MARITIME TRANSPORTATION RESEARCH AND EDUCATION CENTER
TIER 1 UNIVERSITY TRANSPORTATION CENTER
U.S. DEPARTMENT OF TRANSPORTATION

Development of AIS Model of Texas Gulf Intracoastal Waterway Travel Times

October 2019 to April 2021

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May 2021

FINAL RESEARCH REPORT
Prepared for:
Maritime Transportation Research and Education Center

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ACKNOWLEDGMENT

This material is based upon work supported by the U.S. Department of Transportation under Grant Award Number 69A3551747130. The work was conducted through the Maritime Transportation Research and Education Center at the University of Arkansas.

DISCLAIMER

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EXECUTIVE SUMMARY

This report focuses on the Texas portion of the Gulf Intracoastal Waterway (GIWW), a busy and economically important part of the inland waterway system. The objective of this study is to develop a statistical profile of travel times for the GIWW using Automated Identification System (AIS) data. This study also analyzes the impact of several variables on system performance. The study focuses strictly on the main GIWW channel and does not include activity on any ship channel or tributary to the GIWW. The data used in this study are for 2018 and 2019.

This report builds on prior work undertaken by the U.S. Army Corps of Engineers (USACE). In this analysis of the GIWW, the methodology used by USACE has been modified to account for differences in the GIWW from the rest of the inland waterway system. Some of those primary differences include:

- The GIWW crosses several deep-draft ship channels.
- When capturing AIS data, many vessels are included that are not inland towing vessels. The data must be filtered to include only inland towboats.
- Activity is intense in clusters along the waterway.

The complete methodology comprises several methods with corresponding steps. Specifically, the methodology is formed by five main activities:

1. Data acquisition, cleansing, and management.
2. Travel time calculation and statistics.
3. Case/scenario definition and travel time results (i.e., O-Ds, routes, links split/selection, time periods, and unit of observation).
4. Phase 1 statistical forecast method.
5. Phase 2 statistical special conditions analysis method.

The study relies primarily on AIS and Lock Performance Monitoring System data provided by USACE. The raw AIS data must be cleaned before they can be used. Two main problems must be addressed:

- Because the GIWW crosses multiple ship channels, any snapshot of data may include vessels that do not use the GIWW for freight transportation. Such vessels might include pilot boats, oceangoing vessels, bunkering vessels, offshore service vessels, dredging equipment, construction equipment, and other miscellaneous vessels.
- Many of the AIS records are incomplete or have obviously incorrect data in the record. External sources must be used to complete or correct the data as much as possible.

The travel time estimate methodology consists of five main steps.

1. Divide the waterway between the O-D pairs into shorter, consecutive sections, called links.
2. Estimate the travel time for each link.
3. Identify and remove travel time outliers. (This step may also involve a determination of the causes of these outliers.)
4. Calculate link travel time performance measures.

5. Calculate the O-D travel time performance measures from the link travel time performance measure results.

For this study, the definition of a link transit is a one-way trip from one boundary of a link to the other made by a single vessel. The travel time is simply the time it takes to accomplish this movement.

This study employed a numerical method based on field knowledge about the GIWW vessel movements to identify outliers. Any transit time that exceeds a predefined cutoff is considered an outlier. This study employs three cutoffs:

- For links containing locks/floodgates, the cutoff is 48 hours (2 days).
- For the link containing the Port of Houston, the cutoff is 12 hours.
- For links without locks/floodgates, the cutoff is the amount of time it takes to travel the entire link at 2.6 knots (3 mph).

This study removes outliers and then calculates travel time performance measures for each link. The following statistics are recorded for each link:

- Total number of transits.
- Average travel time in hours.
- Standard deviation of travel time in hours.
- 25th, 50th (median), and 75th percentile travel times in hours.
- Total travel time above the baseline in hours.

The travel times are consistent in both directions across both years, with the locks and floodgates introducing the most variability.

Based on the calculated travel times, the research team developed a methodology to obtain travel time forecast projections and to assess if, and how, special conditions affect such travel times.

This methodology was divided in two phases:

- Phase 1 focuses on the forecast projections.
- Phase 2 focuses on evaluating the impacts of special conditions on travel times.

Results from Phase 1 show that forecasted projections smooth out the deeper they go into the future. This is because, due to data availability, projections were based exclusively on the historical data of the same target variable; or, in other words, projections used historical information—past values—of travel time to predict the future. The latter determined the type of statistical tools researchers implemented and resulted in the selection of a smoothing type of model. Therefore, researchers recommend the use of only the first 12 (weeks) of projections.

In Phase 2, the research team obtained information on the following special conditions:

- Dredging: the presence of dredging equipment in or adjacent to the channel.
- Shoaling: a reduction in available draft large enough to warrant a notice to mariners.
- Bridge closure: the closure of the channel due to bridge construction activity.
- Submerged vessel: the presence of a submerged vessel in the vicinity of the channel.
- Construction: the placement of rip-rap along the banks of the GIWW.

- Lock closure: the closure of a lock or floodgate to all traffic for a defined period.
- Submerged pipe: the presence of a submerged pipe in or near the channel.
- Bridge clearance: a reduction in the clearance in terms of width/and or height at a bridge crossing.
- Submerged obstruction: the presence of an unidentified submerged object in or near the channel.
- Regatta: a recreational event requiring the use of the channel.

Weather data were not available for the GIWW, so the effect of weather conditions could not be evaluated.

The analysis suggested that sample count (i.e., completed trips through a link) did not influence travel time significantly in any link. The statistical analysis deemed two special conditions as relevant for travel time: dredging and shoaling. The analysis was able to estimate the expected magnitude of an event and the probability of its occurrence. Charts were developed that showed both.

Since there is no current on the GIWW (as there would be on a river), no significant variations in travel times by direction were expected, and this turned out to be the case. The links containing the Brazos River Floodgates and the Colorado River Locks showed a high degree of variability in travel times. This could be because of congestion at the structures or possibly a hesitancy to cross the rivers when conditions are suboptimal.

Future research should focus on obtaining additional data that enable more robust projections by not relying on a single time series. Also, a higher resolution should be considered in order to balance the time unit of measurement with average travel time unit of measurement when assessing traffic effects on travel time. In addition, expanding the analysis to include additional years (e.g., 2020) could provide more data to increase the sample size and make more accurate predictions and assessments, above all for the special effects but also to investigate the effects of other special conditions such as pandemic impacts.

CHAPTER 1: INTRODUCTION

Background

The Gulf Intracoastal Waterway (GIWW) is an important part of the nation's Marine Transportation System (MTS). The GIWW is one of the most highly used corridors in the U.S. inland waterway commerce network. Along the waterway, manufactured goods, farm products, machinery, petroleum products, and chemicals are transported into and out of the region. In 2019, more than 110 million tons of cargo were transported on the GIWW. Almost 77 million tons were transported on the Texas portion of the GIWW. Petroleum and petroleum products constitute 70 percent of the traffic. Chemicals and related products account for 21 percent (*1*). In addition to commerce, the Texas GIWW has significant fishing and recreational activities.

This report focuses on the Texas portion of the GIWW. The navigable portion of the Texas GIWW begins at the Louisiana border and ends at the Brazos Island Harbor Ship Channel near Brownsville, Texas, a length of 379 miles. The GIWW links together 11 deep-draft ports (25 ft or deeper) and 13 shallow-draft channels. The deep-draft ports handle both shallow- and deep-draft vessels, so the two systems are intertwined. Figure 1 provides a map of the Texas GIWW.

Figure 1. Texas GIWW Map.

The type of freight transportation that takes place on the Texas GIWW is referred to as *inland towing* or *inland barge* transportation. Originally constructed to facilitate dry bulk commodity trade between Texas ports and to facilitate defense during World War II, the Texas GIWW has become an integral

component of the extensive supply chains of Texas petrochemical and manufacturing industries. High levels of vessel traffic reflect the GIWW's importance to the Texas economy.

The Texas portion of the GIWW intersects the Brazos and Colorado Rivers. Without appropriate containment infrastructure, these rivers would discharge their sediment-laden flows into the GIWW. In the 1940s, 75-ft-wide gated structures aimed at controlling flows and silt into the GIWW at each river crossing were completed. The structures at the Brazos River are floodgates, while the structures at the Colorado River are locks. The closing of the gates/locks allows the rivers to perform more naturally by allowing their sediments to continue downstream.

The maintenance of the GIWW is the responsibility of the U.S. Army Corps of Engineers (USACE). The Texas Department of Transportation (TxDOT) is the official non-federal sponsor for the Texas GIWW. The primary responsibility of TxDOT is to provide right of way and disposal areas for byproducts of operations and maintenance.

Fourteen U.S. federal departments have responsibilities related to the MTS in matters such as security, operations, infrastructure, environment, and others. Many of these departments have several agencies that carry out those responsibilities. Other decision makers in Texas include port authorities, state agencies, and municipal authorities.

Clearly, maintaining the GIWW is an important priority for the federal government and Texas. Travel time reliability is important for users of the GIWW. Travel time reliability allows system stakeholders to predict travel times with greater accuracy, which in turn allows operators to optimize departure times and achieve on-time arrivals. Travel time reliability is primarily a matter of consistency or dependability in travel times. Reliability can be affected by factors such allisions (collision with a stationary object), collisions, dredging operations, weather, fluctuations in demand, and structures such as locks and floodgates.

Travel time statistical profiles allow decision makers to evaluate the state of the system, determine baseline measures, quantify the effects of factors that affect reliability, quantify impacts of operations or maintenance decisions, and measure capacity and congestion.

This report builds on prior work undertaken by USACE (*2*). USACE developed a statistical profile of waterway travel times for the Ohio River, the Illinois River, and the Upper Mississippi River by analyzing Automated Identification System (AIS) data. AIS data indicate the identify of a vessel, its location, its heading, and its speed, among other variables. These data points are broadcast every few seconds and stored by USACE, the Coast Guard, or private vendors. In this analysis of the GIWW, the methodology used by USACE has been modified to account for differences in the GIWW from the rest of the inland waterway system. Some of those primary differences include:

- The GIWW crosses several deep-draft ship channels.
- When capturing AIS data, many vessels are included that are not inland towing vessels. The data must be filtered to include only inland towboats.
- Activity is intense in clusters along the waterway.

Therefore, while this work builds on USACE's previous work, there are significant differences in the final methodology employed.

Objective

The objective of this study is to develop a statistical profile of travel times for the GIWW using AIS data. This study also analyzes the impact of several variables on system performance. The study focuses strictly on the main GIWW channel and does not include activity on any ship channel or tributary to the GIWW. The data used in this study are for 2018 and 2019.

Report Organization

Chapter 2 introduces AIS data. Chapter 3 discusses the methodology to establish the framework for the calculation of various performance measures for the GIWW. The chapter discusses data issues and how they are resolved. The chapter goes on to describe how the waterway is defined and how performance measures are calculated. Finally, the chapter describes the results of the performance measure calculations. Chapter 4 describes the statistical analyses that were performed to evaluate the significance of various factors that could influence travel time reliability. Chapter 5 discusses conclusions and recommendations for future research.

CHAPTER 2: INTRODUCTION TO AIS

The following is taken from *Enhancing Accessibility and Usability of Automatic Identification System (AIS) Data across the Federal Government and for the Benefit of Public Stakeholders* (***Error! Bookmark not d efined.***):

> Automatic Identification System (AIS) is a technology that came about in the 1990s. … It was designed to promote ship-to-ship navigation safety, facilitate the provision of vessel traffic services, and allow coastal nations to monitor vessel activity in and near their waters.
>
> AIS technology relies upon global navigational positioning systems, navigation sensors, and digital very high frequency (VHF) radio communication equipment that permit the exchange of navigation information between vessels and shore-side stations. AIS equipment on vessels can broadcast information about the vessel, such as its name or call sign, dimensions, type, position, course, speed, heading, navigation status and other pertinent navigation data. This information is continually updated in near real-time and received by all AIS-equipped stations in its vicinity. The advantage of this automatic and continuous exchange of information is that all can access it, tailored to the users' needs and desires. …
>
> In 2002, the International Maritime Organization (IMO) made it mandatory for AIS to be fitted aboard all ships of 300 gross tonnage and upwards engaged on international voyages, cargo ships of 500 gross tonnage and upwards not engaged on international voyages, and all passenger ships irrespective of size. In 2004, the U.S. accelerated and expanded upon these requirements to most commercial domestic vessels operating in U.S. navigable water. …
>
> When AIS data is transmitted, it contains a large amount of vessel data. In all, about 400 data elements can be transmitted over AIS. The most commonly used data are position reports along with static and voyage related data that enables users to track a vessel's whereabouts and future direction. Position reports describe where a vessel is at a point in time. This information includes the maritime mobile service identity (MMSI) number, latitude, longitude, speed, direction of travel, and rate of turn. Static and voyage data include MMSI number, IMO number, call sign, type of ship and cargo type, estimated time of arrival (ETA), destination, and vessel status (docked or moving).

The following is from a study report published by USACE's Engineering Research and Development Center (ERDC) in 2019 (*2*):

> AIS technical specifications are standardized by the International Telecommunication Union and adopted by the International Maritime Organization for vessel carriage re-casts, in real-time, the vessel's identity, vessel type, position, heading, course, and speed, among other information. These messages are detailed in [Appendix A]. Note that while most of this information is collected electronically by onboard equipment, some information (e.g., those pertaining to vessel characteristics and voyage) is

manually entered and may contain errors or be out of date. Vessel AIS position report transmissions are at discrete time intervals, every 2 to 10 seconds while a vessel is underway (depending on speed and rate of turn), and every 3 minutes while at anchor. In the United States, AIS carry requirements are set by federal regulations. See US Code of Federal Regulations, 33CFR164.46. …

AIS data as received by AIS equipment is in a common format, NMEA 0183 (*3*), but is not decipherable in the native format without a conversion software. The NMEA 0183 standard provides information on the format; there are many open-source and commercial applications that can read and decode AIS data.

In the United States, the USCG runs the Nationwide Automatic Identification System (NAIS) project, which, in conjunction with transceivers on the inland system maintained by the USACE, has approximately 200 VHF receiver sites located throughout the coastal continental United States, inland rivers, Alaska, Hawaii and Guam. NAIS consists of an integrated system of AIS, data storage, processing, and networking infrastructure. …

The USACE and other federal partners may access AIS data with direct requests to the USCG or with the Automatic Identification System Analysis Package (AISAP). AISAP can be used to analyze the AIS data for MTS usage and travel time statistics and trends, to inform waterway operations and maintenance decisions, and to aid vessel operators in voyage planning. [For this study, the Corps of Engineers used AISAP to extract the required AIS data and make it available to the study team.] …

For non USACE users, the US Coast Guard will also consider requests for data, in particular for use in research. There are also several commercial sources of AIS data available. Some offer decoding, analysis, and other value-added services that may be beneficial for certain projects.

CHAPTER 3: METHODOLOGY

Overview

This study presents a method to estimate origin-destination (O-D) waterway travel time statistics from AIS data. This study focuses exclusively on the main channel of the GIWW. Since vessels enter and exit the GIWW at ship channels or tributaries, they were designated as O-Ds for the GIWW. Other O-Ds include port facilities on the GIWW, the Louisiana state boundary, and the western terminus at the Port of Brownsville.

The complete methodology comprises several methods with corresponding steps. Specifically, the methodology is formed by five main activities:

6. Data acquisition, cleansing, and management.
7. Travel time calculation and statistics.
8. Case/scenario definition and travel time results (i.e., O-Ds, routes, links split/selection, time periods, and unit of observation).
9. Phase 1 statistical forecast method.
10. Phase 2 statistical special conditions analysis method.

This chapter covers items 1 through 3. Chapter 4 discusses the statistical analysis, which includes Phase 1 and Phase 2 activities. Finally, Chapter 5 offers conclusions and recommendations for future research.

Data Acquisition, Cleansing, and Management

Acquisition

The AIS data acquired for this study covered the years 2018 and 2019. ERDC provided the data. The sampling interval was 5 minutes.

AIS data are not always complete and continuous for a given vessel. This may be due to atmospheric conditions, physical obstructions, or equipment malfunctions. The methodology used in this study considers this discontinuity in the following ways:

- The methodology allows for the fact that transit data may not be available for the entirety of the waterway between the O-D pair.
- The methodology relies on a robust sample of the population—the methodology does not require transit data to be available for the entire population of vessels on the waterway.
- The methodology takes into account that each vessel may not transit the entire distance between the O-D pair, instead making shorter transits.

Cleansing

The raw AIS data must be cleaned before they can be used. Two main problems must be addressed:

- Because the GIWW crosses multiple ship channels, any snapshot of data may include vessels that do not use the GIWW for freight transportation. Such vessels might include pilot boats, oceangoing vessels, bunkering vessels, offshore service vessels, dredging equipment, construction equipment, and other miscellaneous vessels.

- Many of the AIS records are incomplete or have obviously incorrect data in the record. External sources must be used to complete or correct the data as much as possible.

The task of cleaning the AIS data is one of the most time-consuming tasks in any project based on such data. The process of cleansing the data involved the following steps:

1. Remove all records where the stated ship type is not an inland towing vessel.
2. Remove all remaining records where the Maritime Mobile Service Identity (MMSI) is not a valid U.S. MMSI.[1]
3. Remove all remaining records where the MMSI is clearly invalid (not enough digits).
4. Examine all remaining records using multiple public sources to determine the vessel type and remove vessel types that are not inland towing vessels.
5. Remove all records where no information could be found.
6. Use the remaining records as the inland towing dataset.

Table 1 provides some of the cleaning details for the data that USACE provided for this study. Only 14 percent of the vessels that were identified in the AIS data were confirmed as valid inland towing vessels.

Table 1. Data Cleansing Statistics.

Type of Data	Number of Records			
	2018	Percent	2019	Percent
Unique vessel entries	7,688	100	7,253	100
Excluded ship types	6,145	80	5,515	76
Non-U.S. MMSI numbers	123	2	618	9
MMSI numbers lacking digits	13	—	8	—
Non-traceable identifying information	303	4	96	1
Useable vessels	**1,104**	**14**	**1,016**	**14**

Travel Time Calculation and Statistics

The travel time estimate methodology consists of five main steps.

1. Divide the waterway between the O-D pairs into shorter, consecutive sections, called links.
2. Estimate the travel time for each link.
3. Identify and remove travel time outliers. (This step may also involve a determination of the causes of these outliers.)
4. Calculate link travel time performance measures.
5. Calculate the O-D travel time performance measures from the link travel time performance measure results.

The flowchart in Figure 2 summarizes these steps, and the following sections describe them in detail.

[1] The MMSI is a unique nine-digit number that is assigned to a digital selective calling radio or an AIS unit. Similar to a cell phone number, the MMSI serves as a unique calling number.

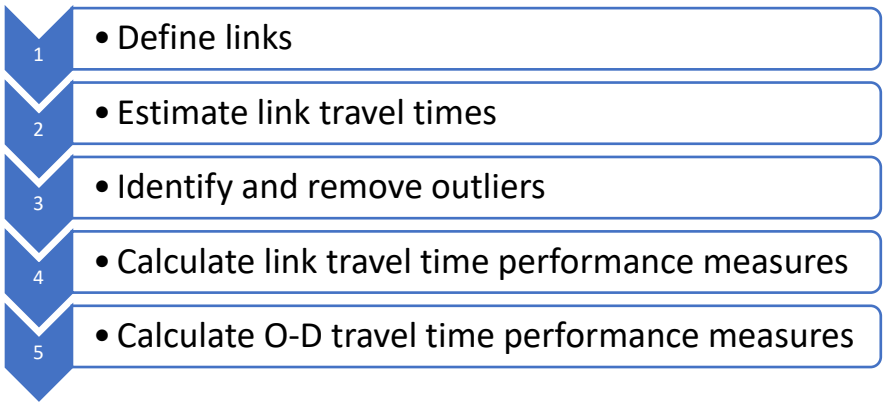


Figure 2. Summary Methodology Flowchart.

Step 1: Define Links

The first step of the methodology is to segment the waterway between the O-Ds into shorter, consecutive links. Each link has an entrance boundary and exit boundary that extend across the waterway from shore to shore, serving as a start and finish line for calculations. For the GIWW, there are two types of links.

The first type of link is a link that represents an area that has homogeneous vessel travel behavior that is uninterrupted through transits—transits that pass from one end of the link to the other. These link boundaries should be placed where vessels change their behavior or speed, at the beginning and end of stretches of waterway with high variability in trip behavior or speed, at intermediate O-Ds along the waterway or at places where vessels make stops, at places where vessels may detour from the fastest route between the origin and destination, and at places that begin or end vessel trip data availability. Examples are:

- Boundaries of an area encompassing a navigation lock or floodgates.
- Boundaries of port infrastructure complexes.
- Boundaries of mooring areas.

The second type of link is a link that represents an area where vessels depart the GIWW. Because of the number of locations at which the GIWW intersects ship channels and because of the high traffic volumes in the ports served by these ship channels, links were defined that were segments of the waterway where vessels enter or exit a ship channel. In summary, the two types of links are those where only through traffic is expected and those where significant departures from the GIWW occur.

Figure 3 illustrates a waterway segment with multiple links. Link boundaries were placed at the point of origin (e.g., Louisiana/Texas state line), upstream and downstream of a ship channel, upstream and downstream of a lock, and at the destination.

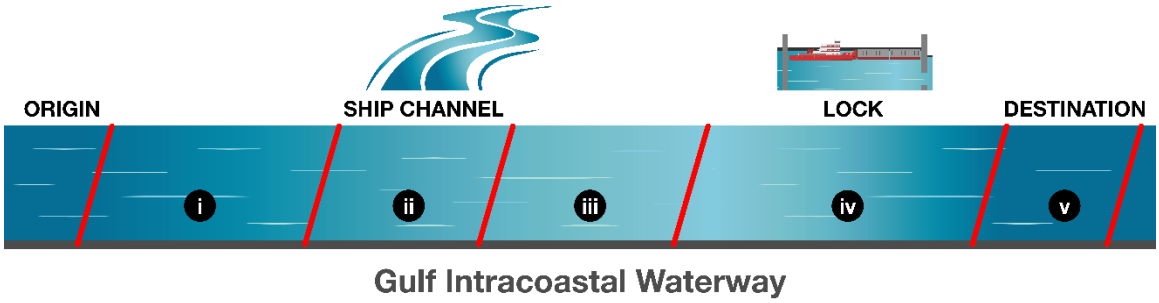


Figure 3. Example of Segmentation of Waterway.

The three main advantages to a link-based approach for estimating O-D transit times are:

- The approach allows shorter transits that take place along the waterway but that do not necessarily complete a full trip between the O-D pair to be included in the analysis. Inclusion of these shorter transits increases the sample size of observations from which to calculate the travel time statistics, thereby providing more robust measures of system performance.
- Segmenting the waterway allows for isolating travel behavior on sections of the waterway that are the main contributors to overall O-D travel times and travel time variability (i.e., locks and mooring area).
- Transit times can be excluded that are incurred from vessels deviating from the direct route between the O-D, such as if a vessel detours from the waterway at a confluence or harbor but later re-enters the waterway at the confluence or harbor to continue its trip to the destination.

In addition to the physical characteristics of a waterway, link transit times may be affected by other factors, such as seasonal variations owing to prevailing congestion or adverse weather conditions. As explained later in this report, the available data did not indicate seasonal variations or congestion on the GIWW. Data were insufficient to evaluate weather conditions.

Step 2: Estimate Link Travel Times

The second step of the methodology is to estimate link travel times of individual transits. For this study, the definition of a link transit is a one-way trip from one boundary of a link to the other made by a single vessel. The travel time is simply the time it takes to accomplish this movement.

Vessels may make multiple trips on a link, and therefore there may be records from different trips. The records were sorted by vessel ID and then by ascending chronological order. An instance in which a record from the entrance area is immediately followed by a record from the exit area represents a transit through the link from the entrance to the exit. If a given vessel's records do not cross either the entrance to or exit from the link for a vessel transit, then the associated transit is not included. In some cases, due to the incompleteness of AIS records, a vessel's records include the entrance area from one trip and the exit area from another trip without in-between records. Then the resulting travel time was an unusually large number, and the transit was excluded. Table 2 is an example of sorted vessel records from the GIWW AIS data.

Table 2. Example of Sorted Vessel Records.

Record Number	Vessel ID	Vessel Name	Date and Time	Latitude	Longitude	Vessel Location
1	3456	ABC	1/24/2019 12:15	29.418948	–94.727279	Link A entrance
2	3456	ABC	…	…	…	Intermediate records
3	3456	ABC	1/24/2019 12:45	29.370211	–94.787389	Link A exit/ Link B entrance
4	3456	ABC	…	…	…	Intermediate records
5	3456	ABC	1/24/2019 13:35	29.341243	–94.828899	Link B exit/ Link C entrance
6	3456	ABC	…	…	…	…

In Table 2,records that can be used as entrance and exit times are included, and the records have been sorted by vessel ID and by time stamp. Record 1 is an entrance record of link A and is followed by record 3, an exit record of link A. Record 3 is also an entrance point of link B that is followed by record 5, an exit record of link B and so on. Therefore, according to the methodology, vessel ABC completed a transit that had a link A entrance time of 12:15, an exit time of 12:45, and thus a link A travel time of 30 minutes. Likewise, link B travel time is the time between record 3 and record 5: 50 minutes.

Step 3: Identify and Remove Outliers

Outliers are data points that differ significantly from other observations. In the case of this study, they may represent errors in the data or deviations from standard practice by barge operators. Vessels may make an unplanned stop; there may be an equipment failure of either the AIS broadcast unit or the receiver. Outliers can distort statistical analyses and inordinately influence conclusions.

This study employed a numerical method based on field knowledge about the GIWW vessel movements to identify outliers. Any transit time that exceeds a predefined cutoff is considered an outlier. This study employs three cutoffs:

- For links containing locks/floodgates, the cutoff is 48 hours (2 days).
- For the link containing the Port of Houston, the cutoff is 12 hours.
- For links without locks/floodgates, the cutoff is the amount of time it takes to travel the entire link at 2.6 knots (3 mph).

The first cutoff considers that lock/floodgate capacity and maintenance issues can cause traffic delays. The cutoff allows for the influence of locks/floodgates to be manifested in the performance calculations. The second cutoff considers the level of oceangoing activity for the Ports of Houston, Texas City, and Galveston and allows any friction with GIWW traffic to be recognized in the performance calculations. The third cutoff is necessary because links are different lengths; therefore, the cutoff time needs to vary by length.

Step 4: Calculate Link Travel Time Performance Measures

This study removes outliers and then calculates travel time performance measures for each link. The following statistics are recorded for each link:

- Total number of transits.

- Average travel time in hours.
- Standard deviation of travel time in hours.
- 25th, 50th (median), and 75th percentile travel times in hours.
- Total travel time above the baseline in hours.

Both mean and median times are recorded because the median provides a better representation of the central tendency if the mean is skewed by very slow or very fast transits.

The total travel time above the baseline is the additional travel time incurred to complete a transit through a link over the baseline travel time. The baseline travel time is defined as the time that can be achieved with no impediments or unusual circumstances. Previous studies conducted by USACE and the Texas A&M Transportation Institute have used the 25th percentile as the baseline. The same was used here.

The total is the sum of the time spent above the baseline of all transits for the time period. The sum depends on two components: the number of transits with travel time above the baseline and the amount of travel time above the baseline for each transit. This means that either of two scenarios can result in similar totals. In the first case, there may be many transits, each of which has a small travel time above the baseline. In the second, there may be a few transits with a large travel time above the baseline. This study does not try to determine which is preferable.

Time above the baseline can be caused by several factors requiring further investigation. Such factors might include congestion, inadequate lock/floodgate capacity, fog, extreme weather, or waterway conditions (e.g., dredging) that required additional or slower maneuvering.

Step 5: Calculate O-D Travel Time Performance Measures

Average O-D travel times are the summation of the values from the links that make up the O-D path. However, percentiles are order statistics and cannot be summed because the sum of the sample populations collected from the links may not be the same population as the O-D pair due to the different characteristics of the links, such as cutoff measures and lengths.

This methodology was used to measure the performance of the main channel of the Texas portion of the GIWW.

Case/Scenario Definition and Travel Time Results

Several points along the Texas GIWW were identified as trip O-Ds. The entrance to each deep-sea port was designated as a destination. Additionally, the petrochemical complex at Chocolate Bayou just west of Houston/Galveston, the entrance to the channel leading to the Port of Victoria, and the entrance to the Arroyo Colorado, which leads to the Port of Harlingen, were designated as O-D points. Because the ship channels for Houston, Galveston, and Texas City all intersect the GIWW in close proximity to each other, these three ports were considered as one O-D point. Also, the Louisiana/Texas border at Mile Marker 262 was designated as an O-D since it marks the eastern terminus of the Texas GIWW. The Port of Brownsville is the western terminus of the GIWW. Table 3 presents the O-D points used for this study. Figure 4 presents the locations.

Table 3. Origin-Destination Boundaries.

Origin-Destination	Eastern/Northern Mile Marker	Western/Southern Mile Marker
Port of Beaumont/Port Arthur	275.5	288
Ports of Houston/Galveston/Texas City	348.5	352
Chocolate Bayou	374.5	392
Port Freeport	392	398
Calhoun Port Authority	456	473
Port of Victoria	487	493
Port of Corpus Christi	539	549
Port of Harlingen	642	645
Port of Port Isabel	665	668
Port of Brownsville	677	682

Figure 4. Locations of Port and GIWW Intersections.

Links

As explained previously in this chapter, the GIWW was segmented into links. Because of the number of special features along the coast and intersections with ship channels, the lengths of these links vary considerably. Links were first defined for ship channel intersections and for the location of the Brazos River Floodgates and the Colorado River Locks. The reaches between these links were then defined as additional links. The lengths of these links were primarily determined by geographical features, the goal being to define links with homogeneous operational characteristics. The longest link (50 miles) is found between Port Arthur and the Bolivar Peninsula. The next longest links (44 miles and 49 miles) are found in the Laguna Madre south of Corpus Christi. All three links are located in areas with no development.

The links for the floodgates/locks include the mooring areas on either side of each river where tows wait for the opportunity to cross the river. The lengths of these links were made identical in order to not allow one location to unduly influence the analysis of traffic behavior. Because the floodgates and locks are contained within a single link for their respective rivers, these links isolated the effects of the structures on vessel behavior and thus travel times. These travel-time-related behaviors included deceleration time approaching the lock, queuing time to enter the lock, passage time through the lock, and acceleration time away from the lock. Table 4 provides these two infrastructure elements, their locations, and the beginning and end point of the link that contains each one. Figure 5 presents these locations.

Table 4. Floodgate/Lock Locations and Associated Link End Points.

Structure	Location (Mile Marker)	Eastern/Northern Endpoint (Mile Marker)	Western/Southern Endpoint (Mile Marker)
Brazos River Floodgates	400	398	404
Colorado River Locks	441	438	444

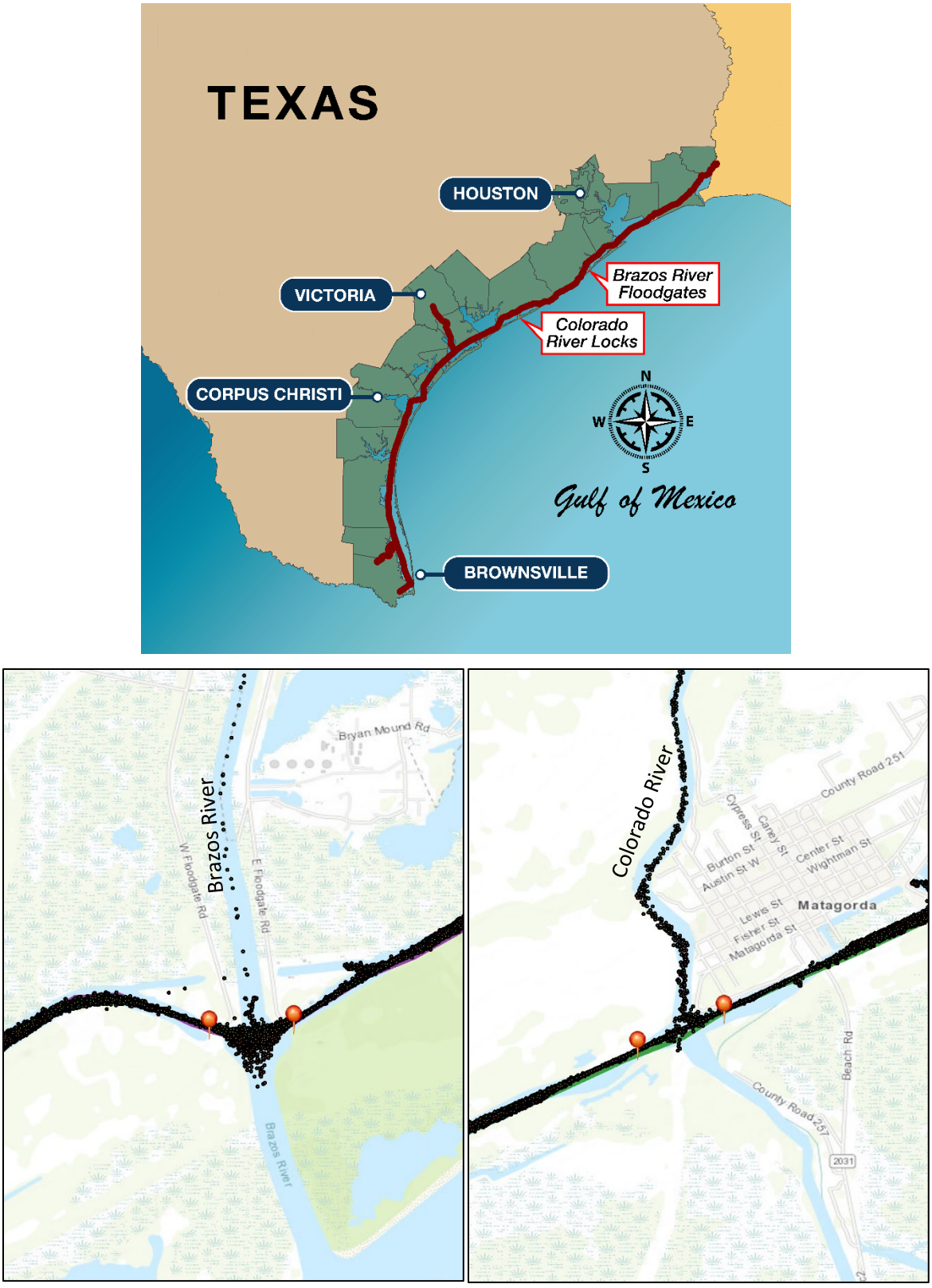


Figure 5. Location of Brazos River Floodgates and Colorado River Locks.

The total number of links created for the Texas GIWW was 29.[2] Table 5 lists each link, its boundaries, its length in river miles, and notes regarding special features. Figure 6, Figure 7, and Figure 8 depict the locations of the links.

Table 5. GIWW Links.

Link No.	Eastern/ Northern Boundary (River Mile)	Western/ Southern Boundary (River Mile)	Length (River Miles)	Notes
1	266	275.5	9.5	
2	275.5	288	12.5	Connection to Port Beaumont and main Port Arthur
3	288	294	6.0	Connection to west Port Arthur
4	294	344	50.0	
5	344	349	5.0	Contains Bolivar Mooring Area (Bolivar Peninsula)
6	349	352	3.0	Connection to Ports of Houston/Galveston/Texas City
7	352	356	4.0	Contains Pelican Mooring Area
8	356	370	14.0	
9	370	374.5	4.5	Contains Chocolate Bayou Mooring Area
10	374.5	392	17.5	Connection to Chocolate Bayou complex
11	392	398	6.0	Connection to Port Freeport
12	398	404	6.0	Contains Brazos River Floodgates
13	404	438	34.0	
14	438	444	6.0	Contains Colorado River Locks
15	444	450	6.0	
16	450	456	6.0	Contains Oyster Lake Mooring Area
17	456	471	15.0	Connection to Calhoun Port Authority
18	471	487	16.0	
19	487	493	6.0	Contains Victoria Mooring Area and connection to Port of Victoria
20	493	509	16.0	
21	509	515	6.0	Contains Aransas Mooring Area
22A	515	539	24.0	Alternative route to Lydia Ann Channel
22B			27.5	Lydia Ann Channel—main route
23	539	551	12.2	Connection to Port of Corpus Christi
24	551	595	44.0	
25	593	642	49.0	
26	642	645	3.0	Connection to Port of Harlingen
27	645	665	20.0	
28	665	668	3.0	
29	668	677	9.0	

[2] Originally, one additional link was at the Port of Brownsville, but it is not possible to calculate meaningful performance measures for that link, so it is not included in the calculations.

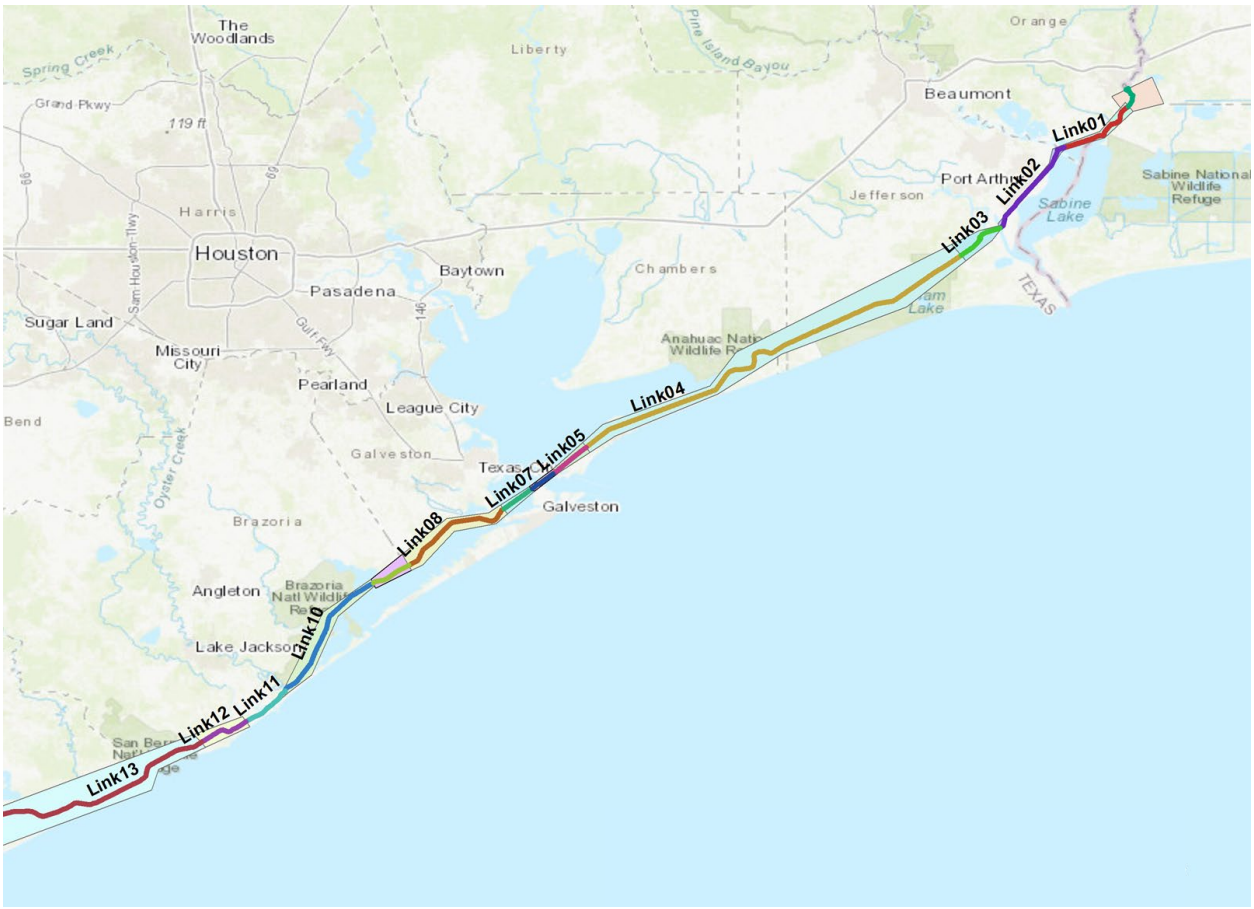


Figure 6. GIWW Links 1–13.

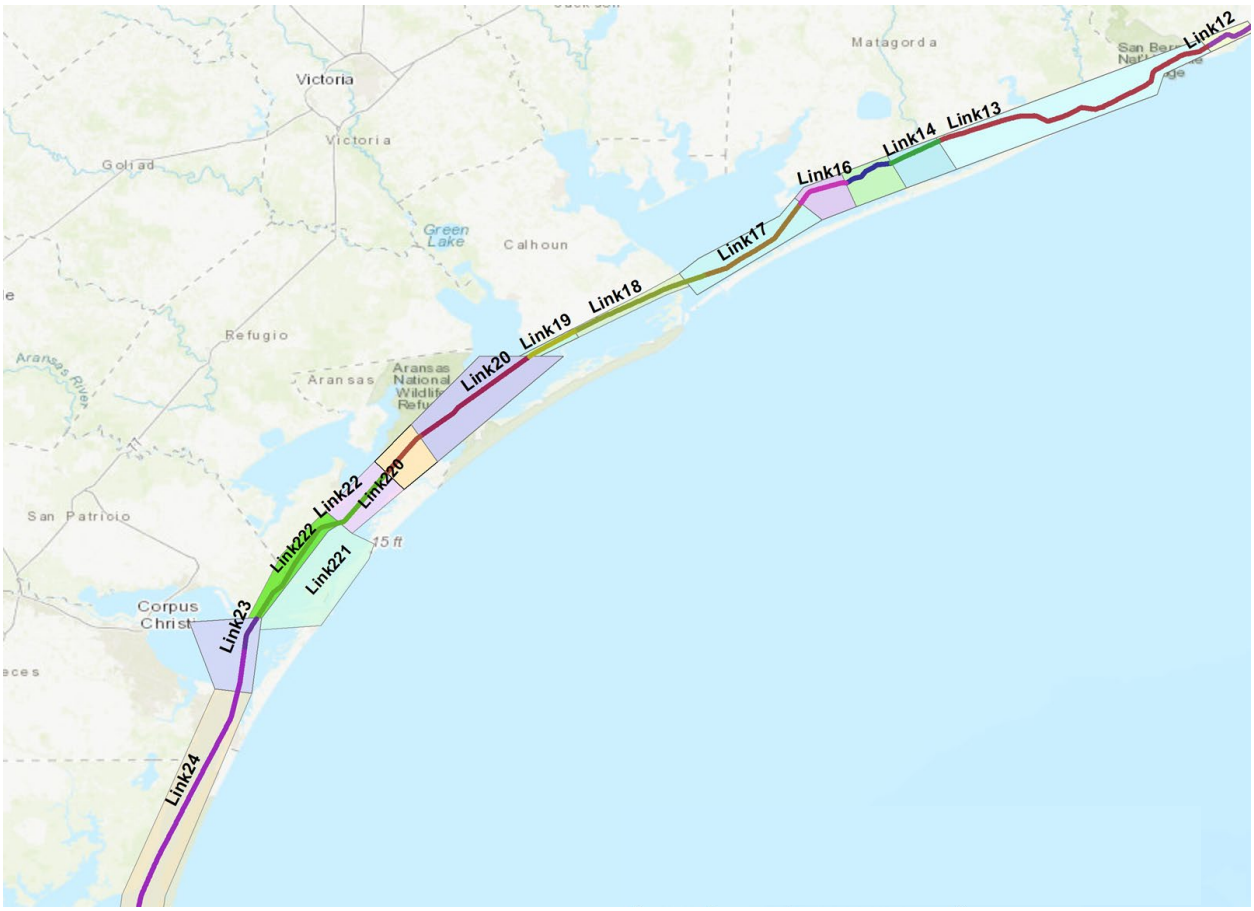


Figure 7. GIWW Links 14–24.

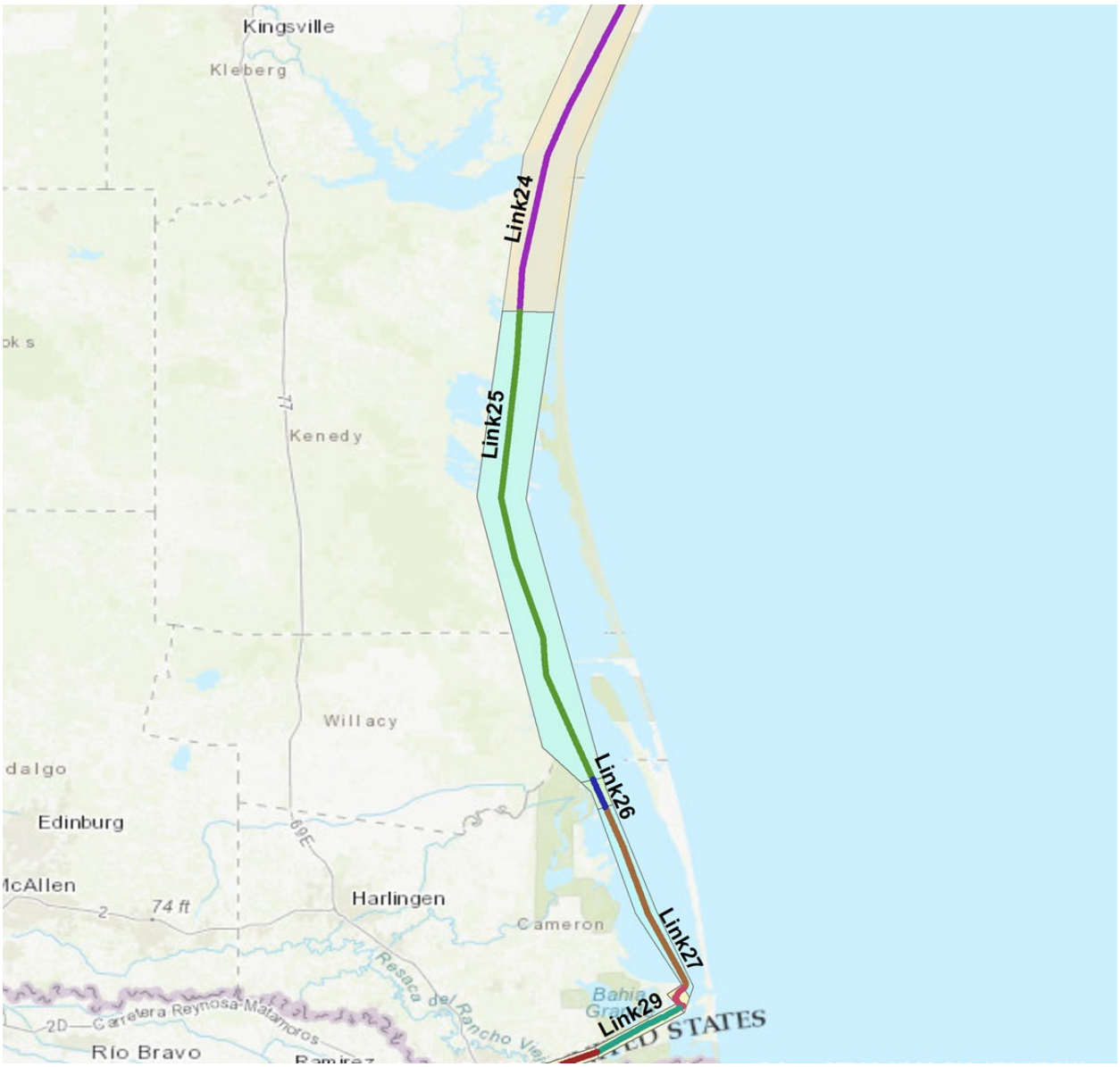


Figure 8. GIWW Links 25–30.

Number of Transits by Link and Sampling Rate

The study attempted to determine the sampling rate or the percentage of actual transits captured via the AIS dataset. This was done in two ways.

First, the study used activity data at the Brazos River Floodgates and the Colorado River Locks as ground truth data. ERDC supplied the activity data. Table 6 shows the sampling rate for the two structures.

Table 6. Sampling Rate for Floodgates and Locks.

Location	Direction	USACE Transits	AIS Transits	Sampling Rate
Brazos River Floodgates East	West/south	5,077	3774	74%
	East/north	4,923	3,752	76%
Brazos River Floodgates West	West/south	5,087	3,774	74%
	East/north	4,913	3,752	76%
Colorado River Locks East	West/south	5,078	3,150	62%
	East/north	4,922	3,160	64%
Colorado River Locks West	West/south	4,928	3,150	64%
	East/north	4,730	3,160	67%

There are some complicating factors. First, the original purpose of the data collected at the two river intersections was not for ground-truthing AIS records. Second, the starting and ending points for the two structures do not align to the starting and ending points of the links; the link covers a greater distance than just the river crossing.

The study also compares the number of records that did not complete a transit in any link that involved a ship channel or tributary to the number of barge trips reported by the Waterborne Commerce Statistics Center (WCSC) for that channel. Table 7 shows the findings for 2018, and Table 8 shows the findings for 2019. The WCSC statistics depend on voluntary reporting by the barge operators and may not include all activity although history has shown a relatively high compliance rate. Additionally, the USACE definition of a port often involves more than what this study calls a port. Some of the links required further examination as shown in the “Notes” column.

Table 7. Incomplete Link Trips versus Reported Traffic on Connecting Channel, 2018.

Link	Number of Incomplete Transits	Trips Reported by WCSC	Percent Coverage	Notes
1	634	647	98%	(Orange)
2	5,665	6,883	82%	(Beaumont)
3	2,477	3,597	69%	(Port Arthur) Port lies along the GIWW, making analysis difficult.
6	16,454	26,933	61%	Includes statistics for Houston, Galveston, and Texas City.
10	1,013	934	108%	(Chocolate Bayou) Within tolerable discrepancy levels. Most likely due to issues in trip reports.
11	3,017	1,388	217%	(Freeport) WCSC only includes the main ship channel in Port Freeport statistics, whereas this study includes a number of facilities along the GIWW on both sides of the ship channel.
17	970	1131	86%	(Calhoun)
19	1,696	1,413	120%	(Victoria) Unable to determine why the study count is higher. Most likely due to issues with trip reports.
23	3,204	4,774	67%	(Corpus Christi)
26	144	73	197%	(Harlingen) Unable to determine why discrepancy exists. Because of low traffic counts, the study did not investigate this further.
28	141	11	Not available	(Port Isabel) This large difference is due to a construction project that was being serviced by barge traffic through Port Isabel. Instead of proceeding west to Brownsville, a number of towboats headed east toward the south end of Padre Island where a construction project was under way.

Note: Trips are for drafts of 12 ft or less.

Table 8. Incomplete Link Trips versus Reported Traffic on Connecting Channel, 2019.

Link	Number of Incomplete Transits	Trips Reported by WCSC	Percent Coverage	Notes
1	652	542	120%	(Orange)
2	6,876	6,639	104%	(Beaumont)
3	2,317	4,022	58%	(Port Arthur) Port lies along the GIWW, making analysis difficult.
6	15,993	28,657	56%	Includes statistics for Houston, Galveston, and Texas City.
10	1,252	743	169%	(Chocolate Bayou) Most likely due to issues in trip reports.
11	3,554	1,146	310%	(Freeport) WCSC only includes the main ship channel in Port Freeport statistics, whereas this study includes a number of facilities along the GIWW on both sides of the ship channel.
17	658	1,046	63%	(Calhoun). February was unusually low. May be an AIS data collection problem.
19	1,288	Not available		(Victoria)
23	2,875	4,598	63%	(Corpus Christi)
26	81	166	49%	(Harlingen) Unable to determine why discrepancy exists. Study sample was much lower in 2019 than 2018. Because of low traffic counts, the study did not investigate this further.
28	70	1	Not available	(Port Isabel) This large difference is due to a construction project that was being serviced by barge traffic through Port Isabel. Instead of proceeding west to Brownsville, a number of towboats headed east toward the south end of Padre Island where a construction project was under way.

Note: Trips are for drafts of 12 ft or less.

Travel Time Results

This section provides a GIWW travel time statistical profile. The study determined the statistics by applying the methodologies described previously to 2018 and 2019 AIS data. The statistics are as follows:

- Number of transits by link.
- AIS sampling rate for links containing locks.
- 25th, 50th, and 75th percentile travel times by link.
- Average travel time, standard deviation, and coefficient of variation by link.
- Total travel time above the baseline for links containing locks.
- 25th, 50th, and 75th percentile travel times by O-D pair.

The study provides results aggregated into the following time periods: weekly, monthly, and annually. The study does not provide results disaggregated to time periods less than 1 week or to individual transits to help protect the possible commercial sensitivity of the data.

Link Travel Times by Average and Percentile

The study estimated the 25th, 50th (median), and 75th percentile travel times (TT) by link based on 2018 and 2019 AIS data. Figure 9 and Figure 10 show the link travel times of the 2 years by percentile. The 2 years have very similar percentile transit times on most of the links. However, links 12 and 14 of 2019 have higher ranges of transit times between the 25th percentile and 75th percentile than those of 2018. Links 12 and 14 include floodgates and locks and are more influenced by their operation.

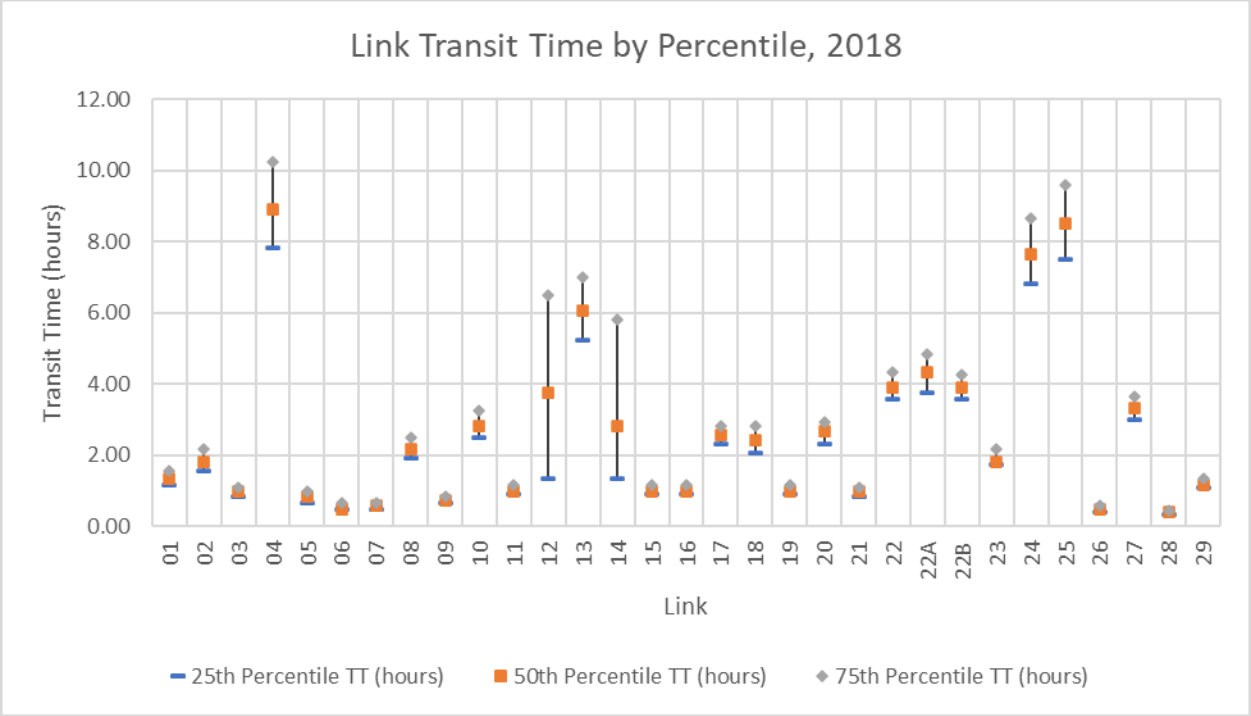


Figure 9. Link Transit Time by Percentile, 2018.

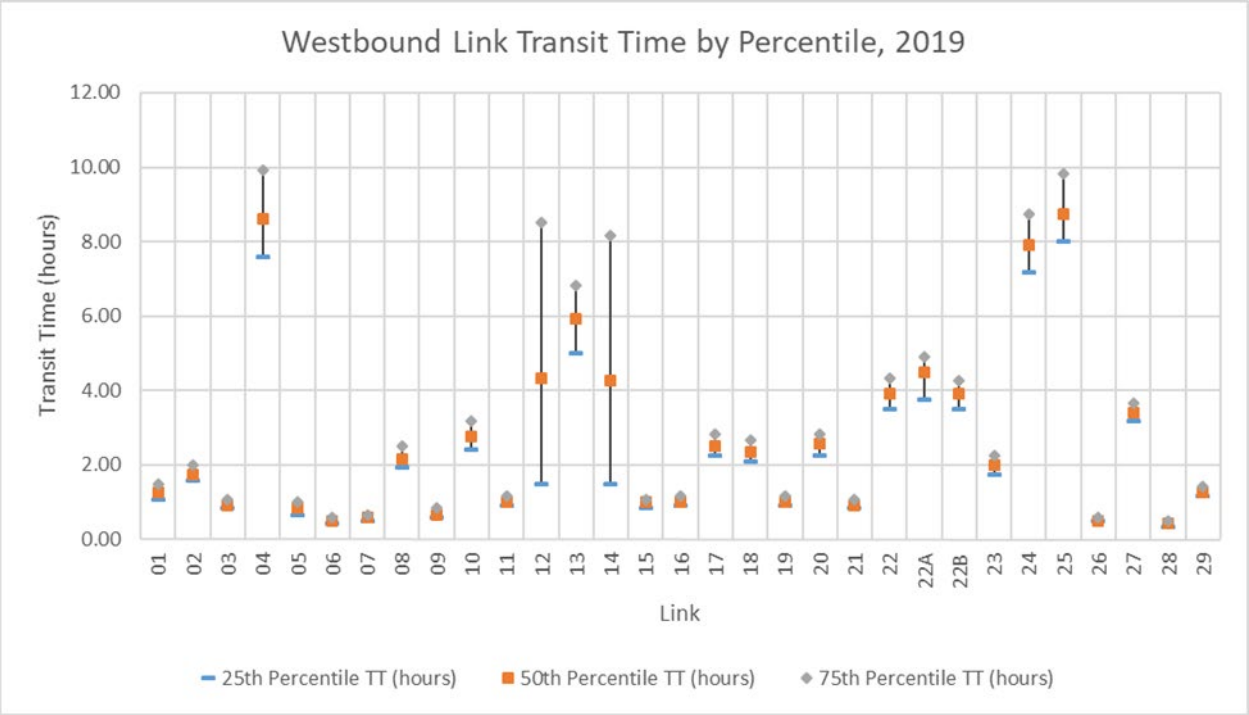


Figure 10. Eastbound Link Transit Time by Percentile, 2019.

The graphs in Figure 11 and Figure 12 illustrate the annual results, with estimated trajectory plots of vessels as if they were to transit the entire Texas portion of the GIWW at the annual average travel time for westbound (blue square) and eastbound (orange triangle) trips. The time begins at hour zero. Vessels traveling west/southbound begin at the Louisiana border at Mile Marker 266. Vessels traveling north/eastbound begin at Mile Marker 677. The arrow on each line represents the direction of travel. On the graphs, the mile marker numbers are on the x-axis; total elapsed transit times are on the y-axis. Appendix B lists results by year, month, and week in table format.

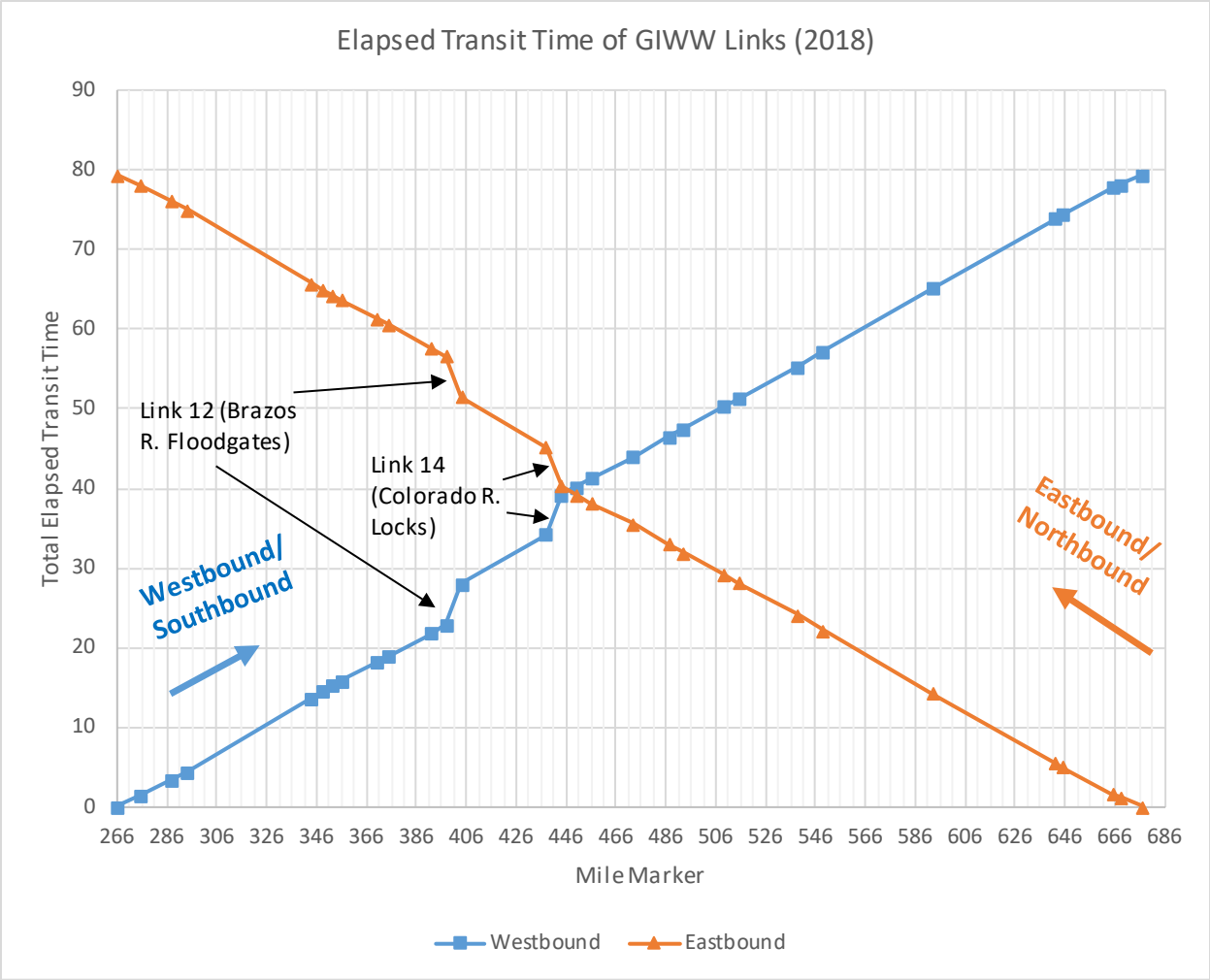


Figure 11. Vessel Estimated Trajectories on GIWW Links, 2018.

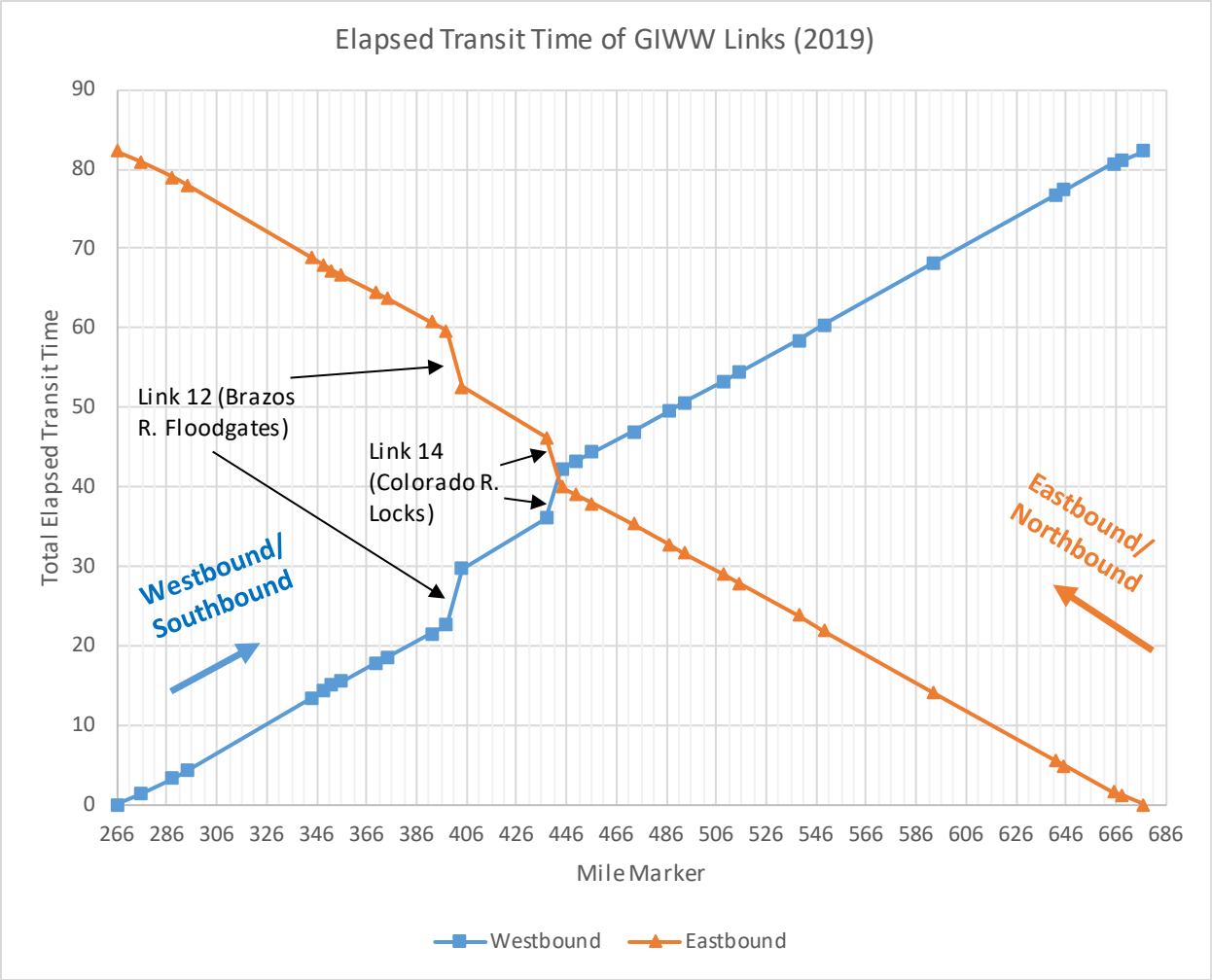


Figure 12. Vessel Estimated Trajectories on GIWW Links, 2019.

Several conclusions may be drawn from the results. From the slopes of the lines, trends are identified in the waterway travel times and speeds. The slope of the line for each link is equivalent to the vessel travel time per mile (i.e., reciprocal of speed). Steeper slopes represent more time to navigate a link, and less steep slopes represent less time to navigate a link. Thus, this type of visualization allows for the comparison of links, even though they are of different lengths. For example, slopes are steeper on links containing locks or floodgates, and thus travel times are longer on these links. In addition, the links containing locks have the greatest variation in travel times. For example, the coefficients of variation for link 12 (Brazos River Floodgates) and link 14 (Colorado River Locks) are four or five times higher than the other links. The next section provides more detailed information about the average travel times and variabilities.

Link Travel Times Average, Standard Deviation, and Coefficient of Variation

The GIWW consists of many navigation segments with different characteristics. Measuring the performance of the segments is an important step to identify problem areas and prioritize the links for planning, operations, and maintenance. Average link travel time and standard deviation are basic statistics to understand the performance of the links. The coefficient of variation is the ratio of the standard deviation to the mean and provides the relative deviation adjusted by the average travel time.

Table 9 shows average transit time, standard deviation, and coefficient of variation by direction for 2018 and 2019. Conditional color formatting by variable in each column highlights higher values in red and lower values in green. In the table, the four groups of direction and year combinations (i.e., westbound-2018, westbound-2019, eastbound-2018, and eastbound-2019) have very similar color patterns. That means there is no noticeable change in the performance measures between the directions and the years.

The travel times are consistent across both years and directions with relatively low variability for most links. This is not surprising, given that the GIWW has no river current and is not subject to flooding or drought conditions. Seasonality is not a factor, either.

Table 9. GIWW Link Average and Standard Deviation of Travel Time, 2018 and 2019.

Link	Westbound/Southbound Trips						Eastbound/Northbound Trips					
	2018			2019			2018			2019		
	Average Transit Time (hours)	Std Dev (hours)	Coeff. of Variation	Average Transit Time (hours)	Std Dev (hours)	Coeff. of Variation	Average Transit Time (hours)	Std Dev (hours)	Coeff. of Variation	Average Transit Time (hours)	Std Dev (hours)	Coeff. of Variation
1	1.39	0.37	0.26	1.34	0.33	0.25	1.45	0.31	0.22	1.46	0.32	0.22
2	1.92	0.55	0.29	1.88	0.53	0.28	2.01	0.55	0.27	1.99	0.54	0.27
3	0.99	0.23	0.23	0.97	0.23	0.23	1.03	0.25	0.24	1.01	0.25	0.24
4	9.22	2.09	0.23	9.05	2.11	0.23	9.32	2.06	0.22	9.17	2.03	0.22
5	0.89	0.27	0.30	0.89	0.27	0.30	0.83	0.21	0.25	0.83	0.21	0.25
6	0.61	0.69	1.13	0.58	0.53	0.93	0.77	0.95	1.23	0.80	1.06	1.32
7	0.62	0.13	0.21	0.61	0.14	0.22	0.60	0.11	0.19	0.60	0.12	0.20
8	2.26	0.50	0.22	2.25	0.52	0.23	2.29	0.51	0.22	2.30	0.50	0.22
9	0.74	0.17	0.23	0.74	0.18	0.24	0.75	0.17	0.22	0.75	0.16	0.21
10	2.90	0.64	0.22	2.88	0.68	0.24	3.02	0.66	0.22	3.03	0.68	0.22
11	1.05	0.24	0.23	1.08	0.27	0.25	1.07	0.23	0.22	1.10	0.25	0.23
12	4.82	5.07	1.05	6.52	6.81	1.04	5.40	5.68	1.05	7.65	7.86	1.03
13	6.06	1.38	0.23	6.14	1.50	0.24	6.45	1.33	0.21	6.57	1.47	0.22
14	5.26	6.62	1.26	6.55	7.34	1.12	4.66	5.56	1.19	5.82	6.08	1.04
15	1.01	0.21	0.21	1.01	0.21	0.21	1.09	0.21	0.20	1.09	0.23	0.21
16	1.08	0.28	0.26	1.09	0.28	0.26	1.08	0.21	0.20	1.09	0.22	0.20
17	2.58	0.42	0.16	2.58	0.44	0.17	2.65	0.43	0.16	2.63	0.43	0.16
18	2.47	0.54	0.22	2.45	0.54	0.22	2.65	0.71	0.27	2.67	0.71	0.27
19	1.10	0.26	0.24	1.08	0.26	0.24	1.05	0.21	0.20	1.02	0.20	0.20
20	2.60	0.44	0.17	2.60	0.46	0.18	2.84	0.62	0.22	2.88	0.66	0.23
21	0.99	0.24	0.24	1.00	0.26	0.26	1.02	0.21	0.20	1.02	0.21	0.21
22	4.00	0.70	0.17	4.07	0.80	0.20	4.08	0.72	0.18	4.09	0.74	0.18
22A	4.32	0.79	0.18	4.43	0.86	0.19	4.35	0.78	0.18	4.33	0.72	0.17
22B	3.96	0.67	0.17	4.02	0.78	0.20	4.04	0.70	0.17	4.06	0.74	0.18
23	2.02	0.39	0.19	2.05	0.38	0.19	1.90	0.43	0.23	1.89	0.41	0.22
24	8.32	1.44	0.17	8.05	1.33	0.17	7.40	1.58	0.21	7.51	2.05	0.27
25	9.27	1.54	0.17	8.98	1.53	0.17	8.11	1.80	0.22	8.15	1.95	0.24
26	0.56	0.10	0.18	0.54	0.10	0.19	0.48	0.09	0.19	0.47	0.09	0.19
27	3.61	0.51	0.14	3.47	0.51	0.15	3.18	0.48	0.15	3.14	0.51	0.16
28	0.45	0.13	0.30	0.42	0.12	0.27	0.39	0.13	0.33	0.38	0.12	0.30
29	1.25	0.25	0.20	1.32	0.25	0.19	1.21	0.18	0.15	1.19	0.19	0.16

The three links with the highest average transit time (links 4, 24, and 25) are the longest in length. However, they have relatively low variabilities in standard deviation and coefficient of variation, as would be expected with the lack of development along those segments. In the coefficient of variation columns, three links—6, 12, and 14—stand out in red. As discussed in the previous section, links 12 and 14 have large variabilities of travel times. It is not unexpected considering the floodgates and locks are in these links. Link 6 is a short segment located at the intersection of the GIWW channel and the Port of

Houston/Texas City/Galveston (Figure 13). Therefore, the large variability could be due to friction between the GIWW vessels and oceangoing vessels.

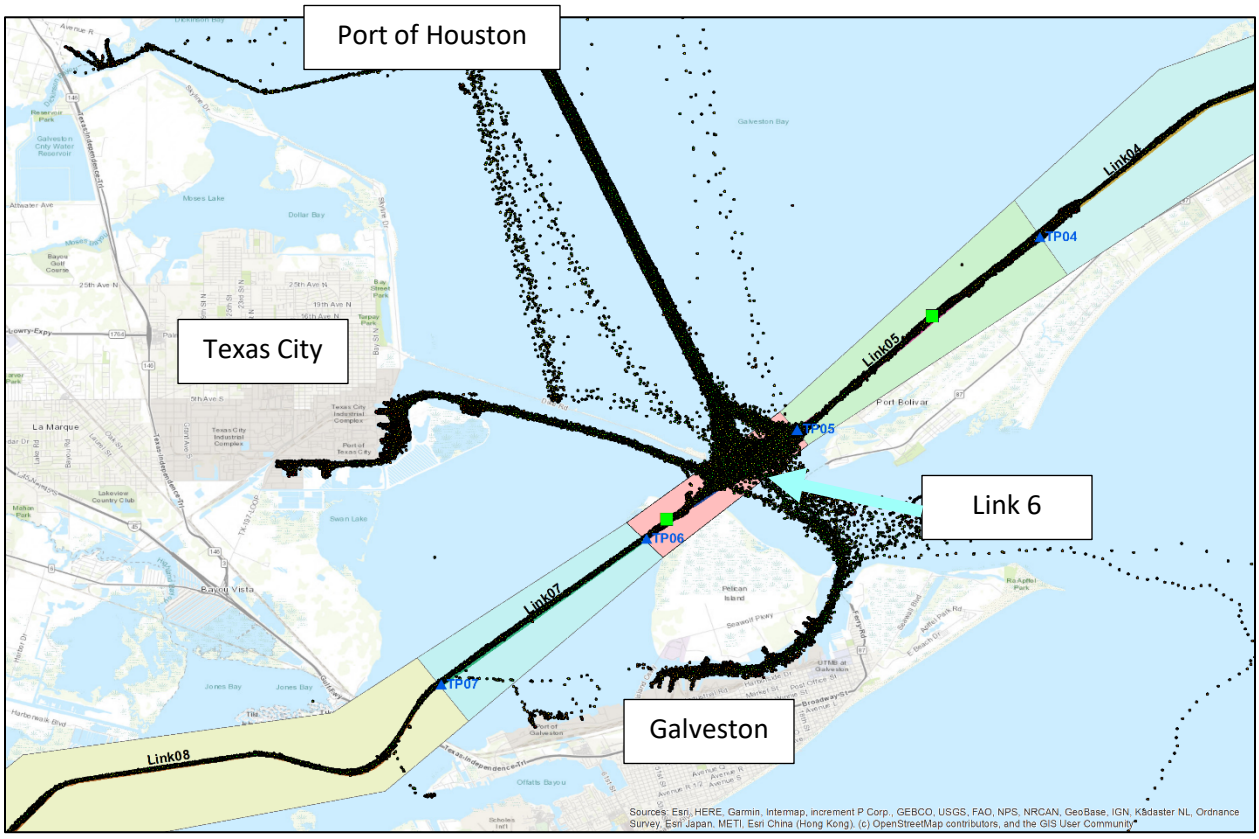


Figure 13. GIWW Link 6 and AIS Trajectories.

Lock and Floodgate Operations

The locks and floodgates are often left in the open position, and vessels can pass through without operating the equipment. Since the floodgates do not operate as locks where a closed chamber is filled or emptied to match external water levels, they only affect traffic when certain river conditions are present, as shown in Table 10.[3] The Colorado River locks are normally operated as floodgates, using only the riverside gates of each lock. In the 2018 USACE Lock Performance Monitoring System data, 92 percent of the transits were through open locks; 823 transits required the operation of the locks. These lockages were single-pass lockages—tows did not have to be split and passed in multiple operations.

Restrictions on vessel transits are primarily based on river conditions. Table 10 and Table 11 summarize these restrictions.

[3] The Code of Federal Regulations (33 CFR §207.187) contains a complete description of restrictions and definitions of terms.

Table 10. Existing Navigation Restrictions—Brazos River Crossing.

Condition	River Velocity	Head Differential	Restriction
1	Over 2 mph	0.7 to 1.8 ft	• Single vessel passage • Tows with single loaded barges • Tows with two empty barges • Velocity reaches 1.7 mph, tows with two empty barges only
2	—	Over 1.8 ft	Closed
3	Over 5 mph	—	• Single vessel passage • Tows with one barge only loaded or empty • Operation during daylight hours only
4	Over 7 mph	—	Closed

Table 11. Existing Navigation Restrictions—Colorado River Locks.

Condition	River Velocity	Restriction
1	2 mph (3.0 fps) or higher	• Single vessel passage • Tows with one loaded barge or two empty barges
2	Over 7 mph	Closed

Passage may also be prohibited while repairs are under way.

Link Total Travel Time above Baseline

The study estimated the annualized link total travel time above the baseline from 2018 and 2019 AIS data. The baseline travel time is defined as a travel time of a link when a vessel navigates the link without any interruption or impediments. In this study, 25th percentile link travel time is used as a proxy for the baseline travel time.

The total travel time above the baseline for a link is equal to the sum of the time spent above the baseline of all transits for the time period, and depends on both the number of transits with travel time above the baseline for the time period and the amount of travel time above the baseline for each transit. By definition, total travel time above the baseline does not distinguish between a link with many transits with small travel times above the baseline and a link with few transits each with large travel time above the baseline. However, the link travel time distribution plots could provide additional information about the skewness of the transit times. Appendix C includes the link travel time histograms by year by direction.

Figure 14 shows the total travel time above the baseline in 2018 and 2019. In the figure, the links that stand out are the links with relatively long distance, floodgates, or locks.

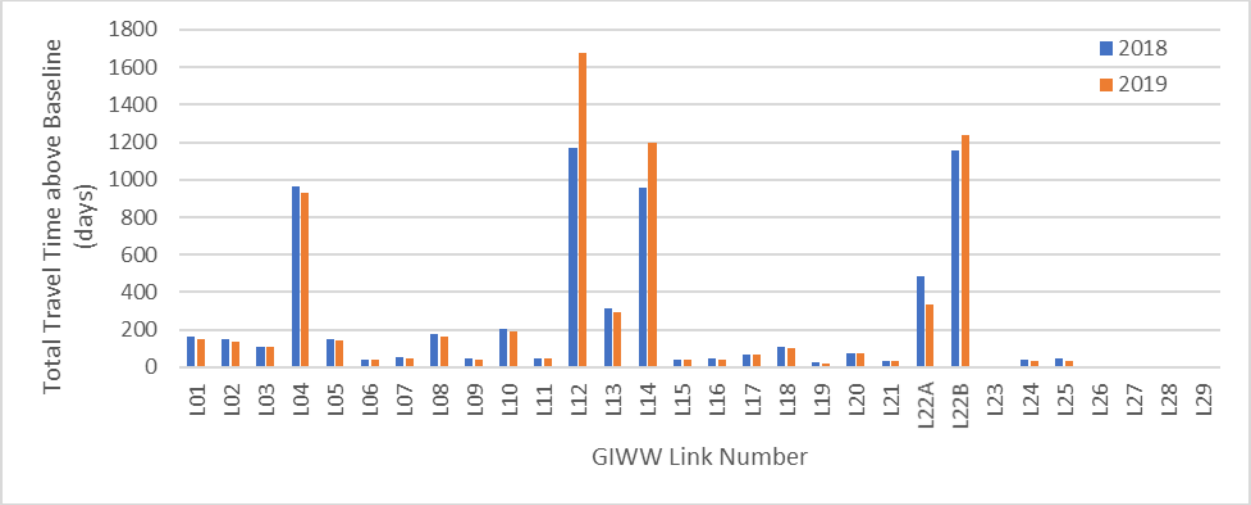


Figure 14. GIWW Total Travel Time above Baseline by Link, 2018 and 2019.

To exclude the effect of the different link lengths, the per-mile total travel time above the baseline is calculated and plotted in Figure 15. Now the figure shows that links 12 and 14 are major areas of delay though the length is relatively short (6 miles each).

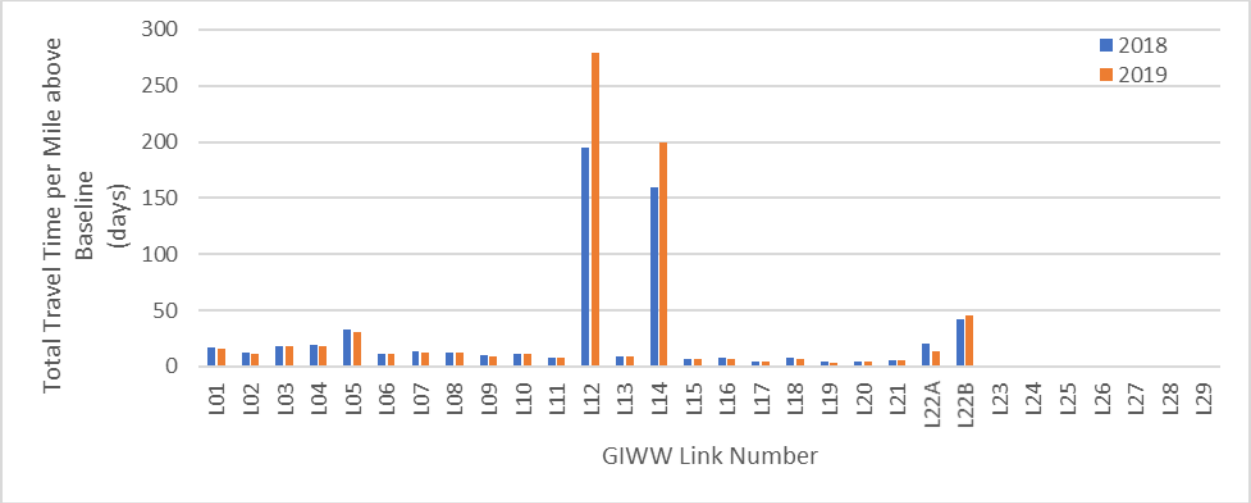


Figure 15. GIWW Total Travel Time per Mile above Baseline by Link, 2018 and 2019.

O-D Travel Times

This study analyzed various travel time statistics for the links between the O-D locations from 2018 and 2019 AIS data. The most accurate travel time estimates would be calculated from the vessel trips that navigate the O-D points in one path of a trip. However, this path-based approach usually suffers from a lack of enough samples when the distance between the origin and the destination increases, or the sample includes areas with very low traffic volumes for various reasons. In this section, a link-based approach is used. That is, all the links' average travel times between an origin and a destination are added together. Percentiles are not calculated because with the differences in the lengths of links and the cutoff parameters, the percentiles are likely to produce erroneous results.

Table 12 and Table 13 show the annual average travel time between major O-Ds in the Texas GIWW for 2018 and 2019. The values in the table are directional. For example, in the 2018 Table 12, the westbound average travel time, 78.63 hours, from the Port Arthur eastern boundary to the Port Brownsville eastern boundary is different from the eastbound travel time, 77.32 hours, from the Port of Brownsville eastern boundary to the Port Arthur eastern boundary.

Table 12. Annual Average Travel Times between O-Ds (Hours), 2018.

Origin/Destination	Port Arthur Eastern Boundary	Port of Houston/ Galveston/ Texas City	Port Freeport Western Boundary	Corpus Christi Eastern Boundary	Port of Brownsville Eastern Boundary
Port Arthur eastern boundary	—	13.04	21.19	53.16	78.63
Port of Houston/ Galveston/ Texas City	13.19	—	7.57	39.53	65.00
Port Freeport western boundary	21.68	7.72	—	31.96	57.43
Corpus Christi eastern boundary	54.64	40.69	32.97	—	25.47
Port of Brownsville western boundary	77.32	63.37	55.64	22.68	—

Table 13. Annual Average Travel Times between O-Ds (Hours), 2019.

Origin/Destination	Port Arthur Eastern Boundary	Port of Houston/ Galveston/ Texas City	Port Freeport Western Boundary	Corpus Christi Eastern Boundary	Port of Brownsville Eastern Boundary
Port Arthur eastern boundary	—	12.78	20.91	55.99	80.82
Port of Houston/ Galveston/ Texas City	13.00	—	7.55	42.63	67.47
Port Freeport western boundary	21.57	7.77	—	35.08	59.92
Corpus Christi eastern boundary	58.09	44.29	36.52	—	24.83
Port of Brownsville western boundary	80.82	67.01	59.25	22.72	—

For both tables, eastbound (northbound) trips take slightly longer between the same O-D pair, except the pairs with the Port Brownsville eastern boundary. For example, the eastbound (northbound) annual average travel time from the Corpus Christi eastern boundary to the Port Arthur eastern boundary, 54.64 hours, is longer than the westbound (southbound) travel time, 53.16 hours, in the same pair. It

holds for the rest of the pairs except the last row or column including the Port of Brownsville eastern boundary.

Comparison between Link-Based and Path-Based Travel Time Calculation

The calculation of the average travel times between O-D pairs in the previous section used a link-based approach where the individual average travel times of each link between an O-D were added together. A path-based approach is preferable but requires relatively homogeneous characteristics between the links in the O-D pair to produce reliable estimates. This assumption could not be guaranteed in every situation.

Figure 16 illustrates the difference between a link-based and a path-based estimate between the Port Arthur eastern boundary and the Port of Houston/Galveston/Texas City. As shown in the diagram, the link-based route consists of four consecutive links that have the samples collected separately. Therefore, the sample distributions are different from each other. On the other hand, the path-based route has samples collected from the vessel trips that make a complete voyage as one link between the two O-D locations. Inherently, the path-based approach gives more reliable estimates. However, for a path-based approach to work, every combination of O-D pairs has to have its own samples and be evaluated independently. It is not always practical when the survey area is large and the number of time periods is increasing.

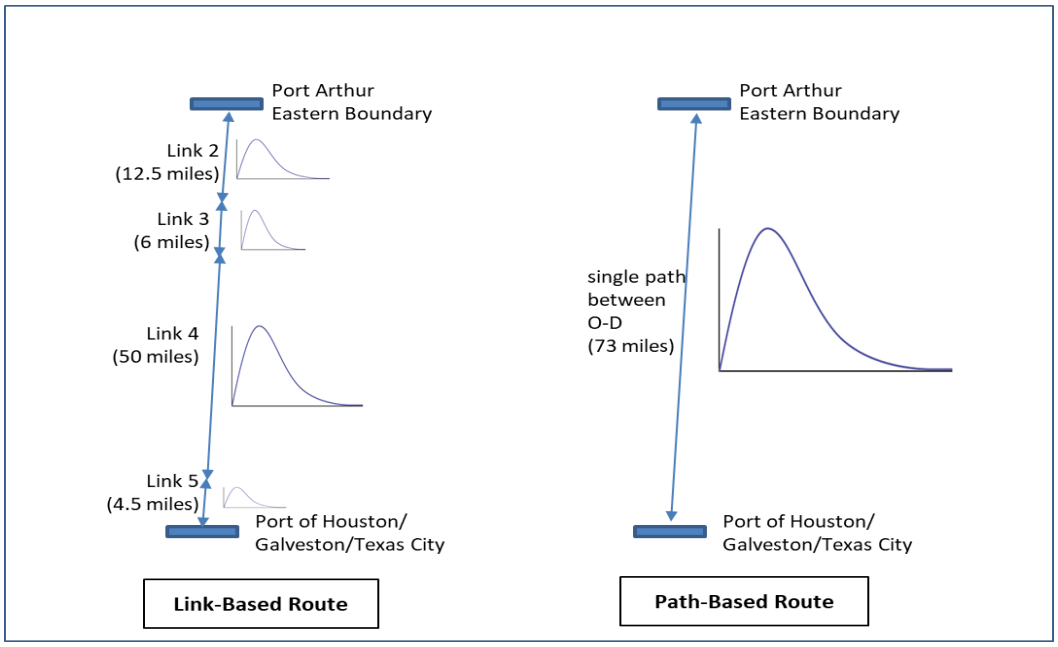


Figure 16. Schematic Diagram of Link-Based and Path-Based Travel Time Calculation.

Records that were eliminated from a link because of excessive travel time could still be included in the path-based calculation if they do not have an excessive travel time for the entire path. This would cause the link-based estimates to be less than the path-based estimates, which is what actually occurred. Table 14 compares the travel time estimates for the link-based and the path-based calculations. As shown in the table, the link-based estimate is about 10 percent less than the path-based estimate for an O-D pair between the Port Arthur eastern boundary and the Port of Houston/Galveston/Texas City. The difference between the two approaches could be larger for an O-D pair that includes complex links.

Table 14. Comparison of Travel Times (Hours) Using Link-Based and Path-Based Approaches.

O-D Pair between Port Arthur Eastern Boundary and Port of Houston/Galveston/Texas City		2018		2019	
		Eastbound (Northbound)	Westbound (Southbound)	Eastbound (Northbound)	Westbound (Southbound)
Average travel time	Link based	13.19	13.01	13.00	12.79
	Path based	14.52	14.45	14.37	14.39
25th percentile travel time	Link based	11.08	10.92	11.00	10.67
	Path based	12.00	11.83	11.83	11.67
50th percentile travel time	Link based	12.75	12.33	12.5	12.17
	Path based	13.83	13.58	13.67	13.42
75th percentile travel time	Link based	14.58	14.25	14.33	14.00
	Path based	16.42	16.50	16.25	16.67
Number of samples	Link based	4,360~9,155	4,369~8,219	4,353~8,696	4,386~7,575
	Path based	4,299	3,710	4,286	3,659

Note: Link-based samples indicate the lowest link sample and the highest link sample.

Figure 17 shows the weekly average travel times between link 12 (Port Freeport) and link 22 (Corpus Christi) for 2018 and 2019. Overall, the link-based average travel time is 30 percent less than the path-based average travel time. This indicates that the floodgates at link 12 and the locks at link 14 introduced more variability.

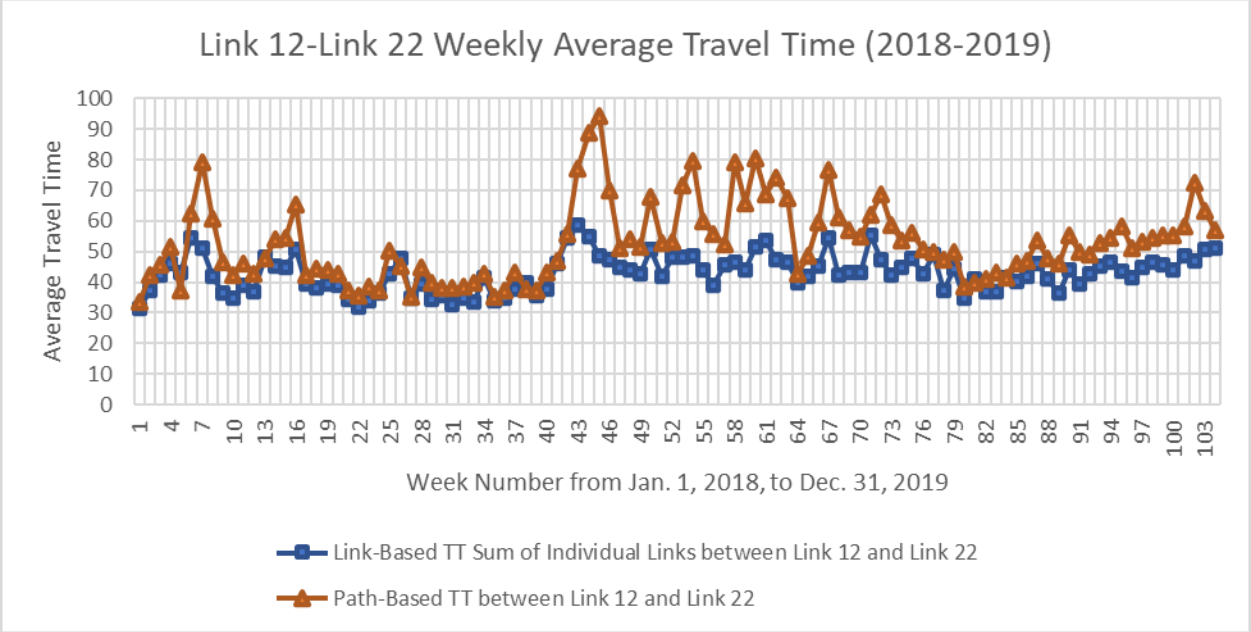


Figure 17. Link-Based and Path-Based Weekly Travel Time Plot.

CHAPTER 4: STATISTICAL ANALYSIS: FORECASTS AND SPECIAL CONDITIONS

Based on the travel times calculated in Chapter 3, the research team developed a methodology to obtain travel time forecast projections and to assess if, and how, special conditions affect such travel times.

This methodology was divided in two phases:

- Phase 1 focuses on the forecast projections.
- Phase 2 focuses on evaluating the impacts of special conditions on travel times.

This chapter describes the methodologies, methods, and results of these analyses.

Phase 1—Forecast Projections

The input data consisted of 104 data points representing 2 years (2018 and 2019) of weekly travel time averages for 31 different links.[4] No other data were available that could help explain travel time behavior, and therefore there were no explanatory or dependent variables. Because of this lack of explanatory variables, the dataset is formed of a single series per link. Given this characteristic of the data, the researchers opted to evaluate two statistical techniques: autoregressive integrated moving average (ARIMA) and exponential smoothing.

The methodology included the following steps:

1. Data preliminaries:
    a. Visualize the data.
    b. Test for stationarity.
    c. Test for autocorrelation and partial autocorrelation.
2. Lag selection.
3. Forecasts:
    a. Separate the data sample in three groups: Training data, ex post, and ex ante.
    b. Select model (ARIMA and exponential smoothing).

Data Preliminaries

Data preliminaries look at assessing the data for features needed to identify the correct model for forecasting. These features include:

- Cyclicity: repeating patterns spanning longer than 1 calendar year.
- Seasonality: repeating patterns observed within 1 calendar year.
- Stationarity: a time series that does not vary over time (i.e., mean and variance are not dependent on time periods)
- Autocorrelation: the level of correlation with past values in a single time series.

[4] There is an extra link in this analysis. The GIWW splits in the vicinity of Port Aransas, with the two branches coming together at the Corpus Christi Ship Channel. The branch known as the Lydia Ann Channel is the more heavily transited of the two. The two branches were evaluated independently here.

- Partial autocorrelation: the level of correlation with specific past values without the effects of (i.e., controlling for) intervening values.

Data visualization is a first step that helps determine stationarity and autocorrelation. In addition, researchers used the Dickey-Fuller test to determine stationarity; and correlograms, Box-Pierce's Q statistic tests, Schwarz's Bayesian info criteria, the Akaike's information criteria, and the Hannan and Quin information criterion procedures to evaluate correlation and partial autocorrelation. These tests helped in proper selection of lags.

Lag Selection

The selection of lags is the process to identify which of the previous periods will be included as moving average, integrated, and autoregressive components. This is fundamental in ARIMA models since too many lags could increase the error in the forecast, whereas too few could leave out relevant information. Specifically, autocorrelation helps in identifying the moving average order, and partial autocorrelation helps in determining autoregressive order. The integration component, which denotes taking differences from specific lags, is only necessary when the time series show evidence of being non-stationary.

Forecasts

Finally, researchers developed the forecasts by splitting the data into:

- Estimation sample or training data: a subsample of the data used as input for the model.
- Ex-post test forecast: a subsample of the data used as a benchmark for model comparison.
- Ex-ante forecast: an actual projection based on the best selected model.

The research team used 100 observations as training data and retained four observations for test forecasts for the ARIMA models. In the case of the exponential smoothing, because there was no need to select the best model lags, the whole sample was used for forecasting.

Researchers selected the best ARIMA model using the residual mean square error, mean absolute error, and mean average percentage error (MAPE). Then researchers used the MAPE to decide between the best ARIMA model and the exponential smoothing model.

Although 52 weeks were projected into the future using the selected model, the research team recommends considering only 12 weeks as forecasts. This is because all these methods tend to converge to single values the farther into the future the forecast goes.

Phase 1 Results

Table 15 shows the forecasted values in hours for the first 12 weeks (i.e., weeks 105–116) per link with total travel time at the bottom (considering traveling throughout all links).

Table 15. 12 Weeks Forecasts per Link (Hours).

Link	O-D Pair	105	106	107	108	109	110	111	112	113	114	115	116
1	Louisiana border to Port Beaumont/Port Arthur upstream boundary	1.43	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42
2	Port Beaumont/Port Arthur upstream boundary to Port Arthur downstream boundary	1.96	1.95	1.93	1.96	1.98	1.93	1.96	1.94	1.94	1.94	1.94	1.96
3		1.04	1.01	1.00	1.02	1.01	1.03	1.00	1.01	1.01	1.02	1.02	0.99
4	Port Arthur downstream boundary to Port Houston/Pelican Island mooring	9.52	9.55	9.58	9.60	9.62	9.64	9.65	9.66	9.66	9.65	9.65	9.63
5		0.87	0.87	0.87	0.87	0.87	0.87	0.86	0.86	0.86	0.86	0.86	0.86
6	Port of Houston/Galveston/Texas City	0.73	0.76	0.78	0.80	0.82	0.83	0.84	0.85	0.85	0.86	0.86	0.87
7	Port Houston/Pelican Island mooring to Chocolate Bayou	0.62	0.62	0.62	0.62	0.62	0.61	0.61	0.61	0.61	0.61	0.61	0.61
8		2.27	2.27	2.28	2.28	2.28	2.27	2.27	2.27	2.28	2.28	2.27	2.27
9		0.75	0.75	0.75	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
10	Chocolate Bayou to Port Freeport upstream boundary	2.97	2.97	2.96	2.96	2.96	2.96	2.96	2.96	2.96	2.96	2.96	2.96
11	Port Freeport upstream boundary to Port Freeport downstream boundary	1.11	1.09	1.10	1.11	1.09	1.09	1.10	1.08	1.08	1.10	1.08	1.08
12	Port Freeport downstream boundary to Colorado River	6.92	6.82	6.74	6.66	6.59	6.54	6.49	6.44	6.40	6.37	6.33	6.31
13		6.41	6.32	6.32	6.32	6.32	6.32	6.32	6.32	6.32	6.32	6.32	6.32
14	Colorado River industry	5.79	5.69	5.67	5.67	5.67	5.67	5.67	5.67	5.67	5.67	5.67	5.67
15	Colorado River to Calhoun	1.06	1.06	1.06	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
16		1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
17	Port Lavaca (Calhoun Port Authority)	2.63	2.60	2.62	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.61
18	Calhoun to Victoria	2.61	2.60	2.60	2.60	2.60	2.59	2.59	2.59	2.59	2.58	2.58	2.58
19	Port of Victoria	1.06	1.09	1.05	1.07	1.08	1.05	1.07	1.07	1.05	1.07	1.06	1.06
20	Victoria to Corpus Christi upstream boundary	2.67	2.71	2.77	2.71	2.69	2.69	2.75	2.73	2.71	2.70	2.76	2.69
21		1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
22		4.08	4.06	4.04	4.03	4.01	4.00	3.99	3.98	3.97	3.96	3.96	3.95
22A	Aransas Pass	4.28	4.23	4.17	4.13	4.09	4.05	4.02	3.99	3.96	3.94	3.92	3.90
22B	Lydia Ann Channel	4.04	4.03	4.02	4.01	4.00	3.99	3.98	3.97	3.97	3.96	3.96	3.95
23	Corpus Christi upstream boundary to Corpus Christi downstream boundary	1.95	1.98	2.00	2.02	2.03	2.03	2.02	2.01	1.99	1.98	1.96	1.96
24		7.74	7.80	7.84	7.88	7.91	7.94	7.95	7.97	7.98	7.99	8.00	8.01

Link	O-D Pair	105	106	107	108	109	110	111	112	113	114	115	116
25	Corpus Christi downstream boundary to Arroyo Colorado upstream boundary	8.51	8.51	8.51	8.51	8.51	8.51	8.51	8.51	8.50	8.50	8.50	8.50
26	Arroyo Colorado upstream boundary to downstream boundary (Port of Harlingen)	0.53	0.53	0.50	0.51	0.51	0.52	0.51	0.52	0.53	0.52	0.52	0.51
27	Arroyo Colorado to Port Isabel upstream boundary	3.32	3.32	3.33	3.33	3.33	3.34	3.34	3.34	3.35	3.35	3.35	3.35
28	Port Isabel upstream boundary to Port Isabel downstream boundary	0.41	0.43	0.44	0.44	0.45	0.45	0.45	0.46	0.46	0.46	0.46	0.46
29	Port Isabel downstream boundary to Port Brownsville upstream boundary	1.19	1.19	1.19	1.19	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
TTT		90.55	90.29	90.25	90.22	90.14	90.03	90.04	89.94	89.83	89.76	89.72	89.55

Note: TTT is the total travel time.

Figure 18 shows the behavior of travel times for the last 12 weeks of data and the forecasted weeks for all links, with total travel time at the top (red dotted line). The black dotted vertical line separates actual data (last 12 weeks on the left) from forecasted values.

Table 15 and Figure 18 show that the forecasted values behave more smoothly (i.e., less variably) than actual travel times. This is expected because researchers only had a single time series of data, and therefore the necessary use of ARIMA and exponential smoothing tended to converge to specific values in the long run.

Some of the variability in the actual values may be explained by special conditions, which were not considered in the first phase of the analysis. Therefore, researchers performed an additional phase to assess the effects of such special conditions.

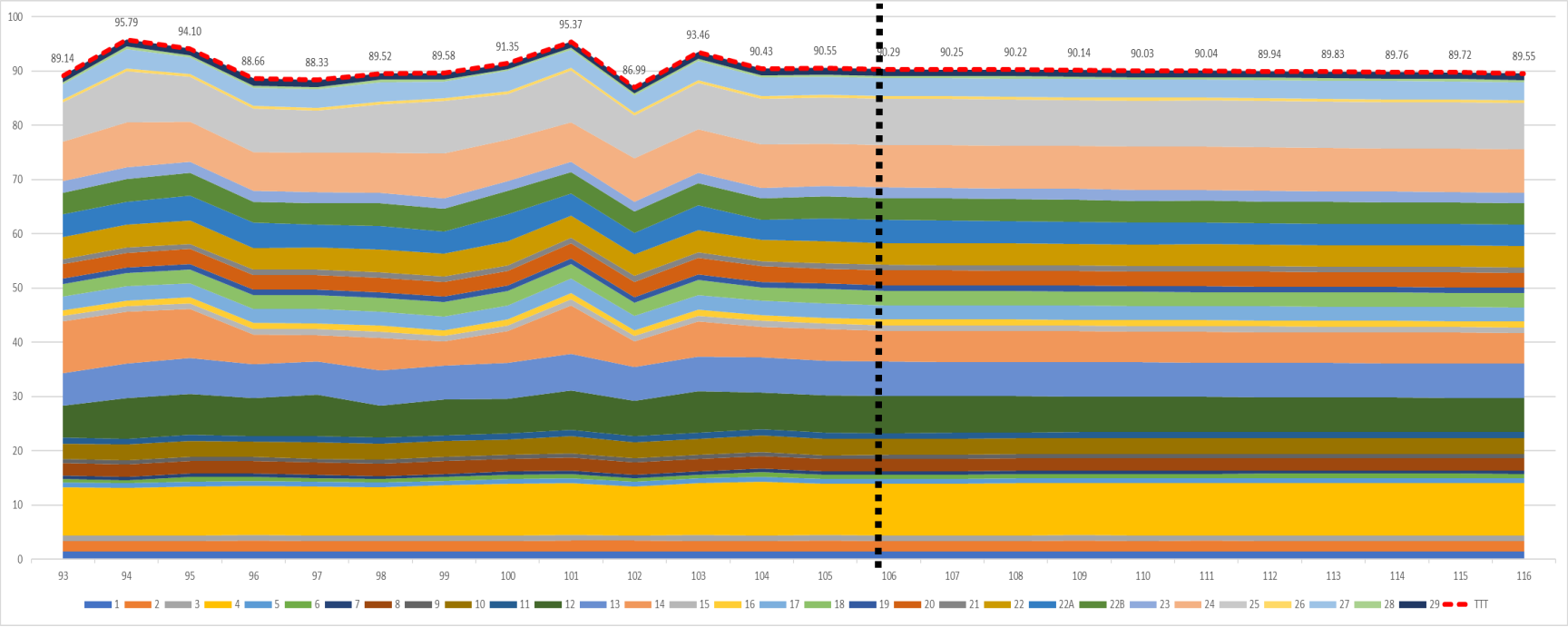


Figure 18. Travel Times for Last 12 Weeks of Data and Forecasted Travel Times.

Phase 2—Special Conditions

The research team obtained information on the following special conditions:

- Dredging: the presence of dredging equipment in or adjacent to the channel.
- Shoaling: a reduction in available draft large enough to warrant a notice to mariners.
- Bridge closure: the closure of the channel due to bridge construction activity.
- Submerged vessel: the presence of a submerged vessel in the vicinity of the channel.
- Construction: the placement of rip-rap along the banks of the GIWW.
- Lock closure: the closure of a lock or floodgate to all traffic for a defined period.
- Submerged pipe: the presence of a submerged pipe in or near the channel.
- Bridge clearance: a reduction in the clearance in terms of width/and or height at a bridge crossing.
- Submerged obstruction: the presence of an unidentified submerged object in or near the channel.
- Regatta: a recreational event requiring the use of the channel.

The information gathered on these special events was coded binary (i.e., 1 denoting occurrence and 0 denoting no presence of a corresponding event or condition) and was allocated to each link and time period (i.e., week) in order to match travel time data used in Phase 1.

In addition, researchers included sample count information (the number of complete trips through the link) to assess its relevance and impact on travel times.

Phase 2 Steps

In Phase 2, the methodology included the following steps:

1. Check linearity.
2. Check collinearity/independence.
3. Check homogeneity and normality.
4. Run linear or non-linear models.
5. Select a model.

The linearity check between the sample count and travel time was necessary to decide the general type of models to use for assessing the effects of the number of trips on transit time. Because different special conditions may exist at the same time in the same link, collinearity was assessed to evaluate the redundancy of special conditions. If redundancy in the form of collinearity is found, then special conditions should be evaluated in different models, and thus not combined in a single model, to estimate their effects more accurately. Homogeneity and normality are assumptions needed in linear models. Homogeneity looks at having a steady or constant variability (i.e., variance) through different values of the explanatory variable (i.e., sample count). Normality looks at the shape of the distribution, which when not normal would yield inaccurate results using simple linear regression, and thus other techniques such as generalized linear models should be implemented.

When the relation between sample counts and travel times was not linear, researchers evaluated eight different non-linear models:

- Exponential trend.

- Logarithmic.
- Power curve.
- Reciprocal.
- Log reciprocal.
- Modified exponential.
- Gompertz.
- Logistic.

Researchers used the R-squared and adjusted R-squared statistical measures to determine the best model.

Phase 2 Results

The statistical analysis suggested that sample count (i.e., completed trips through a link) did not influence travel time significantly in any link. These results could be because the time period used as the unit of measurement was far larger than the average travel time for each link. In other words, one would expect that the amount of traffic in a given link would affect travel time in the same link. This is analogous to the effect of road congestion in road travel time. However, in order to capture this effect, the time unit of measurement should be at the adequate resolution to the actual travel time. For instance, if travel time is a few hours but the time unit of measurement is a week—as in this case—then the variations in travel time counted in hours due to the number of vessels traveling in the same link would dilute and/or net out when averaged over a week. For a model to capture such effects, the unit of measurement should be hours or days since travel time averages for a single link are between 0.41 hours (i.e., 24.6 minutes) and 9.25 hours for links 28 and 4, respectively. Unfortunately, data did not allow the necessary resolution to adequately capture effects due to changes in the number of trips (sample counts) on travel time. (If researchers count the number of vessels per hour, even the highest number is two vessels per hour [at link 5]).

Nevertheless, researchers were able to obtain the effects of special conditions on travel time. Specifically, the statistical analysis deemed two special conditions as relevant for travel time: dredging and shoaling. The effects yielded by the analysis were in the form of magnitude and probability of occurrence. On average, when dredging is present in a link, there is a probability of 78.9 percent that travel time for that link increases by 0.38 hours (i.e., 23 minutes). Similarly, when shoaling is present on any link, there is a probability of 64.7 percent that travel time for that link increases by 0.35 hours (i.e., 21 minutes). These probabilities provide an idea of the general effects of these two special conditions; however, specific effects vary from link to link. Figure 19 and Figure 20 show the individual effects per link. The blue columns represent the magnitude of the effect in hours, and the orange dots represent the probability of that effect occurring.

Several links do not show effects mostly due to the lack of special conditions on those links.

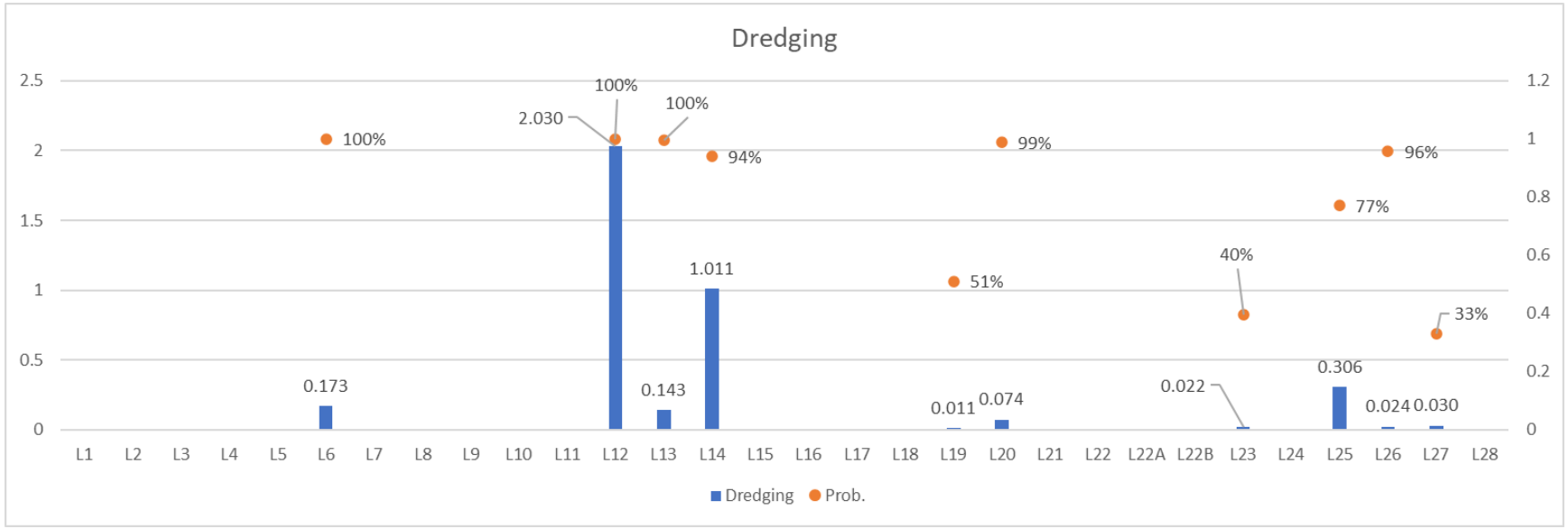


Figure 19. Individual Effects (Magnitude in Hours and Probability of Occurrence as Percentage) per Link—Dredging.

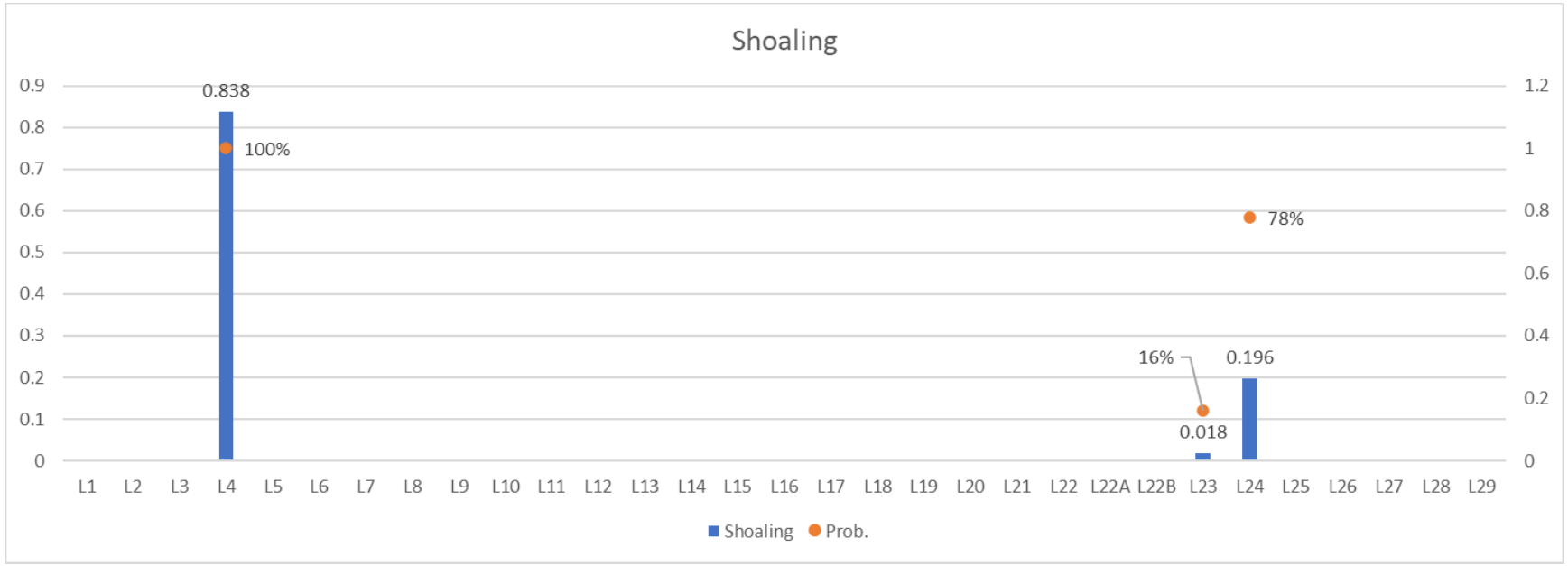


Figure 20. Individual Effects (Magnitude in Hours and Probability of Occurrence as Percentage) per Link—Shoaling.

CHAPTER 5: CONCLUSIONS/FUTURE RESEARCH

Based on statistics published by WCSC, AIS data provide a reasonably robust sample for the calculation of performance measures. Much of the effort involved in using AIS data is focused on cleaning the data and reducing it to the inland towing traffic that uses the GIWW.

The GIWW is a very complex waterway. Because it crosses 11 ship channels and connects to numerous shallow-draft channels, the waterway must be segmented into fairly small links in order to properly evaluate performance. Future research my want to investigate the interactions with these connections.

Since there is no current on the GIWW (as there would be on a river), no significant variations in travel times by direction were expected, and this turned out to be the case. The links containing the Brazos River Floodgates and the Colorado River Locks showed a high degree of variability in travel times. This could be because of congestion at the structures or possibly a hesitancy to cross the rivers when conditions are suboptimal.

A path-based approach is the preferred method for calculating travel times between O-D pairs, but some practical considerations led the researchers to opt for the use of link-based travel times. A path approach requires a separate sample to be developed and maintained for each O-D pair, and each pair must be evaluated independently. Given the complexity of the GIWW, this was not a viable approach for this research.

The statistical analysis was divided in two phases. The first phase looked at developing the forecast projections for travel time based on historical data. The second phase focused on assessing the effects of special conditions on travel time. Researchers also explored the relation of the number of trips (i.e., sample count) with travel time in this last phase of the analysis.

Results from Phase 1 show that forecasted projections smooth out the deeper they go into the future. This is because, due to data availability, projections were based exclusively on the historical data of the same target variable; or, in other words, projections used historical information—past values—of travel time to predict the future. The latter determined the type of statistical tools researchers implemented and resulted in the selection of a smoothing type of model. Therefore, researchers recommend the use of only the first 12 (weeks) of projections.

Phase 2 analysis found no significant relation between sample count and travel time. This is likely because of an imbalance in magnitude between the time period used as a unit of measurement (week) and the average travel time for each link (hours). Analogous to the effect of road congestion in road travel time, to capture such effects, the magnitude of the unit of measurement should be in accordance with average travel time; more specifically, for this type of research, the unit of measurement should be in hours or days since travel time averages for a single link are between 0.41 hours (i.e., 24.6 minutes) and 9.25 hours. Unfortunately, the data did not allow the necessary resolution to adequately capture said effects.

Researchers found two special conditions relevant for travel time: dredging and shoaling. These effects were in the form of magnitude of impact and the probability of that impact occurring when the special condition is present. On average, when dredging is present, there is a probability of 78.9 percent that travel time increases by 0.38 hours (i.e., 23 minutes). Similarly, when shoaling is present on any link,

there is a probability of 64.7 percent that travel time increases by 0.35 hours (i.e., 21 minutes). These probabilities provide an idea of the general effects of these two special conditions; however, specific effects vary from link to link, as shown in Figure 19 and Figure 20.

The methodology developed provides quantitative results that predict, describe, and validate future travel time behaviors based on specific factors. Users of the GIWW can use statistics such as those provided by this study to have a sense of estimated travel time and potential effects of special conditions in a link they may need to traverse. If this type of study is performed regularly, it would highlight significant changes in links and allow analysts to focus on trouble spots along the waterway. Such data will also aid in planning the timing and magnitude of maintenance activities on the GIWW.

Future research should focus on obtaining additional data that enable more robust projections by not relying on a single time series. Also, a higher resolution should be considered in order to balance the time unit of measurement with average travel time, and to be able to assess traffic effects on travel time. In addition, expanding the analysis to include additional years (e.g., 2020) could provide more data to increase the sample size and make more accurate predictions and assessments, above all for the special effects but also to investigate the effects of other special conditions such as pandemic impacts.

APPENDIX A: AIS MESSAGES

There are 27 defined AIS message types. Types 28–63 are undefined and reserved for future use.

Only a few of these types are relevant to the study objectives. Types 1–3 are various position reports. Type 5 is static and voyage-related data. This appendix shows the contents of these message types (*4*). For this study, USACE stripped unnecessary fields and consolidated relevant information into single records for each vessel at 5-second intervals.

Message Types 1, 2, and 3: Position Reports

Parameter	Number of Bits	Description
Message ID	6	Identifier for this message 1, 2 or 3
Repeat indicator	2	Used by the repeater to indicate how many times a message has been repeated. See Section 4.6.1, Annex 2; 0-3; 0 = default; 3 = do not repeat any more.
User ID	30	MMSI number
Navigational status	4	0 = under way using engine 1 = at anchor 2 = not under command 3 = restricted maneuverability 4 = constrained by her draught 5 = moored 6 = aground 7 = engaged in fishing 8 = under way sailing 9 = reserved for future amendment of navigational status for ships carrying DG, HS, or MP, or IMO hazard or pollutant category C, high speed craft (HSC) 10 = reserved for future amendment of navigational status for ships carrying dangerous goods (DG), harmful substances (HS) or marine pollutants (MP), or IMO hazard or pollutant category A, wing in ground (WIG) 11 = power-driven vessel towing astern (regional use) 12 = power-driven vessel pushing ahead or towing alongside (regional use) 13 = reserved for future use 14 = AIS-SART (active), MOB-AIS, EPIRB-AIS 15 = undefined = default (also used by AIS-SART, MOB-AIS and EPIRB-AIS under test)

Parameter	Number of Bits	Description
Rate of turn ROT_{AIS}	8	0 to +126 = turning right at up to 708 deg per min or higher 0 to -126 = turning left at up to 708 deg per min or higher Values between 0 and 708 deg per min coded by ROT_{AIS} = 4.733 SQRT(ROT_{sensor}) degrees per min where ROT_{sensor} is the Rate of Turn as input by an external Rate of Turn Indicator (TI). ROT_{AIS} is rounded to the nearest integer value. +127 = turning right at more than 5 deg per 30 s (No TI available) -127 = turning left at more than 5 deg per 30 s (No TI available) -128 (80 hex) indicates no turn information available (default). ROT data should not be derived from COG information.
SOG	10	Speed over ground in 1/10 knot steps (0-102.2 knots) 1 023 = not available, 1 022 = 102.2 knots or higher
Position accuracy	1	The position accuracy (PA) flag should be determined in accordance with the table below: 1 = high (<= 10 m) 0 = low (> 10 m) 0 = default
Longitude	28	Longitude in 1/10 000 min (+/-180 deg East = positive (as per 2's complement) West = negative (as per 2's complement). 181= (6791AC0h) = not available = default)
Latitude	27	Latitude in 1/10 000 min (+/-90 deg, North = positive (as per 2's complement), South = negative (as per 2's complement). 91deg (3412140h) = not available = default)
COG	12	Course over ground in 1/10 = (0-3599). 3600 (E10h) = not available = default. 3 601-4 095 should not be used
True heading	9	Degrees (0-359) (511 indicates not available = default)
Time stamp	6	UTC second when the report was generated by the electronic position system (EPFS) (0-59, or 60 if time stamp is not available, which should also be the default value, or 61 if positioning system is in manual input mode, or 62 if electronic position fixing system operates in estimated (dead reckoning) mode, or 63 if the positioning system is inoperative)
special maneuvre indicator	2	0 = not available = default 1 = not engaged in special maneuver 2 = engaged in special maneuver (i.e.: regional passing arrangement on Inland Waterway)
Spare	3	Not used. Should be set to zero. Reserved for future use.
RAIM-flag	1	Receiver autonomous integrity monitoring (RAIM) flag of electronic position fixing device; 0 = RAIM not in use = default; 1 = RAIM in use. See Table
Communication state (see below)	19	See Rec. ITU-R M.1371-5 Table 49
Number of bits	168	

Message Type 5: Ship Static and Voyage Related Data

Parameter	Number of Bits	Description
Message ID	6	Identifier for this Message
Repeat indicator	2	Used by the repeater to indicate how many times a message has been repeated. Refer to §?4.6.1, Annex 2; 0-3; 0 = default; 3 = do not repeat any more
AIS version indicator	2	0 = station compliant with Recommendation ITU-R M.1371-1 1 = station compliant with Recommendation ITU-R M.1371-3 (or later) 2 = station compliant with Recommendation ITU-R M.1371-5 (or later) 3 = station compliant with future editions
IMO number	30	0 = not available = default – Not applicable to SAR aircraft 0000000001-0000999999 not used 0001000000-0009999999 = valid IMO number; 0010000000-1073741823 = official flag state number.
Call sign	42	7?=?6 bit ASCII characters, @@@@@@@ = not available = default Craft associated with a parent vessel, should use “A” followed by the last 6 digits of the MMSI of the parent vessel. Examples of these craft include towed vessels, rescue boats, tenders, lifeboats and life rafts
Name	120	Maximum 20 characters 6 bit ASCII "@@@@@@@@@@@@@@@@@@@@" = not available = default The Name should be as shown on the station radio license. For SAR aircraft, it should be set to “SAR AIRCRAFT NNNNNNN” where NNNNNNN equals the aircraft registration number.
Type of ship and cargo type	8	0 = not available or no ship = default 1-99 = as defined below 100-199 = reserved, for regional use 200-255 = reserved, for future use Not applicable to SAR aircraft

Parameter	Number of Bits	Description
Overall dimension/ reference for position	30	Reference point for reported position. Also indicates the dimension of ship (m) For SAR aircraft, the use of this field may be decided by the responsible administration. If used it should indicate the maximum dimensions of the craft. As default should A = B = C = D be set to “0”
Type of electronic position fixing device	4	0 = undefined (default) 1 = GPS 2 = GLONASS 3 = combined GPS/GLONASS 4 = Loran-C 5 = Chayka 6 = integrated navigation system 7 = surveyed 8 = Galileo, 9-14 = not used 15 = internal GNSS
ETA	20	Estimated time of arrival; MMDDHHMM UTC Bits 19-16: month; 1-12; 0 = not available = default Bits 15-11: day; 1-31; 0 = not available = default Bits 10-6: hour; 0-23; 24 = not available = default Bits 5-0: minute; 0-59; 60 = not available = default For SAR aircraft, the use of this field may be decided by the responsible administration
Maximum present static draught	8	In 1/10 m, 255 = draught 25.5 m or greater, 0 = not available = default; in accordance with IMO Resolution A.851 Not applicable to SAR aircraft, should be set to 0
Destination	120	Maximum 20 characters using 6-bit ASCII; @@@@@@@@@@@@@@@@@@@@ = not available For SAR aircraft, the use of this field may be decided by the responsible administration
DTE	1	Data terminal equipment (DTE) ready (0 = available, 1 = not available = default)
Spare	1	Spare. Not used. Should be set to zero. Reserved for future use.
Number of bits	424	Occupies 2 slots

APPENDIX B: ADDITIONAL RESULTS

This appendix includes summary tables for each link. Each yearly table contains the following estimates for a link: the number of transits (labeled "count"); 25th, 50th, and 75th percentile travel times; average travel time; and standard deviation of travel time. Each monthly and weekly table contains average travel times and the number of transits. The tables provide the results by direction of travel. In addition, the tables provide the results by the following time periods: annual, monthly, and weekly. This disaggregation is to support future studies that may want to consider different factors, such as weather conditions, that affect travel time. The tables label the weeks by number, and Table 16 provides the corresponding dates for each week number for both 2018 and 2019. Each table contains its link number in the first row of the table. The study provides the tables in link order from 1 through 29.

Table 16. Weeks of the Year by Number, 2018 and 2019.

Week	2018		2019	
	Start Date	End Date	Start Date	End Date
1	01/01/18	01/07/18	12/31/18	01/06/19
2	01/08/18	01/14/18	01/07/19	01/13/19
3	01/15/18	01/21/18	01/14/19	01/20/19
4	01/22/18	01/28/18	01/21/19	01/27/19
5	01/29/18	02/04/18	01/28/19	02/03/19
6	02/05/18	02/11/18	02/04/19	02/10/19
7	02/12/18	02/18/18	02/11/19	02/17/19
8	02/19/18	02/25/18	02/18/19	02/24/19
9	02/26/18	03/04/18	02/25/19	03/03/19
10	03/05/18	03/11/18	03/04/19	03/10/19
11	03/12/18	03/18/18	03/11/19	03/17/19
12	03/19/18	03/25/18	03/18/19	03/24/19
13	03/26/18	04/01/18	03/25/19	03/31/19
14	04/02/18	04/08/18	04/01/19	04/07/19
15	04/09/18	04/15/18	04/08/19	04/14/19
16	04/16/18	04/22/18	04/15/19	04/21/19
17	04/23/18	04/29/18	04/22/19	04/28/19
18	04/30/18	05/06/18	04/29/19	05/05/19
19	05/07/18	05/13/18	05/06/19	05/12/19
20	05/14/18	05/20/18	05/13/19	05/19/19
21	05/21/18	05/27/18	05/20/19	05/26/19
22	05/28/18	06/03/18	05/27/19	06/02/19
23	06/04/18	06/10/18	06/03/19	06/09/19
24	06/11/18	06/17/18	06/10/19	06/16/19
25	06/18/18	06/24/18	06/17/19	06/23/19
26	06/25/18	07/01/18	06/24/19	06/30/19
27	07/02/18	07/08/18	07/01/19	07/07/19
28	07/09/18	07/15/18	07/08/19	07/14/19
29	07/16/18	07/22/18	07/15/19	07/21/19
30	07/23/18	07/29/18	07/22/19	07/28/19

Week	2018		2019	
	Start Date	End Date	Start Date	End Date
31	07/30/18	08/05/18	07/29/19	08/04/19
32	08/06/18	08/12/18	08/05/19	08/11/19
33	08/13/18	08/19/18	08/12/19	08/18/19
34	08/20/18	08/26/18	08/19/19	08/25/19
35	08/27/18	09/02/18	08/26/19	09/01/19
36	09/03/18	09/09/18	09/02/19	09/08/19
37	09/10/18	09/16/18	09/09/19	09/15/19
38	09/17/18	09/23/18	09/16/19	09/22/19
39	09/24/18	09/30/18	09/23/19	09/29/19
40	10/01/18	10/07/18	09/30/19	10/06/19
41	10/08/18	10/14/18	10/07/19	10/13/19
42	10/15/18	10/21/18	10/14/19	10/20/19
43	10/22/18	10/28/18	10/21/19	10/27/19
44	10/29/18	11/04/18	10/28/19	11/03/19
45	11/05/18	11/11/18	11/04/19	11/10/19
46	11/12/18	11/18/18	11/11/19	11/17/19
47	11/19/18	11/25/18	11/18/19	11/24/19
48	11/26/18	12/02/18	11/25/19	12/01/19
49	12/03/18	12/09/18	12/02/19	12/08/19
50	12/10/18	12/16/18	12/09/19	12/15/19
51	12/17/18	12/23/18	12/16/19	12/22/19
52	12/24/18	12/30/18	12/23/19	12/29/19
53			12/30/19	12/31/2019

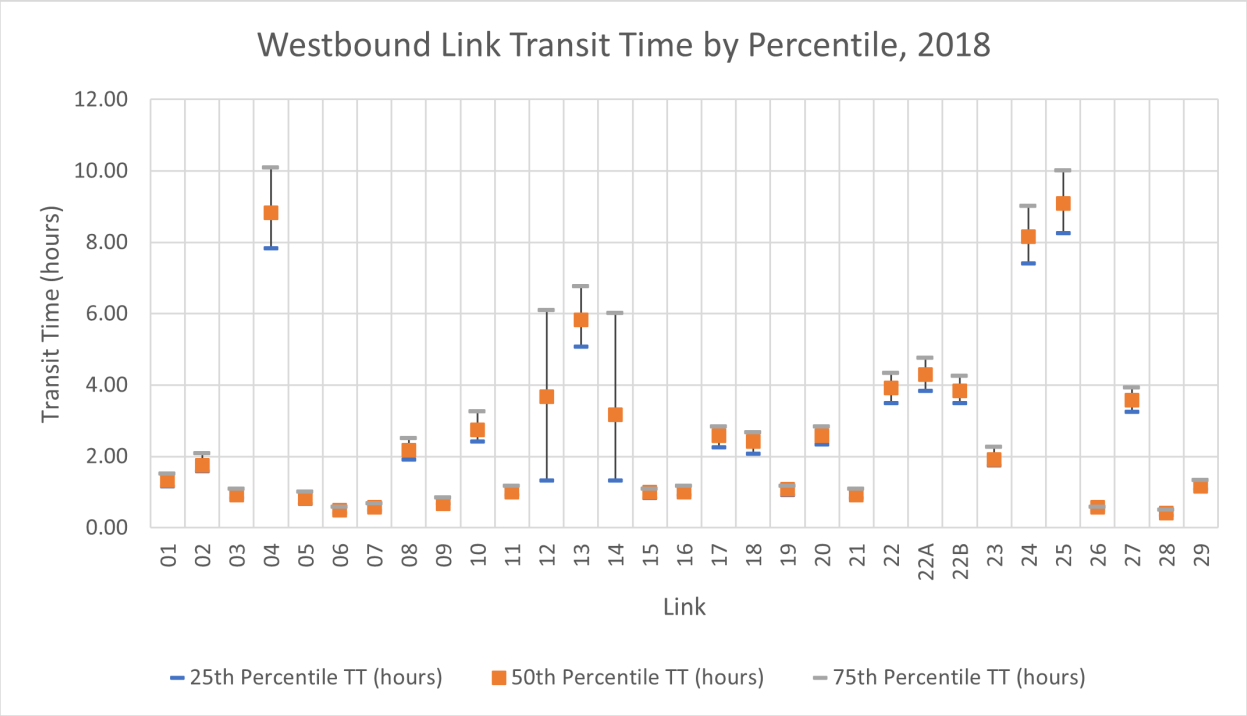


Figure 21. Westbound Link Transit Time by Percentile, 2018.

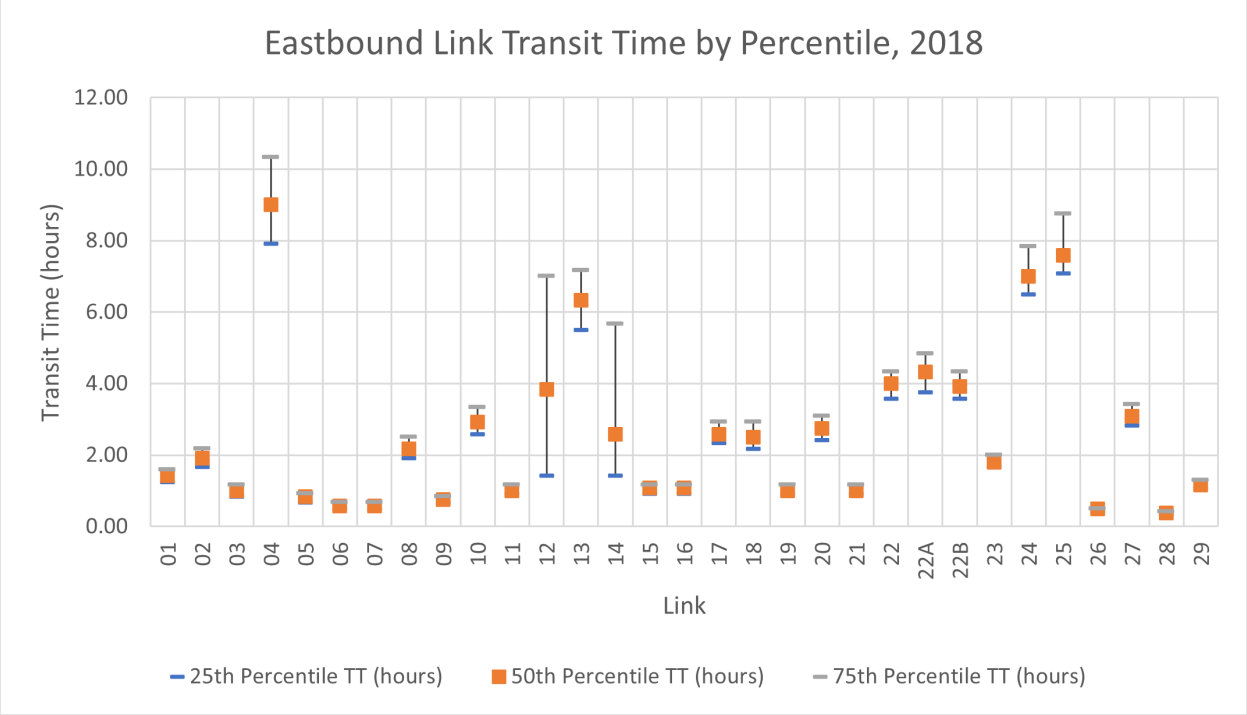


Figure 22. Eastbound Link Transit Time by Percentile, 2018.

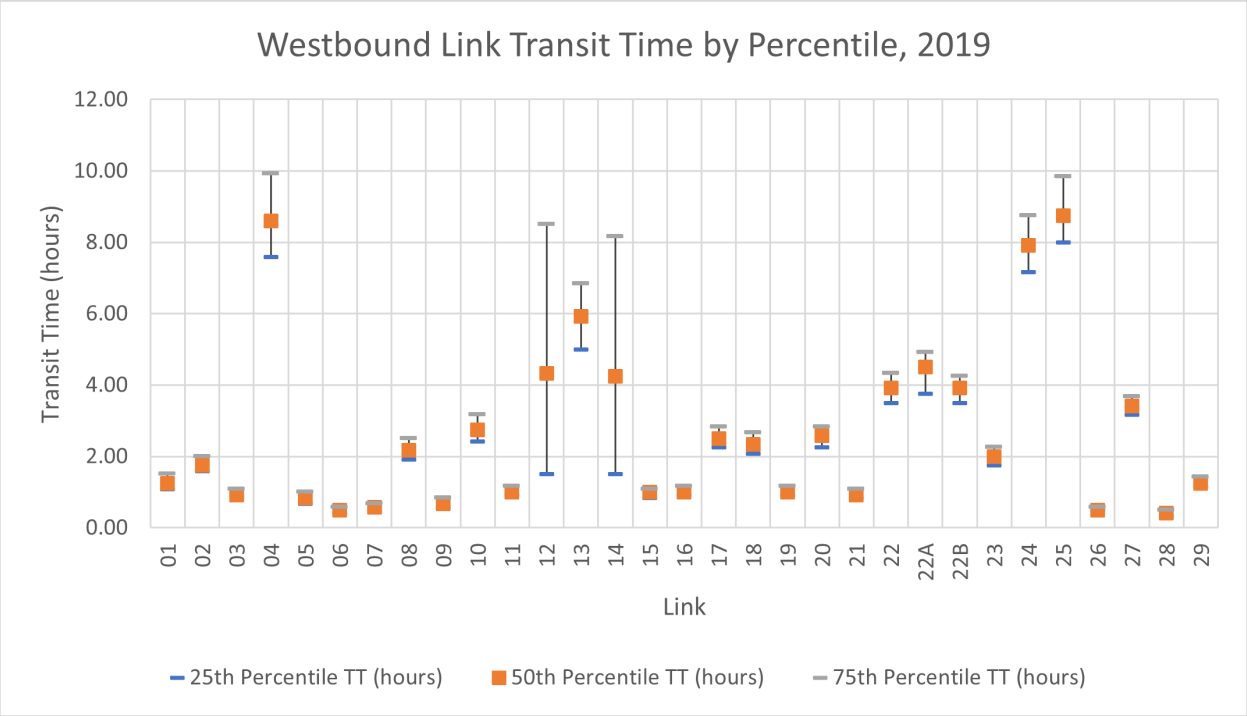


Figure 23. Westbound Link Transit Time by Percentile, 2019.

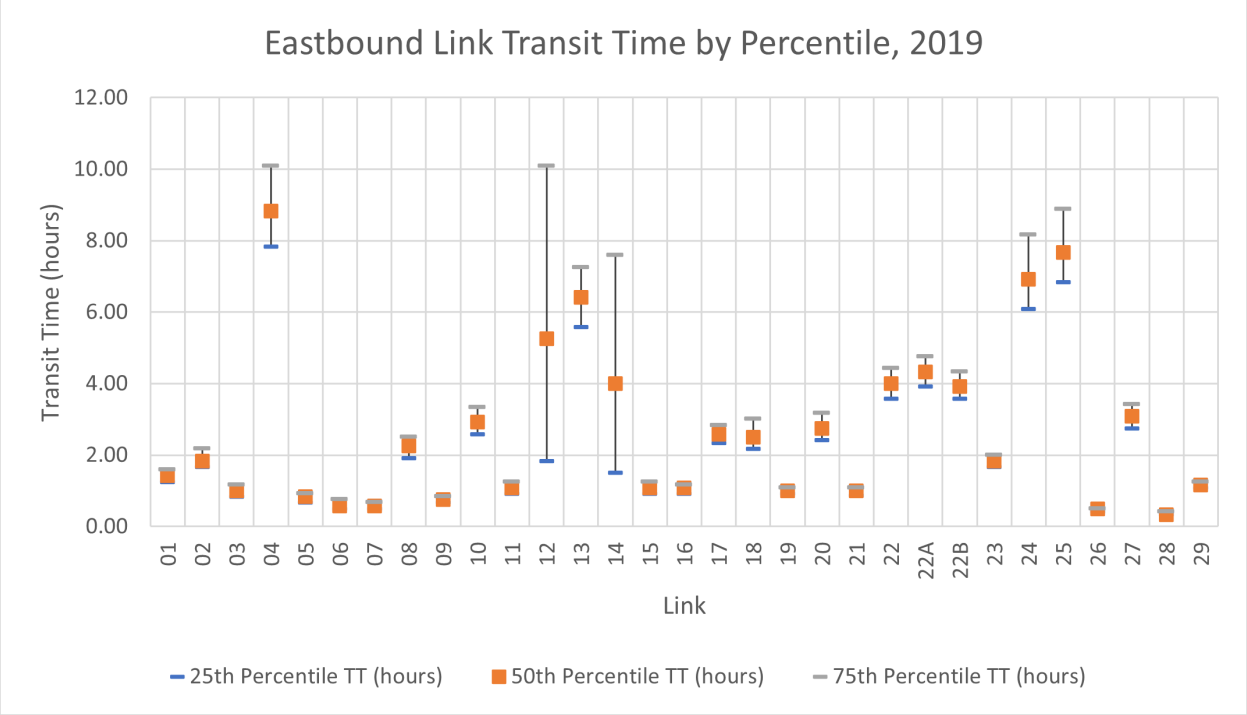


Figure 24. Eastbound Link Transit Time by Percentile, 2019.

Table 17. Yearly Transit Time Estimates (Both Directions), 2018.

		Both Directions						Westbound/Southbound Trips						Eastbound/Northbound Trips					
O-D Pair	Link	Average Transit Time (hours)	Std Dev (hours)	25th %ile TT (hours)	50th %ile TT (hours)	75th %ile TT (hours)	Count	Average Transit Time (hours)	Std Dev (hours)	25th %ile TT (hours)	50th %ile TT (hours)	75th %ile TT (hours)	Count	Average Transit Time (hours)	Std Dev (hours)	25th %ile TT (hours)	50th %ile TT (hours)	75th %ile TT (hours)	Count
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	1.42	0.34	1.17	1.33	1.58	14160	1.39	0.37	1.17	1.33	1.50	6973	1.45	0.31	1.25	1.42	1.58	7187
Port Beaumont/Port Arthur Upstream Boundary	2	1.96	0.55	1.58	1.83	2.17	8712	1.92	0.55	1.58	1.75	2.08	4362	2.01	0.55	1.67	1.92	2.17	4350
to Port Arthur Downstream Boundary	3	1.01	0.24	0.83	1.00	1.08	13559	0.99	0.23	0.83	0.92	1.08	6892	1.03	0.25	0.83	1.00	1.17	6667
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4	9.27	2.07	7.83	8.92	10.25	13584	9.22	2.09	7.83	8.83	10.08	6573	9.32	2.06	7.92	9.00	10.33	7011
	5	0.86	0.24	0.67	0.83	1.00	17341	0.89	0.27	0.67	0.83	1.00	8205	0.83	0.21	0.67	0.83	0.92	9136
Port of Houston/Galveston/Texas City	6	0.69	0.84	0.50	0.50	0.67	4304	0.61	0.69	0.42	0.50	0.58	2126	0.77	0.95	0.50	0.58	0.67	2178
Port Houston/Pelican Island Mooring to Chocolate Bayou	7	0.61	0.12	0.50	0.58	0.67	10898	0.62	0.13	0.50	0.58	0.67	5451	0.60	0.11	0.50	0.58	0.67	5447
	8	2.28	0.51	1.92	2.17	2.50	10449	2.26	0.50	1.92	2.17	2.50	5297	2.29	0.51	1.92	2.17	2.50	5152
	9	0.75	0.17	0.67	0.75	0.83	10613	0.74	0.17	0.67	0.67	0.83	5309	0.75	0.17	0.67	0.75	0.83	5304
Chocolate Bayou to Port Freeport Upstream Boundary	10	2.96	0.65	2.50	2.83	3.25	9491	2.90	0.64	2.42	2.75	3.25	4769	3.02	0.66	2.58	2.92	3.33	4722
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11	1.06	0.24	0.92	1.00	1.17	6344	1.05	0.24	0.92	1.00	1.17	2962	1.07	0.23	0.92	1.00	1.17	3382
Port Freeport Downstream Boundary to	12	5.11	5.39	1.33	3.75	6.50	7507	4.82	5.07	1.33	3.67	6.08	3764	5.40	5.68	1.42	3.83	7.00	3743
Colorado River	13	6.26	1.37	5.25	6.08	7.00	6563	6.06	1.38	5.08	5.83	6.75	3241	6.45	1.33	5.50	6.33	7.17	3322
Colorado River Industry	14	4.96	6.12	1.33	2.83	5.83	6297	5.26	6.62	1.33	3.17	6.00	3145	4.66	5.56	1.42	2.58	5.67	3152
Colorado River to Calhoun	15	1.05	0.22	0.92	1.00	1.17	6141	1.01	0.21	0.83	1.00	1.08	3132	1.09	0.21	0.92	1.08	1.17	3009
	16	1.08	0.24	0.92	1.00	1.17	5670	1.08	0.28	0.92	1.00	1.17	2668	1.08	0.21	0.92	1.08	1.17	3002
Port Lavaca (Calhoun Port Authority)	17	2.62	0.42	2.33	2.58	2.83	5050	2.58	0.42	2.25	2.58	2.83	2550	2.65	0.43	2.33	2.58	2.92	2500
Calhoun to Victoria	18	2.55	0.63	2.08	2.42	2.83	5181	2.47	0.54	2.08	2.42	2.67	2727	2.65	0.71	2.17	2.50	2.92	2454
Port of Victoria	19	1.07	0.24	0.92	1.00	1.17	3396	1.10	0.26	0.92	1.08	1.17	1588	1.05	0.21	0.92	1.00	1.17	1808
Victoria to Corpus Christi Upstream Boundary	20	2.72	0.55	2.33	2.67	2.92	4248	2.60	0.44	2.33	2.58	2.83	2148	2.84	0.62	2.42	2.75	3.08	2100
	21	1.01	0.22	0.83	1.00	1.08	4141	0.99	0.24	0.83	0.92	1.08	1990	1.02	0.21	0.92	1.00	1.17	2151
22A and 22B combined	22	4.05	0.71	3.58	3.92	4.33	3362	4.00	0.70	3.50	3.92	4.33	1516	4.08	0.72	3.58	4.00	4.33	1846
Alternative Route to Lydia Ann Channel	22A	4.34	0.78	3.75	4.33	4.83	405	4.32	0.79	3.83	4.29	4.75	182	4.35	0.78	3.75	4.33	4.83	223
Lydia Ann Channel—Main Route	22B	4.01	0.69	3.58	3.92	4.25	2957	3.96	0.67	3.50	3.83	4.25	1334	4.04	0.70	3.58	3.92	4.33	1623
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23	1.98	0.41	1.75	1.83	2.17	469	2.02	0.39	1.75	1.92	2.25	303	1.90	0.43	1.67	1.79	2.00	166
Corpus Christi Downstream Boundary to Arroyo	24	7.90	1.57	6.83	7.67	8.67	795	8.32	1.44	7.42	8.17	9.00	430	7.40	1.58	6.50	7.00	7.83	365
Colorado Upstream Boundary	25	8.73	1.76	7.50	8.50	9.58	794	9.27	1.54	8.25	9.08	10.00	429	8.11	1.80	7.08	7.58	8.75	365
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26	0.52	0.10	0.42	0.50	0.58	667	0.56	0.10	0.50	0.58	0.58	336	0.48	0.09	0.42	0.50	0.50	331
Arroyo Colorado to Port Isabel Upstream Boundary	27	3.36	0.54	3.00	3.33	3.67	401	3.61	0.51	3.25	3.58	3.92	167	3.18	0.48	2.83	3.08	3.42	234
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28	0.42	0.13	0.33	0.42	0.46	241	0.45	0.13	0.35	0.42	0.50	104	0.39	0.13	0.33	0.38	0.42	137
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29	1.23	0.21	1.08	1.17	1.33	393	1.25	0.25	1.08	1.17	1.33	167	1.21	0.18	1.08	1.17	1.29	226

Table 18. Monthly Average Transit Time Estimates (Hours), 2018.

		Both Directions												Westbound/Southbound Trips												Eastbound/Northbound Trips											
O-D Pair	Link	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	1.42	1.43	1.45	1.42	1.40	1.40	1.43	1.45	1.42	1.40	1.41	1.44	1.40	1.42	1.35	1.28	1.42	1.39	1.42	1.45	1.40	1.38	1.37	1.38	1.44	1.44	1.54	1.56	1.39	1.40	1.44	1.44	1.44	1.41	1.45	1.50
Port Beaumont/Port Arthur Upstream Boundary to Port Arthur Downstream Boundary	2	1.97	1.95	1.97	1.95	1.96	1.94	1.95	2.00	2.00	1.95	1.97	1.95	1.98	1.91	1.88	1.81	1.91	1.89	1.92	2.00	2.00	1.93	1.95	1.84	1.95	1.98	2.07	2.08	2.02	1.98	1.98	2.00	2.01	1.97	1.98	2.07
	3	1.04	1.02	1.02	1.00	0.98	0.99	1.01	1.00	1.02	0.99	0.99	1.00	1.01	0.98	0.98	0.96	0.96	0.98	1.02	0.99	1.02	0.96	0.97	0.97	1.07	1.06	1.06	1.04	1.00	1.01	1.00	1.01	1.01	1.01	1.02	1.03
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4	10.09	10.15	9.54	9.19	8.98	9.16	9.09	9.03	8.94	8.92	9.35	9.61	9.98	10.21	9.49	9.03	9.01	9.24	9.14	9.09	8.76	8.84	9.26	9.46	10.18	10.11	9.59	9.34	8.94	9.09	9.04	8.96	9.13	9.00	9.44	9.76
	5	0.87	0.90	0.88	0.88	0.84	0.84	0.85	0.84	0.84	0.84	0.84	0.87	0.91	0.95	0.93	0.93	0.88	0.85	0.87	0.87	0.86	0.86	0.86	0.91	0.84	0.87	0.84	0.83	0.81	0.82	0.83	0.82	0.83	0.82	0.81	0.83
Port of Houston/Galveston/Texas City	6	0.75	0.74	0.87	0.72	0.60	0.64	0.62	0.59	0.63	0.66	0.71	0.76	0.63	0.65	0.60	0.73	0.55	0.61	0.59	0.59	0.62	0.57	0.60	0.60	0.88	0.82	1.11	0.72	0.64	0.68	0.65	0.60	0.65	0.75	0.82	0.90
Port Houston/Pelican Island Mooring to Chocolate Bayou	7	0.61	0.61	0.60	0.61	0.59	0.61	0.62	0.62	0.61	0.61	0.61	0.62	0.62	0.62	0.61	0.62	0.61	0.63	0.64	0.64	0.62	0.62	0.62	0.62	0.61	0.60	0.60	0.60	0.58	0.59	0.59	0.60	0.60	0.60	0.61	0.62
	8	2.28	2.31	2.26	2.30	2.21	2.25	2.28	2.28	2.28	2.26	2.29	2.32	2.26	2.27	2.23	2.29	2.21	2.27	2.29	2.28	2.26	2.24	2.27	2.27	2.31	2.37	2.30	2.30	2.21	2.23	2.27	2.29	2.30	2.28	2.31	2.36
	9	0.75	0.76	0.73	0.75	0.73	0.74	0.75	0.76	0.75	0.73	0.75	0.75	0.74	0.77	0.73	0.75	0.72	0.72	0.74	0.75	0.74	0.72	0.74	0.75	0.75	0.75	0.74	0.76	0.73	0.75	0.76	0.76	0.75	0.74	0.76	0.76
Chocolate Bayou to Port Freeport Upstream Boundary	10	2.98	3.03	2.96	2.97	2.84	2.90	2.95	2.97	2.95	2.93	2.99	3.06	2.86	2.95	2.85	2.86	2.80	2.92	3.01	2.97	2.86	2.86	2.91	2.97	3.10	3.10	3.07	3.08	2.89	2.87	2.90	2.96	3.05	3.00	3.07	3.16
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11	1.04	1.07	1.06	1.05	1.02	1.03	1.05	1.03	1.03	1.09	1.10	1.12	1.02	1.05	1.05	1.04	1.00	1.04	1.06	1.03	0.99	1.07	1.09	1.14	1.06	1.09	1.07	1.06	1.03	1.03	1.04	1.04	1.07	1.10	1.11	1.11
Port Freeport Downstream Boundary to Colorado River	12	4.57	6.17	5.21	6.31	3.90	3.81	3.48	3.67	3.82	6.78	7.28	7.11	4.08	5.29	4.82	6.05	3.76	4.15	3.28	3.37	3.99	6.65	6.35	6.72	5.05	7.04	5.58	6.57	4.04	3.46	3.69	3.98	3.66	6.92	8.21	7.50
	13	6.32	6.41	6.29	6.40	5.99	6.08	6.25	6.21	6.03	6.24	6.48	6.53	6.12	6.15	6.07	6.27	5.85	5.95	6.16	6.04	5.77	5.95	6.18	6.28	6.50	6.67	6.50	6.53	6.13	6.22	6.35	6.38	6.27	6.51	6.75	6.78
Colorado River Industry	14	5.58	6.27	3.83	5.58	3.42	2.96	4.28	3.13	3.37	6.98	8.45	6.88	6.04	6.50	4.08	7.09	3.52	3.27	4.20	3.11	3.69	7.15	8.48	7.22	5.15	6.03	3.59	4.01	3.32	2.64	4.35	3.14	3.06	6.80	8.41	6.55
Colorado River to Calhoun	15	1.05	1.06	1.05	1.04	1.02	1.03	1.06	1.03	1.03	1.05	1.13	1.08	1.00	1.02	1.02	0.99	1.00	0.99	1.02	1.00	1.00	1.01	1.09	1.01	1.10	1.11	1.08	1.10	1.04	1.07	1.09	1.07	1.06	1.08	1.18	1.15
	16	1.08	1.10	1.06	1.10	1.05	1.07	1.10	1.06	1.07	1.07	1.13	1.08	1.08	1.12	1.07	1.11	1.04	1.03	1.11	1.05	1.09	1.07	1.12	1.04	1.08	1.08	1.05	1.09	1.06	1.10	1.09	1.07	1.05	1.07	1.15	1.11
Port Lavaca (Calhoun Port Authority)	17	2.60	2.63	2.62	2.62	2.57	2.62	2.66	2.62	2.59	2.62	2.63	2.58	2.55	2.57	2.61	2.61	2.56	2.60	2.67	2.60	2.56	2.55	2.56	2.51	2.65	2.70	2.64	2.63	2.58	2.64	2.66	2.64	2.63	2.69	2.70	2.64
Calhoun to Victoria	18	2.48	2.63	2.50	2.60	2.49	2.53	2.60	2.60	2.54	2.54	2.51	2.60	2.39	2.50	2.48	2.44	2.39	2.50	2.57	2.47	2.54	2.43	2.43	2.46	2.59	2.79	2.52	2.81	2.60	2.56	2.63	2.73	2.54	2.67	2.62	2.77
Port of Victoria	19	1.11	1.13	1.06	1.06	1.05	1.04	1.06	1.08	1.04	1.06	1.09	1.08	1.14	1.11	1.09	1.10	1.09	1.06	1.09	1.09	1.06	1.07	1.15	1.09	1.08	1.14	1.04	1.02	1.02	1.02	1.04	1.06	1.02	1.06	1.04	1.07
Victoria to Corpus Christi Upstream Boundary	20	2.71	2.81	2.70	2.71	2.67	2.72	2.74	2.80	2.64	2.71	2.72	2.69	2.53	2.61	2.61	2.61	2.61	2.70	2.75	2.69	2.50	2.50	2.55	2.51	2.90	3.02	2.79	2.82	2.72	2.74	2.73	2.90	2.78	2.92	2.91	2.86
	21	1.01	1.04	0.99	0.99	0.98	1.01	1.02	1.02	0.99	1.02	1.02	1.02	0.94	0.99	0.97	0.97	1.01	1.05	1.04	1.05	0.98	0.97	0.95	0.97	1.07	1.09	1.01	1.01	0.95	0.97	0.99	0.99	1.00	1.07	1.09	1.07
22A and 22B combined	22	4.08	4.20	4.21	4.04	4.21	4.03	4.17	4.12	4.15	4.23	4.23	4.16	4.01	4.05	4.13	4.12	4.26	4.01	4.16	4.13	4.12	4.03	4.11	4.13	4.15	4.33	4.27	3.97	4.17	4.04	4.18	4.10	4.17	4.36	4.33	4.19
Alternative Route to Lydia Ann Channel	22A	4.17	4.75	4.36	4.14	4.85	4.43	4.47	4.17	4.80	4.59	4.68	4.77	4.21	5.19	4.18	4.34	5.32	4.68	4.42	3.98	4.57	4.33	4.40	4.60	4.13	4.52	4.49	4.03	4.47	4.28	4.51	4.33	4.98	4.78	4.94	5.01
Lydia Ann Channel—Main Route	22B	4.06	4.13	4.18	4.02	4.11	3.97	4.13	4.11	4.06	4.17	4.16	4.10	3.96	3.94	4.12	4.09	4.09	3.92	4.13	4.15	4.06	3.98	4.07	4.06	4.15	4.30	4.23	3.96	4.12	4.00	4.13	4.08	4.05	4.30	4.25	4.13
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23	1.89	1.94	2.00	1.95	1.99	1.97	2.08	1.98	1.86	1.90	2.06	2.01	2.01	1.94	2.05	1.98	2.01	1.98	2.10	2.04	1.90	1.91	2.07	2.13	1.66	1.97	1.90	1.89	1.94	1.97	2.02	1.88	1.80	1.87	2.04	1.88
Corpus Christi Downstream Boundary to Arroyo Colorado Upstream Boundary	24	7.86	8.45	7.83	8.10	7.92	8.53	8.08	7.66	7.65	7.61	7.94	7.67	8.38	8.82	8.25	8.35	8.44	8.99	8.59	8.20	7.97	7.97	8.29	8.09	7.27	7.92	7.39	7.75	7.27	8.09	7.43	7.06	7.29	7.16	7.55	7.15
	25	8.76	9.18	8.91	8.88	8.69	8.80	9.13	8.48	8.37	8.54	8.72	8.53	8.94	9.52	9.70	9.09	9.63	9.78	9.88	9.48	8.69	8.69	8.75	8.84	8.54	8.83	8.00	8.68	7.36	7.88	8.18	7.30	7.99	8.34	8.68	8.12
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26	0.52	0.50	0.52	0.53	0.52	0.52	0.56	0.51	0.51	0.50	0.52	0.51	0.53	0.55	0.56	0.53	0.56	0.58	0.61	0.59	0.52	0.53	0.53	0.53	0.51	0.46	0.48	0.53	0.47	0.47	0.49	0.44	0.50	0.48	0.50	0.49
Arroyo Colorado to Port Isabel Upstream Boundary	27	3.42	3.38	3.39	3.40	3.30	3.47	3.46	3.22	3.26	3.24	3.39	3.36	3.64	3.59	3.96	3.47	3.57	3.55	3.71	3.51	3.36	3.64	3.52	3.62	3.20	3.18	3.06	3.37	3.11	3.43	3.19	2.99	3.21	3.03	3.25	3.20
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28	0.41	0.39	0.42	0.41	0.41	0.45	0.44	0.44	0.39	0.36	0.45	0.38	0.44	0.41	0.49	0.41	0.47	0.57	0.44	0.50	0.40	0.38	0.47	0.43	0.39	0.33	0.40	0.42	0.38	0.38	0.45	0.40	0.38	0.36	0.42	0.34
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29	1.17	1.15	1.25	1.27	1.20	1.25	1.23	1.25	1.23	1.37	1.17	1.30	1.15	1.16	1.27	1.29	1.21	1.35	1.27	1.33	1.31	1.54	1.19	1.43	1.19	1.14	1.24	1.27	1.18	1.21	1.20	1.21	1.19	1.31	1.15	1.19

Table 19. Monthly Link Transit Count, 2018.

		Both Directions												Westbound/Southbound Trips												Eastbound/Northbound Trips											
O-D Pair	Link	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	1293	1188	1338	1362	1336	1284	1352	1279	1204	1257	605	682	633	565	642	675	660	630	652	645	607	609	311	353	660	623	696	687	676	654	700	634	597	648	294	329
Port Beaumont/Port Arthur Upstream Boundary to Port Arthur Downstream Boundary	2	799	696	828	850	842	818	858	772	742	745	341	438	419	339	415	430	429	406	415	389	371	348	185	223	380	357	413	420	413	412	443	383	371	397	156	215
	3	1186	1034	1244	1248	1343	1249	1328	1316	1187	1236	569	643	614	518	620	641	686	640	663	664	606	616	299	334	572	516	624	607	657	609	665	652	581	620	270	309
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4	1139	734	1281	1282	1379	1310	1422	1388	1230	1287	557	584	524	300	613	621	681	632	698	693	619	627	282	287	615	434	668	661	698	678	724	695	611	660	275	297
	5	1407	1162	1526	1474	1593	1516	1621	1613	1513	1451	1287	1211	663	499	716	693	765	731	781	781	739	684	609	558	744	663	810	781	828	785	840	832	774	767	678	653
Port of Houston/Galveston/Texas City	6	378	332	379	353	369	343	377	387	367	338	356	330	192	163	174	174	175	174	190	192	186	171	179	158	186	169	205	179	194	169	187	195	181	167	177	172
Port Houston/Pelican Island Mooring to Chocolate Bayou	7	921	822	925	916	959	874	970	1042	952	851	864	829	458	421	453	458	473	445	485	522	471	430	430	422	463	401	472	458	486	429	485	520	481	421	434	407
	8	870	717	906	848	956	851	964	1016	929	821	814	780	444	380	453	437	474	437	484	504	462	419	418	399	426	337	453	411	482	414	480	512	467	402	396	381
	9	896	748	914	875	957	851	948	1010	933	814	828	865	447	385	450	437	475	434	473	505	460	403	416	439	449	363	464	438	482	417	475	505	473	411	412	426
Chocolate Bayou to Port Freeport Upstream Boundary	10	807	653	824	776	850	746	852	916	858	731	736	763	407	334	408	389	419	385	429	458	431	367	368	386	400	319	416	387	431	361	423	458	427	364	368	377
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11	556	463	564	524	560	489	596	676	583	443	435	470	265	224	261	248	268	240	294	334	274	196	169	196	291	239	303	276	292	249	302	342	309	247	266	274
Port Freeport Downstream Boundary to Colorado River	12	619	549	653	612	629	571	675	759	660	583	587	626	308	275	322	308	309	292	341	381	325	300	294	317	311	274	331	304	320	279	334	378	335	283	293	309
	13	550	428	590	540	587	536	607	713	611	482	418	509	265	212	285	275	288	276	301	360	298	235	194	253	285	216	305	265	299	260	306	353	313	247	224	256
Colorado River Industry	14	528	462	542	522	534	482	549	652	539	487	506	511	257	234	262	265	261	245	273	331	268	245	255	256	271	228	280	257	273	237	276	321	271	242	251	255
Colorado River to Calhoun	15	519	439	539	525	534	482	542	649	537	456	451	483	256	222	261	271	261	242	272	328	265	247	261	253	263	217	278	254	273	240	270	321	272	209	190	230
	16	492	360	505	459	504	459	525	606	506	423	382	469	222	160	233	204	234	224	256	289	241	202	192	217	270	200	272	255	270	235	269	317	265	221	190	252
Port Lavaca (Calhoun Port Authority)	17	441	361	432	418	439	345	438	526	443	410	397	420	220	190	205	216	212	181	217	268	225	200	213	209	221	171	227	202	227	164	221	258	218	210	184	211
Calhoun to Victoria	18	437	341	452	420	462	378	478	531	470	399	391	435	231	193	229	238	230	196	238	269	236	219	223	231	206	148	223	182	232	182	240	262	234	180	168	204
Port of Victoria	19	316	215	285	286	305	238	304	328	287	274	257	310	155	98	127	137	135	117	143	151	133	123	127	144	161	117	158	149	170	121	161	177	154	151	130	166
Victoria to Corpus Christi Upstream Boundary	20	367	286	370	358	377	320	369	407	356	333	329	393	188	149	176	188	184	159	183	210	175	169	177	195	179	137	194	170	193	161	186	197	181	164	152	198
	21	368	261	359	342	371	305	361	414	348	323	318	387	177	125	167	169	179	145	174	207	165	149	155	183	191	136	192	173	192	160	187	207	183	174	163	204
22A and 22B combined	22	323	222	301	272	306	248	311	372	288	245	270	314	152	101	132	125	129	110	144	177	128	100	125	141	171	121	169	147	177	138	167	195	160	145	145	173
Alternative Route to Lydia Ann Channel	22A	53	26	46	31	40	33	38	34	35	31	34	30	30	9	19	11	18	13	17	15	15	13	16	18	23	17	27	20	22	20	21	19	20	18	18	12
Lydia Ann Channel—Main Route	22B	270	196	255	241	266	215	273	338	253	214	236	284	122	92	113	114	111	97	127	162	113	87	109	123	148	104	142	127	155	118	146	176	140	127	127	161
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23	30	27	48	31	38	28	39	57	40	36	44	53	20	22	31	21	27	16	27	35	24	23	29	28	10	5	17	10	11	12	12	22	16	13	15	25
Corpus Christi Downstream Boundary to Arroyo Colorado Upstream Boundary	24	56	29	69	55	67	59	77	95	69	58	71	93	30	17	35	32	37	29	43	50	36	32	37	52	26	12	34	23	30	30	34	45	33	26	34	41
	25	55	37	73	59	65	58	84	96	64	55	65	87	29	19	39	29	38	28	47	52	35	31	33	50	26	18	34	30	27	30	37	44	29	24	32	37
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26	41	37	46	44	59	54	75	79	57	48	56	76	20	19	25	20	30	26	39	39	28	22	30	39	21	18	21	24	29	28	36	40	29	26	26	37
Arroyo Colorado to Port Isabel Upstream Boundary	27	22	29	33	30	41	27	60	50	30	23	23	38	11	14	12	9	17	9	31	22	9	8	12	14	11	15	21	21	24	18	29	28	21	15	11	24
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28	12	16	24	17	28	19	41	27	18	13	7	23	4	11	6	6	11	7	24	10	6	4	5	11	8	5	18	11	17	12	17	17	12	9	2	12
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29	56	52	51	39	30	17	45	32	27	15	11	22	27	29	21	13	13	5	20	12	8	4	6	10	29	23	30	26	17	12	25	20	19	11	5	12

Table 20. Weekly Average Transit Time Estimates (Hours): Both Directions, Week 1–Week 26, 2018.

O-D Pair	Link	Direc-tion	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	Both Direc-tions	1.41	1.42	1.42	1.42	1.48	1.40	1.48	1.39	1.44	1.49	1.47	1.42	1.40	1.46	1.41	1.44	1.40	1.39	1.41	1.38	1.44	1.37	1.36	1.42	1.42	1.41
Port Beaumont/Port Arthur Upstream	2		2.00	1.94	2.03	1.93	1.98	1.89	1.90	1.95	1.97	2.07	2.02	1.92	1.89	1.93	1.97	1.98	1.92	1.94	1.96	1.99	1.97	1.91	1.92	1.98	1.92	1.95
Boundary to Port Arthur Downstream	3		1.03	1.05	1.03	1.05	1.03	1.02	0.99	1.03	1.02	1.05	1.02	1.03	0.97	0.99	1.01	1.01	0.99	1.00	0.96	0.97	0.98	0.96	1.00	1.00	1.01	0.99
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		10.62	10.35	9.79	9.93	9.85	9.93	10.32	11.15	9.31	9.71	9.92	9.62	8.96	9.41	9.28	9.17	9.11	8.91	9.10	8.95	9.06	8.70	9.13	9.26	9.44	9.11
	5		0.87	0.87	0.87	0.90	0.85	0.88	0.98	0.91	0.89	0.89	0.89	0.88	0.84	0.89	0.88	0.88	0.87	0.84	0.86	0.84	0.84	0.83	0.83	0.83	0.83	0.86
Port of Houston/Galveston/Texas City	6		0.70	0.69	0.63	0.83	0.78	0.79	0.86	0.65	0.72	1.00	0.64	1.29	0.77	0.85	0.67	0.87	0.59	0.61	0.56	0.70	0.56	0.55	0.56	0.73	0.67	0.70
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		0.62	0.61	0.61	0.61	0.61	0.59	0.61	0.61	0.59	0.61	0.61	0.61	0.59	0.60	0.62	0.62	0.61	0.58	0.60	0.60	0.59	0.60	0.61	0.60	0.60	0.62
	8		2.30	2.28	2.23	2.31	2.27	2.28	2.34	2.37	2.23	2.31	2.22	2.24	2.29	2.24	2.29	2.36	2.30	2.20	2.22	2.27	2.18	2.23	2.24	2.23	2.27	2.29
	9		0.77	0.73	0.74	0.75	0.73	0.76	0.78	0.77	0.74	0.74	0.75	0.73	0.72	0.73	0.77	0.75	0.77	0.71	0.73	0.75	0.72	0.74	0.75	0.72	0.72	0.76
Chocolate Bayou to Port Freeport Upstream Boundary	10		3.04	2.92	2.93	3.04	2.95	3.00	3.07	3.06	2.92	2.98	2.99	2.95	2.93	2.90	3.01	2.96	3.02	2.84	2.79	2.94	2.85	2.85	2.91	2.85	2.90	2.94
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		1.04	1.02	1.08	1.07	1.01	1.06	1.12	1.06	1.08	1.06	1.03	1.09	1.07	1.00	1.07	1.06	1.08	1.03	1.01	1.03	1.00	1.03	1.06	1.03	1.01	1.01
Port Freeport Downstream Boundary to	12		3.34	4.11	6.63	4.44	4.94	6.70	8.07	4.85	5.41	4.45	6.45	4.94	5.55	7.33	7.61	5.58	4.67	4.91	3.36	4.66	3.17	3.48	2.95	3.59	4.86	4.13
Colorado River	13		6.20	6.16	6.45	6.67	6.12	6.58	6.21	6.49	6.29	6.38	6.45	6.19	6.24	6.00	6.58	6.71	6.35	6.08	6.18	5.95	5.85	5.99	6.32	5.91	5.90	6.21
Colorado River Industry	14		4.09	4.35	7.16	8.86	3.33	6.84	7.63	6.14	4.57	3.40	4.35	3.49	4.85	7.72	4.34	6.67	3.62	4.73	3.73	3.17	2.78	2.57	2.56	2.64	3.70	3.26
Colorado River to Calhoun	15		1.06	1.03	1.06	1.06	1.03	1.05	1.10	1.05	1.05	1.07	1.05	1.06	1.00	0.98	1.04	1.09	1.08	1.00	1.05	1.02	1.01	1.02	1.05	1.01	1.01	1.05
	16		1.06	1.09	1.13	1.05	1.08	1.11	1.13	1.06	1.07	1.05	1.05	1.09	1.05	1.06	1.08	1.17	1.13	1.05	1.11	1.04	1.01	1.05	1.06	1.08	1.05	1.09
Port Lavaca (Calhoun Port Authority)	17		2.62	2.63	2.60	2.60	2.57	2.70	2.59	2.65	2.61	2.63	2.61	2.62	2.57	2.49	2.66	2.65	2.71	2.53	2.65	2.55	2.58	2.58	2.61	2.57	2.62	2.63
Calhoun to Victoria	18		2.53	2.45	2.41	2.54	2.51	2.65	2.60	2.59	2.63	2.50	2.50	2.59	2.34	2.46	2.72	2.67	2.63	2.46	2.56	2.53	2.51	2.44	2.51	2.52	2.49	2.54
Port of Victoria	19		1.11	1.10	1.12	1.14	1.07	1.17	1.12	1.15	1.11	1.07	1.06	1.06	1.03	0.99	1.05	1.09	1.09	1.03	1.07	1.06	1.04	1.05	1.06	1.02	1.01	1.06
Victoria to Corpus Christi Upstream Boundary	20		2.75	2.64	2.80	2.74	2.63	2.88	2.78	2.83	2.76	2.66	2.74	2.78	2.61	2.57	2.78	2.72	2.78	2.68	2.70	2.63	2.68	2.62	2.79	2.65	2.63	2.80
	21		1.03	1.03	1.01	0.99	0.98	1.08	1.04	1.05	1.05	0.98	1.00	0.97	0.97	0.95	0.97	1.05	1.01	0.98	0.97	0.99	0.99	0.96	1.06	0.94	1.00	1.02
	22		5.61	10.81	10.05	13.91	16.72	21.70	16.84	12.14	7.87	8.81	9.77	10.25	20.00	12.72	13.91	19.30	12.31	10.77	14.12	13.28	10.74	8.08	9.87	12.51	16.34	21.91
Link 22A (Aransas Pass)	22A		8.80	9.22	12.34	51.59	31.25	14.28	21.48	17.57	7.12	4.87	18.13	9.17	30.09	13.90	15.45	15.44	17.90	15.52	21.06	19.67	17.68	10.98	14.76	25.98	45.18	47.22
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		5.08	11.16	9.40	8.26	12.80	22.76	16.15	11.40	8.03	9.74	7.92	10.54	17.59	12.60	13.61	20.34	11.26	10.01	11.85	12.49	9.27	7.30	9.00	9.31	10.42	16.44
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		1.99	1.86	1.85	1.90	1.79	1.89	2.15	1.95	1.76	2.02	2.16	1.91	2.35	1.75	1.93	2.10	2.00	2.19	2.03	1.63	1.90	2.00	2.19	1.88	2.06	1.91
Corpus Christi Downstream Boundary to	24		7.45	8.28	7.51	8.40	7.36	8.74	8.47	8.35	7.48	7.49	8.10	8.20	9.51	7.01	8.10	8.52	8.49	8.40	7.73	7.72	7.81	8.04	9.30	8.80	8.09	8.34
Arroyo Colorado Upstream Boundary	25		9.38	8.52	8.60	8.77	8.23	9.27	9.17	8.63	8.83	9.12	8.69	9.65	8.68	8.29	9.40	8.70	8.84	9.02	8.20	9.15	8.75	9.04	9.43	8.94	8.20	8.80
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		0.51	0.52	0.55	0.51	0.49	0.49	0.56	0.42	0.47	0.52	0.49	0.57	0.55	0.53	0.51	0.50	0.55	0.54	0.50	0.51	0.52	0.54	0.55	0.53	0.49	0.52
Arroyo Colorado to Port Isabel Upstream Boundary	27		3.61	3.42	3.66	3.26	3.26	3.48	3.61	2.63	3.10	3.21	3.34	4.10	3.36	3.25	3.35	3.29	3.55	3.07	3.30	3.22	3.34	3.55	3.69	3.15	3.32	3.68
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28			0.33	0.79	0.42	0.34	0.39	0.39	0.50	0.38	0.42	0.42	0.44	0.47	0.42	0.39	0.42	0.44	0.47	0.41	0.43	0.36	0.42	0.39	0.47	0.51	0.40
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		1.15	1.22	1.15	1.17	1.13	1.19	1.16	1.13	1.18	1.25	1.09	1.38	1.27	1.35	1.23	1.24	1.33	1.18	1.19	1.17	1.19	1.25	1.32	1.35	1.15	1.35

Table 21. Weekly Average Transit Time Estimates (Hours): Both Directions, Week 27–Week 52, 2018.

O-D Pair	Link	Direc-tion	Week 27	Week 28	Week 29	Week 30	Week 31	Week 32	Week 33	Week 34	Week 35	Week 36	Week 37	Week 38	Week 39	Week 40	Week 41	Week 42	Week 43	Week 44	Week 45	Week 46	Week 47	Week 48	Week 49	Week 50	Week 51	Week 52
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	Both Direc-tions	1.40	1.47	1.45	1.43	1.42	1.45	1.48	1.43	1.41	1.42	1.43	1.40	1.42	1.39	1.39	1.40	1.41	1.41	1.43	1.42	1.41	1.40	1.43	1.46	1.42	1.43
Port Beaumont/Port Arthur Upstream	2		1.91	1.96	1.96	1.98	1.96	2.02	1.99	2.03	1.97	2.00	2.02	1.96	2.06	1.98	1.92	1.96	1.94	1.91	1.94	2.02	2.03	1.92	1.97	1.97	1.98	1.93
Boundary to Port Arthur Downstream	3		1.03	1.03	0.99	1.01	0.98	1.01	1.01	1.00	1.00	1.04	1.03	1.02	0.98	0.95	1.02	1.01	0.96	1.01	0.99	1.02	0.94	1.00	1.03	0.99	1.04	0.96
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		9.06	9.05	8.98	9.20	8.95	8.89	9.29	9.03	8.88	9.12	8.95	8.95	8.84	8.75	8.86	9.07	8.98	9.01	9.67	9.31	9.68	9.00	9.60	9.51	9.82	9.40
	5		0.82	0.85	0.84	0.88	0.85	0.87	0.85	0.82	0.84	0.85	0.87	0.83	0.83	0.83	0.83	0.86	0.84	0.84	0.85	0.86	0.80	0.84	0.88	0.86	0.87	0.87
Port of Houston/Galveston/Texas City	6		0.63	0.64	0.62	0.57	0.62	0.55	0.64	0.54	0.61	0.62	0.55	0.76	0.58	0.62	0.72	0.72	0.62	0.56	0.70	0.89	0.58	0.70	0.76	0.66	0.88	0.79
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		0.61	0.63	0.61	0.61	0.62	0.61	0.62	0.62	0.62	0.59	0.61	0.62	0.62	0.61	0.61	0.60	0.62	0.62	0.60	0.63	0.59	0.61	0.62	0.62	0.64	0.61
	8		2.25	2.32	2.24	2.26	2.29	2.26	2.31	2.28	2.30	2.20	2.30	2.32	2.31	2.25	2.28	2.22	2.24	2.30	2.25	2.39	2.19	2.33	2.33	2.31	2.41	2.27
	9		0.75	0.75	0.75	0.75	0.75	0.75	0.76	0.76	0.75	0.74	0.74	0.76	0.76	0.73	0.73	0.72	0.74	0.75	0.74	0.77	0.72	0.76	0.76	0.75	0.78	0.74
Chocolate Bayou to Port Freeport Upstream Boundary	10		2.92	3.00	2.95	2.94	2.90	2.93	3.01	2.96	3.00	2.90	2.94	3.06	2.89	2.89	2.87	2.94	3.01	3.05	2.93	3.11	2.88	2.97	3.04	3.11	3.15	3.00
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		1.05	1.05	1.05	1.05	1.06	1.04	1.03	1.01	1.04	1.04	1.02	1.05	1.02	1.08	1.06	1.10	1.15	1.07	1.07	1.13	1.13	1.07	1.14	1.11	1.13	1.13
Port Freeport Downstream Boundary to	12		3.16	4.12	3.48	3.17	3.50	4.10	4.02	3.06	3.60	4.33	3.62	3.33	4.24	6.22	6.79	6.83	8.12	6.23	6.99	7.63	7.39	6.14	8.30	6.88	5.37	8.86
Colorado River	13		6.15	6.32	6.35	6.17	6.22	6.21	6.48	6.02	6.06	6.12	6.01	5.99	6.04	6.27	6.19	6.00	6.38	6.80	6.50	6.52	6.29	6.56	6.48	6.52	6.60	6.51
Colorado River Industry	14		3.22	4.61	4.06	4.39	4.28	3.38	3.26	2.71	3.08	3.09	4.27	3.49	2.89	2.77	3.69	6.96	13.63	15.46	12.91	6.94	4.66	5.55	5.31	10.29	5.86	5.40
Colorado River to Calhoun	15		1.06	1.07	1.06	1.04	1.05	1.03	1.05	1.01	1.04	1.02	1.03	1.02	1.05	1.03	1.01	1.02	1.10	1.25	1.27	1.09	1.06	1.09	1.07	1.08	1.09	1.07
	16		1.11	1.11	1.08	1.08	1.10	1.06	1.07	1.05	1.06	1.06	1.08	1.08	1.06	1.06	1.04	1.05	1.08	1.28	1.22	1.10	1.08	1.11	1.08	1.07	1.09	1.07
Port Lavaca (Calhoun Port Authority)	17		2.65	2.75	2.61	2.64	2.61	2.65	2.63	2.61	2.60	2.56	2.59	2.60	2.65	2.62	2.62	2.57	2.70	2.61	2.55	2.68	2.63	2.66	2.63	2.55	2.58	2.54
Calhoun to Victoria	18		2.61	2.63	2.60	2.55	2.63	2.56	2.72	2.57	2.56	2.53	2.54	2.53	2.56	2.54	2.50	2.57	2.49	2.50	2.36	2.71	2.49	2.53	2.55	2.65	2.58	2.65
Port of Victoria	19		1.08	1.07	1.08	1.07	1.03	1.11	1.08	1.06	1.08	1.03	1.02	1.03	1.08	1.09	1.06	1.04	1.06	1.04	1.07	1.13	1.09	1.09	1.04	1.06	1.15	1.08
Victoria to Corpus Christi Upstream Boundary	20		2.78	2.72	2.79	2.71	2.70	2.69	2.95	2.86	2.70	2.61	2.63	2.72	2.57	2.74	2.74	2.67	2.69	2.64	2.74	2.73	2.77	2.66	2.70	2.72	2.75	2.60
	21		1.00	1.01	1.03	1.05	1.03	1.00	1.00	1.05	0.99	0.98	1.00	1.01	0.98	1.02	1.02	1.03	1.03	1.00	1.05	1.04	1.00	1.00	1.05	1.02	1.00	0.99
	22		9.85	12.06	8.44	9.74	6.40	9.14	7.47	17.71	9.37	9.29	12.06	14.87	10.49	10.56	17.36	22.85	18.26	13.99	9.88	13.76	14.46	13.79	10.52	14.71	11.72	15.56
Link 22A (Aransas Pass)	22A		10.91	25.07	13.68	10.20	10.06	26.79	5.30	46.64	5.98	31.14	10.13	64.39	12.41	5.15	28.89	39.23	23.49	25.93	14.91	20.38	12.23	22.95	27.22	32.56	20.56	24.55
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		9.63	9.53	7.00	9.67	6.13	6.52	7.75	12.73	9.82	7.02	12.40	8.53	10.01	11.16	15.18	18.59	16.76	11.74	8.60	12.80	14.85	11.96	7.88	10.82	10.38	14.27
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		2.16	2.31	1.99	2.00	1.90	2.02	2.10	1.77	1.99	1.93	1.65	1.92	1.89	1.93	1.91	1.70	1.96	1.81	2.06	2.07	2.09	2.19	2.02	2.01	2.08	1.96
Corpus Christi Downstream Boundary to	24		8.40	8.43	7.67	7.80	7.62	7.88	7.48	7.98	7.33	7.49	7.28	7.53	8.18	7.49	7.46	6.99	8.15	7.86	7.93	7.53	7.91	8.29	7.77	7.73	8.11	7.31
Arroyo Colorado Upstream Boundary	25		9.82	9.01	8.87	8.89	8.35	8.90	8.09	8.82	8.17	8.49	7.50	8.34	8.76	8.45	8.54	8.53	8.64	8.86	7.35	8.73	9.94	8.02	8.26	8.84	8.74	8.58
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		0.57	0.56	0.55	0.56	0.54	0.51	0.51	0.51	0.50	0.49	0.48	0.52	0.51	0.50	0.51	0.46	0.52	0.53	0.44	0.52	0.52	0.52	0.49	0.54	0.49	0.51
Arroyo Colorado to Port Isabel Upstream Boundary	27		3.49	3.85	3.38	3.27	3.54	3.18	3.19	3.17	3.16	3.20	3.04	3.36	3.17	3.20	3.29	2.76	3.38	3.47	3.24	3.26	3.08	3.44	3.50	3.33	3.54	3.52
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		0.44	0.62	0.44	0.40	0.40	0.35	0.44	0.51	0.33	0.48	0.32	0.37	0.34	0.35	0.33	0.33	0.39	0.46	0.54	0.33		0.31	0.38	0.37	0.49	0.41
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		1.21	1.21	1.22	1.26	1.21	1.20	1.44	1.20	1.19	1.25	1.15	1.21	1.26	1.24	1.85	1.15	1.40	1.42	1.14	1.21	1.00	1.26	1.20	1.35	1.33	1.56

Table 22. Weekly Link Transit Count: Both Directions, Week 1–Week 26, 2018.

O-D Pair	Link	Direc-tion	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	Both Direc-tions	282	312	249	308	327	276	224	343	359	283	299	300	305	273	297	344	339	308	304	311	295	300	283	315	295	310
Port Beaumont/Port Arthur Upstream	2		163	203	142	201	195	165	141	198	210	174	196	190	181	146	191	207	233	190	192	186	199	190	195	186	184	201
Boundary to Port Arthur Downstream	3		265	280	201	294	311	255	210	273	311	286	283	272	270	234	292	293	328	305	312	306	296	309	292	291	253	318
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		220	281	189	296	321	190	102	129	330	308	290	265	275	234	300	304	354	303	334	314	296	322	312	297	266	344
	5		313	352	226	354	353	260	230	315	392	356	347	310	326	298	342	346	389	358	363	355	351	396	368	334	324	384
Port of Houston/Galveston/Texas City	6		86	94	65	93	87	63	63	111	98	96	92	72	75	70	86	79	97	77	88	87	79	91	83	69	82	81
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		213	239	152	207	226	178	176	259	203	239	217	181	199	213	237	198	216	202	229	223	218	214	214	200	200	198
	8		206	224	135	197	219	157	132	222	207	235	208	176	193	185	227	174	215	199	227	220	218	212	217	197	187	193
	9		208	230	140	207	214	170	149	231	207	231	215	184	192	200	227	189	212	200	227	213	224	209	214	193	193	196
Chocolate Bayou to Port Freeport Upstream Boundary	10		188	213	124	184	197	134	125	209	190	208	196	165	169	173	204	167	193	168	202	186	206	186	190	165	171	176
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		138	146	81	118	138	107	95	141	137	141	131	107	116	117	144	119	121	105	129	125	137	124	126	108	110	120
Port Freeport Downstream Boundary to	12		139	164	92	146	146	126	119	163	160	161	150	126	135	151	167	135	140	124	150	132	154	140	144	132	126	136
Colorado River	13		138	152	76	116	137	81	74	141	150	142	137	119	120	122	138	126	126	108	143	124	150	133	137	120	117	120
Colorado River Industry	14		124	133	81	125	130	89	112	138	139	127	128	117	106	119	140	107	122	117	127	115	126	116	125	105	105	108
Colorado River to Calhoun	15		125	131	82	119	130	80	104	129	138	127	132	115	102	125	138	108	123	122	121	115	128	111	125	106	103	110
	16		117	123	74	120	116	61	77	118	122	121	121	105	98	115	116	95	105	106	112	110	127	109	122	95	102	103
Port Lavaca (Calhoun Port Authority)	17		105	109	71	106	107	58	89	110	111	98	108	90	90	96	117	84	95	94	98	91	108	93	93	67	73	85
Calhoun to Victoria	18		109	98	74	101	112	56	76	110	106	99	112	94	99	100	116	74	102	94	114	91	115	103	102	78	78	91
Port of Victoria	19		75	70	56	76	79	40	43	67	73	59	70	59	62	62	80	54	71	59	74	64	75	64	64	55	45	59
Victoria to Corpus Christi Upstream Boundary	20		92	86	61	92	94	45	66	88	93	81	86	75	78	72	104	74	85	76	88	81	94	77	87	71	63	81
	21		92	86	65	88	93	44	59	74	92	78	81	73	74	71	96	71	80	76	87	83	92	73	82	72	59	76
	22		91	89	72	92	94	64	77	101	96	84	83	72	78	85	99	75	82	80	85	82	97	71	86	73	47	90
Link 22A (Aransas Pass)	22A		13	16	16	12	20	8	10	12	17	16	15	15	15	8	16	16	13	11	21	9	17	15	13	14	8	16
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		78	73	56	80	74	56	67	89	79	68	68	57	63	77	83	59	69	69	64	73	80	56	73	59	39	74
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		8	8	7	5	4	10	4	8	13	14	9	9	6	5	10	5	10	7	13	5	8	7	6	8	4	11
Corpus Christi Downstream Boundary to	24		14	14	12	12	9	7	3	9	16	26	13	14	6	9	14	5	24	13	22	10	18	12	11	18	9	17
Arroyo Colorado Upstream Boundary	25		14	13	8	15	10	15	3	8	16	21	15	14	15	9	12	12	21	14	24	10	14	13	11	17	10	14
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		11	7	9	12	6	13	9	5	14	12	6	10	11	5	8	9	18	13	22	8	15	7	12	15	12	13
Arroyo Colorado to Port Isabel Upstream Boundary	27		4	4	4	8	7	10	7	3	10	9	5	7	7	2	6	6	13	7	17	5	11	5	8	6	7	4
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		0	5	1	5	4	5	3	1	8	7	4	6	4	1	4	4	6	4	11	5	8	3	5	4	6	2
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		4	16	6	16	25	8	21	9	12	9	4	12	18	2	13	12	10	4	12	4	9	3	5	2	6	3

Table 23. Weekly Link Transit Count: Both Directions, Week 27–Week 52, 2018.

O-D Pair	Link	Direc-tion	Week 27	Week 28	Week 29	Week 30	Week 31	Week 32	Week 33	Week 34	Week 35	Week 36	Week 37	Week 38	Week 39	Week 40	Week 41	Week 42	Week 43	Week 44	Week 45	Week 46	Week 47	Week 48	Week 49	Week 50	Week 51	Week 52
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	Both Direc-tions	295	285	323	311	313	279	284	295	302	278	286	272	272	273	308	283	282	203	114	169	122	137	104	164	184	181
Port Beaumont/Port Arthur Upstream	2		184	193	204	192	182	165	181	174	180	173	175	169	174	168	177	167	165	119	60	96	70	84	64	104	133	100
Boundary to Port Arthur Downstream	3		294	285	317	302	306	305	290	297	295	292	272	270	270	282	287	272	286	206	111	157	116	120	91	151	169	176
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		298	309	342	325	319	320	323	300	310	295	278	289	281	303	296	275	288	221	105	151	115	120	74	137	176	158
	5		349	368	370	369	356	367	376	363	361	375	335	346	348	339	346	309	312	328	266	311	310	322	248	263	263	299
Port of Houston/Galveston/Texas City	6		85	83	78	94	88	83	87	96	92	87	77	98	73	84	82	64	77	74	67	96	91	80	71	74	79	80
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		221	219	207	231	240	222	247	238	217	217	219	252	200	227	196	185	172	170	173	233	216	204	178	189	179	195
	8		220	217	205	232	238	216	233	232	214	216	207	248	197	228	194	166	163	162	167	213	210	188	168	175	170	188
	9		214	214	205	227	231	216	233	227	217	214	210	249	200	214	190	176	163	163	174	219	208	198	181	193	197	205
Chocolate Bayou to Port Freeport Upstream Boundary	10		189	190	182	204	217	193	217	207	189	201	182	234	188	201	168	153	144	148	157	195	181	171	162	171	175	183
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		136	135	119	139	157	140	154	165	144	144	107	160	130	127	114	97	69	86	85	121	108	108	105	98	117	98
Port Freeport Downstream Boundary to	12		151	155	142	154	182	148	176	185	162	156	132	175	151	161	138	125	111	107	109	172	146	145	139	132	148	147
Colorado River	13		148	139	122	136	173	137	166	173	152	147	112	166	144	145	122	117	70	69	57	125	112	121	113	105	127	118
Colorado River Industry	14		128	127	115	126	151	138	148	152	140	135	99	146	124	123	126	115	80	104	102	150	110	126	101	121	127	102
Colorado River to Calhoun	15		127	123	114	126	150	143	142	153	138	134	100	144	123	126	128	113	60	77	71	143	103	129	101	96	119	109
	16		122	125	109	119	141	133	135	142	131	125	90	139	115	117	116	96	73	56	59	126	92	112	82	112	112	101
Port Lavaca (Calhoun Port Authority)	17		106	96	95	100	119	117	122	124	109	113	79	112	105	107	100	86	81	80	84	116	90	104	71	101	101	86
Calhoun to Victoria	18		110	112	100	110	121	119	121	124	114	118	88	119	109	115	101	82	75	67	83	114	89	107	75	110	99	95
Port of Victoria	19		76	69	66	69	74	60	66	86	77	71	52	78	65	70	70	59	53	52	60	76	55	62	58	74	71	72
Victoria to Corpus Christi Upstream Boundary	20		90	84	80	82	94	85	87	95	93	90	67	91	82	88	81	69	71	60	68	93	83	83	75	92	93	82
	21		87	85	75	83	94	81	96	99	92	89	62	94	75	81	80	68	72	61	66	87	77	87	70	91	85	87
	22		91	86	74	85	100	85	95	102	93	85	61	97	85	80	88	63	81	63	64	95	81	102	66	95	91	88
Link 22A (Aransas Pass)	22A		16	14	16	11	7	11	11	15	11	8	9	11	17	8	14	13	18	10	13	12	12	17	9	17	12	11
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		75	72	58	74	93	74	84	87	82	77	52	86	68	72	74	50	63	53	51	83	69	85	57	78	79	77
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		8	10	7	8	13	16	7	12	16	8	6	13	10	11	10	5	8	9	7	13	9	13	5	20	10	11
Corpus Christi Downstream Boundary to	24		14	23	16	17	19	22	21	17	23	14	11	23	19	21	13	7	12	16	7	22	14	27	11	30	18	21
Arroyo Colorado Upstream Boundary	25		23	23	12	20	18	21	22	19	23	12	9	24	17	19	13	6	11	15	5	24	11	22	17	24	16	20
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		19	19	13	17	19	20	18	16	15	11	7	22	14	16	12	7	10	11	6	18	7	20	15	25	12	16
Arroyo Colorado to Port Isabel Upstream Boundary	27		13	12	12	18	9	12	14	12	10	5	3	13	7	10	3	3	5	8	4	4	1	10	5	13	6	7
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		10	5	8	15	6	3	8	10	3	5	3	6	4	4	2	1	4	4	2	1	0	3	2	8	4	4
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		9	5	10	18	9	7	8	6	6	7	5	7	7	5	2	3	4	2	5	1	1	4	5	6	3	3

Table 24. Weekly Average Transit Time Estimates (Hours): Westbound/Southbound, Week 1–Week 26, 2018

O-D Pair	Link	Direc-tion	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	WB/ SB	1.39	1.41	1.42	1.39	1.46	1.37	1.47	1.41	1.30	1.33	1.41	1.38	1.33	1.20	1.25	1.36	1.28	1.38	1.43	1.38	1.44	1.39	1.35	1.43	1.38	1.40
Port Beaumont/Port Arthur Upstream	2		1.98	1.93	2.07	1.95	2.02	1.89	1.87	1.91	1.84	1.97	1.94	1.81	1.82	1.76	1.85	1.90	1.75	1.80	1.90	1.98	1.89	1.94	1.86	2.02	1.77	1.94
Boundary to Port Arthur Downstream	3		1.00	1.03	1.01	1.02	1.00	0.98	0.95	1.00	0.96	0.99	0.97	1.00	0.95	0.94	0.98	0.96	0.96	0.93	0.94	1.00	0.94	0.98	0.96	0.98	0.99	0.98
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		10.52	10.16	9.81	10.07	9.65	9.90	10.13	11.27	9.26	9.60	9.91	9.81	8.81	9.41	9.26	9.01	8.85	8.72	9.15	9.20	8.90	8.98	9.14	9.42	9.41	9.20
	5		0.90	0.90	0.90	0.95	0.89	0.93	0.97	0.98	0.93	0.93	0.94	0.94	0.88	0.93	0.93	0.94	0.92	0.89	0.90	0.87	0.88	0.87	0.84	0.87	0.81	0.88
Port of Houston/Galveston/Texas City	6		0.65	0.52	0.52	0.80	0.55	0.87	0.83	0.54	0.52	0.70	0.54	0.67	0.52	0.95	0.54	1.08	0.52	0.58	0.51	0.63	0.52	0.54	0.50	0.55	0.77	0.61
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		0.62	0.61	0.62	0.61	0.63	0.59	0.62	0.63	0.58	0.62	0.62	0.61	0.59	0.60	0.63	0.63	0.63	0.59	0.59	0.64	0.61	0.63	0.62	0.61	0.62	0.65
	8		2.31	2.27	2.25	2.21	2.26	2.20	2.34	2.33	2.18	2.29	2.14	2.22	2.27	2.24	2.35	2.27	2.33	2.22	2.18	2.29	2.18	2.29	2.19	2.25	2.36	2.30
	9		0.77	0.73	0.74	0.74	0.75	0.77	0.80	0.75	0.74	0.74	0.75	0.72	0.71	0.75	0.77	0.74	0.76	0.71	0.71	0.75	0.72	0.73	0.75	0.70	0.72	0.72
Chocolate Bayou to Port Freeport Upstream Boundary	10		2.96	2.79	2.83	2.84	2.89	2.90	2.90	3.07	2.80	2.90	2.86	2.86	2.79	2.76	2.88	2.90	2.94	2.69	2.74	3.03	2.77	2.94	2.95	2.86	2.90	2.96
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		1.00	1.01	1.06	1.05	0.99	1.06	1.11	1.08	1.03	1.06	1.03	1.06	1.05	1.01	1.08	1.02	1.08	0.99	1.01	1.03	0.99	1.04	1.06	0.99	1.05	1.04
Port Freeport Downstream Boundary to	12		2.99	3.60	6.57	3.70	4.48	5.91	5.95	4.29	5.15	3.89	5.59	5.53	4.69	7.00	7.40	4.85	4.58	4.63	3.53	4.05	3.24	3.38	2.61	3.73	6.26	4.69
Colorado River	13		5.91	6.02	6.42	6.46	5.86	5.99	5.77	6.46	5.99	6.25	6.16	6.04	6.07	5.89	6.54	6.59	6.19	6.02	6.00	5.77	5.70	5.89	6.22	5.66	5.78	6.21
Colorado River Industry	14		4.16	4.82	8.75	8.74	3.87	5.99	8.27	6.52	5.10	3.81	4.93	3.63	4.76	10.13	4.77	9.97	3.54	5.33	3.61	3.12	2.70	2.63	2.87	2.71	4.17	3.79
Colorado River to Calhoun	15		0.99	0.98	1.05	1.01	0.97	1.00	1.06	1.01	1.00	1.05	1.03	1.03	0.95	0.96	0.99	1.00	1.04	0.99	1.03	1.00	0.99	0.98	1.02	0.96	0.97	1.01
	16		1.04	1.12	1.18	1.00	1.11	1.11	1.16	1.07	1.09	1.07	1.05	1.11	1.03	1.07	1.12	1.17	1.15	1.05	1.10	1.04	1.00	1.02	1.01	1.00	1.04	1.10
Port Lavaca (Calhoun Port Authority)	17		2.57	2.61	2.59	2.47	2.50	2.60	2.55	2.65	2.55	2.59	2.60	2.64	2.54	2.52	2.60	2.60	2.79	2.46	2.61	2.68	2.52	2.62	2.57	2.50	2.61	2.65
Calhoun to Victoria	18		2.43	2.37	2.39	2.38	2.36	2.51	2.55	2.38	2.61	2.43	2.54	2.56	2.28	2.37	2.52	2.50	2.50	2.34	2.41	2.44	2.38	2.42	2.46	2.35	2.57	2.56
Port of Victoria	19		1.16	1.09	1.14	1.18	1.06	1.17	1.15	1.07	1.10	1.11	1.13	1.09	1.09	1.05	1.06	1.09	1.18	1.05	1.11	1.12	1.06	1.07	1.06	1.01	1.06	1.15
Victoria to Corpus Christi Upstream Boundary	20		2.56	2.55	2.63	2.46	2.48	2.57	2.49	2.65	2.64	2.60	2.68	2.65	2.55	2.50	2.65	2.65	2.73	2.55	2.63	2.64	2.58	2.64	2.80	2.52	2.67	2.82
	21		0.96	0.99	0.98	0.87	0.89	1.03	0.92	1.05	1.01	0.97	1.01	0.90	1.01	0.96	0.90	1.07	1.01	1.00	0.99	1.02	0.99	1.01	1.11	0.91	1.05	1.16
	22		6.33	15.82	10.60	8.02	25.86	31.46	25.80	15.13	9.62	11.81	11.11	13.07	35.28	18.20	19.99	25.62	19.83	14.40	22.17	24.29	16.43	9.86	14.01	14.70	28.14	38.01
Link 22A (Aransas Pass)	22A		8.57	11.88	12.91	4.98	37.67	24.67	31.78	36.09	8.72	4.94	10.81	13.65	47.11	15.53	24.99	22.79	29.36	19.94	28.09	32.07	26.26	8.38	23.55	18.11	81.73	65.55
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		5.94	16.68	9.58	8.42	21.69	31.95	24.92	13.04	9.81	14.10	11.17	12.98	31.33	18.38	19.21	26.40	18.10	13.94	19.88	23.08	14.11	10.26	12.79	13.94	16.23	29.10
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		2.01	2.08	2.00	2.00	1.81	1.80	2.42	2.00	1.80	2.05	2.32	1.90	2.48	1.69	1.97	2.19	2.00	1.98	2.05	1.69	2.04	2.08	2.10	1.85	1.96	1.99
Corpus Christi Downstream Boundary to	24		8.33	8.83	7.65	8.81	7.75	8.10	11.08	9.50	7.50	8.28	8.02	8.85	9.11	6.82	8.40	8.77	8.91	8.15	8.32	8.15	8.78	9.00	9.17	8.22	9.13	9.72
Arroyo Colorado Upstream Boundary	25		8.48	9.10	8.92	9.47	8.62	9.14		9.32	9.69	9.88	9.46	9.76	10.67	8.90	9.33	9.23	8.82	9.60	9.22	10.46	9.65	10.00	10.62	9.58	9.40	9.81
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		0.54	0.54	0.56	0.47	0.63	0.51	0.61	0.50	0.50	0.52	0.58	0.57	0.67	0.38	0.53	0.52	0.55	0.57	0.57	0.58	0.56	0.57	0.65	0.58	0.52	0.56
Arroyo Colorado to Port Isabel Upstream Boundary	27		3.64	3.44	3.58	3.86	3.26	3.93	3.78	2.46	3.45	3.46	4.88	4.63	3.96		3.58	3.25	3.51	2.92	3.57	3.25	3.63	3.88	3.69	3.00	3.51	3.67
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28			0.38		0.50	0.33	0.39	0.46	0.50	0.42	0.50		0.47			0.42	0.46	0.38	0.33	0.47	0.83	0.41		0.46	0.58	0.68	0.42
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		1.04	1.25	1.06	1.07	1.15	1.15	1.15	1.22	1.19	1.22		1.42	1.26		1.25	1.26	1.33	1.00	1.19		1.22	1.38	1.17		1.28	1.75

Table 25. Weekly Average Transit Time Estimates (Hours): Westbound/Southbound, Week 27–Week 52, 2018.

O-D Pair	Link	Direc-tion	Week 27	Week 28	Week 29	Week 30	Week 31	Week 32	Week 33	Week 34	Week 35	Week 36	Week 37	Week 38	Week 39	Week 40	Week 41	Week 42	Week 43	Week 44	Week 45	Week 46	Week 47	Week 48	Week 49	Week 50	Week 51	Week 52
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	WB/ SB	1.38	1.48	1.43	1.43	1.41	1.44	1.51	1.45	1.40	1.40	1.42	1.40	1.38	1.38	1.38	1.40	1.36	1.40	1.43	1.33	1.35	1.35	1.39	1.38	1.40	1.36
Port Beaumont/Port Arthur Upstream	2		1.87	1.89	1.96	1.98	1.90	1.99	1.97	2.08	1.96	2.00	2.01	1.99	2.04	1.97	1.91	1.99	1.87	1.85	1.96	1.97	2.06	1.91	1.91	1.81	1.87	1.82
Boundary to Port Arthur Downstream	3		1.04	1.02	1.04	1.03	0.95	1.01	1.00	1.00	0.96	1.04	1.07	1.01	0.96	0.94	0.97	0.99	0.95	0.99	0.95	1.00	0.91	0.99	1.00	1.01	1.02	0.89
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		8.87	8.91	9.27	9.36	8.77	9.11	9.45	9.13	8.74	9.05	8.77	8.80	8.49	8.68	8.90	8.89	8.95	8.91	9.26	9.34	9.51	9.10	9.48	9.54	9.55	9.07
	5		0.84	0.86	0.85	0.92	0.88	0.90	0.87	0.81	0.86	0.86	0.88	0.85	0.84	0.86	0.84	0.88	0.85	0.86	0.91	0.88	0.83	0.87	0.93	0.91	0.92	0.89
Port of Houston/Galveston/Texas City	6		0.56	0.64	0.66	0.54	0.58	0.55	0.71	0.54	0.53	0.54	0.54	0.86	0.56	0.58	0.70	0.50	0.53	0.52	0.55	0.58	0.50	0.83	0.60	0.57	0.71	0.57
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		0.63	0.66	0.65	0.64	0.63	0.64	0.65	0.64	0.63	0.61	0.61	0.64	0.61	0.64	0.61	0.61	0.62	0.64	0.61	0.63	0.60	0.62	0.62	0.62	0.63	0.59
	8		2.26	2.31	2.29	2.27	2.23	2.25	2.34	2.26	2.31	2.24	2.22	2.35	2.23	2.22	2.27	2.26	2.20	2.26	2.26	2.35	2.18	2.35	2.36	2.26	2.32	2.17
	9		0.76	0.73	0.73	0.74	0.76	0.75	0.76	0.75	0.73	0.74	0.72	0.76	0.77	0.72	0.72	0.71	0.72	0.74	0.74	0.75	0.71	0.75	0.75	0.74	0.77	0.76
Chocolate Bayou to Port Freeport Upstream Boundary	10		2.88	3.04	3.12	3.00	2.83	2.99	3.02	2.98	2.91	2.82	2.77	3.07	2.78	2.83	2.81	2.85	2.89	3.17	2.85	3.00	2.75	2.92	2.93	3.07	3.11	2.80
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		1.05	1.04	1.10	1.05	1.07	1.02	1.06	1.00	0.99	1.01	0.93	1.05	0.99	1.05	1.00	1.09	1.21	1.13	1.08	1.03	1.15	1.03	1.15	1.18	1.13	1.12
Port Freeport Downstream Boundary to	12		3.02	3.23	3.10	3.44	3.38	3.61	3.91	2.83	3.13	4.77	3.29	3.65	4.53	6.47	5.62	7.27	8.10	6.05	5.76	5.94	6.74	6.07	6.68	7.45	4.47	8.60
Colorado River	13		6.07	6.19	6.20	6.03	6.07	6.10	6.38	5.81	5.86	5.90	5.62	5.88	5.73	5.99	5.86	5.82	6.07	6.48	5.63	6.26	6.00	6.62	6.31	6.09	6.40	6.18
Colorado River Industry	14		3.19	3.89	3.92	4.94	4.29	3.19	3.13	2.90	3.16	3.16	4.90	3.77	3.01	3.02	3.72	8.26	13.72	14.04	12.30	6.28	5.48	6.27	4.86	10.29	6.56	6.19
Colorado River to Calhoun	15		1.01	1.04	1.05	1.00	1.03	0.98	1.03	0.97	0.99	0.97	0.99	1.01	1.03	1.02	0.96	0.96	1.08	1.19	1.25	1.00	1.05	1.02	1.00	1.00	0.99	1.03
	16		1.12	1.10	1.07	1.10	1.12	1.04	1.07	1.03	1.06	1.07	1.07	1.13	1.09	1.07	1.04	1.03	1.06	1.25	1.22	1.06	1.11	1.04	1.07	1.01	1.06	1.05
Port Lavaca (Calhoun Port Authority)	17		2.61	2.73	2.64	2.68	2.61	2.63	2.63	2.60	2.58	2.49	2.53	2.63	2.60	2.56	2.53	2.54	2.60	2.54	2.49	2.63	2.57	2.55	2.50	2.50	2.56	2.52
Calhoun to Victoria	18		2.50	2.61	2.64	2.46	2.59	2.43	2.62	2.45	2.37	2.54	2.58	2.57	2.54	2.39	2.33	2.43	2.43	2.56	2.32	2.58	2.36	2.45	2.33	2.57	2.44	2.46
Port of Victoria	19		1.11	1.06	1.12	1.09	1.01	1.18	1.09	1.06	1.13	0.99	1.03	1.12	1.11	1.05	1.07	1.07	1.09	1.07	1.08	1.17	1.17	1.14	1.04	1.04	1.22	1.10
Victoria to Corpus Christi Upstream Boundary	20		2.71	2.70	2.91	2.74	2.62	2.71	2.74	2.80	2.54	2.38	2.48	2.67	2.42	2.50	2.52	2.47	2.46	2.61	2.60	2.60	2.46	2.56	2.45	2.52	2.61	2.42
	21		1.00	1.02	1.10	1.08	1.02	1.03	1.06	1.11	0.99	0.94	0.94	1.07	0.92	0.99	0.97	0.95	0.93	0.94	0.97	0.98	0.89	0.96	0.99	0.93	0.97	0.94
	22		13.11	19.63	8.14	13.40	7.88	8.76	9.95	21.58	13.74	12.41	14.81	23.71	16.74	16.40	28.50	16.18	28.25	21.41	9.36	15.50	23.22	18.48	15.59	17.24	14.42	23.85
Link 22A (Aransas Pass)	22A		16.08	33.02	18.15	7.45	8.86	10.01	5.35	27.49	3.87	55.50	10.36	95.79	25.04	3.90	48.54	25.86	30.53	32.57	22.37	20.18	15.81	24.11	35.42	20.81	8.50	38.58
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		12.63	15.74	5.54	14.13	7.81	8.56	10.39	20.67	14.88	7.75	15.88	11.97	15.23	17.79	24.91	13.76	27.48	19.18	6.95	14.77	24.53	17.20	11.02	16.18	15.31	21.75
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		2.18	2.33	2.04	1.92	2.02	2.12	1.98	1.79	2.11	1.88	1.67	2.03	1.90	2.01	1.93	1.81	1.81	1.81	2.02	2.26	2.03	2.10	2.25	2.19	2.19	1.98
Corpus Christi Downstream Boundary to	24		8.53	8.97	8.76	8.11	7.88	8.15	8.65	8.28	7.81	7.56	8.16	8.24	8.04	7.78	7.69	7.17	9.35	8.09	8.48	8.28	7.90	8.56	7.94	8.51	8.30	7.40
Arroyo Colorado Upstream Boundary	25		9.89	9.90	10.06	9.59	9.20	9.51	9.65	9.60	9.29	8.83	7.89	8.68	8.86	8.67	9.35	7.21	8.01	9.05	9.00	9.12	8.03	8.30	8.66	9.13	9.04	8.68
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		0.59	0.60	0.68	0.63	0.61	0.58	0.60	0.57	0.58	0.51	0.46	0.52	0.52	0.56	0.55	0.46	0.49	0.55	0.50	0.54	0.48	0.52	0.53	0.56	0.50	0.55
Arroyo Colorado to Port Isabel Upstream Boundary	27		3.73	3.98	3.69	3.51	3.79	3.40	3.55	3.42	3.51	3.21		3.56	3.08	3.54	4.58		3.71	3.33	3.63	3.65	3.08	3.71	3.33	3.47	4.58	3.76
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		0.45	0.50	0.43	0.40	0.44		0.51	0.53		0.46		0.38	0.38	0.42	0.42		0.33	0.47	0.58			0.33	0.38	0.38	0.83	0.41
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		1.25	1.17	1.30	1.26	1.28	1.21	1.98	1.18	1.24	1.33		1.29	1.25	1.17	2.25	1.42	1.33	1.25	1.21	1.21	1.00	1.25	1.21	1.52	1.92	1.67

Table 26. Weekly Link Transit Count: Westbound/Southbound, Week 1–Week 26, 2018.

O-D Pair	Link	Direc-tion	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	WB/ SB	149	140	126	155	153	146	103	152	173	128	138	147	161	131	147	162	171	156	155	153	138	148	142	162	140	154
Port Beaumont/Port Arthur Upstream	2		87	100	79	114	85	98	71	84	106	72	103	94	104	73	95	97	119	102	99	97	94	98	96	98	87	102
Boundary to Port Arthur Downstream	3		136	135	108	164	151	147	118	117	153	126	145	136	143	124	149	145	169	156	156	157	151	156	152	147	128	172
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		102	120	91	144	141	86	39	44	152	129	141	126	143	119	145	139	179	152	163	149	145	160	152	143	125	179
	5		152	164	111	160	156	113	99	137	187	156	162	137	167	137	165	151	193	168	174	167	168	200	174	157	154	202
Port of Houston/Galveston/Texas City	6		46	44	34	51	46	30	31	53	44	39	40	39	35	37	46	35	47	37	46	36	36	47	40	34	46	37
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		113	119	77	101	113	90	96	121	103	113	105	99	94	113	122	91	105	108	117	103	102	109	109	99	104	96
	8		111	116	72	99	108	86	73	113	104	109	103	100	94	103	119	85	106	109	115	102	102	108	111	100	98	94
	9		106	117	74	105	103	85	80	117	104	108	102	100	95	106	119	84	102	111	114	99	103	108	110	95	101	93
Chocolate Bayou to Port Freeport Upstream Boundary	10		99	106	68	94	97	75	62	100	92	98	93	94	84	94	106	72	95	92	102	85	96	95	99	83	91	84
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		72	71	42	52	67	51	49	60	64	66	58	54	55	59	66	50	56	59	63	58	60	62	61	56	53	51
Port Freeport Downstream Boundary to	12		71	84	49	71	72	62	63	74	79	77	72	67	68	86	82	62	66	70	77	60	70	75	69	71	65	61
Colorado River	13		70	75	38	53	68	37	35	66	74	69	67	61	58	70	71	58	59	64	70	54	71	73	64	64	65	50
Colorado River Industry	14		62	64	44	59	65	40	59	62	73	62	64	58	52	72	66	49	57	63	64	52	59	62	59	56	56	47
Colorado River to Calhoun	15		63	64	40	63	65	38	52	57	72	62	66	57	51	74	69	50	57	66	62	53	59	59	60	55	54	46
	16		53	57	34	54	55	27	31	45	59	57	58	50	46	64	46	35	40	53	53	47	59	57	57	46	53	42
Port Lavaca (Calhoun Port Authority)	17		51	54	42	51	56	26	48	52	58	48	53	47	41	58	57	38	45	50	51	38	49	52	44	37	41	38
Calhoun to Victoria	18		55	52	46	51	60	28	44	58	59	55	57	52	48	62	61	41	55	48	60	43	52	59	48	41	46	39
Port of Victoria	19		37	31	30	36	43	15	22	27	32	28	27	32	30	33	33	27	31	27	36	26	28	36	30	30	25	19
Victoria to Corpus Christi Upstream Boundary	20		49	43	33	44	50	22	34	43	48	42	38	41	36	44	52	37	40	37	43	38	43	41	45	36	35	35
	21		46	41	31	40	45	20	29	35	46	39	36	37	32	37	49	33	37	36	44	37	42	38	40	36	31	29
	22		47	45	36	43	46	30	39	55	47	44	36	37	36	49	52	37	39	39	43	37	47	38	44	38	22	45
Link 22A (Aransas Pass)	22A		7	8	11	5	12	2	5	5	8	11	6	5	9	3	7	8	6	3	12	5	9	8	5	7	4	11
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		40	37	25	38	34	28	34	50	39	33	30	32	27	46	45	29	33	36	31	32	38	30	39	31	18	34
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		7	4	5	3	3	8	2	7	9	9	5	7	4	3	6	4	7	5	11	3	4	5	4	5	2	7
Corpus Christi Downstream Boundary to	24		7	7	7	7	5	5	1	6	7	13	5	9	3	6	9	4	11	7	15	5	8	6	5	10	5	9
Arroyo Colorado Upstream Boundary	25		8	6	6	8	5	7	0	6	8	10	8	9	6	5	5	7	11	7	13	6	8	7	5	10	4	8
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		6	4	4	6	2	8	3	2	8	7	2	7	5	2	3	5	9	5	12	3	7	5	6	8	5	7
Arroyo Colorado to Port Isabel Upstream Boundary	27		3	3	2	3	3	4	3	1	5	4	1	4	1	0	2	2	5	1	8	1	5	2	4	1	3	1
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		0	2	0	2	1	4	2	1	3	3	0	3	0	0	1	2	3	1	5	1	4	0	2	1	3	1
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		2	9	3	6	12	5	11	5	9	3	0	6	6	0	5	3	5	1	6	0	4	2	1	0	3	1

Table 27. Weekly Link Transit Count: Westbound/Southbound, Week 27–Week 52, 2018.

O-D Pair	Link	Direc-tion	Week 27	Week 28	Week 29	Week 30	Week 31	Week 32	Week 33	Week 34	Week 35	Week 36	Week 37	Week 38	Week 39	Week 40	Week 41	Week 42	Week 43	Week 44	Week 45	Week 46	Week 47	Week 48	Week 49	Week 50	Week 51	Week 52
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	WB/ SB	137	132	157	156	157	150	140	144	153	141	149	132	131	141	153	133	140	97	59	78	61	72	54	82	92	102
Port Beaumont/Port Arthur Upstream	2		82	88	102	99	93	89	91	83	85	88	94	81	84	81	87	74	83	55	35	43	39	47	34	51	65	55
Boundary to Port Arthur Downstream	3		137	147	161	154	151	165	139	153	138	150	148	130	138	141	146	140	141	105	56	72	67	63	46	74	87	102
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		133	153	162	164	160	172	159	152	142	148	153	137	138	154	149	134	139	108	48	66	66	59	38	59	83	89
	5		151	177	179	181	176	184	181	171	170	188	173	156	170	163	165	151	147	153	121	133	162	148	112	121	111	150
Port of Houston/Galveston/Texas City	6		39	41	38	53	48	44	41	45	40	46	50	42	37	40	40	36	46	30	37	41	51	40	38	38	28	41
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		110	112	97	121	116	115	123	123	102	109	122	115	99	113	99	97	94	76	95	105	111	97	98	96	82	102
	8		107	113	97	123	115	111	110	121	100	109	115	114	100	114	98	92	87	71	98	99	112	91	92	90	80	98
	9		105	112	95	120	114	113	111	118	100	105	119	112	101	103	93	93	86	72	99	97	107	98	97	96	95	107
Chocolate Bayou to Port Freeport Upstream Boundary	10		93	101	81	111	106	100	105	110	88	102	103	108	96	100	84	79	77	67	89	80	93	88	85	86	87	94
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		67	69	51	75	78	71	71	86	68	70	59	64	64	57	52	46	29	32	43	32	46	40	46	34	56	41
Port Freeport Downstream Boundary to	12		78	81	64	81	93	75	86	99	76	79	74	76	76	82	68	66	61	49	64	77	72	71	72	68	71	82
Colorado River	13		78	71	54	71	87	68	85	91	74	68	66	69	74	73	60	60	32	18	20	65	57	58	62	48	60	68
Colorado River Industry	14		67	65	52	68	75	69	72	81	70	66	60	62	63	60	64	58	43	47	56	73	53	65	46	65	57	62
Colorado River to Calhoun	15		68	64	52	69	74	71	69	81	69	65	59	61	62	61	64	60	41	53	55	76	52	64	47	63	55	63
	16		65	61	48	64	65	65	63	70	62	57	53	56	56	53	55	42	34	37	39	64	41	47	33	59	46	55
Port Lavaca (Calhoun Port Authority)	17		58	47	44	55	58	57	62	68	55	55	47	50	53	53	48	49	33	38	50	62	47	52	33	54	45	52
Calhoun to Victoria	18		59	55	47	61	59	59	60	66	58	58	50	54	54	60	51	53	36	42	49	66	50	55	41	59	47	58
Port of Victoria	19		44	27	29	38	34	25	27	41	37	34	30	31	28	34	28	34	17	22	33	37	24	32	26	32	34	39
Victoria to Corpus Christi Upstream Boundary	20		52	36	38	44	48	44	42	51	45	47	34	45	37	46	41	43	27	31	37	51	43	42	40	44	46	45
	21		49	35	35	44	43	42	45	51	46	43	31	46	32	39	39	36	24	27	34	44	37	43	32	41	39	47
	22		50	40	34	46	49	43	45	52	48	41	31	50	39	40	46	30	36	30	32	52	40	54	32	48	46	48
Link 22A (Aransas Pass)	22A		7	9	7	5	3	6	4	7	5	4	6	7	6	4	7	6	9	5	5	7	6	10	6	11	6	6
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		43	31	27	41	46	37	41	45	43	37	25	43	33	36	39	24	27	25	27	45	34	44	26	37	40	42
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		7	7	4	5	8	10	4	10	8	5	2	9	5	6	8	3	4	6	5	9	5	8	2	9	6	9
Corpus Christi Downstream Boundary to	24		9	13	7	11	9	14	8	13	9	8	4	14	8	11	9	3	5	10	4	11	7	15	7	14	11	14
Arroyo Colorado Upstream Boundary	25		14	13	7	11	9	15	8	13	10	7	3	14	9	11	9	2	4	10	1	13	5	12	11	13	8	14
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		10	11	6	9	10	11	7	9	6	6	2	11	7	8	7	2	4	7	2	10	4	10	10	9	6	11
Arroyo Colorado to Port Isabel Upstream Boundary	27		7	7	6	9	4	6	5	6	4	2	0	4	2	4	1	0	2	6	1	2	1	3	4	3	1	5
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		7	3	6	7	3	0	3	5	0	2	0	2	2	1	1	0	1	3	1	0	0	2	2	3	1	4
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		5	1	4	9	3	2	2	3	4	4	0	2	1	1	1	1	1	1	1	1	1	2	4	2	1	2

Table 28. Weekly Average Transit Time Estimates (Hours): Eastbound/Northbound, Week 1–Week 26, 2018.

O-D Pair	Link	Direc-tion	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	EB/ NB	1.43	1.43	1.42	1.44	1.49	1.43	1.48	1.37	1.58	1.62	1.52	1.45	1.48	1.70	1.57	1.50	1.51	1.39	1.38	1.38	1.43	1.35	1.36	1.41	1.45	1.41
Port Beaumont/Port Arthur Upstream	2		2.02	1.95	1.99	1.90	1.96	1.91	1.94	1.97	2.11	2.14	2.12	2.02	1.97	2.11	2.09	2.06	2.10	2.10	2.02	1.99	2.03	1.89	1.97	1.94	2.05	1.97
Boundary to Port Arthur Downstream	3		1.07	1.06	1.05	1.09	1.06	1.09	1.03	1.05	1.08	1.09	1.06	1.05	1.00	1.05	1.04	1.05	1.02	1.07	0.99	0.95	1.02	0.94	1.03	1.01	1.03	1.00
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		10.70	10.48	9.78	9.79	10.00	9.96	10.43	11.10	9.35	9.79	9.92	9.44	9.12	9.41	9.30	9.31	9.39	9.11	9.06	8.73	9.21	8.43	9.12	9.11	9.46	9.01
	5		0.84	0.84	0.84	0.85	0.81	0.85	0.99	0.85	0.85	0.86	0.84	0.84	0.80	0.85	0.82	0.84	0.83	0.80	0.81	0.82	0.81	0.80	0.82	0.80	0.84	0.84
Port of Houston/Galveston/Texas City	6		0.75	0.84	0.75	0.87	1.04	0.72	0.90	0.75	0.88	1.21	0.71	2.02	0.98	0.74	0.82	0.71	0.66	0.64	0.61	0.76	0.60	0.57	0.61	0.90	0.55	0.77
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		0.61	0.61	0.59	0.62	0.60	0.60	0.60	0.59	0.60	0.60	0.59	0.60	0.59	0.60	0.60	0.61	0.60	0.57	0.60	0.57	0.57	0.57	0.59	0.59	0.57	0.59
	8		2.29	2.30	2.21	2.40	2.27	2.38	2.35	2.42	2.28	2.33	2.31	2.26	2.31	2.25	2.23	2.45	2.28	2.18	2.27	2.25	2.19	2.16	2.28	2.21	2.18	2.28
	9		0.77	0.74	0.75	0.76	0.72	0.74	0.76	0.78	0.75	0.74	0.74	0.74	0.73	0.71	0.77	0.76	0.79	0.70	0.74	0.74	0.72	0.76	0.76	0.74	0.71	0.79
Chocolate Bayou to Port Freeport Upstream Boundary	10		3.12	3.04	3.04	3.25	3.01	3.13	3.24	3.05	3.04	3.06	3.11	3.07	3.06	3.06	3.15	3.01	3.10	3.02	2.85	2.87	2.92	2.75	2.88	2.85	2.91	2.92
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		1.08	1.03	1.09	1.08	1.04	1.06	1.13	1.06	1.12	1.06	1.02	1.13	1.08	1.00	1.07	1.09	1.08	1.09	1.01	1.02	1.01	1.03	1.06	1.08	0.98	0.99
Port Freeport Downstream Boundary to	12		3.71	4.65	6.70	5.15	5.38	7.46	10.46	5.31	5.66	4.97	7.25	4.27	6.41	7.75	7.81	6.20	4.76	5.27	3.17	5.18	3.12	3.61	3.27	3.42	3.37	3.67
Colorado River	13		6.49	6.30	6.49	6.84	6.37	7.07	6.61	6.51	6.58	6.50	6.72	6.36	6.40	6.16	6.62	6.81	6.49	6.16	6.35	6.09	5.99	6.11	6.41	6.20	6.04	6.20
Colorado River Industry	14		4.01	3.91	5.26	8.96	2.80	7.53	6.92	5.84	4.00	3.00	3.77	3.35	4.94	4.02	3.96	3.88	3.69	4.03	3.85	3.21	2.84	2.51	2.27	2.57	3.15	2.85
Colorado River to Calhoun	15		1.13	1.09	1.08	1.12	1.09	1.10	1.15	1.09	1.10	1.08	1.07	1.09	1.04	1.02	1.10	1.17	1.12	1.01	1.07	1.04	1.03	1.06	1.09	1.06	1.06	1.07
	16		1.08	1.07	1.09	1.10	1.06	1.10	1.12	1.06	1.05	1.03	1.05	1.08	1.06	1.04	1.05	1.17	1.12	1.05	1.12	1.03	1.03	1.08	1.11	1.15	1.07	1.08
Port Lavaca (Calhoun Port Authority)	17		2.67	2.65	2.61	2.72	2.65	2.79	2.65	2.65	2.69	2.67	2.63	2.60	2.59	2.45	2.70	2.70	2.65	2.61	2.69	2.46	2.63	2.53	2.65	2.67	2.63	2.62
Calhoun to Victoria	18		2.63	2.56	2.45	2.69	2.69	2.79	2.68	2.82	2.65	2.59	2.45	2.63	2.39	2.61	2.94	2.87	2.78	2.59	2.73	2.61	2.62	2.46	2.56	2.69	2.38	2.52
Port of Victoria	19		1.06	1.10	1.11	1.10	1.07	1.16	1.09	1.20	1.12	1.03	1.02	1.03	0.97	0.93	1.04	1.10	1.02	1.01	1.03	1.03	1.03	1.03	1.05	1.03	0.95	1.01
Victoria to Corpus Christi Upstream Boundary	20		2.98	2.73	3.00	3.00	2.80	3.18	3.10	3.00	2.90	2.74	2.78	2.92	2.66	2.68	2.92	2.79	2.82	2.80	2.76	2.62	2.78	2.61	2.78	2.79	2.59	2.78
	21		1.11	1.06	1.04	1.08	1.06	1.11	1.15	1.05	1.10	0.98	0.99	1.04	0.93	0.95	1.04	1.03	1.00	0.95	0.95	0.96	0.99	0.91	1.01	0.97	0.93	0.93
	22		4.85	5.69	9.51	19.08	7.97	13.09	7.64	8.56	6.19	5.51	8.74	7.27	6.90	5.26	7.18	13.14	5.49	7.31	5.88	4.22	5.40	6.02	5.53	10.12	5.95	5.82
Link 22A (Aransas Pass)	22A		9.07	6.56	11.08	84.88	21.60	10.82	11.17	4.35	5.70	4.72	23.01	6.93	4.57	12.92	8.03	8.08	8.08	13.86	11.69	4.17	8.03	13.95	9.26	33.86	8.63	6.90
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		4.18	5.50	9.25	8.11	5.24	13.57	7.11	9.31	6.30	5.63	5.36	7.41	7.29	4.03	6.98	14.49	4.99	5.72	4.30	4.23	4.89	3.89	4.65	4.19	5.44	5.69
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		1.83	1.65	1.46	1.75	1.75	2.25	1.88	1.58	1.67	1.97	1.96	1.92	2.08	1.83	1.88	1.75	2.00	2.71	1.96	1.54	1.75	1.79	2.38	1.92	2.17	1.77
Corpus Christi Downstream Boundary to	24		6.56	7.73	7.32	7.82	6.88	10.33	7.17	6.06	7.47	6.69	8.15	7.02	9.92	7.40	7.55	7.50	8.13	8.69	6.46	7.28	7.03	7.08	9.42	9.52	6.79	6.79
Arroyo Colorado Upstream Boundary	25		10.58	8.02	7.63	7.96	7.85	9.38	9.17	6.54	7.97	8.43	7.81	9.45	7.36	7.53	9.44	7.96	8.86	8.45	6.99	7.19	7.56	7.93	8.44	8.02	7.40	7.44
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		0.47	0.50	0.54	0.54	0.42	0.45	0.54	0.36	0.43	0.52	0.44	0.56	0.46	0.64	0.50	0.49	0.55	0.52	0.42	0.47	0.49	0.46	0.44	0.48	0.48	0.47
Arroyo Colorado to Port Isabel Upstream Boundary	27		3.54	3.33	3.73	2.89	3.26	3.19	3.49	2.71	2.76	3.01	2.96	3.39	3.26	3.25	3.23	3.31	3.58	3.10	3.06	3.21	3.10	3.33	3.70	3.18	3.17	3.68
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28			0.29	0.79	0.36	0.35	0.42	0.25		0.35	0.35	0.42	0.42	0.47	0.42	0.38	0.38	0.50	0.51	0.36	0.33	0.32	0.42	0.35	0.43	0.35	0.38
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		1.25	1.19	1.25	1.23	1.11	1.25	1.18	1.02	1.15	1.26	1.09	1.33	1.27	1.35	1.21	1.23	1.32	1.24	1.20	1.17	1.16	1.00	1.35	1.35	1.03	1.15

Table 29. Weekly Average Transit Time Estimates (Hours): Eastbound/Northbound, Week 27–Week 52, 2018.

O-D Pair	Link	Direc-tion	Week 27	Week 28	Week 29	Week 30	Week 31	Week 32	Week 33	Week 34	Week 35	Week 36	Week 37	Week 38	Week 39	Week 40	Week 41	Week 42	Week 43	Week 44	Week 45	Week 46	Week 47	Week 48	Week 49	Week 50	Week 51	Week 52
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	EB/ NB	1.41	1.47	1.46	1.43	1.43	1.47	1.45	1.41	1.42	1.44	1.45	1.40	1.46	1.39	1.39	1.40	1.46	1.42	1.43	1.49	1.47	1.45	1.47	1.55	1.44	1.52
Port Beaumont/Port Arthur Upstream	2		1.95	2.02	1.96	1.99	2.02	2.04	2.01	1.99	1.97	2.00	2.03	1.93	2.07	1.98	1.93	1.93	2.01	1.97	1.90	2.07	2.00	1.93	2.04	2.12	2.09	2.07
Boundary to Port Arthur Downstream	3		1.03	1.04	0.93	1.00	1.01	1.00	1.01	1.00	1.03	1.03	1.00	1.02	0.99	0.96	1.08	1.02	0.97	1.02	1.03	1.03	0.97	1.00	1.05	0.97	1.07	1.06
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		9.22	9.20	8.73	9.04	9.14	8.64	9.14	8.93	9.00	9.18	9.17	9.09	9.17	8.82	8.83	9.25	9.01	9.10	10.02	9.29	9.91	8.92	9.73	9.48	10.05	9.82
	5		0.80	0.84	0.82	0.83	0.82	0.84	0.82	0.82	0.83	0.83	0.85	0.81	0.83	0.80	0.82	0.84	0.83	0.83	0.79	0.84	0.77	0.81	0.83	0.82	0.83	0.85
Port of Houston/Galveston/Texas City	6		0.70	0.63	0.58	0.60	0.67	0.56	0.59	0.53	0.67	0.72	0.58	0.67	0.60	0.65	0.75	1.01	0.76	0.59	0.89	1.12	0.69	0.57	0.93	0.74	0.98	1.03
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		0.60	0.59	0.58	0.59	0.61	0.58	0.60	0.60	0.61	0.58	0.60	0.61	0.63	0.59	0.61	0.60	0.62	0.60	0.60	0.63	0.59	0.61	0.62	0.61	0.65	0.63
	8		2.25	2.33	2.21	2.25	2.35	2.28	2.29	2.29	2.28	2.15	2.40	2.30	2.39	2.27	2.29	2.18	2.29	2.33	2.25	2.43	2.19	2.31	2.28	2.37	2.48	2.38
	9		0.74	0.77	0.77	0.75	0.74	0.75	0.77	0.77	0.76	0.73	0.76	0.76	0.75	0.73	0.73	0.72	0.76	0.76	0.74	0.80	0.73	0.77	0.76	0.76	0.79	0.73
Chocolate Bayou to Port Freeport Upstream Boundary	10		2.96	2.95	2.82	2.88	2.96	2.87	3.00	2.94	3.07	2.97	3.16	3.04	3.00	2.95	2.93	3.05	3.14	2.96	3.03	3.18	3.02	3.01	3.17	3.15	3.18	3.21
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		1.04	1.06	1.00	1.05	1.05	1.05	1.01	1.03	1.08	1.08	1.13	1.05	1.05	1.10	1.10	1.11	1.12	1.04	1.07	1.16	1.11	1.10	1.14	1.07	1.12	1.14
Port Freeport Downstream Boundary to	12		3.30	5.09	3.80	2.88	3.62	4.60	4.12	3.33	4.01	3.88	4.03	3.09	3.95	5.97	7.93	6.33	8.15	6.38	8.73	9.01	8.03	6.22	10.04	6.26	6.20	9.18
Colorado River	13		6.25	6.46	6.47	6.33	6.37	6.32	6.58	6.25	6.25	6.30	6.57	6.07	6.36	6.55	6.51	6.20	6.65	6.91	6.97	6.81	6.60	6.51	6.68	6.88	6.77	6.96
Colorado River Industry	14		3.25	5.37	4.17	3.75	4.27	3.58	3.38	2.49	3.00	3.03	3.32	3.29	2.77	2.54	3.65	5.63	13.51	16.64	13.65	7.56	3.89	4.78	5.69	10.29	5.30	4.18
Colorado River to Calhoun	15		1.12	1.10	1.07	1.09	1.07	1.08	1.07	1.05	1.09	1.07	1.09	1.03	1.06	1.04	1.06	1.09	1.14	1.38	1.35	1.19	1.08	1.15	1.12	1.23	1.17	1.12
	16		1.09	1.11	1.09	1.06	1.09	1.08	1.07	1.07	1.05	1.05	1.11	1.04	1.04	1.06	1.03	1.07	1.09	1.34	1.23	1.14	1.06	1.16	1.09	1.14	1.11	1.10
Port Lavaca (Calhoun Port Authority)	17		2.69	2.77	2.59	2.59	2.61	2.68	2.64	2.62	2.62	2.63	2.69	2.58	2.69	2.68	2.70	2.61	2.77	2.68	2.64	2.74	2.70	2.76	2.75	2.60	2.60	2.58
Calhoun to Victoria	18		2.72	2.65	2.57	2.66	2.67	2.68	2.81	2.70	2.76	2.53	2.48	2.49	2.57	2.71	2.66	2.82	2.55	2.40	2.41	2.87	2.66	2.60	2.82	2.75	2.71	2.94
Port of Victoria	19		1.04	1.07	1.04	1.04	1.05	1.06	1.07	1.05	1.04	1.05	0.99	0.97	1.06	1.13	1.06	0.99	1.04	1.02	1.05	1.08	1.02	1.05	1.04	1.08	1.09	1.06
Victoria to Corpus Christi Upstream Boundary	20		2.88	2.74	2.68	2.68	2.77	2.68	3.14	2.93	2.86	2.85	2.78	2.76	2.70	3.01	2.96	2.99	2.84	2.67	2.91	2.90	3.10	2.77	2.99	2.90	2.89	2.81
	21		1.00	1.01	0.97	1.02	1.03	0.96	0.95	0.98	0.99	1.01	1.05	0.95	1.02	1.04	1.07	1.11	1.09	1.04	1.15	1.09	1.09	1.05	1.10	1.10	1.03	1.06
	22		5.88	5.48	8.70	5.42	4.98	9.53	5.24	13.69	4.71	6.39	9.22	5.46	5.19	4.72	5.16	28.92	10.27	7.25	10.40	11.65	5.92	8.52	5.74	12.13	8.96	5.61
Link 22A (Aransas Pass)	22A		6.89	10.75	10.20	12.49	10.96	46.92	5.26	63.40	7.74	6.77	9.67	9.46	5.52	6.40	9.25	50.69	16.45	19.30	10.25	20.65	8.65	21.30	10.83	54.10	32.61	7.70
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		5.60	4.84	8.26	4.14	4.47	4.47	5.23	4.22	4.24	6.35	9.17	5.09	5.09	4.53	4.35	23.06	8.72	5.10	10.45	10.46	5.45	6.34	5.24	5.99	5.32	5.31
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		2.00	2.25	1.92	2.14	1.72	1.85	2.25	1.67	1.86	2.00	1.65	1.69	1.88	1.83	1.83	1.54	2.10	1.81	2.17	1.65	2.17	2.32	1.86	1.86	1.92	1.88
Corpus Christi Downstream Boundary to	24		8.17	7.73	6.82	7.24	7.39	7.40	6.77	6.98	7.02	7.40	6.77	6.42	8.28	7.18	6.94	6.85	7.29	7.49	7.19	6.79	7.92	7.95	7.48	7.04	7.81	7.12
Arroyo Colorado Upstream Boundary	25		9.69	7.84	7.20	8.03	7.50	7.38	7.20	7.14	7.30	8.02	7.31	7.87	8.65	8.15	6.71	9.19	9.00	8.47	6.94	8.27	11.54	7.70	7.54	8.50	8.44	8.35
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		0.55	0.50	0.44	0.48	0.45	0.43	0.45	0.42	0.44	0.47	0.48	0.52	0.49	0.44	0.47	0.47	0.54	0.50	0.42	0.50	0.58	0.53	0.43	0.54	0.49	0.42
Arroyo Colorado to Port Isabel Upstream Boundary	27		3.20	3.67	3.06	3.03	3.34	2.95	2.99	2.93	2.92	3.19	3.04	3.27	3.21	2.98	2.65	2.76	3.17	3.88	3.11	2.88		3.33	4.17	3.29	3.33	2.92
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		0.43	0.79	0.48	0.39	0.35	0.35	0.39	0.49	0.33	0.50	0.32	0.36	0.31	0.33	0.25	0.33	0.40	0.42	0.50	0.33		0.25		0.37	0.38	
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		1.16	1.22	1.16	1.26	1.17	1.19	1.26	1.22	1.10	1.14	1.15	1.18	1.26	1.26	1.46	1.02	1.42	1.58	1.13			1.27	1.17	1.26	1.04	1.33

Table 30. Weekly Link Transit Count: Eastbound/Northbound, Week 1–Week 26, 2018.

O-D Pair	Link	Direc-tion	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	EB/ NB	133	172	123	153	174	130	121	191	186	155	161	153	144	142	150	182	168	152	149	158	157	152	141	153	155	156
Port Beaumont/Port Arthur Upstream	2		76	103	63	87	110	67	70	114	104	102	93	96	77	73	96	110	114	88	93	89	105	92	99	88	97	99
Boundary to Port Arthur Downstream	3		129	145	93	130	160	108	92	156	158	160	138	136	127	110	143	148	159	149	156	149	145	153	140	144	125	146
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		118	161	98	152	180	104	63	85	178	179	149	139	132	115	155	165	175	151	171	165	151	162	160	154	141	165
	5		161	188	115	194	197	147	131	178	205	200	185	173	159	161	177	195	196	190	189	188	183	196	194	177	170	182
Port of Houston/Galveston/Texas City	6		40	50	31	42	41	33	32	58	54	57	52	33	40	33	40	44	50	40	42	51	43	44	43	35	36	44
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		100	120	75	106	113	88	80	138	100	126	112	82	105	100	115	107	111	94	112	120	116	105	105	101	96	102
	8		95	108	63	98	111	71	59	109	103	126	105	76	99	82	108	89	109	90	112	118	116	104	106	97	89	99
	9		102	113	66	102	111	85	69	114	103	123	113	84	97	94	108	105	110	89	113	114	121	101	104	98	92	103
Chocolate Bayou to Port Freeport Upstream Boundary	10		89	107	56	90	100	59	63	109	98	110	103	71	85	79	98	95	98	76	100	101	110	91	91	82	80	92
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		66	75	39	66	71	56	46	81	73	75	73	53	61	58	78	69	65	46	66	67	77	62	65	52	57	69
Port Freeport Downstream Boundary to	12		68	80	43	75	74	64	56	89	81	84	78	59	67	65	85	73	74	54	73	72	84	65	75	61	61	75
Colorado River	13		68	77	38	63	69	44	39	75	76	73	70	58	62	52	67	68	67	44	73	70	79	60	73	56	52	70
Colorado River Industry	14		62	69	37	66	65	49	53	76	66	65	64	59	54	47	74	58	65	54	63	63	67	54	66	49	49	61
Colorado River to Calhoun	15		62	67	42	56	65	42	52	72	66	65	66	58	51	51	69	58	66	56	59	62	69	52	65	51	49	64
	16		64	66	40	66	61	34	46	73	63	64	63	55	52	51	70	60	65	53	59	63	68	52	65	49	49	61
Port Lavaca (Calhoun Port Authority)	17		54	55	29	55	51	32	41	58	53	50	55	43	49	38	60	46	50	44	47	53	59	41	49	30	32	47
Calhoun to Victoria	18		54	46	28	50	52	28	32	52	47	44	55	42	51	38	55	33	47	46	54	48	63	44	54	37	32	52
Port of Victoria	19		38	39	26	40	36	25	21	40	41	31	43	27	32	29	47	27	40	32	38	38	47	28	34	25	20	40
Victoria to Corpus Christi Upstream Boundary	20		43	43	28	48	44	23	32	45	45	39	48	34	42	28	52	37	45	39	45	43	51	36	42	35	28	46
	21		46	45	34	48	48	24	30	39	46	39	45	36	42	34	47	38	43	40	43	46	50	35	42	36	28	47
	22		44	44	36	49	48	34	38	46	49	40	47	35	42	36	47	38	43	41	42	45	50	33	42	35	25	45
Link 22A (Aransas Pass)	22A		6	8	5	7	8	6	5	7	9	5	9	10	6	5	9	8	7	8	9	4	8	7	8	7	4	5
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		38	36	31	42	40	28	33	39	40	35	38	25	36	31	38	30	36	33	33	41	42	26	34	28	21	40
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		1	4	2	2	1	2	2	1	4	5	4	2	2	2	4	1	3	2	2	2	4	2	2	3	2	4
Corpus Christi Downstream Boundary to	24		7	7	5	5	4	2	2	3	9	13	8	5	3	3	5	1	13	6	7	5	10	6	6	8	4	8
Arroyo Colorado Upstream Boundary	25		6	7	2	7	5	8	3	2	8	11	7	5	9	4	7	5	10	7	11	4	6	6	6	7	6	6
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		5	3	5	6	4	5	6	3	6	5	4	3	6	3	5	4	9	8	10	5	8	2	6	7	7	6
Arroyo Colorado to Port Isabel Upstream Boundary	27		1	1	2	5	4	6	4	2	5	5	4	3	6	2	4	4	8	6	9	4	6	3	4	5	4	3
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		0	3	1	3	3	1	1	0	5	4	4	3	4	1	3	2	3	3	6	4	4	3	3	3	3	1
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		2	7	3	10	13	3	10	4	3	6	4	6	12	2	8	9	5	3	6	4	5	1	4	2	3	2

Table 31. Weekly Link Transit Count: Eastbound/Northbound, Week 27–Week 52, 2018.

O-D Pair	Link	Direc-tion	Week 27	Week 28	Week 29	Week 30	Week 31	Week 32	Week 33	Week 34	Week 35	Week 36	Week 37	Week 38	Week 39	Week 40	Week 41	Week 42	Week 43	Week 44	Week 45	Week 46	Week 47	Week 48	Week 49	Week 50	Week 51	Week 52
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	EB/ NB	158	153	166	155	156	129	144	151	149	137	137	140	141	132	155	150	142	106	55	91	61	65	50	82	92	79
Port Beaumont/Port Arthur Upstream	2		102	105	102	93	89	76	90	91	95	85	81	88	90	87	90	93	82	64	25	53	31	37	30	53	68	45
Boundary to Port Arthur Downstream	3		157	138	156	148	155	140	151	144	157	142	124	140	132	141	141	132	145	101	55	85	49	57	45	77	82	74
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		165	156	180	161	159	148	164	148	168	147	125	152	143	149	147	141	149	113	57	85	49	61	36	78	93	69
	5		198	191	191	188	180	183	195	192	191	187	162	190	178	176	181	158	165	175	145	178	148	174	136	142	152	149
Port of Houston/Galveston/Texas City	6		46	42	40	41	40	39	46	51	52	41	27	56	36	44	42	28	31	44	30	55	40	40	33	36	51	39
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		111	107	110	110	124	107	124	115	115	108	97	137	101	114	97	88	78	94	78	128	105	107	80	93	97	93
	8		113	104	108	109	123	105	123	111	114	107	92	134	97	114	96	74	76	91	69	114	98	97	76	85	90	90
	9		109	102	110	107	117	103	122	109	117	109	91	137	99	111	97	83	77	91	75	122	101	100	84	97	102	98
Chocolate Bayou to Port Freeport Upstream Boundary	10		96	89	101	93	111	93	112	97	101	99	79	126	92	101	84	74	67	81	68	115	88	83	77	85	88	89
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		69	66	68	64	79	69	83	79	76	74	48	96	66	70	62	51	40	54	42	89	62	68	59	64	61	57
Port Freeport Downstream Boundary to	12		73	74	78	73	89	73	90	86	86	77	58	99	75	79	70	59	50	58	45	95	74	74	67	64	77	65
Colorado River	13		70	68	68	65	86	69	81	82	78	79	46	97	70	72	62	57	38	51	37	60	55	63	51	57	67	50
Colorado River Industry	14		61	62	63	58	76	69	76	71	70	69	39	84	61	63	62	57	37	57	46	77	57	61	55	56	70	40
Colorado River to Calhoun	15		59	59	62	57	76	72	73	72	69	69	41	83	61	65	64	53	19	24	16	67	51	65	54	33	64	46
	16		57	64	61	55	76	68	72	72	69	68	37	83	59	64	61	54	39	19	20	62	51	65	49	53	66	46
Port Lavaca (Calhoun Port Authority)	17		48	49	51	45	61	60	60	56	54	58	32	62	52	54	52	37	48	42	34	54	43	52	38	47	56	34
Calhoun to Victoria	18		51	57	53	49	62	60	61	58	56	60	38	65	55	55	50	29	39	25	34	48	39	52	34	51	52	37
Port of Victoria	19		32	42	37	31	40	35	39	45	40	37	22	47	37	36	42	25	36	30	27	39	31	30	32	42	37	33
Victoria to Corpus Christi Upstream Boundary	20		38	48	42	38	46	41	45	44	48	43	33	46	45	42	40	26	44	29	31	42	40	41	35	48	47	37
	21		38	50	40	39	51	39	51	48	46	46	31	48	43	42	41	32	48	34	32	43	40	44	38	50	46	40
	22		41	46	40	39	51	42	50	50	45	44	30	47	46	40	42	33	45	33	32	43	41	48	34	47	45	40
Link 22A (Aransas Pass)	22A		9	5	9	6	4	5	7	8	6	4	3	4	11	4	7	7	9	5	8	5	6	7	3	6	6	5
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		32	41	31	33	47	37	43	42	39	40	27	43	35	36	35	26	36	28	24	38	35	41	31	41	39	35
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		1	3	3	3	5	6	3	2	8	3	4	4	5	5	2	2	4	3	2	4	4	5	3	11	4	2
Corpus Christi Downstream Boundary to	24		5	10	9	6	10	8	13	4	14	6	7	9	11	10	4	4	7	6	3	11	7	12	4	16	7	7
Arroyo Colorado Upstream Boundary	25		9	10	5	9	9	6	14	6	13	5	6	10	8	8	4	4	7	5	4	11	6	10	6	11	8	6
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		9	8	7	8	9	9	11	7	9	5	5	11	7	8	5	5	6	4	4	8	3	10	5	16	6	5
Arroyo Colorado to Port Isabel Upstream Boundary	27		6	5	6	9	5	6	9	6	6	3	3	9	5	6	2	3	3	2	3	2	0	7	1	10	5	2
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		3	2	2	8	3	3	5	5	3	3	3	4	2	3	1	1	3	1	1	1	0	1	0	5	3	0
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		4	4	6	9	6	5	6	3	2	3	5	5	6	4	1	2	3	1	4	0	0	2	1	4	2	1

Table 32. Yearly Transit Time Estimates, 2019.

		Both Directions						Westbound/Southbound Trips						Eastbound/Northbound Trips					
O-D Pair	Link	Average Transit Time (hours)	Std Dev (hours)	25th %ile TT (hours)	50th %ile TT (hours)	75th %ile TT (hours)	Count	Average Transit Time (hours)	Std Dev (hours)	25th %ile TT (hours)	50th %ile TT (hours)	75th %ile TT (hours)	Count	Average Transit Time (hours)	Std Dev (hours)	25th %ile TT (hours)	50th %ile TT (hours)	75th %ile TT (hours)	Count
Louisiana Border to Port Beaumont/Port Arthur	1	1.40	0.33	1.17	1.33	1.58	13509	1.34	0.33	1.08	1.25	1.50	6667	1.46	0.32	1.25	1.42	1.58	6842
Port Beaumont/Port Arthur Upstream Boundary	2	1.93	0.53	1.58	1.83	2.08	8692	1.88	0.53	1.58	1.75	2.00	4371	1.99	0.54	1.67	1.83	2.17	4321
to Port Arthur Downstream Boundary	3	0.99	0.24	0.83	0.92	1.08	14269	0.97	0.23	0.83	0.92	1.08	7281	1.01	0.25	0.83	1.00	1.17	6988
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4	9.11	2.07	7.75	8.75	10.00	14158	9.05	2.11	7.58	8.60	9.92	6796	9.17	2.03	7.83	8.83	10.08	7362
	5	0.86	0.24	0.67	0.83	1.00	16174	0.89	0.27	0.67	0.83	1.00	7534	0.83	0.21	0.67	0.83	0.92	8640
Port of Houston/Galveston/Texas City	6	0.69	0.85	0.50	0.50	0.67	4522	0.58	0.53	0.42	0.50	0.58	2207	0.80	1.06	0.50	0.58	0.75	2315
Port Houston/Pelican Island Mooring to Chocolate Bayou	7	0.61	0.13	0.50	0.58	0.67	10516	0.61	0.14	0.50	0.58	0.67	5270	0.60	0.12	0.50	0.58	0.67	5246
	8	2.27	0.51	1.92	2.17	2.50	9945	2.25	0.52	1.92	2.17	2.50	5073	2.30	0.50	1.92	2.25	2.50	4872
	9	0.74	0.17	0.67	0.75	0.83	10039	0.74	0.18	0.58	0.67	0.83	4984	0.75	0.16	0.67	0.75	0.83	5055
Chocolate Bayou to Port Freeport Upstream Boundary	10	2.95	0.68	2.50	2.83	3.25	8811	2.88	0.68	2.42	2.75	3.17	4327	3.03	0.68	2.58	2.92	3.33	4484
Port Freeport Upstream Boundary to Port	11	1.09	0.26	0.92	1.08	1.25	5543	1.08	0.27	0.92	1.00	1.17	2342	1.10	0.25	0.92	1.08	1.25	3201
Port Freeport Downstream Boundary to	12	7.08	7.38	1.67	4.75	9.25	7086	6.52	6.81	1.50	4.33	8.50	3537	7.65	7.86	1.83	5.25	10.08	3549
Colorado River	13	6.35	1.50	5.25	6.17	7.08	5679	6.14	1.50	5.00	5.92	6.83	2927	6.57	1.47	5.58	6.42	7.25	2752
Colorado River Industry	14	6.18	6.74	1.50	4.08	7.92	5888	6.55	7.34	1.50	4.25	8.17	2939	5.82	6.08	1.50	4.00	7.58	2949
Colorado River to Calhoun	15	1.05	0.22	0.92	1.00	1.17	5632	1.01	0.21	0.83	1.00	1.08	2904	1.09	0.23	0.92	1.08	1.25	2728
	16	1.09	0.25	0.92	1.08	1.17	5246	1.09	0.28	0.92	1.00	1.17	2418	1.09	0.22	0.92	1.08	1.17	2828
Port Lavaca (Calhoun Port Authority)	17	2.61	0.44	2.33	2.58	2.83	4811	2.58	0.44	2.25	2.50	2.83	2404	2.63	0.43	2.33	2.58	2.83	2407
Calhoun to Victoria	18	2.56	0.64	2.17	2.42	2.83	4600	2.45	0.54	2.08	2.33	2.67	2421	2.67	0.71	2.17	2.50	3.00	2179
Port of Victoria	19	1.05	0.23	0.92	1.00	1.17	3380	1.08	0.26	0.92	1.00	1.17	1583	1.02	0.20	0.92	1.00	1.08	1797
Victoria to Corpus Christi Upstream Boundary	20	2.74	0.58	2.33	2.67	2.92	4062	2.60	0.46	2.25	2.58	2.83	2057	2.88	0.66	2.42	2.75	3.17	2005
	21	1.01	0.24	0.83	1.00	1.08	3970	1.00	0.26	0.83	0.92	1.08	1911	1.02	0.21	0.88	1.00	1.08	2059
22A and 22B combined	22	4.08	0.77	3.58	3.92	4.42	3101	4.07	0.80	3.50	3.92	4.33	1358	4.09	0.74	3.58	4.00	4.42	1743
Alternative Route to Lydia Ann Channel	22A	4.38	0.78	3.83	4.42	4.83	355	4.43	0.86	3.75	4.50	4.92	159	4.33	0.72	3.92	4.33	4.75	196
Lydia Ann Channel—Main Route	22B	4.04	0.76	3.58	3.92	4.33	2746	4.02	0.78	3.50	3.92	4.25	1199	4.06	0.74	3.58	3.92	4.33	1547
Corpus Christi Upstream Boundary to Corpus	23	1.99	0.40	1.75	1.92	2.17	560	2.05	0.38	1.75	2.00	2.25	356	1.89	0.41	1.67	1.83	2.00	204
Corpus Christi Downstream Boundary to Arroyo	24	7.81	1.71	6.67	7.58	8.58	652	8.05	1.33	7.17	7.92	8.75	358	7.51	2.05	6.08	6.92	8.17	294
Colorado Upstream Boundary	25	8.60	1.78	7.42	8.33	9.50	611	8.98	1.53	8.00	8.75	9.83	335	8.15	1.95	6.83	7.67	8.88	276
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26	0.51	0.10	0.42	0.50	0.58	482	0.54	0.10	0.50	0.50	0.58	253	0.47	0.09	0.42	0.50	0.50	229
Arroyo Colorado to Port Isabel Upstream Boundary	27	3.30	0.53	2.92	3.25	3.58	299	3.47	0.51	3.17	3.42	3.67	144	3.14	0.51	2.75	3.08	3.42	155
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28	0.40	0.12	0.33	0.42	0.46	150	0.42	0.12	0.33	0.42	0.50	77	0.38	0.12	0.33	0.33	0.42	73
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29	1.25	0.23	1.08	1.21	1.33	163	1.32	0.25	1.17	1.25	1.42	74	1.19	0.19	1.08	1.17	1.25	89

Table 33. Monthly Average Transit Time Estimates (Hours), 2019.

		Both Directions												Westbound/Southbound Trips												Eastbound/Northbound Trips											
O-D Pair	Link	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	1.45	1.42	1.38	1.39	1.41	1.39	1.37	1.39	1.41	1.41	1.41	1.43	1.27	1.35	1.34	1.31	1.27	1.31	1.29	1.35	1.39	1.40	1.40	1.43	1.62	1.49	1.42	1.46	1.54	1.47	1.44	1.44	1.42	1.42	1.42	1.44
Port Beaumont/Port Arthur Upstream Boundary to Port Arthur Downstream Boundary	2	1.94	1.87	1.91	1.94	1.92	1.95	1.88	1.93	1.97	1.97	1.92	1.95	1.79	1.81	1.82	1.84	1.82	1.85	1.81	1.87	1.97	1.99	1.92	1.98	2.10	1.94	2.00	2.02	2.02	2.05	1.96	1.99	1.96	1.94	1.92	1.92
	3	0.99	0.99	0.97	0.98	0.96	0.97	0.98	0.99	1.02	1.01	1.01	1.03	0.96	0.95	0.93	0.95	0.92	0.97	0.96	0.97	1.03	1.00	0.99	0.99	1.01	1.04	1.00	1.01	0.99	0.98	1.00	1.01	1.01	1.02	1.03	1.07
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4	9.37	9.87	9.07	9.35	8.91	8.90	8.80	8.98	8.93	8.86	9.20	9.50	9.19	9.85	9.11	9.56	8.76	8.80	8.71	8.98	8.80	8.78	9.10	9.56	9.55	9.89	9.04	9.18	9.05	9.00	8.90	8.98	9.07	8.94	9.29	9.44
	5	0.86	0.91	0.86	0.87	0.84	0.84	0.82	0.85	0.86	0.86	0.86	0.89	0.92	0.97	0.90	0.91	0.84	0.85	0.83	0.89	0.89	0.89	0.88	0.93	0.82	0.86	0.83	0.84	0.83	0.82	0.81	0.82	0.83	0.82	0.84	0.86
Port of Houston/Galveston/Texas City	6	0.69	0.95	0.73	0.74	0.60	0.65	0.62	0.59	0.67	0.70	0.65	0.78	0.57	0.72	0.57	0.58	0.53	0.62	0.50	0.53	0.60	0.55	0.53	0.64	0.80	1.16	0.88	0.88	0.68	0.67	0.73	0.65	0.74	0.86	0.78	0.91
Port Houston/Pelican Island Mooring to Chocolate Bayou	7	0.61	0.61	0.61	0.60	0.60	0.59	0.59	0.61	0.62	0.62	0.61	0.63	0.61	0.61	0.60	0.61	0.61	0.60	0.60	0.63	0.62	0.62	0.62	0.62	0.60	0.62	0.61	0.60	0.59	0.58	0.58	0.60	0.61	0.61	0.61	0.63
	8	2.26	2.32	2.26	2.29	2.23	2.28	2.21	2.26	2.30	2.27	2.27	2.31	2.22	2.28	2.23	2.27	2.23	2.27	2.18	2.24	2.30	2.24	2.24	2.30	2.31	2.37	2.30	2.31	2.22	2.29	2.24	2.28	2.31	2.31	2.31	2.33
	9	0.75	0.76	0.74	0.75	0.73	0.73	0.71	0.75	0.76	0.74	0.74	0.77	0.75	0.76	0.73	0.75	0.73	0.72	0.70	0.74	0.74	0.73	0.74	0.78	0.75	0.76	0.74	0.75	0.73	0.73	0.72	0.75	0.77	0.75	0.73	0.76
Chocolate Bayou to Port Freeport Upstream Boundary	10	2.99	3.04	2.95	2.97	2.87	2.96	2.85	2.95	2.99	2.92	2.93	3.03	2.88	2.88	2.86	2.90	2.80	2.95	2.80	2.93	2.91	2.84	2.83	2.93	3.08	3.20	3.04	3.04	2.94	2.97	2.90	2.97	3.08	3.00	3.03	3.13
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11	1.09	1.11	1.10	1.10	1.10	1.09	1.04	1.07	1.10	1.08	1.09	1.12	1.09	1.08	1.08	1.12	1.12	1.12	1.04	1.05	1.08	1.03	1.06	1.11	1.09	1.13	1.11	1.09	1.08	1.06	1.04	1.10	1.11	1.12	1.12	1.13
Port Freeport Downstream Boundary to Colorado River	12	7.86	8.52	7.43	###	7.08	6.26	3.86	5.27	7.80	6.98	6.38	6.96	6.62	7.72	6.56	9.98	6.15	5.89	3.52	5.16	6.98	7.09	5.74	7.12	9.09	9.32	8.23	###	8.06	6.62	4.20	5.37	8.62	6.88	7.03	6.79
	13	6.46	6.66	6.29	6.50	6.36	6.27	6.11	6.33	6.39	6.29	6.32	6.41	6.19	6.32	6.17	6.33	6.16	6.04	5.94	6.14	6.20	6.16	5.95	6.17	6.79	7.04	6.42	6.74	6.56	6.49	6.26	6.51	6.63	6.40	6.70	6.65
Colorado River Industry	14	6.98	6.76	5.23	4.52	8.33	7.13	5.07	6.58	3.99	8.35	5.28	6.36	7.33	6.77	5.58	4.71	8.53	7.19	5.22	7.05	4.15	9.14	6.20	6.78	6.63	6.76	4.87	4.34	8.12	7.08	4.92	6.12	3.82	7.57	4.33	5.94
Colorado River to Calhoun	15	1.06	1.04	1.05	1.04	1.07	1.05	1.03	1.06	1.03	1.02	1.06	1.09	0.99	1.01	1.00	0.99	1.03	1.01	0.99	1.02	1.01	0.99	1.01	1.03	1.14	1.08	1.11	1.10	1.11	1.10	1.07	1.10	1.05	1.05	1.11	1.14
	16	1.10	1.10	1.09	1.11	1.09	1.08	1.08	1.11	1.05	1.04	1.10	1.13	1.07	1.15	1.08	1.12	1.10	1.09	1.09	1.10	1.06	1.02	1.11	1.13	1.12	1.07	1.10	1.10	1.08	1.08	1.08	1.11	1.05	1.06	1.08	1.13
Port Lavaca (Calhoun Port Authority)	17	2.63	2.56	2.59	2.63	2.62	2.59	2.62	2.65	2.57	2.60	2.59	2.64	2.62	2.52	2.57	2.58	2.60	2.56	2.60	2.66	2.52	2.55	2.56	2.62	2.63	2.60	2.62	2.68	2.64	2.62	2.63	2.63	2.61	2.64	2.62	2.66
Calhoun to Victoria	18	2.66	2.61	2.60	2.58	2.58	2.61	2.55	2.52	2.41	2.48	2.53	2.58	2.47	2.47	2.43	2.48	2.51	2.48	2.43	2.48	2.31	2.41	2.43	2.53	2.87	2.77	2.78	2.70	2.67	2.77	2.68	2.55	2.52	2.55	2.64	2.63
Port of Victoria	19	1.06	1.07	1.07	1.07	1.05	1.05	1.02	1.08	1.04	1.03	1.02	1.07	1.08	1.11	1.10	1.13	1.10	1.10	1.04	1.10	1.06	1.05	1.05	1.11	1.04	1.02	1.04	1.03	1.00	1.01	1.01	1.07	1.02	1.01	1.00	1.03
Victoria to Corpus Christi Upstream Boundary	20	2.77	2.75	2.68	2.76	2.76	2.74	2.71	2.78	2.63	2.70	2.72	2.82	2.52	2.54	2.53	2.64	2.56	2.62	2.66	2.74	2.48	2.60	2.57	2.66	3.03	2.98	2.83	2.90	2.97	2.88	2.76	2.82	2.79	2.80	2.87	2.96
	21	1.03	1.01	1.00	1.02	1.03	1.01	1.00	1.02	1.01	0.98	0.97	1.08	0.98	0.96	0.95	1.03	0.99	1.02	1.02	1.06	0.99	0.99	0.95	1.06	1.07	1.06	1.04	1.02	1.06	1.01	0.98	0.98	1.03	0.97	0.99	1.09
22A and 22B combined	22	4.29	4.09	4.17	4.17	4.27	4.18	4.16	4.17	4.19	4.19	4.24	4.17	4.25	4.11	4.19	4.21	4.29	4.16	4.15	4.31	4.23	4.09	4.26	4.07	4.33	4.07	4.16	4.14	4.26	4.19	4.17	4.07	4.16	4.27	4.21	4.26
Alternative Route to Lydia Ann Channel	22A	4.72	4.40	4.43	4.96	4.66	4.33	4.47	4.25	4.41	4.50	4.49	4.58	4.65	4.50	4.16	5.01	4.62	4.26	4.90	4.57	4.48	4.71	4.49	4.73	4.77	4.32	4.67	4.92	4.70	4.38	4.21	4.01	4.38	4.32	4.50	4.33
Lydia Ann Channel—Main Route	22B	4.22	4.04	4.14	4.09	4.24	4.16	4.12	4.17	4.16	4.13	4.19	4.11	4.19	4.05	4.19	4.12	4.26	4.15	4.05	4.29	4.20	3.97	4.23	3.92	4.25	4.03	4.09	4.07	4.22	4.17	4.17	4.08	4.12	4.26	4.16	4.25
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23	2.05	1.92	2.00	1.85	1.97	2.10	2.07	1.98	1.95	2.10	1.98	1.90	2.07	1.92	2.12	1.90	2.10	2.19	2.16	2.03	1.91	2.15	2.04	1.98	2.01	1.92	1.74	1.76	1.73	1.97	1.86	1.91	2.03	2.00	1.83	1.81
Corpus Christi Downstream Boundary to Arroyo Colorado Upstream Boundary	24	8.19	7.33	8.32	7.84	8.40	7.91	7.80	7.89	7.28	7.51	7.52	7.76	7.83	7.79	8.40	8.09	8.16	8.44	8.69	8.28	7.47	7.73	8.01	7.91	8.66	6.79	8.19	7.55	8.74	7.40	6.69	7.30	7.07	7.26	6.96	7.56
	25	8.67	8.16	9.23	8.77	8.31	8.85	8.25	8.83	8.33	8.39	8.70	8.46	8.87	8.16	9.37	9.14	9.38	9.59	9.22	9.57	8.74	8.83	8.58	8.46	8.42	8.18	9.05	8.34	7.18	8.05	7.19	7.64	7.84	7.87	8.85	8.45
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26	0.51	0.48	0.51	0.53	0.52	0.52	0.51	0.52	0.49	0.50	0.51	0.51	0.53	0.45	0.53	0.58	0.57	0.56	0.55	0.57	0.52	0.53	0.54	0.52	0.50	0.49	0.49	0.47	0.44	0.49	0.47	0.45	0.46	0.46	0.47	0.49
Arroyo Colorado to Port Isabel Upstream Boundary	27	3.43	3.12	3.18	3.30	2.87	3.57	3.21	3.30	3.15	3.26	3.42	3.35	3.54	3.16	3.21	3.47	2.83	3.62	3.43	3.49	3.32	3.46	3.71	3.52	3.34	3.09	3.14	3.16	2.88	3.49	2.99	3.09	3.00	3.00	3.12	3.24
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28	0.39	0.40	0.40	0.38	0.35	0.49	0.44	0.41	0.35	0.42	0.39	0.41	0.37	0.38	0.40	0.42		0.45	0.45	0.46	0.38	0.42	0.41	0.50	0.42	0.41	0.39	0.34	0.35	0.59	0.43	0.37	0.33	0.42	0.37	0.33
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29	1.20	1.14	1.32	1.22	1.16	1.34	1.35	1.38	1.16	1.29	1.22	1.18	1.26	1.17	1.42	1.20	1.13	1.36	1.43	1.61	1.18	1.39	1.30	1.35	1.13	1.13	1.19	1.23	1.21	1.32	1.28	1.15	1.15	1.22	1.16	1.10

Table 34. Monthly Link Transit Count, 2019.

		Both Directions												Westbound/Southbound Trips												Eastbound/Northbound Trips											
O-D Pair	Link	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	1190	918	1091	1085	1085	1183	1072	1271	1082	1155	1268	1194	591	426	543	521	533	596	534	630	525	590	622	587	599	492	548	564	552	587	538	641	557	565	646	607
Port Beaumont/Port Arthur Upstream Boundary to Port Arthur Downstream Boundary	2	754	602	690	676	714	759	677	816	678	743	844	786	375	299	346	325	354	378	352	413	333	381	425	405	379	303	344	351	360	381	325	403	345	362	419	381
	3	1207	965	1122	1182	1209	1292	1203	1350	1144	1242	1261	1165	615	503	570	592	610	653	617	668	601	655	639	584	592	462	552	590	599	639	586	682	543	587	622	581
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4	1256	746	1021	1121	1238	1323	1266	1427	1163	1267	1293	1135	610	328	455	496	601	645	632	707	591	624	615	526	646	418	566	625	637	678	634	720	572	643	678	609
	5	1380	910	1172	1296	1400	1477	1445	1625	1322	1395	1456	1393	640	377	518	568	665	701	695	788	619	679	673	652	740	533	654	728	735	776	750	837	703	716	783	741
Port of Houston/Galveston/Texas City	6	357	287	416	404	382	397	366	393	381	379	377	406	169	139	207	192	190	181	176	202	189	192	187	192	188	148	209	212	192	216	190	191	192	187	190	214
Port Houston/Pelican Island Mooring to Chocolate Bayou	7	933	717	875	834	826	982	918	912	901	921	881	869	464	363	434	415	419	482	455	468	446	467	443	437	469	354	441	419	407	500	463	444	455	454	438	432
	8	885	627	798	788	780	846	908	911	891	906	837	820	450	336	411	400	396	418	452	466	434	470	434	431	435	291	387	388	384	428	456	445	457	436	403	389
	9	887	648	823	795	803	853	886	894	888	928	845	833	434	329	403	397	409	414	438	447	429	464	426	416	453	319	420	398	394	439	448	447	459	464	419	417
Chocolate Bayou to Port Freeport Upstream Boundary	10	726	543	717	670	706	759	808	819	810	813	749	735	330	268	353	317	357	363	403	416	394	402	375	373	396	275	364	353	349	396	405	403	416	411	374	362
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11	467	362	438	390	426	465	538	530	486	527	485	455	173	153	165	133	193	192	260	252	201	229	209	199	294	209	273	257	233	273	278	278	285	298	276	256
Port Freeport Downstream Boundary to Colorado River	12	644	476	572	555	532	610	618	624	643	647	597	598	320	237	275	285	273	300	308	312	321	324	300	300	324	239	297	270	259	310	310	312	322	323	297	298
	13	440	310	451	421	390	526	559	553	530	547	523	467	245	166	239	250	195	254	275	268	288	268	265	234	195	144	212	171	195	272	284	285	242	279	258	233
Colorado River Industry	14	505	375	475	494	457	500	514	519	529	526	526	512	250	184	239	244	234	248	255	255	270	261	267	253	255	191	236	250	223	252	259	264	259	265	259	259
Colorado River to Calhoun	15	464	339	461	485	401	469	514	499	520	505	516	488	249	172	233	243	230	250	253	249	267	265	265	244	215	167	228	242	171	219	261	250	253	240	251	244
	16	461	279	406	427	405	445	484	478	493	488	475	434	217	110	186	185	191	209	226	221	240	227	227	193	244	169	220	242	214	236	258	257	253	261	248	241
Port Lavaca (Calhoun Port Authority)	17	422	285	398	417	384	418	436	406	417	415	427	415	213	137	204	203	193	212	215	199	215	206	216	206	209	148	194	214	191	206	221	207	202	209	211	209
Calhoun to Victoria	18	391	236	377	402	360	396	435	411	421	414	408	377	211	128	199	215	196	219	222	205	222	215	212	192	180	108	178	187	164	177	213	206	199	199	196	185
Port of Victoria	19	296	176	266	304	277	286	335	295	281	307	310	265	137	84	127	141	126	130	157	141	144	146	146	114	159	92	139	163	151	156	178	154	137	161	164	151
Victoria to Corpus Christi Upstream Boundary	20	353	226	314	351	355	345	375	351	332	378	372	335	181	119	161	188	188	179	179	178	172	189	186	152	172	107	153	163	167	166	196	173	160	189	186	183
	21	334	224	307	343	357	344	371	343	331	372	350	317	164	111	146	167	171	167	173	164	166	178	167	152	170	113	161	176	186	177	198	179	165	194	183	165
22A and 22B combined	22	298	173	239	279	290	279	302	284	274	302	269	245	136	86	103	123	128	117	121	121	122	138	115	112	162	87	136	156	162	162	181	163	152	164	154	133
Alternative Route to Lydia Ann Channel	22A	42	22	28	25	24	28	37	19	35	47	40	33	18	10	13	12	11	12	14	8	13	22	17	21	24	12	15	13	13	16	23	11	22	25	23	12
Lydia Ann Channel—Main Route	22B	256	151	211	254	266	251	265	265	239	255	229	212	118	76	90	111	117	105	107	113	109	116	98	91	138	75	121	143	149	146	158	152	130	139	131	121
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23	56	24	44	51	51	41	33	40	52	56	53	62	33	18	30	34	33	24	23	25	33	36	36	34	23	6	14	17	18	17	10	15	19	20	17	28
Corpus Christi Downstream Boundary to Arroyo Colorado Upstream Boundary	24	65	28	42	60	44	57	38	53	59	72	71	68	37	15	26	32	26	28	21	32	31	38	38	38	28	13	16	28	18	29	17	21	28	34	33	30
	25	56	25	40	60	31	56	40	47	53	64	68	75	31	15	23	32	16	29	21	29	29	35	38	39	25	10	17	28	15	27	19	18	24	29	30	36
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26	43	26	32	47	26	44	28	36	43	52	53	54	25	11	18	25	16	22	13	20	23	26	28	28	18	15	14	22	10	22	15	16	20	26	25	26
Arroyo Colorado to Port Isabel Upstream Boundary	27	18	17	18	33	5	26	24	23	32	27	38	38	8	7	9	15	1	15	12	12	15	15	19	16	10	10	9	18	4	11	12	11	17	12	19	22
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28	12	6	8	18	2	14	12	10	21	17	15	15	6	2	3	8	0	10	7	5	10	11	8	7	6	4	5	10	2	4	5	5	11	6	7	8
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29	13	6	14	18	5	17	11	8	16	16	18	21	7	2	8	8	3	8	5	4	8	7	7	7	6	4	6	10	2	9	6	4	8	9	11	14

Table 35. Weekly Average Transit Time Estimates (Hours): Both Directions, Week 1–Week 26, 2019.

O-D Pair	Link	Direc-tion	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	Both Direc-tions	1.48	1.45	1.47	1.41	1.45	1.44	1.39	1.42	1.39	1.38	1.39	1.41	1.34	1.39	1.39	1.39	1.38	1.38	1.39	1.39	1.44	1.43	1.43	1.36	1.37	1.38
Port Beaumont/Port Arthur Upstream	2		1.95	2.00	1.93	1.93	1.86	1.82	1.89	1.87	1.92	1.89	1.92	1.95	1.90	1.92	2.00	1.97	1.84	1.93	2.04	1.87	1.92	1.86	1.95	1.94	2.02	1.93
Boundary to Port Arthur Downstream	3		0.97	1.01	0.98	0.99	0.96	1.00	0.99	1.00	0.97	0.95	0.96	0.97	1.00	0.95	1.00	0.99	0.98	0.98	0.94	0.97	0.94	0.96	0.96	0.96	0.99	1.00
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		9.65	9.31	9.50	9.26	9.64	10.93	9.53	9.94	9.35	9.37	9.07	8.81	9.02	9.78	9.29	9.38	9.28	8.81	9.03	8.52	9.08	8.99	8.96	8.79	8.93	9.00
	5		0.86	0.86	0.86	0.86	0.85	0.94	0.90	0.94	0.86	0.87	0.89	0.85	0.85	0.86	0.88	0.89	0.88	0.83	0.82	0.82	0.85	0.84	0.83	0.84	0.83	0.86
Port of Houston/Galveston/Texas City	6		0.63	0.70	0.73	0.69	0.63	1.07	0.94	1.17	0.68	0.86	0.85	0.63	0.65	0.80	0.98	0.66	0.64	0.54	0.69	0.56	0.55	0.64	0.63	0.69	0.71	0.61
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		0.61	0.61	0.60	0.60	0.61	0.61	0.61	0.62	0.61	0.62	0.62	0.61	0.60	0.60	0.61	0.60	0.60	0.60	0.59	0.61	0.58	0.61	0.57	0.59	0.59	0.61
	8		2.37	2.27	2.24	2.20	2.35	2.24	2.30	2.27	2.37	2.35	2.24	2.23	2.23	2.33	2.27	2.30	2.27	2.25	2.18	2.24	2.19	2.23	2.28	2.27	2.28	2.32
	9		0.74	0.75	0.75	0.75	0.73	0.76	0.77	0.77	0.74	0.74	0.72	0.75	0.72	0.73	0.75	0.75	0.77	0.73	0.74	0.72	0.71	0.74	0.73	0.72	0.73	0.72
Chocolate Bayou to Port Freeport Upstream Boundary	10		2.99	3.16	2.94	2.98	2.85	3.01	3.10	3.04	3.05	3.04	2.91	2.96	2.89	2.90	2.96	3.05	2.99	2.90	2.81	2.92	2.81	2.85	2.99	2.99	2.96	2.97
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		1.10	1.19	1.04	1.09	1.02	1.14	1.14	1.10	1.10	1.11	1.10	1.08	1.14	1.08	1.17	1.07	1.10	1.08	1.12	1.14	1.06	1.06	1.15	1.09	1.08	1.06
Port Freeport Downstream Boundary to	12		9.26	10.74	7.25	6.27	7.00	9.21	8.85	8.51	7.28	6.11	8.34	7.34	7.49	9.01	12.93	10.40	12.05	7.60	8.16	9.43	6.06	5.90	8.46	6.11	6.56	4.42
Colorado River	13		6.43	6.57	6.46	6.45	6.60	6.67	6.98	6.38	6.25	6.82	6.19	6.24	6.02	6.64	6.71	6.60	6.12	6.31	6.37	6.64	6.27	6.24	6.33	6.38	6.23	6.17
Colorado River Industry	14		9.58	10.41	6.58	4.69	6.43	6.34	5.34	7.50	7.92	7.29	4.96	3.68	3.82	4.29	5.77	4.14	4.04	5.10	14.61	11.08	5.52	4.53	9.72	7.78	7.04	5.92
Colorado River to Calhoun	15		1.09	1.08	1.04	1.06	1.02	1.09	1.07	1.02	1.02	1.12	1.03	1.04	1.04	1.03	1.04	1.07	1.03	1.05	1.08	1.07	1.05	1.06	1.06	1.07	1.02	1.06
	16		1.14	1.09	1.04	1.10	1.08	1.13	1.09	1.11	1.10	1.23	1.04	1.06	1.06	1.09	1.11	1.14	1.09	1.11	1.03	1.10	1.07	1.10	1.08	1.10	1.08	1.09
Port Lavaca (Calhoun Port Authority)	17		2.62	2.57	2.63	2.64	2.58	2.57	2.58	2.59	2.55	2.69	2.49	2.63	2.55	2.62	2.64	2.66	2.61	2.64	2.50	2.66	2.61	2.63	2.60	2.64	2.61	2.55
Calhoun to Victoria	18		2.61	2.62	2.65	2.71	2.58	2.65	2.65	2.61	2.62	2.83	2.45	2.61	2.53	2.47	2.64	2.65	2.57	2.55	2.56	2.48	2.75	2.52	2.56	2.70	2.64	2.57
Port of Victoria	19		1.10	1.06	0.98	1.11	1.00	1.05	1.10	1.08	1.14	1.13	1.02	1.03	1.07	1.02	1.10	1.13	1.03	1.11	1.03	1.01	1.05	1.03	1.06	1.08	1.04	1.04
Victoria to Corpus Christi Upstream Boundary	20		2.70	2.73	2.68	2.83	2.82	2.75	2.88	2.70	2.71	2.71	2.67	2.62	2.71	2.81	2.73	2.78	2.72	2.81	2.82	2.73	2.72	2.68	2.59	2.71	2.76	2.87
	21		1.08	0.97	1.06	1.02	1.00	0.98	1.03	1.02	1.07	1.03	0.97	0.99	0.99	1.07	0.99	1.03	1.02	1.04	1.01	1.02	1.03	1.00	0.99	1.01	1.02	1.04
	22		10.42	8.60	11.73	9.17	13.73	12.13	10.48	16.99	19.97	14.54	15.56	10.44	12.63	13.40	16.88	8.88	8.76	11.91	14.29	8.14	12.37	16.29	11.40	10.00	16.92	8.68
Link 22A (Aransas Pass)	22A		8.81	23.04	9.17	10.56	17.86	20.76	9.92	9.38	8.52	14.43	11.93	22.73	4.46	15.82	24.58	13.76	9.59	17.05	25.41	14.03	32.18	16.97	23.46	17.55	8.08	15.58
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		10.72	5.58	12.24	8.87	13.01	10.55	10.55	18.61	23.67	14.55	16.24	8.49	13.88	13.17	15.30	7.92	8.69	11.07	12.94	6.84	8.30	16.17	8.60	8.89	17.56	7.41
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		1.94	2.05	2.00	2.09	2.11	1.83	1.88	1.94	2.07	1.94	1.97	2.09	1.99	1.85	1.88	1.90	1.81	2.06	2.03	1.89	1.86	2.10	2.17	2.11	2.38	1.86
Corpus Christi Downstream Boundary to	24		7.96	7.63	8.63	8.13	8.05	8.75	7.18	7.20	7.03	8.98	8.53	8.34	7.79	7.56	7.82	8.11	7.90	7.90	9.62	7.41	8.45	7.31	7.38	8.30	8.02	7.94
Arroyo Colorado Upstream Boundary	25		8.75	8.66	7.90	8.35	9.73	8.45	8.25	8.05	7.90	8.58	8.05	10.05	8.74	8.21	8.54	8.92	9.29	8.11	10.42		8.46	8.23	8.77	9.36	9.01	8.30
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		0.49	0.52	0.49	0.48	0.58	0.43	0.53	0.46	0.45	0.54	0.50	0.52	0.46	0.47	0.48	0.58	0.56	0.48	0.67		0.54	0.51	0.52	0.50	0.54	0.53
Arroyo Colorado to Port Isabel Upstream Boundary	27		3.31	3.41	3.25	3.29	2.92	3.19	3.58	2.98	2.73	3.06	3.07	3.41	2.81	3.16	3.22	3.38	3.41	3.01			2.94	2.83	3.60	3.55	3.88	3.38
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		0.35	0.39	0.40				0.49		0.31		0.43	0.39	0.33	0.54	0.34	0.40	0.36	0.25			0.29	0.42	0.57	0.38	0.50	0.50
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		1.19	1.20	1.15	1.08			1.33	0.83	1.14	1.48	1.23	1.43	1.19	1.21	1.19	1.20	1.31	1.10			1.17	1.08	1.18	1.40	1.38	1.43

Table 36. Weekly Average Transit Time Estimates (Hours): Both Directions, Week 27–Week 53, 2019.

O-D Pair	Link	Direction	Week 27	Week 28	Week 29	Week 30	Week 31	Week 32	Week 33	Week 34	Week 35	Week 36	Week 37	Week 38	Week 39	Week 40	Week 41	Week 42	Week 43	Week 44	Week 45	Week 46	Week 47	Week 48	Week 49	Week 50	Week 51	Week 52	Week 53
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	Both Directions	1.38	1.34	1.40	1.34	1.38	1.38	1.42	1.40	1.39	1.38	1.38	1.39	1.45	1.44	1.39	1.40	1.41	1.43	1.40	1.41	1.42	1.40	1.44	1.43	1.45	1.40	1.44
Port Beaumont/Port Arthur Upstream	2		1.92	1.80	1.89	1.89	1.90	1.91	1.98	1.93	1.93	1.94	1.91	1.82	2.15	1.92	1.96	1.97	1.95	2.01	1.92	1.90	1.92	1.92	1.97	1.97	1.92	1.94	2.01
Boundary to Port Arthur Downstream	3		1.00	0.95	0.99	0.97	1.00	0.98	0.98	0.99	1.00	1.00	0.98	0.99	1.11	1.00	1.01	1.01	1.02	1.01	0.98	1.04	1.00	1.01	1.07	0.97	1.04	1.03	1.07
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		8.85	8.64	8.93	8.87	8.75	8.88	9.08	8.91	9.03	8.84	8.69	9.09	9.33	8.73	8.87	8.77	9.03	9.05	9.11	8.95	9.25	9.57	9.55	9.07	9.55	9.94	9.52
	5		0.82	0.81	0.79	0.83	0.84	0.84	0.86	0.87	0.85	0.86	0.84	0.84	0.88	0.88	0.87	0.83	0.88	0.84	0.84	0.87	0.86	0.87	0.90	0.85	0.89	0.91	0.97
Port of Houston/Galveston/Texas City	6		0.64	0.64	0.63	0.60	0.66	0.54	0.57	0.59	0.58	0.65	0.63	0.79	0.63	0.66	0.64	0.59	0.88	0.86	0.65	0.57	0.65	0.79	0.75	0.63	0.67	0.88	1.04
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		0.59	0.59	0.59	0.59	0.60	0.62	0.62	0.60	0.62	0.63	0.61	0.62	0.61	0.61	0.62	0.63	0.61	0.61	0.62	0.61	0.62	0.61	0.64	0.62	0.62	0.62	0.64
	8		2.26	2.19	2.21	2.17	2.20	2.23	2.32	2.22	2.31	2.31	2.30	2.29	2.32	2.23	2.33	2.26	2.30	2.26	2.26	2.24	2.31	2.28	2.39	2.32	2.30	2.26	2.23
	9		0.71	0.71	0.70	0.73	0.71	0.74	0.76	0.75	0.76	0.75	0.76	0.76	0.75	0.74	0.75	0.74	0.73	0.73	0.73	0.73	0.78	0.73	0.79	0.76	0.77	0.76	0.78
Chocolate Bayou to Port Freeport Upstream Boundary	10		2.91	2.85	2.85	2.78	2.92	2.94	2.98	2.86	3.06	3.00	2.99	3.05	2.96	2.87	2.88	2.92	2.99	2.88	2.98	2.93	2.93	2.92	3.13	2.91	3.02	3.06	3.09
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		1.04	1.05	1.04	1.03	1.05	1.05	1.05	1.06	1.14	1.10	1.07	1.10	1.14	1.06	1.05	1.09	1.12	1.06	1.14	1.13	1.05	1.08	1.18	1.09	1.11	1.10	1.13
Port Freeport Downstream Boundary to	12		4.71	3.31	3.59	3.69	4.28	3.17	4.28	3.91	11.81	8.66	6.84	8.50	6.84	5.29	5.95	7.44	7.51	7.00	7.63	5.85	6.68	6.34	7.32	6.62	7.66	6.86	3.61
Colorado River	13		6.13	6.09	6.06	6.18	6.07	6.21	6.40	6.44	6.43	6.26	6.61	5.92	6.63	6.04	5.99	6.43	6.59	6.17	6.22	6.54	6.25	6.62	6.74	6.16	6.32	6.43	6.25
Colorado River Industry	14		4.42	4.87	4.84	5.44	5.76	7.98	7.50	7.68	3.50	3.17	3.46	4.68	4.13	7.33	9.50	9.57	9.14	5.50	4.85	6.06	4.35	5.85	8.92	4.72	6.47	5.67	4.46
Colorado River to Calhoun	15		1.07	1.02	1.02	1.01	1.03	1.04	1.08	1.09	1.05	1.04	1.03	1.03	1.02	0.99	1.04	1.01	1.03	1.02	1.07	1.08	1.03	1.10	1.15	1.04	1.08	1.05	1.16
	16		1.06	1.10	1.06	1.09	1.09	1.11	1.13	1.13	1.08	1.06	1.07	1.05	1.04	1.04	1.02	1.04	1.05	1.12	1.07	1.13	1.07	1.10	1.16	1.05	1.17	1.11	1.16
Port Lavaca (Calhoun Port Authority)	17		2.59	2.59	2.65	2.59	2.69	2.62	2.69	2.66	2.59	2.61	2.53	2.55	2.57	2.63	2.49	2.64	2.59	2.59	2.60	2.63	2.59	2.58	2.60	2.62	2.69	2.59	2.80
Calhoun to Victoria	18		2.46	2.55	2.56	2.59	2.55	2.46	2.59	2.52	2.49	2.45	2.46	2.40	2.31	2.48	2.33	2.44	2.49	2.55	2.54	2.47	2.60	2.60	2.70	2.49	2.69	2.47	2.57
Port of Victoria	19		1.05	1.00	1.00	1.01	1.09	1.03	1.09	1.10	1.11	1.01	1.08	1.04	1.04	1.01	1.02	1.00	1.06	1.01	1.02	1.04	1.00	1.06	1.05	1.01	1.13	1.05	1.06
Victoria to Corpus Christi Upstream Boundary	20		2.65	2.74	2.64	2.78	2.78	2.65	2.86	2.80	2.83	2.63	2.64	2.53	2.67	2.68	2.63	2.70	2.76	2.68	2.76	2.68	2.79	2.70	2.76	2.70	2.95	2.85	2.69
	21		0.99	1.01	0.99	0.99	1.00	1.02	0.99	1.05	1.02	1.02	1.02	0.99	0.98	1.00	0.99	0.95	1.00	0.97	0.98	0.99	0.96	0.99	1.08	1.21	1.07	0.97	0.97
	22		17.43	8.56	14.73	9.46	8.67	12.22	9.43	11.64	12.41	11.06	7.85	13.15	10.03	12.37	12.42	11.36	8.59	10.93	14.00	15.95	16.34	12.97	13.34	17.51	17.45	20.00	33.99
Link 22A (Aransas Pass)	22A		12.53	14.08	11.34	7.27	11.54	34.98	16.21	7.39	7.23	18.45	16.70	21.68	13.02	12.44	10.96	19.29	8.19	18.59	21.95	9.57	15.65	13.86	41.35	13.04	35.59	34.35	14.63
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		18.27	7.44	15.07	9.67	8.18	8.42	8.82	12.06	13.20	9.91	6.45	12.28	9.26	12.35	12.76	9.82	8.68	9.37	12.67	17.55	16.52	12.74	7.03	18.06	13.32	16.10	35.83
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		2.33	2.12	1.92	2.02	2.17	1.81	1.92	2.02	2.05	1.85	2.06	1.92	1.99	2.01	2.07	2.17	2.06	2.09	2.02	1.93	1.96	1.75	1.93	1.81	2.02	1.90	1.86
Corpus Christi Downstream Boundary to	24		8.62	8.39	7.70	6.95	8.03	6.86	7.68	8.07	8.13	6.90	8.07	7.06	6.81	7.08	7.33	8.26	7.42	7.05	7.27	7.43	8.21	7.66	7.27	7.91	7.95	8.03	7.04
Arroyo Colorado Upstream Boundary	25		9.67	8.74	8.24	7.35	8.88	8.00	8.57	9.14	8.72	8.56	8.48	8.45	7.54	8.32	7.29	9.39	8.21	8.02	7.76	8.87	9.72	8.43	9.49	7.97	8.54	8.50	7.58
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		0.63	0.54	0.51	0.43	0.53	0.47	0.51	0.54	0.52	0.49	0.51	0.47	0.45	0.49	0.43	0.55	0.51	0.51	0.48	0.53	0.50	0.47	0.51	0.49	0.52	0.49	0.63
Arroyo Colorado to Port Isabel Upstream Boundary	27		3.69	3.44	2.97	3.09	3.24	3.29	3.10	3.54	3.26	3.08	3.28	3.13	3.03	3.68	2.90	3.59	3.07	3.31	3.44	3.60	3.01	3.79	3.34	3.13	3.53	3.37	
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		0.47	0.43	0.42	0.29	0.46	0.38	0.35		0.46	0.35	0.32	0.34	0.38	0.46	0.35	0.46	0.43	0.40	0.44	0.40	0.36	0.33	0.33	0.39	0.44	0.46	
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		1.65	1.28	1.08	1.13	1.66	1.25	1.08		1.22	1.16	1.54	1.23	1.06	1.38	1.21	1.30	1.20	1.42	1.26	1.16	1.22	1.00	1.14	1.17	1.21	1.21	

Table 37. Weekly Link Transit Count: Both Directions, Week 1–Week 26, 2019.

O-D Pair	Link	Direc-tion	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	Both Direc-tions	212	300	238	306	239	212	242	249	232	219	255	267	248	233	271	285	253	214	253	220	258	267	280	283	257	279
Port Beaumont/Port Arthur Upstream	2		127	191	147	206	152	136	165	161	151	134	160	192	141	146	152	183	161	142	159	148	169	191	182	181	163	172
Boundary to Port Arthur Downstream	3		212	321	225	322	231	233	256	257	233	234	274	275	245	251	262	296	307	259	253	272	268	313	292	321	291	298
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		204	342	229	340	206	104	234	230	201	218	227	276	221	189	239	302	320	273	258	287	257	315	296	323	318	305
	5		239	365	271	360	251	162	280	254	215	253	259	300	286	267	281	314	354	336	291	297	303	352	333	348	355	342
Port of Houston/Galveston/Texas City	6		63	86	78	94	66	46	86	81	65	79	86	114	121	96	79	99	95	108	73	75	89	97	89	94	93	96
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		188	224	196	235	189	137	204	191	163	190	210	217	208	173	174	222	205	211	160	186	179	204	213	254	247	214
	8		170	213	185	225	175	116	184	167	142	164	194	209	189	158	160	212	196	201	159	184	155	198	179	207	190	215
	9		175	213	186	227	176	123	185	176	150	174	199	209	191	157	166	220	197	203	155	188	170	197	186	205	191	216
Chocolate Bayou to Port Freeport Upstream Boundary	10		133	139	161	207	151	100	160	162	115	154	161	191	173	138	132	198	157	179	136	164	150	173	148	187	174	199
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		89	81	108	132	113	66	88	113	82	104	100	113	93	70	79	116	95	115	73	98	97	108	82	107	110	131
Port Freeport Downstream Boundary to	12		116	138	154	171	134	88	126	138	108	137	134	148	116	105	113	161	138	144	92	123	111	143	107	154	145	161
Colorado River	13		72	67	94	138	106	61	77	105	63	98	94	129	105	94	83	123	97	114	56	77	89	122	93	125	123	141
Colorado River Industry	14		102	104	106	140	110	72	104	118	74	109	116	131	86	97	102	136	127	126	78	110	102	112	95	127	113	126
Colorado River to Calhoun	15		79	86	104	135	108	62	98	106	74	98	115	132	82	99	94	134	127	120	65	78	96	115	78	119	109	121
	16		94	96	89	132	92	49	81	94	58	75	107	126	73	84	87	120	114	110	81	88	81	107	83	116	97	109
Port Lavaca (Calhoun Port Authority)	17		89	86	91	113	84	57	80	94	55	87	103	110	76	81	93	109	109	107	75	84	85	85	77	111	87	116
Calhoun to Victoria	18		74	86	76	105	82	43	61	83	48	71	102	118	68	80	87	98	115	100	77	77	76	78	71	106	85	108
Port of Victoria	19		54	67	64	75	56	39	48	63	27	52	73	81	48	60	71	74	85	66	65	61	57	60	47	82	57	82
Victoria to Corpus Christi Upstream Boundary	20		77	72	75	89	70	55	59	75	37	67	82	94	58	68	77	86	100	86	78	80	79	75	61	92	69	100
	21		72	70	71	84	67	56	57	75	37	62	78	93	59	64	73	88	100	81	76	82	85	77	59	86	69	104
	22		77	81	85	84	81	58	68	80	45	78	88	102	53	71	88	91	104	86	83	89	82	78	69	86	74	96
Link 22A (Aransas Pass)	22A		12	14	14	15	12	9	7	14	11	8	14	14	7	6	15	15	9	12	9	16	14	12	13	11	5	15
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		65	67	71	69	69	49	61	66	34	70	74	88	46	65	73	76	95	74	74	73	68	66	56	75	69	81
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		12	17	8	12	9	8	7	6	5	9	10	15	8	10	12	13	15	9	14	10	16	8	6	12	7	11
Corpus Christi Downstream Boundary to	24		14	17	14	15	10	4	9	9	6	5	10	18	7	12	12	12	20	12	9	4	19	9	10	15	12	15
Arroyo Colorado Upstream Boundary	25		10	16	12	13	9	5	8	7	5	5	8	20	7	13	13	10	21	9	1	0	18	10	11	13	12	16
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		9	16	8	9	10	7	5	6	5	6	5	14	6	9	10	7	18	9	1	0	14	8	10	10	8	13
Arroyo Colorado to Port Isabel Upstream Boundary	27		8	11	2	1	1	3	5	4	5	3	4	8	3	6	8	5	12	3	0	0	2	2	4	9	5	8
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		6	8	2	0	0	0	3	0	3	0	3	4	1	2	5	4	6	1	0	0	1	1	5	4	2	3
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		7	7	2	1	0	0	3	1	3	2	2	4	5	3	4	4	6	3	0	0	1	2	5	5	2	5

Table 38. Weekly Link Transit Count: Both Directions, Week 27–Week 53, 2019.

O-D Pair	Link	Direc-tion	Week 27	Week 28	Week 29	Week 30	Week 31	Week 32	Week 33	Week 34	Week 35	Week 36	Week 37	Week 38	Week 39	Week 40	Week 41	Week 42	Week 43	Week 44	Week 45	Week 46	Week 47	Week 48	Week 49	Week 50	Week 51	Week 52	Week 53
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	Both Direc-tions	260	209	244	256	269	280	264	308	294	280	264	199	256	263	266	271	276	269	290	302	283	280	288	234	280	275	82
Port Beaumont/Port Arthur Upstream	2		186	120	144	170	169	172	175	193	191	179	180	100	167	165	182	167	179	173	197	191	192	181	196	150	184	195	46
Boundary to Port Arthur Downstream	3		274	259	251	301	285	304	289	320	307	301	298	164	298	300	297	283	271	296	286	293	306	247	288	240	284	250	73
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		289	270	275	312	295	312	311	339	331	311	311	153	300	310	314	300	265	294	304	288	323	242	294	253	281	197	77
	5		319	335	308	341	359	334	367	375	374	346	321	209	363	317	332	340	308	327	333	318	369	278	361	296	324	286	96
Port of Houston/Galveston/Texas City	6		77	83	69	105	82	75	105	88	86	97	95	70	96	83	82	90	87	104	78	89	93	74	111	91	88	81	23
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		194	201	211	229	191	176	215	217	223	224	233	180	212	200	195	237	209	238	213	196	190	177	240	182	183	184	52
	8		185	196	215	227	194	172	216	215	228	221	241	169	208	206	195	236	202	219	203	189	185	153	225	176	175	175	47
	9		185	192	204	221	187	173	209	218	220	223	233	177	204	202	201	231	207	231	210	193	183	163	222	177	177	188	43
Chocolate Bayou to Port Freeport Upstream Boundary	10		165	186	183	200	172	162	181	203	201	205	216	147	195	186	185	201	172	202	180	182	162	132	198	164	161	151	42
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		113	121	127	134	111	117	122	133	105	123	129	81	128	127	112	108	121	141	114	110	107	93	109	103	97	110	25
Port Freeport Downstream Boundary to	12		132	138	135	161	131	129	143	156	142	156	169	119	162	146	136	148	147	160	154	132	137	114	151	133	128	142	26
Colorado River	13		116	131	123	147	114	119	124	135	122	134	145	99	123	131	122	129	126	121	148	116	109	92	116	110	91	102	34
Colorado River Industry	14		112	114	118	131	108	108	116	129	118	127	141	99	125	130	116	107	125	137	147	111	115	90	127	110	114	116	35
Colorado River to Calhoun	15		108	113	120	130	105	107	113	118	118	126	138	98	124	127	108	105	121	131	149	106	115	88	108	111	112	114	29
	16		97	107	114	125	97	101	109	120	110	127	127	93	113	124	108	106	108	118	134	108	108	77	98	98	97	99	29
Port Lavaca (Calhoun Port Authority)	17		96	99	100	103	87	80	97	100	94	110	105	89	88	102	87	87	95	110	112	97	100	71	103	88	94	94	28
Calhoun to Victoria	18		93	102	99	102	90	80	104	94	98	112	107	86	90	102	89	90	88	107	115	93	94	64	78	91	88	86	24
Port of Victoria	19		66	80	79	78	74	61	71	63	71	73	69	54	67	71	66	67	72	73	85	76	67	54	48	59	66	65	18
Victoria to Corpus Christi Upstream Boundary	20		80	87	86	82	87	69	90	77	82	90	86	63	71	90	75	82	88	92	105	87	80	66	50	78	90	86	24
	21		81	85	85	80	83	69	91	76	79	86	84	67	72	82	71	84	88	83	99	86	77	66	49	76	85	77	23
	22		89	83	87	80	89	70	85	78	83	89	81	65	73	86	75	86	88	89	98	90	79	68	49	91	97	89	23
Link 22A (Aransas Pass)	22A		13	14	8	7	13	10	7	7	11	12	11	6	15	15	14	14	15	15	14	18	16	14	9	10	18	19	2
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		76	69	79	73	76	60	78	71	72	77	70	59	58	71	61	72	73	74	84	72	63	54	40	81	79	70	21
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		3	7	9	10	10	6	9	10	11	16	15	6	12	13	5	13	15	18	17	15	10	6	10	16	18	13	3
Corpus Christi Downstream Boundary to	24		7	10	8	11	12	6	14	11	14	17	18	8	14	11	12	17	21	20	17	24	13	10	12	13	24	13	4
Arroyo Colorado Upstream Boundary	25		5	11	9	12	13	5	12	11	12	15	16	7	11	13	8	18	16	18	13	27	12	10	11	18	25	17	2
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		4	6	7	8	10	6	7	9	9	12	13	5	10	13	8	11	13	15	13	18	9	8	7	12	19	12	2
Arroyo Colorado to Port Isabel Upstream Boundary	27		3	6	6	6	7	4	6	4	6	11	10	4	6	3	6	5	7	10	11	10	8	5	8	9	11	10	0
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		3	5	2	1	3	3	2	0	4	7	3	4	6	1	3	3	5	7	3	3	6	1	2	6	3	4	0
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		3	3	2	1	4	1	1	0	5	6	1	2	6	2	2	4	5	4	7	4	5	1	4	8	5	4	0

Table 39. Weekly Average Transit Time Estimates (Hours): Westbound/Southbound, Week 1–Week 26, 2019.

O-D Pair	Link	Direc-tion	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	WB/ SB	1.26	1.19	1.25	1.34	1.32	1.35	1.33	1.34	1.35	1.34	1.37	1.36	1.31	1.37	1.28	1.27	1.33	1.33	1.29	1.24	1.25	1.22	1.29	1.31	1.36	1.31
Port Beaumont/Port Arthur Upstream	2		1.82	1.81	1.79	1.78	1.66	1.71	1.87	1.79	1.95	1.78	1.88	1.86	1.76	1.86	1.91	1.85	1.75	1.84	1.98	1.75	1.78	1.75	1.84	1.88	1.90	1.84
Boundary to Port Arthur Downstream	3		0.99	0.98	0.97	0.94	0.93	0.95	0.96	0.95	0.94	0.93	0.93	0.93	0.94	0.91	0.96	0.97	0.96	0.93	0.93	0.94	0.88	0.93	0.95	0.96	1.00	0.97
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		9.62	8.91	9.61	9.11	9.37	11.52	9.38	10.19	9.00	9.90	9.19	8.55	9.12	9.97	9.57	9.65	9.41	8.85	8.91	8.31	9.02	8.72	8.71	8.80	9.01	8.73
	5		0.90	0.91	0.90	0.92	0.92	0.97	0.96	1.04	0.96	0.95	0.90	0.85	0.91	0.91	0.91	0.95	0.93	0.83	0.82	0.82	0.86	0.86	0.83	0.85	0.86	0.89
Port of Houston/Galveston/Texas City	6		0.61	0.54	0.54	0.59	0.57	0.59	1.04	0.60	0.55	0.56	0.74	0.52	0.53	0.67	0.62	0.54	0.51	0.52	0.52	0.51	0.50	0.60	0.55	0.52	0.86	0.59
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		0.62	0.62	0.60	0.61	0.60	0.59	0.62	0.60	0.60	0.60	0.61	0.62	0.60	0.60	0.63	0.60	0.61	0.62	0.59	0.63	0.58	0.63	0.58	0.60	0.62	0.62
	8		2.32	2.25	2.18	2.15	2.35	2.20	2.24	2.23	2.29	2.28	2.20	2.23	2.19	2.35	2.26	2.22	2.26	2.28	2.18	2.23	2.19	2.25	2.24	2.26	2.26	2.33
	9		0.73	0.74	0.74	0.75	0.74	0.76	0.77	0.77	0.76	0.72	0.72	0.74	0.72	0.73	0.74	0.75	0.76	0.74	0.74	0.73	0.70	0.71	0.72	0.72	0.72	0.72
Chocolate Bayou to Port Freeport Upstream Boundary	10		2.92	3.02	2.85	2.89	2.70	2.81	3.09	2.75	2.96	2.96	2.79	2.88	2.78	2.73	2.90	3.01	2.96	2.88	2.73	2.86	2.69	2.82	2.97	2.94	3.03	2.94
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		1.06	1.18	1.04	1.14	1.01	1.09	1.07	1.06	1.13	1.09	1.03	1.11	1.10	1.10	1.18	1.09	1.15	1.12	1.10	1.16	1.07	1.12	1.23	1.09	1.17	1.07
Port Freeport Downstream Boundary to	12		7.38	9.25	5.91	5.29	6.07	8.58	8.08	7.46	7.39	5.43	7.10	5.82	7.20	8.53	14.27	8.62	9.16	6.50	8.74	6.85	5.29	4.29	9.11	5.98	5.92	4.32
Colorado River	13		5.91	6.13	6.44	6.21	6.21	6.47	6.28	6.20	6.20	6.81	6.16	5.90	5.81	6.50	6.66	6.35	5.89	6.31	6.19	6.23	5.98	5.85	6.15	6.14	6.09	6.01
Colorado River Industry	14		9.29	11.01	7.64	4.84	7.75	4.96	5.77	6.91	8.81	8.03	4.94	3.94	3.46	3.80	7.10	3.73	4.28	5.40	14.46	10.59	5.84	4.90	10.49	7.39	7.79	6.03
Colorado River to Calhoun	15		0.98	1.03	0.96	1.01	0.96	1.05	1.02	0.99	1.01	1.05	0.99	1.00	0.96	1.00	0.97	1.00	0.98	0.99	1.08	1.05	1.00	1.02	1.03	1.01	0.99	1.01
	16		1.02	1.09	0.99	1.11	1.09	1.16	1.11	1.23	1.13	1.18	1.08	1.05	1.07	1.13	1.10	1.14	1.11	1.11	1.02	1.13	1.06	1.11	1.13	1.11	1.07	1.09
Port Lavaca (Calhoun Port Authority)	17		2.52	2.50	2.66	2.66	2.65	2.41	2.55	2.55	2.61	2.56	2.53	2.61	2.53	2.56	2.60	2.61	2.59	2.60	2.46	2.61	2.62	2.64	2.52	2.65	2.61	2.47
Calhoun to Victoria	18		2.48	2.48	2.49	2.46	2.41	2.32	2.55	2.55	2.40	2.56	2.26	2.48	2.43	2.38	2.63	2.52	2.43	2.53	2.38	2.36	2.62	2.50	2.38	2.47	2.70	2.40
Port of Victoria	19		1.15	1.06	1.00	1.13	1.02	1.06	1.08	1.20	1.21	1.14	1.04	1.09	1.04	1.04	1.16	1.20	1.07	1.21	1.06	1.04	1.16	1.06	1.20	1.14	1.08	1.05
Victoria to Corpus Christi Upstream Boundary	20		2.51	2.47	2.42	2.66	2.47	2.49	2.74	2.48	2.49	2.58	2.50	2.47	2.58	2.56	2.69	2.70	2.57	2.66	2.55	2.43	2.58	2.60	2.50	2.65	2.69	2.60
	21		1.07	0.92	1.00	1.02	0.93	0.89	1.00	0.99	0.98	0.98	0.93	0.94	0.97	1.08	0.96	1.03	1.05	1.01	0.97	0.89	1.02	1.04	1.02	1.03	1.10	0.97
	22		16.64	10.81	12.56	12.57	18.99	13.74	8.81	15.83	28.25	17.14	19.84	17.09	17.38	18.85	24.80	9.99	12.99	16.21	15.88	10.06	16.16	28.63	18.35	13.50	27.01	11.80
Link 22A (Aransas Pass)	22A		8.44	26.15	5.81	9.02	18.63	29.04	13.00	5.67	10.22	16.14	11.63	32.63	4.30	7.33	29.12	8.33	13.31	9.08	32.58	14.59	40.75	25.94	34.58	21.14	4.75	18.11
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		17.46	6.36	13.90	13.05	19.06	9.56	8.68	17.73	35.02	17.22	21.01	13.90	20.65	19.62	23.48	10.24	12.96	16.74	13.24	8.46	10.20	29.24	14.29	12.13	27.59	10.43
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		2.08	1.98	1.96	2.27	2.05	1.86	1.98	1.77	2.07	2.02	2.03	2.38	2.02	1.90	1.90	2.01	1.80	2.14	2.35	1.98	2.00	2.18	2.25	2.18	2.73	1.77
Corpus Christi Downstream Boundary to	24		8.23	7.35	7.52	8.44	7.65	8.75	7.55	7.00	7.83	9.04	8.43	8.61	7.44	7.48	7.91	8.13	8.47	7.70	10.11	7.41	8.36	7.79	8.25	8.19	9.42	8.31
Arroyo Colorado Upstream Boundary	25		9.13	8.34	7.78	8.99	10.31	8.46	8.35	7.48	8.39	8.56	7.58	10.21	9.00	8.25	9.09	8.64	9.73	8.50	10.42		10.07	9.42	9.49	8.96	10.72	9.19
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		0.52	0.51	0.47	0.52	0.60	0.44	0.46	0.50	0.42	0.54	0.46	0.56	0.50	0.53	0.49	0.69	0.62	0.51	0.67		0.62	0.55	0.58	0.54	0.60	0.50
Arroyo Colorado to Port Isabel Upstream Boundary	27		3.77	3.36				3.50	3.38	3.02	2.92	3.00	3.10	3.42	3.00	3.63	3.37	3.40	3.52	3.67				2.83	3.31	3.77	3.84	3.38
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		0.42	0.34					0.42		0.33		0.42	0.40		0.75	0.36	0.44	0.33						0.40	0.39	0.50	0.50
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		1.23	1.31	1.13				1.25		1.08	1.88	1.17	1.51	1.26	1.17	1.19	1.33	1.17	1.21			1.17	1.00	1.25	1.39	1.38	1.38

Table 40. Weekly Average Transit Time Estimates (Hours): Westbound/Southbound, Week 27–Week 53, 2019.

O-D Pair	Link	Direc-tion	Week 27	Week 28	Week 29	Week 30	Week 31	Week 32	Week 33	Week 34	Week 35	Week 36	Week 37	Week 38	Week 39	Week 40	Week 41	Week 42	Week 43	Week 44	Week 45	Week 46	Week 47	Week 48	Week 49	Week 50	Week 51	Week 52	Week 53
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	WB/ SB	1.30	1.29	1.30	1.27	1.31	1.29	1.42	1.35	1.36	1.36	1.41	1.34	1.43	1.44	1.41	1.39	1.37	1.38	1.40	1.39	1.41	1.41	1.42	1.46	1.43	1.42	1.41
Port Beaumont/Port Arthur Upstream	2		1.83	1.72	1.80	1.85	1.84	1.84	1.97	1.80	1.93	1.94	1.89	1.73	2.25	1.94	2.04	1.98	1.94	2.02	1.90	1.92	1.91	1.96	1.97	2.02	1.96	1.96	2.32
Boundary to Port Arthur Downstream	3		0.97	0.96	0.97	0.94	0.96	0.99	0.96	0.96	0.99	0.97	0.96	1.00	1.17	0.96	1.03	0.99	1.02	0.98	0.96	0.99	1.00	1.01	1.01	0.95	0.99	1.02	1.03
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		8.64	8.60	8.93	8.72	8.64	8.89	9.12	8.98	8.99	8.93	8.68	8.81	8.90	8.38	9.00	8.75	8.94	8.90	8.99	9.02	8.95	9.51	9.38	9.46	9.51	10.12	9.63
	5		0.82	0.82	0.79	0.86	0.86	0.88	0.92	0.91	0.89	0.89	0.89	0.84	0.92	0.91	0.92	0.83	0.93	0.89	0.87	0.88	0.85	0.89	0.93	0.89	0.92	0.96	0.99
Port of Houston/Galveston/Texas City	6		0.48	0.50	0.53	0.48	0.54	0.51	0.54	0.57	0.50	0.61	0.69	0.52	0.58	0.53	0.56	0.53	0.56	0.50	0.57	0.49	0.58	0.52	0.65	0.55	0.49	0.82	0.96
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		0.60	0.60	0.61	0.59	0.61	0.65	0.63	0.63	0.63	0.64	0.62	0.63	0.61	0.61	0.62	0.64	0.61	0.60	0.62	0.62	0.62	0.61	0.64	0.62	0.62	0.61	0.66
	8		2.21	2.12	2.22	2.14	2.15	2.23	2.32	2.24	2.23	2.30	2.31	2.27	2.32	2.22	2.27	2.22	2.30	2.17	2.21	2.20	2.28	2.29	2.32	2.41	2.22	2.27	2.28
	9		0.68	0.69	0.71	0.72	0.69	0.74	0.76	0.76	0.74	0.74	0.75	0.74	0.73	0.74	0.74	0.73	0.74	0.72	0.73	0.72	0.77	0.74	0.80	0.79	0.75	0.76	0.81
Chocolate Bayou to Port Freeport Upstream Boundary	10		2.81	2.80	2.91	2.70	2.82	2.96	3.01	2.82	2.98	2.94	2.89	2.97	2.89	2.80	2.82	2.84	2.91	2.74	2.88	2.79	2.85	2.79	3.11	2.85	2.90	2.84	3.09
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		1.02	1.05	1.06	1.02	1.00	1.06	1.05	1.01	1.12	1.11	1.01	1.16	1.12	1.05	0.97	1.06	1.06	1.01	1.16	1.07	1.00	1.01	1.16	1.09	1.10	1.07	1.20
Port Freeport Downstream Boundary to	12		3.50	3.23	3.50	3.50	4.27	3.23	4.62	3.83	11.19	7.48	5.93	7.78	6.39	5.82	6.74	7.37	7.68	5.74	6.95	5.18	5.51	6.37	7.80	7.36	7.07	6.90	3.68
Colorado River	13		5.77	5.93	6.04	6.03	5.80	6.28	6.14	6.36	6.10	6.00	6.58	5.66	6.25	6.09	5.88	6.40	6.38	5.83	5.81	6.26	6.00	6.05	6.63	5.87	6.10	6.20	5.80
Colorado River Industry	14		4.29	4.63	5.42	5.81	5.50	9.00	8.37	7.48	3.94	3.23	3.96	3.26	4.76	7.01	11.15	8.94	11.28	6.83	5.11	7.93	4.99	6.54	8.73	5.67	8.30	5.17	2.99
Colorado River to Calhoun	15		1.02	0.96	1.00	0.97	0.99	1.00	1.04	1.04	1.01	1.02	1.02	1.02	1.00	0.96	1.02	0.98	0.97	0.97	1.02	1.02	1.01	1.05	1.10	1.03	1.00	1.01	1.02
	16		1.02	1.09	1.06	1.15	1.10	1.12	1.15	1.10	1.06	1.06	1.06	1.09	1.05	1.03	1.03	1.02	0.98	1.16	1.07	1.13	1.08	1.12	1.14	1.08	1.16	1.15	1.10
Port Lavaca (Calhoun Port Authority)	17		2.55	2.57	2.65	2.58	2.70	2.63	2.76	2.64	2.52	2.59	2.48	2.48	2.54	2.63	2.45	2.53	2.51	2.60	2.55	2.55	2.58	2.64	2.51	2.69	2.66	2.65	2.56
Calhoun to Victoria	18		2.38	2.47	2.44	2.44	2.46	2.52	2.56	2.32	2.49	2.35	2.29	2.36	2.22	2.42	2.26	2.38	2.45	2.37	2.30	2.40	2.54	2.84	2.68	2.47	2.55	2.43	2.54
Port of Victoria	19		1.13	0.98	0.99	1.04	1.09	1.10	1.14	1.05	1.13	1.00	1.07	1.11	1.07	1.04	1.05	0.98	1.06	1.05	1.02	1.06	1.06	1.11	1.07	1.12	1.19	1.11	1.03
Victoria to Corpus Christi Upstream Boundary	20		2.66	2.62	2.69	2.60	2.73	2.74	2.79	2.74	2.69	2.47	2.46	2.44	2.56	2.48	2.54	2.60	2.59	2.70	2.54	2.57	2.64	2.59	2.66	2.80	2.68	2.66	2.33
	21		1.05	0.99	1.06	0.96	1.04	1.15	1.03	1.07	1.02	0.99	0.96	1.01	0.99	0.98	1.01	1.01	0.94	1.04	0.98	0.93	0.94	0.96	1.15	1.20	1.03	0.98	0.84
	22		30.59	10.49	22.42	16.09	11.22	14.32	14.03	18.40	19.71	16.75	10.34	16.64	15.30	17.00	18.22	14.99	10.96	12.39	15.62	25.21	27.25	16.80	24.30	16.07	24.94	36.64	48.28
Link 22A (Aransas Pass)	22A		21.28	10.55	16.15	9.69	5.00	24.10	28.25	5.67	8.53	37.67	21.86	38.28	23.72	14.15	13.80	30.69	10.56	12.53	13.25	13.57	22.09	8.17	82.65	7.33	46.83	54.42	3.33
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		32.10	10.48	23.00	16.89	11.86	12.92	12.96	19.86	21.57	14.60	8.22	14.14	13.66	17.51	19.32	11.50	11.06	12.36	16.14	27.66	28.80	18.46	9.71	17.09	17.25	29.66	51.49
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		2.50	2.19	1.96	2.15	2.14	1.75	1.98	2.00	2.20	1.92	1.93	1.68	2.03	2.07	2.07	2.20	2.07	2.11	2.17	2.03	1.91	1.90	1.97	1.95	2.08	2.06	1.86
Corpus Christi Downstream Boundary to	24		9.67	9.38	8.22	7.67	8.22	7.58	8.36	8.46	8.24	7.37	7.94	6.88	7.29	7.62	7.81	7.90	7.62	7.28	8.00	7.90	8.47	8.32	7.36	7.25	8.36	8.92	7.04
Arroyo Colorado Upstream Boundary	25		9.92	9.78	8.90	8.37	9.46	9.13	9.46	9.79	9.46	9.00	8.94	8.35	8.07	8.85	7.56	9.52	8.50	8.26	8.22	8.27	10.48	7.60	10.71	8.29	8.32	8.94	7.58
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		0.64	0.58	0.52	0.47	0.57	0.50	0.56	0.60	0.57	0.53	0.53	0.50	0.49	0.53	0.46	0.57	0.50	0.54	0.56	0.57	0.54	0.48	0.50	0.53	0.51	0.56	0.63
Arroyo Colorado to Port Isabel Upstream Boundary	27		3.54	3.54	3.11	3.54	3.45		3.39	3.92	3.36	3.27	3.46	3.14	3.42	3.81	3.17	3.69	3.05	3.64	3.73	3.88	3.24	4.24	3.17	3.44	3.67	3.54	
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		0.50	0.44	0.42		0.40		0.42		0.54	0.43	0.17	0.36	0.43	0.46	0.33	0.46	0.39	0.43	0.50	0.44	0.39	0.33		0.44	0.46	0.63	
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		1.75	1.29	1.08		1.94				1.29	1.13	1.54	1.25	1.06	1.75	1.25	1.35	1.25	1.42	1.33	1.33	1.27		1.25	1.36	1.29	1.50	

Table 41. Weekly Link Transit Count: Westbound/Southbound, Week 1–Week 26, 2019.

O-D Pair	Link	Direc-tion	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	WB/ SB	102	167	108	151	116	95	106	115	117	93	128	138	133	119	130	131	120	104	128	111	124	129	145	144	126	139
Port Beaumont/Port Arthur Upstream	2		57	109	67	103	73	72	78	71	84	55	84	95	79	77	66	85	79	73	76	75	88	87	94	95	80	82
Boundary to Port Arthur Downstream	3		98	179	114	163	119	121	124	124	132	109	146	141	127	146	120	142	152	130	127	141	140	150	149	162	145	151
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		89	184	111	163	93	44	100	95	88	85	106	138	101	87	92	131	151	132	128	142	124	147	147	162	153	146
	5		106	187	110	180	98	65	119	102	86	97	121	141	137	128	119	122	160	161	136	139	153	159	162	165	165	165
Port of Houston/Galveston/Texas City	6		30	49	27	43	33	23	44	35	34	44	38	54	63	49	35	47	45	55	36	36	44	44	44	42	44	42
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		97	123	83	114	94	79	106	90	84	99	101	102	106	92	88	105	103	106	86	84	98	96	109	119	127	103
	8		90	118	79	113	93	72	96	83	80	90	96	100	101	87	82	103	97	100	88	85	87	93	96	96	94	106
	9		89	113	77	109	87	69	97	81	78	94	93	96	98	84	78	103	103	105	87	85	93	92	98	93	93	106
Chocolate Bayou to Port Freeport Upstream Boundary	10		65	53	62	101	81	53	80	74	56	84	75	88	91	69	61	93	72	90	78	74	81	79	69	87	86	98
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		29	22	32	56	53	31	32	50	40	46	32	36	39	28	22	41	34	49	41	35	50	41	29	37	48	63
Port Freeport Downstream Boundary to	12		53	74	70	85	66	52	61	64	57	74	64	65	55	64	58	81	68	71	52	57	62	66	49	75	72	83
Colorado River	13		35	42	54	75	53	35	42	55	35	59	52	60	54	52	55	74	57	62	27	35	50	58	40	58	58	73
Colorado River Industry	14		41	51	59	69	57	37	52	57	41	59	54	60	43	48	54	67	61	65	42	55	53	55	40	65	57	64
Colorado River to Calhoun	15		40	52	59	68	55	34	49	53	43	53	54	61	40	49	53	66	61	64	42	56	49	55	43	65	56	64
	16		33	47	47	62	44	20	37	31	33	30	45	57	33	37	41	53	48	51	36	50	34	49	37	54	43	52
Port Lavaca (Calhoun Port Authority)	17		33	43	52	59	43	26	43	44	31	47	51	50	38	38	48	52	53	57	35	43	45	40	36	58	44	59
Calhoun to Victoria	18		34	44	47	56	46	23	41	41	27	43	51	55	36	41	52	52	58	56	41	38	47	41	35	61	45	63
Port of Victoria	19		20	29	27	39	28	16	26	29	17	28	38	32	21	28	33	36	38	29	30	29	24	27	13	43	28	39
Victoria to Corpus Christi Upstream Boundary	20		33	35	38	49	36	28	33	39	22	37	45	41	30	36	39	50	53	47	42	37	45	38	26	53	36	53
	21		30	33	32	45	34	29	29	36	21	31	39	38	29	32	31	47	50	37	41	36	42	35	21	47	35	51
	22		33	40	42	42	43	28	34	38	22	40	48	47	25	32	47	46	52	43	44	42	41	38	30	46	39	45
Link 22A (Aransas Pass)	22A		3	9	7	5	7	6	1	6	6	3	6	8	5	2	11	6	4	3	6	11	8	7	6	7	1	8
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		30	31	35	37	36	22	33	32	16	37	42	39	20	30	36	40	48	40	38	31	33	31	24	39	38	37
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		7	10	4	7	5	7	4	4	5	7	8	9	4	4	10	9	11	8	6	7	11	5	3	8	4	5
Corpus Christi Downstream Boundary to	24		7	9	8	8	5	4	4	5	4	4	6	11	3	5	8	6	12	8	3	4	10	4	4	10	5	7
Arroyo Colorado Upstream Boundary	25		4	10	5	7	6	4	4	4	3	4	3	12	4	4	8	6	12	6	1	0	8	6	5	8	6	7
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		5	8	3	5	5	4	2	3	2	4	2	9	3	3	6	4	10	6	1	0	8	5	5	6	4	5
Arroyo Colorado to Port Isabel Upstream Boundary	27		4	5	0	0	0	1	2	2	2	2	2	4	1	2	5	3	4	1	0	0	0	1	2	5	4	4
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		3	4	0	0	0	0	1	0	1	0	1	2	0	1	3	2	2	0	0	0	0	0	2	3	2	3
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		4	3	1	0	0	0	1	0	1	1	1	3	3	1	3	1	3	1	0	0	1	1	1	3	2	2

Table 42. Weekly Link Transit Count: Westbound/Southbound, Week 27–Week 53, 2019.

O-D Pair	Link	Direc-tion	Week 27	Week 28	Week 29	Week 30	Week 31	Week 32	Week 33	Week 34	Week 35	Week 36	Week 37	Week 38	Week 39	Week 40	Week 41	Week 42	Week 43	Week 44	Week 45	Week 46	Week 47	Week 48	Week 49	Week 50	Week 51	Week 52	Week 53
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	WB/ SB	130	95	129	124	133	135	130	159	148	148	131	96	115	130	136	135	143	129	143	150	133	150	129	111	155	140	31
Port Beaumont/Port Arthur Upstream	2		91	60	79	85	88	87	91	104	95	95	85	48	78	84	96	79	94	85	93	101	90	105	89	76	108	108	15
Boundary to Port Arthur Downstream	3		144	122	132	156	140	152	144	157	153	162	147	84	171	153	157	149	145	141	145	158	147	139	134	125	152	129	26
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		146	126	140	159	149	149	154	166	166	162	146	70	178	153	148	149	135	134	148	137	149	124	131	116	143	91	26
	5		161	154	157	161	173	157	173	182	185	174	149	77	178	153	161	167	158	140	159	148	168	132	169	130	162	137	41
Port of Houston/Galveston/Texas City	6		37	39	34	54	37	37	56	47	41	49	47	30	51	46	43	44	45	48	43	43	45	36	54	41	41	41	9
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		94	102	106	113	90	91	110	114	113	111	122	84	107	101	100	122	109	110	115	98	95	86	121	92	93	95	22
	8		90	99	109	112	92	86	110	115	116	107	124	80	103	102	102	122	111	107	113	98	94	77	115	92	92	97	22
	9		89	98	99	110	87	85	106	113	108	108	119	84	99	99	103	119	112	101	113	98	93	73	114	87	88	93	22
Chocolate Bayou to Port Freeport Upstream Boundary	10		77	94	93	100	84	82	90	108	101	103	108	67	96	89	95	102	91	91	94	93	82	58	103	84	78	77	23
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		49	59	61	64	55	60	59	68	41	50	60	23	59	57	53	45	56	58	44	50	50	36	43	47	42	45	16
Port Freeport Downstream Boundary to	12		62	69	70	75	67	65	71	83	68	81	87	53	82	74	71	78	80	70	80	66	69	54	76	68	63	68	15
Colorado River	13		53	64	64	68	58	57	61	68	60	76	76	54	66	64	58	65	61	65	80	58	56	41	52	53	48	53	19
Colorado River Industry	14		50	57	63	60	55	53	61	65	56	67	75	47	59	69	57	53	70	65	76	56	57	41	67	54	54	56	18
Colorado River to Calhoun	15		50	56	63	60	53	52	58	63	56	66	75	47	58	70	57	54	73	64	77	54	57	40	60	54	54	56	16
	16		43	51	57	55	44	46	52	57	51	65	64	40	50	64	50	50	57	50	64	53	48	33	48	43	41	44	14
Port Lavaca (Calhoun Port Authority)	17		44	50	53	49	41	37	51	50	46	58	57	42	43	55	41	42	56	49	58	52	49	29	60	41	46	44	14
Calhoun to Victoria	18		44	51	55	51	47	35	55	48	49	59	61	41	45	55	45	43	57	50	59	52	49	28	41	45	46	43	14
Port of Victoria	19		26	42	41	34	36	24	38	30	34	35	38	25	35	33	32	30	42	32	39	41	27	21	25	23	30	25	10
Victoria to Corpus Christi Upstream Boundary	20		33	46	45	37	44	31	49	38	41	45	49	28	37	46	38	39	48	44	54	48	37	29	22	32	44	37	15
	21		33	45	42	36	37	31	49	34	38	40	47	29	36	40	33	40	49	35	49	44	34	29	24	38	39	34	15
	22		43	42	47	36	43	32	43	39	42	43	45	29	37	46	35	44	48	41	50	46	39	31	20	48	50	39	15
Link 22A (Aransas Pass)	22A		6	7	4	4	4	4	3	4	6	4	7	3	6	7	7	8	9	8	9	8	9	5	4	5	13	11	1
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		37	35	43	32	39	28	40	35	36	39	38	26	31	39	28	36	39	33	41	38	30	26	16	43	37	28	14
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		2	6	7	5	8	2	6	6	7	9	9	5	8	8	5	8	11	9	12	10	8	4	3	10	12	4	3
Corpus Christi Downstream Boundary to	24		4	6	6	5	8	2	7	8	8	9	9	4	8	6	7	8	12	10	10	12	8	5	3	8	16	5	4
Arroyo Colorado Upstream Boundary	25		4	6	6	5	8	2	6	8	7	7	9	4	6	8	4	10	9	10	9	13	8	5	3	10	16	6	2
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		3	3	4	3	6	1	4	5	5	6	6	3	6	6	4	6	7	8	6	11	4	4	2	8	11	4	2
Arroyo Colorado to Port Isabel Upstream Boundary	27		2	4	3	3	4	0	3	2	3	5	4	3	3	2	3	4	4	4	4	6	4	3	2	4	6	4	0
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		2	4	1	0	2	0	1	0	2	3	1	3	3	1	2	3	3	3	1	2	3	1	0	3	2	2	0
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		2	2	1	0	2	0	0	0	2	4	1	1	2	1	1	3	1	1	2	1	4	0	1	3	2	1	0

Table 43. Weekly Average Transit Time Estimates (Hours): Eastbound/Northbound, Week 1–Week 26, 2019.

O-D Pair	Link	Direc-tion	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	EB/ NB	1.68	1.78	1.65	1.48	1.56	1.52	1.43	1.49	1.44	1.41	1.42	1.45	1.38	1.42	1.50	1.50	1.43	1.42	1.49	1.54	1.61	1.62	1.58	1.41	1.39	1.46
Port Beaumont/Port Arthur Upstream	2		2.05	2.26	2.06	2.08	2.05	1.94	1.91	1.93	1.88	1.96	1.96	2.05	2.07	1.98	2.07	2.07	1.93	2.04	2.10	1.98	2.07	1.95	2.08	2.00	2.14	2.02
Boundary to Port Arthur Downstream	3		0.95	1.05	1.00	1.04	0.99	1.05	1.03	1.05	1.00	0.98	0.98	1.00	1.06	1.02	1.03	1.02	1.00	1.02	0.95	1.00	1.00	0.99	0.97	0.95	0.98	1.02
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		9.67	9.77	9.39	9.40	9.86	10.49	9.64	9.76	9.62	9.04	8.97	9.06	8.95	9.61	9.11	9.16	9.16	8.77	9.15	8.72	9.13	9.23	9.20	8.77	8.85	9.26
	5		0.84	0.81	0.83	0.81	0.80	0.93	0.85	0.87	0.80	0.82	0.87	0.84	0.80	0.82	0.85	0.86	0.84	0.83	0.82	0.82	0.83	0.83	0.83	0.83	0.80	0.83
Port of Houston/Galveston/Texas City	6		0.65	0.91	0.83	0.77	0.69	1.56	0.83	1.60	0.82	1.25	0.93	0.72	0.79	0.93	1.28	0.76	0.75	0.56	0.85	0.60	0.60	0.68	0.70	0.83	0.58	0.62
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		0.60	0.60	0.60	0.59	0.62	0.62	0.60	0.65	0.63	0.63	0.63	0.60	0.60	0.60	0.60	0.60	0.60	0.58	0.58	0.59	0.57	0.59	0.57	0.58	0.56	0.60
	8		2.42	2.30	2.28	2.25	2.34	2.30	2.37	2.31	2.48	2.43	2.28	2.23	2.27	2.32	2.28	2.37	2.28	2.22	2.19	2.25	2.19	2.22	2.33	2.28	2.30	2.31
	9		0.75	0.75	0.75	0.75	0.72	0.77	0.76	0.77	0.72	0.77	0.73	0.75	0.73	0.72	0.76	0.74	0.78	0.72	0.73	0.70	0.72	0.76	0.74	0.73	0.74	0.72
Chocolate Bayou to Port Freeport Upstream Boundary	10		3.06	3.24	3.00	3.06	3.04	3.25	3.11	3.29	3.13	3.15	3.01	3.03	3.01	3.07	3.02	3.08	3.01	2.92	2.92	2.96	2.95	2.87	3.02	3.03	2.89	3.00
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		1.11	1.20	1.05	1.05	1.03	1.18	1.18	1.13	1.07	1.13	1.13	1.06	1.16	1.07	1.16	1.06	1.08	1.06	1.14	1.13	1.05	1.03	1.11	1.08	1.00	1.06
Port Freeport Downstream Boundary to	12		10.84	12.46	8.36	7.23	7.91	10.13	9.58	9.42	7.16	6.91	9.47	8.54	7.75	9.76	11.52	12.20	14.85	8.67	7.41	11.65	7.03	7.28	7.92	6.24	7.20	4.52
Colorado River	13		6.93	7.29	6.48	6.74	6.98	6.92	7.82	6.57	6.31	6.85	6.23	6.53	6.24	6.81	6.80	6.97	6.45	6.31	6.54	6.99	6.64	6.60	6.47	6.60	6.36	6.35
Colorado River Industry	14		9.78	9.82	5.26	4.54	5.00	7.80	4.91	8.06	6.81	6.41	4.98	3.46	4.18	4.77	4.27	4.54	3.82	4.78	14.80	11.56	5.17	4.17	9.16	8.20	6.28	5.81
Colorado River to Calhoun	15		1.20	1.16	1.15	1.10	1.08	1.13	1.12	1.05	1.03	1.20	1.08	1.08	1.10	1.07	1.12	1.15	1.08	1.12	1.08	1.12	1.11	1.10	1.09	1.13	1.05	1.12
	16		1.20	1.10	1.09	1.09	1.08	1.11	1.07	1.06	1.07	1.27	1.02	1.07	1.05	1.05	1.12	1.13	1.08	1.12	1.04	1.06	1.07	1.09	1.05	1.09	1.08	1.09
Port Lavaca (Calhoun Port Authority)	17		2.68	2.64	2.59	2.62	2.52	2.70	2.62	2.62	2.48	2.84	2.46	2.64	2.58	2.66	2.69	2.71	2.64	2.70	2.53	2.71	2.61	2.62	2.66	2.62	2.62	2.63
Calhoun to Victoria	18		2.73	2.76	2.90	3.01	2.80	3.03	2.85	2.67	2.91	3.25	2.63	2.73	2.64	2.56	2.66	2.79	2.73	2.57	2.77	2.59	2.97	2.53	2.73	3.01	2.57	2.80
Port of Victoria	19		1.07	1.05	0.96	1.08	0.98	1.05	1.11	0.97	1.02	1.12	1.01	0.99	1.10	1.01	1.05	1.06	1.00	1.03	1.00	0.99	0.97	1.02	1.00	1.01	1.00	1.04
Victoria to Corpus Christi Upstream Boundary	20		2.84	2.98	2.94	3.04	3.18	3.02	3.06	2.93	3.04	2.88	2.88	2.73	2.85	3.08	2.78	2.88	2.89	3.00	3.13	2.99	2.90	2.75	2.66	2.79	2.83	3.19
	21		1.09	1.02	1.11	1.03	1.08	1.08	1.06	1.04	1.18	1.08	1.01	1.03	1.01	1.07	1.00	1.04	0.99	1.07	1.06	1.12	1.03	0.96	0.97	0.99	0.93	1.11
	22		5.76	6.45	10.93	5.77	7.77	10.63	12.16	18.05	12.04	11.80	10.42	4.76	8.39	8.92	7.81	7.74	4.54	7.61	12.51	6.41	8.59	4.58	6.05	5.98	5.69	5.93
Link 22A (Aransas Pass)	22A		8.94	17.45	12.54	11.33	16.78	4.19	9.40	12.16	6.47	13.40	12.16	9.53	4.88	20.06	12.08	17.37	6.62	19.70	11.06	12.80	20.75	4.40	13.92	11.25	8.92	12.69
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		4.94	4.92	10.62	4.03	6.40	11.35	12.75	19.44	13.59	11.56	9.98	4.18	8.66	7.65	7.35	5.34	4.32	4.41	12.63	5.65	6.50	4.60	4.33	5.39	5.27	4.86
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		1.73	2.15	2.04	1.83	2.19	1.67	1.75	2.29		1.63	1.71	1.65	1.96	1.82	1.79	1.67	1.81	1.50	1.79	1.69	1.57	1.97	2.08	1.98	1.90	1.94
Corpus Christi Downstream Boundary to	24		7.70	7.95	10.10	7.79	8.45		6.88	7.46	5.42	8.75	8.69	7.90	8.04	7.61	7.65	8.10	7.04	8.29	9.38		8.55	6.92	6.79	8.52	7.02	7.63
Arroyo Colorado Upstream Boundary	25		8.51	9.21	7.99	7.61	8.58	8.42	8.15	8.81	7.17	8.67	8.33	9.80	8.39	8.19	7.67	9.33	8.70	7.33			7.17	6.44	8.17	10.01	7.31	7.61
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		0.45	0.53	0.50	0.44	0.57	0.42	0.58	0.42	0.47	0.54	0.53	0.47	0.42	0.44	0.46	0.44	0.50	0.40			0.44	0.44	0.47	0.45	0.47	0.54
Arroyo Colorado to Port Isabel Upstream Boundary	27		2.85	3.44	3.25	3.29	2.92	3.04	3.71	2.94	2.61	3.17	3.04	3.41	2.71	2.93	2.99	3.35	3.35	2.69			2.94	2.83	3.90	3.27	4.00	3.39
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		0.28	0.43	0.40				0.52		0.29		0.44	0.38	0.33	0.33	0.31	0.35	0.38	0.25			0.29	0.42	0.68	0.33		
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		1.14	1.13	1.17	1.08			1.38	0.83	1.17	1.08	1.29	1.17	1.08	1.23	1.17	1.15	1.46	1.04				1.17	1.17	1.42		1.47

Table 44. Weekly Average Transit Time Estimates (Hours): Eastbound/Northbound, Week 27–Week 53, 2019.

O-D Pair	Link	Direc-tion	Week 27	Week 28	Week 29	Week 30	Week 31	Week 32	Week 33	Week 34	Week 35	Week 36	Week 37	Week 38	Week 39	Week 40	Week 41	Week 42	Week 43	Week 44	Week 45	Week 46	Week 47	Week 48	Week 49	Week 50	Week 51	Week 52	Week 53
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	EB/ NB	1.47	1.38	1.50	1.41	1.45	1.46	1.42	1.44	1.43	1.40	1.35	1.45	1.47	1.43	1.36	1.41	1.46	1.47	1.41	1.43	1.42	1.39	1.46	1.41	1.47	1.37	1.46
Port Beaumont/Port Arthur Upstream	2		2.00	1.89	2.00	1.93	1.97	1.99	1.98	2.07	1.94	1.94	1.93	1.90	2.05	1.90	1.88	1.97	1.97	2.01	1.95	1.88	1.94	1.86	1.96	1.91	1.88	1.92	1.86
Boundary to Port Arthur Downstream	3		1.03	0.95	1.01	1.00	1.03	0.97	1.00	1.02	1.01	1.03	1.00	0.98	1.02	1.03	1.00	1.03	1.01	1.04	0.99	1.11	1.00	1.01	1.12	0.99	1.09	1.05	1.09
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		9.07	8.68	8.93	9.02	8.86	8.88	9.05	8.84	9.06	8.75	8.70	9.34	9.97	9.06	8.76	8.80	9.11	9.17	9.22	8.88	9.51	9.62	9.69	8.74	9.59	9.79	9.46
	5		0.82	0.80	0.79	0.81	0.82	0.80	0.81	0.83	0.82	0.83	0.80	0.84	0.85	0.86	0.81	0.82	0.82	0.81	0.80	0.86	0.86	0.85	0.87	0.82	0.86	0.88	0.96
Port of Houston/Galveston/Texas City	6		0.79	0.76	0.73	0.73	0.76	0.57	0.59	0.62	0.66	0.68	0.56	0.99	0.69	0.82	0.73	0.66	1.23	1.17	0.76	0.65	0.72	1.04	0.84	0.69	0.83	0.93	1.08
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		0.59	0.59	0.57	0.59	0.59	0.58	0.61	0.58	0.61	0.61	0.61	0.62	0.61	0.60	0.62	0.61	0.61	0.62	0.61	0.60	0.62	0.60	0.64	0.61	0.62	0.62	0.63
	8		2.31	2.27	2.19	2.20	2.25	2.22	2.33	2.19	2.40	2.31	2.30	2.30	2.33	2.23	2.39	2.30	2.30	2.33	2.32	2.27	2.34	2.27	2.47	2.23	2.38	2.24	2.19
	9		0.73	0.73	0.70	0.73	0.73	0.73	0.77	0.73	0.78	0.77	0.77	0.78	0.77	0.75	0.75	0.74	0.73	0.73	0.72	0.73	0.78	0.73	0.79	0.73	0.78	0.76	0.74
Chocolate Bayou to Port Freeport Upstream Boundary	10		2.99	2.89	2.78	2.86	3.02	2.91	2.96	2.91	3.14	3.05	3.09	3.11	3.04	2.93	2.95	3.00	3.08	3.00	3.10	3.09	3.01	3.03	3.16	2.96	3.13	3.28	3.08
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		1.06	1.05	1.02	1.04	1.10	1.05	1.05	1.11	1.15	1.10	1.13	1.08	1.16	1.06	1.13	1.12	1.17	1.10	1.13	1.17	1.10	1.12	1.19	1.08	1.12	1.12	1.00
Port Freeport Downstream Boundary to	12		5.78	3.39	3.69	3.85	4.30	3.11	3.94	4.01	12.38	9.93	7.81	9.07	7.30	4.75	5.08	7.52	7.31	7.98	8.37	6.52	7.87	6.30	6.83	5.85	8.24	6.82	3.52
Colorado River	13		6.43	6.24	6.09	6.30	6.35	6.15	6.66	6.52	6.76	6.60	6.64	6.23	7.08	6.00	6.08	6.46	6.79	6.57	6.70	6.81	6.52	7.07	6.83	6.43	6.57	6.67	6.81
Colorado River Industry	14		4.52	5.11	4.18	5.12	6.02	7.00	6.54	7.89	3.10	3.11	2.90	5.96	3.56	7.69	7.91	10.19	6.43	4.31	4.57	4.15	3.72	5.27	9.14	3.80	4.82	6.13	6.01
Colorado River to Calhoun	15		1.11	1.08	1.04	1.04	1.08	1.07	1.12	1.14	1.08	1.06	1.05	1.05	1.04	1.03	1.06	1.03	1.11	1.07	1.12	1.14	1.06	1.14	1.21	1.06	1.15	1.09	1.34
	16		1.09	1.11	1.06	1.04	1.07	1.09	1.11	1.16	1.10	1.06	1.09	1.02	1.02	1.05	1.01	1.05	1.13	1.08	1.08	1.13	1.06	1.10	1.18	1.03	1.17	1.09	1.21
Port Lavaca (Calhoun Port Authority)	17		2.62	2.61	2.65	2.59	2.68	2.62	2.61	2.69	2.65	2.63	2.59	2.62	2.59	2.63	2.53	2.73	2.71	2.58	2.66	2.72	2.60	2.55	2.73	2.56	2.71	2.55	3.05
Calhoun to Victoria	18		2.53	2.64	2.72	2.74	2.65	2.42	2.62	2.72	2.49	2.56	2.68	2.44	2.41	2.56	2.40	2.50	2.58	2.71	2.81	2.57	2.68	2.41	2.72	2.50	2.84	2.52	2.60
Port of Victoria	19		1.01	1.02	1.00	0.98	1.09	0.98	1.04	1.15	1.09	1.01	1.08	0.98	1.01	0.98	0.99	1.00	1.06	0.98	1.02	1.03	0.96	1.04	1.03	0.95	1.08	1.01	1.11
Victoria to Corpus Christi Upstream Boundary	20		2.64	2.89	2.58	2.92	2.83	2.57	2.94	2.85	2.97	2.79	2.88	2.60	2.79	2.88	2.73	2.79	2.96	2.67	2.98	2.82	2.91	2.79	2.84	2.63	3.21	3.00	3.29
	21		0.94	1.04	0.92	1.01	0.96	0.92	0.95	1.04	1.03	1.03	1.10	0.97	0.97	1.02	0.97	0.91	1.07	0.92	0.98	1.05	0.98	1.01	1.02	1.22	1.11	0.97	1.21
	22		5.13	6.59	5.68	4.04	6.28	10.45	4.72	4.88	4.93	5.75	4.72	10.34	4.62	7.04	7.35	7.57	5.75	9.68	12.31	6.28	5.70	9.76	5.77	19.11	9.49	7.02	7.20
Link 22A (Aransas Pass)	22A		5.04	17.62	6.54	4.06	14.45	42.22	7.19	9.69	5.68	8.84	7.69	5.08	5.88	10.95	8.13	4.08	4.64	25.52	37.62	6.38	7.37	17.02	8.32	18.75	6.37	6.76	25.92
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		5.14	4.32	5.59	4.04	4.30	4.49	4.46	4.47	4.82	5.09	4.35	10.82	4.20	6.06	7.19	8.15	5.94	6.97	9.37	6.25	5.35	7.43	5.24	19.16	9.86	7.07	4.52
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		2.00	1.67	1.75	1.88	2.29	1.83	1.81	2.04	1.77	1.76	2.27	3.08	1.90	1.92		2.12	2.02	2.07	1.67	1.73	2.17	1.46	1.90	1.57	1.92	1.83	
Corpus Christi Downstream Boundary to	24		7.22	6.92	6.13	6.36	7.65	6.50	6.99	7.03	7.97	6.36	8.21	7.25	6.17	6.44	6.65	8.58	7.17	6.83	6.24	6.97	7.78	7.00	7.24	8.97	7.13	7.48	
Arroyo Colorado Upstream Boundary	25		8.67	7.50	6.92	6.62	7.97	7.25	7.67	7.42	7.67	8.17	7.89	8.58	6.90	7.47	7.02	9.23	7.85	7.72	6.73	9.42	8.21	9.27	9.04	7.57	8.94	8.25	
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		0.58	0.50	0.50	0.40	0.48	0.47	0.44	0.46	0.46	0.46	0.49	0.42	0.40	0.46	0.40	0.52	0.51	0.46	0.42	0.48	0.47	0.46	0.52	0.40	0.54	0.46	
Arroyo Colorado to Port Isabel Upstream Boundary	27		4.00	3.25	2.83	2.64	2.97	3.29	2.81	3.17	3.17	2.92	3.16	3.08	2.64	3.42	2.64	3.21	3.08	3.09	3.27	3.19	2.77	3.13	3.40	2.89	3.38	3.25	
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		0.42	0.42	0.42	0.29	0.58	0.38	0.29		0.38	0.29	0.40	0.29	0.33		0.38		0.50	0.39	0.42	0.33	0.33		0.33	0.33	0.42	0.29	
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		1.46	1.25	1.08	1.13	1.38	1.25	1.08		1.17	1.23		1.21	1.06	1.00	1.17	1.17	1.19	1.42	1.23	1.10	1.00	1.00	1.10	1.05	1.15	1.11	

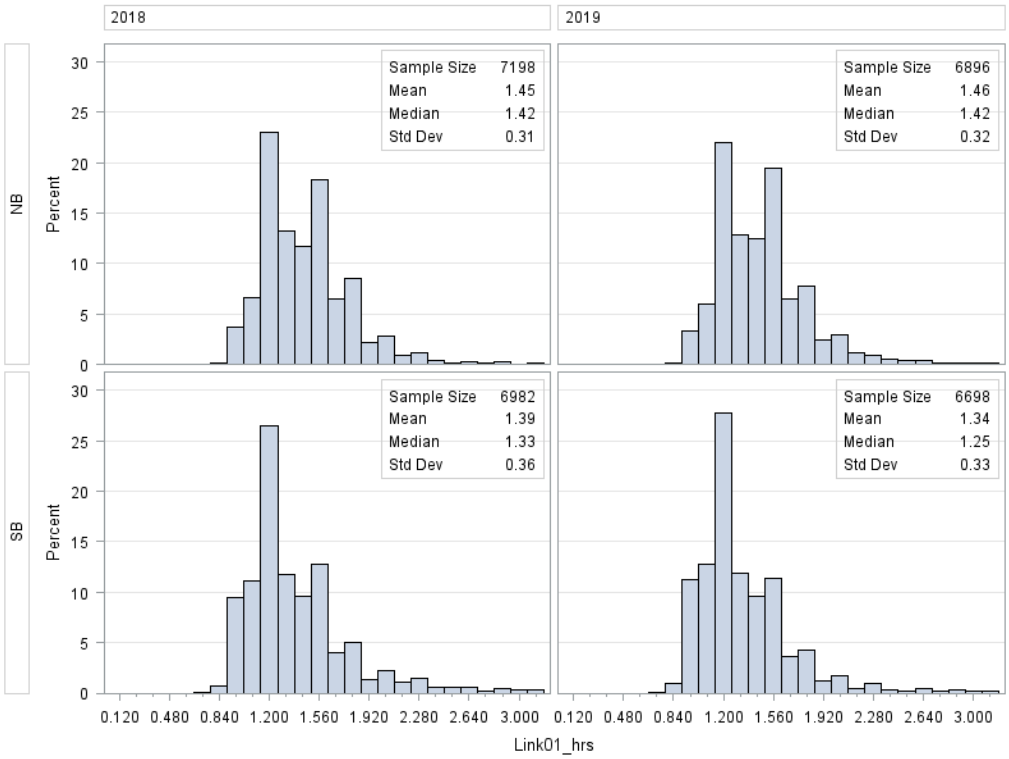
Table 45. Weekly Link Transit Count: Eastbound/Northbound, Week 1–Week 26, 2019.

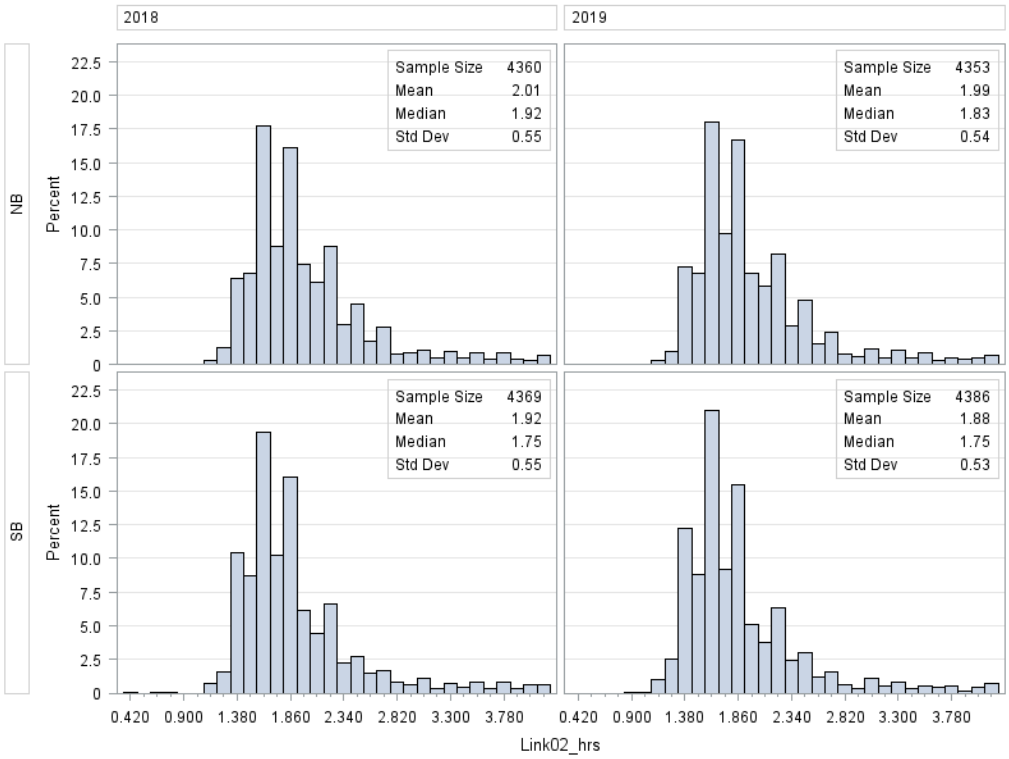
O-D Pair	Link	Direc-tion	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	EB/ NB	110	133	130	155	123	117	136	134	115	126	127	129	115	114	141	154	133	110	125	109	134	138	135	139	131	140
Port Beaumont/Port Arthur Upstream	2		70	82	80	103	79	64	87	90	67	79	76	97	62	69	86	98	82	69	83	73	81	104	88	86	83	90
Boundary to Port Arthur Downstream	3		114	142	111	159	112	112	132	133	101	125	128	134	118	105	142	154	155	129	126	131	128	163	143	159	146	147
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		115	158	118	177	113	60	134	135	113	133	121	138	120	102	147	171	169	141	130	145	133	168	149	161	165	159
	5		133	178	161	180	153	97	161	152	129	156	138	159	149	139	162	192	194	175	155	158	150	193	171	183	190	177
Port of Houston/Galveston/Texas City	6		33	37	51	51	33	23	42	46	31	35	48	60	58	47	44	52	50	53	37	39	45	53	45	52	49	54
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		91	101	113	121	95	58	98	101	79	91	109	115	102	81	86	117	102	105	74	102	81	108	104	135	120	111
	8		80	95	106	112	82	44	88	84	62	74	98	109	88	71	78	109	99	101	71	99	68	105	83	111	96	109
	9		86	100	109	118	89	54	88	95	72	80	106	113	93	73	88	117	94	98	68	103	77	105	88	112	98	110
Chocolate Bayou to Port Freeport Upstream Boundary	10		68	86	99	106	70	47	80	88	59	70	86	103	82	69	71	105	85	89	58	90	69	94	79	100	88	101
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		60	59	76	76	60	35	56	63	42	58	68	77	54	42	57	75	61	66	32	63	47	67	53	70	62	68
Port Freeport Downstream Boundary to	12		63	64	84	86	68	36	65	74	51	63	70	83	61	41	55	80	70	73	40	66	49	77	58	79	73	78
Colorado River	13		37	25	40	63	53	26	35	50	28	39	42	69	51	42	28	49	40	52	29	42	39	64	53	67	65	68
Colorado River Industry	14		61	53	47	71	53	35	52	61	33	50	62	71	43	49	48	69	66	61	36	55	49	57	55	62	56	62
Colorado River to Calhoun	15		39	34	45	67	53	28	49	53	31	45	61	71	42	50	41	68	66	56	23	22	47	60	35	54	53	57
	16		61	49	42	70	48	29	44	63	25	45	62	69	40	47	46	67	66	59	45	38	47	58	46	62	54	57
Port Lavaca (Calhoun Port Authority)	17		56	43	39	54	41	31	37	50	24	40	52	60	38	43	45	57	56	50	40	41	40	45	41	53	43	57
Calhoun to Victoria	18		40	42	29	49	36	20	20	42	21	28	51	63	32	39	35	46	57	44	36	39	29	37	36	45	40	45
Port of Victoria	19		34	38	37	36	28	23	22	34	10	24	35	49	27	32	38	38	47	37	35	32	33	33	34	39	29	43
Victoria to Corpus Christi Upstream Boundary	20		44	37	37	40	34	27	26	36	15	30	37	53	28	32	38	36	47	39	36	43	34	37	35	39	33	47
	21		42	37	39	39	33	27	28	39	16	31	39	55	30	32	42	41	50	44	35	46	43	42	38	39	34	53
	22		44	41	43	42	38	30	34	42	23	38	40	55	28	39	41	45	52	43	39	47	41	40	39	40	35	51
Link 22A (Aransas Pass)	22A		9	5	7	10	5	3	6	8	5	5	8	6	2	4	4	9	5	9	3	5	6	5	7	4	4	7
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		35	36	36	32	33	27	28	34	18	33	32	49	26	35	37	36	47	34	36	42	35	35	32	36	31	44
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		5	7	4	5	4	1	3	2	0	2	2	6	4	6	2	4	4	1	8	3	5	3	3	4	3	6
Corpus Christi Downstream Boundary to	24		7	8	6	7	5	0	5	4	2	1	4	7	4	7	4	6	8	4	6	0	9	5	6	5	7	8
Arroyo Colorado Upstream Boundary	25		6	6	7	6	3	1	4	3	2	1	5	8	3	9	5	4	9	3	0	0	10	4	6	5	6	9
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		4	8	5	4	5	3	3	3	3	2	3	5	3	6	4	3	8	3	0	0	6	3	5	4	4	8
Arroyo Colorado to Port Isabel Upstream Boundary	27		4	6	2	1	1	2	3	2	3	1	2	4	2	4	3	2	8	2	0	0	2	1	2	4	1	4
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		3	4	2	0	0	0	2	0	2	0	2	2	1	1	2	2	4	1	0	0	1	1	3	1	0	0
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		3	4	1	1	0	0	2	1	2	1	1	1	2	2	1	3	3	2	0	0	0	1	4	2	0	3

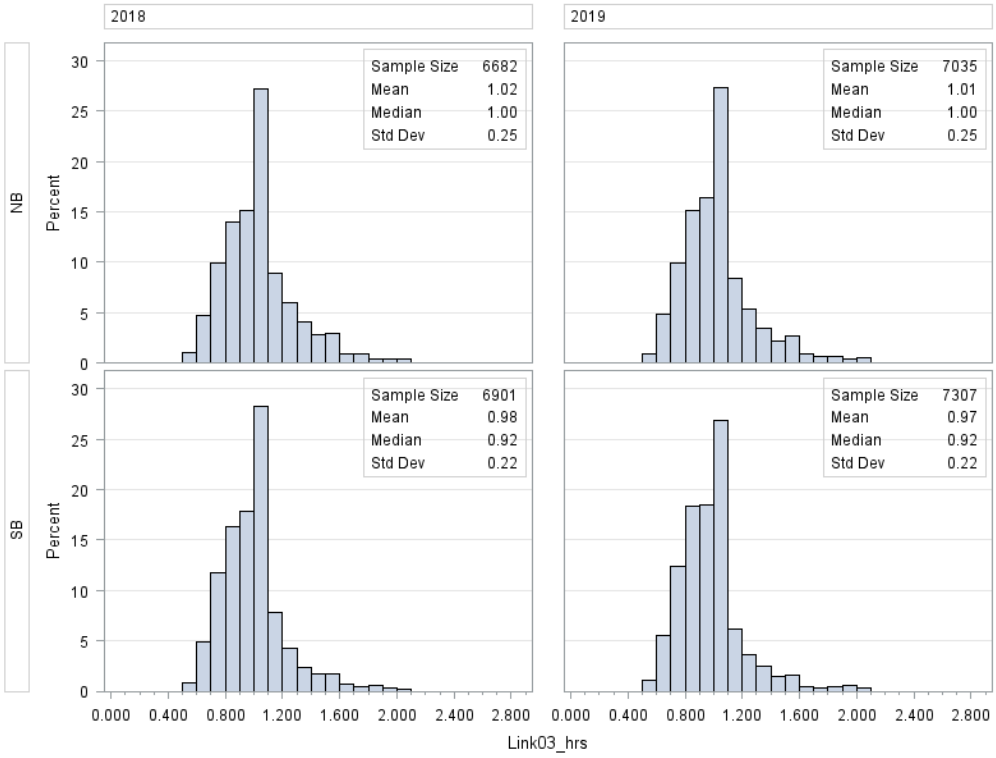
Table 46. Weekly Link Transit Count: Eastbound/Northbound, Week 27–Week 53, 2019.

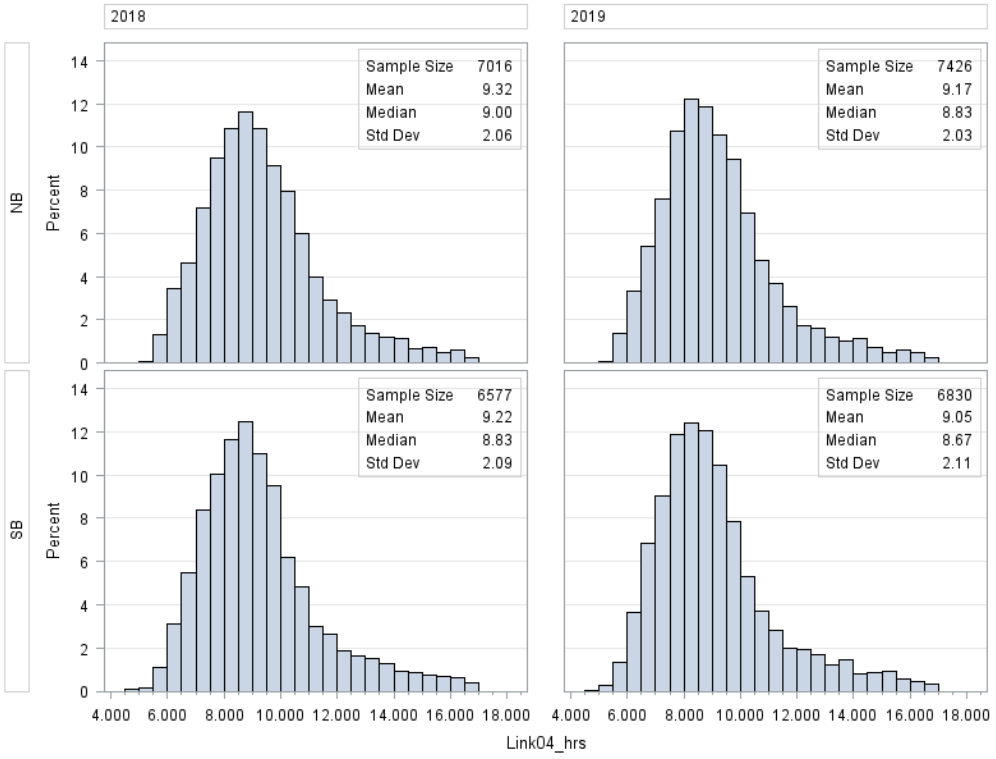
O-D Pair	Link	Direc-tion	Week 27	Week 28	Week 29	Week 30	Week 31	Week 32	Week 33	Week 34	Week 35	Week 36	Week 37	Week 38	Week 39	Week 40	Week 41	Week 42	Week 43	Week 44	Week 45	Week 46	Week 47	Week 48	Week 49	Week 50	Week 51	Week 52	Week 53
Louisiana Border to Port Beaumont/Port Arthur Upstream Boundary	1	EB/ NB	130	114	115	132	136	145	134	149	146	132	133	103	141	133	130	136	133	140	147	152	150	130	159	123	125	135	51
Port Beaumont/Port Arthur Upstream	2		95	60	65	85	81	85	84	89	96	84	95	52	89	81	86	88	85	88	104	90	102	76	107	74	76	87	31
Boundary to Port Arthur Downstream	3		130	137	119	145	145	152	145	163	154	139	151	80	127	147	140	134	126	155	141	135	159	108	154	115	132	121	47
Port Arthur Downstream Boundary to Port Houston/Pelican Island Mooring	4		143	144	135	153	146	163	157	173	165	149	165	83	122	157	166	151	130	160	156	151	174	118	163	137	138	106	51
	5		158	181	151	180	186	177	194	193	189	172	172	132	185	164	171	173	150	187	174	170	201	146	192	166	162	149	55
Port of Houston/Galveston/Texas City	6		40	44	35	51	45	38	49	41	45	48	48	40	45	37	39	46	42	56	35	46	48	38	57	50	47	40	14
Port Houston/Pelican Island Mooring to Chocolate Bayou	7		100	99	105	116	101	85	105	103	110	113	111	96	105	99	95	115	100	128	98	98	95	91	119	90	90	89	30
	8		95	97	106	115	102	86	106	100	112	114	117	89	105	104	93	114	91	112	90	91	91	76	110	84	83	78	25
	9		96	94	105	111	100	88	103	105	112	115	114	93	105	103	98	112	95	130	97	95	90	90	108	90	89	95	21
Chocolate Bayou to Port Freeport Upstream Boundary	10		88	92	90	100	88	80	91	95	100	102	108	80	99	97	90	99	81	111	86	89	80	74	95	80	83	74	19
Port Freeport Upstream Boundary to Port Freeport Downstream Boundary	11		64	62	66	70	56	57	63	65	64	73	69	58	69	70	59	63	65	83	70	60	57	57	66	56	55	65	9
Port Freeport Downstream Boundary to	12		70	69	65	86	64	64	72	73	74	75	82	66	80	72	65	70	67	90	74	66	68	60	75	65	65	74	11
Colorado River	13		63	67	59	79	56	62	63	67	62	58	69	45	57	67	64	64	65	56	68	58	53	51	64	57	43	49	15
Colorado River Industry	14		62	57	55	71	53	55	55	64	62	60	66	52	66	61	59	54	55	72	71	55	58	49	60	56	60	60	17
Colorado River to Calhoun	15		58	57	57	70	52	55	55	55	62	60	63	51	66	57	51	51	48	67	72	52	58	48	48	57	58	58	13
	16		54	56	57	70	53	55	57	63	59	62	63	53	63	60	58	56	51	68	70	55	60	44	50	55	56	55	15
Port Lavaca (Calhoun Port Authority)	17		52	49	47	54	46	43	46	50	48	52	48	47	45	47	46	45	39	61	54	45	51	42	43	47	48	50	14
Calhoun to Victoria	18		49	51	44	51	43	45	49	46	49	53	46	45	45	47	44	47	31	57	56	41	45	36	37	46	42	43	10
Port of Victoria	19		40	38	38	44	38	37	33	33	37	38	31	29	32	38	34	37	30	41	46	35	40	33	23	36	36	40	8
Victoria to Corpus Christi Upstream Boundary	20		47	41	41	45	43	38	41	39	41	45	37	35	34	44	37	43	40	48	51	39	43	37	28	46	46	49	9
	21		48	40	43	44	46	38	42	42	41	46	37	38	36	42	38	44	39	48	50	42	43	37	25	38	46	43	8
	22		46	41	40	44	46	38	42	39	41	46	36	36	36	40	40	42	40	48	48	44	40	37	29	43	47	50	8
Link 22A (Aransas Pass)	22A		7	7	4	3	9	6	4	3	5	8	4	3	9	8	7	6	6	7	5	10	7	9	5	5	5	8	1
Link 22B (Main Route) (Lydia Ann Channel Route)	22B		39	34	36	41	37	32	38	36	36	38	32	33	27	32	33	36	34	41	43	34	33	28	24	38	42	42	7
Corpus Christi Upstream Boundary to Corpus Christi Downstream Boundary	23		1	1	2	5	2	4	3	4	4	7	6	1	4	5	0	5	4	9	5	5	2	2	7	6	6	9	0
Corpus Christi Downstream Boundary to	24		3	4	2	6	4	4	7	3	6	8	9	4	6	5	5	9	9	10	7	12	5	5	9	5	8	8	0
Arroyo Colorado Upstream Boundary	25		1	5	3	7	5	3	6	3	5	8	7	3	5	5	4	8	7	8	4	14	4	5	8	8	9	11	0
Arroyo Colorado Upstream Boundary to Downstream Boundary (Port of Harlingen)	26		1	3	3	5	4	5	3	4	4	6	7	2	4	7	4	5	6	7	7	7	5	4	5	4	8	8	0
Arroyo Colorado to Port Isabel Upstream Boundary	27		1	2	3	3	3	4	3	2	3	6	6	1	3	1	3	1	3	6	7	4	4	2	6	5	5	6	0
Port Isabel Upstream Boundary to Port Isabel Downstream Boundary	28		1	1	1	1	1	3	1	0	2	4	2	1	3	0	1	0	2	4	2	1	3	0	2	3	1	2	0
Port Isabel Downstream Boundary to Port Brownsville Upstream Boundary	29		1	1	1	1	2	1	1	0	3	2	0	1	4	1	1	1	4	3	5	3	1	1	3	5	3	3	0

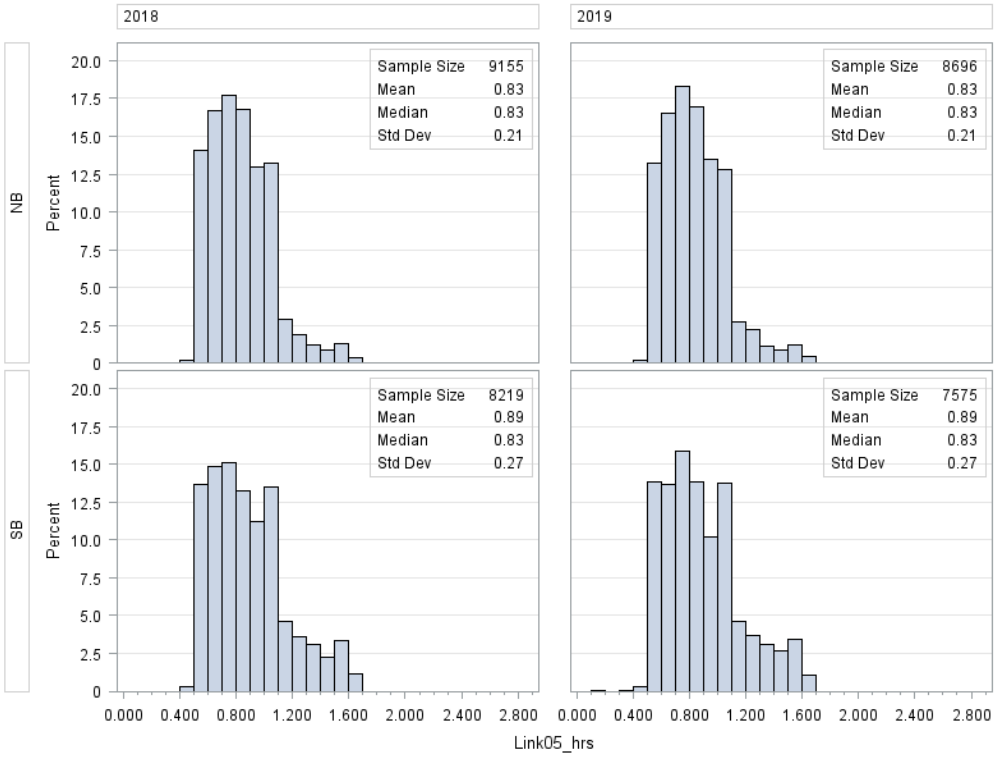
APPENDIX C: LINK TRAVEL TIME HISTOGRAMS BY YEAR BY DIRECTION

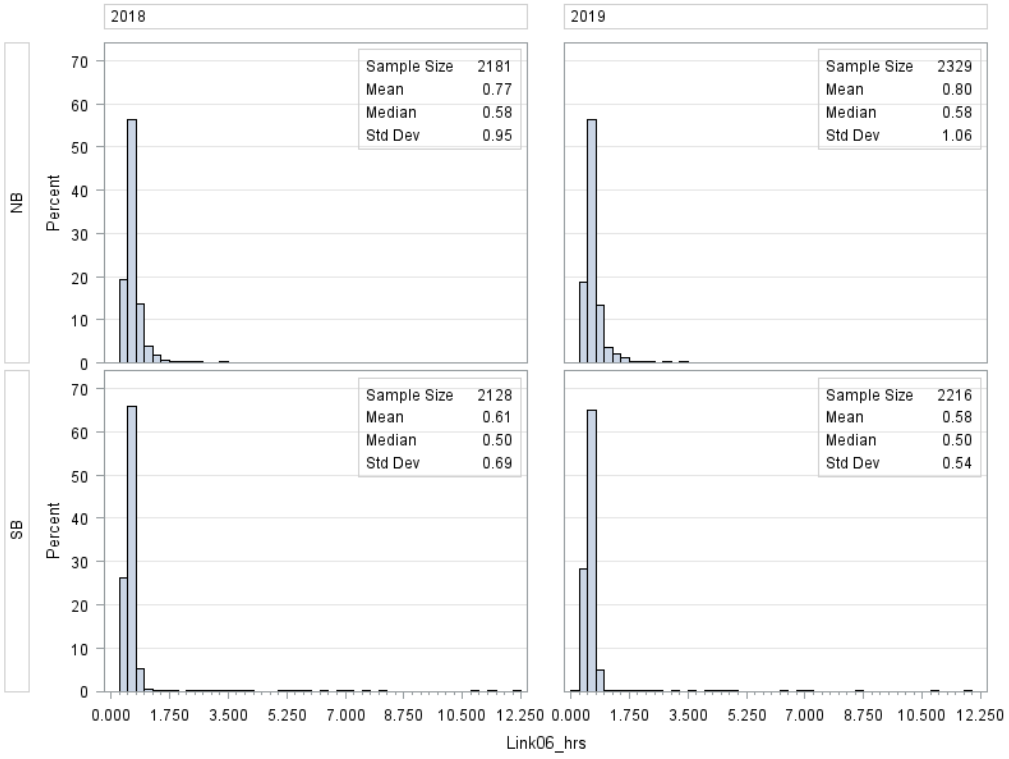


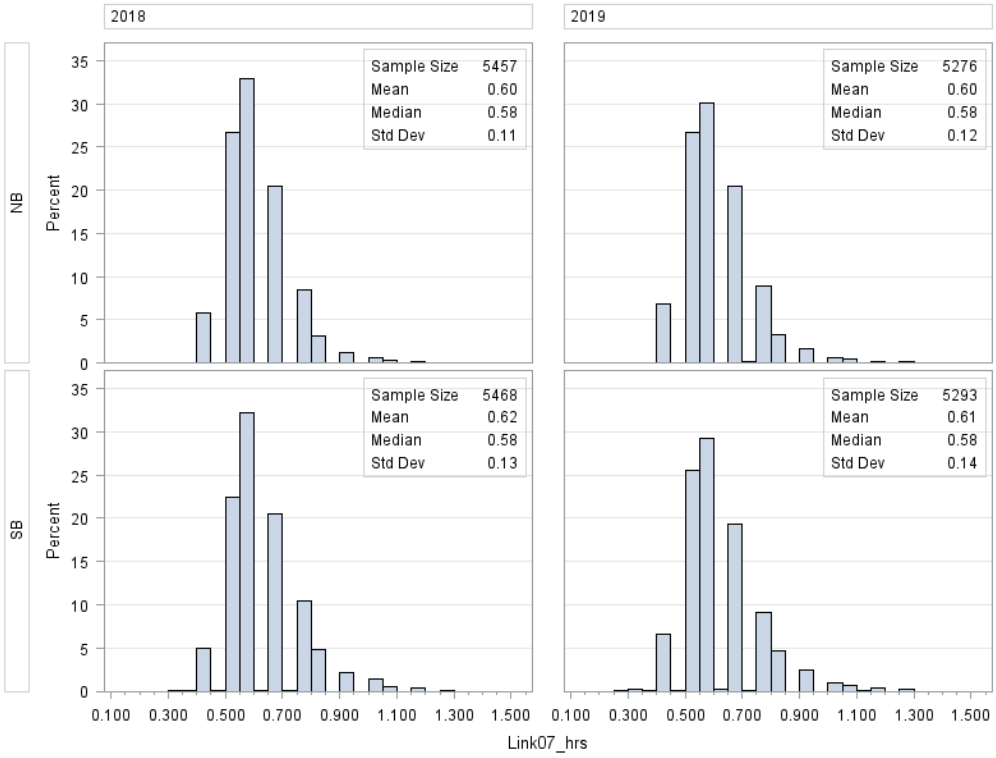


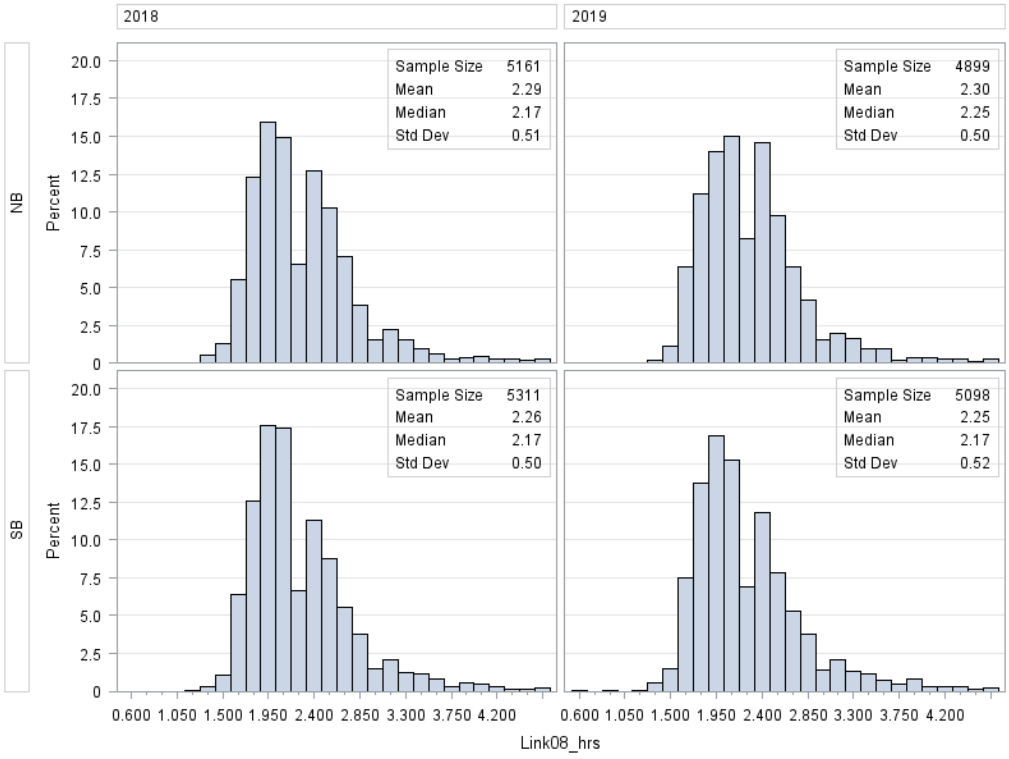

2018
2019
NB
SB
Percent
Sample Size 6682
Mean 1.02
Median 1.00
Std Dev 0.25
Sample Size 7035
Mean 1.01
Median 1.00
Std Dev 0.25
Sample Size 6901
Mean 0.98
Median 0.92
Std Dev 0.22
Sample Size 7307
Mean 0.97
Median 0.92
Std Dev 0.22
0.000 0.400 0.800 1.200 1.600 2.000 2.400 2.800
Link03_hrs

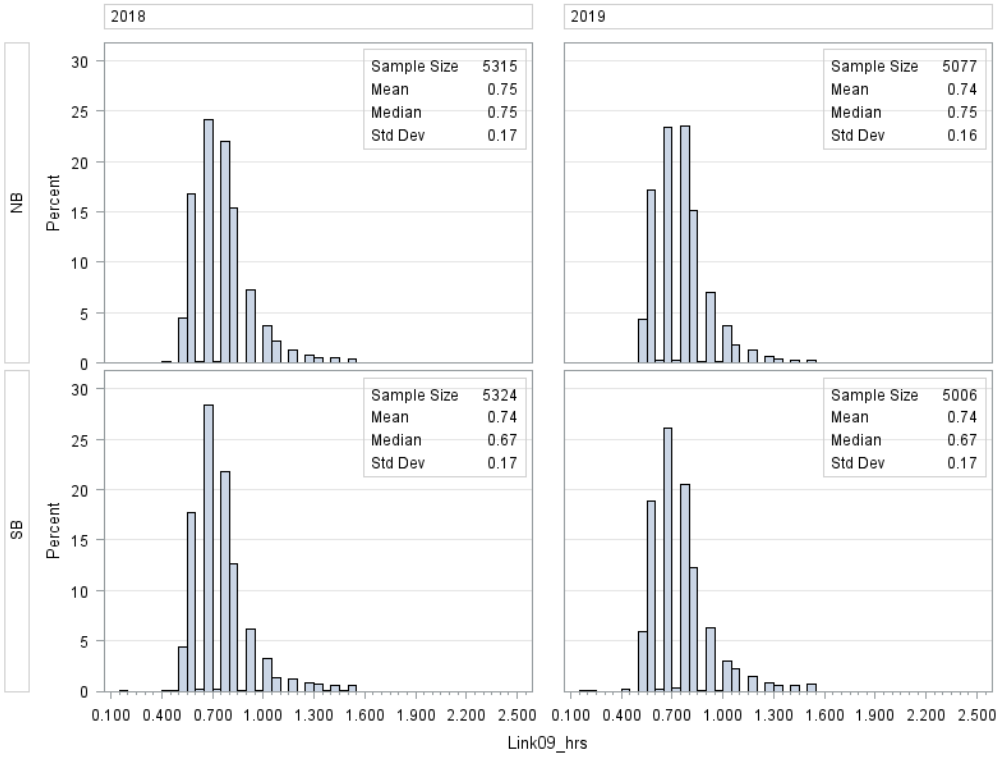

2018
2019
NB
SB
Percent
Sample Size 7016
Mean 9.32
Median 9.00
Std Dev 2.06
Sample Size 7426
Mean 9.17
Median 8.83
Std Dev 2.03
Sample Size 6577
Mean 9.22
Median 8.83
Std Dev 2.09
Sample Size 6830
Mean 9.05
Median 8.67
Std Dev 2.11
4.000 6.000 8.000 10.000 12.000 14.000 16.000 18.000
Link04_hrs

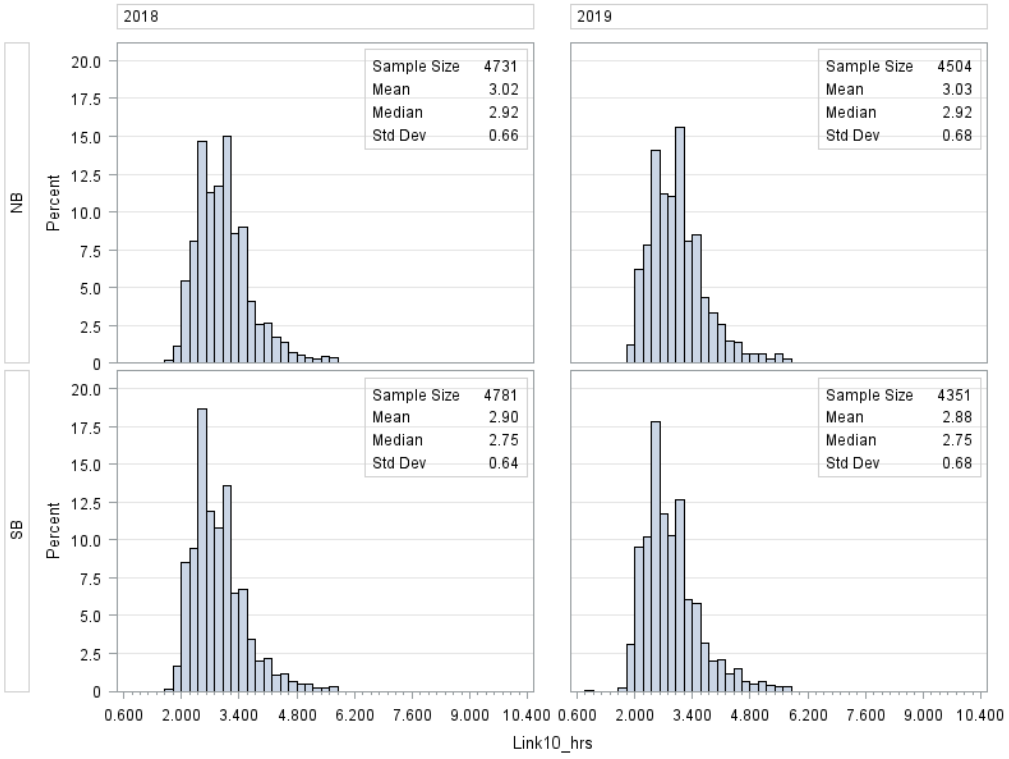

2018
2019
NB
SB
Percent
Sample Size 9155
Mean 0.83
Median 0.83
Std Dev 0.21
Sample Size 8696
Mean 0.83
Median 0.83
Std Dev 0.21
Sample Size 8219
Mean 0.89
Median 0.83
Std Dev 0.27
Sample Size 7575
Mean 0.89
Median 0.83
Std Dev 0.27
0.000 0.400 0.800 1.200 1.600 2.000 2.400 2.800
Link05_hrs

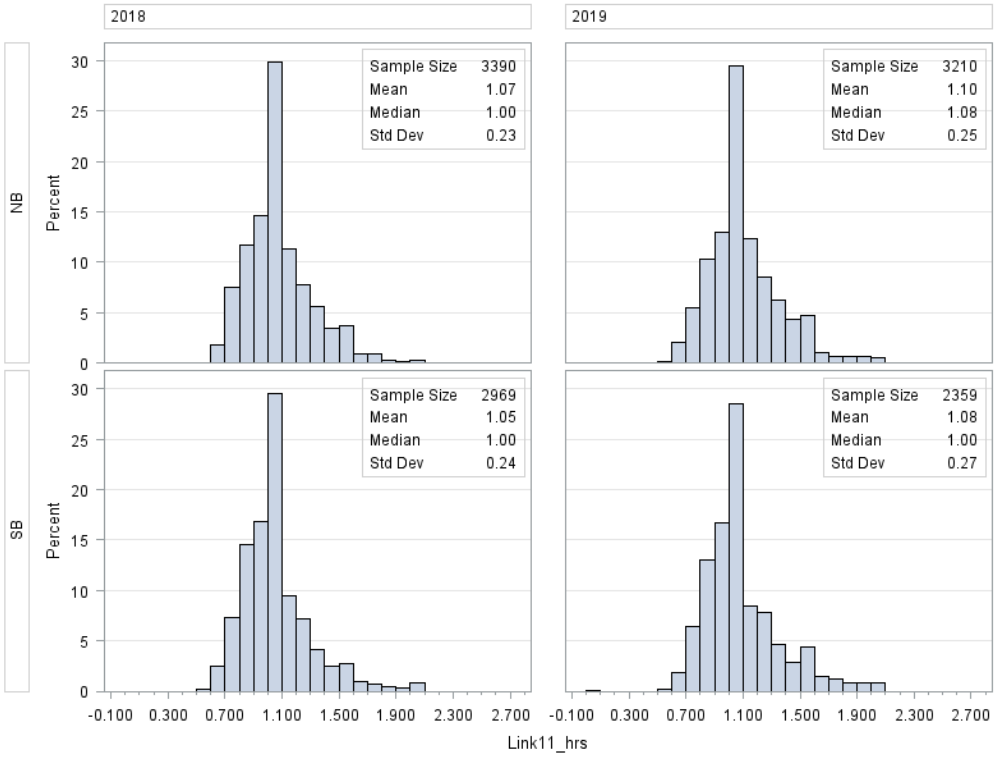

2018
2019
NB
SB
Percent
Sample Size 2181
Mean 0.77
Median 0.58
Std Dev 0.95
Sample Size 2329
Mean 0.80
Median 0.58
Std Dev 1.06
Sample Size 2128
Mean 0.61
Median 0.50
Std Dev 0.69
Sample Size 2216
Mean 0.58
Median 0.50
Std Dev 0.54
0.000 1.750 3.500 5.250 7.000 8.750 10.500 12.250
Link06_hrs

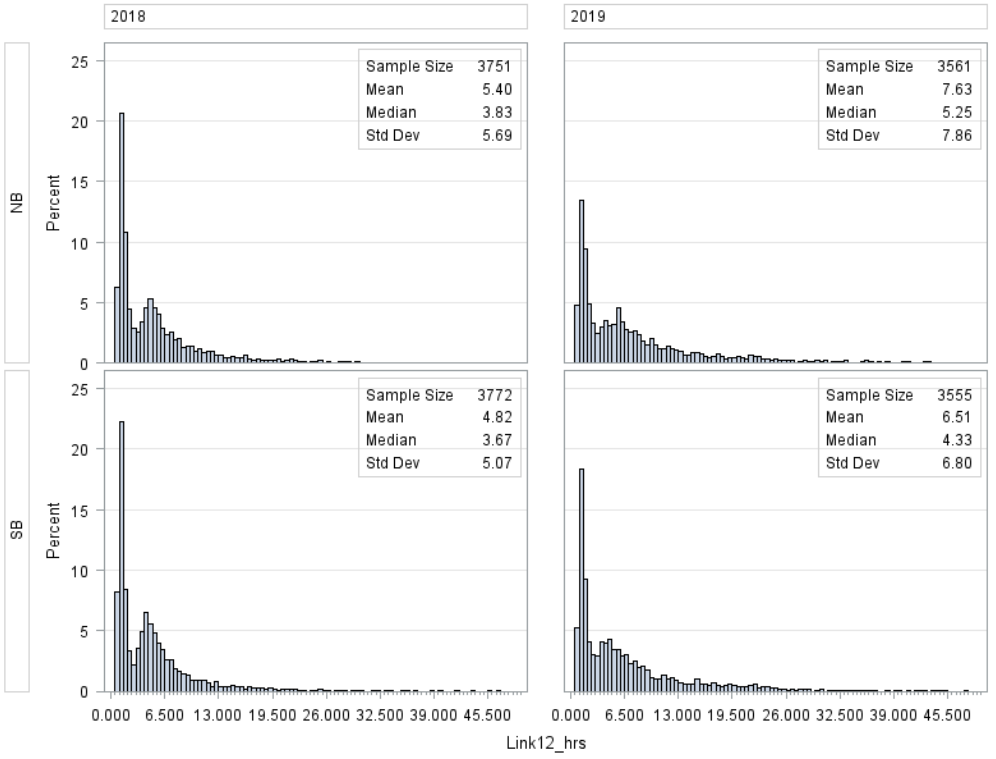

2018
2019
NB
SB
Percent
Sample Size 5457
Mean 0.60
Median 0.58
Std Dev 0.11
Sample Size 5276
Mean 0.60
Median 0.58
Std Dev 0.12
Sample Size 5468
Mean 0.62
Median 0.58
Std Dev 0.13
Sample Size 5293
Mean 0.61
Median 0.58
Std Dev 0.14
0.100 0.300 0.500 0.700 0.900 1.100 1.300 1.500
Link07_hrs

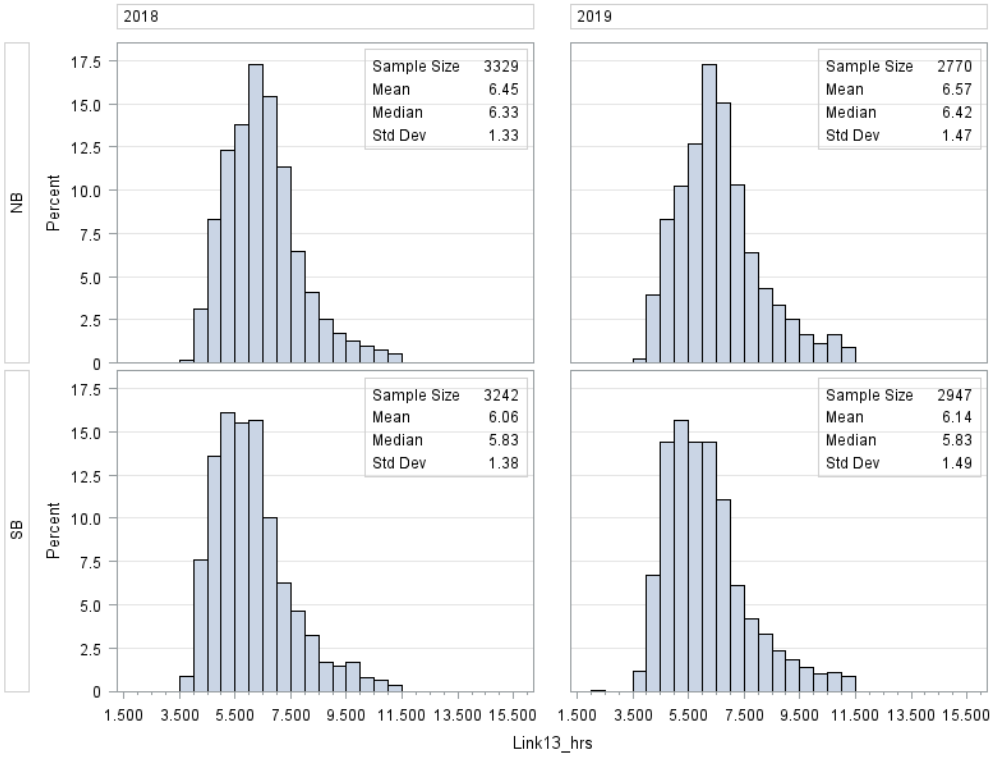

2018
2019
NB
SB
Percent
Sample Size 5161
Mean 2.29
Median 2.17
Std Dev 0.51
Sample Size 4899
Mean 2.30
Median 2.25
Std Dev 0.50
Sample Size 5311
Mean 2.26
Median 2.17
Std Dev 0.50
Sample Size 5098
Mean 2.25
Median 2.17
Std Dev 0.52
0.600 1.050 1.500 1.950 2.400 2.850 3.300 3.750 4.200
Link08_hrs

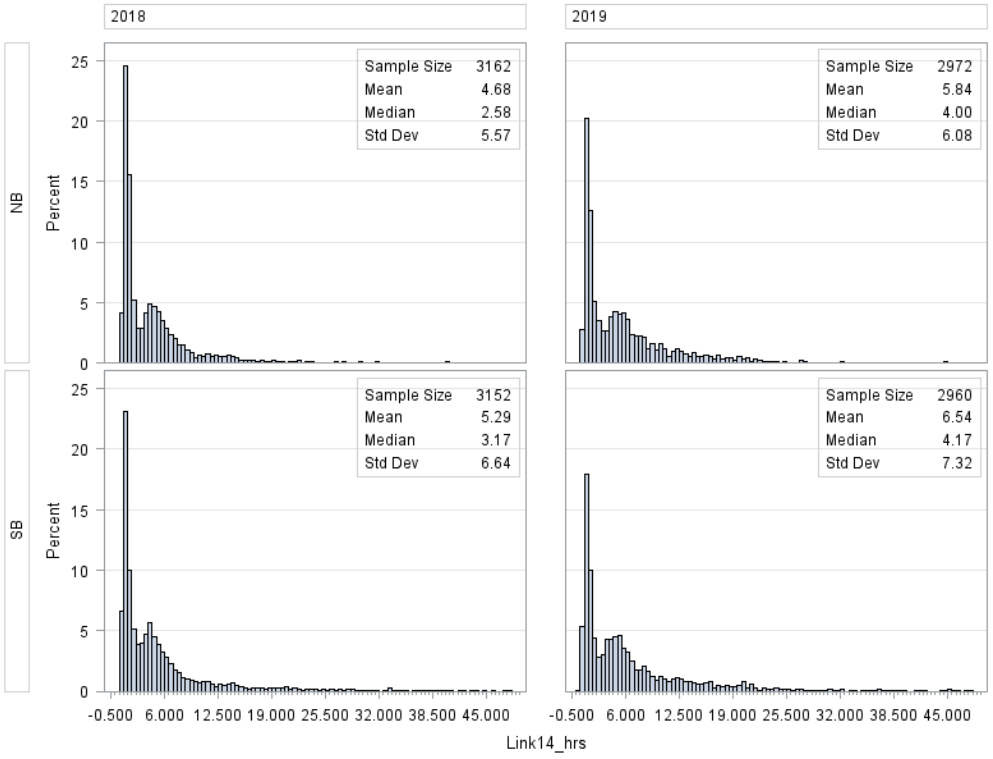

2018
2019
NB
SB
Percent
Sample Size 5315
Mean 0.75
Median 0.75
Std Dev 0.17
Sample Size 5077
Mean 0.74
Median 0.75
Std Dev 0.16
Sample Size 5324
Mean 0.74
Median 0.67
Std Dev 0.17
Sample Size 5006
Mean 0.74
Median 0.67
Std Dev 0.17
0.100 0.400 0.700 1.000 1.300 1.600 1.900 2.200 2.500
Link09_hrs

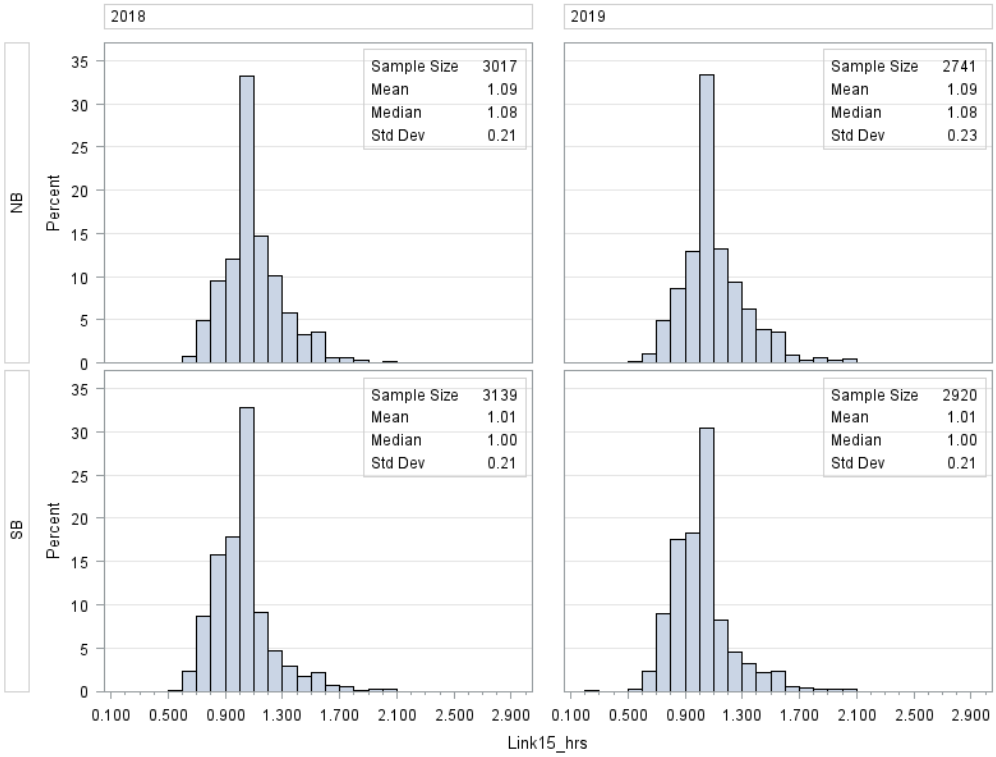

2018
2019
NB
SB
Percent
Sample Size 4731
Mean 3.02
Median 2.92
Std Dev 0.66
Sample Size 4504
Mean 3.03
Median 2.92
Std Dev 0.68
Sample Size 4781
Mean 2.90
Median 2.75
Std Dev 0.64
Sample Size 4351
Mean 2.88
Median 2.75
Std Dev 0.68
0.600 2.000 3.400 4.800 6.200 7.600 9.000 10.400
Link10_hrs

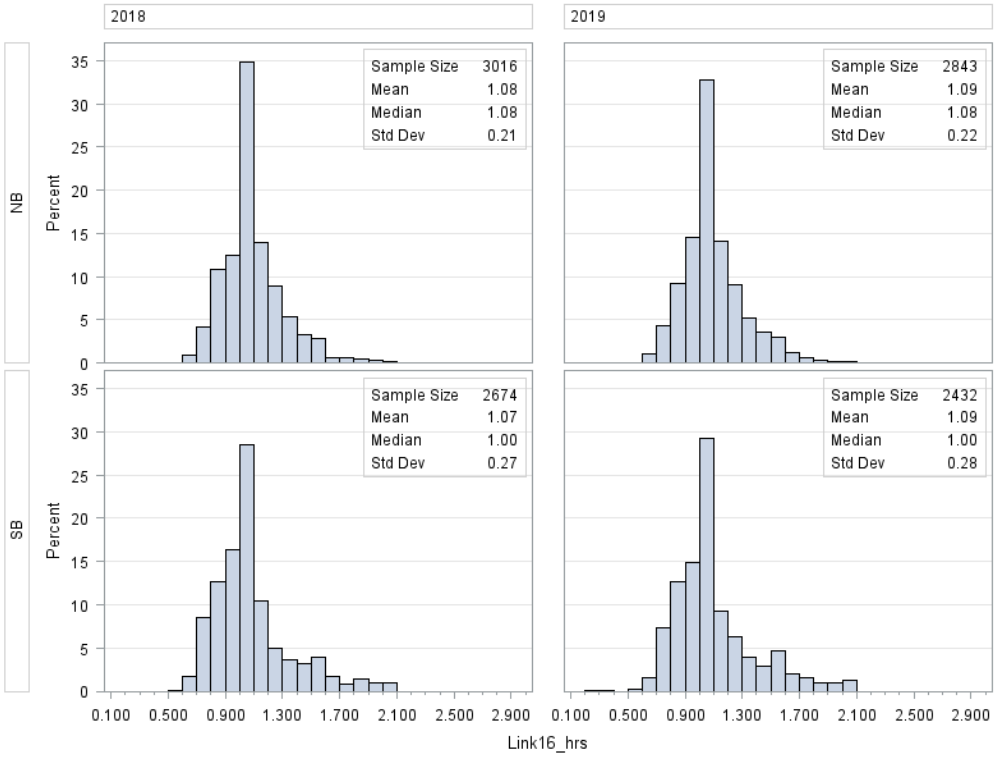

2018
2019
NB
SB
Percent
Sample Size 3390
Mean 1.07
Median 1.00
Std Dev 0.23
Sample Size 3210
Mean 1.10
Median 1.08
Std Dev 0.25
Sample Size 2969
Mean 1.05
Median 1.00
Std Dev 0.24
Sample Size 2359
Mean 1.08
Median 1.00
Std Dev 0.27
0 5 10 15 20 25 30
-0.100 0.300 0.700 1.100 1.500 1.900 2.300 2.700
Link11_hrs

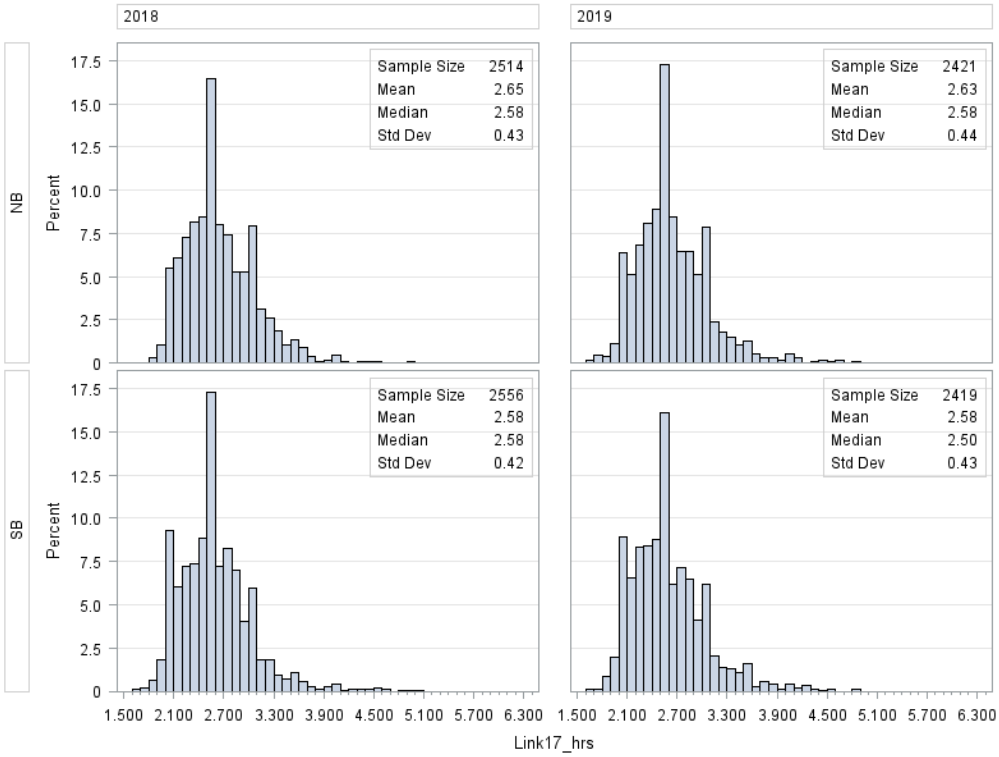

2018
2019
NB
SB
Percent
Sample Size 3751
Mean 5.40
Median 3.83
Std Dev 5.69
Sample Size 3561
Mean 7.63
Median 5.25
Std Dev 7.86
Sample Size 3772
Mean 4.82
Median 3.67
Std Dev 5.07
Sample Size 3555
Mean 6.51
Median 4.33
Std Dev 6.80
0 5 10 15 20 25
0.000 6.500 13.000 19.500 26.000 32.500 39.000 45.500
Link12_hrs

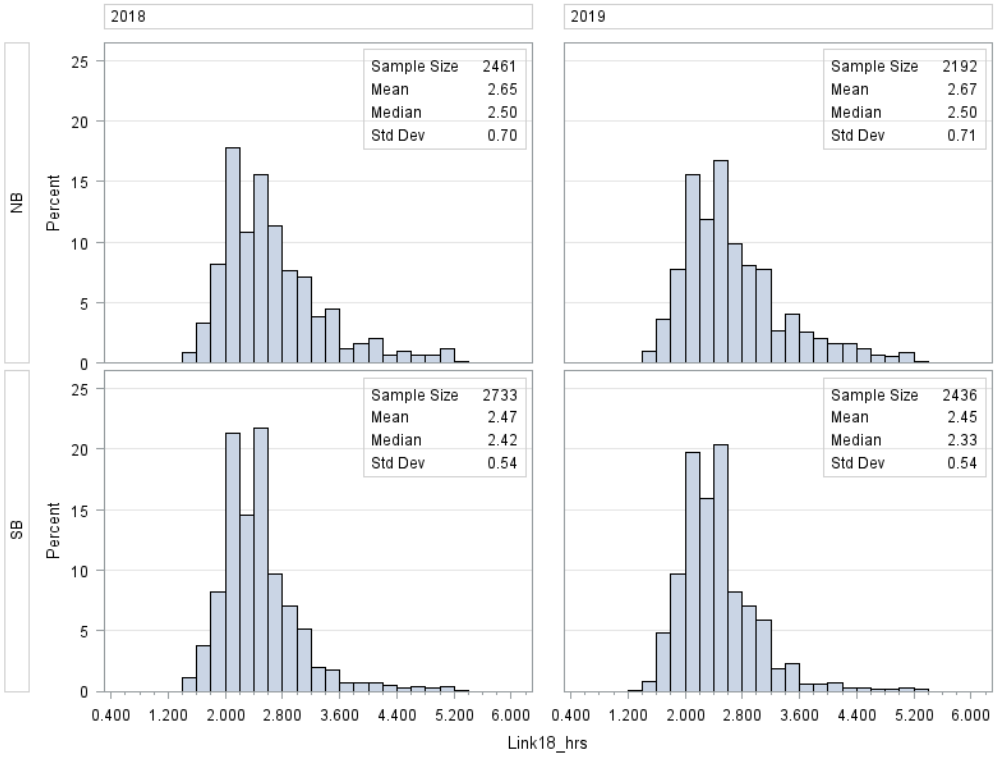

2018
2019
NB
SB
Percent
Sample Size 3329
Mean 6.45
Median 6.33
Std Dev 1.33
Sample Size 2770
Mean 6.57
Median 6.42
Std Dev 1.47
Sample Size 3242
Mean 6.06
Median 5.83
Std Dev 1.38
Sample Size 2947
Mean 6.14
Median 5.83
Std Dev 1.49
1.500 3.500 5.500 7.500 9.500 11.500 13.500 15.500
Link13_hrs

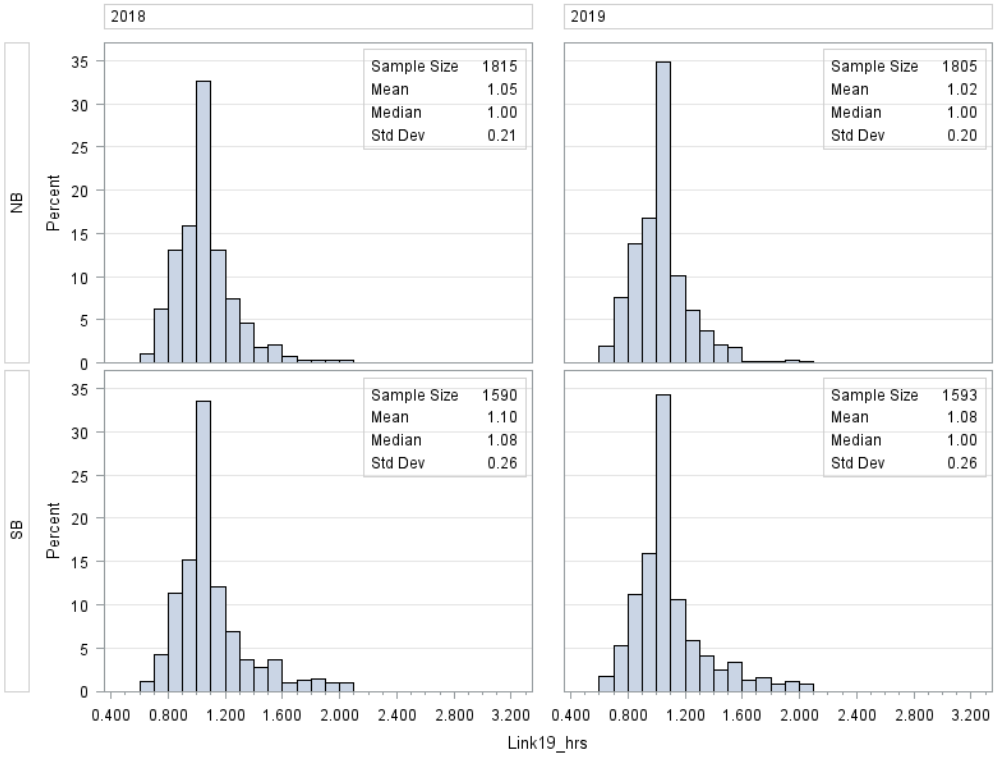

2018
2019
NB
SB
Percent
Sample Size 3162
Mean 4.68
Median 2.58
Std Dev 5.57
Sample Size 2972
Mean 5.84
Median 4.00
Std Dev 6.08
Sample Size 3152
Mean 5.29
Median 3.17
Std Dev 6.64
Sample Size 2960
Mean 6.54
Median 4.17
Std Dev 7.32
-0.500 6.000 12.500 19.000 25.500 32.000 38.500 45.000
Link14_hrs

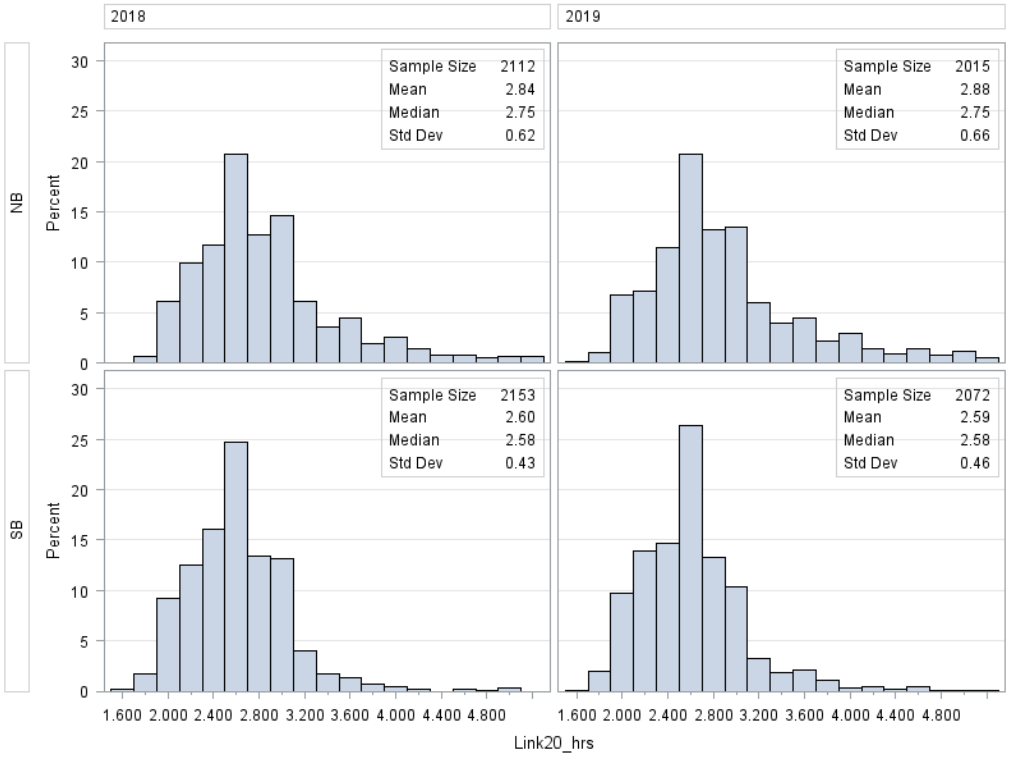

2018
2019
NB
SB
Percent
Sample Size 3017
Mean 1.09
Median 1.08
Std Dev 0.21
Sample Size 2741
Mean 1.09
Median 1.08
Std Dev 0.23
Sample Size 3139
Mean 1.01
Median 1.00
Std Dev 0.21
Sample Size 2920
Mean 1.01
Median 1.00
Std Dev 0.21
0.100 0.500 0.900 1.300 1.700 2.100 2.500 2.900
Link15_hrs

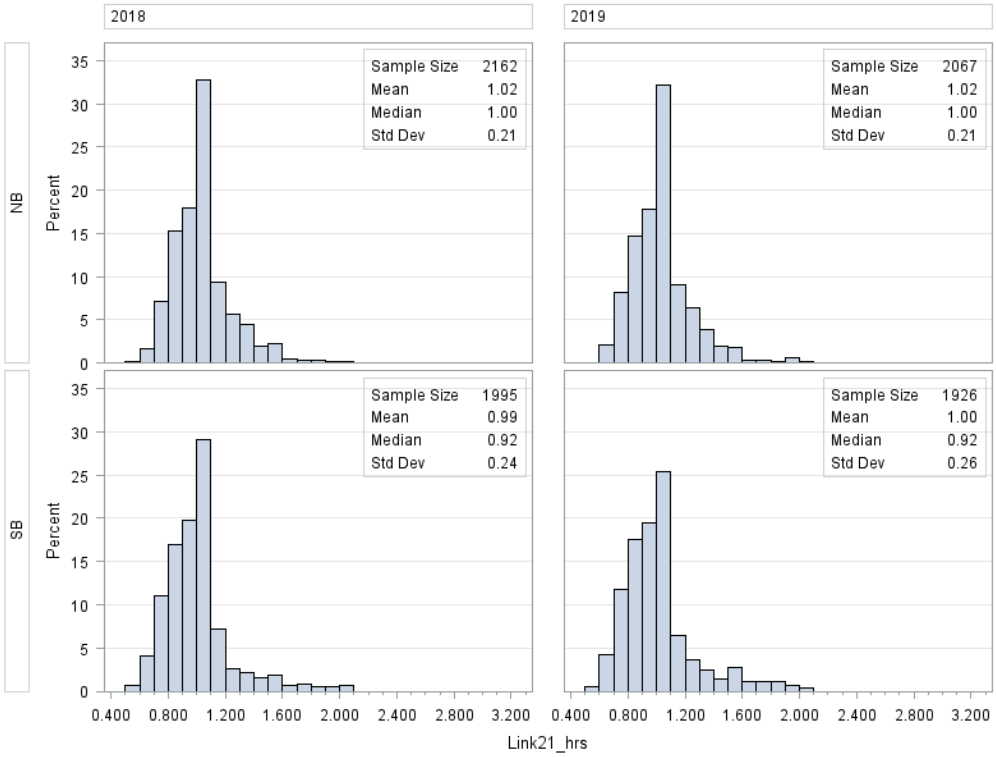

2018
2019
NB
SB
Percent
Sample Size 3016
Mean 1.08
Median 1.08
Std Dev 0.21
Sample Size 2843
Mean 1.09
Median 1.08
Std Dev 0.22
Sample Size 2674
Mean 1.07
Median 1.00
Std Dev 0.27
Sample Size 2432
Mean 1.09
Median 1.00
Std Dev 0.28
0.100 0.500 0.900 1.300 1.700 2.100 2.500 2.900
Link16_hrs

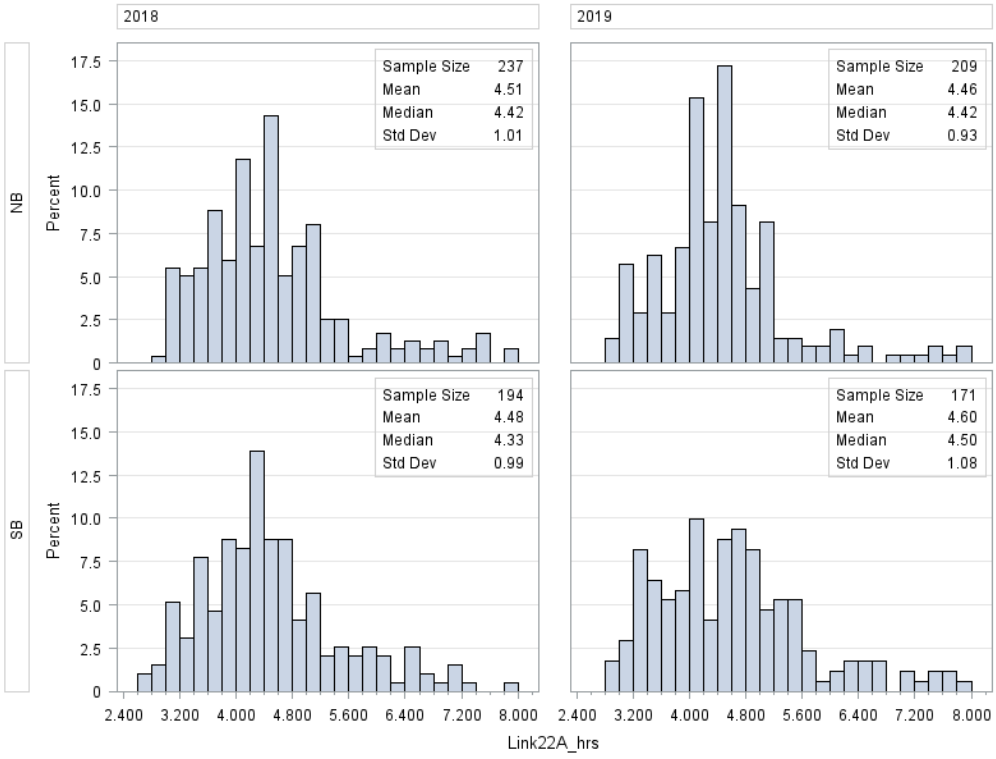

2018
2019
NB
SB
Percent
Sample Size 2514
Mean 2.65
Median 2.58
Std Dev 0.43
Sample Size 2421
Mean 2.63
Median 2.58
Std Dev 0.44
Sample Size 2556
Mean 2.58
Median 2.58
Std Dev 0.42
Sample Size 2419
Mean 2.58
Median 2.50
Std Dev 0.43
1.500 2.100 2.700 3.300 3.900 4.500 5.100 5.700 6.300
Link17_hrs

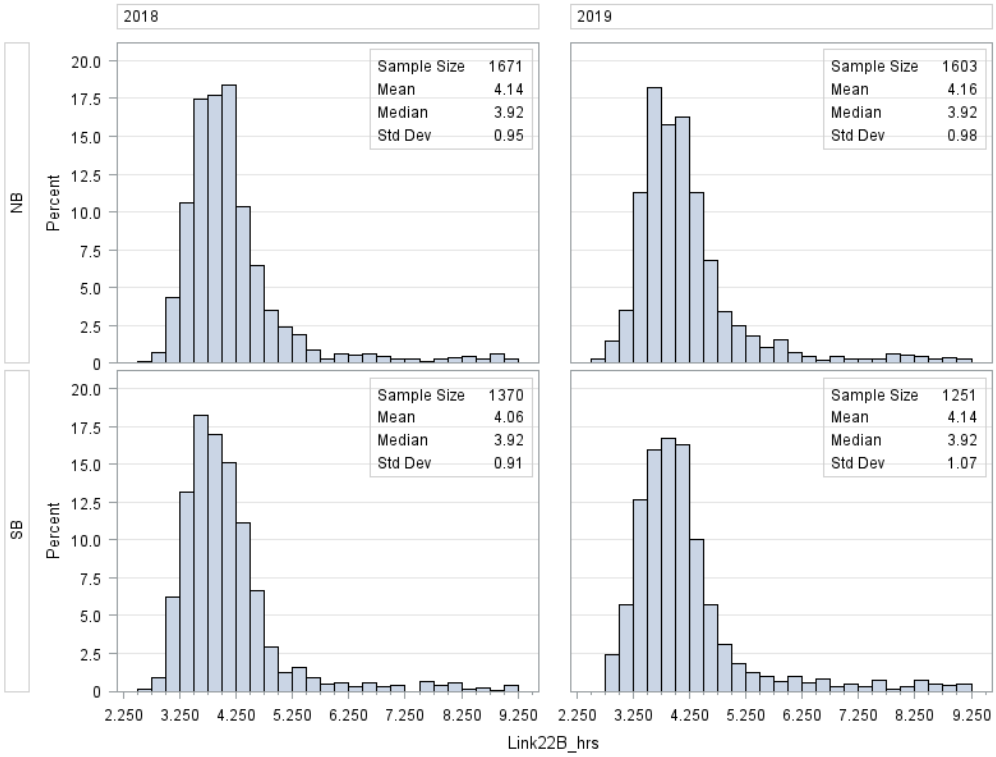

2018
2019
NB
SB
Percent
Sample Size 2461
Mean 2.65
Median 2.50
Std Dev 0.70
Sample Size 2192
Mean 2.67
Median 2.50
Std Dev 0.71
Sample Size 2733
Mean 2.47
Median 2.42
Std Dev 0.54
Sample Size 2436
Mean 2.45
Median 2.33
Std Dev 0.54
0.400 1.200 2.000 2.800 3.600 4.400 5.200 6.000
Link18_hrs

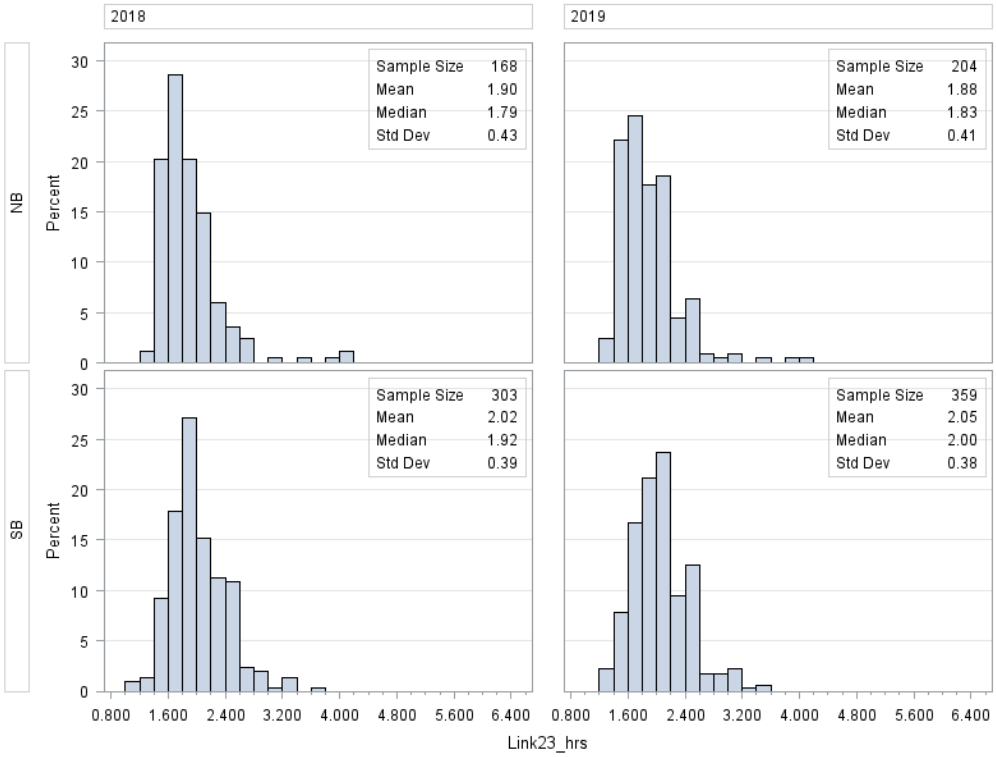

2018
2019
NB
SB
Percent
Sample Size 1815
Mean 1.05
Median 1.00
Std Dev 0.21
Sample Size 1805
Mean 1.02
Median 1.00
Std Dev 0.20
Sample Size 1590
Mean 1.10
Median 1.08
Std Dev 0.26
Sample Size 1593
Mean 1.08
Median 1.00
Std Dev 0.26
0.400 0.800 1.200 1.600 2.000 2.400 2.800 3.200
Link19_hrs

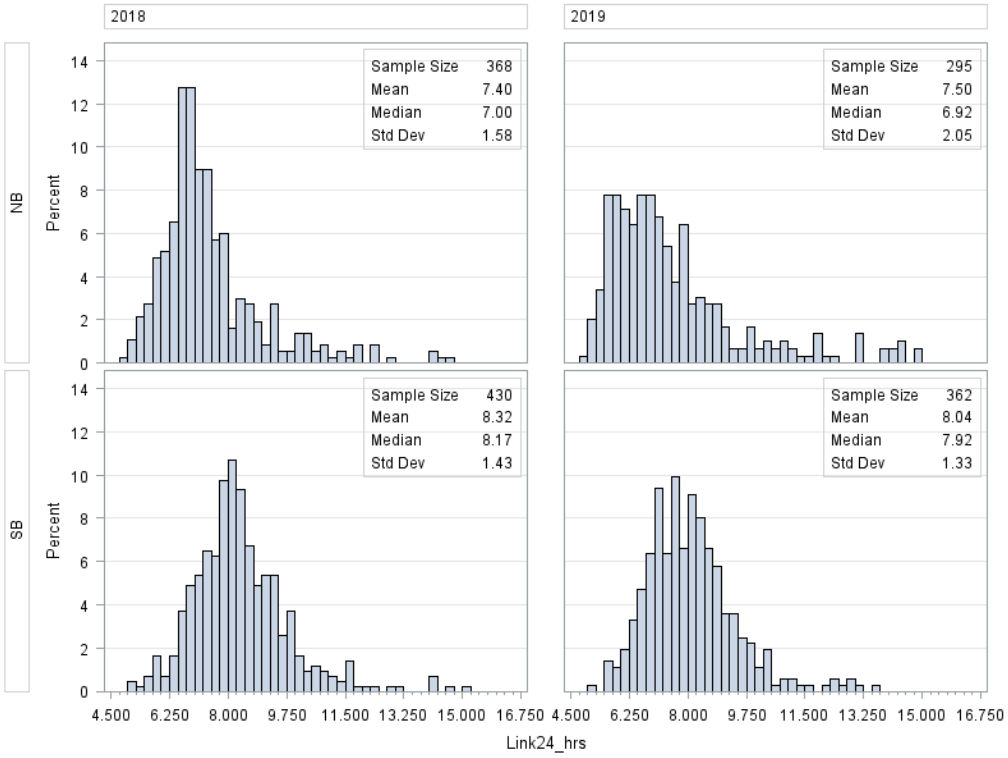

2018
2019
NB
SB
Percent
Sample Size 2112
Mean 2.84
Median 2.75
Std Dev 0.62
Sample Size 2015
Mean 2.88
Median 2.75
Std Dev 0.66
Sample Size 2153
Mean 2.60
Median 2.58
Std Dev 0.43
Sample Size 2072
Mean 2.59
Median 2.58
Std Dev 0.46
1.600 2.000 2.400 2.800 3.200 3.600 4.000 4.400 4.800
Link20_hrs

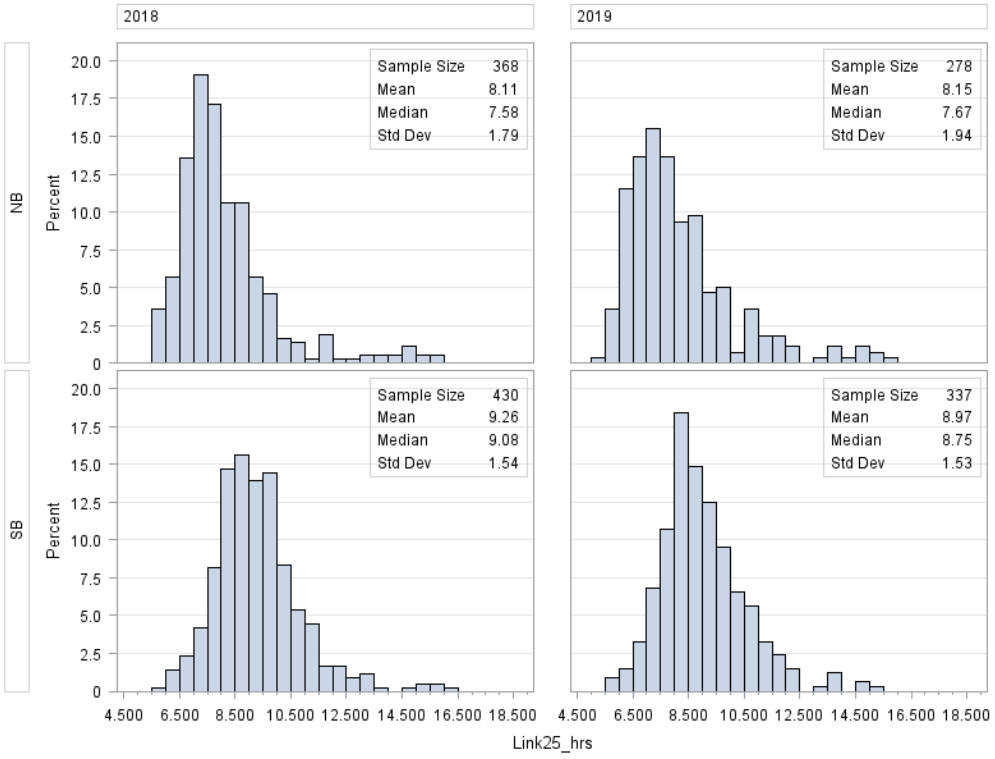

2018
2019
NB
SB
Percent
Sample Size 2162
Mean 1.02
Median 1.00
Std Dev 0.21
Sample Size 2067
Mean 1.02
Median 1.00
Std Dev 0.21
Sample Size 1995
Mean 0.99
Median 0.92
Std Dev 0.24
Sample Size 1926
Mean 1.00
Median 0.92
Std Dev 0.26
0.400 0.800 1.200 1.600 2.000 2.400 2.800 3.200
Link21_hrs

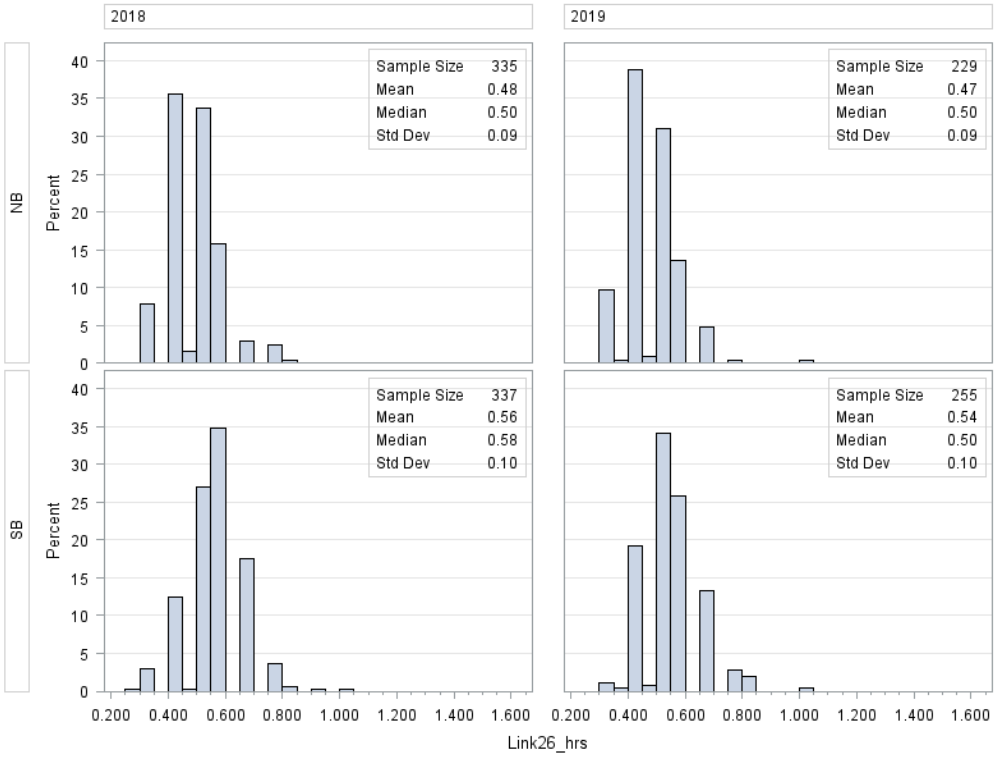

2018
2019
NB
SB
Percent
Sample Size 237
Mean 4.51
Median 4.42
Std Dev 1.01
Sample Size 209
Mean 4.46
Median 4.42
Std Dev 0.93
Sample Size 194
Mean 4.48
Median 4.33
Std Dev 0.99
Sample Size 171
Mean 4.60
Median 4.50
Std Dev 1.08
2.400 3.200 4.000 4.800 5.600 6.400 7.200 8.000
Link22A_hrs

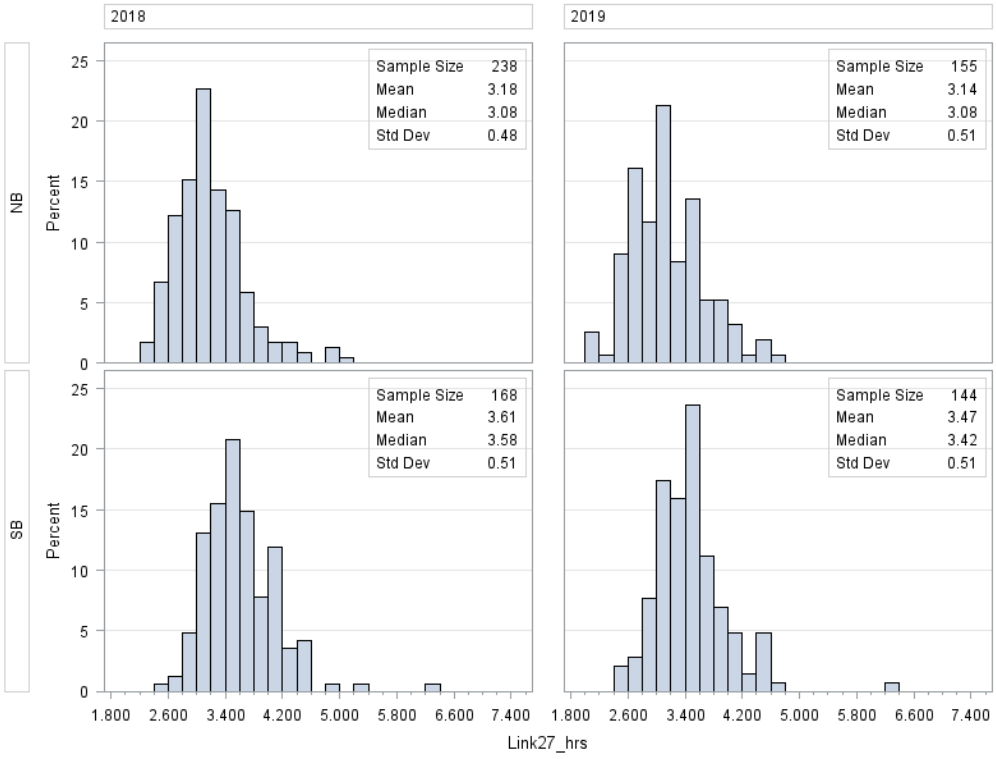

2018
2019
NB
SB
Percent
Sample Size 1671
Mean 4.14
Median 3.92
Std Dev 0.95
Sample Size 1603
Mean 4.16
Median 3.92
Std Dev 0.98
Sample Size 1370
Mean 4.06
Median 3.92
Std Dev 0.91
Sample Size 1251
Mean 4.14
Median 3.92
Std Dev 1.07
0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0
2.250 3.250 4.250 5.250 6.250 7.250 8.250 9.250
Link22B_hrs

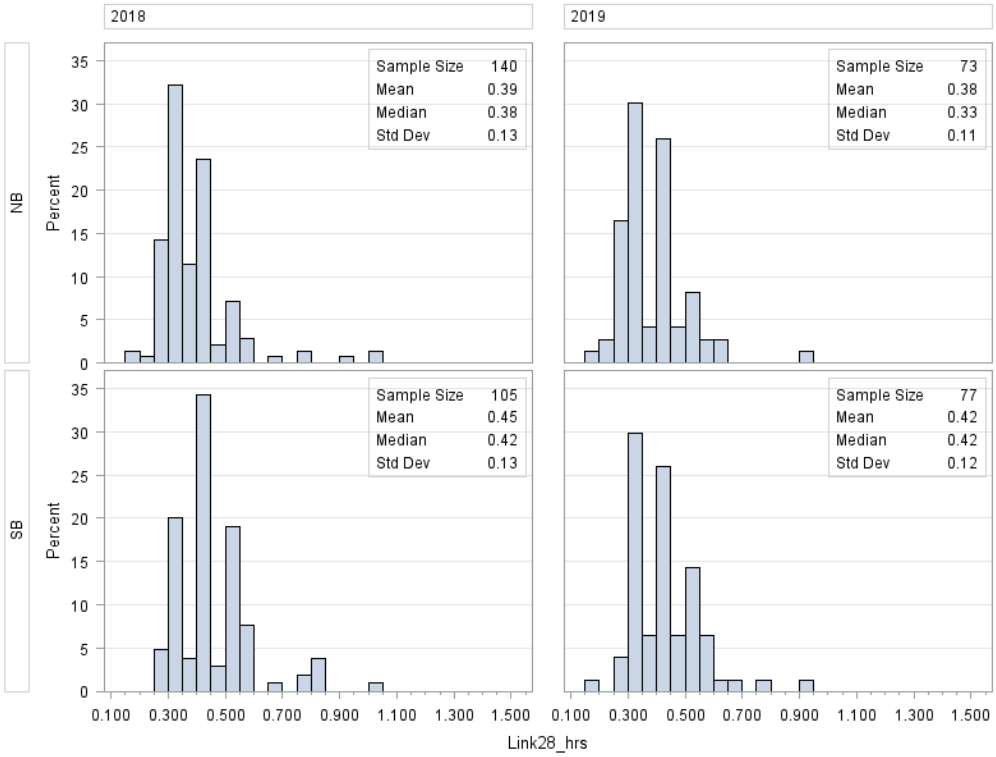

2018
2019
NB
SB
Percent
Sample Size 168
Mean 1.90
Median 1.79
Std Dev 0.43
Sample Size 204
Mean 1.88
Median 1.83
Std Dev 0.41
Sample Size 303
Mean 2.02
Median 1.92
Std Dev 0.39
Sample Size 359
Mean 2.05
Median 2.00
Std Dev 0.38
0 5 10 15 20 25 30
0.800 1.600 2.400 3.200 4.000 4.800 5.600 6.400
Link23_hrs

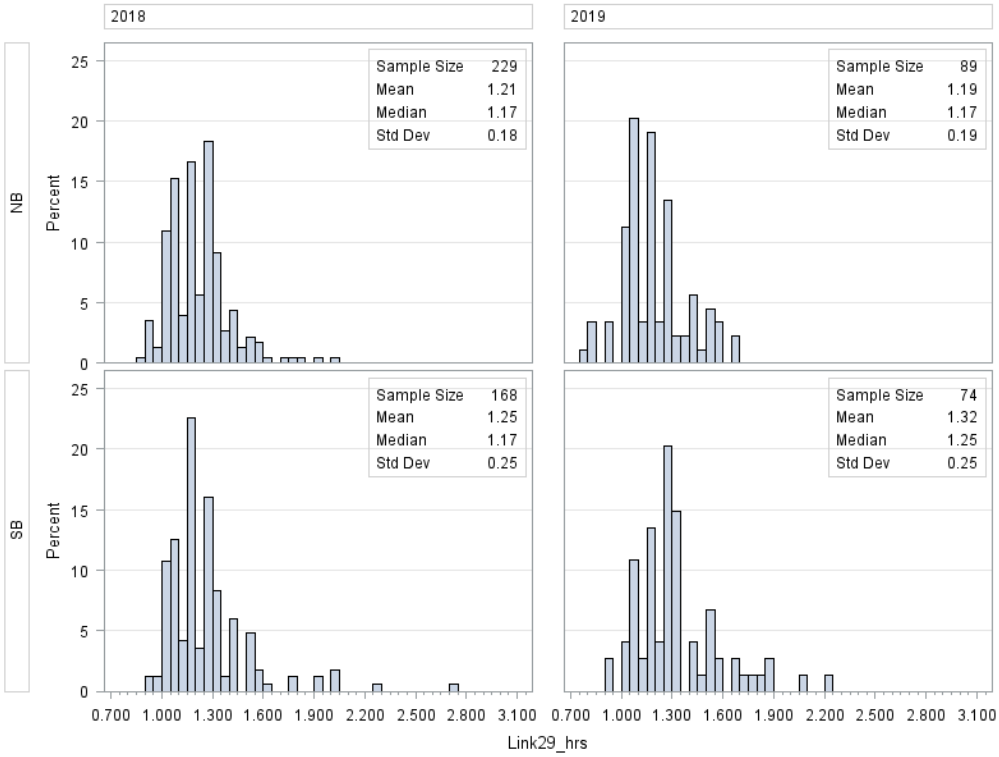

2018
2019
NB
SB
Percent
Sample Size 368
Mean 7.40
Median 7.00
Std Dev 1.58
Sample Size 295
Mean 7.50
Median 6.92
Std Dev 2.05
Sample Size 430
Mean 8.32
Median 8.17
Std Dev 1.43
Sample Size 362
Mean 8.04
Median 7.92
Std Dev 1.33
4.500 6.250 8.000 9.750 11.500 13.250 15.000 16.750
Link24_hrs


2018
2019
NB
SB
Percent
Sample Size 368
Mean 8.11
Median 7.58
Std Dev 1.79
Sample Size 278
Mean 8.15
Median 7.67
Std Dev 1.94
Sample Size 430
Mean 9.26
Median 9.08
Std Dev 1.54
Sample Size 337
Mean 8.97
Median 8.75
Std Dev 1.53
4.500 6.500 8.500 10.500 12.500 14.500 16.500 18.500
Link25_hrs


2018
2019
NB
SB
Percent
Sample Size 335
Mean 0.48
Median 0.50
Std Dev 0.09
Sample Size 229
Mean 0.47
Median 0.50
Std Dev 0.09
Sample Size 337
Mean 0.56
Median 0.58
Std Dev 0.10
Sample Size 255
Mean 0.54
Median 0.50
Std Dev 0.10
0.200 0.400 0.600 0.800 1.000 1.200 1.400 1.600
Link26_hrs


2018
2019
NB
SB
Percent
Sample Size 238
Mean 3.18
Median 3.08
Std Dev 0.48
Sample Size 155
Mean 3.14
Median 3.08
Std Dev 0.51
Sample Size 168
Mean 3.61
Median 3.58
Std Dev 0.51
Sample Size 144
Mean 3.47
Median 3.42
Std Dev 0.51
1.800 2.600 3.400 4.200 5.000 5.800 6.600 7.400
Link27_hrs


2018
2019
NB
SB
Percent
Sample Size 140
Mean 0.39
Median 0.38
Std Dev 0.13
Sample Size 73
Mean 0.38
Median 0.33
Std Dev 0.11
Sample Size 105
Mean 0.45
Median 0.42
Std Dev 0.13
Sample Size 77
Mean 0.42
Median 0.42
Std Dev 0.12
0.100 0.300 0.500 0.700 0.900 1.100 1.300 1.500
Link28_hrs


2018
2019
NB
SB
Percent
Sample Size 229
Mean 1.21
Median 1.17
Std Dev 0.18
Sample Size 89
Mean 1.19
Median 1.17
Std Dev 0.19
Sample Size 168
Mean 1.25
Median 1.17
Std Dev 0.25
Sample Size 74
Mean 1.32
Median 1.25
Std Dev 0.25
0.700 1.000 1.300 1.600 1.900 2.200 2.500 2.800 3.100
Link29_hrs

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