

# TECHNICAL ADVISORY COMMITTEE (TAC) REGULAR MEETING AGENDA AND 2050 MTP WORKSHOP

**THURSDAY, JANUARY 18, 2024** 

9:00 A.M. REGULAR TAC MEETING (Board Room 210)
10:00 A.M. 2050 MTP WORKSHOP (Multi-Purpose Room 324)

<u>Venue</u>: Corpus Christi Regional Transportation Authority (CCRTA) Staples Street Center, 602 N. Staples Street, Corpus Christi, Texas 78401

- 1. CALL TO ORDER, ROLL CALL, AND QUORUM DETERMINATION
- 2. ELECTION OF OFFICERS FOR THE TECHNICAL ADVISORY COMMITTEE

<u>The Corpus Christi MPO Bylaws and Operating Procedures (Chapter IV)</u> indicate that the Technical Advisory Committee (TAC) shall elect a Chairperson and a Vice Chairperson from among its voting members during the first meeting of each calendar year. Such election shall be by a majority vote of that voting membership.

#### 3. NON AGENDA ITEMS PUBLIC COMMENTS:

Opportunity for public suggestions and comments for any items <u>not</u> on the Agenda and within the TAC's jurisdiction (except in matters related to pending litigation). Proceedings are recorded. To make a public suggestion or comment at the meeting, please fill out the printed comment card available at the meeting and submit it to Corpus Christi MPO staff 10 minutes before the meeting starts. We ask that remarks be limited to three minutes, that you identify yourself, and give your address. Those persons addressing the TAC through a translator are given twice the amount of time, or six (6) minutes to provide their comments. All Public Comments submitted shall be placed into the record of the meeting.

- 4. APPROVAL OF THE TAC NOVEMBER 16, 2023 REGULAR MEETING MINUTES
- 5. <u>DISCUSSION AND POSSIBLE ACTION ITEMS</u>
  - A. Safety Performance Measures and Targets (PM1) Action: Review, Discuss and Recommend Approval by the Transportation Policy Committee
- 6. INFORMATION ITEMS
  - A. TxDOT Household and Establishments Surveys for Corpus Christi MPO Region MPO
  - B. 2050 MTP Timeline Presentation
  - C. Active Transportation Plan: Public Meeting Materials Review and Results 🗪
  - D. Corpus Christi MPO Regional Coordination Group for Federal Transportation Grants Update 🔀
- 7. TAC MEMBER STATEMENTS ON LOCAL AGENCY ACTIVITIES OR ITEMS OF INTEREST
- 8. UPCOMING MEETINGS/EVENTS

A. Transportation Policy Committee: Regular Meeting February 1, 2024
B. Joint Regional Traffic Safety Task Force: Regular Meeting February 14, 2024
C. Technical Advisory Committee: Regular Meeting February 15, 2024

9. ADJOURN REGULAR TAC MEETING

#### 10. TAC 2050 MTP WORKSHOP (Meets in Multi-Purpose Room 324 of the CCRTA Staples Street Center)

- A. DRAFT Regional Safety Action Plan
- B. DRAFT Regional Resiliency Improvement Plan Phase 1 Technical Memo XX
  - Harte Institute's GeoRED 🗪 🔀
- C. Functional Classification Update: Interstates, Local Streets, and STRAHNET
- D. Small Area Forecast Scenario Options

Indicates attachment(s) for the agenda item.

- Indicates a weblink for agenda item.

Public suggestions and comments may be provided before the meeting by emailing ccmpo@cctxmpo.us, by regular mail, or by hand-delivery to the Corpus Christi MPO Office at 602 N. Staples St., Suite 300, Corpus Christi, TX 78401. Please limit written comments to 1,000 characters. Written comments should be provided at least 1 hour before the start of the TAC meeting.

All Corpus Christi MPO Committee meetings are public meetings and open to the public subject to the access policies of the building owner where the meeting is being held. Any persons with disabilities who plan to attend this meeting and who may need auxiliary aids or services are requested to contact the Corpus Christi MPO at (361) 884-0687 at least 48 hours in advance so that appropriate arrangements can be made.

#### **MEETING LOCATION MAP**



#### **TECHNICAL ADVISORY COMMITTEE (TAC) REGULAR MEETING MINUTES**

#### **THURSDAY, NOVEMBER 16, 2023**

#### 9:00 A.M. - TAC REGULAR MEETING

#### 1. CALL TO ORDER, ROLL CALL, AND QUORUM DETERMINATION

TAC Chair Brian DeLatte called the meeting to order at 9:00 a.m.

#### **TAC Members Present:**

Chair Brian DeLatte, P.E., City of Portland

Vice-Chair Gordon Robinson, AICP, Corpus Christi Regional Transportation Planning Authority (CCRTA)

Juan Pimentel, P.E., Nueces County

Jeff Pollack, AICP, Port of Corpus Christi Authority

Dan McGinn, AICP, City of Corpus Christi

Paula Sales-Evans, P.E., TxDOT – Corpus Christi District (CRP)

MPO Staff Present: Robert MacDonald, P.E., Craig Casper, AICP, Victor Mendieta, and Karla Carvajal

#### 2. NON AGENDA ITEMS PUBLIC COMMENTS:

None were offered or provided to the MPO staff before the meeting.

#### 3. APPROVAL OF THE TAC OCTOBER 19, 2023 REGULAR MEETING MINUTES

Ms. Sales-Evans made a motion to approve the October 19, 2023, TAC Regular Meeting Minutes,

Mr. McGinn seconded; the motion passed unanimously.

#### 4. DISCUSSION AND POSSIBLE ACTION ITEMS

#### A. TxDOT 2025 Unified Transportation Program (UTP) Projects Process and Discussion

Mr. MacDonald presented the item stating that TxDOT and the Corpus Christi MPO update the TxDOT 10-year Unified Transportation Program (UTP) each year on a similar schedule as illustrated on the current 2054 UTP process (see Attachment 1). The approval process contains action milestones for both TxDOT and the Corpus Christi MPO to perform. The 2025 UTP will cover the 10-year time period of FY 2025 through FY 2034. The TxDOT 2025 UTP Schedule illustrates that the most recent UTP Document was made available to the public in October 2023 for projects to be considered in fiscal years 2025-2034. TxDOT and the Corpus Christi MPO are asking the TAC members to review the current set of 2024 UTP projects for possible changes: cost estimate revisions, delayed projects, and "new projects" as part of the public comment portion of the TxDOT 2025 UTP process. TxDOT headquarters is requesting the initial list of projects for the 2025 UTP on December 1, 2023. This schedule requires the TAC to recommend and the TPC to approve and submit an initial list of projects for the TxDOT-CRP District to TxDOT HQ as a first step in the year-long process.

#### **Discussion:**

Mr. MacDonald opened the floor for questions.

Ms. Sales-Evans suggests that the December 1 deadline for candidate submissions provides an opportunity to request evaluation and scoring for additional projects. The idea is to submit projects at this stage, assess funding allocations later, and make decisions based on the available budget. The transportation planning and programming division recommends considering an extra year of funding, estimating around \$25 million for Category 2 and potentially \$15 million for Category 4. There's also approximately \$20 million from previous years' allocations in Category 2. Ms. Sales-Evans emphasized the importance of updating cost estimates due to volatility but acknowledges there's time for that and encourages the MPO to identify potential projects for consideration, such as those from the MTP, including FM 43, the remaining portion of 286 for an additional northbound lane, and a project for revamping the interchange with 358 and I-37. While recognizing the momentum of existing projects, Ms. Sales-Evans raised the question of whether the MPO should leave an estimated \$60 million unallocated to projects, or consider incorporating it into a few candidate projects. Mr. MacDonald highlighted the importance of referencing the 2025 list of projects,

echoing Ms. Sales-Evans point. He pointed out the carryover dollars, particularly the \$20 million currently unallocated. Emphasizing the significant amount of available funds, estimated at \$50-60 million, he suggested considering the eligible projects from the 2045 MTP. Referring to the previously approved longrange plan, Mr. MacDonald noted that there's room to add projects from the list. While recognizing the need for TAC members to review and potentially endorse projects, he directed attention to the table, specifically highlighting Park Road 22, which remains unfunded at nearly \$80 million and falls under Category 2.

Ms. Sales-Evans highlighted a \$2 million gap in the remaining amount, emphasizing that it increases as the years progress.

Mr. MacDonald contributed by noting the increase from \$16 million to \$17.9 million.

Ms. Sales-Evans expressed the district's perspective, acknowledging the need not to precede the policy board but urging consideration for potential additions in the candidates submitted on December 1. She emphasized the challenge of introducing new considerations until the discussion of the 2026 UTP. Ms. Sales-Evans encouraged identifying projects suitable for Category 2 and urban funding on state system facilities, suggesting a tentative inclusion on the list for later evaluation with the policy board. She stressed the efficiency of removing a project after submission compared to waiting a year for consideration.

Mr. MacDonald discussed the statewide funding review within a 10-year timeframe for the UTP. He highlighted the need for potential shifts in funding due to certain early years being over-programmed by billions of dollars, necessitating reallocation for some projects. Mr. MacDonald suggested the possibility of updating the project list, pending resource allocation decisions by the commission or TPP and TxDOT in the coming months.

Ms. Sales-Evans emphasized the importance of tentatively including projects in the December 1 submission to allow for consideration, as waiting until the 26th UTP process would delay new additions.

Mr. Pollack supported the idea of adding to the list as a risk mitigation strategy, advocating for demonstrating additional needs and projects to account for uncertainties and unexpected events, and promoting a strategy of over allocation to showcase flexibility.

Mr. MacDonald suggested that TAC members consider adding projects from the approved 2045 MTP list to reach a target of \$60-100 million.

Ms. Sales-Evans pointed out projects like State Highway 35, 361, and 202 from the list of the last UTP but recommended exploring additional Category 7 projects, especially those labeled as purple projects in the last years of the 2045 MTP.

Mr. MacDonald proposed a TAC recommendation to add up to \$60 million from the 2045 MTP list, emphasizing the importance of prioritizing projects that were approved three to four years ago.

Mr. DeLatte raised a question about the eligibility of operations projects not listed in the MTP.

Ms. Sales-Evans explained the operations projects are eligible if they meet the criteria based on project characteristics and mentioned possible concerns about exceeding budgets at the state level.

Mr. MacDonald clarified that the TAC recommendation does not typically consider the CAT 2 and CAT 4 funding carryover issue. He expressed staff support for adding projects, leaving the decision to the TAC.

Ms. Sales-Evans discussed the deferral of the MPO-031 project and suggested considering the Interstate 37 – Highway 358 Interchange project for \$100 million. She recommended deferring certain components until the Harbor Bridge replacement project progresses, providing insights into costs and scope. Ms. Sales-Evans also mentioned ongoing projects like FM 624 and highlighted the potential significance of the interchange project due to traffic concerns.

Mr. DeLatte presented three options for the approval of the project list: approving the list as is, approving the list with an additional dollar amount and letting MPO staff select projects, or identifying projects during the meeting for prioritized inclusion.

Ms. Sales-Evans recommended identifying projects at this level to allow sufficient time for accurate data collection and effective scoring by the December 1 deadline. She suggested considering the I-37 / 358 interchange, and Weber projects, anticipating potential additional funding in the 2025 UTP.

Mr. DeLatte proposed these projects for consideration, emphasizing a preference for overpopulating the list rather than underpopulating it.

Mr. McGinn sought clarification on the 2024 approved list, specifically regarding Park Road 22.

Mr. Pollack clarified that additions would likely be placed at the bottom, ensuring they wouldn't jeopardize existing projects, and suggested a hierarchical approach based on available funding.

Mr. McGinn questioned whether the recommended changes might impact existing priorities.

Ms. Sales-Evans addressed the possibility of reshuffling priorities, emphasizing the need for project inclusion, and discussed challenges with the Park Road 22 project. She also mentioned considerations for State Highway 361, highlighting the need for its inclusion in the updated MTP for future funding.

Mr. MacDonald emphasized that the MPO guides recommendations into the TxDOT UTP process, clarifying that the MPO doesn't approve the UTP but contributes a proposed list of projects.

Mr. McGinn discussed the importance of the Rodd Field project due to increasing traffic, suggesting prioritizing it over the Weber project.

Ms. Sales-Evans expressed willingness to explore submitting the operational improvement for consideration, given it aligns with the MTP and doesn't require listing.

Mr. McGinn inquired about the next steps, and Mr. MacDonald explained the submission process and timeline.

#### **Recommendation:**

The motion is for the TPC to approve the draft 2025 UTP project list that is in our packets with the addition of the three projects as identified.

#### **Motion:**

Mr. DeLatte summarized the motion made by Ms. Sales-Evans which includes the I-37/358 interchange (MPO-035), FM 43 (MPO-036), and Rodd Field Road Operational Safety Improvements (MPO-TBD) from SH 358 to Saratoga as additional projects for TxDOT consideration for the 2025 UTP.

Mr. Pollack seconded; the motion passed unanimously.

#### 5. **INFORMATION ITEMS**

#### A. Adjusted Urban Area Status Update and Urban Density Discussion

Mr. Casper provided an update on the final federal adjustments to the census urban area, following federal highway criteria. Recommendations were made, but some of the recommended changes, such as incorporating an area of the City of Corpus Christi city limits into the urban area, did not happen. Notably, the area on the Island between the state park and Port Aransas shifted from Corpus Christi to Port Aransas. Mr. Casper outlined the implications, including funding allocation changes.

Ms. Sales-Evans sought clarification on Gregory's boundaries.

Mr. Casper explained the next steps involve FHWA approval, and then described how federal functional classification adjustments and defining the MPO boundary will be based on the Adjusted Urban Area and the forecasted growth by 2050. Mr. Casper asked if there were any further questions.

Ms. Sales-Evans inquired about the south side, seeking clarification on the alignment of the Adjusted Urban Boundary.

Mr. Casper confirmed that it closely matched the initial proposed alignment.

Ms. Sales-Evans then highlighted the northern stop near Oso Creek, questioning if it followed the recommendations, to which Mr. Casper affirmed that it followed the creek. They discussed the urgency of

starting certain projects before there were any significant changes to the MPO boundary, which might impact funding status, with Mr. Casper inviting further questions via email.

#### B. Congestion Management Process (CMP) Working Group Goals Discussion

Mr. Louis Cutaia, from the Halff Consultant team, presented a PowerPoint presentation on the topic. He outlined the goals of the Congestion Management Process (CMP) and its importance in managing congestion in metropolitan areas. Mr. Cutaia provided insights into the eight-step process, emphasizing the flexibility of refining goals and objectives throughout the ongoing 8-10 month process. The presentation concluded with a discussion of the revised goals and objectives.

Ms. Sales-Evans suggested a non-sequential approach to displaying the goals and objectives to eliminate the giving the impression that safety is a lower priority.

Mr. Cutaia acknowledged the input highlighted the iterative nature of the CMP process and thanked the TAC Members for their attention.

#### C. CMP Working Group Functional Classification (FC) Update Discussion

Mr. DeLatte introduced agenda item number five, focusing on the CMP Working Group's discussion about functional classification updates.

Mr. Casper then introduced Ed Elam, from Alliance Transportation Group. Alliance is a subconsultant to Halff Associates. Mr. Elam explained the federal eight-step process.

Mr. Elam emphasized the importance of considering project priorities, land use changes, and the impact on traffic operations. He detailed the criteria for defining the functional classification, highlighting the need for stakeholder input. Ed discussed the current network's composition, focusing on major highways and their role in regional mobility. He addressed potential changes in functional classification, mentioning specific projects like SH 286 and State Highway 44 that require consideration. Ed explained the evaluation process for potential changes, including examining traffic volumes, vehicle speed, and adjacent land uses. The discussion also touched on the characteristics of different road classifications, such as interstates, principal arterials, and collectors. Ed presented data on current network usage and sought input on identifying major activity centers based on population and employment data within the MPO boundary. He emphasized the collaborative nature of the process, seeking approval and input from the MPO throughout the development of the functional network.

Mr. Pollack raised a concern during the meeting, emphasizing the need for a holistic approach when considering the reclassification of local or neighborhood streets. He suggested avoiding automatic upgrades based solely on criteria like Average Daily Traffic (ADT) and urged a more comprehensive evaluation to preserve the character and function of such streets.

Mr. Elam acknowledged the importance of considering existing road issues and assured the TAC that additional information and insights would be shared throughout the process.

Ms. Sales-Evans added to the discussion, pointing out the absence of Del Mar's campus south in the major activity centers list.

Mr. Pollack highlighted the relevance of data from the bicycle mobility plan and urged the examination of hotspots identified in GIS. The discussion also touched upon traffic calming programs, and Mr. McGinn mentioned challenges with speed bumps and the absence of an official program. Mr. Pollack had to leave the meeting, expressing the need for additional coordination with Mr. Casper.

Ms. Sales-Evans emphasized the importance of cooperation in functional classification beyond boundaries. The meeting concluded with Mr. Elam discussing the upcoming steps in the Congestion Management Process (CMP) and Mr. Cutaia outlining the next iteration involving defining the CMP network and obtaining data for performance measures. The attendees were thanked for their time, and further engagement was anticipated in the new year.

#### D. Receive Comments from TAC members from October meeting information:

- i. CMP/FC Working Group
- ii. Regional Safety Action Plan Draft Documents

#### iii. DRAFT Resiliency Plan Technical Memo 2 Comments

Mr. MacDonald provided an overview of items, including the CMP functional class and the regional Safety Action Plan. He encouraged TAC members to share their feedback, either during the meeting or through email.

Ms. Sales-Evans expressed her intention to provide comments later via email.

#### 6. TAC MEMBER STATEMENTS ON LOCAL AGENCY ACTIVITIES OR ITEMS OF INTEREST

Mr. MacDonald shared positive news about TxDOT offering \$50,000 to each MPO for safety planning, with the Corpus Christi MPO receiving approval for the funding scope. The discussion continued with updates on the resiliency planning technical memo and a request for CMP working group names.

Mr. Casper asked TAC members to provide names of people they think should be involved in the CMP working group.

Mr. DeLatte reported progress on the FM 893 project, indicating that the Corps of Engineers had approved the permit. Ms. Sales-Evans sought a timeline for breaking ground, emphasizing the importance of project continuity. Mr. DeLatte relayed that Dr. Banks would be in contact with Ms. Sales-Evans to pass along that information.

Mr. Pollack highlighted successful grant agreements, mentioning initiatives like the creation of a digital twin and modular deployment within asset management.

Mr. McGinn announced the approval of a grant for the Holly Trail-Trestle project, emphasizing its significance for both recreation and mobility. Mr. McGinn discussed the need for improvement in the East-West movement across Flour Bluff. Mr. Pollack and Mr. McGinn highlighted the importance of connectivity and crossings in the area.

#### 7. UPCOMING MEETINGS/EVENTS

Α.	Transportation Policy Committee:	Regular Meeting	December 7, 2023
В.	Joint Regional Traffic Safety Task Force	<b>Regular Meeting</b>	December 13, 2023
C.	Technical Advisory Committee:	Regular Meeting	December 21, 2023

Mr. DeLatte provided updates on upcoming meetings, with the possibility of the TAC meeting on December 21 being canceled for the holidays.

#### 8. ADJOURN TAC REGULAR MEETING

Mr. DeLatte adjourned the meeting at 10:28 AM.



**Date:** January 11, 2024

**To:** Technical Advisory Committee (TAC)

**From:** Craig Casper, Senior Transportation Planner

**Through:** Robert MacDonald, Transportation Planning Director

**Subject:** <u>Item 5A:</u> Safety Performance Measures and Targets (PM1)

**Action:** Review, Discuss, Receive Public Comments and Possible Action

#### **Summary**

Car crashes are the leading cause of death in the United States for people ages 1 to 54. Federal Regulations direct MPOs and state Departments of Transportation to establish both performance measures to track, and targets to work towards for the national performance measures for Safety (PM1). MPOs are not evaluated directly on achieving the targets, therefore we have two options when setting targets for each measure:

- 1) Establish our own Corpus Christi MPO numerical targets for each of the performance measures, or
- 2) formally agree to support the TxDOT targets

The Corpus Christi MPO has previously adopted resolutions supporting TxDOT's adopted Safety Targets (PM1). In May of 2019, the Texas Transportation Commission (TTC) adopted Minute Order 115481, directing TxDOT to work toward the goal of reducing the number of deaths on Texas roadways by half by year 2035 and to zero by the year 2050. TxDOT modified its performance measures and target calculations accordingly. The proposed Resolution 24-02 stating that the Corpus Christi MPO continues to formally support the TxDOT's targets for PM1 is attached.

The Safety Performance Measures (PM1) include the following targets that were adopted as part of the TxDOT 2023 Highway Safety Plan:

TxDOT Established Safety (PM1) Performance Measures and Targets								
Performance Measure	2020*	2021*	2022*	2023**	2024**	2024***		
Number of Fatalities	3,874	4,486	3,272	3,159	3,046	3,567		
Rate of Fatalities per 100 million VMT	1.49	1.70	1.25	1.20	1.14	1.36		
Number of Serious Injuries	14,659	19,434	17,539	17,819	18,242	17,062		
Rate of Serious Injuries per 100 million VMT	5.63	7.35	6.70	6.77	6.77	6.39		
Number of Non-Motorized Fatalities and Serious Injuries	2,206	2,628	2,321	2,340	2,360	2,357		

<sup>\*</sup>Actual Data, \*\*Target Data, \*\*\*Target as a 5-Year Average

Target Source: Texas FY 2024 Strategic Highway Safety Plan (SHSP)

As of January 2<sup>nd</sup>, in 2023, there were 550,873 total crashes in the State of Texas, including 3,727 fatal crashes that killed 4,124 people. A December 2023 report by Forbes Advisor revealed Texas has the third worse rate of drunk drivers involved in fatal crashes, with over 40% of traffic deaths in Texas caused by impaired drivers. On January 1, 2024 there were 2 fatal crashes in the City of Corpus Christi.

In the context of the Corpus Christi MPO, the following data are shown for illustration purposes. As discussed in prior TAC and TPC meetings, it is more relevant for our planning partners to identify where a crash occurs and to diagnose these locations than it is to identify the total number of fatalities and serious injuries within the MPO region. Identifying locations with anomalous crash occurrences, diagnosing the issues, evaluating countermeasures, and developing implementation plans will reduce fatalities and serious injuries in the MPO region. The table below shows the proportionally relevant performance measures and safety targets in the Corpus Christi MPO region.

Corpus Christi MPO Proportionally Relevant Safety Measures and Targets (For Illustration Purposes Only)								
Performance Measure	2020*	2021*	2022*	2023**	2024**	2024***		
Number of Fatal Crashes	32	45	29	28	27	32.2		
Rate of Fatal Crashes per 100 million VMT	1.18	1.43	0.96	0.93	0.89	1.08		
Number of Serious Injury Crashes	123	128	135	130	125	128		
Rate of Serious Injury Crashes per 100 million VMT	4.21	4.08	4.48	4.32	4.16	4.25		
Number of Non-Motorized Fatal and Serious Injury Crashes	38	36	35	34	33	35		

<sup>\*</sup>Actual Data, \*\*Target Data, \*\*\*Target as 5-Year Average

Sources: Crash Records Information System (C.R.I.S.), TxDOT Multi-Year Roadway Data Tables

For the past several years the Corpus Christi MPO has supported the TxDOT safety performance measures and targets adopted by TxDOT. By supporting the TxDOT safety targets, the Corpus Christi MPO agrees to plan and program projects which contribute to achieving the TxDOT state targets and to report regional performance.

#### Recommendation

The MPO staff recommends that the TAC review and receive public comments on the DRAFT Resolution 24-02 and PM1 information and recommend approval to the TPC. The attached Resolution 24-02 reports the regions performance and lists the performance measures and targets for Safety (PM1).

#### **Proposed Motion**

Move to recommend approval to the TPC of the DRAFT Resolution 24-02 supporting the Texas Department of Transportation (TxDOT) Safety (PM1) performance measures and targets as presented.

#### Attachments:

- 1. FY 2024 Strategic Highway Safety Plan (SHSP) Performance Targets
- 2. DRAFT Resolution 24-02: 2024 Adoption of Safety Performance Measures and Targets (PM1)

# FY 2024 STRATEGIC HIGHWAY SAFETY PLAN (SHSP) PERFORMANCE TARGETS

**Performance Measures and Target Setting** – The Texas Transportation Commission (TTC) adopted Minute Order 115481 in May of 2019, directing the Texas Department of Transportation (TxDOT) to work toward the goal of reducing the number of deaths on Texas roadways by half by the year 2035 and to zero by the year 2050. TxDOT has modified its performance measures and target calculations accordingly.

#### **PERFORMANCE TARGETS:**

#### **Target: Total number of traffic fatalities**

2024 Target: To decrease the expected rise of fatalities to not more than a five-year average of 3,567 fatalities in 2024. The FY 2024 Targets expressed as a 5-year average, would be as follows:

Year	Target or Actual Data
2020	3,874
2021	4,486
2022	3,272
2023	3,159
2024	3,046
2024 Target expressed as 5-year avg.	3,567

As noted in the table above, the calendar year target for 2024 would be 3,046 fatalities.

#### **Target: Total number of serious injuries**

2024 Target: To decrease the expected rise of serious injuries to not more than a five-year average of 17,062 serious injuries in 2024. The FY 2024 Targets expressed as a 5-year average, would be as follows:

Year	Target or Actual Data
2020	14,659
2021	19,434
2022	17,539
2023	17,819
2024	18,242
2024 Target expressed as 5-year avg.	18,096

As noted in the table above, the calendar year target for 2024 would be 18,242 serious injuries. The five-year average increases but based on the BIL requirements – the targets are to remain the same or decrease from the previous year. That said, the 2024 Target expressed as 5-year avg. remains 17,062.

#### Target: Fatalities per 100 million vehicle miles traveled

2024 Target: To decrease the expected rise of fatalities per 100 MVMT to not more than a five-year average of 1.36 fatalities per 100 MVMT in 2024. The 2024 Target expressed as a 5-year average would be as follows:

Year	Target or Actual Data
2020	1.49
2021	1.70
2022	1.25
2023	1.20
2024	1.14
2024 Target expressed as 5-year avg.	1.36

As noted in the table above, the calendar year target for 2024 would be 1.14 fatalities per 100 MVMT.

#### Target: Serious Injuries per 100 million vehicle miles traveled

2024 Target: To decrease the serious injuries per 100 MVMT to not more than a five-year average of 6.39 serious injuries per 100 MVMT in 2024. The 2024 Target expressed as a 5-year average would be as follows:

Year	Target or Actual Data
2020	5.63
2021	7.35
2022	6.70
2023	6.77
2024	6.77
2024 Target expressed as 5-year avg.	6.64

As noted in the table above, the calendar year target for 2024 would be 6.77 serious injuries per 100 MVMT. The five-year average increases but based on the BIL requirements – the targets are to remain the same or decrease from the previous year. That said, the 2024 Target expressed as 5-year avg. remains 6.39.

#### Target: Total number of non-motorized fatalities and serious injuries

2024 Target: To decrease the expected rise of non-motorized fatalities and serious injuries to not more than a five year average of 2,357 non-motorized fatalities and serious injuries in 2024. The 2024 Target expressed as a 5-year average would be as follows:

Year	Target or Actual Data
2020	2,206
2021	2,628
2022	2,321
2023	2,340
2024	2,360
2024 Target expressed as 5-year avg.	2,371

As noted in the table above, the calendar year target for 2023 would be 2,360 non-motorized fatalities and serious injuries. The five-year average increases but based on the BIL requirements – the targets are to remain the same or decrease from the previous year. That said, the 2024 Target expressed as 5-year avg. remains 2,357.



#### CORPUS CHRISTI METROPOLITAN PLANNING ORGANIZATION

#### **DRAFT** RESOLUTION 24-02

#### 2024 SAFETY (PM1) PERFORMANCE MEASURES AND TARGETS

**WHEREAS**, the Corpus Christi Metropolitan Planning Organization (Corpus Christi MPO) was established to identify and support the implementation of regionally significant transportation projects to address future mobility needs; and

WHEREAS, the Infrastructure Investment and Jobs Act (IIJA) requires the Texas Department of Transportation (TxDOT) to establish Safety (PM1) targets based on five year rolling averages for the following measures:

- Safety (PM1)
  - Number of Fatalities,
  - o Rate of Fatalities per 100 million Vehicles Miles Traveled (VMT),
  - Number of Serious Injuries,
  - Rate of Serious Injuries per 100 million VMT,
  - Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries; and

**WHEREAS**, the IIJA also requires each MPO to either support the PM1 targets established by the state DOT (TxDOT) or adopt a separate set of targets no later than 180 days after TxDOT adoption;

**NOW, THEREFORE, BE IT RESOLVED** that the Corpus Christi MPO Transportation Policy Committee hereby supports the TxDOT PM1 targets for the performance measures and adopts these within this Resolution; and

**BE IT FURTHER RESOLVED** that the Corpus Christi MPO Transportation Policy Committee will plan and program projects that contribute to the accomplishment of the Safety (PM1) Targets:

TxDOT Established Safety (PM1) Performance Measures and Targets								
Performance Measure	2020*	2021*	2022*	2023**	2024**	2024***		
Number of Fatalities	3,874	4,486	3,272	3,159	3,046	3,567		
Rate of Fatalities per 100 million VMT	1.49	1.70	1.25	1.20	1.14	1.36		
Number of Serious Injuries	14,659	19,434	17,539	17,819	18,242	17,062		
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Number of Non-Motorized Fatalities and Serious Injuries	2,206	2,628	2,321	2,340	2,360	2,357		

<sup>\*</sup>Actual Data, \*\*Target Data, \*\*\*Target as a 5-Year Average Source: Texas FY 2024 Strategic Highway Safety Plan (SHSP)

That it is hereby officially found and determined that the meeting at which this resolution is passed is open to the public and that public notice of the time, place, and purpose of said meeting was given as required by law.

That all public participation requirements identified within the Corpus Christi MPO Public Participation Plan related to this action by the Transportation Policy Committee were met and completed.

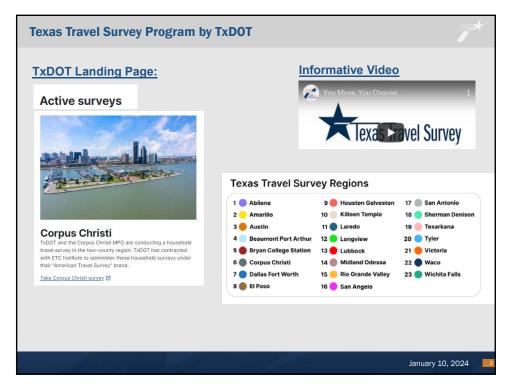
ADOPTED AND PASSED this the 1st day of February 2024.

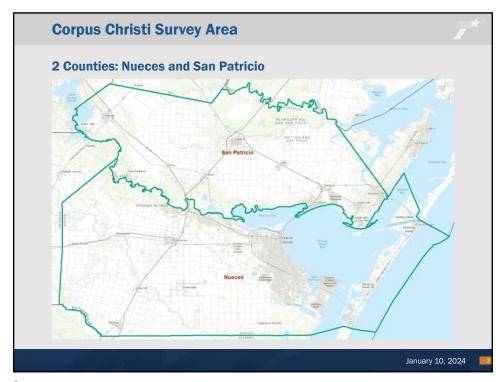
The Honorable David R. Krebs, TPC Chair Corpus Christi Metropolitan Planning Organization County Judge, San Patricio County

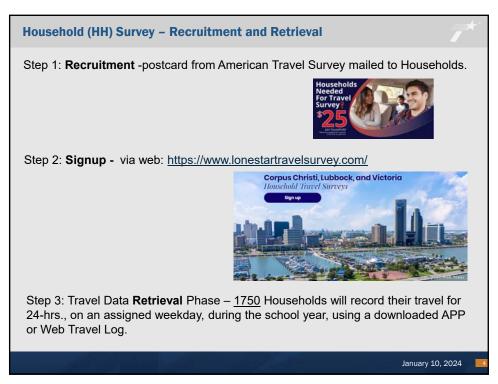
ATTEST:

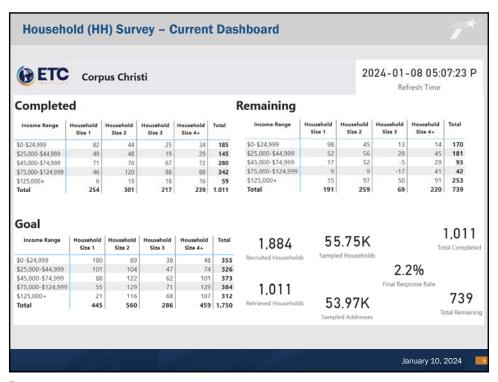
Robert F. MacDonald, MPA, PE Transportation Planning Director Corpus Christi Metropolitan Planning Organization











#### Establishment Surveys-Workplace & Commercial Vehicle: Jan-Feb 2024

-DI---- 0-----

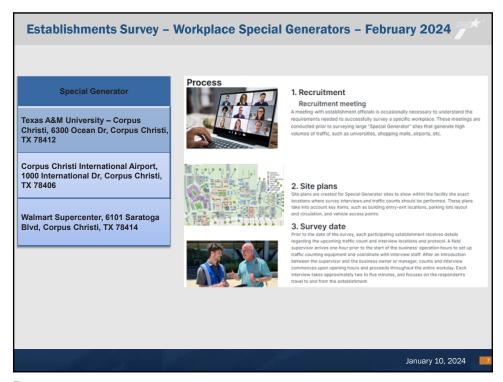
Step 1: Businesses are randomly contacted via letter about participating for the WorkPlace Survey.

Step 2: **Recruitment** survey via phone to set up a Travel Survey date.

Step 3: **Data Collection Phase (300 Workplaces)**— Vendor personnel and equipment are deployed to participating workplaces during normal business hours to collect vehicle/person counts (all sites) and perform intercept interviews with willing employees and visitors to gather Origin-Destination data (half of surveyed sites, only).

Step 4: Commercial Vehicle Survey (300 CVs) – Drivers asked to carry a provided smartphone (with pre-loaded and pre-configured CV Survey App) in their vehicle. App automatically records stops on travel day and prompts driver for other required stop-related information.

January 10, 2024



## Survey Awareness and Legitimacy

#### **Current Options:**

- TxDOT Landing Page
- MPO website
- Social Pinpoint coordinating synergies with other CC surveys
- In-Person MPO Technical Policy Committee and Technical Advisory Committee Meetings

January 10, 2024

#### **TxDOT Travel Data Inputs for the Corpus Christi Model**

#### **Household and Establishment Survey Data**

#### Data Provides:

Trip production rates by trip purpose, Trip lengths frequency distributions, Estimate of total internal travel by area residents.

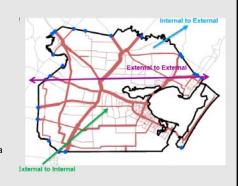
#### **External (EXT) Travel Study 2017**

- via Passive Data (Report available on TxDOT Landing Page)

#### <u>Data provides:</u>

- Local and through travel by noncommercial and commercial trips
- Non-resident travel estimates
- Trip-Length frequency distributions for external trips.

**NOTE:** To provide an update to this report, TxDOT has purchased External Passive Data in the Fall 2023 and a new report will be out by end of 2024.



January 10, 2024

C

#### **Project Schedule by Task - Estimated Dates**

- Task A Survey Implementation Plan and Startup Documentation
   Dates: Completed in April May 2023
- Task B Develop Survey Materials

Dates: Completed June - August 2023

- Task E Main Survey Collection (No Pilot Survey)
  - Workplace/Commercial Vehicle: January February 2024
  - Special Generators: February 2024
  - Households: September 2023 May 2024
- Task F Process Survey Data June 2024
- Task G- Final Reports/Closeout July August 2024

January 10, 2024

### **Meet the Team**



Sponsor



Contracted Vendor for All Travel Surveys



MPO



Inter-Agency Partner

11



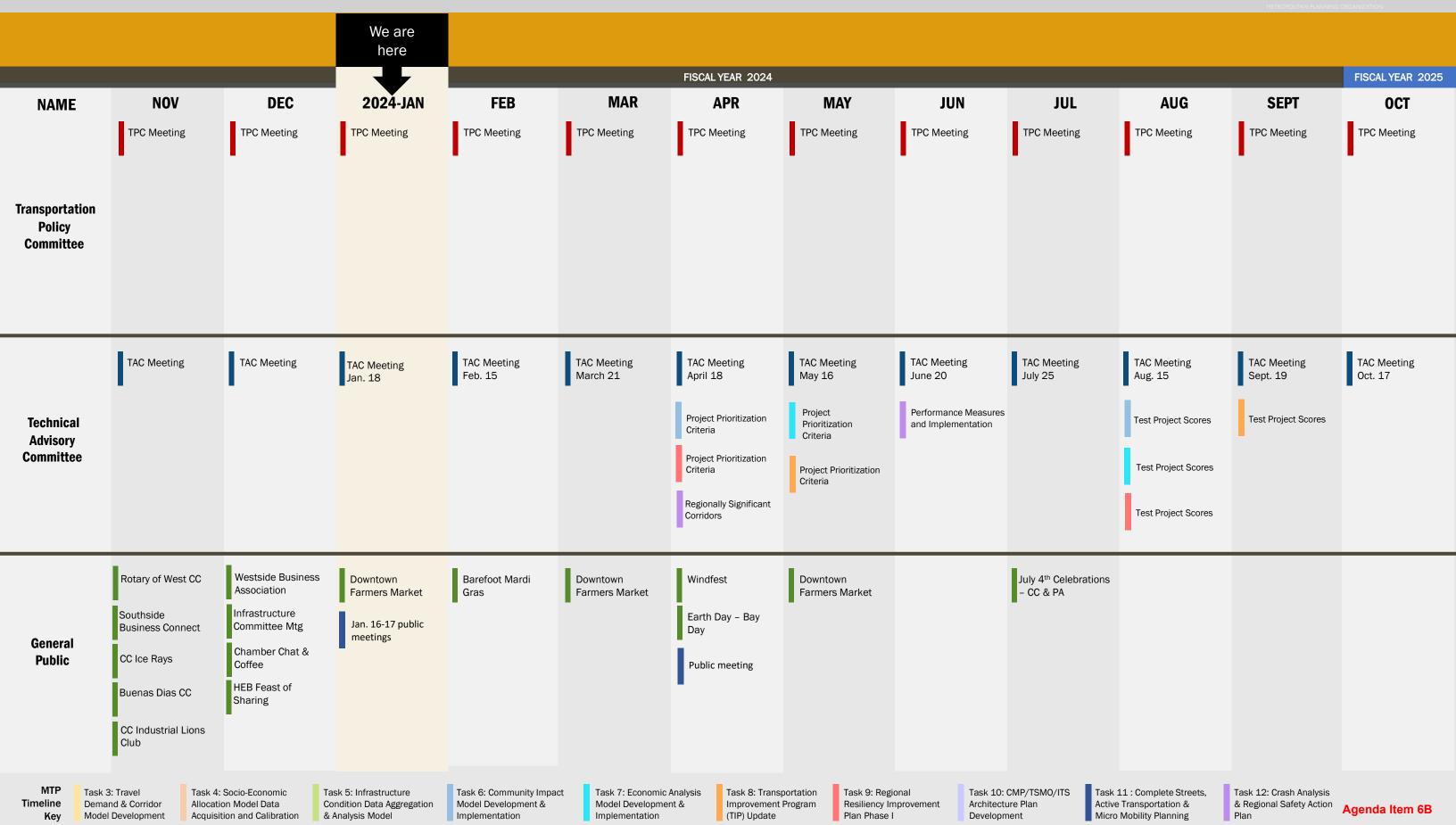
# **2050 Metropolitan Transportation Plan Timeline**



			We are here									
						FISCAL YEAR 2024						FISCAL YEAR 2025
AFA TASK	NOV	DEC	2024-JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	ОСТ
Travel Demand & Corridor Model				Focus Group: Scenario Development – Small Area Task Force		PTV VISUM Simulation- Based Assignment (SBA) Evaluation		Corpus Christi PTV VISUM Training				
Socio-Economic Allocation Model 4						Focus Group						
Highway Economic Requirements System (HERS)												
Community Impact Model				Drafted project prioritization criteria		Survey opens on weighting the importance of various community impacts	Survey closes	Test Project Scores		Community Impact Model Integrated into Project Prioritization Tool		
Economic Analysis Model. TREDIS					ion ontona	Survey opens on weighting the importance of various economic impacts	Survey closes	Test Project Scores		Economic Analysis Model Integrated into Project Prioritization Tool		
Transportation Improvement Program Update (Tool)	m				ion criteria	Survey opens on weighting holistic project prioritization criteria across MTP goals	Survey closes	Test Project Scores		Project Prioritization Tool Complete		
Regional Resiliency Improvement Plan		Phase 1A Prioritized Assets	Inputs to Resilience and Disaster Recovery (RDR) Tool are Collected			Survey opens on weighting the importance of resilience priorities	Survey closes	Weighted Project Scores		Resilience and Disaster Recovery Scores Integrated into Project Prioritization Tool		
CMP/TSMO/ITS Plan Development 10				Drafted regionally significant corridors		Drafted performance measures and implementation		Final Docs to MPO				
Complete Streets, Active Transportation & Micro Mobility 11			Public meeting launches these surveys:     First Responder     General     Active	These surveys close:     First Responder     General     Active		Public Mtg #2		Final Report & Map	Presentation to MPO	Close Out		
Regional Safety Actio Plan 12	Focus Group ion	Active Survey	Close	Final Deliverables to MPO including Final Report with ranked projects and programs								
Notes:	3:											
Timeline Den	emand & Corridor Allo	location Model Data	Task 5: Infrastructure Condition Data Aggregation & Analysis Model	Task 6: Community Impa Model Development & Implementation	ract Task 7: Economic A Model Developmer Implementation		t Program Resiliency	cy Improvement Architectu	ture Plan Activ	ve Transportation &	Task 12: Crash Analysis & Regional Safety Action Plan	Agenda Item 6B

# **2050 Metropolitan Transportation Plan Timeline**







**Date:** January 11, 2024

**To:** Technical Advisory Committee (TAC)

From: Robert MacDonald, Transportation Planning Director

**Subject:** <u>Item 6D</u>: Corpus Christi MPO Regional Coordination Group for Federal Transportation

**Grants Update** 

**Action:** Review and Discuss Grant Proposals and Coordination

#### **Summary**

The Corpus Christi MPO staff continues to present information to serve as the focus for the Regional Coordination Group, which is the monthly Technical Advisory Committee (TAC) meeting. We also provide monthly updates to the TPC.

The TAC members and Corpus Christi MPO staff invite other local agency staff to provide information on transportation projects and program grant submittal proposals. We encourage all those to attend the TAC meeting to provide their input on the specific federal transportation grants being proposed and identified for future submittals over the remaining three years of these federal transportation grants. The Corpus Christi MPO staff will inform the TPC and TAC of available grant opportunities whenever these become available and ask for their comments and directions as part of the regional coordination efforts.

The most recent **Corpus Christi MPO FY 2024 Competitive Grant Summary Table** is provided as Attachment 1.

New for this month is the Notices of Funding Opportunity (NOFO) for:

- Advanced Transportation Technologies and Innovation (ATTAIN) Grant, the deadline for the grant is February 2, 2024
- **Bus and Bus Facilities Competitive Grants,** the application process is anticipated to open in January 2024
- Low/No Emission Bus Program, the application process is anticipated to open in February 2024
- FY 2024 RAISE Grants, the deadline for the grant is February 28, 2024
- Safe Streets and Roads for All, the application process is anticipated to open in February 2024
- Port Infrastructure Development, the application process is anticipated to open in February 2024
- Planning and Other Bridge Programs (see Attachment 2), the application process is anticipated to open on March 19, 2024

#### **Grant Submittals**

The Corpus Christi Regional Transportation Authority (CCRTA) is planning to submit for the Advanced Transportation Technology and Innovation (ATTAIN) Grant due on February 2, 2024. We have included in Attachment 5 the CCRTA Board of Director's information regarding this proposed ATTAIN Grant submittal. The FHWA Fact Sheet for this ATTAIN Grant is provided as Attachment 6.

#### **Federal Grant Results**

There have been two recent awards for Federal IIJA/BIL Grants. Both grants were in the Safe Streets and Roads for All (SS4A) category. Grants were made for 1) Project Implementation Grants and 2) Planning Grants. The summary information for Texas projects is provided in Attachments 3 and 4, respectively.

#### **Attachments**

- 1. Corpus Christi MPO FY 2024 Competitive Grant Summary Table
- 2. Federal Bridge Investment Program Planning and Bridge Project Grants Summary
- 3. Safe Streets and Roads for All (SS4A) Implementation Grants in Texas 2023
- 4. Safe Streets and Roads for All (SS4A) Planning Grants in Texas 2023
- 5. Corpus Christi Regional Transportation Authority Advanced Transportation Technology and Innovation (ATTAIN) Grant Request
- 6. Advanced Transportation Technologies and Innovation (ATTAIN) Grant Fact Sheet from FHWA

#### **BIPARTISAN INFRASTRUCTURE LAW - KEY NOTICES OF FUNDING OPPORTUNITY**

https://www.transportation.gov/bipartisan-infrastructure-law/key-notices-funding-opportunity

Program	Description	Eligible Entity	2023/2024 Deadlines
	TRANSPORTATION SAFETY, EQUITY, RESILIE	ENCE & OTHER	
Rebuilding American Infrastructure with Sustainability and Equity (RAISE)	Provides grants for surface transportation infrastructure projects that will have a significant local or regional impact (aka Local and Regional Project Assistance).	State, MPO, Local Government	2/28/2024
Nationally Significant Multimodal Freight and Highway Projects (INFRA)	Provides grants for multimodal freight and highway projects of national or regional significance.	State, MPO, Local Government, FLMA	8/21/2023
National Infrastructure Project Assistance (Mega)	Supports large, complex projects that are difficult to fund by other means and likely to generate national/regional economic, mobility, or safety benefits.	State, MPO, Local Government, Political Subdivision	8/21/2023
Bridge Investment Program  Planning and other Bridge Projects	Provides grants for projects to improve the condition of bridges and culverts and the safety, efficiency, and reliability of the movement of people and freight over bridges.	State, MPO, Local Government, FLMA	12/20/2023 03/19/2024
Natural Gas Distribution Infrastructure Safety and Modernization Program	Repair, rehabilitate, or replace the natural gas distribution pipeline systems	Local Governments or Community Owned Utility	7/24/2023
Safe Streets and Roads for All	Provides grants to support local initiatives to prevent transportation-related death and serious injury on roads and streets (commonly referred to as "Vision Zero" or "Toward Zero Deaths" initiatives).	MPO, Local Government	02/2024 Start of Process
Thriving Communities	Ensure disadvantaged communities adversely and/or disproportionately affected by environmental, climate, and human health policy outcomes have the technical tools and organizational capacity to comprehensively plan for and deliver quality infrastructure projects and community development projects.	State, Local, MPO, Transit	11/28/2023

Program	Description	Eligible Entity	2023/2024 Deadlines
Reconnecting Communities and Neighborhoods (RCN) Program Capital Construction	Provides grants for projects focused on reducing environmental harm and improving access in disadvantaged communities.	State, MPO, Local Government	9/28/2023
Reconnecting Communities and Neighborhoods Pilot (RCN) Program Community Planning	Provides grants for planning activities to support future construction projects and allow for innovative community planning to address localized transportation challenges.	State, MPO, Local Government	9/28/2023
Reconnecting Communities Pilot (RCP) Program Regional Partnerships Challenge	To incentivize stronger partnerships between local governments, MPO, State DOT and non-profit, private, and community partners to tackle persistent equitable access and mobility challenges, as well as greenhouse gas emissions reductions.	State, MPO, Local Government, Private, Non-profit	9/28/2023
Nationally Significant Federal Lands and Tribal Projects (NSFLTP) Program	Provides grants to Tribes and Federal land management agencies to complete projects that will provide substantial benefits to their communities or parklands.	State, Local Governments, Tribes	9/6/2023
Т	RANSPORTATION SAFETY, EQUITY, RESILIENC	E & OTHER	
Advanced Transportation Technologies and Innovative Mobility Deployment (ATTAIN)	Provides grants to deploy, install, and operate advanced transportation technologies to improve safety, mobility, efficiency, system performance, intermodal connectivity, and infrastructure return on investment.	State, MPO, Local Government	02/02/2024
Strengthening Mobility and Revolutionizing Transportation (SMART)	Projects utilizing innovative technology to Improve Transportation Efficiently and Safety	State, MPO, Local Government, Public Transit	Summer 2024 Start of Process
Accelerated Innovation Deployment (AID) Demonstration Program	Provides grants to support the pilot/demonstration of innovations on projects, in areas such as planning, financing, operations, pavements, structures, materials, environment, and construction.	State, FLMA, *MPO & Local Government through State	

Program	Description	Eligible Entity	2023/2024 Deadlines
Charging and Fueling Infrastructure Grants Program (Community Charging)	Provides grants for projects to develop electric vehicle charging and hydrogen, propane, and natural gas fueling infrastructure access along alternative fuel corridors throughout the country, including in rural areas, low- and moderate-income neighborhoods, and communities with a low ratio of private parking spaces to households or a high ratio of multiunit dwellings to single family homes.	State, MPO, Local Government, FLMA	6/13/2023
Charging and Fueling Infrastructure Grants Program (Corridor Charging)	Deploys publicly accessible EV charging infrastructure and hydrogen, propane, and natural gas fueling infrastructure along designated Alternative Fuel Corridors.	State, MPO, Local Government, FLMA	6/13/2023
Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation (PROTECT) Discretionary Grants	Provides grants for activities that enable communities to address vulnerabilities to current and future weather events, natural disasters, and changing conditions, including sea level rise, and plan transportation improvements and emergency response strategies to address those vulnerabilities.	State, MPO, Local Government, *FLMA with State	8/18/2023
	TRANSIT & INTERCITY RAIL		
Transit-Oriented  Development Planning	Integrating land use and transportation Planning in new fixed guideway and core capacity transit project corridors	FTA Grantees	10/10/2023
Railroad Crossing Elimination Program	Railway Grade Separation		Summer 2023 (TBA)
Areas of Persistent Poverty Program	Increase transit access for the underserved communities	Recipients and subrecipients 5307, 5310, and 5311	3/10/2023
FEMA Transit Security Grant	Promote sustainable, risk-based efforts to protect critical transportation infrastructure and the traveling public	Public transit based on the ridership, transit systems	5/18/2023
Low/No Emission Bus Program	Support the transition to the clean and efficient transit vehicles	Public Transit	01/2024 Start of Process
Capital Investment Grants (CIG)	Fixed guideway investments, rapid rail, commuter rail, light rail, streetcars, bus rapid transit, ferries	State and Local Government	

Program	Description	Eligible Entity	2023/2024 Deadlines			
Bus and Bus Facilities Competitive Grants	Bus and Bus Facility Procurements	Public Transit	01/2024 Start of Process			
	PORT & FREIGHT					
Port Infrastructure Development	Port Safety, Reliability, Efficiency		02/2024 Start of Process			
America's Marine Highway Program	Marine Highway development and expansion		4/28/2023			
Reduction of Truck Emissions at Port Facilities	Port Emissions Reduction		7/26/2023			
	CLIMATE, ENERGY, & ENVIRONMENT					
Building Resilient Infrastructure and Communities Program	Hazard mitigation projects					
Flood Mitigation Assistance	Reduce/Eliminate the risk of repetitive flood damage to buildings insured by the national flood insurance program					
Regional Clean Hydrogen Hubs	Development of minimum 4 regional clean hydrogen hubs to improve hydrogen production, processing, delivery, storage, and end use					
AVIATION						
Airport Improvement Program Discretionary Grant	Airport Capital Improvements and Rehabilitation Programs		7/14/2023			
Airport Terminals Program	Terminal Development Projects that address the aging air infrastructure at large, medium, and small hub airports	State, Local Government, Transit Agency				

#### Federal Bridge Investment Program - Planning and Bridge Project Grants Summary







#### **VIEW GRANT OPPORTUNITY**

693JJ323NF00019

Fiscal Year (FY) 2023 & 2026 Bridge Investment Program, Large Bridge Project Grants

Department of Transportation DOT Federal Highway Administration

SYNOPSIS

**VERSION HISTORY** 

**RELATED DOCUMENTS** 

**PACKAGE** 

**General Information** 

**Document Type:** Grants Notice **Version:** Synopsis 6

**Funding** 693JJ323NF00019 **Posted Date:** Sep 27, 2023

Opportunity Number:

Funding Fiscal Year (FY) 2023 & 2026 Last Updated Dec 12, 2023

**Opportunity** Bridge Investment Program, **Date**:

Title: Large Bridge Project Grants

Opportunity Discretionary Original Closing Nov 27, 2023 FY 2023 and FY 2024 funds,

Category:

Date for applications must be submitted by 11:59

Applications: p.m. EST on 11/27/23. FY 2025 funds,

Opportunity
Category
Explanation:

applications must be submitted by 11:59
p.m. EDT on 08/01/24. FY 2026 funds,
applications must be submitted by 11:59

p.m. EDT on 08/01/25.

Funding Grant Current Closing Aug 01, 2024 FY 2023 and FY 2024 funds,

**Date for** applications must be submitted by 11:59

Type: Applications: p.m. EST on 12/04/23. FY 2025 funds,

applications must be submitted by 11:59 p.m. EDT on 08/01/24. FY 2026 funds, applications must be submitted by 11:59

Funding
Activity:

Activity:

Applications must be set of p.m. EDT on 08/01/25.

Category Archive Date: Nov 01, 2025

**Explanation:** 

**Expected** 50 **Estimated Total** \$ 9,620,100,000

Number of Program Funding:

Awards:

CFDA 20.205 -- Highway Planning and Award Ceiling: \$3,000,000,000

Number(s): Construction

**Category of** Transportation

Cost Sharing or Yes Award Floor: \$50,000,000

Matching Requirement:

#### Federal Bridge Investment Program - Planning and Bridge Project Grants Summary

#### Eligibility

Eligible Applicants: City or township governments

County governments

Special district governments

Native American tribal governments (Federally recognized)

State governments

Others (see text field entitled "Additional Information on Eligibility" for clarification)

Additional 1. A State or a group of States; 2. A metropolitan planning organization that serves an urbanized **Information on** area (as designated by the Bureau of the Census) with a population over 200,000; 3. A unit of local Eligibility: government or a group of local governments; 4. A political subdivision of a State or local government; 5. A special purpose district or a public authority with a transportation function; 6. A Federal Land Management Agency (FLMA); 7. A Tribal government or a consortium of Tribal governments; and 8. A multistate or multijurisdictional group of entities as described above in 1 & 7.

#### **Additional Information**

**Agency Name:** DOT Federal Highway Administration

**Description:** The purpose of this notice is to solicit applications for Large Bridge Project grants (a project with

total eligible costs greater than \$100 million) for awards under the Bridge Investment Program (BIP). This notice establishes a "rolling application" process for Large Bridge Project applications by providing the schedule, requirements, and selection process for such projects for the remaining available amounts of BIP funding provided by the Infrastructure Investment and Jobs Act (also known as the "Bipartisan Infrastructure Law" or BIL) for FY 2023 through FY 2026, which total up to \$9.62 billion (see section B.1 for details for funds available for each fiscal year). The FHWA will solicit applications for the other two BIP project categories in a subsequent NOFO: (1) Planning and (2) Bridge Project (a project with total eligible costs not greater than \$100 million).

**Link to Additional** Information:

Opportunity

**Funding** If you have difficulty accessing the full announcement electronically, please contact:

Veronica Jacobson Number:

> Agreement Specialist Office of Acquisition and Grants Management Federal Highway Administration U.S. Department of Transportation 12300 West Dakota Avenue, #180 Lakewood,

CO 80228

**Bridge Investment Program** 







# Safe Streets and Roads for All (SS4A) Implementation Grants in Texas 2023 Safe Streets and Roads for All (SS4A) Grants



Project	Applicant	State	Award Amount	Rural or Urban	Page
We Are Nolensville Pike	Metropolitan Government of Nashville-Davidson County	TN	\$13,049,572	Urban	43
MLK Jr./Cedar Crest Blvd Complete Street & Safety Upgrades	City of Dallas	TX	\$21,800,000	Urban	44
Prioritizing Vulnerable Roadway Users in El Paso Network-Wide Safety Improvements along El Paso's High-Injury Network	City of El Paso	TX	\$9,900,065	Urban	45
Greater Northside and International Districts Safe Streets Project	Greater Northside Management District	TX	\$10,143,200	Urban	46
Safe and Equitable Streets in Richmond, VA	City of Richmond	VA	\$10,768,909	Urban	47
Virginia Beach Trail Phase 1: A Regional Connector	City of Virginia Beach	VA	\$14,900,000	Urban	48
Safe Streets and Roads for All Implementation Grant for Downtown Connectivity on George Washington Way, Jadwin Avenue, and Symons Street in Richland, WA	City of Richland	WA	\$11,729,500	Urban	49
Safe Streets for Spokane	City of Spokane	WA	\$9,600,000	Urban	50
Fourth Plain Safety and Mobility Improvement Project	City of Vancouver	WA	\$5,696,000	Urban	51
Forward to Vision Zero – Madison, Safe System for Vulnerable Roadway Users	City of Madison	WI	\$6,267,668	Urban	52
Shining the Light on Safety	City of Casper	WY	\$1,215,324	Rural	53

The Bipartisan Infrastructure Law established the new Safe Streets and Roads for All (SS4A) discretionary program with \$5 billion in appropriated funds over 5 years. The SS4A program funds regional, local, and Tribal initiatives through grants to prevent roadway deaths and serious injuries.



# Safe Streets and Roads for All (SS4A) Grants



Urban

#### MLK Jr./Cedar Crest Blvd Complete Street & Safety Upgrades

**Applicant: City of Dallas** 

Dallas, Texas

SS4A Award: \$21,800,000

#### **Project Description**

The City of Dallas, Texas, is awarded funds for multiple improvements on Martin Luther King Jr. (MLK Jr.) Boulevard/Cedar Crest Boulevard for pedestrians and bicyclists. Project components include installing bike lanes and implementing a road diet from five lanes to four, leading pedestrian intervals, raised crosswalks, and bus shelter improvements, among other safety enhancements.

The corridor provides residents access to the MLK Jr. light rail station, a community center, a library, health centers, grocery stores, and other significant destinations. This project will help to safely connect multiple neighborhoods and schools along the corridor and reduce the fatality rate in the City, ranked 2nd highest among the 15th most populous U.S. cities.





# Safe Streets and Roads for All (SS4A) Grants



**Urban** 

# Prioritizing Vulnerable Roadway Users in El Paso Network-Wide Safety Improvements along El Paso's High-Injury Network

**Applicant: City of El Paso** 

El Paso, Texas

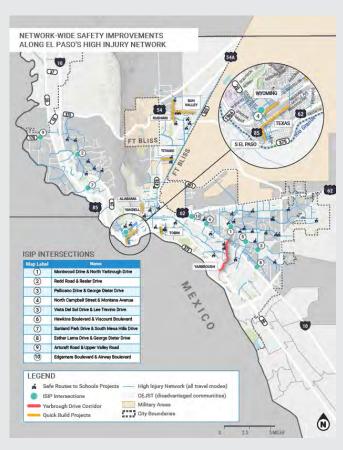
SS4A Award: \$9,900,065

#### **Project Description**

The City of El Paso, Texas, is awarded funding to transform the North Yarbrough Drive corridor to implement its Intersection Safety Improvement Program.

Improvements will address right-angle, leftturn, and rear-end crashes; disregard for traffic signals; speeding; and driver inattention. The project will also launch a Safe Routes to School Program, expand El Paso's Vision Zero Education and Encouragement Campaign, and install signage along the City's high-injury network.

The corridor is the second highest in the region for bicycle- and pedestrian-involved crashes and is ranked among the top 10 city-wide segments for motor vehicle fatal or serious-injury crashes. The corridor has long distances between signalized crossings, wide curb radii at intersections, a lack of ADA ramps, and missing or narrow bike lanes.





# Safe Streets and Roads for All (SS4A) Grants



Urban

# **Greater Northside and International Districts Safe Streets Project**

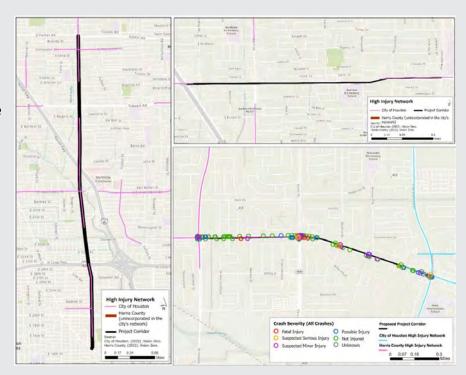
**Applicant: Greater Northside Management District** 

Houston, Texas

SS4A Award: \$10,143,200

#### **Project Description**

The Greater Northside Management District in Houston, Texas, is awarded funding for multiple improvements across Airline Drive, Bissonnet Street, Jensen Drive, and Tidwell Road, including installation of rectangular rapidflashing beacons and construction of new sidewalks to complete the sidewalk network along the project area. Other key elements include pedestrian refuge islands, hybrid beacons, wider sidewalks,



multiuse paths, improved bus stop accessibility, and improved street lighting.

The project corridors had a total of 1,025 crashes resulting in 13 pedestrians killed or severely injured, and 2 severely injured cyclists between 2017 and 2021. The improvements will connect residents and visitors to local destinations, including a local farmer's market.

# Safe Streets and Roads for All (SS4A) Planning Grants in Texas 2023

### Texas

Lead Applicant	Project Title	Application Type	Urban/ Rural	Funding Award
City of Alvarado	Alvarado Multimodal Transportation Safety Plan	Develop Action Plan as well as Demonstration or Other Supplemental Planning	Rural	\$236,000
City of Arlington	City of Arlington - ADA Transition Plan	Conduct Demonstration or Other Supplemental Planning Activities (only)	Urban	\$385,000
City of Austin	City of Austin Planning Activities	Conduct Demonstration or Other Supplemental Planning Activities (only)	Urban	\$288,000
City of Balch Springs	SS4A Action Plan Grant for the City of Balch Springs, Texas	Develop New Action Plan (only)	Urban	\$160,000
City of Baytown	A Comprehensive Safety Action Plan for Baytown, Texas	Develop New Action Plan (only)	Urban	\$400,000
City of Brackettville	City of Brackettville's Action Plan Project - Accept Zero	Develop Action Plan as well as Demonstration or Other Supplemental Planning	Rural	\$120,000
City of Brownsville	Brownsville Safety Demonstration Project	Conduct Demonstration or Other Supplemental Planning Activities (only)	Urban	\$256,244
City of Frisco, Texas	City of Frisco TX Safety Action Plan	Develop Action Plan as well as Demonstration or Other Supplemental Planning	Urban	\$280,000
City of Gladewater	Safe Streets and Roads for All	Develop Action Plan as well as Demonstration or Other Supplemental Planning	Rural	\$240,000
City of Mansfield	Mansfield Active Transportation and Safety Plan	Develop Action Plan as well as Demonstration or Other Supplemental Planning	Urban	\$548,800
City Of McKinney	City of McKinney Safety Action Plan	Develop New Action Plan (only)	Urban	\$240,000
City of Mesquite	SS4A Action Plan Grant for the City of Mesquite, Texas	Develop New Action Plan (only)	Urban	\$256,000
City of Midlothian, Texas	Midlothian Mobility Safety Action Plan	Develop Action Plan as well as Demonstration or	Urban	\$107,284

Lead Applicant	Project Title	Application Type	Urban/ Rural	Funding Award
		Other Supplemental Planning		
City of Port Arthur	City of Port Arthur - Transportation Safety Plan	Develop New Action Plan (only)	Rural	\$1,931,696
City of Richardson	Richardson Comprehensive Safety Action Plan	Develop Action Plan as well as Demonstration or Other Supplemental Planning	Urban	\$320,000
City of Saginaw (TX)	Saginaw Comprehensive Safety Action Plan	Develop New Action Plan (only)	Urban	\$184,000
City of Terrell	City of Terrell Road Safety Action Plan	Develop New Action Plan (only)	Rural	\$168,000
City of Watauga	Watauga Safe Streets and Roads for All Action Plan	Develop New Action Plan (only)	Urban	\$160,000
City of Weatherford, TX	Weatherford Comprehensive Safety Action Plan	Develop New Action Plan (only)	Rural	\$224,000
East Texas Council of Governments	East Texas Council of Governments Regional Road Safety Proposal	Develop Action Plan as well as Demonstration or Other Supplemental Planning	Rural	\$768,000
Greater Southeast Management District	Safety Actions for Houston Southeast	Develop Action Plan as well as Demonstration or Other Supplemental Planning	Urban	\$320,000
North Central Texas Council of Governments	Advancing Regional Safety in the Dallas-Fort Worth Region	Conduct Demonstration or Other Supplemental Planning Activities (only)	Urban	\$4,000,000
South Plains Association of Governments	South Plains Association of Governments Safe Streets and Roads for All Action Plan	Develop New Action Plan (only)	Urban	\$960,000
Waco Metropolitan Planning Organization, City of Waco	Place-Based Planning and Demonstration Projects for Vulnerable Road User Safety in McLennan County, TX	Conduct Demonstration or Other Supplemental Planning Activities (only)	Rural	\$1,200,000
Texas Total				\$13,753,024



Board of Directors Meeting Memo

January 5, 2024

Subject: Resolution to Apply for the FY23-FY24 Advanced Transportation Technology and Innovation (ATTAIN) Program Grant Funding Opportunity

#### Background

The Department of Transportation has opened a grant funding opportunity through the Advanced Transportation Technology and Innovation (ATTAIN) Program. Funding would be for entities to deploy, install, and operate advanced technologies to improve safety, mobility, efficiency, system performance, intermodal connectivity, and infrastructure return on investment.

\$120 million has been allotted for the estimated total program funding, with 20 expected awards.

Application Deadline: February 2, 2024

#### **Identified Need**

CCRTA would use funding to retrofit 51 buses within CCRTA's fleet with the Mobileye Shield+ 3-Camera System Version 4 with the Rosco Collision Avoidance (RCA) Advanced Pedestrian Alert System (APAS). The technology would be used to reduce traffic-related fatalities and injuries through advanced driver assistance and alerts to drivers for potentially dangerous situations.

#### **Financial Impact**

CCRTA's funding request would be \$684,636 for the technology to be retrofitted on 51 buses within CCRTA's fleet, installation, training, software subscription, and freight shipment. If funding is received, 80% would be DOT-funded, with the remaining 20% (\$136,927.20) being locally funded.

#### **Board Priority**

This item aligns with the Board Priorities - Safety & Security and Financial Transparency

#### **Project Outlook**

Upon award, CCRTA would work with a vendor to conduct installation for the Mobileye Shield+ 3-Camera System, Version 4 with the Rosco Collision Avoidance (RCA) Advanced Pedestrian Alert Systems (APAS), and training, which would take an estimated 10 – 14 months, based on the procurement, shipping, installation, and training processes.

#### Recommendation

Staff requests the Board of Directors adopt a Resolution to support the Advanced Transportation Technology and Innovation (ATTAIN) Program grant funding opportunity by authorizing the Chief Executive Officer or designee to execute and submit an application.

Respectfully Submitted,

Submitted by:

Rita Patrick

Managing Director of Public Relations

Final Approval by:

Derrick Majchszak

Chief Executive Officer

### Corpus Christi Regional Transportation Authority



# IN SUPPORT OF ADVANCED TRANSPORTATION TECHNOLOGY TO REDUCE TRAFFIC-RELATED INCIDENTS THROUGH ADVANCED DRIVER ASSISTANCE

**WHEREAS**, the Corpus Christi Regional Transportation Authority (CCRTA) has a longterm goal of enhancing transportation safety for customers, employees, and the community.

WHEREAS, the Corpus Christi Regional Transportation Authority has identified Mobileye Shield+ 3-Camera System Version 4 with the Rosco Collision Avoidance (RCA) Advanced Pedestrian Alert Systems (APAS) as a technology that would reduce traffic-related incidents through advanced driver assistance.

## NOW THEREFORE, BE IT RESOLVED BY THE CORPUS CHRISTI REGIONAL TRANSPORTATION AUTHORITY BOARD OF DIRECTORS THAT:

Section 1. The Board hereby declares its support for the shipment, installation, training, and subscription of transit artificial intelligence technology to assist CCRTA Bus Operators in the detection of vehicles, pedestrians, lanes, and traffic signs in order minimize any potentially dangerous conditions.

Section 2. The Board of Directors further declares its intention to support the exploration of grant opportunities for advanced transportation technology to reduce traffic-related incidents and improve safety within the CCRTA's fleet and transportation system.

ATTEST:

CORPUS CHRISTI REGIONAL
TRANSPORTATION AUTHORITY

Derrick Majchszak
Chief Executive Officer

Dan Leyendecker
Chairman of the Board

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#### **Advanced Transportation Technologies and Innovation**

(Advanced Transportation Technologies and Innovative Mobility Deployment)

	FAST Act (extension)	Bipartisan Infrastructure Law (BIL)				
Fiscal Year (FY	2021	2022	2023	2024	2025	2026
Authorization	\$60 M	\$60 M	\$60 M	\$60 M	\$60 M	\$60 M

Note: Except as indicated, all references in this document are to the Bipartisan Infrastructure Law (BIL), enacted as the Infrastructure Investment and Jobs Act, Pub. L. 117-58 (Nov. 15, 2021).

Note: The BIL amended the Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) grant program and renamed it the Advanced Transportation Technologies and Innovative Mobility Deployment Program. In implementing BIL, FHWA will refer to this program as the Advanced Transportation Technologies and Innovation (ATTAIN) program.

#### **Program Purpose**

The ATTAIN program provides competitive grants to deploy, install, and operate advanced transportation technologies to improve safety, mobility, efficiency, system performance, intermodal connectivity, and infrastructure return on investment.

#### Statutory Citations

§ 13006(b); 23 U.S.C. 503(c)(4)

#### **Funding Features**

#### Type of Budget Authority or Authorization of Appropriations

Contract authority from the Highway Account of the Highway Trust Fund, subject to the overall Federal-aid obligation limitation.

#### Source of funding

The BIL funds the program through a set-aside from the Highway Research and Development, Technology and Innovation Deployment, and Intelligent Transportation System Research Programs. [§ 13006(b)(9); 23 U.S.C. 503(c)(4)(I)(i)]

#### Set-aside for rural areas

[NEW] Not less than 20% of the amounts made available to carry out this program shall be reserved for projects serving rural areas. [§ 13006(b)(5); 23 U.S.C. 503(c)(4)(D)(ii)(II)]

#### Federal Share

[NEW] Up to 80% of the cost of the project (vs. 50% of the cost of the project under the FAST Act) [§ 13006(b)(10); 23 U.S.C. 503(c)(4)(J)]

#### Eligible Activities

Grant recipients may use funds under this program to deploy the following advanced transportation and congestion management technologies—

- advanced transportation technologies to improve emergency evacuation and responses by Federal, State, and local authorities;
- integrated corridor management systems;
- advanced parking reservation or variable pricing systems;
- electronic pricing, [NEW] toll collection, and payment systems;
- technology that enhances high occupancy vehicle toll lanes, cordon pricing, or congestion pricing;
- integration of transportation service payment systems;
- advanced mobility access and [NEW] on-demand transportation service technologies, such as dynamic ridesharing
  and [NEW] other shared-use mobility applications and information systems to support human services for elderly
  and disabled individuals:
- retrofitting dedicated short-range communications (DSRC) technology deployed as part of an existing pilot program to cellular vehicle-to-everything (C-V2X) technology, subject to the condition that the retrofitted technology operates only within the existing spectrum allocations for connected vehicle systems; or
- advanced transportation technologies, in accordance with research areas described in the DOT's 5-year transportation research and development strategic plan (section 6503 of title 49, United States Code). [§ 13006(b)(6); 23.U.S.C. 503(c)(4)(E)]

#### **Eligible Entities**

- a State or local government or political subdivision thereof;
- a transit agency;
- **[NEW]** any metropolitan planning organization (MPO) (vs. under the FAST Act, only MPOs that represented a population of more than 200,000);
- a multijurisdictional group made up of the above eligible applicants, with a signed agreement to implement the initiative across jurisdictional boundaries; and
- a consortium of research or academic institutions. [§ 13006(b)(11); 23 U.S.C. 503(c)(4)(N)]

#### **Program Features**

Except as specified, the BIL continues all requirements that applied to ATCMTD under the FAST Act.

#### **Project Selection**

The BIL requires the Secretary to develop criteria for selection of an eligible entity to receive a grant, including how the proposed deployment of technology will—

- **[NEW]** improve the mobility of people and goods;
- [NEW] improve the durability and extend the life of transportation infrastructure;
- reduce costs and improve return on investments, including through **[NEW] optimization** of existing transportation capacity;
- [NEW] Protect the environment and deliver environmental benefits that alleviate congestion and streamline traffic
  flow;
- measure and improve the operational performance of the applicable transportation network;
- reduce the number and severity of traffic crashes and increase driver, passenger, and pedestrian safety;
- collect, disseminate, and use real-time traffic, [NEW] work zone, weather, transit, [NEW] paratransit, parking, and
  other transportation-related information to improve mobility, reduce congestion, and provide for more efficient,
  accessible, [NEW] and integrated transportation and transportation services;
- [NEW] facilitate account-based payments for transportation access and services and integrate payment systems across modes;
- monitor transportation assets to improve infrastructure management, reduce maintenance costs, prioritize investment decisions, and ensure a state of good repair;
- deliver economic benefits by reducing delays, improving system performance, and providing for the efficient and reliable movement of goods and services;
- accelerate the deployment of vehicle-to-vehicle, vehicle-to-infrastructure, [NEW] vehicle-to-pedestrian, autonomous vehicles, and other technologies; or
- [NEW] incentivize travelers—
  - to share trips during periods in which travel demand exceeds system capacity; or
  - o to shift trips to periods in which travel demand does not exceed system capacity. [§ 13006(b)(3); 23 U.S.C. 503(c)(4)(B)]

#### **Grant Awards**

• Each fiscal year for which funding is made available for this program, the BIL requires the Secretary to request applications and to award grants to at least 5 and not more than 10 eligible entities. The BIL further requires that the awards, to the extent practicable, represent diverse technologies and geographic areas of the United States, including urban and rural areas. [§ 13006(b)(5); 23 U.S.C. 503(c)(4)(D)]

#### **Reporting Requirements**

The BIL carries forward grant recipient annual reporting requirements to the Secretary on the costs and benefits of a project and how the project has met the expectations described in the recipient's application, including lessons learned and recommendations for future deployment strategies to optimize transportation [NEW] mobility, efficiency, multimodal system performance, and [NEW] payment system performance.
 [§ 13006(b)(7); 23 U.S.C. 503(c)(4)(F)]

#### **Additional Information and Assistance**

• FHWA can connect you with your local FHWA office and support you with technical assistance for planning, design, construction, preserving, and improving public roads and in the stewardship of Federal funds. For assistance, visit: <a href="https://www.fhwa.dot.gov/bipartisan-infrastructure-law/technical\_support.cfm">https://www.fhwa.dot.gov/bipartisan-infrastructure-law/technical\_support.cfm</a>.





#### Technical Memo 3: Criticality Framework

Corpus Christi MPO Regional Resiliency Improvement Plan - Phase 1

#### **Project Context**

The Corpus Christi Metropolitan Planning Organization (Corpus Christi MPO) and its region face a unique combination of natural hazards including a dry, non-freeze southern Texas climate and its location in 'hurricane alley' along the Gulf Coast. The ability to continue and or quickly restore transportation operations in the face of such hazards can save lives and protect critical and costly infrastructure investments and is therefore of central concern to the Corpus Christi MPO. As evidenced Hurricane Harvey in 2017 - which destroyed or severely damaged 80 percent of homes and buildings in Rockport, Fulton, Bayside, Aransas Pass, and Port Aransas [Texas A&M Corpus Christi, 2018] – there is a critical need for more resilient infrastructure in the region.

To proactively make the system more resilient and mitigate potential consequences of known environmental risks and hazards, the Corpus Christi MPO has contracted with the High Street Consulting Group (High Street) to make progress toward developing a regional Resiliency Improvement Plan by completing a Phase 1 analysis. Phase 1 will identify and prioritize an initial set of assets based on existing data related to their vulnerability to hazards and criticality. This in turn will help position the Corpus Christi MPO and its partner agencies to tactically pursue federal PROTECT grants that can help fund identified improvements to its vulnerable assets. The PROTECT Formula and Discretionary Grant Programs (1) provides formula funding to states for resilience improvements, (2) distributes competitive planning grants to enable communities to assess vulnerabilities to current and future weather events, natural disasters and changing conditions, and plan transportation improvements and emergency response strategies to address those vulnerabilities, and (3) distributes competitive resilience improvement grants to protect surface transportation assets, coastal infrastructure, natural infrastructure, and communities.

#### Task Overview

This Technical Memo 3: Criticality Framework (TM3) builds on the previous two technical memos. Tech Memo 1: Network Definition (TM1) analyzed existing regional resiliency work to identify assets generally considered in resiliency analyses. Tech Memo 2: Hazard Definition (TM2) incorporated the relevant natural hazards which have been included in similar resiliency planning efforts. TM3 details the criticality criteria that will be employed to prioritize the transportation assets in the Corpus Christi MPO region. The TM3 outline is as follows: **Resource Review** 





Asset Type	Transit Facilities	Oil & Gas Pipelines	Culverts	Low Water Crossings	Ferry Facilities	ITS/Ancillary Assets
Total	5	3	2	2	1	1
Texas SRP		х	х			х
Statewide Freight Resiliency Plan		x				
Central Texas Extreme Weather and Climate Report	х					
Climate Change/Extreme Weather Risk Assessment						
Gulf Coast Study	X					
TCRS	х	х		х	х	
TCRMP	x					
Resilient Houston	х					
Broward MPO Memo						
НМАР						
Nueces Regional Flood Plan			х	х		

#### **Hazard** Summary

All 11 sources considered in the literature review discussed relevant hazards. Error! Reference source not found. provides the literature review hazard reference counts. Flood was referenced the most frequently, with each source mentioning it as a hazard (this includes sources that mention storm surge or specific types of floods, like riverine). Heat Waves and Wildfires are mentioned in half the resources with the other hazards being mentioned in fewer than half. Dam/Levee Failure, Lightning, and Expansive Soils were each mentioned once. Tables 3 and 4 display the hazard references for each individual source.





Table 3: Hazard Type Literature Review Reference Summary Table

Asset Type	Flooding	Heat Wave	Wildfire	Drought	Coastal Erosion
Total	13	8	6	6	5
Texas SRP	Х	Х	Х	Х	
Statewide Freight Resiliency Plan	Х		Х		
Central Texas Extreme Weather and Climate Report	Х	Х	Х	Х	
Climate Change/Extreme Weather Risk Assessment	Х	Х	Х		
Gulf Coast Study	X	X			
TCRS	Х				Х
TCRMP	Х				Х
Coastal Texas Study	Х				Х
Extreme Weather Assessment	Х	Х	Х	Х	Х
Resilient Houston	Х	Х		Х	
Broward MPO Memo	Х	Х		Х	
НМАР	Х	Х	Х	Х	Х
Nueces Regional Flood Plan	Х				







Table 4: Hazard Type Literature Review Reference Summary Table (Continued)

Asset Type	Strong Wind	Sea Level Rise	Land Subsidence/ Landslides	Lightning	Dam/Levee Failure	Expansive Soils
Total	5	5	3	3	1	1
Texas SRP						
Statewide Freight Resiliency Plan	Х		X			
Central Texas Extreme Weather and Climate Report						
Climate Change/Extreme Weather Risk Assessment						
Gulf Coast Study		X				
TCRS	Х					
TCRMP		x				
Coastal Texas Study		Х				
Extreme Weather Assessment	Х			Х		
Resilient Houston	Х	Х	Х	Х		
Broward MPO Memo		Х				
НМАР	Х		Х	X	х	X
Nueces Regional Flood Plan						

Data Assessment, **Criticality Framework**, and **Implementation Recommendations**. **Appendix II: Additional Resources** summarizes other topical but not directly relevant resources (which may be used in future stages of the analysis).





#### **Asset Definitions**

The definitions of the assets identified in this resource review and therefore included in the technical memorandum are listed below:<sup>1</sup>

**Roadways**: physical infrastructure designed and built to accommodate passenger and freight vehicular, bicycle, and pedestrian traffic. Roadway assets review covers roads on and off system as well as evacuation routes.

**Railways**: networks of tracks and associated structures that enable the movement of trains, which can carry passengers, freight, or both.

**Airports**: aviation facilities designed to accommodate the arrival, departure, and maintenance of aircraft. The review encompasses various types of aviation facilities including public airports, private airports, and heliports.

**Bridges**: structures built to span physical obstacles, such as rivers, valleys, or roads, providing a passage for vehicles, pedestrians, and sometimes railways. Bridges included in this document research include bridges that are part of the National Bridge Inventory (NBI), which have spans over 20 ft, and non-NBI bridges.

**Seaports**: areas along coastlines or navigable waterways where ships can dock to load and unload cargo and passengers. Seaports review covers maritime facilities, waterways, and ports facilities including both shallow and deep draft ports.

Large and Small Culverts: tunnels or pipes that allow water to flow under roads, railways, or other structures. The literature review sections below do not consistently distinguish culverts based on their sizes, so they are referred to as merely culverts. However, the data assessment sections report data availability for the two culvert categories, large and small, which have span greater than and less than or equal to 20 feet, respectively.

**Oil and Gas Pipelines**: systems for transporting petroleum products, natural gas, and other fluids. Oil and gas pipelines review includes pipelines carrying various commodities such as crude oil, anhydrous ammonia, natural gas, and refined liquid products.

**Transit Facilities**: stations and routes of the public transportation system that are used to move people from one place to another. Transit facilities cover various modes such as buses, subways, trams, and light rail.

**Low Water Crossings:** low-elevation roadways traversing over a body of water that stays dry above the water when the flow is low and are designed to be submerged under high-flow conditions, such as floods.

<sup>1</sup> Asset type nomenclature varies among plans and resources; the High Street Team grouped similar or analogous asset names together as illustrated in **Appendix I: Asset Type Crosswalk**.





**Ferry Facilities**: stations where ferries, which are vessels that transport passengers and vehicles across bodies of water, dock and embark/disembark passengers and vehicles. The ferry facilities review includes terminals and routes.

**ITS/Ancillary Assets**: Intelligent Transportation Systems (ITS) and ancillary assets refer to technologies and equipment used to improve transportation safety, efficiency, and coordination. This includes traffic signals, cameras, electronic signs, sensors, communication systems, and data management tools.

#### Hazard Definitions

The following relevant hazards and definitions were identified through the literature review:

**Coastal Erosion:** the loss of land, marshes, wetlands, beaches, or other coastal features within the coastal zone because of the actions of wind, waves, tides, storm surges, subsidence, or other forces.

Dam and Levee Failure: A dam is a barrier that is constructed to hold back water. A dam failure is a systematic failure of a dam structure resulting in the uncontrolled release of water, often resulting in floods that could exceed the 100-year floodplain boundaries. A levee is an embankment built to prevent overflow from a body of water. A levee failure is when a levee embankment fails, or is intentionally breached, causing the previously contained water to flood the land behind the levee.

**Drought:** a natural reduction in the amount of precipitation expected over an extended period of time, usually a season or more in length.

Expansive Soil: soils and soft rock that tend to swell or shrink due to changes in moisture content.

**Extreme Heat/Heat Wave:** a combination of very high temperatures and, usually, exceptionally humid conditions. When persisting over a period of time (generally more than two days), it is called a heat wave.

**Flooding:** the accumulation of water within a water body and the overflow of excess water into adjacent floodplain lands. Types of floods include:

**Coastal Flooding/Storm Surge**: areas at risk of flooding when sea water surges inland from tropical storm events/an abnormal rise of water generated by a storm over and above the predicted astronomical tide.

Riverine Flooding: areas at risk of flooding when rivers and creeks come out of their banks.

Land subsidence/Landslides: the loss of surface elevation due to the removal of subsurface support. It can range from broad, regional lowering of the land surface to localized, full-blown collapses. Land subsidence occurs in different areas for different reasons. A sinkhole is a category of subsidence.

**Lightning:** a massive electrostatic discharge between electrically charged regions within clouds, or between a cloud and the Earth's surface.

**Sea Level Rise:** an increase in the level of the world's oceans.

**Strong Wind:** a storm with high winds or violent gusts with little or no rain. The windstorm hazard excludes extreme wind events that occur with other wind-related natural hazards such as hurricanes, tropical storms, and tornados.



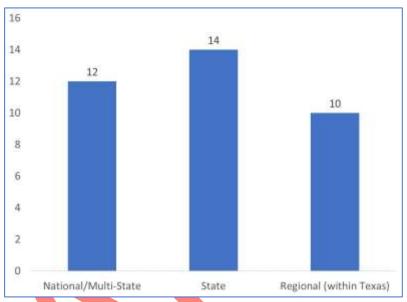


**Wildfire**: a sweeping and destructive conflagration and can be further categorized as wildland, interface, or intermix fires. Wildland fires are fueled almost exclusively by natural vegetation wildland/urban interface (WUI) fires include both vegetation and the built environment. The wildfire disaster cycle begins when homes are built adjacent to wildland areas.

#### Resource Review

Resiliency is an emerging and important topic that has garnered increased attention and has new funding programs associated with it (such as PROTECT); as a result, agencies from federal to regional and local have developed resiliency plans, studies, and programs, as well as provide databases and GIS files ("resources"). Therefore, to understand which transportation assets and hazards the Corpus Christi MPO should consider including in its inaugural Resiliency Improvement Plan, the project

Figure 1: Resources by Geographical Coverage



team documented which asset types have been considered most frequently and has available data. The High Street team reviewed a total of 36 resources covering a range of geographies, as illustrated Error!

Reference source not found.

#### Literature Review

The literature review identifies which assets and hazards are considered in relevant plans, programs, and studies. There is sometimes overlap and agreement among resources, and they can often differ in their scope, methodology, terminology, and focus. The literature review covers the following:

- resiliency plans and programs in Texas such as the Regional Resilience Partnership for Coastal Bend regional counties, Texas Department of Transportation (TxDOT) Statewide Resiliency Plan, vulnerability assessment reports for the Austin and Dallas metropolitan areas; and
- emergency plans from Corpus Christi, Nueces County, and other research entities and government agencies.

The following section details the resources considered and summarizes the assets referenced. It also provides a foundation for further work on identifying hazard types and criticality criteria.





#### Resiliency Plans and Programs in Texas TxDOT Statewide Resiliency Plan (SRP)

The Texas Statewide Resiliency Plan began in December 2022 and is slated to finish in the Summer of 2024. This ongoing effort aims to proactively manage and assess future transportation system disruptions due to extreme weather events. This includes identifying critical infrastructure and hazards, evaluating the vulnerability of these infrastructure assets to the hazards, and accordingly developing strategies to improve resilience. The SRP includes a balance of a science-based approach and stakeholder and public involvement. The SRP will satisfy Texas' Infrastructure Investment and Jobs Act PROTECT requirements and serve as a resource for state and local agencies to pursue further

	Texas SRP							
Ass	sets	На	zards					
*	Roadways	*	Flooding					
*	Railways	*	Wildfire					
*	Airports	*	Heat Wave					
*	Bridges	*	Drought					
*	Seaports							
*	Oil & Gas							
	Pipelines							
*	Culverts							
*	ITS/Ancillary							

funding. The TxDOT SRP website lists the types of assets and hazards that will be analyzed in the plan.

#### TxDOT Statewide Freight Resiliency Plan, Stage 1: Prepare the Freight System

TxDOT developed the Statewide Freight Resiliency Plan to prepare, detect, respond to, and recover from events, which include natural disasters, terrorist incidents, or infrastructure failure. Specifically, the purpose of this study is to "assess the resilience of the strategic freight system in Texas when an event of extended duration limits freight mobility, resulting in prioritized infrastructure enhancements to keep freight moving." Stage 1 of the Plan, released in 2011, focuses on understanding the existing system's preparedness. The report identifies relevant freight infrastructure and hazards before analyzing resiliency. Stage 2, also released in 2011,

#### Statewide Freight Resiliency Plan

#### Assets

Roadways

Assets

- Railways
- Airports
- Seaports
- Oil and Gas Pipelines

#### Hazards

- Flooding
- Wildfire
- Strong Wind
- LandSubsidence/Landslides

primarily focuses on the freight communication network. The Statewide Freight Resiliency Plan analyzes the assets relevant to Texas' Freight System, which are included in the call-out box. Additionally, the Plan provides a matrix of hazards considered.

## Central Texas Extreme Weather and Climate Change Vulnerability Assessment of Regional Transportation Infrastructure

This 2015 report was part of a series of Federal Highway Administration (FHWA) grant pilot studies meant to establish best practices for assessing transportation infrastructure vulnerability to climate change and extreme weather, as well as determine strategies for improving resiliency. Specifically, the Capital Area Metropolitan Planning Organization (CAMPO) and the City of Austin Office of Sustainability assess the potential vulnerability of a limited number of critical

## Central Texas Extreme Weather and Climate Report

#### Assets

- Roadways
- Railways
- Airports
- Bridges
- Transit
  Facilities

#### Hazards

- Flooding
- Wildfire
- Strong Wind
- LandSubsidence/Landslides

transportation assets in the CAMPO region to the effects of extreme weather and climate. The report





discusses the transportation data considered before assessing criticality, sensitivity, and vulnerability to natural hazards.

Impacts of Climate Change and Variability on Transportation Systems and Infrastructure: The

Gulf Coast Study, Phases 1 and 2 (Gulf Coast Study)

The Gulf Coast Study was produced by the U.S. Climate Change Science Program with funds from the U.S. Department of Transportation (DOT) in partnership with the U.S. Geological Survey. The Study Phases consider how changes in weather could affect the transportation infrastructure of the U.S. Gulf Coast between Galveston, Texas and Mobile, Alabama. The Phases aim to evaluate how changes in climate could impact design, construction, safety, operations, and maintenance of transportation

Gulf Coa	ast Study
Assets ❖ Roadways	Hazards ❖ Flooding
Railroads	♣ Heat Wave
Roadways	Sea Level
Airports	Rise
Seaports	

infrastructure. Moreover, they focus on the decisions policy makers and managers can consider which increase safety and resiliency in the transportation system. Phase 1 (2008) takes a regional case study approach, while Phase 2 (2013) takes a more focused approach by analyzing specific infrastructure components and adaptation strategies. After elaborating on the importance of and risks to the Gulf Coast, the Phases analyze the potential climate impacts on different transportation modes, with Phase 1

analyzing the entire Gulf Coast and Phase 2 focusing on examples in Mobile, AL.

#### Texas Coastal Resiliency Study (TCRS)

This report was created in 2016 for the Texas General Land Office to identify the critical coastal infrastructure assets that are most vulnerable to storms similar to Hurricanes Dolly and Ike. The report identified and ranked priority existing and future projects that could protect vulnerable assets. Through three phases, the report recommends the projects that would have the greatest impact on recovery and resiliency. The TCRS identifies the critical infrastructure considered, specifies the transportation assets, and then performs the risk analysis for identified hazards.

	TC	RS	
Ass	sets	Ha	zards
*	Roadways	*	Flooding
*	Railways	*	Coastal
*	Airports		Erosion
*	Bridges	*	Strong Wind
*	Seaports		
*	Transit		
	Facilities		
*	Oil & Gas		
	Pipelines		
*	Low Water		
	Crossings		
*	Ferry		
	Facilities		





#### Texas Coastal Resiliency Master Plan (TCRMP)

The Texas Coastal Resiliency Master Plan (TCRMP), created by the Texas General Land Office (GLO), is a multi-part statewide plan to analyze and protect the natural environment and infrastructure along the Texas coast. The TCRMP outlines projects across four Gulf regions compiled by coastal and environmental experts that will help enhance resiliency along the state's coast. The most recent installment, TCRMP 2023, is an update to the 2019 report. Analysts were asked to assess the impact of eight vulnerabilities in 48 coastal subregions identified in the 2023 TCRMP through a Qualtrics Survey. The projects are ranked by economic and ecological measures to help communities

TCRMP						
Assets	Hazards					
Roadways	❖ Flooding					
Railways	❖ Sea Level					
Airports	Rise					
Bridges	❖ Coastal					
Maritime	Erosion					
Seaports	<b>❖</b> Land					
Transit	Subsidence/					
Facilities	Landslides					

determine which to implement. The report is accompanied by data and mapping resources, which are

discussed in depth in the Data Assessment section. The TCRMP 2023 covers five hazards, which are most relevant to the coastal regions of Texas, and it distinguishes between riverine and coastal flooding.

## Coastal Texas Protection and Restoration Feasibility Study Final Report (Coastal Texas Study)

The Coastal Texas Study was a collaboration between the US Army Corps of Engineers and the Texas General Land Office completed in 2021. In

recognition of the economic and ecological importance of Texas, the authors created the report to identify feasible projects that can address natural hazard risks to the economy and public health, as well as restore ecosystems and improve coastal resiliency. The report focuses on mechanisms for mitigating the impact of storm surges and protecting communities. It does not discuss specific transportation assets.

## Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, 2021 Update (Extreme Weather Assessment)

The Extreme Weather Assessment was an update to a report created by the Texas A&M University, Office of the Texas State Climatologist. The report was sponsored by Texas 2036, a nonpartisan think tank. The report reviews historic trends in temperature, precipitation, and extreme weather in Texas to forecast trends out to 2036. The report acknowledges variation in the actual climate, but this provides scenarios that Texas can use to inform decision making. The report covers the entire state and hazards including coastal erosion, drought, flooding, wildfires, and a variety of storm types. The data employed in the report is not readily available but can provide methods for evaluating resiliency.

#### **Coastal Texas Study**

#### Hazards

- Flooding
- Sea Level Rise
- Coastal Erosion

## Extreme Weather Assessment

#### Hazards

- Flooding
- Heat Wave
- Wildfire
- Coastal erosion
- Strong Wind
- Drought
- Lightning





## Climate Change/Extreme Weather Vulnerability and Risk Assessment for Transportation Infrastructure in Dallas and Tarrant Counties

The University of Texas Arlington created this report in 2015 for the North Central Texas Council of Government, a voluntary assortment of local governments and districts, and the MPO for the Dallas-Fort Worth metropolitan regions. The main objectives of this study are to assess how extreme weather events could affect the transportation infrastructure of North Central Texas, focusing on Dallas and Tarrant counties. It enables transportation planners to adapt and prepare future transportation infrastructure for extreme

# Climate Change/Extreme Weather Risk Assessment Assets Roadways Railways Airports Bridges Climate Change/Extreme Weather Risk Assessment Hazards Flooding Wildfire Heat Wave

weather events. The assessment discusses the transportation infrastructure and hazards considered before assessing vulnerability. The assets and hazards considered are in the Climate Change/Extreme Weather Risk Assessment call-out box.

#### **Resilient Houston**

Resilient Houston is a review of Houston with a consideration for resilience. It takes a detailed look at the neighborhoods and people; water infrastructure, including bayous; and assesses relevant the lasting and acute hazards. It provides a framework that the city can follow to improve their city's resilience to extreme weather, of which the area is expected to experience in a greater degree over the coming decades. The report advocates for local, regional, and national partnerships to achieve the community centric goals. It also includes a component of individual ownership to facilitate citizen buy-in. The report clearly outlines the relevant regional hazards. Resilient Houston does not focus on transportation, but assets referenced in detail are listed here.

Resilient Houston							
Hazards							
<ul><li>Lightning</li></ul>							

#### Broward MPO Resilience Analysis Methodology Technical Memo (Broward MPO Memo)

The Broward MPO Memo builds on two prior reports, the 2015 FHWA South Florida Climate Change Vulnerability Assessment and Adaptation Pilot Project and the 2016 Extreme Weather and Climate Change Risk to the Transportation System in Broward County Florida. This memo takes the findings of the prior two reports to develop a framework for evaluating network vulnerabilities and plan for preparedness. While the framework provides an inclusive list of potential assets and hazards, it only applies the hazards listed here to 8 corridors.

Broward MPO Memo							
Assets  ❖ Roadways  ❖ Bridges	Hazards  ❖ Flooding  ❖ Heat Wave  ❖ Drought  ❖ Sea Level  Rise						





#### Local Hazard Resources and Emergency Plans

The Corpus Christi MPO identified a few regionally specific resources which provide important information for a local understanding of assets, hazards, and critical infrastructure. This subsection provides a summary of these resources.

#### Nueces County Hazard Mitigation Action Plan (HMAP) Draft

The 2023 HMAP Draft is a 5-year update of the 2017 HMAP sponsored by the Coastal Bend Council of Governments. The goal of the Nueces County HMAP is to eliminate losses due to natural disasters and improve community resilience. The plan employs data analysis, stakeholder meetings, and public engagement to understand the assets and risks for the county and individual cities and districts. It provides valuable insights into the region's hazards and the public's perception towards their seriousness. For each identified hazard, the plan mentions the assets that could be harmed in the included parts of the county.

#### **HMAP** Assets Hazards \*\* Flooding Roadways Railways Wildfire Heat Wave Coastal Erosion Drought Land Subsidence/ Landslides Strong Wind Expansive Soil Lightning Dam/Levee Failure

#### City of Corpus Christi Emergency Operations Center

The City of Corpus Christi's website contains valuable information on emergency response, including resources for residents and information about the Emergency Operations Center (EOC). One such resource provided is an evacuation map with labeled routes (Figure 2). The city is separated into zones and the routes indicate which direction residents should evacuate. Operating as an evacuation route is an important criticality criterion for roadways. The EOC is





assembled during an emergency to coordinate the efforts between local, regional, state, and national departments and agencies. Day-to-day EOC activities include receiving and communicating warnings and information, developing policies, and preparing for emergencies. During emergencies, the EOC leads the operations, analyzes information to recommend countermeasures, and communicates with residents, officials, and neighboring jurisdictions. The EOC operates in tandem with the City's Office of Emergency Management (OEM). Both the EOC and OEM contain experts on the City's assets, hazards, and critical infrastructure.





#### Corpus Christi Regional Transit Authority (CCRTA) Emergency Preparedness Policy

The CCRTA Emergency Preparedness Policy, updated 2023, outlines CCRTA employee responsibilities. During an emergency, CCRTA provides evacuation services for multiple cities and unincorporated areas in Nueces County. CCRTA receives instructions on evacuation procedures from the Nueces County Emergency Management Offices (EMO) when an emergency arises. CCRTA performs evacuation services while safety permits.

#### Nueces Regional Flood Plan

The Nueces Regional Flood Plan is updated by the Nueces Regional Flood Planning Group, one of 15 regions overseen by the Texas Water Development Board. The Nueces Regional Flood Plan focuses on determining hazards, exposure, and vulnerability to evaluate the current and future flood risk. This includes evaluating the region's susceptibility to flooding, determining what and who will be impacted, and identifying the most vulnerable communities and critical facilities. This Plan provides in-depth information

Nueces Regional Flood Plan							
Assets  Roadways  Airports  Bridges  Culverts  Low Water	Hazards ❖ Flooding ❖ Heat Wave ❖ Sea Level Rise						
Crossings							

pertaining specifically to flood risks and policy recommendations for mitigation. As part of the vulnerability analyses, it identifies roadways and roadway crossings (bridges, culverts, low water crossings), as well as hazards to the region.

#### Summary of Findings

#### **Asset Summary**

Nine of the 10 sources in the literature review elaborated on asset types. Error! Reference source not found. provides the reference counts for each asset type; roadways, airports, and railways were mentioned most frequently. Table 1 and Table 2 provide the breakdown for which sources referenced which assets. For instance, the Texas Statewide Resilience Plan mentions eight of the 11 asset types.

Figure 3: Count of Asset Types References in the Literature Review

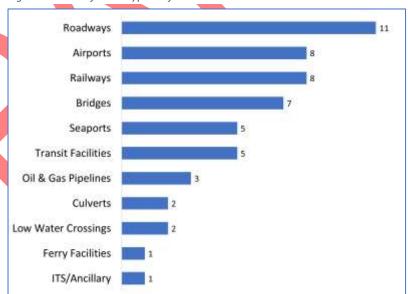






Table 1: Asset Type Literature Review Reference Summary Table

Asset Type	Roadways	Railways	Airports	Bridges	Seaports
Total	11	8	8	7	5
Texas SRP	х	х	х	х	х
Statewide Freight Resiliency Plan	x	х	х		х
Central Texas Extreme Weather and Climate Report	х	х	х	х	
Climate Change/Extreme Weather Risk Assessment	x	х	х	x	
Gulf Coast Study	x	X	X	x	x
TCRS	x	х	х		x
TCRMP	х	Х	Х	х	х
Resilient Houston	х				
Broward MPO Memo	х			х	
НМАР	х	х			
Nueces Regional Flood Plan	x		Х	х	







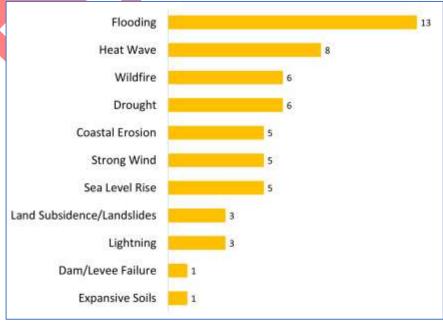
Table 2: Asset Type Literature Review Reference Summary Table (Continued)

Asset Type	Transit Facilities	Oil & Gas Pipelines	Culverts	Low Water Crossings	Ferry Facilities	ITS/Ancillary Assets
Total	5	3	2	2	1	1
Texas SRP		х	х			х
Statewide Freight Resiliency Plan		х				
Central Texas Extreme Weather and Climate Report	х					
Climate Change/Extreme Weather Risk Assessment						
Gulf Coast Study	x					
TCRS	х	х		х	х	
TCRMP	x					
Resilient Houston	х					
Broward MPO Memo						
НМАР						
Nueces Regional Flood Plan			х	х		

#### **Hazard Summary**

All 11 sources considered in the literature review discussed relevant hazards. Error! Reference source not found. provides the literature review hazard reference counts. Flood was referenced the most frequently, with each source mentioning it as a hazard (this includes sources that mention storm surge or specific types of floods, like riverine). Heat Waves and Wildfires are mentioned in half the resources with the other hazards being mentioned in fewer than half. Dam/Levee Failure, Lightning, and Expansive

Figure 4: Count of Hazard Types References in the Literature Review







Soils were each mentioned once. Tables 3 and 4 display the hazard references for each individual source.

Table 3: Hazard Type Literature Review Reference Summary Table

Asset Type	Flooding	Heat Wave	Wildfire	Drought	Coastal Erosion
Total	13	8	6	6	5
Texas SRP	X	Х	Х	Х	
Statewide Freight Resiliency Plan	Х		Х		
Central Texas Extreme Weather and Climate Report	Х	Х	Х	Х	
Climate Change/Extreme Weather Risk Assessment	Х	X	Х		
Gulf Coast Study	x	X			
TCRS	Х				Х
TCRMP	Х				Х
Coastal Texas Study	Х				Х
Extreme Weather Assessment	Х	Х	Х	Х	Х
Resilient Houston	Х	Х		Х	
Broward MPO Memo	Х	Х		Х	
НМАР	Х	Х	Х	Х	Х
Nueces Regional Flood Plan	х				







Table 4: Hazard Type Literature Review Reference Summary Table (Continued)

Asset Type	Strong Wind	Sea Level Rise	Land Subsidence/ Landslides	Lightning	Dam/Levee Failure	Expansive Soils
Total	5	5	3	3	1	1
Texas SRP						
Statewide Freight Resiliency Plan	Х		X			
Central Texas Extreme Weather and Climate Report						
Climate Change/Extreme Weather Risk Assessment						
Gulf Coast Study		X				
TCRS	Х					
TCRMP		X				
Coastal Texas Study		Х				
Extreme Weather Assessment	X			X		
Resilient Houston	X	Х	X	X		
Broward MPO Memo		Х				
НМАР	Х		Х	X	Х	Х
Nueces Regional Flood Plan						

#### Data Assessment

To understand what data is currently available to locate and potentially assess the criticality of the various asset types and hazards in Corpus Christi MPO, the project team reviewed relevant ESRI maps, dashboards, and data hubs. These data sources fall into three groups:

- National-level data sources
  - Homeland Infrastructure Foundation-Level Data (HIFLD)
  - United States Army Corps of Engineers (USACE) National Inventory of Dams (NID)
  - United States Department of Agriculture (USDA) Web Soil Survey (WSS)
  - USACE National Levee Database (NLD)
- Statewide data sources
  - TxDOT Open Data Portal
  - TxDOT Planning Map
  - o Texas Railroad Commission Data
  - o Texas Water Development Board
- Regional data sources for Corpus Christi MPO and Nueces County:
  - o GeoRED Hazard Impact and Planning Tool





#### The Coastal Bend Hurricane Evacuation Study Planning Atlas

The project team reviewed each data source to assess the availability of location and criticality information including ridership, demand, and condition. The review covered the 11 asset types: roadways, railways, airports, bridges, seaports, oil and gas pipelines, transit facilities, culverts, ferry facilities, ITS/ ancillary assets, and low water crossings.

The team also considered whether spatial data was available for each hazard type identified through the literature review. The following subsections provide full details of the information each data source covered for each asset and hazard type.

#### Homeland Infrastructure Foundation-Level Data (HIFLD)

Homeland Infrastructure Foundation-Level Data (HIFLD) is a program within the United States Department of Homeland Security (DHS) that focuses on collecting, maintaining, and providing geospatial data related to critical infrastructure and key resources across the United States. The goal of HIFLD is to enhance the nation's understanding of its infrastructure and to support decision-making processes for emergency management, disaster response, and national security. HIFLD collects data from various federal, state, local, tribal, and private sector sources, and compiles this information into a comprehensive geospatial database. This database includes data about infrastructure such as transportation systems, energy facilities, communication networks, water resources, healthcare facilities, and more.

	HIF	LD		
Ass	Roadways Railroads Airports Oil and Gas Pipelines Transit Facilities Railroads	Ha *	zards Flooding Wildfire	
	·			

HIFLD covers six main asset types: roadways, railroads, airports, ferry facilities, transit facilities, and oil and gas pipelines. For roadways, HIFLD provides information about the locations of primary, secondary, and local roads. HIFLD includes the Federal Aviation Administration's aviation facilities dataset, providing precise airport locations. Railroads are also covered, offering insights into their locations. Ferry facilities are comprehensively detailed, revealing essential information such as ferry route locations, lengths, trip durations, passenger numbers, vessel types, and trip types. In terms of transit, HIFLD supplies data on national transit routes and stops. Additionally, the program extends its coverage to oil and gas pipelines, disclosing the locations of major natural gas transmission pipelines, including both interstate and gathering pipelines, as sourced from the U.S. Energy Information Administration.

#### National Inventory of Dams (NID)

The National Inventory of Dams is a database provided by the U.S. Army
Corps of Engineers. The focus of the NID is to provide dam location, type,
size, purpose, uses and benefits, date of last inspection, other structural
and geographical information. The NID also models dam flood inundation
to demonstrate what could occur during a dam-related flood. The NID
also provides data from the HIFLD for various public works and critical
infrastructure, including nuclear power stations, fire stations, and railway lines.

# NID Hazards ❖ Dam and Levee Failure





#### Web Soil Survey (WSS)

The Web Soil Survey is a product provided by the US Department of Agriculture Natural Resources Conservation Service. The WSS provides soil information and data collected through the Cooperative Sil Survey. The soil data was collected to provide information for agriculture purposes but can also be used to assess susceptibility to erosion, land subsidence, and expansive soils.

#### National Levee Database (NLD)

The U.S. Army Corps of Engineers maintains the National Levee Database.

The NLD displays a map of levees across the nation with the levees risk (if screened), the area protected by the levee, and an estimate for the damage if the levee fails. The NLD includes four levees in the three counties encompassing Corpus Christi: Nueces County, San Patricio County, and Jim Wells County. The NLD outlines the area that would be impacted if the levees failed, which can be used to determine impacted assets.

#### TxDOT Open Data Portal

The TxDOT Open Data Portal is TxDOT's platform for exploring and downloading GIS datasets. It serves as the primary location for state transportation inventory data. It has a wide variety of datasets that are referenced and used in other tools and dashboards. This data source is unique because it includes both on-system and off-system roadway inventory. It also has the location and type of seaports and railroads, including their classification such as business lead, industrial lead, main line, side-track, and spur line. Furthermore, the TxDOT Open Data Portal provides access to the statewide oil and gas pipelines data provided by the Texas Railroad Commission.

#### TxDOT Statewide Planning Map

The TxDOT Statewide Planning Map is an Esri application designed to present a variety of TxDOT transportation geospatial data to facilitate planning operations within the organization. The mapping tool includes the geographic positions and types of seaports and railroads assets. Additionally, the map offers comprehensive details regarding bridges as reported to the National Bridge Inventory (NBI), such as their locations, condition ratings, ages, deck geometries, waterway sufficiency ratings, and lengths.

#### WSS

#### Hazards

- Coastal Erosion
- Land Subsidence /Landslides
- Expansive Soils

#### NID

#### Hazards

Dam and Levee Failure

## TxDOT Open Data Portal

#### Assets

- Roadways
- Railroads
- Airports
- Bridges
- Seaports
- Oil and Gas Pipelines
- Large Culverts

#### **TxDOT Planning Map**

- Roadways
- Bridges
- Railroads
- Seaports

The map also includes a wealth of data about roadway assets including locations, Average Annual Daily Traffic (AADT), Vehicle Miles Traveled (VMT), percentage of truck traffic, geometric characteristics, anticipated future traffic and truck percentages, presence within the Strategic Highway Network, locations of evacuation routes, the top 100 congested roads, as well as both State and National freight networks including critical urban and rural freight corridors.





#### Texas Railroad Commission

The Railroad Commission (RRC) of Texas is the state agency that regulates the oil and gas industry, gas utilities, pipeline safety, safety in the liquefied petroleum gas industry, and surface coal and uranium mining. RRC publishes Esri maps that have information about oil and gas pipelines (also included in the TxDOT Open Data Portal described above)

Texas Railroad Commission

#### Assets

Oil and Gas Pipelines

and wells. Pipelines data include location, diameter, commodity types, and status (active or abandoned). The TRC does not address hazards.

#### Texas Water Development Board (TWDB)

The Texas Water Development Board (TWDB) is a state agency in Texas responsible for collecting and disseminating water-related data; assisting with regional water supply and flood planning that contributes to preparing the state water plan and state flood plan; and administering cost-effective financial programs for constructing water supply, wastewater treatment, flood control, and agricultural water

TW	/DB
Assets  Low Water  Crossing	Hazards  Flooding  Dam & Levee Failure

conservation projects. The TWDB has an open data hub that has data covering the state's hydrological assets and only one transportation asset, which is the low water crossing. TWDB open data hub has the location of the low water crossing assets without information about their criticality. TWDB open data hub also includes data related to flooding and dam or levee failure.

#### GeoRED - Hazard Impact and Planning Tool

The Regional Resilience Partnership (RRP) developed a GIS platform called the Geospatial Resilient Economic Development (GeoRED), which is a tool for building resilience to disaster and economic risks. The GeoRED online platform has multiple tools for local officials and experts to analyze and share data with other interested stakeholders. One of these tools is the Hazard Impact and Planning Tool, which is an Esri tool that contains data layers focused on hazard planning and response, such as critical infrastructure and facilities, storm surge, and FEMA's National Flood Hazard Layer (NFHL) 1% and 0.2% flood zones. This tool includes the

	Geo	RED	
*	Roadways Railroads Airports Oil and Gas Pipelines Railroads Ferry	Ha: ❖ ❖	zards Flooding Sea Level Rise
	Facilities		

locations of roadways, evacuation routes, airports, railroads, ferry facilities, and transit facilities. It also has spatial files for subsets of these assets that are in FEMA 1% and 0.2% annual flood risk. For oil and gas pipelines, this tool has data showing pipelines locations, diameters, commodity types, and activity status.





#### The Coastal Bend Hurricane Evacuation Study Planning Atlas

The Coastal Bend Hurricane Evacuation Study Planning Atlas is an ESRI map that has multiple data layers for the coastal bend region and is published as part of the Coastal Bend Hurricane Evacuation Study. These data layers cover:

 Administrative unit layers, including counties, places, school districts, coastal management zones, and coastal zones.

Hurricane Planning Atlas							
Hazards ❖ Flooding ❖ Sea Level Rise							

- Physical risks layers covering:
  - Historic wind and storm tracks.
  - Three sea level rise scenarios.
  - Storm surge models for tropical storms, and storm categories 1 through 5.
- Built environment and critical facilities:
  - o Population.
  - Critical facilities including police stations; fire stations, local EOC, EMS, Urgent care, nursing homes, and hospitals.
  - Built environment including hotels, schools, mobile home units, buildings, and infrastructure.
- Social risk layers:
  - Social vulnerability index.
  - o Childcare need.
  - o Eldercare need.
  - Transportation need.
  - Shelter need.
  - Housing types.
  - Poverty status.
  - Limited English proficiency.
  - Unemployment.
  - Civic capacity.
  - Low to moderate income.
  - Education level.
- Evacuation zones and routes layers.

The Coastal Bend Hurricane Evacuation Study Planning Atlas provides data layers encompassing three primary transportation asset types: roadways, airports, and railroads. Within each of these asset types, users can access two key pieces of information: their respective locations and types. The roadway category includes various types such as major highways, US and state highways, farm roads, and city/county roads. Notably, the Atlas includes layers dedicated to evacuation routes, each representing distinct route types, including major evacuation routes, potential contraflow routes, and evacuation lanes. Moreover, the Atlas features surge-affected routes categorized by storm category.





#### Texas Geographical Information Office (TxGIO, previously TNRIS)

The Texas Geographic Information Office, previously the Texas Natural Resources Information System, is a division of the Texas Water Development Board. It is a geographical information systems resource. It contains maps and data captured by LIDAR, sensors, and imagery. Some data is region specific while others span the entire state. While

TxGIO							
Assets  * Low Water  Crossing	Hazards ❖ Flooding						

TxGIO has extensive data for hazards including increased temperature and extreme heat, wind, wildfires, winter storms, and more, only data related for floods and storm surges covering Corpus Christi has been identified by the project team. Regarding assets, only Low Water Crossing data is available.

#### Climate Toolbox

The Climate Toolbox is a collection of web tools that visualize past and forecasted climate and hydrology for the contiguous US. The applications cover agriculture, climate, fire, and water. One such tool is the Climate Mapper which maps real-time conditions, current forecasts, and future projections of climate information across the United States to assist with decisions related to agriculture, climate, fire conditions, and water. The data employed in the maps is also available for download. Partners for this project include the Climate Impacts Research

#### **Climate Toolbox**

#### Hazards

- Wildfire
- Heat Wave
- Drought
- Strong Wind

Consortium, Regional Integrated Sciences and Assessments, the US Department of Agriculture's Northwest Climate Hub, and other regional and national organizations and agencies.

Texas Coastal Resiliency Master Plan (TCRMP) and the Gulf of Mexico Research Initiative Information and Data Cooperative (GRIIDC)

Both the TCRMP 2019 and 2023 installments provide data employed in the written reports. TCRMP 2019 provides an ESRI power map for Region 3, which covers Corpus Christi. The map includes data recording the potential impact of flooding from storm surges.

The data employed in the TCRMP 2023 is published on the GRIIDC. The Gulf of Mexico Research (GoMRI) Initiative is an independent research program funded by BP following the Deepwater Horizon spill to study

#### TCRMP/GRIIDC

#### Assets

- Flooding
- Wildfire
- Heat Wave
- Drought

the impacts of oil spills in the Gulf of Mexico. The GRIIDC is the data center that aims to provide data and information to promote and support research and awareness about the Gulf of Mexico ecosystem. The GRIIDC hosts data and reports from researchers studying the Gulf of Mexico. The GRIIDC satisfies the GoMRI requirement to ensure that relevant data from research is publicly available. The GRIIDC encourages researchers to use available data and share their own data to promote regional research.

#### **Data Assessment Summary**

#### **Asset Summary**

Figure 5 summarizes the findings of the data assessment. Table 5 details the asset data available for each source. For location data availability, roadway and railroads assets are at the top of the list followed by airports and pipelines. On the other hand, no location data were found for small culverts and ITS/ ancillary assets.





If a data source reports asset condition and/or traffic levels/ridership, it is considered to have criticality data for that asset. Furthermore, data sources with evacuation routes information are considered to have criticality data for roadway assets only. With this initial definition of criticality, roadway assets are covered by the largest number of data sources as expected. Bridges come next in order as they are covered by two data sources. On the contrary, none of the data sources have criticality data for seaports, small culverts, airports, railroads, transit facilities, and ITS/ ancillary assets. It is also important to highlight that vulnerability to FEMA 1% and 0.2% annual flood risk is available for roadways, airports, railroads, ferry facilities, and transit facilities, which fit into the hazards data that will be investigated in later tasks.

Regarding low water crossings, TWDB includes point data for low water crossings. The point data can be joined to roadway data from the TxDOT Open Data Portal to determine the criticality of the low water crossing.





Table 5: Asset Data Assessment Reference Summary Table

Table 5: Asset Da	iu Assessiiieiil						
Assets	HIFLD	TxDOT Open Data Portal	TxDOT Planning Map	Texas Railroad Commission	GeoRED	Hurricane Planning Atlas	TWDB
Roadways	8	9!	₽!		<b>9</b> !	9!	(Ctrl) ▼
Railroads	9	8	8		8	8	
Airports	8	8			8	8	
Bridges		<b>9</b> !	₽!				
Seaports		9	9				
Oil and Gas Pipelines	8	8		9	8		
Transit Facilities	0				8		
Large Culverts		<b>9</b> !					
Small Culverts							
Low Water Crossings		İ					9
Ferry Facilities	<b>9</b> !				8		
ITS/Ancillary Assets							

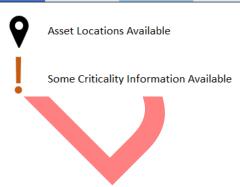
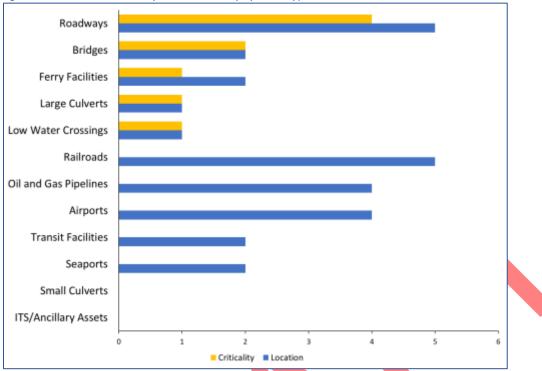






Figure 5: Location and Criticality Data Availability by Asset Types



#### Hazard Summary

**Error! Reference source not found.** summarizes the hazard data. Notably, each hazard type has at least one data source. Some data hubs reference data from the same resources, for example flood data from FEMA. In a later stage of this project, the asset inventory will be assessed for susceptibility to hazards.







Table 6: Hazard Type Data Review Reference Summary Table

	RAPT	HIFLD	TWDB	GeoRED	Hurricane Planning Atlas	TxGIO	Climate Toolbox	TCRMP/ GRIIDC	Web Soil Survey	NID	National Levee Database
Flooding	4	1	1	4	4	1		1			
Wildfire	4	1					1				
Heat Wave	Y						1				
Sea Level Rise	V.			1				1			
Coastal Erosion									~		
Drought	1						1				
Land Subsidence /Landslides									¥		
Strong Wind	1						1				
Expansive Solls									1		
Lightning			1								
Dam and Levee Failure			1							1	7

#### Criticality Framework

Criticality measures how important each asset is to the overall community; they allow transportation assets to be prioritized based on the impact or consequence of failure or disruption. In this Phase 1 analysis, Corpus Christi MPO is objectively evaluating criticality based on criteria from available data sources; future analyses may include opportunities to elicit and add stakeholder input to the criticality framework.

FHWA's Vulnerability and Adaptation Framework cites the USDOT Gulf Coast Study and recommends including criticality measures in three categories<sup>2</sup>:

- Socio-Economic Criteria:
- Use/Operational Criteria
- Health and Safety Criteria

#### Socio-Economic Criteria

Socio-economic criteria capture information about the communities surrounding an asset and estimate each community's ability to adapt to and/or recover from nearby assets' disruption or failure.

2

https://www.fhwa.dot.gov/environment/sustainability/resilience/adaptation\_framework/climate\_adaptation.pdf





#### Social Vulnerability

More vulnerable communities may experience disproportionate negative impacts and may be less able to recover when hazards impact or disrupt nearby infrastructure assets. The Federal Emergency Management Agency's (FEMA) National Risk Index rates census tracts' social vulnerability from very low to very high based on the <u>Social Vulnerability Index</u> (SVI). The SVI is an estimate of the "susceptibility of social groups to the adverse impacts of natural hazards" and comprises 16 factors measuring socioeconomic status, household characteristics, racial and ethnic minority status, and housing type and transportation. The SVI score indicates the relative level of social vulnerability in each census tract within Corpus Christ MPO. The SVI will be used to prioritize all assets; where an asset crosses more than one census tract, the weighted average SVI score will be applied to the asset.

#### Use/Operational Criteria

Use or operational criteria estimate how much each asset is used to transport people and/or freight. It is a measure of how important each asset is for mobility.

#### Average Annual Daily Traffic

Average annual daily traffic (AADT) provides a metric for determining the importance of roadway-related assets. AADT data is available through the TxDOT Open Data Portal and provides a continuous quantitative metric for establishing assets' importance based on average usage; high AADT indicates that an asset is used frequently and should therefore be prioritized above less heavily trafficked assets. AADT will be used to prioritize roadways, bridges, and low water crossing assets.

#### Ridership

Ridership counts, like AADT, provide quantitative count to determine the relative importance of ferry terminals. For each ferry terminal, a ridership count based on number of routes and average ridership for each route will be calculated and employed to prioritize ferry terminal assets. The HIFLD and GeoRED provide ferry station, ridership, and route data. Ridership will be used to prioritize ferry terminal assets.

#### Detour Length

The distance a user would need to travel to circumvent a closed bridge (detour length) is a useful indicator of how important each individual bridge is to the movement of people and goods. The National Bridge Inventory (NBI) includes an estimated detour length for each bridge. Detour length will be used to prioritize bridges; bridges with shorter detour lengths would be given lower priority than those with long detour lengths.

#### Health and Safety Criteria

#### **Evacuation Routes**

Evacuation routes are vital for emergency management during hazardous events to ensure that residents and visitors can safely leave the region if necessary. The evacuation route criterion offers a binary indicator to assess asset priority. Statewide evacuation route data is available on the TxDOT Statewide Planning Map.<sup>4</sup> Evacuation routes will be used to prioritize roadways, bridges, and low water crossing assets.

<sup>&</sup>lt;sup>3</sup> https://www.fema.gov/sites/default/files/documents/fema national-risk-index technical-documentation.pdf

<sup>&</sup>lt;sup>4</sup> Corpus Christi MPO stakeholders indicated that additional routes may serve as "unofficial" evacuation routes in the region; when data becomes available, these routes could be included in future criticality analyses.





#### Vicinity to Critical Infrastructure

Each asset's vicinity to emergency facilities serves as a proxy for estimating the asset's importance for access to non-transportation infrastructure that officials or residents may need to access during a hazardous event. Assets will be prioritized based on the count of critical infrastructure points within a 0.1 mile buffer radius. Corpus Christi MPO and its stakeholders selected the following types of critical infrastructure (locations drawn from GeoRED) for initial analyses:

- Police Stations
- Fire Stations
- Emergency Medical Facilities
- Schools

Vicinity to critical infrastructure points will be used to prioritize all assets.

#### **Criticality Summary**

Table 7 summarizes the criticality prioritization criteria and the asset classes to which they will be applied.

Table 7: Criticality Framework

Asset Class	Social Vulnerability	AADT	Ridership	Detour Length	Evacuation Routes	Critical Infrastructure
Roadways	✓	✓			✓	✓
Bridges	✓	✓		✓	✓	✓
Large Culverts	✓	✓		✓	✓	✓
Ferry Facilities	✓		✓			✓
Low Water Crossings	✓	✓			✓	✓

#### Implementation Recommendations

#### Asset Recommendations

Based on the literature review and data assessment, the project team developed recommendations for which assets should continue to be considered in subsequent steps of the Phase 1 Corpus Christi MPO regional resiliency improvement plan. Recommendations are based on whether each asset type i) is included in existing resiliency plans; ii) has location data readily available; and iii) has at least some criticality data readily available (Table 8). The list of assets may be narrowed further if data limitations are identified.

The project team recommends focusing on the following assets for the subsequent stages of this Phase 1 analysis:

**Roadways** are referenced by each of the eight resources which included assets in the literature review and have numerous data sources for both location and potential criticality criteria, which indicates that they are an important and relevant asset and data is likely to be available to execute the initial prioritization. Moreover, roadways connect to most other transportation assets and serve multiple





modes of travel including passenger and freight vehicles, emergency response vehicles, pedestrians, transit, and bicyclists.

Bridges are explicitly referenced in five of eight resources considered in the literature review; in addition, some sources included bridges as part of their definition of "roadway". Bridge location and criticality data are available through multiple TxDOT sources. Similar to roadways, the region's bridges serve multiple modes of travel.

Large Culverts were referenced in the literature review and location and potential criticality data related to large culverts is readily available. In some instances, from the literature review, large culverts are classified as bridges or as part of roadways.

Table 8: Recommendation Summary Table

Asset Class	Recommended	Literature Review	Location	Criticality
Roadways	1	<b>✓</b>	1	1
Bridges	1	1	1	✓
Large Culverts	·	1	1	✓
Ferry Facilities	1	<b>✓</b>	1	V
Low Water Crossings	1	1	1	1
Railways		1	1	
Airports		1	1	
Seaports		✓	✓	
Oil & Gas Pipelines		~	1	
Transit Facilities		1	✓	
Small Culverts		1		
ITS/Ancillary Assets		1		

Ferry Facilities are relatively unique; while slightly outside of the Corpus Christi MPO boundaries, the Port Aransas ferry is one of only two ferry systems in Texas and provides connection to locations within the MPO boundaries. Ferry facilities were mentioned in the literature review and there are both location and criticality data available, so if desired, ferry facilities could be included in future analysis stages.

Low Water Crossings are not mentioned often, only two times in the literature review. Yet, there is location data available, and since they are sections of roadway, the criticality roadway can be employed to determine the criticality of the low water crossing.

#### Hazard Recommendations

Considering the hazards mentioned in the literature review and with data available per the data assessment, each hazard could be eligible for analysis. Indeed, employing reference and data availability criteria for inclusion would not remove any hazards from the analysis. Therefore, the High Street team recommends that all hazards be considered going into the next phase of the project. Subsequently, the project team will identify the most relevant hazards based on the number of impacted assets and the potential impact severity on the transportation assets identified in TM1 and above.

#### Criticality Recommendations

The relevant criticality criteria will be applied to each asset and then combined to calculate an overall criticality score for each asset. Using the asset prioritization spreadsheet, Corpus Christi MPO will be able to modify individual criticality criteria weights based on local knowledge or stakeholder input.

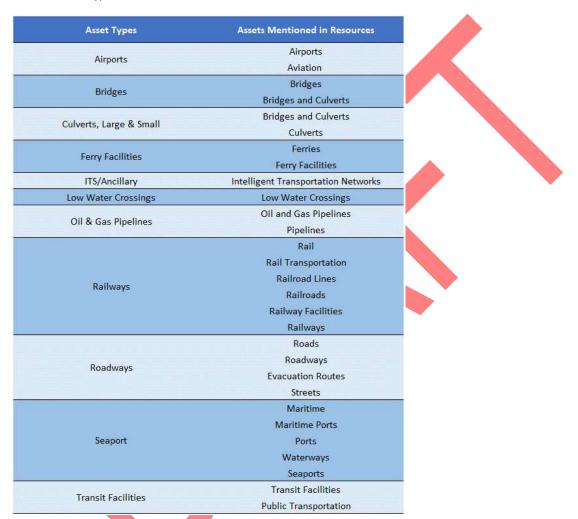




#### Appendix I: Asset Type Crosswalk

The literature review and data assessment produced a list of 29 distinct asset names, many of which were analogous or overlapping. For the purposes of this memorandum, High Street Team distilled the 29 asset names into a set of 11 as shown in **Error! Reference source not found.**.

Table A1: Asset Types and Assets Mentioned in Resources Crosswalk



#### Appendix II: Additional Resources

The following resources and data sources did not discuss specific assets but may provide valuable hazard and criticality criteria that will be important for later analyses, technical memos, and reports.





#### Resilience and Disaster Recovery (RDR) Tool Suite

The Resilience and Disaster Recovery (RDR) Tool Suite was developed by the Volpe Center to help transportation agencies explore scenarios and evaluate the performance of resilience investments during long-range transportation planning. The tool suite utilizes established Robust Decision-Making concepts to address deeply uncertain future scenarios. Robust Decision-Making is a scenario-based decision-making tool that integrates with existing travel demand forecasting models. The RDR Tool Suite enables transportation agencies to assess transportation resilience return on investment (ROI) for specific transportation assets over a range of potential future conditions and hazard scenarios, which can then be considered during project prioritization processes. The classic paradigm for transportation planning is to first, forecast what will happen in the future (e.g., trips in a region will increase 20%), and then act on that forecast (e.g., add transportation capacity). This paradigm breaks down when the future is highly uncertain, such as trying to predict storms, earthquakes, or other hazards. Under these conditions, the prediction of a single future is unlikely to be correct, and the resulting decisions may be grossly sub-optimal. An alternative approach is focusing on performance across a range of potential futures rather than selecting specific forecasts. With robust decision-making (RDM), the objective is not predicting the future, but rather, making decisions that produce good outcomes under a wide range of plausible futures. This alternative approach is especially appropriate for prioritizing which projects to include in long-range investment plans, as long-range investment planning tends to focus on which assets will be deployed or improved to provide the best return. The objective of the RDR Tool Suite is to help state Departments of Transportation (DOTs) and Metropolitan Planning Organizations (MPOs) make informed infrastructure investment decisions by evaluating the performance of potential resilience investments across the set of uncertain future events of interest. It supports long-range investment analyses where agencies need to decide which assets to improve using general information about the options and future conditions. The RDR Tool Suite can be used whether agencies already have proposed projects or are simply exploring what potential assets they could improve. The outputs of the RDR Tool Suite are focused on total and net benefits of the project in terms of investment cost, repair cost, and network performance.

#### FEMA Resilience Analysis and Planning Tool (RAPT)

RAPT is a free, publicly available geographic information systems (GIS) tool developed by Federal Emergency Management Agency (FEMA) to help emergency managers and community partners of all GIS skill levels visualize and assess potential challenges to community resilience. RAPT has over 100 data layers covering buildings and hazards. RAPT is designed to help decision-makers understand the population and infrastructure at risk for forecasted extreme weather, identify at-risk infrastructure assets, prioritize areas for evacuation, with estimates of nursing home and hospital beds.

## Establish TxDOT Transportation Resilience Planning Scorecard and Best Practices: Technical Report

This report was developed by the Texas A&M Institute and sponsored by FHWA and TxDOT. It contains an analysis on policies TxDOT can implement to improve resilience and mitigate the impact of natural hazards. The report performs literature review then implements analytical methods on the Texas road network's vulnerability and resilience. Moreover, it aims to provide a scorecard of best practices that Texas can use to evaluate and improve transportation resiliency. The report outlines an in-depth methodology for determining criticality for roadways.





## NCHRP Research Report 1014: Developing a Highway Framework to Conduct an All-Hazards Risk and Resilience Analysis

This report, completed in 2023, was conducted by the Transportation Research Board as part of the National Cooperative Highway Research Program (NCHRP). This report presents a framework for performing quantitative risk and resilience evaluations that satisfy recent federal requirements. It includes economic analyses, project prioritization, performance management, and risk and resilience evaluation. Specifically, the study focuses on protecting and reinforcing the highway system.

#### Vulnerability Assessment Scoring Tool (VAST)

VAST is a tool created by the USDOT to aid transportation organizations such as DOTs and MPOs in evaluating the vulnerability of their assets. VAST uses asset characteristics as indicators of exposure, sensitivity, and adaptive capacity which are used to calculate assets vulnerability scores. VAST covers various asset types like rail, seaports, airports, pipelines, bridges, and roads, along with climate stressors such as temperature changes, floods, sea level rise, storms, wind, drought, wildfires, freeze/thaw and permafrost thaw. VAST, operating in Microsoft Excel, helps users document asset vulnerability by determining the scope of the vulnerability assessment, selecting appropriate indicators, collecting data about those indicators, and devising an approach to convert raw data about indicators into scores. This process facilitates ranking assets by vulnerability and improving transportation planning and adaptation strategies.

#### Texas Delivers 2050

Texas Delivers 2050 is an in depth TxDOT assessment of the Texas freight network. It covers many topics, from autonomous trucking to maritime and railway freight. The report includes a resilience section, but it does not cover resilience to natural hazards in depth. It discusses methods for creating a flexible network that can withstand a variety of changes, not specifically those related to the climate.



# New Coastal Bend geospatial data tool available for leaders and the public



## Olivia Garrett Corpus Christi Caller Times

Published 1:39 p.m. C.T. Jan 9, 2024

In the wake of Hurricane Harvey, Coastal Bend leaders realized that economic growth in the region depends on how prepared communities are to prevent, withstand and recover from disaster and disruption.

Decision-makers needed better access to data and information necesary to evaluate and anticipate risk.

In the years since, the Regional Resilience Partnership has set out to meet that need. After soft launching its new <u>GeoRED</u> data mapping tool at a hurricane conference this spring, the partnership has recently made the geospatial data platform publicly available <u>online</u> at geored.org.

Resilience isn't just how you bounce back from a disaster, Harte Research Institute community resilience program manager Christine Hale said. It's how you bounce forward.

"We don't necessarily want to get back to where we were before a disaster," Hale said. "We want to bounce forward to be in a better position next time a storm comes our way."

The geospatial information system, which covers Aransas, Bee, Refugio, San Patricio, Nueces, Kleberg and Kenedy counties, allows Coastal Bend residents to zoom into their neighborhoods and better understand what resilience looks like in their community.



The Regional Resiliency Partnership has created the Geospatia Resilient Economic Development platform, allowed the public to explore geospatial data from the Coastal Bend region. Downtown Corpus Christi can be seen in screenshots from GeoRED tool captured Tuesday. *Contributed by Geospatial Resilient Economic Development Platform* 

"In the Coastal Bend, we have a lot of things going on – floods, droughts – there's a lot of types of risks to think about and plan ahead for," Hale said. "Having access to this tool is going to help us plan ahead for those types of hazards that are becoming more common."

The Regional Resilience Partnership is a joint initiative of the Coastal Bend Council of Governments and the Harte Research Institute at Texas A&M University-Corpus Christi. To create the GeoRED tool, the team started with outreach to local communities, including discussions with planners and emergency responders.

Sara Williams, emergency management coordinator for San Patricio County Emergency Management, was one of the people the team talked to. Williams recalls a conversation about what sorts of data would be useful, including data on social vulnerabilities. That data is included in the tool.

"We're able to see where things are, where they're associated with different populations and changes over time," Williams said. "...it allows us to draw conclusions about what certain outcomes might be like and which populations might need the most attention based on where things happen."

With the interactive Hazard Impact and Planning tool, users can visualize the locations of critical infrastructure facilities and flood hazard zones. The Environmental Resilience Tool displays the health of the natural environment, including protected lands, water quality, hazard disposal sights, the locations of wetlands and urban heat.

"We've curated the data to get the viewer thinking about the relationship between people and the environment," Hale said.

In the Social Vulnerability Tool, users can examine social, cultural, economic and demographic data, including the locations of colonias, access to the internet, social vulnerability index measures of resilience and U.S. Centers for Disease Control health data. The Economic Development Tool displays transportation, energy, communication, business infrastructure, utilities, land use and flood hazard data.



A tug boat travels down the ship channel in Port of Corpus Christi on April 24, 2023, in Texas. Refineries line the channel in an area dubbed Refinery Row. *Angela Piazza/Caller-Times* 

"If we're making a development choice, what are the things we need to consider, in terms of flooding and critical infrastructure?" Hale said. "Are there any socially vulnerable communities nearby that will be affected by this development decision? How do we support growth here in the Coastal Bend, but do it smartly?"

The tool also includes "scenarios" showing how data layers can be combined to examine specific issues, such as evacuation routes during a storm, sea level rise near oil and gas facilities, community respiratory health and nature-based solutions restoring ecosystems to address societal challenges.

The "enhancing community respiratory health" scenario shows air quality, wastewater outfalls, whether an area is considered disadvantaged and the prevalence of asthma.

"The scenarios are a starting point for helping the user envision how they could use this tool," Hale said. "They were imagined with the help of the communities we've met with so far and it's based on the needs and desires that they talked to us about."

In the future, the team hopes to create more scenarios based on actual projects in local communities. The partnership also plans to incorporate data from additional counties. Another goal is to integrate more public health data and the social determinants of health.

For individuals, Hale said a member of the public could use the tool to zoom into their neighborhood.

"Being resilient starts at the individual level," Hale said. "...We know we're going to continue to see flooding hazards and major storms. It's good to be prepared and informed. And hopefully, you have engaged citizens who are interested in the decisions that their cities are making. This is a tool that you can bring to your school board or your city council meetings."