The Impact of Freight Delay to Economic Productivity




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This White Paper is one in a series developed as part of the Tampa Bay Regional Goods Movement Study. The purpose of this series of White Papers is to provide background and information for the freight community in the Tampa Bay Region.

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INTRODUCTION

The purpose of this White Paper is to synthesize various research sources regarding the economic impact of freight delays to the economy. The White Paper includes some anecdotal examples of impacts of freight delay, studies of the value of travel time and operating delays, and summarizes various studies of the impact of freight delay to economic productivity.

In practice, much of the literature related to the economic impacts of delays in freight delivery is highly related to the converse, which is the evaluation of benefits and costs associated with reducing those delays. Traditionally, computation of transportation benefits in benefit-cost analysis has relied on the application of a value of time as one of the primary benefits. While the value of time is a major component of estimation of the cost of delay, this White Paper also describes additional factors that need to be addressed to evaluate the full cost of freight delivery delays.

FREIGHT IS A CRITICAL COMPONENT OF THE ECONOMY

Importance to the State of Florida

An important contribution to recognizing the importance of freight to Florida's economy was a report jointly developed by the Florida Transportation Commission and Floridians for Better Transportation[1]. The report included several examples related to the importance of the ease of freight movement. Among the organizations citing the importance of ease of freight movement were:

- Berg Steel Pipe Corporation, which emphasized the importance of all modes of freight to their business operation;
- Cargill Corporation, which relies on truck and rail transportation for its citrus processing and juice operations;
- Dairyman's Supply Company, Florida, Inc. noted they chose their location in Wildwood due to its proximity to I-75, Florida's Turnpike, and the CSX Railroad;

[1] Florida Transportation Commission and Floridians for Better Transportation, *Transportation: An Investment in Florida's Future*, June 1996.

- Publix Supermarkets, which relies on truck transportation for store deliveries, and also receives goods by truck and shipping containers, and transports recycled cardboard by rail; and
- Sunbeam Corporation, which relocated its corporate headquarters to Broward County, cited the importance of the Port of Miami and Miami International Airport for its export operations.

Other illustrations of the importance of transportation system efficiency to the freight logistics system are included in a study prepared for the Federal Highway Administration. The study included several case histories illustrating corporate reorganizations of freight and production activities that were enabled by the transportation system. Among them were Polaroid Corporation and Dell Computer[2]. In the case of Polaroid, a high quality transportation network allowed them to reorganize their European operation by centralizing warehousing inventory, substituting transportation for a network of warehouses. This redesign of their logistics system resulted in an annual savings of $6.3 million.

Dell Computer, a model of just-in-time manufacturing, was able to launch their on-line store, relying on just-in-time delivery of parts to assemble bundles of computer hardware and software in response to individual consumer's custom requirements. The process allowed Dell to compress the time from receipt of order to shipping to consumer to 36 hours. As noted in the study, the online store concept was a revolutionary precedent that allowed Dell to virtually eliminate stocked parts and finished machines. Dell transformed itself into an assembly and shipping company. With their just-in-time system of part delivery, Dell was able to reduce inventory of components to 6.6 days, compared to an industry norm of 75 to 100 days. Dell estimated they saved $30 per computer by reducing inventory. The examples of Polaroid and Dell both illustrate freight logistics actions with large cost savings dependent on a high quality transportation system.

While these examples are not specific to the Tampa Bay region, they do illustrate the importance of freight transportation to business operations. The leadership of the State of Florida has recognized the importance to Florida's economy of a robust system for moving freight. In June 2013 the Florida Department of Transportation (FDOT) released the Policy Element of the Florida

[2] AECOM, *Capturing the Full Benefits of Freight Transportation Improvements*, Prepared for Federal Highway Administration, May 2001.

Mobility and Trade Plan, and is currently developing the Investment Element. The FMTP identifies seven objectives:

1. Capitalize on the freight transportation advantages of Florida through collaboration on economic development, trade and logistics' programs
2. Increase operational efficiency of goods movement
3. Minimize costs in the supply chain
4. Align public and private efforts for trade and logistics
5. Raise awareness and support for freight movement investments
6. Develop a balanced transportation planning and investment model that considers and integrates all forms of transportation
7. Transform the FDOT's organizational culture to include consideration of supply chain and freight movement issues

All of these objectives support the desire to move freight more efficiently, which is critical to our economy and quality of life at the national, state, regional and local levels.

Importance to the Tampa Bay Region

The movement of freight and goods throughout the Tampa Bay region is a vital component of the area's economy. As such, delays to the timely delivery of freight can have a major effect on economic productivity in the region. Delays can be caused by congestion on the transportation network, recurring or non-recurring; traffic work zones; regulation of goods movement routes; time of day restrictions, and other factors. When it comes to prioritizing transportation projects, emphasis is often placed on consideration of commuter time and reducing inconvenience. Yet time and costs associated with delivery of goods can be substantially higher than for commuters. The purpose of this paper is to highlight the importance of freight movement to the local economy and to assure freight improvement projects receive just as much emphasis in the planning process.

The Tampa Bay Regional Strategic Freight Plan demonstrates the importance of freight to the Tampa Bay economy, noting that the freight transportation industry is directly responsible for over 31,800 jobs in the Tampa Bay region. When other freight generating industries are included, the total employment affected by freight movement reaches over 240,000 workers.[3]

[3] Florida Department of Transportation, Tampa Bay Regional Strategic Freight Plan, July 2012

In 2013 Port Tampa Bay released its report on the economic impact of the Port.[4] It demonstrated the enormous economic impact of Port Tampa Bay to the region's economy. Of the 240,000 freight-dependent jobs in the Tampa Bay region, a significant number are associated with activities at Port Tampa Bay. Freight related activities at the Port account for 11,570 direct jobs, 12,700 jobs created by purchases of those directly employed in freight activities at the Port, 8,750 jobs supported by businesses supplying freight related services to the Port, and 40,460 related user jobs, for a total of 73,480 jobs. These freight related jobs were reported to generate $3.88 billion in wages and salaries, $14.44 billion in economic value, and $361million in State and local taxes. In addition to these freight related jobs, there are also jobs related to the Port's cruise, shipyard and real estate activities.

Port Manatee also makes significant contributions to the regional economy, as documented in its 2009 Master Plan. These contributions included a reported 18,810 combined direct, indirect, and induced jobs, $656 million in wages and salaries, $2.4 billion in economic value, and $80 million in taxes[5].

In 2005 Tampa International Airport also conducted a study of its economic impact to the Tampa Bay Region.[6] It reported that import and export activities contributed 2,374 total jobs, with $112 million in wages and salaries and $330 million in economic value.

The United States Department of Transportation's (USDOT) Federal Highway Administration maintains the Freight Analysis Framework (FAF), which is a compilation of data on the movement of freight within the United States, including foreign shipments, which are reflected in the statistics for ports of arrival and ports of departure. Information from FAF is reported for the Tampa Metropolitan Statistical Area, which includes only a subset of the Tampa Bay Regional Strategic Freight Study, specifically Hillsborough, Pinellas, Pasco and Hernando Counties. According to FAF, shipments leaving the Tampa MSA had a combined value of approximately $102 billion in 2011. For the same time period, FAF estimates the value of shipments to Tampa at $116 billion. Since many of the products that enter the Tampa MSA are also shipped out of the Tampa MSA,

[4] Martin Associates, prepared for the Tampa Port Authority, The Economic Impact of the Port of Tampa, 2012.
[5] PBS&J*, Port Manatee Master Plan*, prepared for the Manatee County Port Authority, 2009
[6] USF Center for Urban Transportation Research, *Tampa International Airport Economic Impact Study*, Prepared for the Hillsborough County Aviation Authority 2005.

it is impossible to simply add the values of shipments to and from the Tampa MSA. It should also be recognized that the small sample size, comprised of 100,000 establishments, across the entire nation results in a high degree of variability from survey year to survey year. In spite of these precision limitations, the order of magnitude of these numbers indicates the enormous impact of freight to the Tampa Bay region economy.

THE COST OF FREIGHT DELAY

The Federal Highway Administration has reported a range of different estimates of the values of time for freight delivery in various studies and research efforts. They recognize the valuation of travel time is an unsettled aspect of benefit-cost analysis. Drawing upon estimates of average vehicle occupancy, time-related vehicle depreciation cost, and the inventory cost of freight in transit, for 2010 the average value per vehicle-hour was reported at $32.17 for four-axle combinations and $31.44 for five-axle combination trucks[7]. Another Federal Highway Administration publication[8] notes that shippers and carriers value transit time at $25 to $200 per hour, depending on the value and perishability of the product being carried.

The Texas Transportation Institute (TTI) has estimated the cost of delay to trucking operations in several different efforts. A May 2008 report cited a Canadian study that estimated hourly truck operating costs for the southern United States averaging between $67 and $71 per hour, based on Year 2000 dollars. As part of the same report, TTI prepared its own estimates and came up with an average truck hourly operating cost of $74.86 in Year 2006 dollars[9].

TTI has most notably gained widespread national respect for its Urban Mobility Report, which recently addressed the cost of delay specifically to the trucking industry. For the Tampa Bay urbanized area, TTI estimated a 2011 annual truck delay of 3,223,000 hours at a cost of $246 million. The imputed cost of truck delay would be $76.32 per hour for the Tampa Bay urbanized

[7] Federal Highway Administration, 2013 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance

[8] Federal Highway Administration, Office of Freight Management and Operations, *Measuring Travel Time in Freight-Significant Corridors*, Flyer

[9] David Ellis, Texas Transportation Institute, Cost per Hour and Value of Time Calculations for Passenger Vehicles and Commercial Trucks for Use in the Urban Mobility Study, May 2008.

area[10]. However, it should be recognized that the methods used by TTI to estimate these numbers are based on some small sample data, which have a high degree of year to year variability. For example, while the calculated cost of truck delay in the Tampa Bay urbanized area translates to $76.32 per hour in 2011, the data for 2010 would translate to a value of $92.34[11].

Another analysis of the value of delay to truckers and carriers was reported by collaborating researchers from Texas A&M University and the University of Wisconsin[12]. Their objective was to evaluate the value of delay to commercial vehicle operators due specifically to highway congestion. They used two different methods to estimate the value of delay. The first was a stated preference survey of drivers which estimated the value of time related to route choice decisions. The second was a carrier fleet operations simulation that compared delivery costs for congested and non-congested conditions.

The driver surveys included 47 drivers in several Texas cities and 64 drivers in Wisconsin cities. Drivers were presented with two hypothetical scenarios of operating on a congested facility and asked how much they would be willing to pay to save various amounts of time on a parallel toll road. The first scenario assumed they were running 30 minutes late, while the second scenario assumed they were operating pretty much on time. The responses were used to estimate a logit equation that demonstrated values of $56.48 per hour under the running late scenario, and $33.25 for the on-time scenario. Based on characteristics of the driver and the trip, the researchers also provide other interesting insights:

- Drivers who are paid by the mile are much more sensitive to time savings, $73.40 per hour vs. $39.50 per hour for drivers who are paid by other bases
- Private carriers (who transport their own goods) were much more time sensitive, $87.82 per hour, than owner-operators at $53.58, or for hire carriers, at $26.26.
- Long-haul drivers are willing to pay twice as much, $85.71 per hour, than local delivery drivers, at $41.71 per hour.

[10] David Schrank, Bill Eisele, and Tim Lomax, Texas A&M Transportation Institute, TTI's 2012 Urban Mobility Report, December 2012.
[11] William Eisele, David Schrank, Jason Bittner, and Gregory Larson, *Incorporating Urban Area Truck Freight Value into the Texas A&M Transportation Institute's Urban Mobility Report*, Transportation Research Board 92nd Annual Meeting, Washington, D.C., January 2013.
[12] Quing Miao, Bruce Wang and Teresa Adams, Texas A&M University and the University of Wisconsin, Assessing *the Value of Delay to Truckers and Carriers*, July 2011.

The second method, based on a Houston area simulation of a wide range of demand and delivery conditions estimated value of delay ranging from $80 to $120 dollars per hour of delay.

The American Transportation Research Institute (ATRI), which is the research arm of the American Trucking Association, has prepared a summary report of the operational costs of the trucking industry[13]. They distributed a survey to a representative sample of for hire carriers, including truckload, less than truckload (LTL), and specialized fleets. They received over 40,000 responses, 98 percent of which were truck tractors, which averaged 103,000 miles per year. Responses represented a varied mix of trip types, with trips less than 100 miles, between 100 and 500 miles, between 500 and 1,000 miles, and over 1,000 miles almost all well represented. They also found that sixteen percent of vehicle-miles travelled were non-revenue or empty miles. Their analysis shows an average 2012 cost per hour of $65.29, including fuel costs at $25.63 and driver wages and benefits at $21.31. Other significant cost elements include lease or purchase payments, repair and maintenance, and insurance premiums. On a per-mile basis, the average cost amounted to $1.63.

THE VALUE OF RELIABILITY

In recent years there has been a great deal of interest and research in the subject of the value of reliability in travel time. Concas and Koplakov[14], in their research into the value of time and the value of reliability, conclude that under ordinary circumstances where there is no serious time constraint, travel time reliability is valued at 80 to 100 percent of the value of time. In the presence of a serious non-flexible arrival or departure constraint, they value travel time reliability at up to three times the basic value of time.

As reported earlier, research for the Federal Highway Administration found shippers and carriers value transit time at $25 to $200 per hour, depending on the product being carried and that

[13] Katherine J. Fender and David A. Pierce, American Transportation Research Institute, *An Analysis of the Operational Costs of Trucking: 2013 Update*, September 2013

[14] Sisinnio Concas and Alexander Kolpakov, Center for Urban Transportation Research, *Synthesis of Research on Value of Time and Value of Reliability*, prepared for Florida Department of Transportation, January 2009.

unexpected delays can increase that value by 50 to 250 percent[15]. This is a clear indication of the value of predictability in travel time.

Researchers at Washington State University synthesized a number of other studies and reported values of freight movement travel time reliability at $60/hour for mining products, $176/hour for agricultural products, and $223/hour for certain types of manufactured products, representing factors of 2.5, 7.0, and 8.7 times their respective values of travel time[16].

The most recent version of the TTI Urban Mobility Report makes use of a large INRIX, Inc. database of GPS-enabled vehicles and mobile devices to create an extensive database of traffic conditions for each urbanized area. They note that in addition to normal congestion delay, there can be significant variability in the amount of delay. This variability can be caused by traffic incidents, roadway maintenance or construction activities, weather, and the normal variability in traffic volumes. The most recent Urban Mobility Report addresses the importance of reliability and offers explanations of why the value of reliability is so high[17]. For passenger vehicles, examples of trips requiring a high level of confidence of arriving in time might include driving to the airport to catch a flight, or driving to a day care pick-up at the end of the day. For trucks, just in time deliveries of manufacturing components, or deliveries of highly perishable commodities would be examples.

The TTI researchers have introduced the concept of "planning time", which might be thought of as risk time. The planning time describes the additional time that needs to be built into a schedule to be confident of arriving at a destination in time. They then go on to define the "planning time index (PTI)", which is a factor that identifies the extra time that needs to be allowed to arrive at a destination with a 95 percent level of confidence. For freeway travel in the Tampa-St. Petersburg urbanized area, the PTI value is 2.90, which says for peak period travel, to be confident that 19 times out of 20 you will arrive on time, you need to allow 2.9 times the normal free flow travel time. This compares to an average travel time index of 1.15 (which says that on average peak period travel takes 15 percent longer than free flow travel). For example, if a trip would take 30 minutes off-peak, during peak period travel the same trip would take 34.5 minutes.

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[15] Federal Highway Administration, Office of Freight Management and Operations, *Measuring Travel Time in Freight-Significant Corridors*, Flyer

[16] Jeremy Sage and Ken Casavant, *Development of a Freight Benefit/Cost Methodology for Project Planning*, Washington State Transportation Center, June 30, 2013.

[17] Schrank, Eisele, and Lomax, ibid.

In addition to their studies of the cost or value of delay to freight, the team of Texas A&M University and University of Wisconsin researchers also estimated values of reliability at $40 per hour for shippers and as high as $31 per hour for those receiving shipments[18].

A 2013 Swedish Study addressed the value of reducing freight time variability. The Swedish government guidelines for cost-benefit analysis recommend factoring travel time reductions by a value of two. Their intent is to reflect the likely improvement to reliability, for which the researchers employed stated preference methods and derived values of reliability at approximately ninety percent of the value of travel time[19].

IMPACTS OF FREIGHT DELAY TO SHIPPERS

A 2004 report prepared for the Federal Highway Administration notes that in addition to direct costs to truckers, there are delay costs associated with shippers in the form of inventories tied up in traffic, forcing them to hold greater inventories to avoid outages. In addition, for some commodities, such as fresh fruits and vegetables, delays depreciate the value. The authors estimated a cost to shippers of $33.69 per hour of delay, based on Year 2000 dollars[20].

A more recent study by researchers from Texas A&M University and the University of Wisconsin examined the cost of delay to both shippers and to those receiving shipments[21]. They made note of the fact that the magnitude of impacts of freight delay on businesses depend on several factors, including the value of goods, available time windows for delivery, perishability, seasonality, and the type of business. They conducted extensive surveys of shippers and performed willingness-to-pay studies of the value of delay. They reported an average value of delay to shippers' operations of $56 per hour. They also developed an analytical inventory model of the value of

[18] Qi Gong, Qing Miao, Bruce Wang, and Teresa Adams*, Assessing Public Benefits and Cost of Freight Transportation Projects: Measuring Shippers' Value of Delay on the Freight System*, Texas A&M University and University of Wisconsin, May 2012.
[19] Niclas Kruger, Inge Vierth, Gerard de Jong, Askill Halse, and Marti Killi, *Value of Freight Time Variability Reductions,* performed for the Swedish Transport Administration, 2013.
[20] Clifford Winston and Ashley Langer, *The Effects of Government Highway Spending on Road Users' Congestion Costs*, Final Report to the Federal Highway Administration, October 2004.
[21] Qi Gong, Qing Miao, Bruce Wang, and Teresa Adams*, Assessing Public Benefits and Cost of Freight Transportation Projects: Measuring Shippers' Value of Delay on the Freight System*, Texas A&M University and University of Wisconsin, May 2012.

delay for those receiving shipments. Their results varied substantially by industry type, ranging from a low of $0.53 per hour for general merchandise, to a high of $13.89 per hour for chemical industries.

BROADER ECONOMIC IMPACTS

There have been a number of recent studies looking at ways to incorporate a more complete picture of economic benefits of freight improvements into the decision-making framework. The Washington State University researchers cited previously, identified a range of cost and benefits that go beyond the driver labor costs[22]. They noted that the value of travel time differs across shippers, based on the value and the degree of perishability of the items being shipped. They also noted other potential benefits of freight improvement projects:

- Improved travel times
- Improved travel time reliability
- Reduced truck operating cost
- Safety improvement
- Freight network connectivity improvement
- Network resiliency improvement
- Improved air quality
- Economic output

Conversely, delays in freight delivery negatively impact each of these factors. Some of these can readily be converted to monetary values based on operator time, fuel and maintenance costs, and reduced crashes. For other factors, the monetary conversion is not as straightforward. Benefits attributable to network connectivity, resiliency, air quality, and economic output can be difficult to quantify. The issue of freight travel time reliability also is a major concern to shippers and freight companies.

Staff of Economic Development Research Group, Inc. performed a synthesis of studies of the economic consequences of congestion, with a focus on freight movement[23]. They examined

[22] Jeremy Sage and Ken Casavant, Ibid.
[23] Glen Weisbrod and Stephen Fitzroy, Economic Development Research Group, Inc., *Defining the Range of Urban Congestion Impacts on Freight and their Consequences for Business Activity*, Presented at the Transportation Research Board Annual Meeting,, Washington, D.C., January 2008.

studies sponsored by regional business organizations in Vancouver, B.C.; Chicago, Illinois; and Portland, Oregon and distilled some interesting findings related to the impact of congestion to the freight system on regional economies. Among the economic impacts they identified were:

- Labor and operating costs – congestion means fewer deliveries per truck, need for additional drivers and possible implications for hours of service limits.
- Inventory costs – businesses in the Portland region reported a need to increase inventories by an additional five percent to eight percent when compared to five years earlier to accommodate road and rail congestion. This has been problematic in an economy that has come to rely more and more on just in time delivery.
- Capital costs – Congestion requires the addition of more vehicles to the fleet to meet delivery requirements.
- Loss of economies of scale – congestion shrinks the area that can be served from one facility, reducing the ability to gain economies of scale.
- Delivery times – due to increased congestion, particularly in the late afternoon and evening, businesses are needing to accommodate deliveries later at night or early in the morning, resulting in increased labor costs.
- Backhaul operations – congestion has made it more difficult to accommodate productive backhaul, especially with hours of service restrictions on drivers.
- Impaired cross-docking operations – congestion and lack of reliability have made it much more difficult to schedule docking crews to handle intermodal connections.
- Air cargo – the high value of shipments by air is being negatively impacted by congestion on airport access routes.

A more recent effort by the Economic Development Research Group on behalf of the Strategic Highway Research Program (SHRP-2) of the Transportation Research Board deals with the wider economic benefits of transportation projects. Substantial portions of the report deal directly with the impact of investment in projects that benefit freight. Specifically, the report deals with the impacts of improved reliability, connectivity, and accessibility, with much of the benefits based on freight improvements.[24]

[24] Strategic Highway Research Program, SHRP-2, *Development of Tools for Assessing Wider Economic Benefits of Transportation,* July 2013, performed by a consulting team led by Economic Development Research Group, Inc.

The report notes that improved reliability allows for more daily deliveries for each vehicle, fewer vehicles and trips required, less fuel used, less driver time, less overtime at loading docks, less safety inventory, and more centralized dispatch and distribution. It also notes that projects that improve intermodal connectivity reduce existing delivery costs and also enable movements between new origin-destination pairs that were previously impractical. Some improvements expand the geographic range and number of destinations that can be served by same-day truck deliveries from a given business location.

The SHRP-2 project attempted to isolate these factors and estimate economic benefits from each factor. It distinguishes between benefit cost analysis and economic impact analysis. Benefit cost analysis focuses on direct benefits to users of reduced crashes or time savings, which can be valued based on users willingness to pay. Broader costs and benefits, such as environmental externalities and other social costs or benefits are less likely to be included. Economic impact analysis, in contrast, measures impacts in terms of business output, net income, and job generation and includes only benefits that affect the flow of money, so that travel time is included only for freight and business travel. Changes in travel costs are reflected as changes in the cost of production. In both benefit cost analysis and economic impact analysis, all factors need to be able to be expressed in monetary terms.

A key product of the SHRP-2 project was the creation of a series of spreadsheet models that allow for estimation of widespread benefits of projects that improve reliability, increase intermodal connectivity, and expand market access. The models can be a useful tool, although the built-in default factors are selected from a huge range of possible values. For example, the report notes that reliability is typically valued at 0.7 to 1.5 times the value of time. The default cost for truck travel is $86 per hour. Since the model consists of a series of interconnected spreadsheets, there is great flexibility for users to input their own values for each parameter.

For increased market access, the model is based on an elasticity measure that relates increase in economic activity (income or regional gross domestic product) that is generated per one percent increase in effective market scale or density that could be attributable to improved transportation. The report cites elasticity measures of 0.02 to 0.08.

The intermodal connectivity tool calculates intermodal market access for airport, marine ports and rail terminals. It calculates a value of truck time savings based on the size of the intermodal

terminal, the degree of connectivity (frequency and number of Origin-Destination pairs served), and the scale of activity in the surrounding area.

With their many built-in default values, these tools should be applied with caution; however, they are an important first step upon which future research can build. In addition, the tools provide an option for user over-rides of all the default values.

FUTURE ADVANCEMENTS THROUGH ON-GOING RESEARCH

The understanding and estimation of the cost of freight delays is an evolving subject. It is likely that additional research in the coming years will provide a richer and more complete understanding of the economic impacts of freight delays. There continues to be major research into properly valuing reducing delay in freight deliveries. The Transportation Research Board (TRB), alone, has two ongoing projects that may add further to the understanding of the value of reducing freight delays:

- National Cooperative Highway Research Program Project 8-99: Methodology for Estimating the Value of Travel Time Reliability for Truck Freight System Users (Project in progress) – the objective of this research is to develop and demonstrate a methodology to estimate the value of travel time reliability to truck freight system users in order to assist in the evaluation of proposed highway infrastructure and operations investments.

- National Cooperative Freight Research Program Project 46: Benefit-Cost Methodologies for Evaluating Multimodal Freight Corridor Investments (Project Underway) – The objective of this research is to develop a guidebook for practitioners for conducting benefit-cost analyses of proposed infrastructure investments on multimodal, multi-jurisdictional freight corridors to inform public and private decision makers and other stakeholders at local, state, regional, and national levels.

SUMMARY AND IMPLICATIONS

This White Paper has synthesized a number of research sources related to the impact of freight delays to economic productivity. The paper also recognizes the evolving base of knowledge in

addressing economic impacts of freight movement and freight delays. There have been numerous studies that estimated a wide range of values of time for trucking companies, with a preponderance of estimates in the $65 to $80 per hour range. A recent addition to the research in the subject has estimated the average cost of delays to shippers, at $56 per hour and also those receiving shipments ranging as high as $14 per hour.

Another topic of recent research interest has been the value of reliability of freight delivery, with some estimated costs of unanticipated delay multiple times more than the basic value of time. Uncertainty in delivery time caused by unanticipated events causes all those involved in the logistics network to build in risk time, especially for time-sensitive shipments.

This White Paper has reported on the importance of freight transportation to the economic health of the Tampa Bay region, accounting for over 240,000 jobs, including direct freight industry and freight generating industries. Travel time savings and safety improvement are the two primary factors used to compute benefits of transportation improvement projects. The value of time savings to freight vehicles is several times the value of time generally attributed to passenger vehicles. As transportation agencies prioritize projects, the high economic value of freight efficiency should be reflected in project selection criteria.