park and facilities leased to independent third-party operators. The Port Authority contributes 164.5 miles of railroad track with operating rights on an additional 54.0 miles to support the operation of the Port Terminal Railway Association, the group of line railroads serving the Houston Ship Channel.

Figure 4: Location

The "***Grade Separation to Improve Safety and Mobility of Goods and People: Port Road Design***" project is located on Port Road near Bayport Container Terminal:

| | Project Location |
|---|---|
| Latitude: | 29.604005 |
| Longitude: | -95.016017 |

## Grade Crossing Information

Figure 5: Grade Crossing Information


Union Pacific owns the railroad infrastructure and crossing and is the primary railroad operator. The DOT crossing number is DOT675255L and the railroad crosses over a 6-lane divided Port Road. Port Road is the main thoroughfare for the Bayport Container Terminal.

## Evaluation and Selection Criteria

### A. Project Benefits and Benefit Cost Analysis

The current state allows both the rail and the road traffic to move with limited conflict. With anticipated demand this will not remain the environment for much longer. The Port Authority has extended gate hours to 6 a.m. to 7 p.m. and added Saturday operations. This leaves limited hours for the train to run without impacting traffic. The Port Authority has seen increased demand for containers reaching double digit growth in both 2021 and 2022. This demand will lead to additional gate hours to move the supply chain.

In addition, the main user of the rail is Baystar, Bayport Polymers LLC. Baystar is currently undergoing an expansion project that will increase their demand for use of rail. This is projected to double the current frequency needs of the rail.

With the anticipated growth in both sectors, the inevitable conflict of rail and road movement of goods will cause large backups and delays. These delays are expected to stop traffic both in the container terminal and on Highway 146.

The grade separation will allow the continued movement of the supply chain both by rail and truck. The benefits from one rail and roadway conflict have the project at an undiscounted benefit cost ratio of three. (Appendix 2- Benefit Cost Analysis)

This ratio looked at the projected total cost of the project, including:

1. Design $2.3 million (This application)
2. Construction $21 million (Future application)
3. Maintenance $2.6 million (25-year asset life)

The benefits included delay to truck drivers, emission impacts of the delays, and safety of incidents projected to take place due to conflict of rail and roadway traffic.

DELAY BENEFITS

The Benefit Cost Analysis workbook used the assumptions that a train would cross paths with the roadway traffic during peak operations once a week for 20 minutes. This conflict and standstill of roadway traffic will cause a back up of on average 265 hours per year.

| **Trains Per Week** | **Average Peak Traffic** | **Train Conflict Time** | **Average Hours of Conflict** | **Cost Savings Average per Conflict** |
|---|---|---|---|---|
| 1 | 803 | 20 Minutes (.33) | 265 | $8,480 |

Over the 25-year life of the grade separation it is expected to save **381,376 hours** of idling truck traffic which equates to **$19,014,000** (Undiscounted) and **$17,683,000** (discounted at 7%). These numbers consider the increasing demand and inflation rate.

EMISSION BENEFITS

The emission benefit is calculated by the number of saved idling hours multiplied by Houston-Galveston Area Council emissions factors for idling trucks.

| **Environmental Impacts** | | |
|---|---|---|
| **One train a week impact** | | |
| **2022 $/ ton Monetized Values** | **TOTALS** | **Discounted 7%**** |
| Nitrogen oxides (NOx) | $ 88,050 | $ 42,244 |
| Particulate matter (PM) | $ 15,748,166 | $ 10,337,718 |
| Sulfur dioxide (SO2) | $ 242,292 | $ 93,692 |
| **CO2 is discounted at 3% | $ 43,881,044 | $ 27,506,210 |
| Totals | $ 59,959,552 | $ 37,979,864 |

The following emission impacts:

- 592,611 tons of $CO_2$ at a cost of $43,881,044
- 4.89 ton of NOx at a cost of $88,050
- 18.36 tons of $PM_{2.5}$ at a cost of $15,748,166
- 4.95 SO2 at a cost of $242, 292

SAFETY BENEFITS

According to the Federal Rail Administration (Tracking Toward Zero: Improving Grade Crossing Safety and Addressing Community Concerns | US Department of Transportation) trespassing on railroad property is the leading cause of all rail-related deaths in the United States. Grade crossing incidents are the second. Together these types of accidents account for 97 percent of all fatalities along the nation's railroad rights-of-way.

Most at grade crossings are truck and trailer impacts. Nationally, these types of incidents happen 10 times per week. (Highway-Rail Grade Crossing Safety | FMCSA (dot.gov)) The Port Authority wants to mitigate theses incidents.

These safety statistics demonstrate why providing a grade separation for this roadway is important not only for the movement of the supply chain, but for all the people who cross this road or will be impacted by the blockage of Highway 146.

To provide the safety benefits for this project, the Port Authority looked at City of Seabrook statistics provided by Texas Department of Transportation. (Crashes and Injuries Cities and Towns (txdot.gov)). These 2021 data starting point numbers were multiplied by the anticipated increase in truck arrivals.

The assumption is that one third of these incidents are related to traffic around the container terminal. Due to the limited conflict in the current state and no statistics provided for the rail crossing, the Port Authority has used a very conservative number of .09%.

With these statistics the grade separation would save **$2,560,876 (undiscounted)** over the 25-year life of the asset.

## B. Technical Merit

This scope is expected to take 18-24 months to complete design. The scope of the work required for design and environmental analysis of the grade separation on Port Road near the Bayport Container Terminal includes the following:

1. The consultant will use Port Road Grade Separation Schematics and other information developed by Port Authority and the engineering consultant in the design. Current schematic shows road expansion from SH-146 to Cruise Street with a road rail overpass option.
2. Design and coordinate with the Port Authority and contractors currently working on various Bayport Projects such as the Electrical and Telecommunications Bore at Port Road, Container Yard 7 Construction and East End development. Prevention and mitigation of construction and/or operational delays is critical.

3. Design and obtain approval from Union Pacific at 30, 60, and 100 percent completion of the design.
4. Develop and submit to completion the environmental analysis required for this project. This will require coordination with the Federal Railroad Administration, the community, local businesses, and Union Pacific.

The Port Authority would be the sole grant recipient and has the technical capacity to complete the project on time. The Port Authority has coordinated with Harris County, Union Pacific and local businesses during the first phase of the project to move to design and eventual construction without delay.

The Port Authority is an independent governmental entity governed by a Port Commission composed of seven commissioners. Two are appointed by Harris County Commissioners Court, two by the Houston City Council, one by the Pasadena, Texas City Council, and one by the Harris County Mayors and Councils Association, a group comprised of representatives of other county municipalities. The Chairman of the Port Commission is jointly appointed by Harris County Commissioner's Court and the Houston City Council.

The Port Authority has more than 700 employees and has successfully managed millions of dollars in federal and state grants. Last year alone, the Port Authority managed more than $25 million in grants from organizations such as the U.S. Department of Homeland Security, U.S. Department of Transportation, and the U.S. Environmental Protection Agency.

## Project Implementation and Management

The "***Grade Separation to Improve Safety and Mobility of Goods and People: Port Road Design***" project will permit the Port Authority to hasten a roadway project to ensure that cargo is moved economically, safely, efficiently, and in an environmentally sound manner.

- Design and environmental analysis of the grade separation at Port Road. This design is anticipated to begin in 2023 and complete in early 2025 with the support of this application for federal funding.
- While the construction phase is currently scheduled for late 2028 or beyond depending on availability of funds, a successful application could allow the construction phase to begin in 2025.The probable construction duration is between 18 and 24 months from the time of construction contractor mobilization.

The design will incorporate the latest operational requirements and technology improvements, as well as preliminary design and environmental assessment. If this application is successful, moving this forward to 2023 will accelerate the project, as the current design is not slated to be contracted for until 2025 or later depending on funding. Environmental analysis activities are expected to be complete by March 2024 with final design taking place in early 2025. Probable construction duration is between 18 and 24 months from the time of contractor mobilization. Major project milestones include: (i) obligation of the Rail Crossing Elimination FY 2022 grant by early-2023, (ii) awarding the design contract in June 2023, (iii) National Environmental Protection Act (NEPA) compliance completion early-2024, and (iv) final approval by Union Pacific in early 2025.

Aside from our organization size the Port Authority has a proven track record for successfully managing millions of dollars in federal and state grants. Last year alone, the Port Authority managed more than $79 million in grants from organizations such as the U.S. Department of Homeland Security, U.S. Department of Transportation, and the U.S. Environmental Protection Agency. The Port Authority also boasts a plethora of resources which promote successful grant management. A full-time, permanent Grant Manager, and a full-time, permanent Grant Coordinator are dedicated to the successful execution of funding.

## Project Readiness

The initial discussion about this project began in 2017 with preliminary drawings completed in 2018. Preliminary drawings can be found on page 6, Figure 3. (Appendix 3) These designs were completed with Texas Department of Transportation, Union Pacific, and local businesses in mind.

Since that time this project has been discussed with stakeholders to include needs of the community, local businesses, Port Authority, and Railroad.

## Strategic Goals

### A. Safety

**The Port Authority was the first seaport in the world to be certified to the ISO 28000 standard for supply chain security. Including safety aspects in the movement of freight allows the Port Authority to maintain a high standard for supply chain security.**

According to a news report Texas ranks #1 for train collisions | CW39 Houston.

"Texas ranks highest for the number of train collisions in the country, according to the latest full-year statistics from the Federal Railroad Administration. Harris County had the greatest number of highway-rail incidents totaling 28 in 2020, followed by Tarrant with 16, Bexar with eight and Dallas with seven."

The "***Grade Separation to Improve Safety and Mobility of Goods: Port Road Design***" will design a safe grade separation taking into consideration the needs of the businesses, rail and the people that use the roadway. This updated infrastructure will mitigate any additional rail-related incidents in Harris County when operational hours conflict with rail movement.

### B. Equitable Economic Strength and Improving Core Assets

***The "Grade Separation to Improve Safety and Mobility of Goods and People: Port Road Design" does exactly what this funding is meant for: improves the mobility of freight and safety for the people moving on Port Road near the Bayport Container Terminal. This is accomplished while investing in the supply chain, strengthening the nation's ability to make and move more goods efficiently and promptly, and grow the economy for the region, state, and nation.***

In 2014 the greater Port of Houston, the 25-mile complex that includes the Port Authority and more than 200 private industrial companies along the Houston Ship Channel, celebrated 100 years as a deep-water port. The Port of Houston is one of the region's most important economic assets.

**Statistical Highlights for the Houston Ship Channel complex**

- *1st ranked U.S. port in foreign waterborne tonnage – 193.8 million short tons (2021)*
- *1st ranked U.S. port in total foreign and domestic waterborne tonnage – 276 million short tons (2020)*
- *3rd ranked U.S. port in terms of total foreign cargo value ($169.7 billion) (2021)*
- *Largest Texas port, with 35% of market share by tonnage*
- *Goods moved through the Port of Houston reach 100 million consumers, or approximately one-third of the U.S. population*.

With over 22,000 ship movements each year and 100,000 vessel movements (barges and tugs), the Port of Houston is the largest port by tonnage in the country. This is according to a report by the Houston Maritime Center on August 3, 2022.

Numerous railroads and trucks also call at the Port of Houston for daily delivery and receipt of containers as well as the shipping of other cargo between inland origins (e.g., manufacturing sites, big-box retail stores, and small business operations) and marine terminals.

The Port Authority is a crucial component of this critical economic engine for the Houston region, the State of Texas, and the United States. Port Authority facilities, located just a few hours from the Gulf of Mexico and centered in the 4th largest city in the U.S, enable Port Authority cargo to quickly access an excellent system of interstate highways to serve both the region and the heartland of the U.S.

**Statistical Highlights for the Port Authority**

- *7th ranked U.S. container port by total TEUs*
- *Largest Gulf Coast container port, handling almost 70% of U.S. Gulf Coast container traffic*
- *Largest Texas port, with about a 97% market share in containers*

The Bayport Container Terminal, according to the Port Authority's 2018 Economic Impact of Marine Cargo Activity at the Port of Houston on the State of Texas and United States Study, is a large and vibrant component of the regional and national economy, and this project will have strong impacts benefitting the local, State and National population. Because of this, there is broad support for this project as show in Appendix 4, Support Letters.

As such, the Port Authority is a critical economic engine for the Houston region, the State of Texas, and the United States. The Port of Houston's trade with the world rose 13.64 percent, from $74.95 billion to $85.18 billion through the first eight months of 2017, when compared to the same period the previous year. During the same time, the nation's total trade was $2.54 trillion, with exports at $1.01 trillion and imports at $1.53 trillion. The nation's total trade increased 6.38 percent compared to the same period last year. Exports rose 6.18 percent and imports rose 6.52 percent.[ii]

| | U.S. | Texas |
|---|---|---|
| **Economic Activity** | $802 Billion | $339 Billion |
| **Jobs** | $3.2 Million | $1.35 Million |
| **Tax Revenue** | $38 Billion | $6 Billion |
| **Personal Income** | $170 Billion | $74 Billion |

Full report can be found at https://porthouston.com/about-us/economic-impact/

There is a huge potential for strong future growth in exports tied to the increased production of shale oil, resins, and chemical products. As just one example, The Greater Houston Port Bureau has estimated that the shale oil industry has generated up to $29 billion in investments in the Houston area since 2010.

The table below summarizes the projected increases by percentage in TEUs for the Port Authority.

Table 1: Historical and Projected TEUs, Port Authority

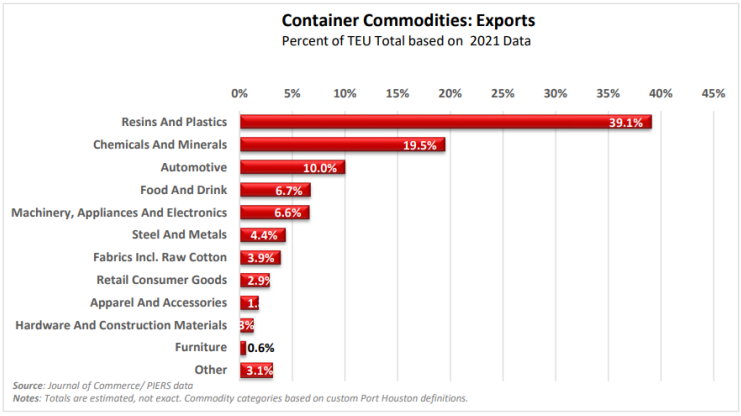
| Port of Houston Authority | TEUs Handled |
|---|---|
| 2021 Actuals | 3,319,655 |
| 2041 Projections | 7,829,741 |
| Percent Total Increase | 236% |
| Annual Increase (divided by 20 years) | 12% |

Source: Port Authority

As shown in Figure 7, over 58.6 percent of the Port Authority's exports tie to the energy trade. While this displays statistics for all Port Authority export commodities, the percent shares are similar over all terminal operations.

Figure 7: 4-Container-Volume-by-Commodity-2021.pdf (porthouston.com)

| | | | | | | Rank | Percent |
|---|---|---|---|---|---|---|---|
| Total | 948,383 | 1,041,636 | 1,230,255 | 1,201,124 | 1,012,482 | - | 100.0% |
| Resins And Plastics | 255,259 | 311,727 | 438,013 | 522,713 | 395,525 | 1 | 39.1% |
| Chemicals And Minerals | 153,331 | 167,769 | 220,695 | 234,905 | 197,488 | 2 | 19.5% |
| Automotive | 71,498 | 100,909 | 100,909 | 95,328 | 101,413 | 3 | 10.0% |
| Food And Drink | 79,681 | 67,524 | 71,564 | 74,787 | 68,295 | 4 | 6.7% |
| Machinery, Appliances And Electronics | 70,254 | 68,964 | 66,625 | 59,953 | 67,156 | 5 | 6.6% |
| Retail Consumer Goods | 70,532 | 76,986 | 70,107 | 38,382 | 29,068 | 6 | 2.9% |
| Fabrics Incl. Raw Cotton | 62,160 | 57,493 | 58,390 | 50,364 | 39,587 | 7 | 3.9% |
| Steel And Metals | 30,477 | 37,833 | 42,312 | 42,178 | 44,358 | 8 | 4.4% |
| Apparel And Accessories | 19,834 | 21,632 | 27,868 | 29,247 | 18,574 | 9 | 1.8% |
| Hardware And Construction Materials | 18,090 | 19,553 | 24,123 | 16,775 | 13,643 | 10 | 1.3% |
| Furniture | 4,077 | 3,449 | 3,434 | 4,222 | 6,357 | 11 | 0.6% |
| *Other* | *113,190* | *107,797* | *106,215* | *32,271* | *31,018* | - | *3.1%* |




The Port Authority is by far the leading U.S. container port for the export of raw plastic resins: in 2019, it handled 52 percent of all U.S. plastic resin exports. Of this, 4.5 million metric tons were polyethylene (PE), a 77 percent increase over the prior 12 months as many new manufacturing plants came online. This product category could potentially double over the next decade, as more U.S. ethylene

crackers and associated polyethylene plants are built.

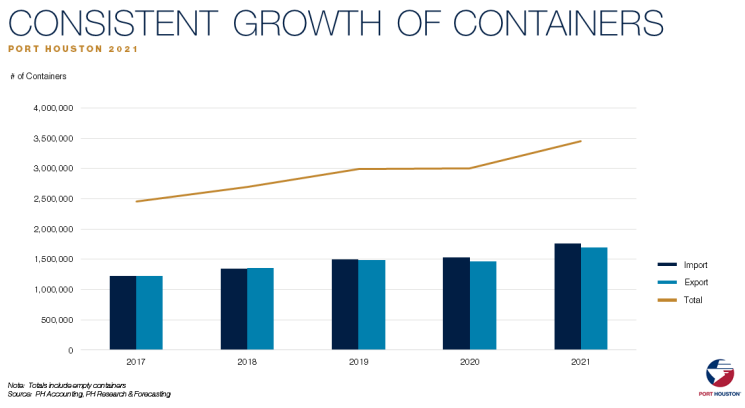
Containerized shipping is the preferred export mode for raw plastics resins created from U.S. ethylene, which originates from American natural gas liquids (NGLs) produced as a key component of shale gas. The domestic plastics market for raw resin is essentially saturated, so most new production is flowing to the export market, supporting American oil and gas production and contributing to a positive U.S. balance of trade. Houston is the leading U.S. port for plastics exports due to the numerous plastics plants in the region, as well as its concentration of third-party plastics packaging facilities that receive railcars of plastics and package them for export in 25-kilogram bags that are palletized and containerized. Value-added products like ethylene and polyethylene have been critical to supporting high NGL prices even as natural gas (i.e., methane) prices remained very low, supporting oil and gas exploration activity, our nation's energy producers, and its energy independence.

The Port Authority's container terminals also serve as essential export nodes for specialty chemicals, which move in palletized drums, "IBC totes," bladders, sacks, and tank containers. In 2018, containerized chemical exports represented about 2.5 million metric tons of cargo at the Port Authority, almost 22 percent of all exports.

The containerized route provides significant additional flexibility for U.S. specialty chemical producers, who would otherwise have to depend on parcel tankers to carry their products to market. Though specialty chemicals are a very broad field, they generally depend on feedstocks flowing from oil and gas production. This means that the ability to easily export specialty chemicals supports specialty chemical production, which in turn supports demand for oil and gas-derived products including ethane/ethylene, propane/propylene, the "C4 chain," and many other products. The benefits of this increased demand flow straight back to oil and gas producers.

To support continued growth of all these cargo categories, the Bayport Container Terminal must continue to increase its capacity, while minimizing the impact on the community and environment. The design and environmental analysis is a step forward to provide construction in the most efficient and effective way for all stakeholders.

**Figure 8:** https://porthouston.com/about-us/statistics/

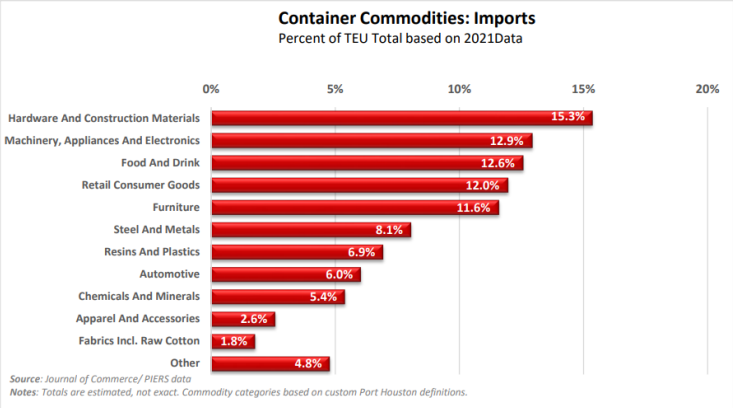



As seen in Figure 8, the "***Grade Separation to Improve Safety and Mobility of Goods and People: Port Road Design***" project will improve the mobility of goods and people for the Bayport Container Terminal. This allows the continued growth in exports and imports without delays caused by the at grade crossing on Port Road.

Port Authority container terminals serve as essential node supports for U.S. manufacturing exports. Houston is a leading U.S. manufacturing city and the world's leading location for manufacturing of oil and gas exploration and production equipment. Since many manufactured products are sent to overseas locations most efficiently via containerized shipping, Port Authority container terminals provide these Houston manufacturers with easy access to global export markets.

Figure 9: 4-Container-Volume-by-Commodity-2021.pd (porthouston.com)

| Commodity Category | 2017 | 2018 | 2019 | 2020 | 2021 | 2021 Rank | 2021 Percent |
|---|---|---|---|---|---|---|---|
| Total | 1,073,113 | 1,194,335 | 1,244,502 | 1,293,277 | 1,626,201 | - | 100.0% |
| Hardware And Construction Materials | 158,806 | 173,729 | 177,094 | 212,862 | 249,526 | 1 | 15.3% |
| Food And Drink | 154,274 | 158,138 | 159,044 | 187,811 | 204,387 | 2 | 12.6% |
| Machinery, Appliances And Electronics | 121,759 | 148,698 | 167,382 | 155,995 | 210,244 | 3 | 12.9% |
| Retail Consumer Goods | 143,041 | 152,543 | 153,959 | 151,173 | 194,417 | 4 | 12.0% |
| Furniture | 97,916 | 117,636 | 117,908 | 131,444 | 188,459 | 5 | 11.6% |
| Steel And Metals | 102,045 | 116,639 | 122,745 | 98,376 | 131,130 | 6 | 8.1% |
| Resins And Plastics | 61,430 | 73,087 | 79,150 | 79,874 | 112,889 | 7 | 6.9% |
| Chemicals And Minerals | 67,884 | 73,493 | 78,346 | 82,082 | 87,900 | 8 | 5.4% |
| Automotive | 68,649 | 78,604 | 73,720 | 67,198 | 98,316 | 9 | 6.0% |
| Apparel And Accessories | 20,035 | 20,983 | 28,858 | 34,202 | 42,371 | 10 | 2.6% |
| Fabrics Incl. Raw Cotton | 17,946 | 21,183 | 23,883 | 26,274 | 29,246 | 11 | 1.8% |
| *Other* | *59,329* | *59,602* | *62,414* | *65,985* | *77,316* | | *4.8%* |



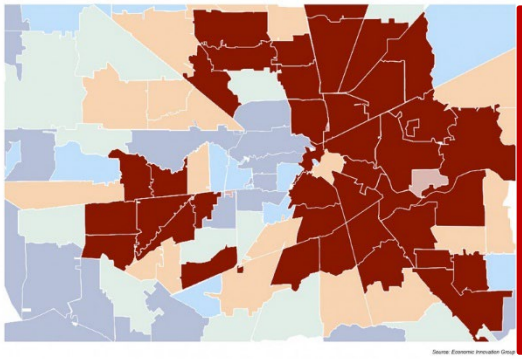

Port Authority container terminals also support U.S. agriculture. Refrigerated exports of meat products, including beef organ meat exports, is an important cargo sector, and critical to supporting U.S. cattle producers, given little domestic demand for some of these products. These exports help to support cattle prices in a difficult environment for both cattlemen and consumers. The Port Authority container terminals also have a long history of exporting bagged PL-480/USAID food aid, as well as many other processed and value-added food products. According to our records in 2021, edible agricultural products represented 7 percent of the Port Authority's containerized exports, with an additional 4 percent for non-edible agriculture cargos, including various agricultural byproducts and another 4 percent for cotton. Additional commodity breakdowns can be seen in Figure 7. The chart displays the breakdown of commodities over the last 5 years.

To support continued growth of all cargo categories mentioned above, Bayport Container Terminal must continue to increase its capacity. To do this without causing congestion, a grade separation to Improve Safety and Mobility of Goods and People on Port Road is essential.

### C. Equity and Barriers to Opportunity

Port Road is the main thoroughfare for Bayport Container Terminal, local businesses, and the community located near the terminal. The impact of this project will stretch far beyond the terminal, and especially benefit Harris and surrounding counties. Harris County alone serves a population close to 5 million people, with 104 opportunity zones identified by the Internal Revenue Service. Many of the surrounding rural counties also serve Historically Disadvantaged populations.

Figure 10: Historically Disadvantaged Map



According to the Rice Kinder Institute for Urban Research: "Of the 45 zip codes in Harris County that are economically distressed – many of which are seen in red – eight are majority-Black and 28 are majority-Hispanic."

**Job creation**

According to the 2018 Economic Impact of Marine Cargo Activity at the Port of Houston on the State of Texas and United States Study, "In addition to the direct (67,039), induced (126,999) and indirect (64,283) job impacts, the port activity supports 2,950,488 jobs throughout the United States, of which 1,125,671 related jobs are in the state of Texas."

The Port Authority's project "***Grade Separation to Improve Safety and Mobility of Goods and People: Port Road Design***" will improve the mobility of goods and people moving on Port Road near the Bayport Container Terminal, giving access to jobs in and around the terminal.

## D. Climate Change and Sustainability

***The Port Authority is dedicated to creating greater value for our region through environmental leadership. With our strategic focus on air, water, waste, and operational efficiency, we are supporting the sustainable growth of the Houston Ship Channel region to help ensure a brighter future for all.***

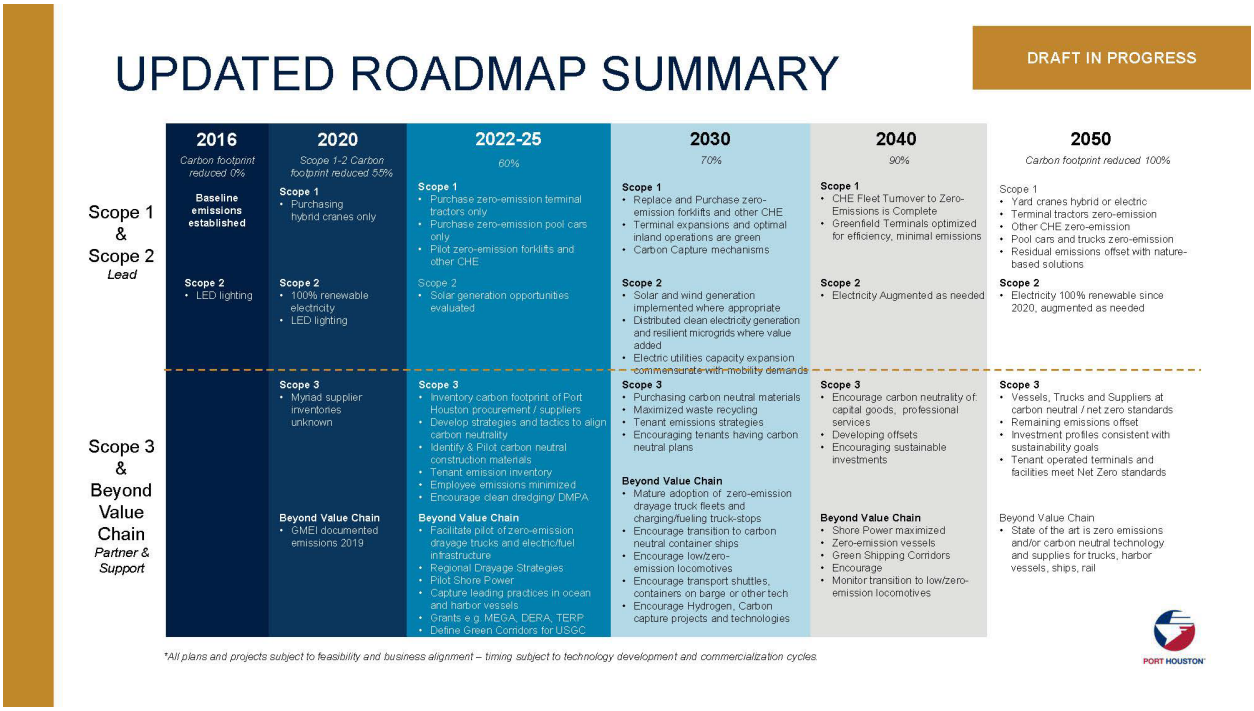



Figure 11: Appendix 5

The "***Grade Separation to Improve Safety and Mobility of Goods and People: Port Road Design*** project is in the Houston-Galveston area and impacts Harris, Galveston, and Chambers counties. Effective August 3, 2018, a six-county area, including Brazoria, Chambers, Fort Bend, Galveston, Harris, and Montgomery Counties was designated nonattainment and classified marginal under the 2015 eight-hour ozone NAAQS. These counties have large populations of historically disadvantaged communities. This project will help mitigate and improve environmental justice goals without causing disruption to the area supply chain, as it mitigates emission impacts while addressing the increased supply demand.

Emission benefits are calculated by using the efficiency reduction of hours reduced by not stopping movement of roadway while a train crosses. Those hours with the percentage of tiered fleet were entered into the EPA's Diesel Emissions Quantifier to calculate emissions (https://cfpub.epa.gov/quantifier). The emission results were quantified in tons for Nitrogen Oxide (NOx), and fine particulate matter (PM2.5). The Carbon emission (CO2) conversions were taken from Houston-Galveston Area Council's guide for local truck emissions. The total tons were multiplied by the U.S. Department of Transportation's Benefit-Cost Analysis Guidance for Discretionary Grant Programs' financial calculations for emissions in ton. Details can be found Appendix 2: Benefit-Cost Analysis.

This project will allow the Port Authority to continue to move the supply chain without increasing environmental impacts on the surrounding communities.

## E. Transformation

**The "*Grade Separation to Improve Safety and Mobility of Goods and People: Port Road Design*" project will design a safe grade separation taking into consideration the needs of the businesses, rail and people that use the roadway.**

The Port Authority has seen increased demand of cargo and has made extraordinary efforts to address the resulting increases in cargo. With over 9,000 truck moves a day on Port Road, one train moving during high capacity once a week would result in: (Appendix 2: Benefit Cost Analysis)

- An average of 207 hours of delay per blockage. This delay is just to the trucks and not the residual traffic as trucks back up onto Highway 146 and block all movement.
- The potential delay cost to truckers of $3,420,000 undiscounted over the lifetime of the construction project.
- The following emission impacts:
    - 113,963 tons of $CO_2$ at a cost of $8,438,662
    - 1 ton of NOx at a cost of $16,933
    - 3.53 tons of $PM_{2.5}$ $3,028,493

As displayed in Figures 12 and 13 below, the impact of delays grow as container cargo grows with time. In addition, with each new train crossing during operational hours, the above impacts will be compounded. This grade separation is essential to mitigate impacts of the rail on current and future demands of the roadway. The separation will improve safety, allow added capacity to already congested corridors, and improve supply chain resilience.

Figure 12 Projected 2023 delay due to crossing.

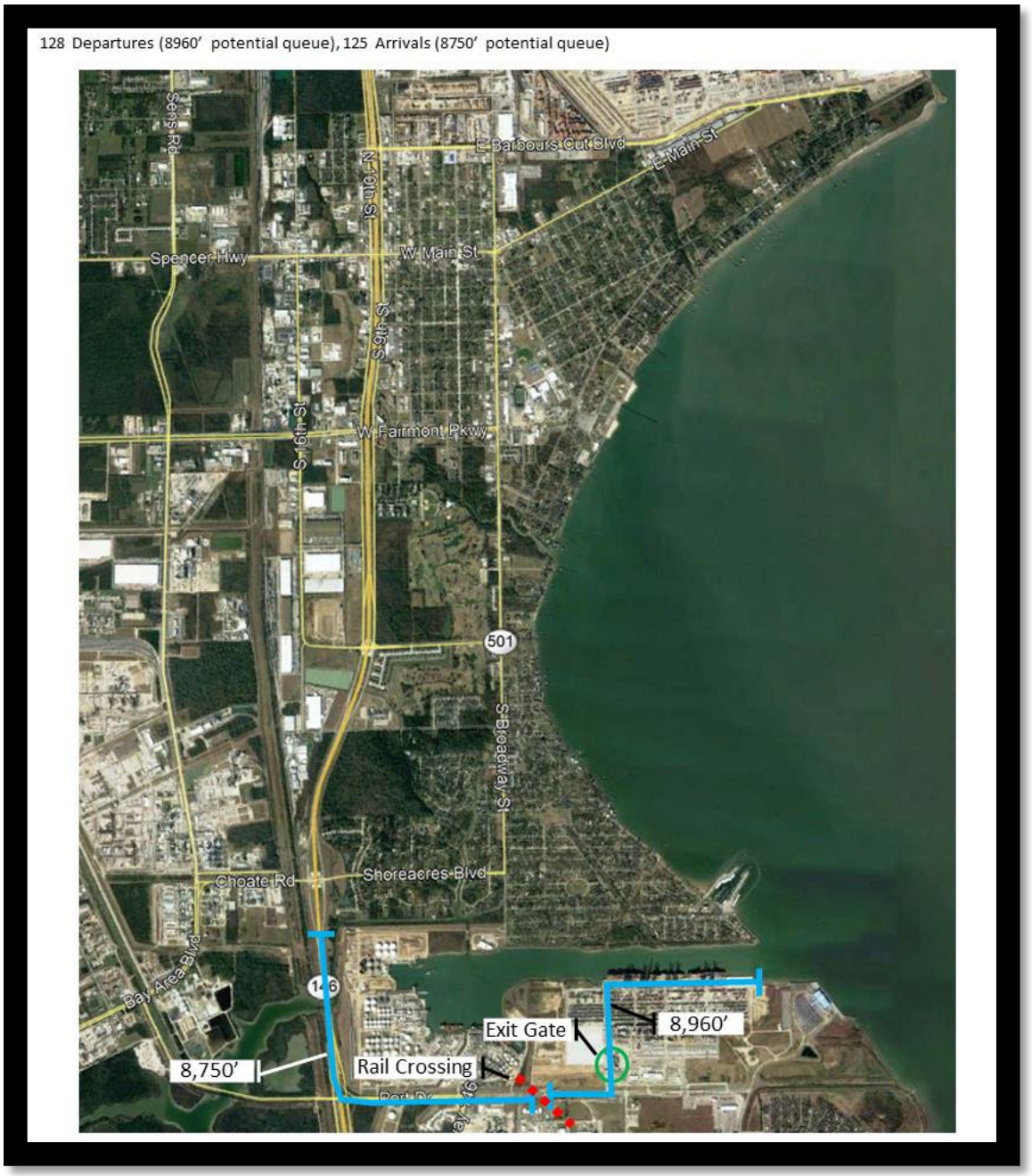
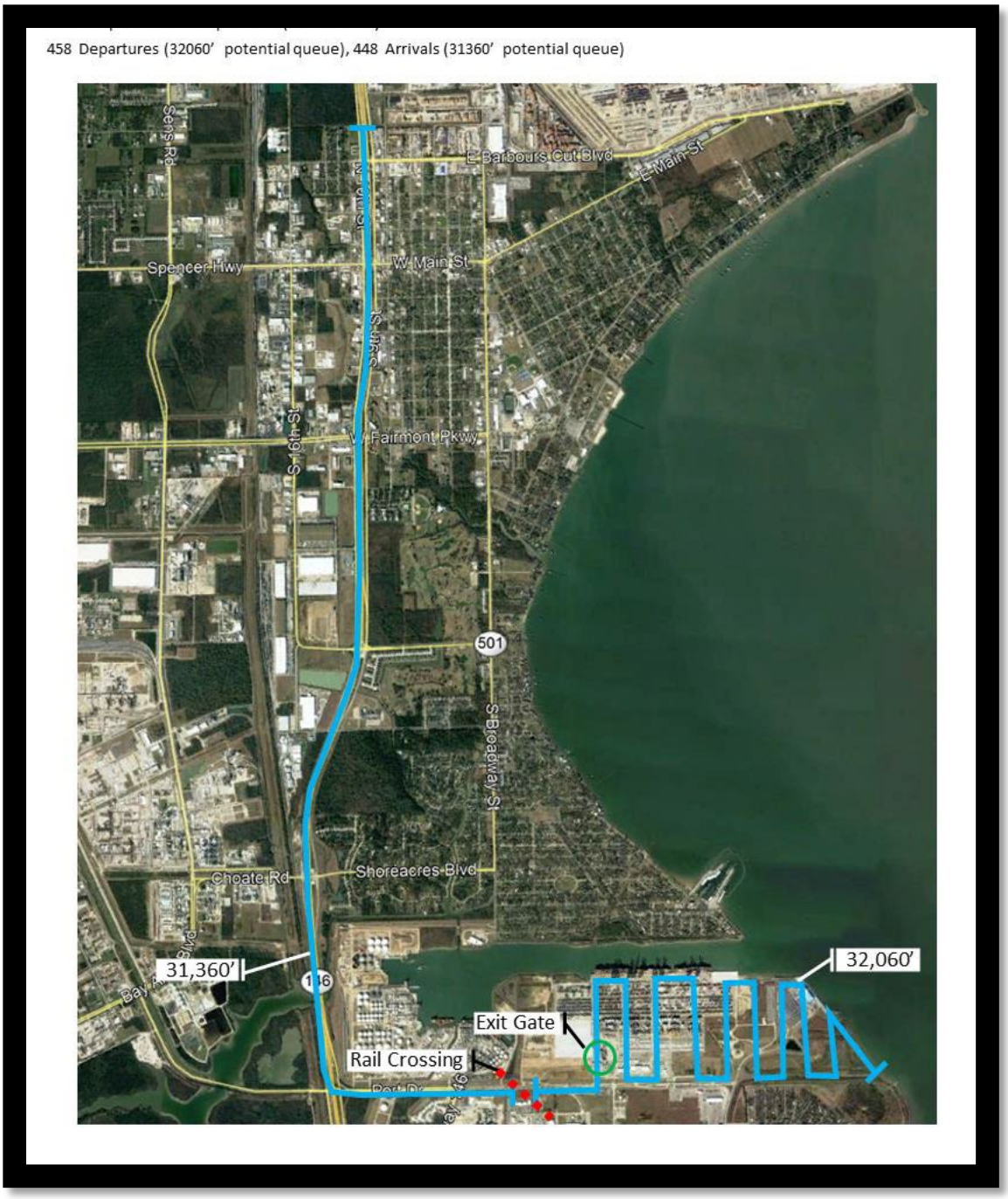


Figure 13: Projected 2045 delay due to crossing.



According to the Federal Rail Administration's (FRA) Office of Safety Analysis (5.10 - Hwy/Rail Map with Table (dot.gov)) Harris County, where the grade crossing is located, is three times more likely to have incidents than any other county in Texas. Over the last ten years the county has seen 384 incidents with 7 deaths and 118 injuries.

This crossing ID DOT 675225L generates an error in the FRA's data system. In the past, there have been few incidents, that Port Authority has record since the rail currently operates during gate closure hours at the Bayport Container Terminal. Vessel operations are already working 24/7 and gate operations have recently been expanded to 6 a.m. to 8 p.m. Monday through Friday (previously 7 a.m. to 7 p.m.) and 8 a.m. to 5 p.m. on Saturday (previously closed on Saturday). This is a weekly total of 19 fewer hours where the train can run without impacting traffic.

It is projected that evening gate hours at the Bayport Container Terminal will be implemented soon. This will put all pedestrians and truck traffic that move through this route at risk of amplifying Harris County's current statistics related to incidents at crossings.

Figures 9 and 10 display the ramifications of delays when a train moves across the grade crossing during peak hours. The projections dramatically increase the risk of fatality as the traffic will back up onto Highway 146. The design of this project will hasten the future construction of the grade separation to mitigate any potential safety and efficiency concerns when gates open in the evening.

***Appendices (Appendices are found as attachments to the application)***

1. Letter of Commitment
2. Benefit Cost Analysis
3. Preliminary drawing
4. Support Letters
5. Sustainability Roadmap
6. BCA Narrative

***Reference Documents***

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[1] Remarks by President Biden on Efforts to Address Global Transportation Supply Chain Bottlenecks, October 13, 2021 Remarks by President Biden on Efforts to Address Global Transportation Supply Chain Bottlenecks | The White House