



Harrisburg Area Transportation Study

REGIONAL FREIGHT PLAN



September 2017



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Harrisburg Area Transportation Study

Regional Freight Plan

Prepared for:

Harrisburg Area Transportation Study

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Message from the MPO Chairman

Dear reader –

Whether you are a municipal official, major shipper/receiver, or freight carrier, we all share a common objective: to keep our regional freight infrastructure operating at peak condition. We all recognize that having good freight infrastructure is a vital part of maintaining our economy. The Greater Harrisburg area has historically served as a freight hub – that distinction has only grown, even as our economic base has transitioned from one of manufacturing to one of transportation and logistics.

The Harrisburg Area Transportation Study continues to work with PennDOT and its many partners in investing in our freight transportation system. This includes notable, high-profile projects such as the widening of Interstate 81 between PA 581 and PA 114, and improvements to Interstate 83 in Dauphin County. More are on the way.

The formal update of the regional freight plan over the past year has provided us with an opportunity to take a closer look at the freight concerns our region faces. While our last freight plan was created in 2006, many new products, services, and business models have converged to continue to transform freight and logistics today in the global economy.

The pace of change over the past decade has only been accelerating. Trends in “just-in-time” delivery, eCommerce, and recent improvements at the Panama Canal will continue to be felt not only in Harrisburg, but also in places like Bloomfield, Halifax, and Newville.

HATS’ latest freight plan recognizes these challenges, and offers a set of strategies and actions that we can take in working with the freight transportation industry and its effects on our economy. The decisions and directions we take from this important planning effort will help guide us toward building and maintaining a safer and more efficient freight transportation system that a strong economy requires.

I invite your review of HATS’ latest freight plan, and as always, I look forward to hearing more regarding your ideas for improving freight transportation in the HATS region.

Sincerely,

Jeff Haste, Chairman
Harrisburg Area Transportation Study





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TABLE OF CONTENTS

A 25-year HATS Freight Retrospective 8

Our Regional Geographic Position 9

Acknowledgments..... 10

Executive Summary 13

Glossary and Definition of Terms..... 16

Introduction 18

Methodology..... 19

Regional Freight Profile 22

Commodity Flow Analysis 77

Universal Freight Trends and Issues..... 83

Stakeholder Engagement 90

Plan Goals, Strategies, and Actions..... 97

Literature Review108

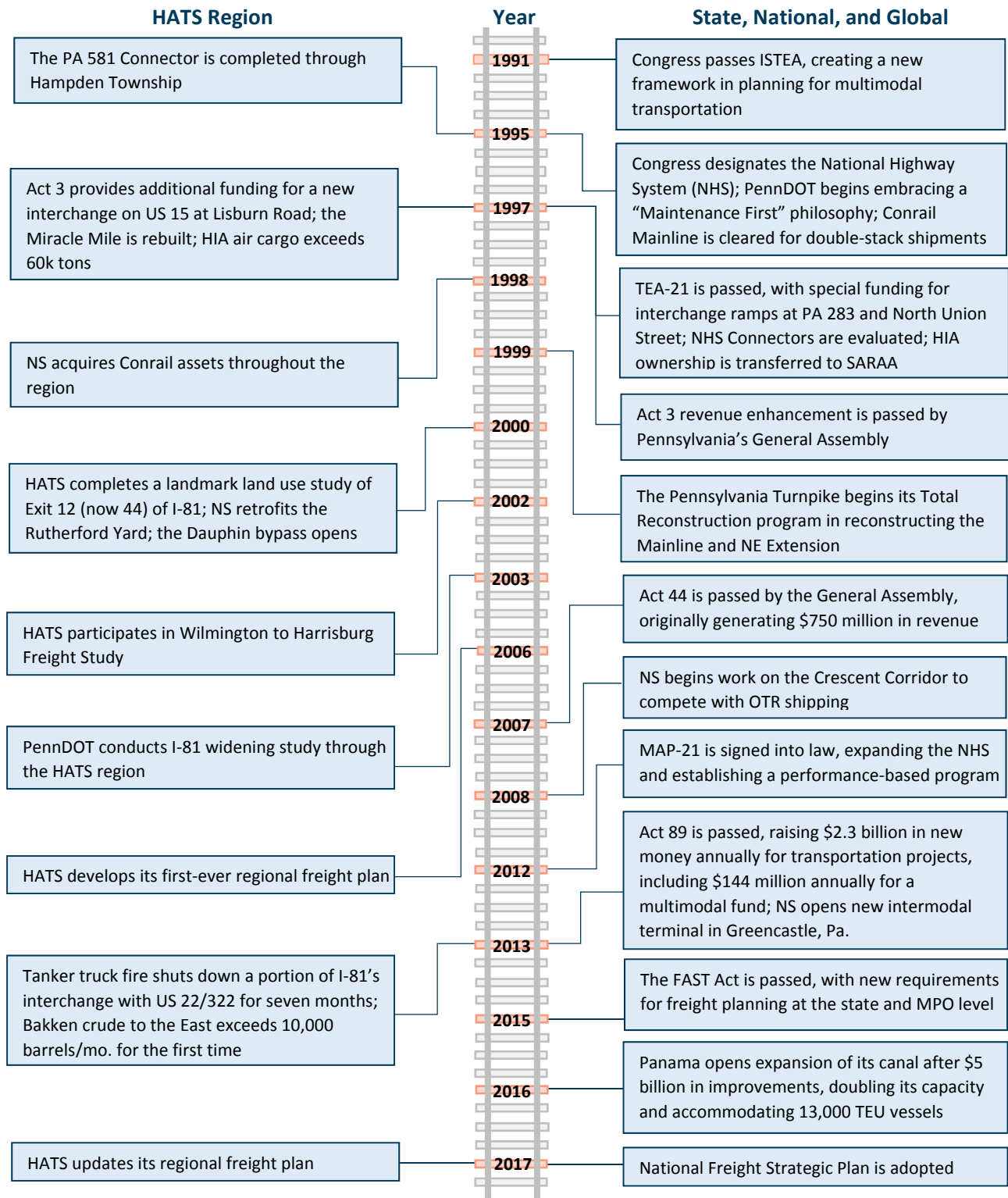
Appendix A: Commodity Flow Tables, by County.....111

Appendix B: Freight Intersection Studies124

Appendix C: Analysis of Regional Functional Classification129



A 25-year HATS Freight Retrospective (selected milestones and highlights)

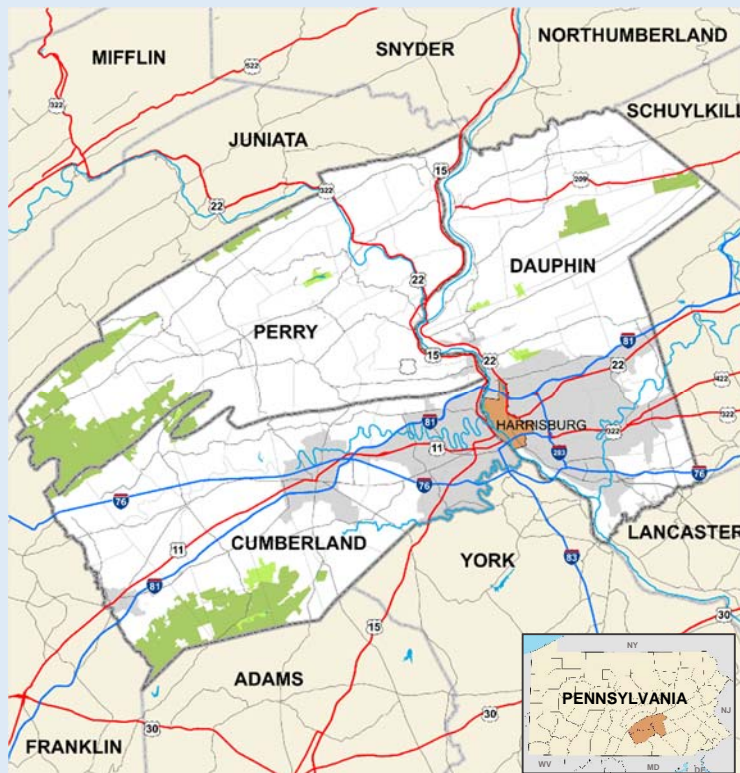


Our Regional Geographic Position

The HATS region is approximately 1,660 square miles in size and includes the counties of Cumberland, Dauphin, and Perry in south central Pennsylvania. The former two counties are urbanized, while Perry County is very rural, and one of 52 counties in Pennsylvania that is a part of the Federally-designated Appalachian region. A major physiographic feature includes the Susquehanna River, which bisects the region and is a major tributary of the Chesapeake Bay.

The region includes the capital city of Harrisburg, as well as the Borough of Carlisle and several First Class Townships: East Pennsboro, Hampden, Lower Allen, Lower Swatara, Susquehanna, Swatara, and Upper Allen. These municipalities have been suburbanizing for the past several decades and some now rival the City of Harrisburg in size. Overall, the region is home to 568,033 people (2016).

The HATS region is located on the western fringe of the urban agglomeration known as megalopolis. It is within one day's drive of 40 percent of the U.S. population which represents 60 percent of the nation's buying power. Additionally, within the same day drive radius the region is within reach of 50 percent of Canada's population. Measured from Harrisburg, the region is 80 miles north of the Port of Baltimore, 100 miles west of the Port of Philadelphia, and 285 miles southeast of Canada's Peace Bridge. In addition to its geographic position, it has other excellent advantages, being located at the center of a transportation crossroads that include several major interstates, Class I and short line railroad service, and Harrisburg International Airport.





Acknowledgments

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	Member	Alternate	Member	Alternate
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Vice Chairman	Commissioner Stephen Naylor		Diane Myers-Krug (non-voting)	
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	Skip Memmi	George Conner	James Szymborski	Timothy Reardon, AICP
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Executive Summary

Who initiated the freight plan update?

The planning process was facilitated by the Tri-County Regional Planning Commission which provides the administrative staffing support for the Harrisburg Area Transportation Study (HATS) Metropolitan Planning Organization (MPO). The Commission contracted with Michael Baker International to help facilitate the planning effort.

Why was this study initiated?

HATS is responsible for more than just planning and programming. Its responsibility extends to all areas of transportation planning, including freight movement. Freight is the physical manifestation of our economy, and so planning for its success is a vital part of the MPO's work.

Who participated in the planning process?

The plan was shaped through the input of a 15-member steering committee, which met four times over the course of the planning process. HATS also conducted a series of freight focus group meetings around the region, with events in Bloomfield Borough, South Middleton Township, and Swatara Township. The planning team conducted other stakeholder interviews with HIA, Norfolk Southern, and the Pennsylvania Motor Truck Association.

What are the region's existing freight conditions?

Topic	Status
Total Population	<ul style="list-style-type: none"> The region continues to grow and now exceeds 565,000 in total population. Cumberland County was the fastest-growing county in the state from 2010-15. The Harrisburg-Carlisle MSA is the fourth-largest in Pennsylvania.
Employment by Industry	<ul style="list-style-type: none"> The region has lost 3,700 manufacturing jobs since 2005. The region is a leader statewide in the share of its employment in the Warehousing & Transportation industry.
Roadway Network	<ul style="list-style-type: none"> The region boasts a roadway network of nearly 4,900 linear miles supporting 16.5 million miles of travel, daily.
Truck Travel Demand	<ul style="list-style-type: none"> The HATS region accommodates 6 percent of all travel demand, statewide, and 8 percent of all truck traffic.
Critical Urban and Rural Freight Corridors	<ul style="list-style-type: none"> HATS has identified 40 miles of Critical Urban Freight Corridors and 8 miles of Critical Rural Freight Corridors for potential certification by FHWA. Successful certification of these candidates would expand the HATS region's share of roadway eligible for FHWA's National Highway Freight Program funds.



Topic	Status
Pavement Quality	<ul style="list-style-type: none"> Percent of the region’s pavement on Interstates and the NHS rated as “Good” or Excellent” has declined overall since 2010.
Truck Crashes	<ul style="list-style-type: none"> The region’s total number of truck crashes has been increasing steadily over the past three years, to a 2015 total of 551, a decade-high.
Bridge Conditions	<ul style="list-style-type: none"> The region’s <i>total number</i> of structurally deficient bridges has been declining, although structurally deficient <i>deck area</i> has been increasing. Nearly 12 percent of the region’s state-owned bridges (>8’) are structurally deficient, compared to 22 percent of locally-owned bridges (>20’). The average state-owned bridge in the HATS region is 56 years old. One-in-five of the region’s local bridges were built before 1940.
Priority Networks	<ul style="list-style-type: none"> The region’s interstates consist of only 8 percent of the HATS region’s roadway network, but carry over a third of all travel.
Commodity Flow	<ul style="list-style-type: none"> The region receives approximately 17 million tons of freight annually, and generates over 22 million tons. The HATS region counts Lancaster County as its top export destination, while the greater Chicago and Philadelphia metropolitan regions are among the top trading partners. The region’s top commodity export is broken stone and riprap. Top import commodity is petroleum refining products.

What are the plan’s major findings?

The planning process identified several major findings, including:

Reliance on Transportation & Warehousing – The region is a leader statewide in the share of its employment in the Transportation & Warehousing Industry. Since 2010, employment in the Transportation & Warehousing industry has increased by nearly 20 percent. Sectors such as this, along with the construction, wholesale and retail industry sectors are by nature very reliant on freight movement for their success.

Strategic Highway Routes – The region’s interstates comprise only 4 percent of the entire regional roadway network, yet they facilitate over a third of all travel. This illustrates the strategic importance of (and the need to continue to invest in) these higher-order roadways.

Increasing Number of Truck Crashes – Despite new Hours-of-Service regulations, the number of truck crashes has been increasing on HATS roadways over the last three years. In 2015, the region experienced a decade high of 551 truck crashes. Cumberland County historically has led the region in the total number of truck crashes. Over the last decade, it has averaged 212 truck crashes per year.

Mixed Bridge Conditions – PennDOT and HATS have been making progress in reducing the region’s number of structurally deficient bridges. The region’s *total number* of SC bridges has declined nearly 10 percent from 142 in 2013 to 126 in 2017. However, when based on bridge performance by *deck area*, the square footage of the region’s structurally deficient bridges has increased during the same period.

Worsening Pavement Conditions – The percent of the region’s Interstate and NHS routes rated as “Good” and “Excellent” have declined since a 2010 baseline was established. The percent of the region’s interstates and non-NHS <2,000 rated as “Poor” have increased over previous years.

Rail Assets – Shippers and receivers in the HATS region are connected to the national rail network through a mix of short lines and a Class I carrier. Harrisburg is one of three primary intermodal hubs in the Norfolk Southern system east of the Mississippi, incorporating the Harrisburg and Rutherford Intermodal Yards. The region is also situated at the northern extent of the railroad’s Crescent Corridor initiative, which is its highest expansion priority. The Crescent Corridor traverses the HATS region and facilitates the movement of domestic intermodal traffic between the Northeast and the Southeast.

Air Assets – Harrisburg International Airport is also a significant cargo airport. In terms of cargo weight landed, HIA ranked third in the state and sixty-eighth in the country. Since 1990, air cargo tonnage has increased by 15,000 tons, and is projected to increase by an additional 17,000 tons by 2032. HIA will be expanding its air cargo apron to meet the growing needs of the airport.

Commodity Imports and Exports – The region is a net exporter of freight, with approximately 22 million tons of freight each year, at a total value of just over \$27 billion. The growth in freight being shipped from the region is expected to grow to over 38 million tons by 2040. The top destination for the region’s freight includes Lancaster County, Delaware Valley, York County, and the Illinois portion of Chicago-Naperville-Michigan City. Top commodities being shipped out of the region include broken stone or riprap, warehouse & distribution center, rail intermodal drayage from ramp, and semi-trailers returned empty.

What happens next?

The HATS Coordinating Committee accepted the freight plan during its September 22, 2017 meeting. The plan and its findings will be used by the MPO as part of its future planning and programming activities, including the update of the 2019 program.



Glossary and Definition of Terms

AADTT	Annual Average Daily Truck Traffic
ADT	Average Daily Traffic
CIMS	Commodity Information Management System. A GIS-based, freight planning tool available through PennDOT.
CRFC	Critical Rural Freight Corridor. An element of the National Highway Freight Network and a target for funding under the National Highway Freight Program. HATS identified over 8 miles of CRFCs for consideration by PennDOT and FHWA for eventual certification for placement on this national priority freight network. CRFCs lie outside of urbanized areas.
CUFC	Critical Urban Freight Corridor. Similar to CRFCs, only located within urbanized areas. HATS identified over 40 miles of CUFC segments for consideration by PennDOT and FHWA.
DVMT	Daily Vehicle Miles of Travel. A measure of the total demand for travel. Within the HATS region, the highway network supported an average of 16.5 million DVMT during 2015 and has exhibited very little increase over the past three years.
FAK	Freight All Kinds
FAST Act	Fixing America’s Surface Transportation Act (FAST Act) was signed by President Obama in December 2015 and provides predictable, long-term funding for the nation’s transportation system.
FHWA	Federal Highway Administration
HATS	Harrisburg Area Transportation Study, is one of 24 planning partners statewide that works collaboratively with PennDOT and other partners in implementing the region’s transportation program.
IRI	International Roughness Index, a measure used to indicate the smoothness of a pavement’s surface.
MAP-21	Moving Ahead for Progress in the 21 st Century Act, predecessor act to the FAST Act, MAP-21 was signed into law in July 2012 and emphasized performance and outcomes-based plans.
M&H	Middletown & Hummelstown Railroad. A short line railroad that operates in southern Dauphin County between its two namesake boroughs, interchanging with Norfolk Southern.
MPO	Metropolitan Planning Organization
NHFN	National Highway Freight Network. An element of the National Multimodal Freight Network.
NHS	National Highway System. A network of strategic roadways first designated by Congress in 1995. MAP-21 subsequently expanded the network, which includes only 323.4 miles, or less than 7 percent of all roadway within the HATS region. The NHS however carries 63 percent of all traffic within the HATS region, illustrating its strategic importance.

Regional Freight Plan

NHTSA	National Highway Traffic Safety Administration
NMFN	National Multimodal Freight Network
NS	Norfolk Southern, one of seven Class I rail carriers in the United States.
OPI	Overall Pavement Index. A measure of roadway performances that takes in account roughness and pavement distress.
PennDOT	Pennsylvania Department of Transportation
PHFS	Primary Highway Freight Network. An element of the National Highway Freight Network.
PTC	Pennsylvania Turnpike Commission
STC	Standard Transportation Commodity
TCRPC	Tri-County Regional Planning Commission - the agency that provides administrative support to HATS.
TEU	Twenty-foot Equivalent Unit. The unit measures the capacity of cargo ships and intermodal terminal and is based on the volume of 20-foot container.
TIGER	Transportation Investment Generating Economic Recovery
TIP	Transportation Improvement Program. The program constitutes as the first four-year period of the Twelve Year Program. HATS' 2017 TIP includes \$258.7 million in highway and bridge projects.
TYP	Twelve Year Program. The TYP is updated every two years and is approved by the State Transportation Commission by statute.
USDOT	United States Department of Transportation
VMT	Vehicle Miles of Travel. The HATS region's roadway network supported just over 6 billion miles of travel during 2015.



Introduction

The development of a regional freight plan coincided with similar efforts at the state and national levels. PennDOT in the summer of 2016 completed an update of Pennsylvania's long range transportation plan and first-ever comprehensive freight movement plan. The plan included a wealth of data on freight and freight forecasts that were made available to HATS for its own planning purposes at a regional level. These are resources that would have been cost-prohibitive for HATS to acquire on its own.

At a federal level, the passage of the FAST Act in December 2015 ushered in a new era for freight planning. The Act required the development of a National Freight Strategic Plan and a national freight policy. The release of MAP-21 final rulemaking for performance measures related to freight also occurred.

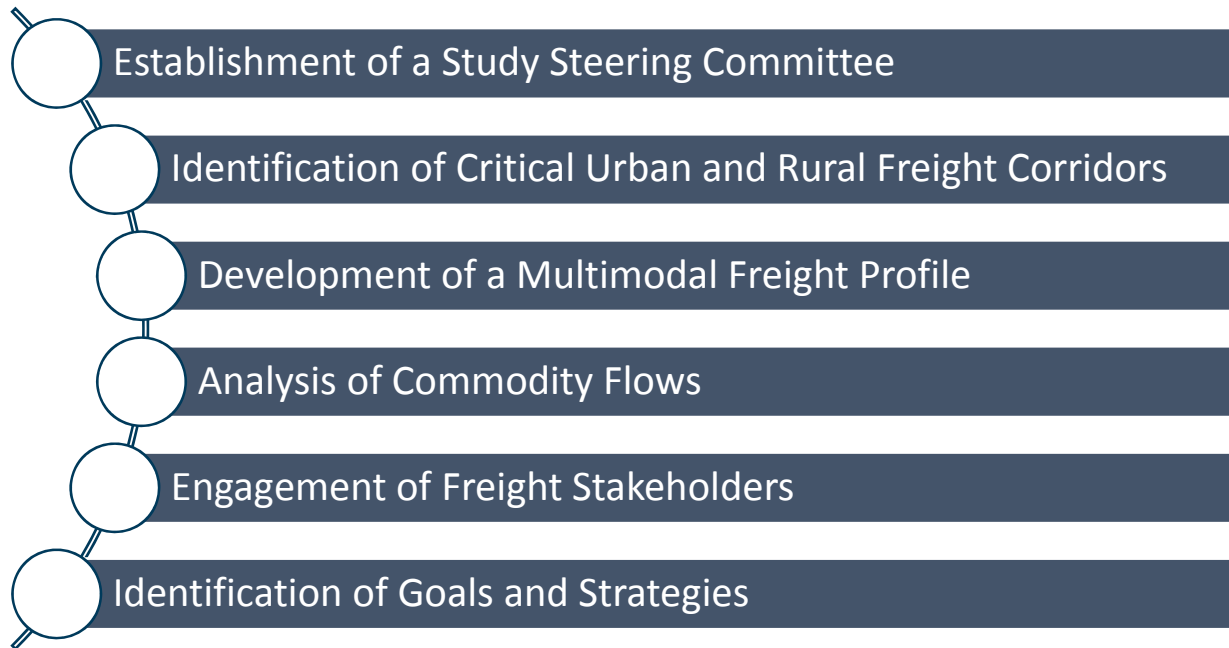
There are other major events currently happening outside of the region that are certain to have implications on freight movement within the HATS region. Supply chains are getting shorter, and other changes in shipping and e-commerce will contribute to long-standing freight problems, such as truck parking, truck idling, and railroad crossing safety. Meeting the needs of the region's shippers and receivers will continue to be important.

Looking longer range, the recent \$5 billion expansion of the Panama Canal effectively doubled the capacity of that waterway with the completion of a third set of locks to accommodate a new generation of larger container ships. Panama set shipping records in 2015 in the amount of cargo that passed through its locks. Nicaragua is also exploring the construction of a new canal through that country that would be funded by the Chinese.

In sum, east coast ports will get busier, and so the HATS region needs to continually assess how well its transportation assets facilitate the movement of freight not only within the region, but also to more distant points, including international ports of entry. The update of the region's freight plan represents an ongoing step in what has been a continuous process aimed at maintaining HATS' freight infrastructure. The intent as transportation planners is to ensure that the directions of the plan will effectively support the region's many shippers, receivers, and carriers that underpin the region's economic competitiveness.

Methodology

The HATS regional freight plan update followed the following primary tasks:



Study Steering Committee – HATS developed a Steering Committee to guide the planning process. The committee included 15 members representing diverse interests including shippers/receivers, freight carriers, county planning, and state and federal government. The committee met four times over the course of the planning process to provide input on draft plan products and offer guidance on research findings.

Critical Urban and Rural Freight Corridors – The update of the freight plan occurred at the same time that USDOT was developing subsystems of its National Highway Freight Network (NHFN). PennDOT collaborated with HATS and its counterparts statewide in the identification of Critical Urban Freight Corridors (CUFCs) and Critical Rural Freight Corridors (CRFCs) to be considered for eventual inclusion on the NHFN. Successful candidates would become part of this national priority freight network and become eligible for funding through the National Highway Freight Program. FHWA has instituted Pennsylvania’s mileage cap at 141.26 miles of Critical Urban Freight Corridors, and 282.53 miles of Critical Rural Freight Corridors. There are over 50 linear miles of segments within the HATS region that were identified for consideration by PennDOT and USDOT for inclusion into this network. A list of identified CUFCs and CRFCs is included within the plan.

Regional multimodal freight profile – The study includes a detailed baseline of data and information regarding the region’s freight assets. These include the extent and condition information related to its roadways, bridges, rail freight lines, and airports.

Commodity flow analysis – HATS examined freight data available from IHS Global Insight through PennDOT in developing a picture of freight flows coming into and out of the HATS region. Data were

summarized by county, by year, by mode. Major commodities being moved were highlighted and analyzed.

Stakeholder engagement – The MPO conducted several freight focus group meetings at locations throughout the region. The intent of the focus groups was to collect more anecdotal, qualitative data that would supplement the quantitative data gleaned through spreadsheets and PennDOT’s various management systems. A total of 50 stakeholders participated in these meetings.

Goals and strategies – While the region’s long range transportation plan includes strategies addressing goods movement, this planning process offered a more detailed offering of specific freight strategies. Strategies address capital, operational, institutional, and other policy goal areas in guiding MPO decision-making. The MPO hosted a regional freight summit toward the end of the process to allow freight stakeholders to make recommendations on the region’s strategic directions as they relate to goods movement.

The following pages summarize the findings of the planning process. Detailed tables documenting freight movement and the flow of commodities through the region are included in the plan appendix.



Regional Freight Profile

Socio-economics

Change in population is but one indicator in marking the health of a region's economy. Population characteristics are also important drivers in affecting the demand for freight. Population change in the HATS region has been characterized by steady growth for more than half a century. Since 1970, the region's population has grown from 410,505 to a current (2015) estimated total of over 565,000. Rates of growth by decade have varied from over nine percent during the 1970s, to a low of six percent during the 1980s. This growth has come, even as Pennsylvania's population growth has been much more moderate by comparison.

Within the region, Cumberland County has experienced the most significant population growth, and now rivals neighboring Dauphin County in size. During the first half of the 2010s, Cumberland County led the state in population growth, at a rate of 4.6 percent. Dauphin County is still the largest in the region, and the 15th-largest county in Pennsylvania by total population. Altogether, the Harrisburg-Carlisle Metropolitan Statistical Area (MSA) includes 565,006 persons (2015), ranking fourth statewide among Pennsylvania's metropolitan areas.

Data from Tri-County Regional Planning Commission indicate that the region's total population is expected to continue to increase to an estimated 627,469 persons by 2040. This translates into an expected increase of 77,994 additional persons through 2040, or an annual average of 2,600 people.

Table 1 provides more detail on historic and projected changes in the region's population by county, dating back to 1970.

Table 1: Historic and Projected Total Population, by City and County, 1970-2040

	City of Harrisburg	Cumberland	Dauphin	Perry	Region	% Change
1970	68,061	158,177	223,713	28,615	410,505	-
1980	53,264	179,624	232,317	35,718	447,659	9.1%
1990	52,376	195,257	237,813	41,172	474,242	5.9%
2000	48,950	213,674	251,798	43,602	509,074	7.3%
2010	49,528	235,406	268,100	45,969	549,475	7.9%
2020	49,335	251,836	279,506	48,597	579,939	5.5%
2030	49,137	268,063	289,132	50,348	607,543	4.8%
2040	49,044	280,505	296,766	50,198	627,469	3.3%

Source: Tri-County Regional Planning Commission

Age 65 and over

Just as the region's total population is expected to continue to grow over the next 25 years, it is also expected to continue to age. There has been an increase in the region's senior population, a phenomenon which has continued from 1990 to the present. With the oldest of the baby boomer generation turning 65 in 2010, the size of this age group is expected to increase in the region and across the state as seen in **Table 2**.



Table 2: Percent Population Age 65 and over, 2000–40

	Cumberland	Dauphin	Perry	Pennsylvania
2000	14.9%	14.2%	12.3%	15.2%
2010	15.6%	13.7%	13.7%	15.5%
2020	19.9%	17.1%	22.8%	18.6%
2030	24.9%	20.7%	24.5%	22.6%
2040	26.6%	19.4%	23.8%	23.1%

Source: US Census and Woods & Poole

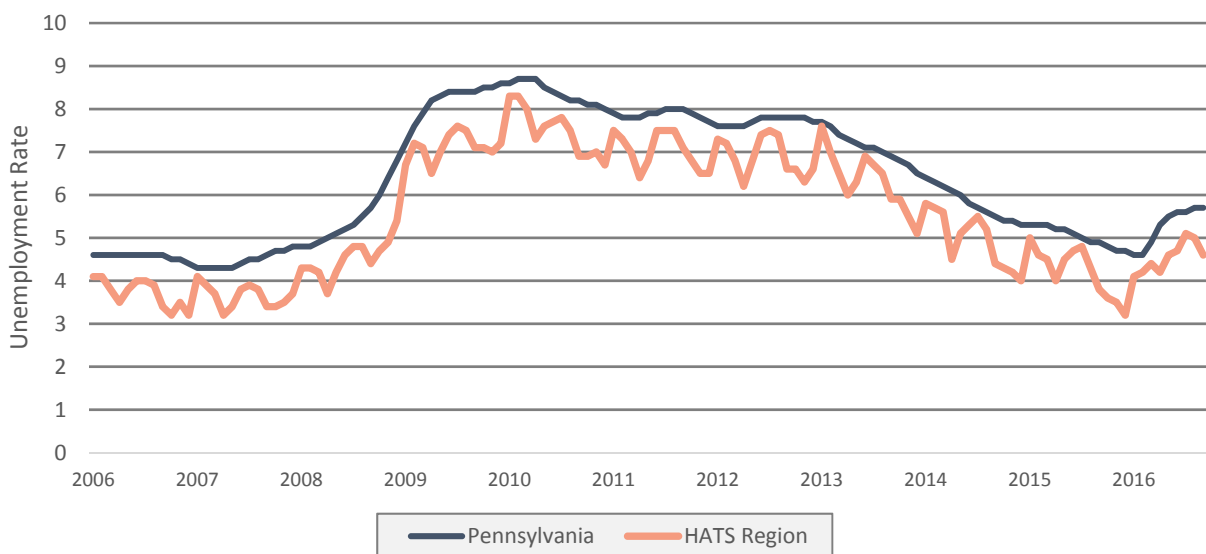
The growth of the region’s senior population will have implications on the transportation system. These may include the need for planning for mature drivers, predictable construction zones, improved signing, access to public transportation and planning for autonomous and connected vehicles and other future technologies. More importantly for freight movement, as the region’s population ages, a greater share of the region’s population will be involved in wealth consumption (retirement) as opposed to wealth creation. This will involve changes in the level and composition of goods being hauled by the region’s freight carriers.

Industry Structure of the Regional Economy

Regionally, participation in the labor force is estimated to be approximately 284,000. In the months after the end of the Great Recession, the unemployment rate for the HATS region peaked at 8.3 percent in February 2010. It has since declined to a near pre-recession rate of 4.6 percent in September 2016.

Figure 1 compares the unemployment trends for the region and Pennsylvania.

Figure 1: Unemployment Rate for Pennsylvania and HATS Region, 2006-16



Source: US Department of Labor

Regional Freight Plan

For the decade ending 2015, the region added over 11,700 jobs, including 9,100 in the Health Care & Social Assistance sector, and an additional 3,900 in the Transportation & Warehousing sector. Accommodations and Food Services also experienced significant job gains while other major employment sectors including Retail Trade and Manufacturing lost over 5,300 jobs. While the Manufacturing sector did see an increase in employment of 1,300 from 2010-15, this was not enough to offset job losses from 2005-10. Even with gains in Transportation & Warehousing, as seen in **Table 3**, employment in freight-dependent industries (including wholesale, retail, manufacturing, and construction) declined by nearly 5,800 over the past decade. It is possible that these sectors have not fully recovered from the effects of the Great Recession. Regardless, increases in Transportation & Warehousing, Accommodations & Food Services, Health Care & Social Assistance, and other sectors should off-set freight losses seen in Retail Trade, Wholesale Trade, and Construction.

Table 3: Change in Employment, by Industry 2005-15

NAICS Code	Description	2005	2010	2015	Percent Change		
					2005-10	2010-15	2005-15
	Total, all industries	248,771	244,088	260,542	-1.9%	6.7%	4.7%
11	Agriculture, forestry, fishing and hunting	1,013	941	559	-7.1%	-40.6%	-44.8%
21	Mining, quarrying, and oil and gas extraction	143	193	140	35.0%	-27.5%	-2.1%
22	Utilities	886	957	1,158	8.0%	21.0%	30.7%
23	Construction	11,977	10,035	9,786	-16.2%	-2.5%	-18.3%
31-33	Manufacturing	25,136	19,990	21,381	-20.5%	7.0%	-14.9%
42	Wholesale trade	12,823	10,893	10,824	-15.1%	-0.6%	-15.6%
44-45	Retail trade	32,815	31,381	31,258	-4.4%	-0.4%	-4.7%
48-49	Transportation and Warehousing	19,620	19,552	23,295	-0.3%	19.1%	18.7%



NAICS Code	Description	2005	2010	2015	Percent Change		
					2005-10	2010-15	2005-15
51	Information	5,964	5,391	3,937	-9.6%	-27.0%	-34.0%
52	Finance and insurance	21,029	19,079	18,053	-9.3%	-5.4%	-14.2%
53	Real estate and rental and leasing	3,281	2,775	3,015	-15.4%	8.6%	-8.1%
54	Professional and technical services	14,015	14,121	15,476	0.8%	9.6%	10.4%
55	Management of companies and enterprises	5,871	6,726	8,245	14.6%	22.6%	40.4%
56	Administrative and waste services	15,104	15,080	19,027	-0.2%	26.2%	26.0%
61	Educational services	5,115	6,083	6,184	18.9%	1.7%	20.9%
62	Health care and social assistance	36,178	40,223	45,317	11.2%	12.7%	25.3%
71	Arts, entertainment, and recreation	5,235	7,235	7,394	38.2%	2.2%	41.2%
72	Accommodation and food services	22,048	22,751	24,007	3.2%	5.5%	8.9%
81	Other services (except Public Administration)	10,352	10,235	10,989	-1.1%	7.4%	6.2%

Source: US Bureau of Labor and Statistics

Table 4 depicts anticipated changes in employment in the region over the next several years by industry, and the commodities that are closely related to these industries.

Table 4: Summary of Select Major Industries Affecting Regional Freight

Industry	2015 Emp.	2010-15 Emp. Change	Projected Change, 2014-24	Related Commodities
Health Care and Social Assistance	45,317	5,094	7,510	Pharmaceuticals
Retail Trade	31,258	-123	250	Warehouse and Distribution Center, Merchandise, Home Goods, Grocery
Accommodation and Food Services	24,007	1,256	1,550	Processed Milk; Beverages; Chocolate
Transportation and Warehousing	23,295	3,743	2,850	Warehouse and Distribution Center
Manufacturing	21,381	1,391	0	Metals, Paper, pulp
Administrative and Waste Services	19,027	3,947	2,230	Paper
Wholesale Trade	10,824	-69	410	Nonperishable Foods, Cosmetics, Detergents, Tobacco, Specialty Items
Construction	9,786	-249	1,860	Lumber, glass, metal, brick

Source: U.S. Bureau of Labor Statistics, PA Work Stats

Major Employers

As noted previously, the most significant industries that dominate the region's employment picture include Retail Trade, Health Care & Social Assistance, Accommodations & Food Services, Transportation & Warehousing, and Manufacturing. Retail Trade is the leading industry by employment in all but Dauphin County where Health Care is the prominent sector. The dominance of the Health Care sector in Dauphin County is easily seen in the listing of major employers depicted in [Table 5](#).





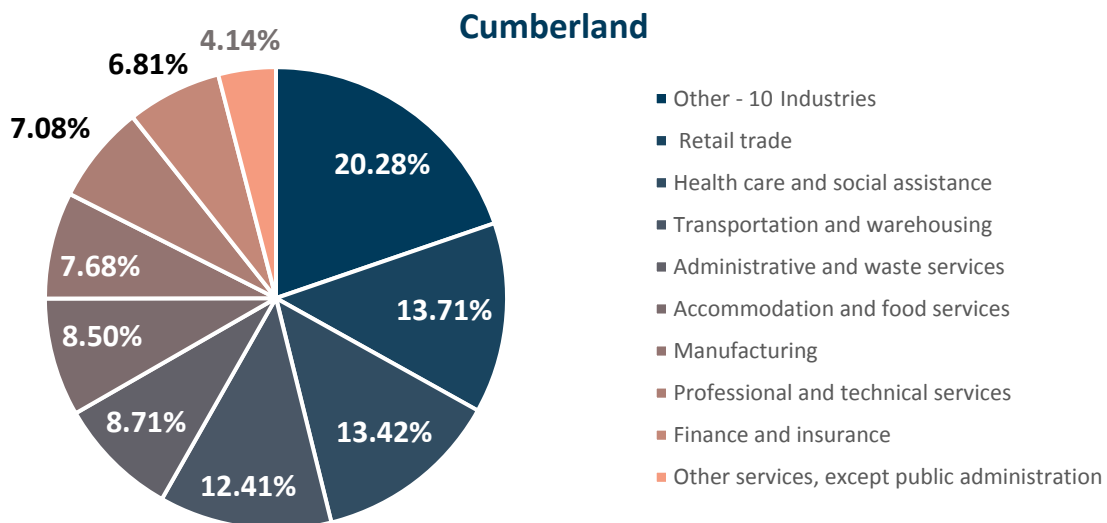
Table 5: Major Employers, by County, March 2016

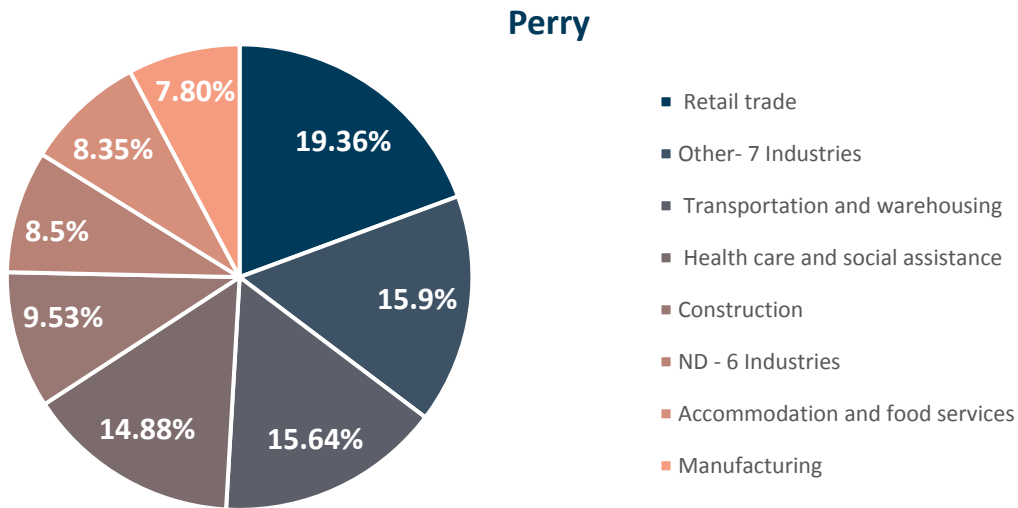
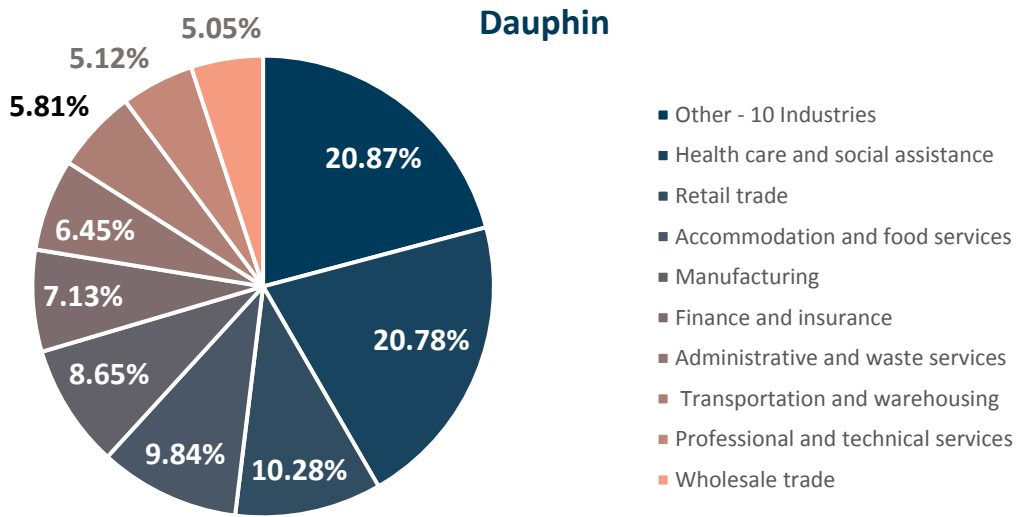
Cumberland County	Dauphin County	Perry County
Federal Government	State Government	H E Rohrer Inc
Giant Food Stores LLC	Milton S Hershey Medical Center	State Government
Amazon.com DEDC LLC	Hershey Entertainment & Resorts Co	West Perry School District
State Government	The Hershey Company	Susquenita School District
Holy Spirit Hospital	Pinnacle Health Hospitals	Perry County Commissioners
Highmark Inc	Federal Government	Specialty Bakers LLC
Wal-Mart Associates	PHEAA	Newport School District
Cumberland County	Tyco Electronics Corporation	Greenwood School District
Cumberland Valley School District	Pennsylvania State University	HC Private Duty Ltd
HGSS Inc	United Parcel Service Inc	Mutzabaughs Market Inc

Source: Pennsylvania Department of Labor and Industry, PA Work Statistics

Cumberland County perhaps has the region’s most diversified economy with no one industry employing a significant percentage of workers. While Dauphin County is also diversified, the Healthcare and Social Assistance sector employs a higher percentage of workers than other sectors. Perry County is the least diversified with a majority of workers employed across just three industries. **Figure 2** illustrates the percentage of workers in each industry.

Figure 2: Employment by Industry by County, 2015





Source: US Bureau of Labor and Statistics

Location Quotient

Location Quotient is a metric used for measuring the relative strength of an area’s economy in comparison with other areas. It compares an industry’s share of employment at the local level to the industry’s share of employment at the state level. As such, it is a measure of economic strength. According to economic base theory, industries with an employment share that exceeds the state employment share have excess production – production that serves export markets. Because export activity injects new money into the local economy, these basic industries are considered “key drivers” of economic growth.

Table 6 demonstrates the strength of the region’s economy by county, particularly in the Transportation & Warehousing industry, which is naturally highly dependent upon the movement of freight. Industries are sorted by their regional location quotient.



Table 6: Location Quotient, by County, 2015

Industry	Cumberland	Dauphin	Perry	Region
Transportation and warehousing	2.72	1.27	3.42	1.96
Arts, entertainment, and recreation	0.49	2.46	0.13	1.54
Administrative and waste services	1.41	1.04	ND	1.37
Finance and insurance	1.34	1.41	0.86	1.37
Other services, except public administration	1.07	1.09	1.53	1.09
Accommodation and food services	0.94	1.09	0.92	1.02
Retail trade	1.09	0.81	1.53	0.95
Wholesale trade	0.73	1.13	ND	0.93
Utilities	0.27	1.50	ND	0.92
Real estate and rental and leasing	1.01	0.89	0.51	0.92
Professional and technical services	1.06	0.76	0.48	0.89
Information	0.96	0.86	0.28	0.89
Management of companies and enterprises	1.48	1.02	ND	0.89
Health care and social assistance	0.71	1.09	0.78	0.89
Construction	0.72	0.81	2.03	0.80
Manufacturing	0.68	0.77	0.69	0.73
Educational services	0.79	0.62	0.31	0.69
Agriculture, forestry, fishing and hunting	0.56	0.37	ND	0.45
Mining, quarrying, and oil and gas extraction	0.12	0.06	ND	0.08

Source: US Bureau of Labor and Statistics and Calculations

Table Key:

< 1.0

1.0 > x > 2.0

2.0 > x > 3.0

> 3.0

Freight Infrastructure

The HATS region's multimodal freight infrastructure includes a network of roadways that are both state- and locally-owned. It also includes regional railroads, and airports including Harrisburg International Airport.

The backbone of the region's freight system includes its 5,000-mile roadway network. These include nearly 120 miles of interstate highways (I-81, I-83, I-283, and I-76), and 323.4 miles of National Highway System (NHS) routes. Of the region's total roadway network, only 1,230 miles (25%) are on the Federal-aid system.

There are non-roadway-based elements of the network as well. Within the HATS region, these include the following assets:

- Intermodal connector roadways, such as Industrial Road to the NS Lucknow Intermodal Terminal, and Grayson Road to Rupp Hill Road to Paxton Street to Penhar Drive to US 322.
- All of Norfolk Southern's railroad lines, including (from Harrisburg): the Harrisburg Line to Philadelphia; the Pittsburgh Line to Pittsburgh; the Reading Line to Reading; the Buffalo Line to Driftwood, Pa.; the Lurgan Branch to Hagerstown, Md.; the Shippensburg Secondary to Carlisle; the Royalton Branch to Shocks Mills; and the Port Road Branch to Perryville, Md.

Highway Network

The HATS region is criss-crossed by nearly 5,000 linear miles of roadway. Over 1,500 miles of this network are owned by the Commonwealth, while an additional 3,200 miles are owned and maintained by local government. The Pennsylvania Turnpike owns nearly 51 linear miles of roadway through Cumberland and Dauphin counties, while other government agencies own another 56 miles of roadway.

Table 7 provides more detail on the region's roadways, by ownership.

Table 7: Roadway Mileage by Ownership, 2015

	PennDOT	Other Agencies	Turnpike	Toll Bridge	Local Municipalities	Total Linear Miles
Cumberland	556.29	51.72	37.88	-	1,310.39	1,956.28
Dauphin	556.55	0.24	12.89	1.00	1,338.74	1,909.42
Perry	417.35	4.09	-	-	599.54	1,020.98
HATS Region	1,530.19	56.05	50.77	1.00	3,248.67	4,886.68

Source: PennDOT, Bureau of Planning and Research

The region's roadway network supports an average of over 16.5 million vehicle miles of travel, daily. Despite a growing population, the demand for travel has actually declined after reaching an historic peak of 17.8 million miles in 2007. One factor has been the national recession and financial crisis of 2007-09. The demand for travel naturally increased as the economy has improved, but has not yet returned to levels previously experienced before the economic downturn. **Table 8** provides a snapshot



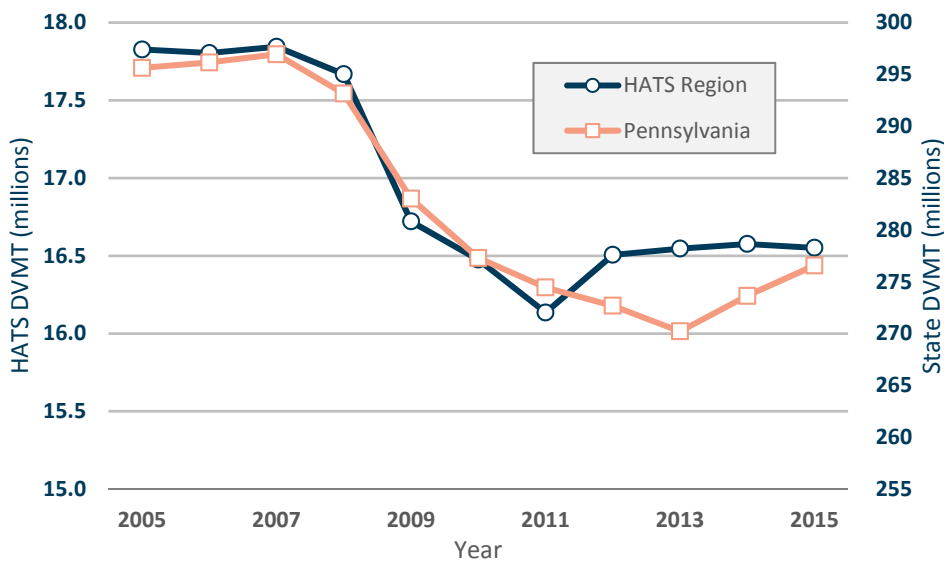
of travel demand for 2015 by ownership, while **Figure 3** shows how historic trends in travel demand for the region are mirroring that of Pennsylvania’s overall.

Table 8: Daily Vehicle Miles of Travel (DVMT) by Ownership, 2015

	PennDOT	Other Agencies	Turnpike	Toll Bridge	Local Municipal	Total DVMT
Cumberland	5,636,538	135,144	855,806	-	936,484	7,562,972
Dauphin	6,187,337	627	350,388	100	1,090,916	7,629,368
Perry	1,203,146	10,687	-	-	144,450	1,358,283
HATS Region	13,027,021	146,458	1,206,194	100	2,171,850	16,551,623

Source: PennDOT, Bureau of Planning and Research

Figure 3: Daily Vehicle Miles of Travel, HATS Region and Pennsylvania, 2005-15

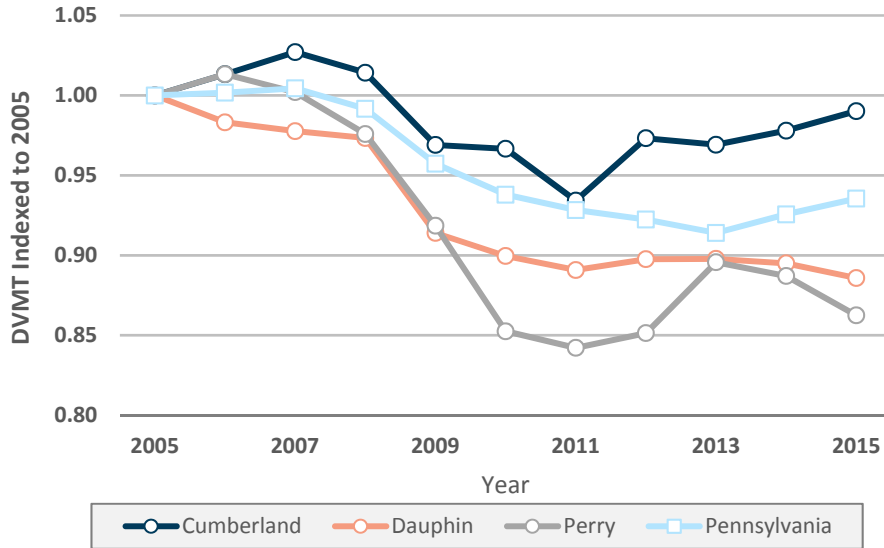


Source: PennDOT Bureau of Planning and Research

Dauphin County roadways currently rank 11th in the state in total daily travel demand, at 7.6 million miles. Cumberland County posts nearly identical numbers but has exhibited stronger travel demand over the past decade, as shown in the following figure, which indexes travel against numbers recorded a decade ago. **Figure 4** shows that the demand for travel within Cumberland County has been steadily increasing from its post-recession levels, and is outpacing that of the state overall. Total travel demand in Perry County is down nearly 15 percent from levels experienced a decade ago.

Regional Freight Plan

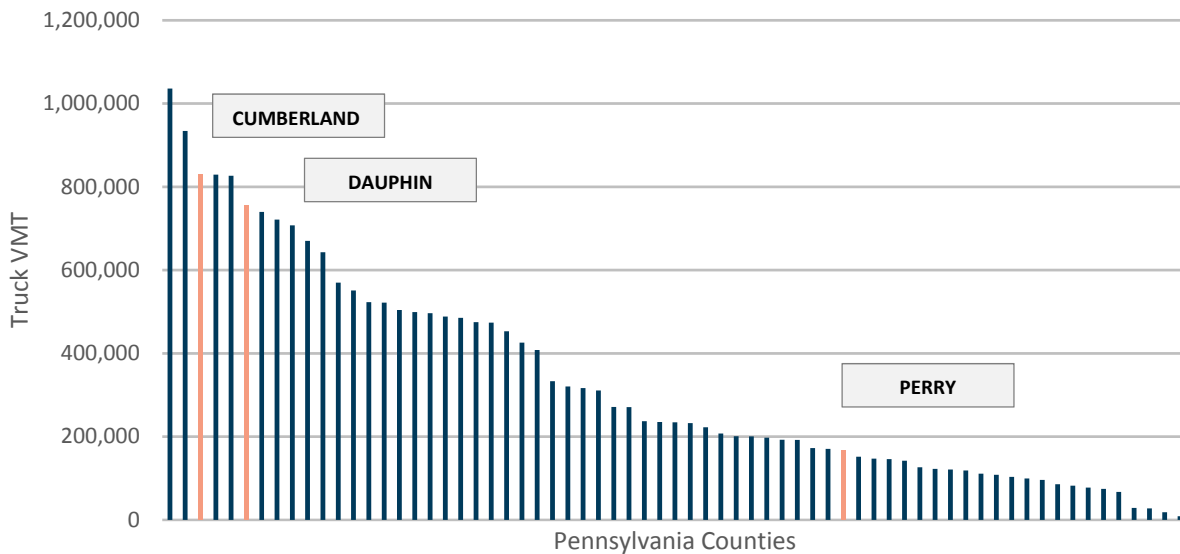
Figure 4: Regional and State DVMT, Indexed to 2005



Source: PennDOT Bureau of Planning and Research

The HATS region accommodates nearly 6 percent of all travel that occurs within the state but 8 percent of total truck traffic. This rate is higher than any other region in the state, outside of the greater Philadelphia and Pittsburgh metropolitan areas. **Figure 5** illustrates how each county in Pennsylvania compares to one another in daily truck VMT. Cumberland County ranks third in the state, behind only Allegheny and Berks Counties. Dauphin ranks sixth, following Lancaster and Luzerne Counties. Perry County ranks forty-fifth among Pennsylvania counties in truck VMT.

Figure 5: Pennsylvania Truck VMT, by County

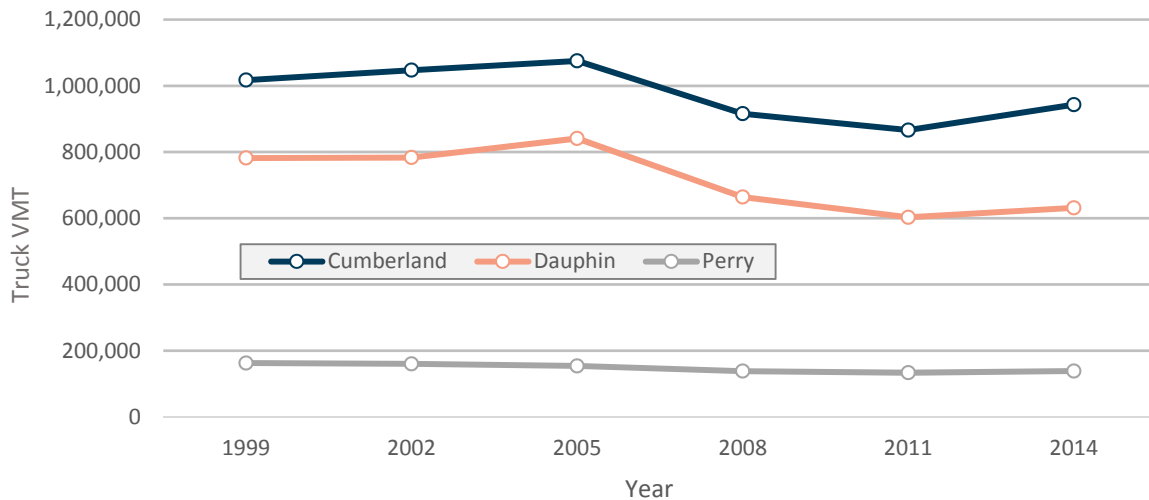


Source: PennDOT Center for Program Development and Management



Based on historic snapshots of PennDOT’s Roadway Management System (RMS), regional truck VMT was calculated using segment average annual daily traffic (AADT), truck percentages, and distances. Truck VMT in Perry County have remained steady, with only a slight decline in VMT between 2005 and 2011. However, Cumberland and Dauphin Counties have experienced a significant decline in truck VMT from their 2005 peak to 2011. **Figure 6** illustrates the decline in VMT. This decline can be attributed to the economic recession. While all three counties have seen increases in truck VMT since 2011, these levels still remain lower than their peak levels.

Figure 6: Average Daily Truck VMT, by County, 1999-2014



Source: PennDOT Roadway Management System (RMS)

ATRI Data: Concentrations of Truck Activity

The planning process included an assessment of GPS truck position data as obtained from the American Transportation Research Institute (ATRI). The data shown in the following figures represent individual truck position pings and associated travel speeds accumulated between May 1-14, 2016. The data serves as a valuable resource to identify truck generators, truck bottlenecks and key first- and last-mile connections.

In the **Greater Carlisle area**, shown in **Figure 7**, truck generators are primarily clustered in three areas with the largest along US 11 from the Turnpike to Appalachian Drive. This area contains truck stops, freight companies (ABC Freight, Knight Transportation, etc.), and warehousing (Carolina Supply Chain Services, Amazon). It also provides a direct connection to Interstate 81 and the Turnpike. Allen Road between Interstate 76 and Walnut Bottom Road and Ritner Highway from Orange Street to Allen Road also experience a significant concentration of truck generators. Both corridors have been identified by HATS as potential Critical Urban Freight Corridors, and contain several distribution centers (Key Distribution Centers, Allen Distribution, DHL Supply Chain), warehousing (Pepsico, Pfizer-Carlisle), and fulfillment centers (Amazon). Trucks are able to directly access Interstate 81. In Mount Holly Springs, PPG Industries and Land O’Lakes are major truck generators and drive traffic through this area.

Regional Freight Plan

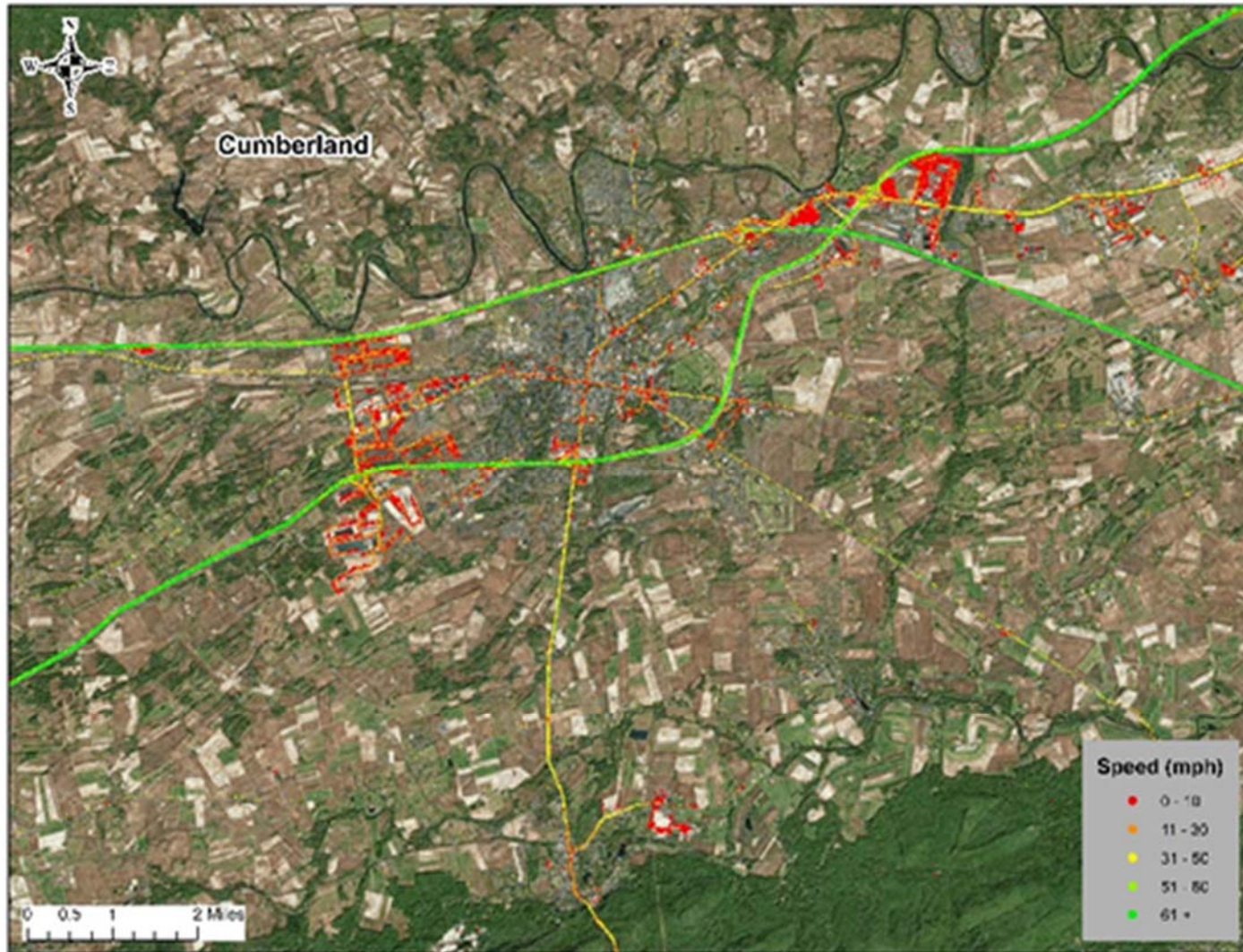
Based on the ATRI data, one of the largest generators in the **Greater Mechanicsburg Area**, shown in **Figure 8**, is the Naval Support Activity Mechanicsburg. Another major concentration of truck activity is the area surrounding the interchange of US 11 and Trindle Road. Sunoco Fuel Storage Terminal, Napa Transportation, Land O'Lakes-Purina Mills, etc. are major drivers of truck traffic through this area. Other major origins and destinations for trucks include the Capital City Mall, US 11 between in the interchange with PA 581 and Lambs Gap Road (UPS Freight), and the interchange of US 11 and PA 114 (Walmart Supercenter).

ATRI data for the **greater Harrisburg area** (see **Figure 9**) shows the region as a major origin and destination for truck traffic. Major origins and destinations for trucks include the intermodal yards of Norfolk Southern, in both Susquehanna and Swatara Townships. Other concentrations of truck activity are evident at major interchanges along I-83, including Union Deposit (e.g., Pepsi Bottling Group, etc.), and at the Eisenhower interchange (Glen Sponaugle & Sons). Other corridors of note include Seventh Street in Harrisburg, as well as Cameron Street, which is a major connection linking Interstate 81 with Interstate 83. Not coincidentally, HATS has also proposed this as a Critical Urban Freight Corridor. US 22 between Interstate 83 and Mountain Road has also developed into a major commercial corridor, and many trucks use the roadway in serving the many commercial businesses that have frontage along US 22 in Colonial Park.

Other major truck trip generators within this part of the region include the Fulling Mill Road corridor just off of PA 283, areas immediately adjacent to the interchange of Interstate 283, PA 283, and the Pennsylvania Turnpike, and the area between Interstate 83 and PA 230 in Swatara Township. The latter area includes major truck trip generators such as Frito-Lay, Inc.

Within **Perry County**, truck traffic is not as prevalent as in neighboring counties, yet there are still concentrations of truck activity that occur at different truck origins and destinations across the county. Most of the county's truck traffic is focused on Newport Borough, which is the county's commercial business center. **Figure 10** shows concentrations of truck traffic within the borough, as well as in neighboring Howe Township, where US 22/322 interchanges with PA 34. The completion of the Dauphin Bypass in 2000 has sparked commercial land development activity, as the area has developed into a growing commercial center, with a new shopping center, home improvement store, medical professional center, and drive through restaurant. Existing businesses in the area have also expanded. More development within the immediate area is planned, with the expansion of public water and sewer service, new traffic signals, and a proposed new business park. Truck activity is not limited to Howe Township however as there are also concentrations of truck traffic at the county's truck stops located along US 11/15, and at commercial areas northwest of Bloomfield Borough, in Centre Township.

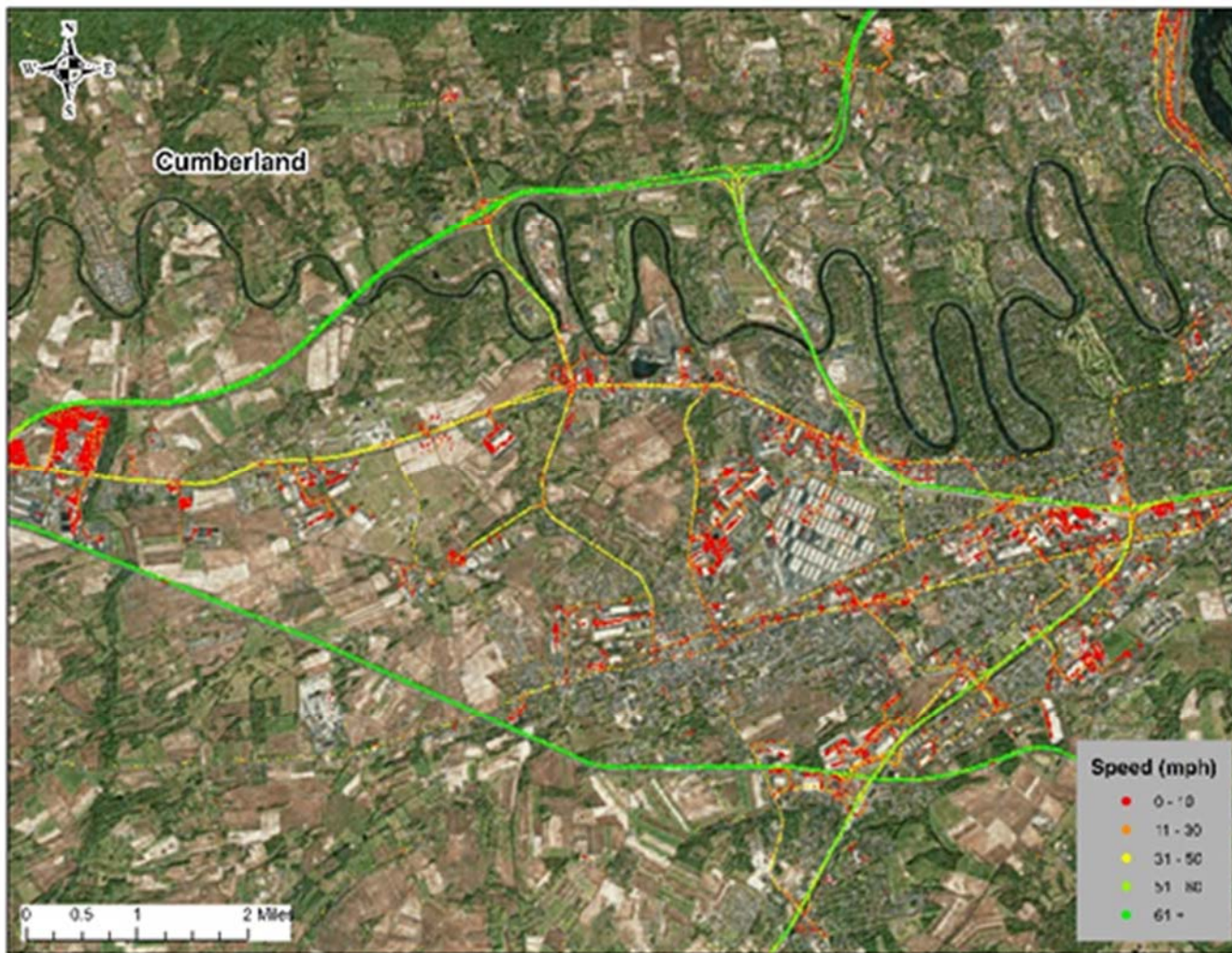
Figure 7: Truck Activity in Greater Carlisle, Cumberland County



Source: ATRI GPS Data

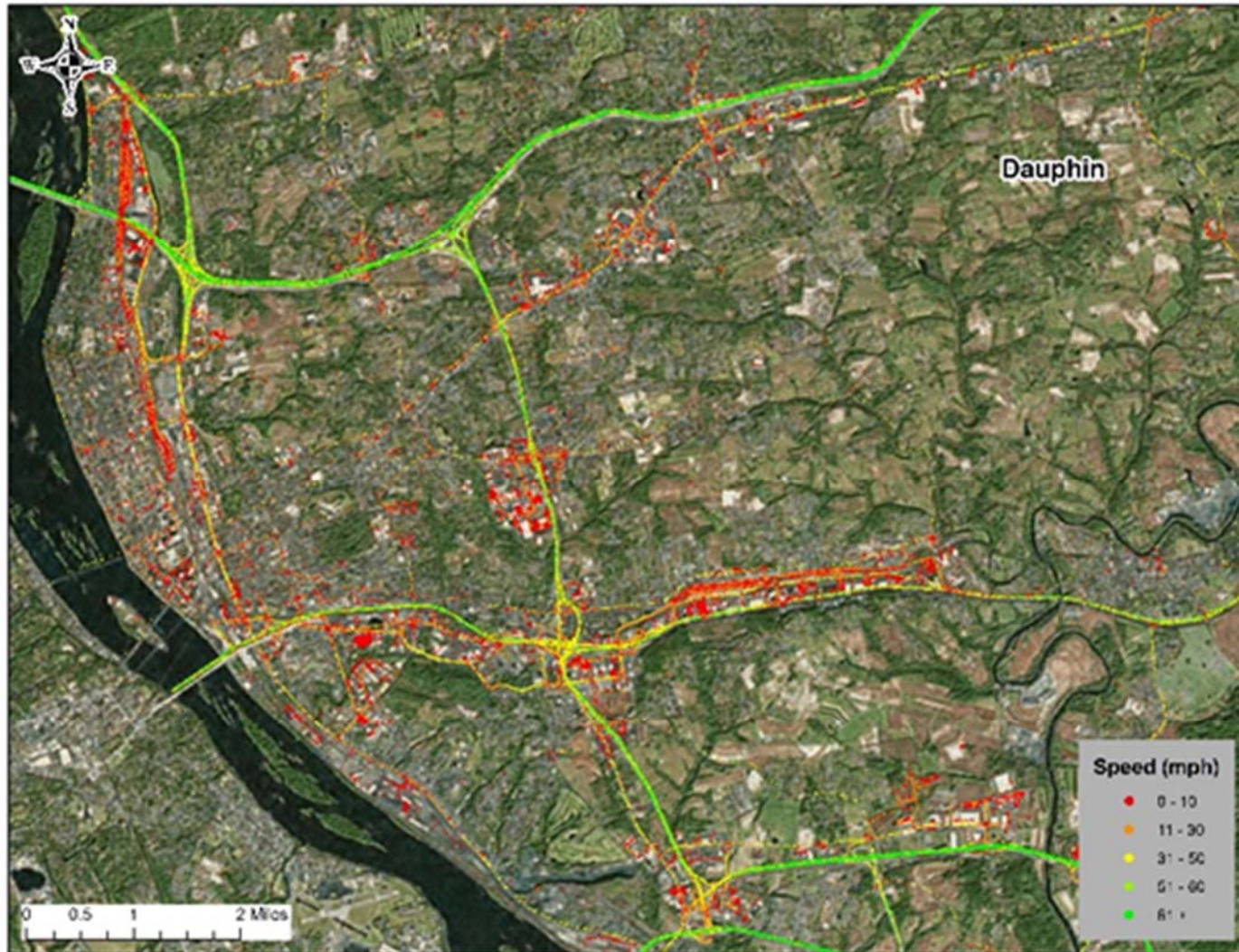
Regional Freight Plan

Figure 8: Truck Activity in Greater Mechanicsburg, Cumberland County



Source: ATRI GPS Data

Figure 9: Truck Activity in Greater Harrisburg, Dauphin County



Source: ATRI GPS Data

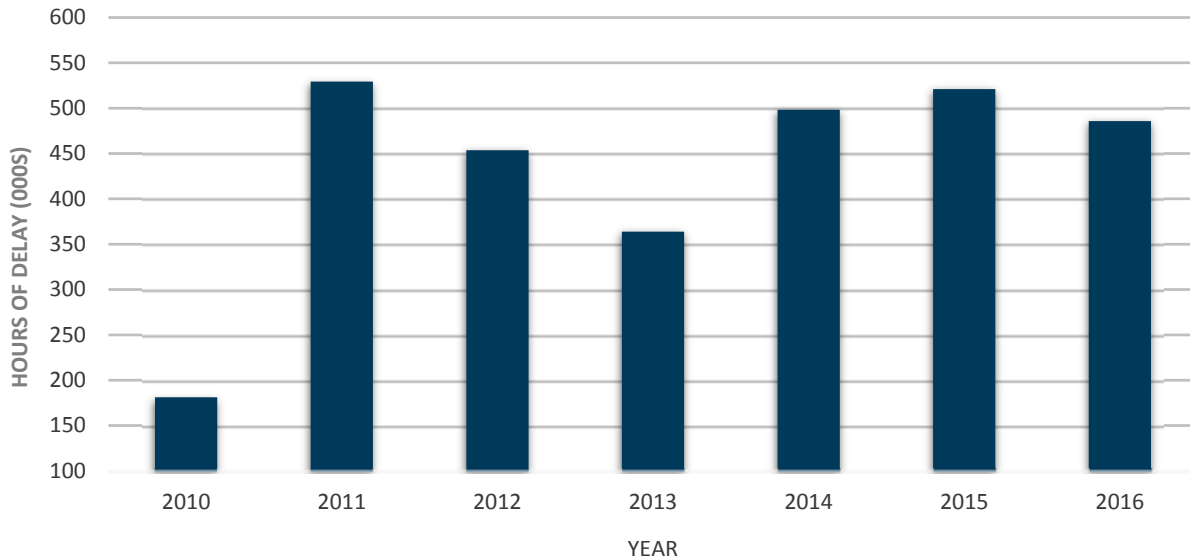
Figure 10: Truck Activity in Eastern Perry County



Source: ATRI GPS Data

INRIX travel time data was also evaluated using the Regional Integrated Transportation Information System (RITIS) to determine trends in regional truck delay. Delay is defined as the extra travel time (in hours) incurred by the number of trucks on each roadway as compared to off-peak travel times. Delay has fluctuated since 2010 and is most likely linked to the amount of truck travel during peak periods, non-truck travel volumes, and major incidents on the region’s transportation system. **Figure 11** shows annual truck hours of delay by year.

Figure 11: Annual Truck Hours of Delay, (000s), 2010-16



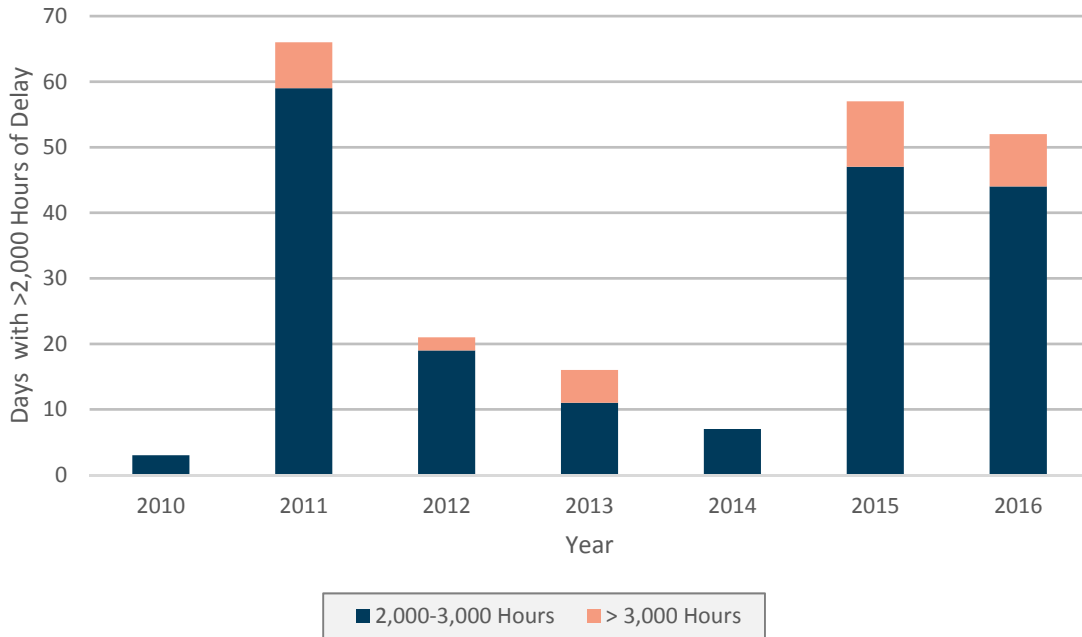
Source: INRIX Travel Time Data Integrated with Highway Performance Monitoring System (HPMS) Truck VMT

The INRIX data allows for assessments of delay trends and variations. The number of days, shown in **Figure 12**, with high truck delay provide insights into the number of incidents and their impact on regional truck movement. As expected, most of the truck delay occurs during the peak morning and evening time periods. **Figure 13** shows delay by time of day. The 3-hour evening peak period accounts for nearly 35 percent of all truck delay in 2016. The delay by the day of week has fluctuated over the last seven years and may be closely correlated to days with extreme weather or other accidents as shown in **Figure 14**. On average, Thursday and Fridays are the days for which the most accumulated truck delay has occurred. Trucks experience the greatest percentage of delay during the summer season as shown in **Figure 12**. This delay may be closely correlated with the increase in vehicles on roadways due to vacations and other outdoor activities.



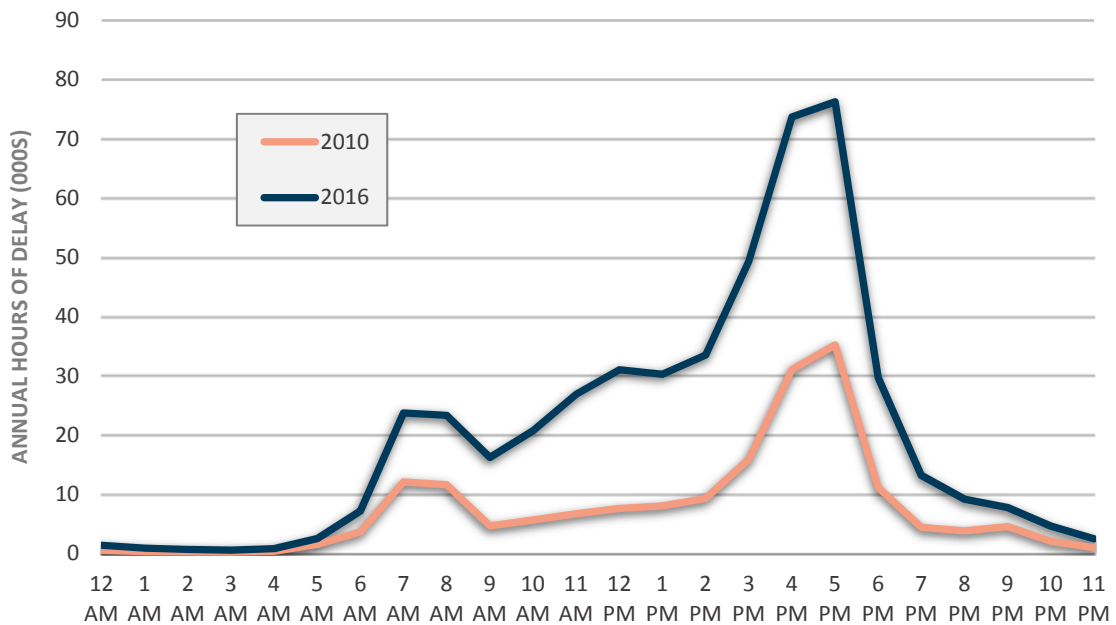
Regional Freight Plan

Figure 12: Number of Days with over 2,000 Hours of Delay, 2010-16



Source: INRIX Travel Time Data Integrated with Highway Performance Monitoring System (HPMS) Truck VMT

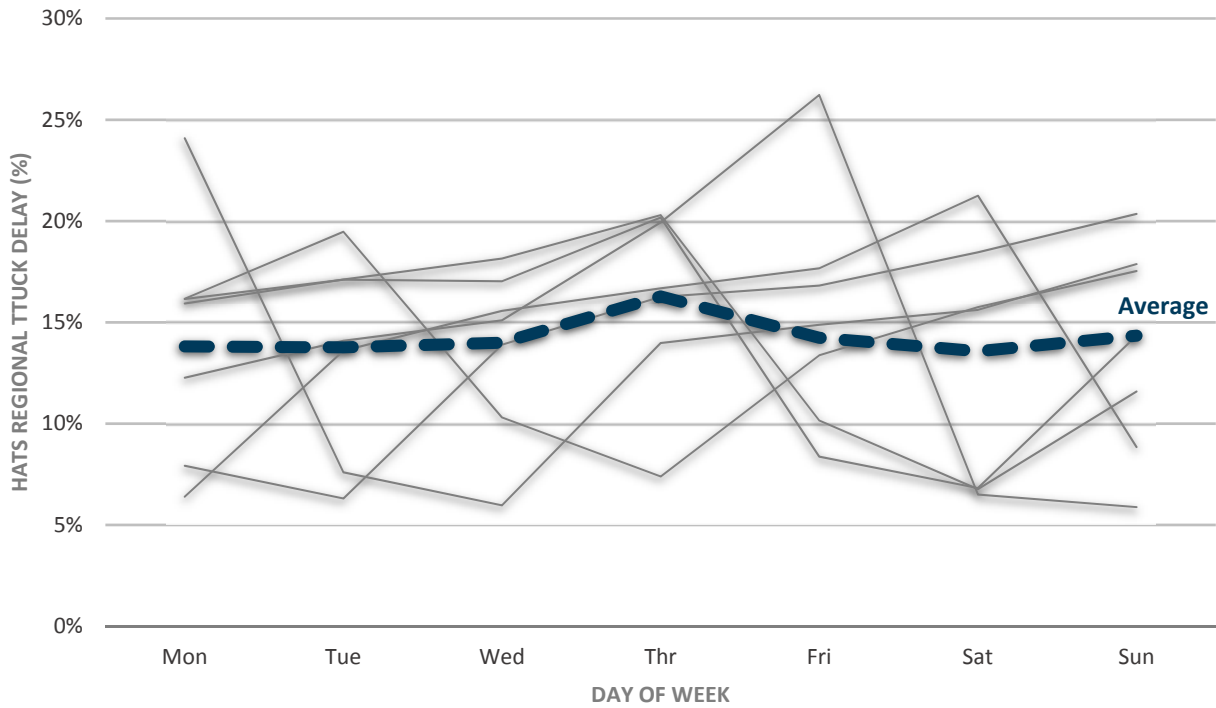
Figure 13: Annual Truck Hours of Delay by Time-of-Day, 2010 and 2016



Source: INRIX Travel Time Data Integrated with Highway Performance Monitoring System (HPMS) Truck VMT

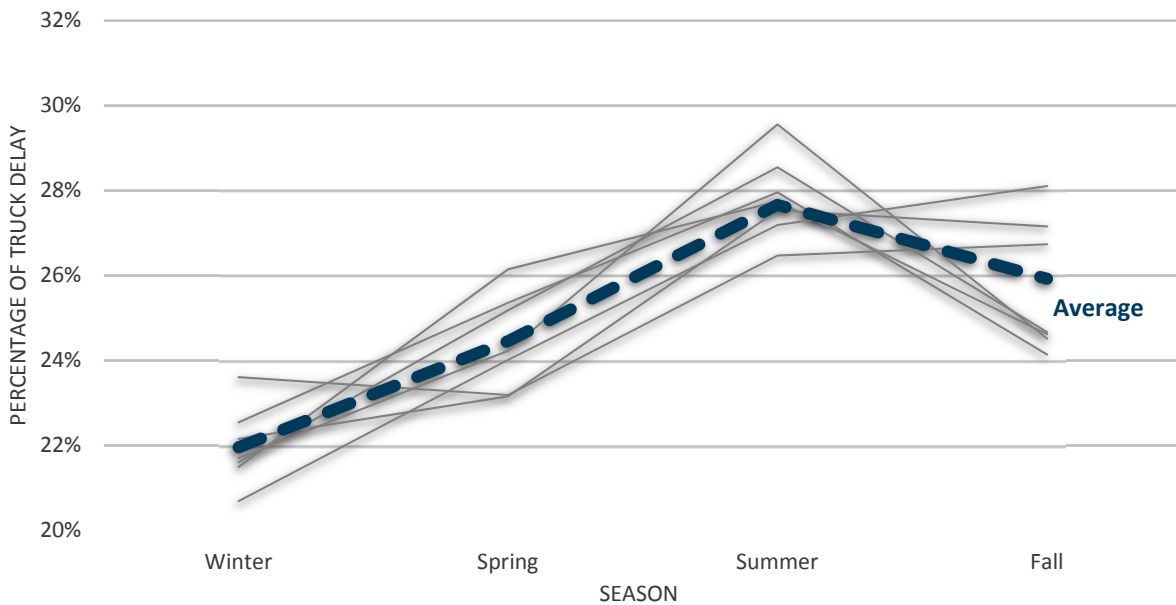


Figure 14: Percentage of Regional Truck Delay by Day of Week, 2010-16



Source: INRIX Travel Time Data Integrated with Highway Performance Monitoring System (HPMS) Truck VMT

Figure 15: Percentage of Regional Truck Delay by Season, 2010-16

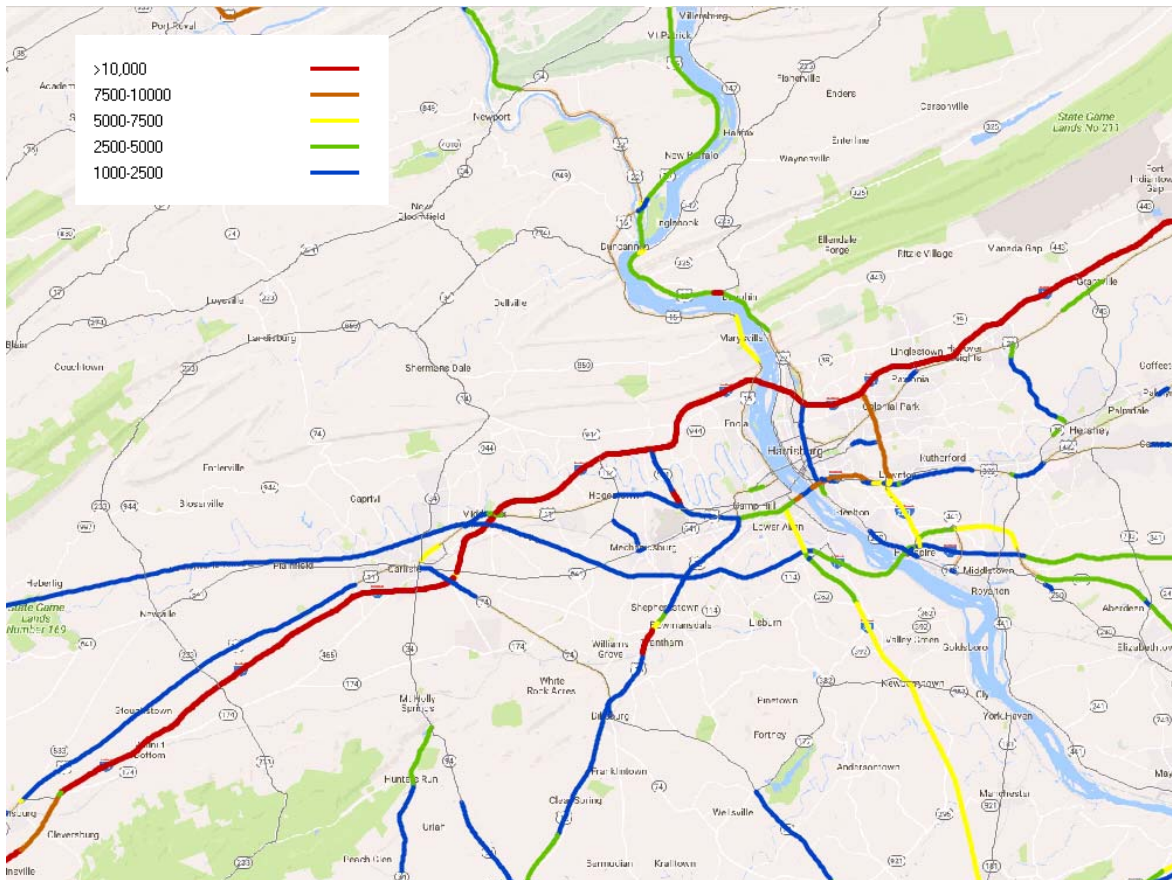


Source: INRIX Travel Time Data Integrated with Highway Performance Monitoring System (HPMS) Truck VMT

Regional Freight Plan

Figure 16 depicts the forecasted growth of truck volume in the HATS region from 2012-40. The majority of the region's roadways are projected to have truck volumes increase by 1,000 – 2,500 AADTT. Interstate 83 between the Susquehanna River and Interstate 81 will see an increase of 7,500 -10,000 AADTT. The largest growth in truck volumes will occur along the I-81 Corridor, which is expected to experience an increase of at least 10,000 AADTT. With increases in truck volumes, PennDOT and the MPO will need to be aware of the impacts of increased volumes on congestion and infrastructure conditions.

Figure 16: Forecasted Growth in Truck Volume, 2012-40

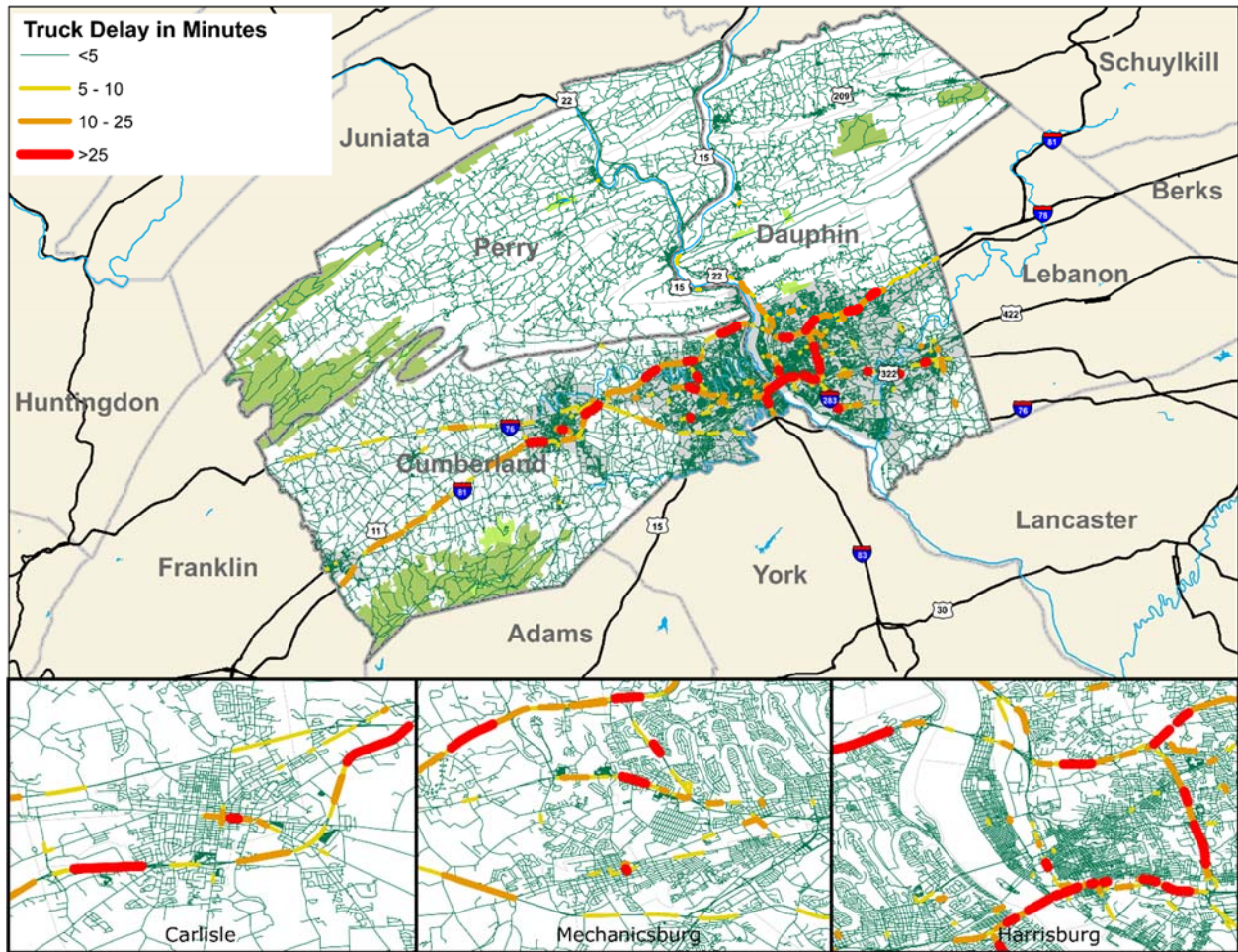


Source: Freight Analysis Framework (FAF4)

Truck Bottlenecks

Truck delays in the region were identified using Tom-Tom Travel Time Data and Truck Volumes from PennDOT Roadway Management System. Within the HATS region, major truck bottleneck locations include Interstate 83, segments of Interstate 81 in Carlisle, Mechanicsburg, and Harrisburg, segments of US 11 and PA 581 in Mechanicsburg, and segments of US 11 in Carlisle. On average, these roadway segments average at least 25 minutes of truck delay during peak hours. **Figure 17** graphically shows the average peak hours of truck delay in the region.

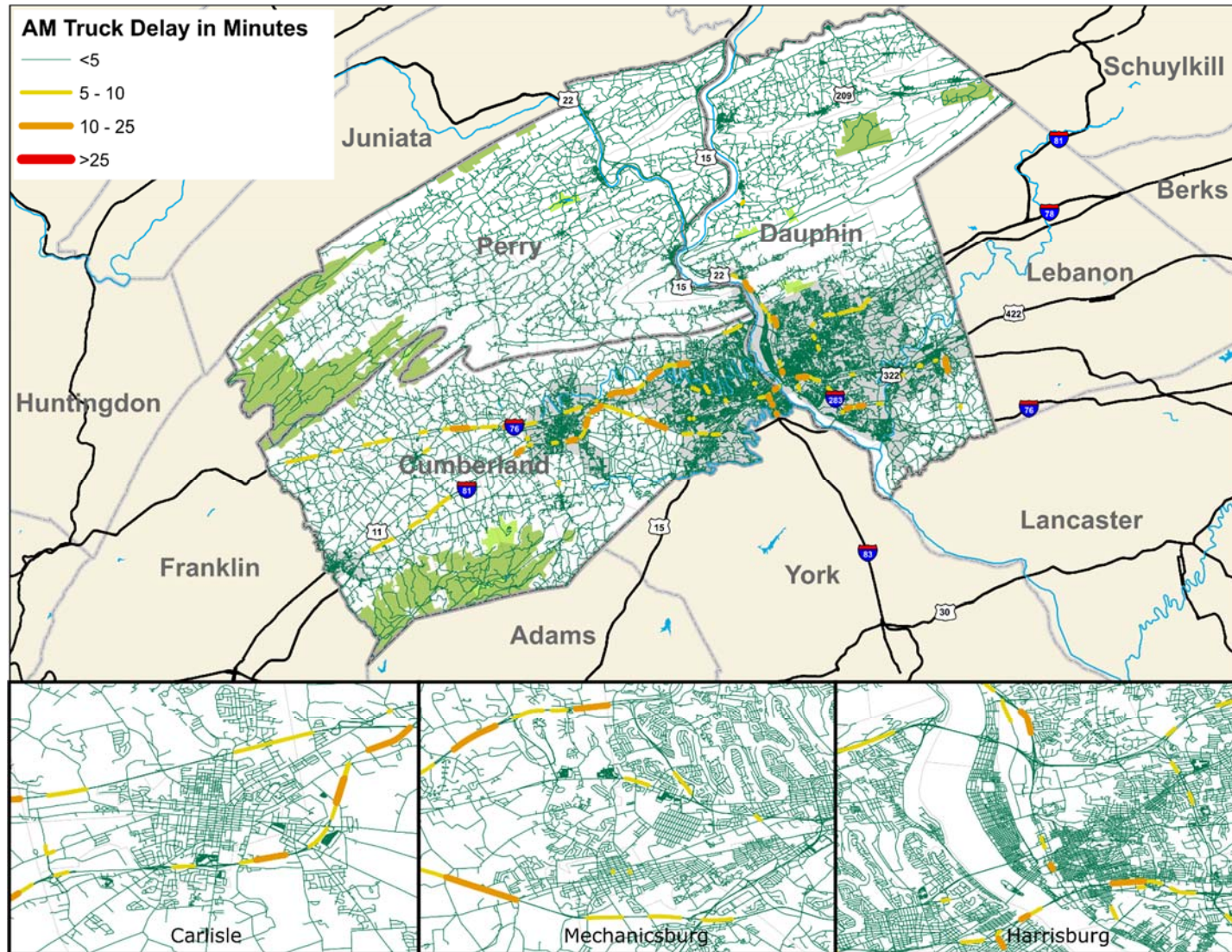
Figure 17: Average Peak Hour Truck Delay, 2014-2016



Source: Tom-Tom Travel Time Data and PennDOT Roadway Management System.

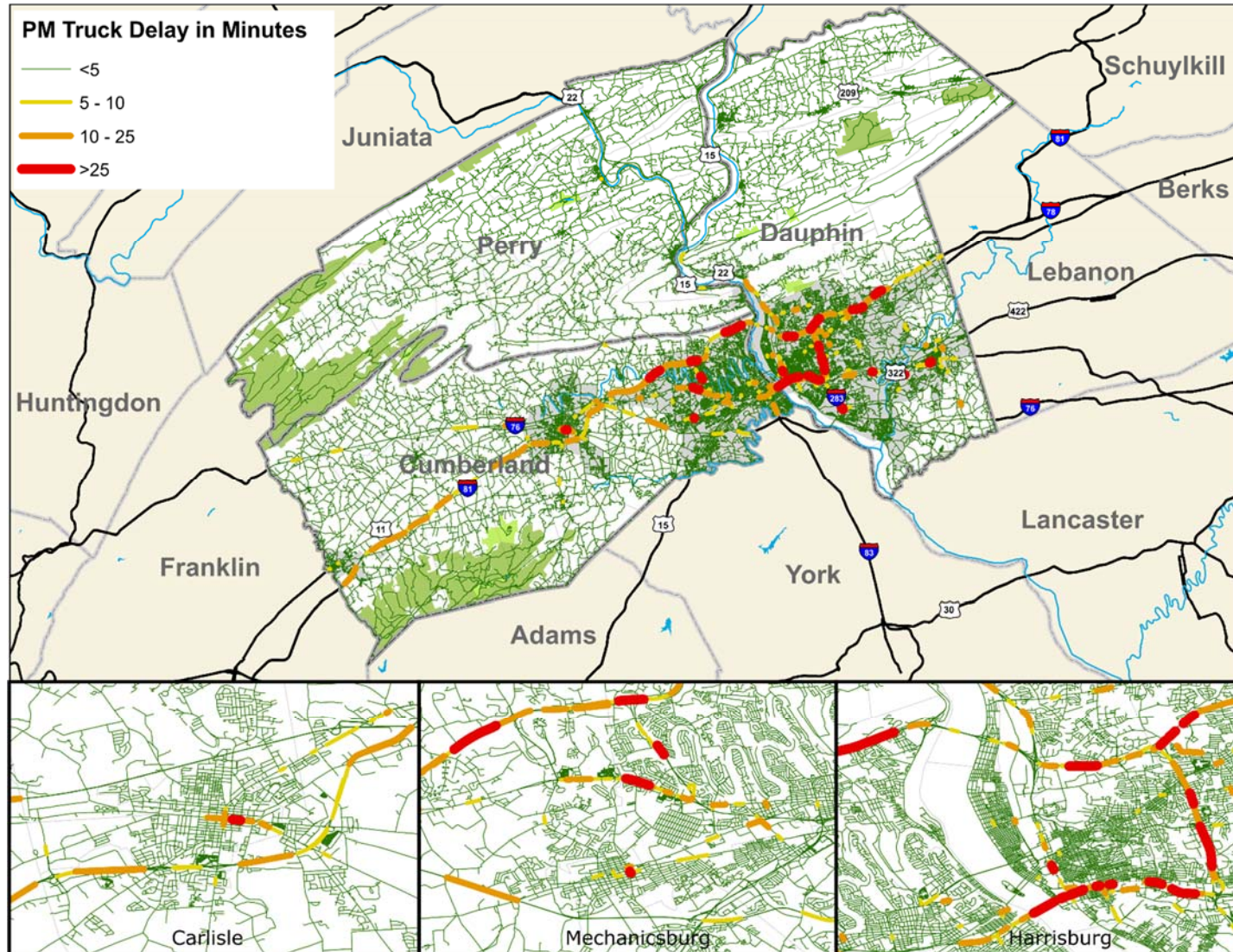
Trucks experience longer periods of delay in the afternoon than in the morning. **Figure 18** and **Figure 19** compares average peak truck delays for peak morning and afternoon hours. During the morning hours, there are several roadway segments, including Interstate 76 in Cumberland County, Interstate 81 near Carlisle and Mechanicsburg, segments of Interstate 83, that average 10-25 minutes of delay. However, no roadway segment averages more than 25 minutes of truck delay. In the afternoon, the majority of Interstates 81 and 83 average at least 10 minutes of peak truck delay, with most of Interstate 83, segments of Interstate 81 in Mechanicsburg and Harrisburg, and US 11 in Mechanicsburg experiencing more than 25 minutes of peak truck delay during afternoon hours.

Figure 18: Average Peak Truck Delay, AM Peak, 2014-2016



Source: Tom-Tom Travel Time Data and PennDOT Roadway Management System

Figure 19: Average Peak Truck Delay, PM Peak, 2014-2016



Source: Tom-Tom Travel Time Data and PennDOT Roadway Management System.

Functional Classification

The region has been functionally classifying its roadways for many years. The use of networks in transportation planning has been performed by FHWA and its partners at the state and regional level at least since the Federal-aid Highway Act of 1973 required the practice for updating and modifying the Federal-aid highway system. PennDOT and HATS have grouped the region's roadways into a hierarchy, according to the character of service they provide. Functional classification defines the role that any particular roadway should play in serving the movement of people and goods across the regional highway network.

Table 9 provides more information on the extent of the region's roadway network, by functional class, by county.

Table 9: Roadway Mileage by Functional Classification, 2015

	Federal Aid Linear Miles					Non Federal Aid Linear Miles		Total Linear Miles
	Interstate	Other Frwy/Expwy	Other Princ Arter	Minor Arter	Major Coll	Minor Coll	Local	
Cumberland	79.5	15.0	40.0	112.8	219.0	95.4	1,394.6	1,956.3
Dauphin	41.0	30.6	62.9	176.5	224.8	57.6	1,316.1	1,909.5
Perry	0.0	18.1	24.6	79.4	106.0	73.1	719.9	1,021.1
HATS Region	120.5	63.7	127.5	368.7	549.8	226.1	3,430.6	4,886.9

Source: PennDOT, Bureau of Planning and Research

National Highway System

Congress designated the National Highway System (NHS) in 1995. The NHS consists of roadways deemed important to the nation's economy, defense, and mobility. **Table 10** describes the subsystems within the NHS and a listing of elements within the HATS region that are included as part of this priority network. There are 323.4 miles of NHS roadway within the HATS region, which is 6.6 percent of the total network. The NHS carries a disproportionate share of travel through the region, with over 10 million DVMT, or nearly 63 percent of all trips.

Table 10: National Highway System Elements

	Description	Elements within the HATS Region
Interstate	The Eisenhower Interstate system of highways is included as part of the NHS yet retains its separate identity	<ul style="list-style-type: none"> • I-76 (PA Turnpike) • I-81 • I-83 • I-283



	Description	Elements within the HATS Region
Other Principal Arterials	Highways in rural and urban areas which provide access between an arterial and a major port, airport, public transportation facility, or other intermodal transportation facility	<ul style="list-style-type: none"> • US 11 • US 15 • US 22 • US 322 • US 422 • PA 641 • PA 283 • Airport Connector
Strategic Highway Network (STRAHNET)	Highways which are important to the United States' strategic defense policy and which provide defense access, continuity and emergency capabilities for defense purposes	<ul style="list-style-type: none"> • PA 581 between I-81 and US 11 • US 11 north of I-81
Major Strategic Highway Network Connectors	Highways which provide access between major military installations and highways which are part of the Strategic Highway Network	
Intermodal Connectors	Roadways providing access between major intermodal facilities and the other four subsystems making up the National Highway System	<ul style="list-style-type: none"> • Industrial Road in Susquehanna Township • Grayson Road in Swatara Township

Source: USDOT; HATS

Interstate Management

Beginning with the creation of the 2007 TYP, PennDOT assumed responsibility as the lead planning agency for the Pennsylvania interstate system in cooperation with the planning partners. The approach is consistent with PennDOT's philosophy of managing Pennsylvania's Interstate System as a single, statewide asset.

Within the HATS region, this entails over 120 linear miles of roadway through Cumberland and Dauphin Counties. The interstates consist of only 8 percent of the regional network, yet they carry over a third (5.6 million DVMT) of all the region's traffic. Projects on the interstate are managed on a separate Interstate Management TIP and funds are programmed centrally. The priority for the Interstate Management Program is for system preservation. PennDOT notifies HATS of any TIP amendments and modifications, even though formal approval is not required. The 2017 Program includes \$671 million in improvements on HATS' share of interstates, as depicted in **Table 11**.

Table 11: Interstate Projects on the 2017 Program

County	ID #	Route	Project Title	Project Type	Period	Cost (\$000s)
Cumberland	91015	81	I-81 Carlisle West	HRST	1	55
Cumberland	91015	81	I-81 Carlisle West	HRST	2	261

Regional Freight Plan

County	ID #	Route	Project Title	Project Type	Period	Cost (\$000s)
Cumberland	91015	81	I-81 Carlisle West	HRST	3	13,439
Dauphin	90204	81	I-81 Merge Lanes	SAFE	1	11,000
Dauphin	92931	83	Eisenhower Interchange	HRCT	1	51,752
Dauphin	92931	83	Eisenhower Interchange	HRCT	2	101,848
Dauphin	92931	83	Eisenhower Interchange	HRCT	3	160,000
Dauphin	82356	83	I-83 East Shore Overpasses	IMP	1	15,500
Dauphin	70024	83	I-83 East Shore Section 1	HRCT	1	60,000
Dauphin	70024	83	I-83 East Shore Section 1	HRCT	2	52,900
Dauphin	97828	83	I-83 East Shore Section 3	HRCT	1	6,000
Dauphin	97828	83	I-83 East Shore Section 3	HRCT	2	49,000
Dauphin	97828	83	I-83 East Shore Section 3	HRCT	3	150,000

Source: State Transportation Commission

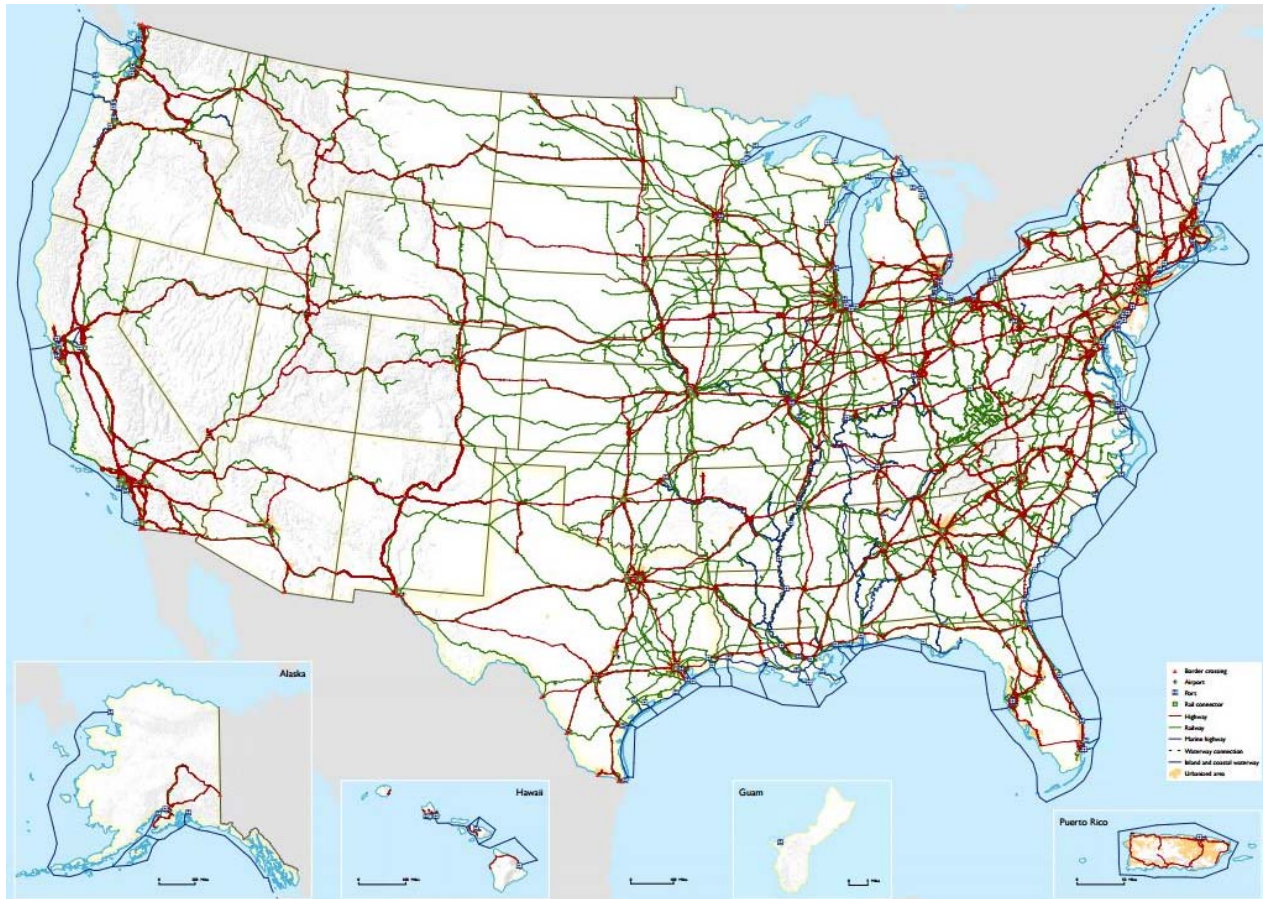
Priority Freight Network

One of the early key initiatives of the FAST Act was the expansion of a proposed priority freight network that was originally suggested under MAP-21. The FAST Act's predecessor had designated 27,000 centerline miles nationwide to be considered as a Primary Freight Network (PFN). The PFN however was inadequate in that it did not entail enough roadway mileage to achieve a contiguous network, and that it was designated as "highway-only" and thus not multimodal in scope.

In October 2015, USDOT released a draft Multimodal Freight Network (MFN) as part of its draft National Freight Strategic Plan. This updated network addressed the deficiencies of the PFN by identifying 65,000 centerline miles of road, more than 28 percent of the National Highway System (NHS) and approximately 1.6 percent of the nation's total public road mileage; 49,900 route miles of railways, including 35 percent of the nation's rail route miles; 78 ports that accounted for approximately 90 percent of total (2013) U.S. tonnage; and 56 airports that accounted for approximately 90 percent by weight of the nation's landed cargo in 2013.

Sometime during 2017, the USDOT is expected to designate a final National Multimodal Freight Network (NMFN). The NMFN is composed of several elements, as described in the following points, and shown spatially in **Figure 20**.

Figure 20: Interim National Multimodal Freight Network



Source: US Department of Transportation

- **National Multimodal Freight Network (NMFN)** – Improves on the original PFN of MAP-21 by becoming more expansive, and multimodal in scope. It includes all the freight networks described below.
- **National Highway Freight Network (NHFN)** – This network is 51,029 miles in size, nationwide. Total mileage will fluctuate, as new Interstates are added to the system, and thus automatically become part of the network. The NHFN consists of the following four subsystems:
 - **Primary Highway Freight System (PHFS)** – this network is 41,518 miles in length, nationwide. Within the HATS region, this network includes Interstate 81, Interstate 83, Interstate 76, and Interstate 283.
 - **Portions of Interstates not on the PHFS** – Within Pennsylvania, this includes routes such as Interstate 79 in its entirety, and Interstate 83 between the City of York and the Maryland State Line. The HATS region does not have any portions of Interstates that were not included in the PHFS.

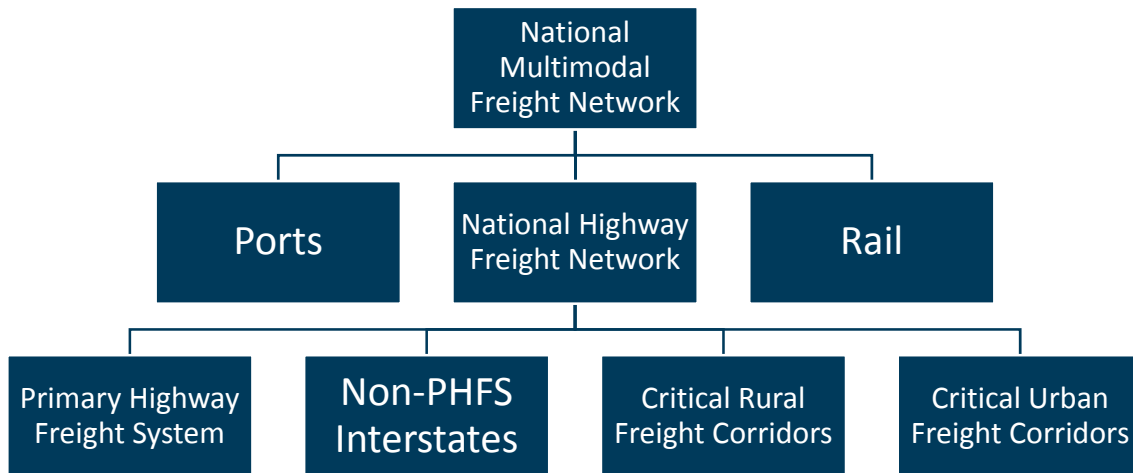
Regional Freight Plan

- **Critical Urban Freight Corridors (CUFCs)** – These priority freight segments typically consist of first- or last-mile connector routes from high-volume freight corridors to freight-intensive land and key urban freight facilities. They must lie within an urbanized area, or urban cluster as defined by the Census Bureau. The HATS MPO, in consultation with PennDOT, identified over 40 miles of candidate CUFCs to the network.
- **Critical Rural Freight Corridors (CRFCs)** – Priority freight segments classified as CRFCs lie outside of an urbanized area and satisfy one of seven or more criteria as defined by USDOT. As the HATS MPO considered which segments for this designation, it considered public roads that provide immediate links as first- and last-mile freight corridors to key rural freight facilities, including manufacturing centers, agricultural processing centers, farms, and intermodal facilities. Over 8 miles were identified as candidate CRFCs for the network.

The identification of CUFCs and CRFCs to the network makes these segments eligible for Federal National Highway Freight Network formula funds and FASTLANE Grant Program funds, pending their certification by USDOT. FHWA has instituted Pennsylvania’s mileage cap at 141.26 miles of Critical Urban Freight Corridors, and 282.53 miles of Critical Rural Freight Corridors.

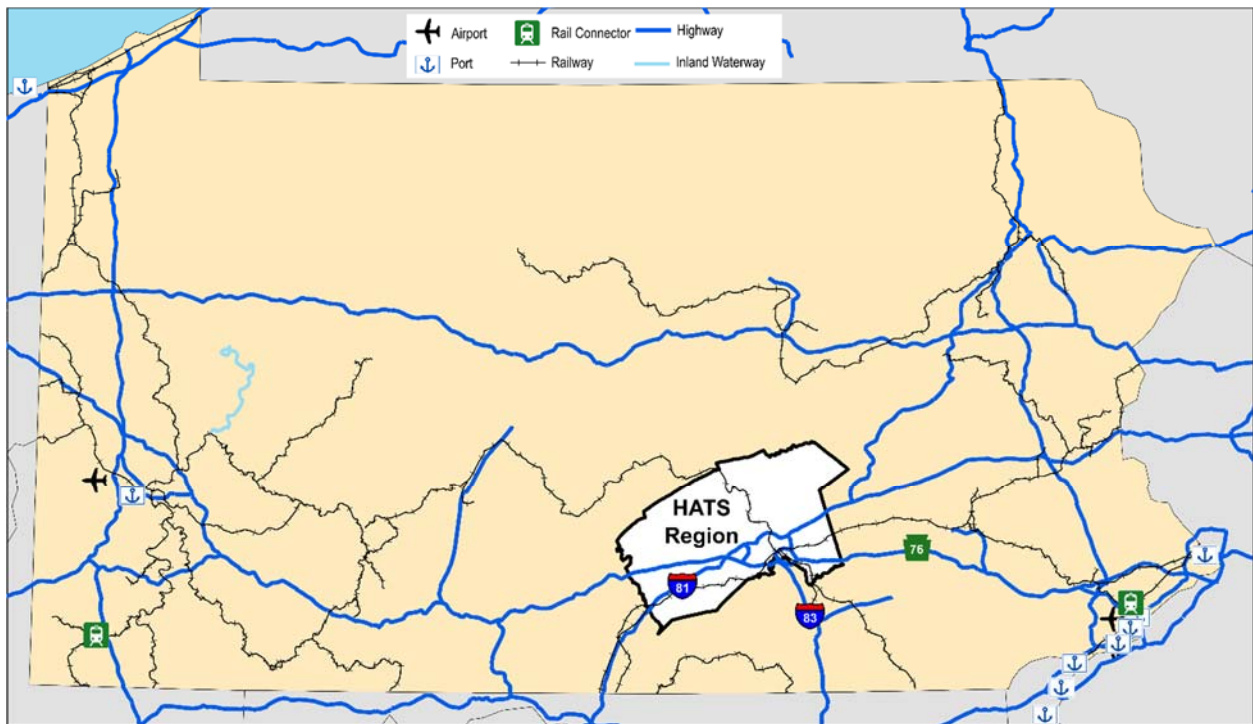
The relationship of the various subsystems within the National Multimodal Freight Network is illustrated in **Figure 21**.

Figure 21: The National Multimodal Freight Network and Related Subsystems



The HATS region’s share of the NMFN is displayed as part of **Figure 22**.

Figure 22: The HATS Region and Pennsylvania’s Position within the Proposed National Multimodal Freight Network (NMFN)



Source: US Department of Transportation

HATS’ candidate Critical Urban and Rural Freight Corridors are depicted in the following tables based on their priority as high, medium, or low. HATS formally approved the list in December 2016 and as of the writing of this plan, is awaiting FHWA’s action on certification of these priority freight roadway segments.

Regional Freight Plan

Table 12: Proposed Priority Freight Corridors (High)

Street/Route	From:	To:	County	Length(mi)	Priority	Description/Justification
PA 283	Union Street	I-283	Dauphin	2.6	1	Provides connection of freight facilities to I-283
PA 581	I-83	I-81	Cumberland	7.08	2	This area completes the Beltway and connects freight traffic generated from facilities along Route 11/Carlisle Pike to the interstates.
US 11	I-81	I-76	Cumberland	1.33	3	The "Miracle Mile" connects the PA Turnpike to I-81. Facilities located east of the interchanges generate heavy freight traffic.
Airport Connector (SR3032)	PA-283	PA 230	Dauphin	1.94	4	Provides connection to the system for FedEx and Harrisburg International Airport; According to the recent master plan for HIA (Leigh-Fisher, May 2016), HIA is expected to see an increase in air cargo activity.
Allen Road (PA 465)	PA 641	PA 174	Cumberland	2.3	5	Many freight facilities surround the exit 44 interchange. Top 100 Freight Generator statewide. Amazon Fulfillment Center connects to this interchange.
Ritner Highway (US 11)	PA 641	PA 465	Cumberland	1.9	5	Many freight facilities surround the exit 44 interchange. Top 100 Freight Generator statewide. Amazon Fulfillment Center connects to this interchange.
Cameron Street (PA 230)	Industrial Rd	I-81	Dauphin	0.57	6	Key truck thoroughfare through the City of Harrisburg. AADT approx. 25,000 and truck volume approx. 2,000.
Grayson Road	Existing Network/Old Triple Crown Driveway	New Triple Crown Driveway	Dauphin	0.95	7	Is one of the state's top 100 freight generators. Freight traffic generated by Triple Crown and Norfolk Southern Intermodal utilize this road to access Rutherford Yard. Current NHFN designation stops at the old access to the intermodal yard.



Table 13: Proposed Priority Freight Corridors (Medium)

Street/Route	From:	To:	County	Length(mi)	Priority	Description/Justification
Gibson Boulevard Corridor						
Gibson Boulevard	UPS Drive	19th Street (SR3007)	Dauphin	0.15	8	This area connects the UPS Harrisburg Hub along with other freight facilities to I-83. This area is a Top 100 freight generator, statewide.
19th Street (SR3007)	Gibson Boulevard	I-83	Dauphin	1.01	8	
Fulling Mill Road Corridor						
AIP Drive	Kreider Drive	Fulling Mill Road (SR3002)	Dauphin	0.29	9	Heavy concentration of warehouses in this area. Facilities include FedEx, Hershey's Ice Cream. AADT approx. 7,000 and truck volume approx. 600
Fulling Mill Road	AIP Drive	Union Street	Dauphin	0.67	9	
Union Street	Fulling Mill Road (SR 3002)	PA-283 Interchange	Dauphin	0.26	9	
PA 283	Union Street	I-283	Dauphin	see above	see above	see above
US 11						
US 11	Farmers Street	I-81	Cumberland	2.51	10	High freight generators along this corridor with connection to I-81.
Silver Spring Road (SR 1011)	Old Silver Spring Road	Carlisle Pike (US 11)	Cumberland	1.67	11	Salem Church Road is closed to truck traffic which redirects freight movement to Silver Spring Road on Brackbill Blvd and Baseshore Rd. This provides connection with Carlisle Pike. This area partially falls within one of the state's Top 100 Freight Generators.
PA 233	I-81	PA 174	Cumberland	1.4	12	Corridor expected to see industrial growth and increased freight movement. Unilever and Office Depot warehouses are currently generating freight movement activity in the area.
St. Johns Church Road/Trindle Corridor						
St. Johns Church Road (SR2029)	Norfolk Southern RR Crossing	Carlisle Pike (SR1010)	Cumberland	1.01	13	This area is within one of the state's Top 100 Freight Generators. Freight movement coming from facilities e.g.,

Regional Freight Plan

Street/Route	From:	To:	County	Length(mi)	Priority	Description/Justification
Carlisle Pike (SR1010)	St. Johns Church Road (SR2029)	PA 581	Cumberland	0.81	13	Land O'Lakes/Purina Feed utilize this series of roadway segments to access to PA 581.
Trindle Road (PA 641)	St. Johns Church Road (SR2029)	PA 581	Cumberland	0.21	13	
PA 39	Manor Dr	Jonestown Rd	Dauphin	1.74	14	Truck corridor est. at 134,000 tons. AADT approx. 5,000 and truck volumes approximately 200.
US 22/322	11/15 Interchange	Linglestown Rd (PA 39)	Dauphin	11.5	15	This is a key access point for trucks heading north. AADT approx. 40,000, truck volume approx. 8,000.
Cameron Street Corridor						
Cameron Street (PA 230)	Industrial Rd	Paxton St.	Dauphin	2.58	16	Key truck thoroughfare through the City of Harrisburg. AADT approx. 25,000 and truck volume approx. 2,000.
Paxton Street	Cameron St	13th Street	Dauphin	0.2	16	
13th Street	Paxton St.	I-83 Interchange	Dauphin	0.12	16	

Table 14: Proposed Priority Freight Corridors (Low)

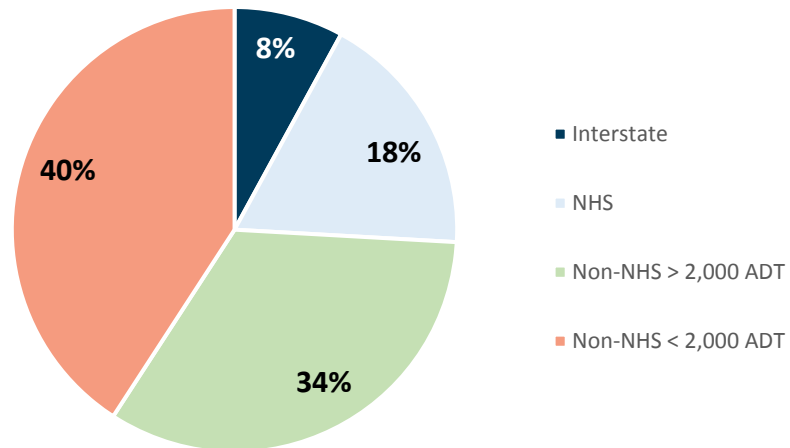
Street/Route	From:	To:	County	Length(mi)	Priority	Description/Justification
Walnut Bottom Road (PA 174)	SR 4003 (JLG Industries)	I-81	Cumberland	2.04	17	Connects JLG Facilities to I-81. There is potential for future industrial growth since warehouses are slowly developing in this area.
Lingle Avenue	Hersheypark Drive	PA 743	Dauphin	1.065	18	Freight traffic generated from Lebanon County freight facilities utilize this road to access PA 743, which allows access to I-81.
PA 743	Hersheypark Drive	I-81	Dauphin	6.18	18	Connects Hershey Food/Resorts and Entertainment, Reese Candy, etc. to I-81.

Source: HATS

Pavement Conditions

Figure 23 shows how the region’s roadways are organized across PennDOT’s major business plan networks: Interstates; the National Highway System (NHS); non-NHS with greater than 2,000 ADT; and non-NHS with less than 2,000 ADT. The figure shows that the Interstates comprise a minute portion of the overall system, compared to the non-NHS roadways.

Figure 23: Segment Miles by Business Plan Network, 2016



Source: PennDOT

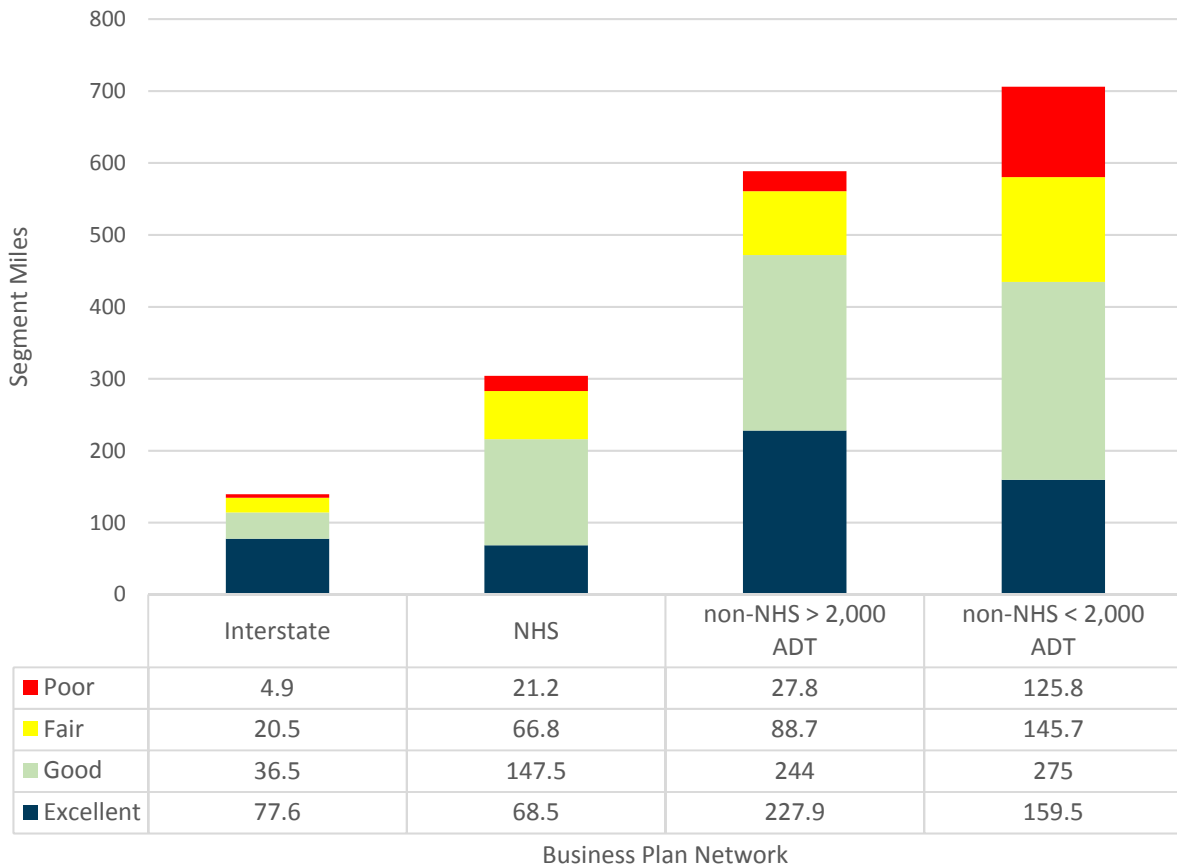
PennDOT and HATS analyze pavement needs in different ways, including International Roughness Index (IRI), which indicates the level of roughness on a roadway (a lower number indicates a better score).

Figure 24 shows a snapshot of the region’s existing pavement conditions, by business plan network. The figure demonstrates that PennDOT and HATS have driven down IRI values on its most important, higher-order networks such as its Interstates and Non-Interstate NHS routes that carry the most freight.



Regional Freight Plan

Figure 24: Pavement Condition (IRI Ratings) by Business Plan Network, 2016



Source: PennDOT Performance Measures

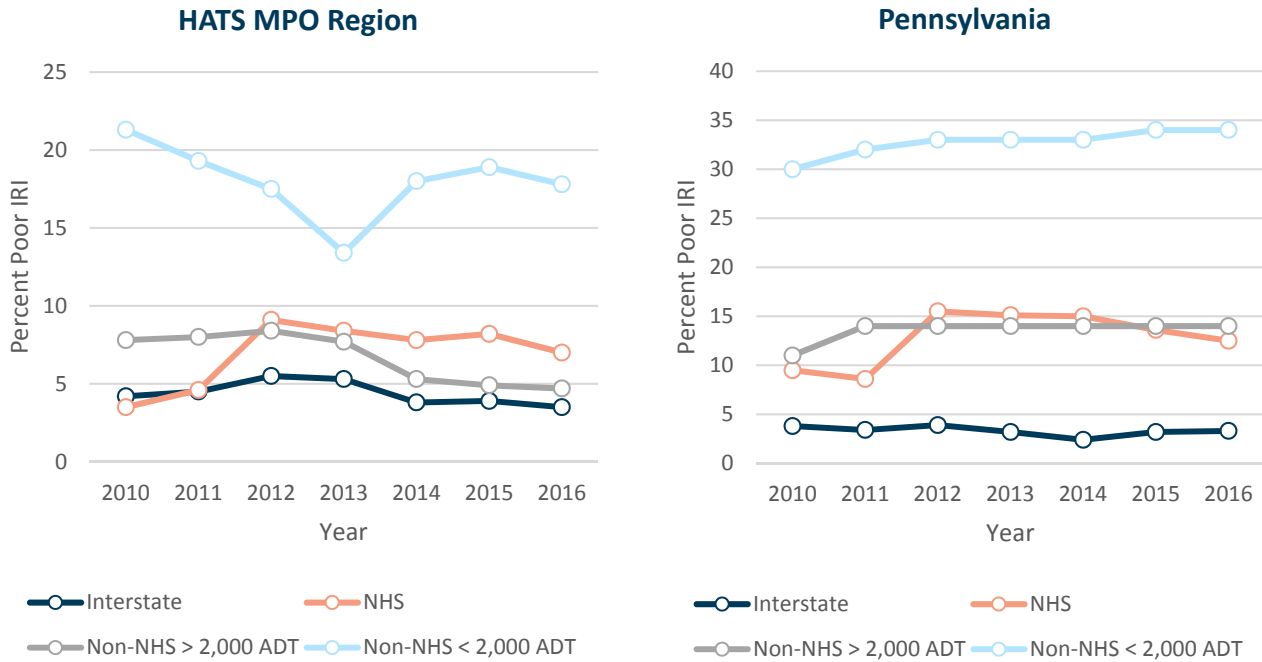
Trends in IRI values have varied across the system in recent years, but in general have decreased from their 2010 baseline, signaling an overall improvement in pavement quality. Pavement quality for Non-NHS > 2,000 ADT has been increasing over the past 5 years as exhibited by the decreasing IRI values. While IRI values in 2015 for the region’s interstates and non-NHS <2,000 are lower than their 2010 baseline values, these IRI values are higher than those in previous years. Pavement conditions on the NHS, however have been declining, as exhibited by the rising IRI values shown in **Figure 25**.

The figure demonstrates that overall pavement quality has improved since 2010 and that pavement quality in the HATS region compares favorably with statewide trends, when measured as a percentage of “Poor” IRI values.

The International Roughness Index (IRI) is a pavement roughness index that is obtained from roadway profiles for evaluating road systems. The higher the number, the poorer the pavement quality.



Figure 25: “Poor” IRI Ratings by Business Plan Network, 2010-16 (%)

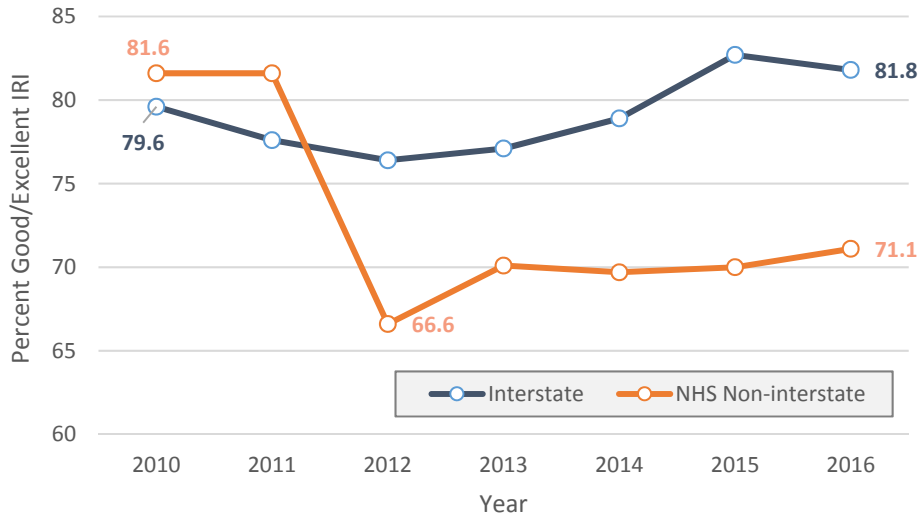


Source: PennDOT Performance Measures

“Good” and “Excellent” IRI values on the region’s highest-order roadways, such as its interstates and Non-Interstate NHS routes (e.g., US 11, US 322, etc.) overall have varied since their 2010 baseline was established. IRI values have been improving in recent years as shown in Figure 26. The percentage of the region’s Interstate segments rated as “Good” or Excellent has risen from a 2010 value of 80.0 percent, to a 2016 rate of 81.8 percent. However, values of NHS Non-Interstate route segments have fallen over the same time period, from 81.6 percent, to just 71 percent in 2016.

Much of this decline in IRI values on the Non-interstate NHS can be attributed to the additional mileage of roadway added to the NHS with the passage of MAP-21 in July 2012. As an example, many 4-digit SRs then became part of what became known as the “enhanced NHS,” including portions of SR 1010 (Market Street), 1014 (Camp Hill Bypass), SR 1027 (Front Street), and SR 1029 (a portion of Second Street) in Cumberland County; and SR 3001 (Eisenhower Blvd), SR 3009 (Front Street), SR 3010 (Paxton Street), SR 3012 (Derry Street), SR 3014 (State Street), SR 3016 (Forster Street and the Harvey Taylor Bridge), SR 3018 (Herr Street), SR 3020 (Union Deposit Road), and SR 3022 (two separate bridges on Maclay Street) in Dauphin County. No new mileage was added to the NHS from Perry County as a result of the law.

Figure 26: “Good/Excellent” IRI Ratings for Interstate and Non-interstate NHS, 2010-16 (%)



Source: PennDOT Performance Measure Report

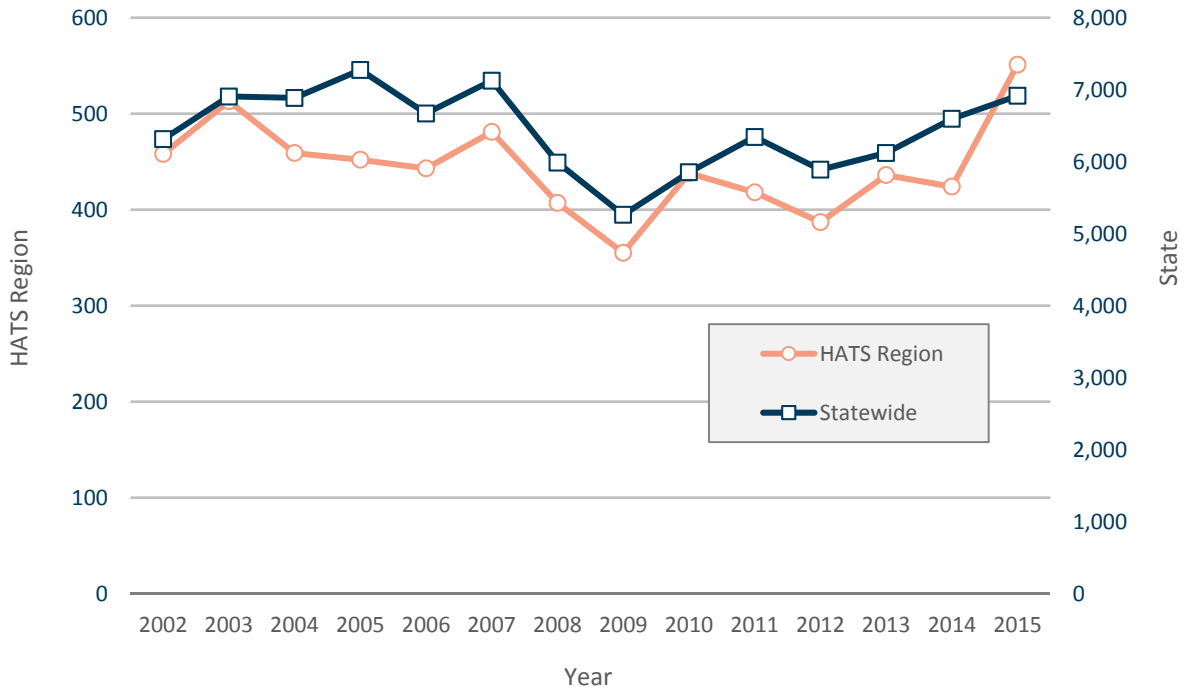
Highway Safety

The total number of heavy truck crashes occurring within the HATS region has followed the overall trend for the state, declining from 2007 until 2009 and then steadily increasing in number. For the decade ending 2015, the region averaged 434 heavy truck crashes per year. Cumberland County historically leads the region in the total number of heavy truck crashes, averaging 212 annually over the past decade. In contrast, Perry County has experienced the fewest number of crashes, averaging only 25 per year. **Figure 27** compares trends in truck crashes within the HATS region to Pennsylvania.

Average Annual Truck Crashes 2006-15	
Cumberland	212
Dauphin	197
Perry	25



Figure 27: Truck Crashes, Region and State, 2002-15



Source: PennDOT

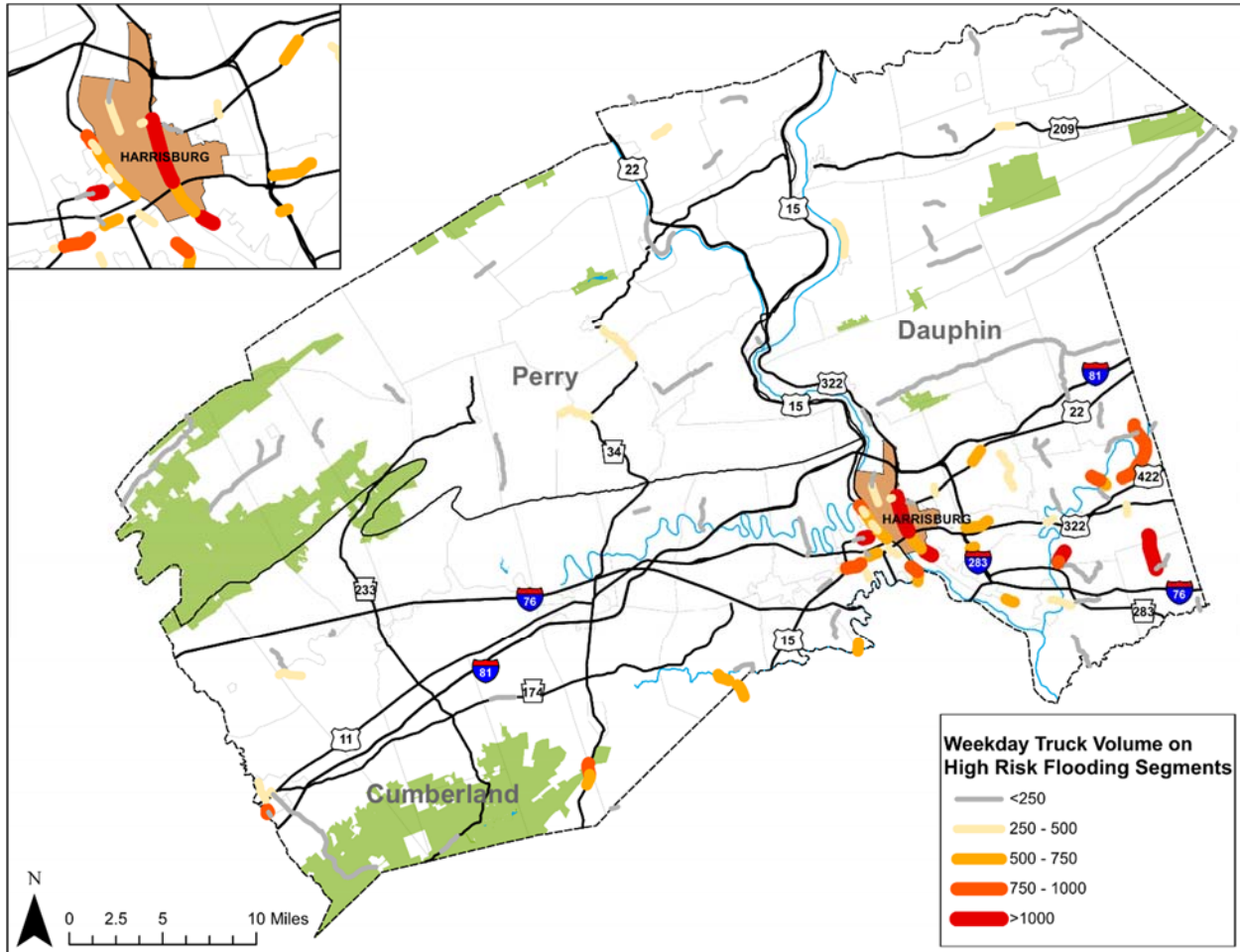
Flooding Vulnerability

PennDOT has recently completed an *Extreme Weather Vulnerability Study* to identify historic flooding locations on state-owned roads and bridges. The study utilized PennDOT’s Road Conditions Reporting System (RCRS) and collected stakeholder comments representing more than 3,000 miles of vulnerable roadway segments statewide. This data was combined with truck volumes from PennDOT’s Roadway Management System (RMS) and used to develop maps highlighting the locations of flooding vulnerabilities within the HATS region.



Figure 28 provides color coding of each flooding location by the number of trucks travelling at that location.

Figure 28: Truck Flooding Vulnerability



Source: PennDOT RMS

Bridges

The HATS region’s transportation system is undergird with 1,087 state-owned bridges greater than 8 feet in length, and 230 locally-owned bridges that are greater than 20 feet in length.¹ All of these bridges are tracked within PennDOT’s Bridge Management System (BMS). The MPO, along with PennDOT, has been working in recent years to address its deteriorating bridge stock. The achievements in this area are reflected in the most recent numbers that are available.

State-owned Bridges

Of the region’s state-owned bridges, 126 are considered to be structurally deficient (SD). The region’s SD bridge rates have been trending in a favorable direction in recent years, as its total of state-owned SD bridge rate decreased from 13 percent in 2010 to 11.6 percent in 2017. When measuring SD rates by the

¹ It is bridges of this length and ownership type that are included within PennDOT’s Bridge Management Data system (BMS). This dataset includes extensive information and data regarding the extent and condition of these structures, statewide.



more meaningful measure of bridge *deck area*, there has been an increase in structural deficiency by square footage.

Table 15 includes more detailed information on the condition of the region’s state-owned bridges greater than 8 feet in length compared to Pennsylvania.

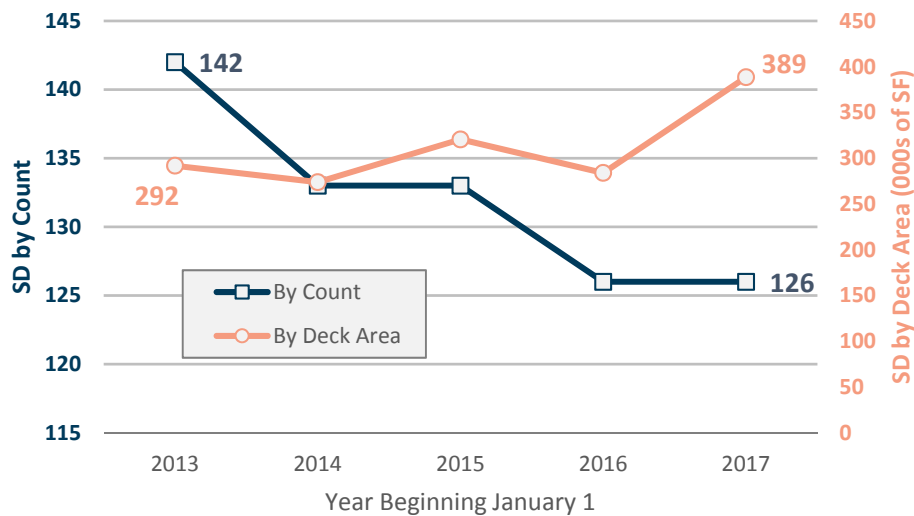
Table 15: State-owned Bridge Conditions, 2017

	Total Count	Deck Area (MSF)	Closed	Posted	SD Count	% SD by Count	SD Deck Area (MSF)	% SD by Deck Area
Cumberland	372	1.634	1	7	39	10.5%	0.100267	6.1%
Dauphin	440	4.523	0	2	35	8.0%	0.233312	5.2%
Perry	275	0.547	0	11	52	18.9%	0.054936	10.0%
HATS Region	1,087	6.704	1	20	126	11.6%	0.388515	5.8%
Pennsylvania	25,393	114.459	35	695	3,512	13.8%	9.69487	8.5%

Source: PennDOT BMS, January 4, 2017

PennDOT and HATS continue to program bridge projects in driving down the region’s rate of structurally deficient bridges. Just over the past four years, the total number of structurally deficient state-owned bridges throughout the region has been reduced by over 10 percent, from 142 to 126. **Figure 29** shows the progress that PennDOT and the MPO have been making in reducing the total number of SD bridges within the region. However, when measuring SD bridge performance based on deck area, the square footage of SD bridges has increased over the same period.

Figure 29: State-owned SD Bridge Conditions, 2013-17

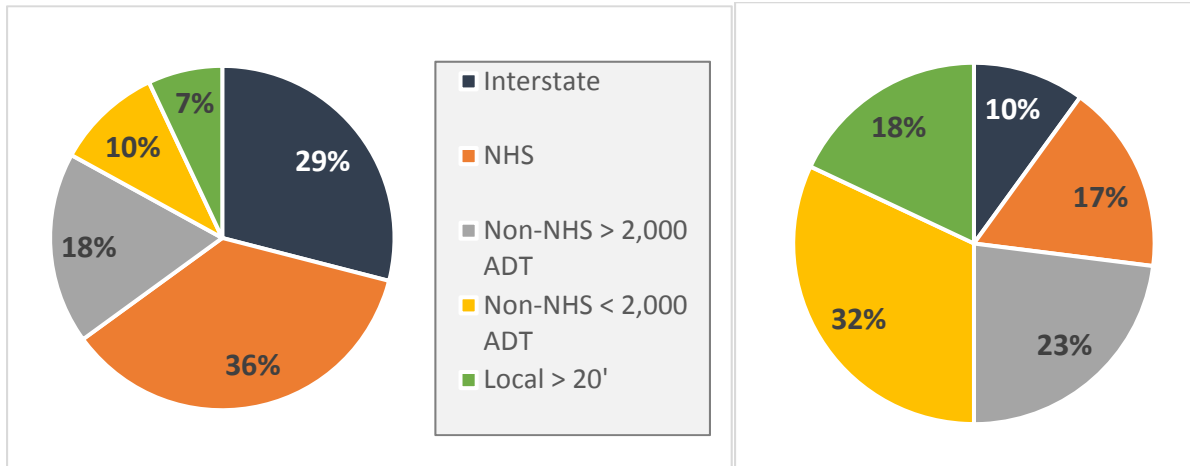


Source: PennDOT BMS

Regional Freight Plan

Figure 30 shows how the region’s bridges are arrayed across PennDOT’s five major business plan networks: Interstates; the National Highway System (NHS); non-NHS with greater than 2,000 ADT; non-NHS with less than 2,000 ADT; and the Local system. The region’s largest bridges are on the Interstate system. Only 10 percent of the region’s bridges are Interstate bridges, yet they comprise nearly 30 percent of all bridge deck area. Conversely, the bridges on the region’s lower-order roadways tend to be shorter and more numerous, as indicated in the following figures.

Figure 30: Bridges by Business Plan Network, by Deck Area, and Count, December 2016 (%)



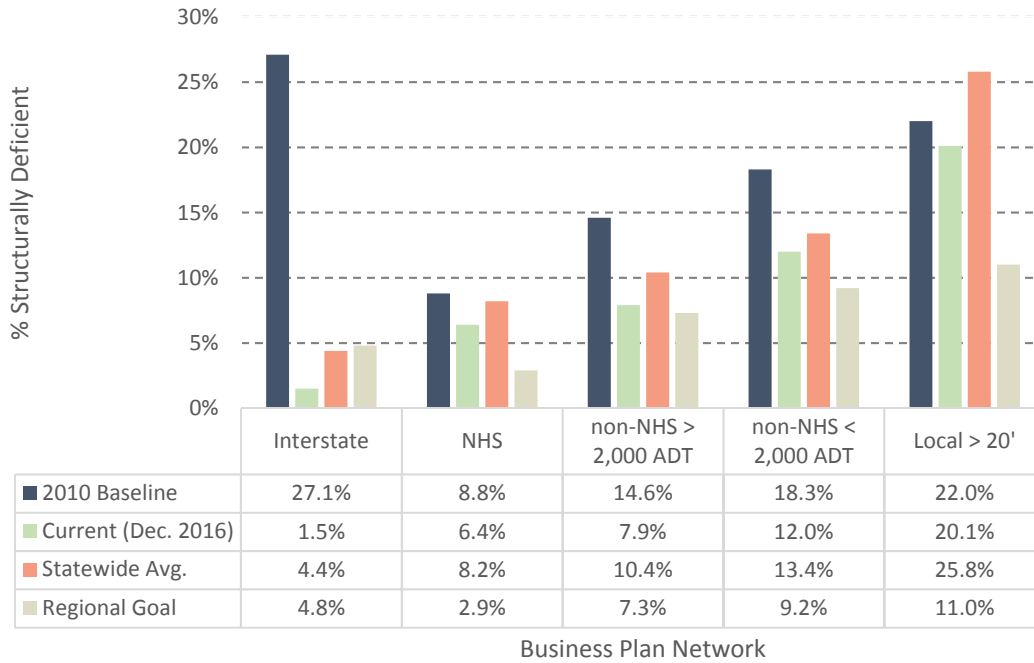
Source: PennDOT

by Deck Area

by Count

Figure 31 demonstrates the good work that PennDOT and the MPO have done over the past six years in maintaining the region’s bridge inventory at an acceptable operating condition. The figure shows how bridge conditions have changed across the business plan networks since the 2010 base year. SD bridges on the region’s Interstates are now almost completely addressed, with 31,500 square feet of deck area remaining. Rates of SD bridges have improved across every business plan network including Non-NHS > 2,000 ADT and Non-NHS < 2,000 ADT. With the exception of bridges on the lower-order networks and on the local system, the region has achieved its targets for SD ratings.

Figure 31: Structural Deficiency by Deck Area, December 2016 (%)



Source: PennDOT

Local Bridges (>20')

Conditions on the region’s locally-owned bridge network are generally worse compared to its state-owned bridges. Of the region’s 230 locally-owned bridges (>20’), 51 are considered to be structurally deficient. When measured by total deck area, the HATS region has an overall SD percentage of 20.3 percent, which is over 6 percentage points better than the state’s rate of 26.4. When measured by bridge count, the overall regional rate of 20.3 percent is significantly better than the state percentage of 32.6; however, conditions vary significantly by county. Dauphin County has the lowest SD percent in the region with 17.8 percent whereas Perry County has the highest SD percent with a rate of 30.2 percent. **Table 16** provides more information on the region’s stock of locally-owned bridges.



Regional Freight Plan

Table 16: Locally-owned Bridge Conditions (>20'), June 2016

County	Total Count	Deck Area (MSF)	Closed	Posted	SD Count	% SD by Count	SD by Deck Area (MSF)	% SD by Deck Area
Cumberland	69	.1594	2	19	16	23.2%	.0325	20.4%
Dauphin	118	.3058	4	9	21	17.8%	.0619	20.2%
Perry	43	.0511	3	17	13	30.2%	.0103	20.2%
HATS Region	230	.5163	10	45	51	22.2%	.1047	20.3%
Pennsylvania	6,458	14.510	188	1,668	2,116	32.6%	3.8276	26.4%

Source: PennDOT BMS

County-owned Bridges (>20')

Included within the numbers shown in **Table 17** above are those of county-owned bridges greater than 20 feet in length. Within the HATS region, there are 86 of these structures. Conditions of this subset of bridges are most acute in Cumberland County, where over 30 percent of county-owned bridge deck area is considered structurally deficient, compared to a statewide rate of nearly 25 percent. **Table 17** provides more details on the region's county-owned bridges greater than 20 feet in length.

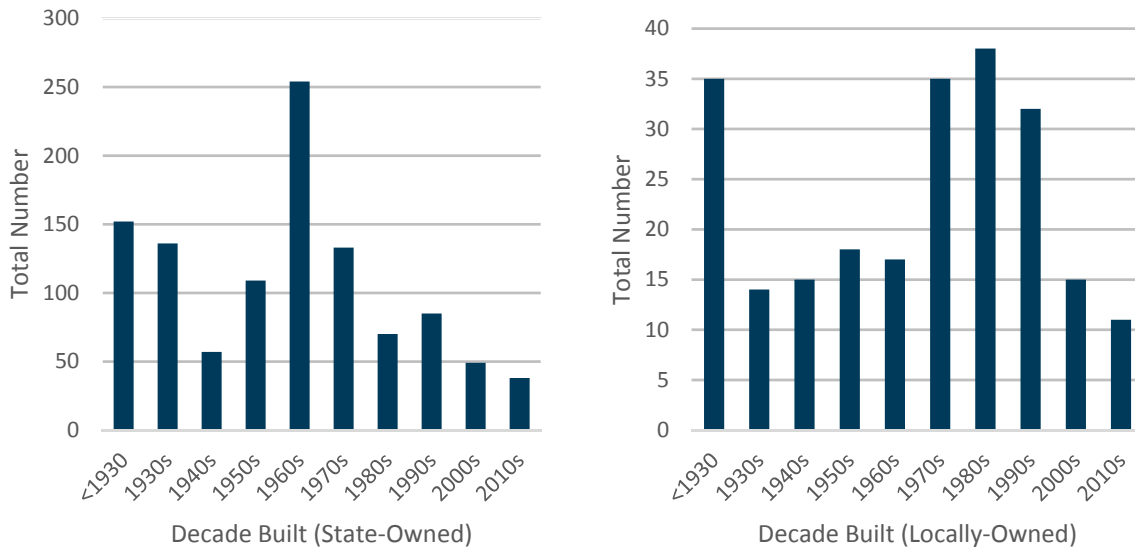
Table 17: County-owned Bridge Conditions (>20'), January 2017

County	Total Count	Deck Area	Closed	Posted	SD Count	% SD by Count	SD by Deck Area	% SD by Deck Area
Cumberland	23	97,481.8	2	10	10	43.4%	29,333.0	30.1%
Dauphin	51	142,767.5	2	0	4	7.8%	14,060.9	9.8%
Perry	12	25,481.7	1	6	2	16.7%	3,792.0	14.9%
HATS Region	86	265,731.0	5	16	16	18.6%	47,185.9	17.8%
Pennsylvania	2,658	7,011,742	88	742	811	30.5%	1,721,566	24.6%

Source: PennDOT BMS

Within the HATS region, the average state-owned bridge is 56 years old. Locally-owned bridges are on average four years newer. A time series analysis of both state- and locally-owned bridges in the HATS region shown in **Figure 32** depicts an aging inventory. HATS will be faced with a greater stock of interstate-era bridges (read: 1950s and 1960s construction) that are requiring greater maintenance and rehabilitation attention. Depression-era bridges and those bridges built before 1930 also represent an inordinate share of the region's bridge stock (particularly those that are locally-owned) and may need to be replaced altogether. (Over 20 percent of all the region's locally-owned bridges were built before 1940.) Many of these older bridges are now facilitating the movement of greater volumes of trucks, complicating the upkeep of these older structures.

Figure 32: Bridges by Decade Built, State- and Locally-owned



Source: PennDOT

Rail

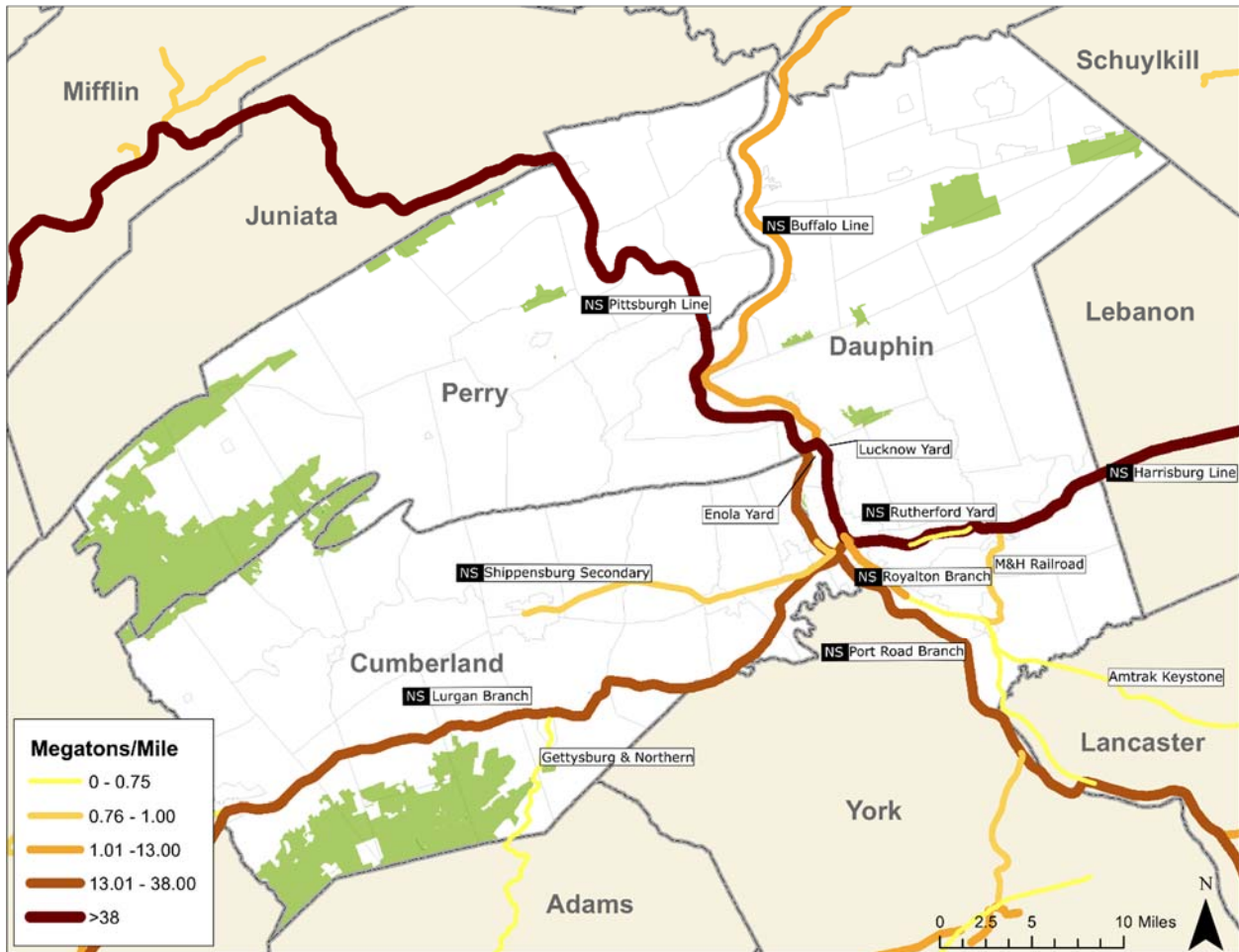
Throughout its history, one thing has remained constant regarding the Harrisburg region: it has been a railroading hub almost since the industry’s inception in Pennsylvania in 1809.

Railroading in Harrisburg has evolved over time, from the rise and fall of the Pennsylvania Railroad, to the deregulation of the industry wrought by the Staggers Act of 1980, to the divestiture of Conrail in 1998. The advent of containerization, along with the passage of international trade agreements and construction of double-stack clearance projects have cleared the way for a railroad industry that is operating more efficiently than ever, even as it currently grapples with an ongoing decline in coal traffic, which has long been a mainstay of the industry.

Today, shippers and receivers in the HATS region are connected to the national rail network through a mix of short lines and a Class I carrier in Norfolk Southern (NS). Pennsylvania leads the nation in the total number of operating railroads (with more than 50), and has more than 5,000 route miles of railroad. The strength of the region’s railroad infrastructure is vital to ensuring proper rail connections to the state and nation. The extent and rail line density of the region’s rail network is as shown in [Figure 33](#).

Regional Freight Plan

Figure 33: HATS Region Rail Line Density



Source: PA On Track

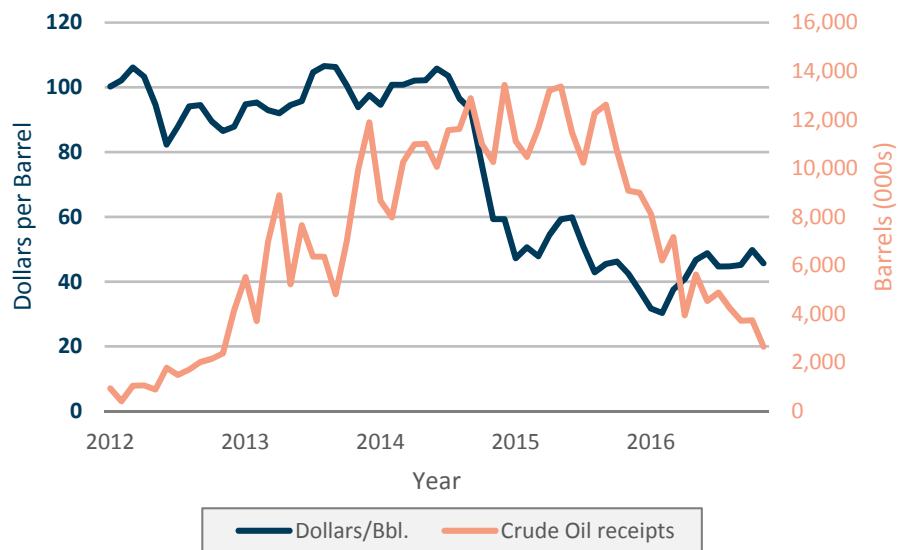
The commonwealth itself has historically been a strong supporter of rail freight, given the scope of the industry within the Keystone State. PennDOT’s Rail Freight Assistance Program (RFAP) currently provides \$10 million of vital assistance annually to regional railroads and short lines, while the commonwealth’s Capital Budget provides an additional \$30 million. (The RFAP is underwritten through the commonwealth’s new Multimodal Fund, created by Act 89 of 2013.) The grant funding comes with a 30 percent local match requirement.

Overall, the railroad industry has been resilient in adapting to the economic forces that have affected its core business. Much of the state’s rail infrastructure was originally built to haul coal. The decline of this traffic can be traced to a variety of factors, including more stringent EPA regulations that have accelerated the closure of coal-fired electric generating stations. The decline in natural gas energy prices, along with an increase in wind and solar power projects have also suppressed a demand for coal. The strong U.S. dollar also has negatively affected demand from export customers.



Some of the carrying capacity has been made up in the movement of crude oil. The advent of “fracking” as a drilling technique has over the past decade become commonplace in Pennsylvania’s Marcellus Shale region as well as in North Dakota’s Bakken Formation. As oil production has soared, shippers turned to the railroad in delivering their commodity to refineries in Philadelphia and Marcus Hook. These trains navigate their way through the HATS region on their way to their East Coast destinations. As with any other commodity, the movement of oil is subject to the vagaries of the economy, and a drop in oil prices that began in June 2014 has since made it more advantageous for East Coast refiners to import oil as opposed to moving deliveries from the Bakken Formation (**Figure 34**). The anticipated expansion of pipeline capacity nationally is expected to further displace the need for unit oil trains.

Figure 34: World Oil Prices and East Coast Receipts by Rail from Midwest of Crude Oil



Source: Energy Information Administration

Intermodal traffic (or the movement of containerized cargo and trailers) has been a growth area for the railroad industry for many years. This traffic declined during the Great Recession of 2007-09, but has recovered since then. Oil prices, rebounding from a low of \$39 a barrel in early 2009, to a figure of \$110 two years later, encouraged over-the-road movements in switching from highway to rail. The aforementioned decline in oil prices since 2014 has naturally dampened demand for rail intermodal traffic to some extent, with this traffic diverting to the highway.

As railroads adjust to these headwinds, they must also consider technological changes now under development in connected and highly automated trucks. The advent of this technology – including driverless trucks and platooning – could mean further volume losses for railroads as the technology becomes more widespread and operational within the next 25-30 years. Pennsylvania has been positioning itself as a leader in encouraging the development of this technology. It has already developed policy for the testing of these vehicles in advance of legislation that is anticipated of being developed and passed by the General Assembly in fall 2017.

Regional Freight Plan

The Trump Administration is expected to have an impact on freight's mode split between highway and rail, as "For the first time ever, the word 'infrastructure' was mentioned in an inaugural address."² The motor carrier industry faces a shortage of drivers in coming years, and new Federal regulations will require truck drivers to log their drive times and rest periods electronically. Many of the Eisenhower-era Interstate highways and bridges that were built are also nearing the end of their design life and in need of being reconstructed altogether.

The transportation industry awaits to see how the new administration and the 115th Congress will address the nation's transportation system at the Federal level. The FAST Act provides funding for transportation only through September 2020.

A description of the region's major rail freight carriers and related rail freight activity is discussed within the following section.

Norfolk Southern (NS)

Norfolk Southern is the region's primary provider of rail freight service, with over 198 miles of track throughout the three-county area. Harrisburg is one of three primary intermodal hubs in the Norfolk Southern system east of the Mississippi, incorporating the Harrisburg (Lucknow) and Rutherford Intermodal Yards. The region is also situated at the northern extent of the railroad's Crescent Corridor initiative, which is its highest expansion priority. Norfolk Southern's yards are connected to the National Highway System through Federally-designated "NHS Connectors."

NS' Harrisburg Line to Reading and points north and east is expected to remain critical and is currently expanding capacity. Intermodal shipments (shipped by rail and converted to trucks at a rail intermodal yard (e.g., NS Rutherford and Harrisburg Yards) represents the fastest-growing segment of the rail freight industry. NS is also investing millions of dollars on this section of the Crescent Corridor to parallel Interstate 81 with double track, double stack service. The Crescent Corridor, shown in **Figure 35**, traverses the HATS region and facilitates the movement of domestic intermodal traffic and is intended to be a strong competitor to single-driver, over-the-road truck shipments of more than 500 miles. NS' ultimate goal is to offer high-speed, premium service to intermodal customers shipping between the Northeast and the Southeast.



² Doug Peterson, President and CEO of S&P Global

In recent years NS has received federal TIGER grant funding to offset costs required to improve the Crescent Corridor initiative including infrastructure and operations improvements at the Harrisburg Intermodal Rail Yard, and increase the capacity by 50 percent of the existing double-stack truck-rail transfer facility at the Rutherford Intermodal Operations Rail Yard. NS estimates that improvements to the Crescent Corridor will produce the following estimated annual benefits:

- 1.3 million long-haul trucks diverted from interstates
- \$146 million in accident avoidance savings
- 1.9 million tons in CO² reduction
- \$575 million in congestion savings
- \$92 million in highway maintenance savings
- 169 million gallons in fuel savings

NS also operates a classification yard in Enola.

Figure 35: Norfolk Southern's Crescent Corridor



Source: Norfolk Southern

Other Class I Service

Norfolk Southern's primary competitor in the East, CSX Transportation, has trackage rights on the Lurgan Branch, from the Enola Yard to Lurgan (just west of Shippensburg in Franklin County). From there, CSX owns the line south through Franklin County to its new multimodal facility near Chambersburg.

Canadian Pacific (CPR) no longer operates in Pennsylvania. NS acquired their trackage rights on the NS Buffalo Line from Lucknow Yard north to Sunbury, and on the Harrisburg Line east to Reading.

Middletown & Hummelstown Railroad

Middletown & Hummelstown Railroad operates a short line railroad between its namesake communities in southern Dauphin County. In Hummelstown, the line connects with the NS Harrisburg Line. The railroad has four at-grade crossings, including a notable one at US 322. This particular crossing limits train crossings to Hummelstown at 12 per year, which minimizes freight movement along the line. The line features several shippers that could not survive without rail freight access. The railroad also provides passenger excursion trips from Middletown.

Steelton & Highspire Railroad

The S & H Railroad provides access between Pennsylvania Steel Technologies on the former Bethlehem Steel site in Steelton and Highspire Boroughs and Norfolk Southern's operations along the Amtrak Keystone Corridor between Harrisburg and Middletown.

Gettysburg and Northern Railroad

The Gettysburg and Northern Railroad operates a 25-mile longline between Gettysburg in Adams County and Mount Holly Springs in Cumberland County. In Gettysburg, the line interchanges with CSX and in Mount Holly Springs where it interchanges with NS. Gettysburg & Northern Railroad Co will be receiving \$107,250, as part of the state's investment in rail projects, to rehabilitate and install a new turnout to an existing dead-end stub track siding to create a 2,400 turnaround track.

At-grade Crossings

Crashes involving rail crossings are rare within the HATS region with only nine recorded from 2006-15. The majority of these crashes, five in total, occurred in Dauphin County. For the decade ending 2015, there has been only one recorded fatality. Most years record zero at-grade railroad crossing crashes. Many of the vehicle/train crashes that occur come as a result of motorists trying to circumvent or purposely violate active control devices. **Table 18** shows trends in at-grade railroad crossing crashes within the region over the past decade.





Table 18: At-grade Railroad Crossing Crashes, 2006-15

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Cumberland	0	1	0	0	0	0	0	0	0	1
Dauphin	1	1	1	0	0	1	0	0	0	1
Perry	0	1	0	0	0	1	0	0	0	0
HATS Region	1	3	1	0	0	2	0	0	0	2

Source: Pennsylvania Crash Information Tool

Air Cargo

Air cargo service in the region is provided by Harrisburg International Airport (HIA). HIA’s location adjacent to major shipping routes (I-76, I-81, and I-83) allows for easy transfer of cargo to and from connecting highway infrastructure. In addition to HIA, Capital City Airport, located just outside of the HATS region in York County, provides aviation services.

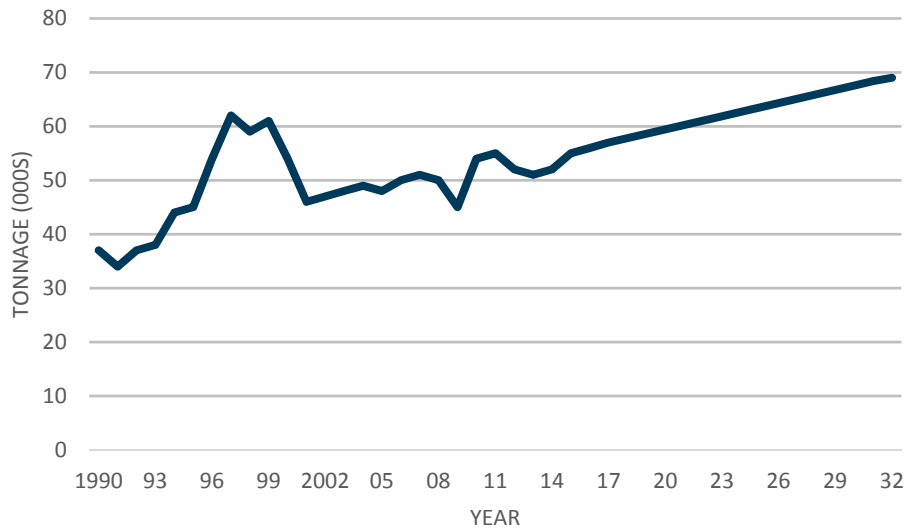
Harrisburg International Airport is currently Pennsylvania’s third-largest commercial airport in terms of passenger enplanements. Located about 1.5 miles west of Middletown Borough, HIA is situated on an approximately 800-acre site adjacent to the Susquehanna River. Most major U.S. airline carriers or their subsidiary regional carriers serve the airport; carriers providing service include those shown in the accompanying table.

 <ul style="list-style-type: none"> • Toronto 	 <ul style="list-style-type: none"> • Atlanta • Detroit
 <ul style="list-style-type: none"> • Myrtle Beach • Orlando • Punta Gorda • St. Petersburg 	 <ul style="list-style-type: none"> • Franklin, Pa. • Pittsburgh
 <ul style="list-style-type: none"> • Boston • Charlotte • Chicago • Philadelphia 	 <ul style="list-style-type: none"> • Chicago • Washington

The airport has a single, concrete runway, 9,501 feet long and 200 feet wide. Air traffic is controlled by an FAA air traffic control tower, which is attended 24 hours a day. HIA also has a U.S. Customs facility to handle international activity.

In addition to commercial passenger services, HIA is also a significant cargo airport that is served by three major air cargo carriers (Federal Express (FedEx), United Parcel Service (UPS) and American Airlines). In terms of cargo weight landed, HIA ranked third in the state and sixty-eighth in the country. Since 1990, air cargo tonnage has increased by 15,000 tons, and is projected to increase by an additional 17,000 tons by 2032. HIA’s historic and forecasted air cargo tonnage is shown in **Figure 36**.

Figure 36: HIA Historic and Forecasted Air Cargo Tonnage



Source: HIA Master Plan

Facility Needs

The HIA Master Plan, completed in 2016, identified the cargo facility as being undersized. The present air cargo landside is too small for its current capacity needs and will need to be expanded from 6.8 acres to 11 acres. While the air cargo warehouse is the appropriate size, projected growth in air tonnage will require the facility to be expanded to meet future demand. Expansion of the cargo apron, sorting facilities, and landside area would occur in a three-phased approach. In addition to expansion, the Master Plan recommends realigning Olmstead Drive. This would reduce the conflict between tugs, cargo trucks, and the Pennsylvania Air National Guard (PaNG) due to the current configuration.

The 2017 Twelve Year Program (TYP)

HATS works with PennDOT and other partners in developing a four-year transportation improvement program, which serves as the first four-year period of the Twelve Year Program (TYP). The State Transportation Commission (STC) adopted Pennsylvania’s most recent TYP on August 11, 2016. The HATS region’s share of this program includes nearly 360 projects and line items totaling over \$824 million in roadway and bridge improvements. **Table 19** summarizes the program for the HATS region.

Table 19: Composition of the 2017 Twelve Year Program

Project Type	Total Count	Cost (\$000s)
Highway Restoration	49	\$209,330
Bridge Replacement	138	\$118,032
Transit Line Item	n/a	\$93,703



Project Type	Total Count	Cost (\$000s)
Regional Reserve Line Item	n/a	\$87,184
Bridge Restoration	30	\$82,446
Bridge Preservation	64	\$56,969
CMAQ Regional Line Item	n/a	\$46,161
Safety	12	\$43,594
Highway Reconstruction	3	\$42,307
Additional Lanes	2	\$14,550
Congestion Reduction	2	\$12,600
General Maintenance	6	\$8,625
Preventive Maintenance	1	\$2,990
Air Quality	4	\$2,350
New Alignment	1	\$1,903
Railroad Crossing Safety	1	\$470
Transportation Alternatives	2	\$395
Bicycle/Pedestrian	1	\$220
Study	2	\$80

Source: PennDOT, August 11, 2016

From the preceding table, it is evident that the region is programming a significant majority of its transportation dollars on maintenance, rehabilitation, and restoration projects. A more detailed summary of the major program line items follows:

- **Highway Restoration** – A majority of the region’s highway dollars have been programmed for highway restoration projects. An illustrative sample of these include reconstruction of PA 283 in Dauphin County and US 22/322 resurfacing in Perry County.
- **Bridge Replacement** – There are over 130 projects of this type on the program, underscoring the great need the region has in investing in its bridge stock. Major projects include Ritner Highway Bridge-2 over Spring Creek and Walnut Bottom Road Bridge-A in Cumberland County, and Cameron Street over Asylum Run in Dauphin County.
- **Bridge Restoration** – Major bridge restoration projects include the I-81 River Relief Bridge connecting Cumberland and Dauphin Counties and the US 22 bridge over PA 34 in Perry County.
- **Safety** – Safety improvements are included as part of every programmed project, yet there are certain projects that are programmed specifically for the safety benefits. A few of the largest safety projects include I-81 northbound and southbound from PA 581 to PA 114 in Cumberland County, improvements to US 322 exit ramp in Dauphin County, and US 11/15 Rock Slope in

Perry County. The latter project was completed in the summer of 2016 following a complete closure of the roadway through Marysville.

- **Preventive Maintenance** – One major PM project includes the American Ex-POW Memorial Highway in Cumberland County.
- **Highway Reconstruction** – Programmed projects here include the \$31 million improvement to Exit 29 on I-81 in Cumberland County and \$8.4 million to improve the PA 283 and I-76 Interchange.
- **Bridge Preservation** – The region has over 60 projects under this line item, including Old Mill Road over Conodoguinet Creek and US 11 (Harrisburg Pike) southbound over the Bypass in Cumberland County and the Paxton Street Bridge over I-83 in Dauphin County.

Turnpike Capital Plan

In 2016, the Pennsylvania Turnpike Commission (PTC) adopted the FY 2017 Capital Plan. The plan identified maintenance, highway, and new construction projects for the next 10 years. These projects will improve the Turnpike’s safety, reliability, and accessibility. Twelve projects, totaling over \$186 million, have been identified for the sections of the Turnpike that pass through Cumberland and Dauphin Counties. **Table 20** summarizes these 12 Capital Plan projects.

Table 20: Turnpike FY 2017 Capital Plan for HATS Region

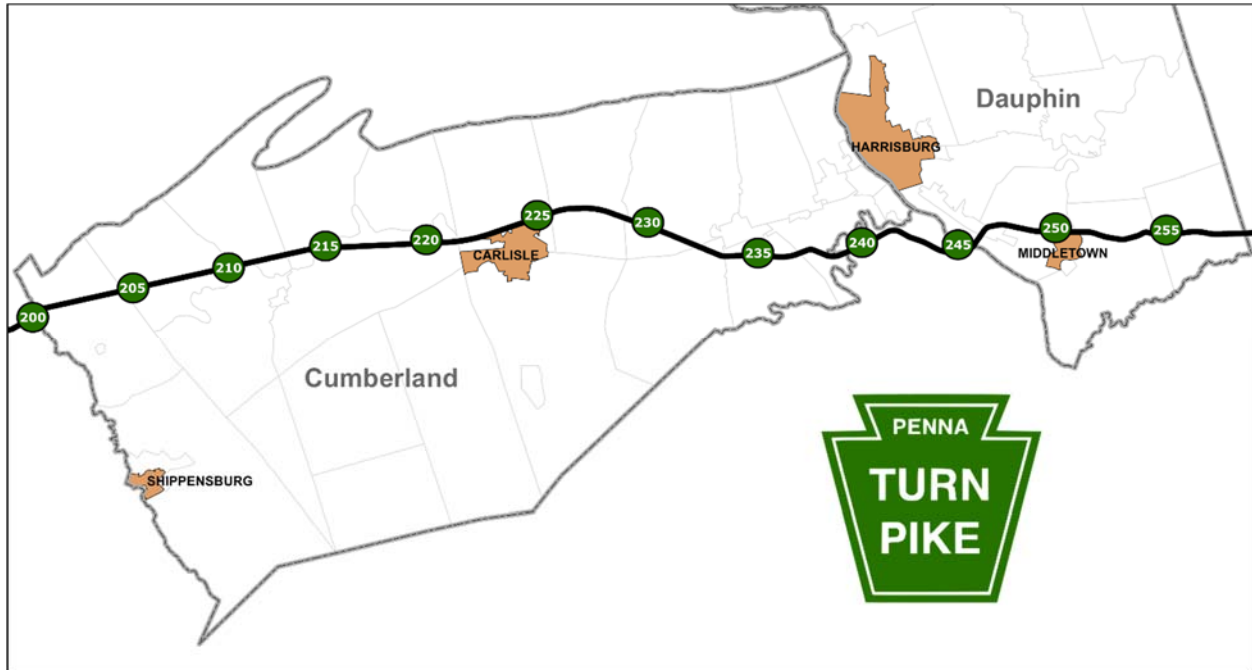
Project Category	Total Count	Cost (\$000s)
Roadway Safety	2	\$ 8,912
Bridge Tunnels & Misc Structure	4	\$ 41,867
Total Reconstruction	5	\$ 127,407
Facilities Design	1	\$ 8,713

Source: Pennsylvania Turnpike Commission, May 2016

Based on the previous table, over two-thirds of the \$186 million identified for Turnpike improvements in Cumberland and Dauphin Counties would be used for Total Reconstruction projects. A detailed summary of each project category is below.

- **Total Reconstruction** – A significant portion of funds would be used for the Total Reconstruction (Construction) of Milepost 202-206, Milepost 206-210, and Milepost 220-227. Additional projects include Total Reconstruction (Design) of Milepost 202-206 and Milepost 214-227. **Figure 37** shows the Turnpike Mileposts through Cumberland and Dauphin Counties. This reconstruction is part of the Turnpike’s \$2 billion Statewide Total Reconstruction Initiative, which will rebuild and widen the Turnpike in sections. Since the beginning of the initiative, 120 miles of the Turnpike have been reconstructed, including 18 miles through Cumberland and Dauphin Counties. An additional 14 miles of the Turnpike in Cumberland and Dauphin Counties are currently under construction. Once completed, the PTC will have invested over \$686 million in total reconstruction of the Turnpike through Cumberland and Dauphin Counties.

Figure 37: Pennsylvania Turnpike Mile Markers



Source: Pennsylvania Turnpike Commission

- **Bridge Tunnels & Misc Structure** - The Capital Plan identified over \$40 million in Bridge, Tunnels, and Miscellaneous Structure improvements. Projects include mainline replacements near Carlisle and Mechanicsburg, overhead replacement in Middletown, and replacement of the Swatara Creek Bridge.
- **Roadway Safety** – Almost \$9 million will be used for Roadway Safety projects, including .6 miles of bituminous overlay in Mechanicsburg and 8.3 miles of bituminous overlay from Highspire to Elizabethtown in Dauphin County.
- **Facilities Design** – The Capital Plan designated \$8.7 million for the East Park Drive –EZPass Customer Service Center and Violations Processing System.

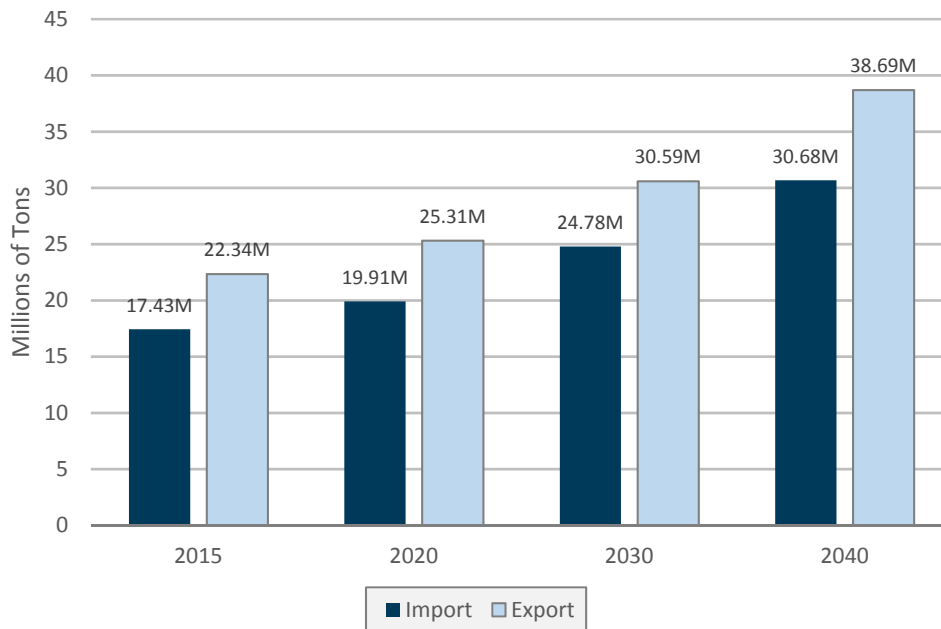
Commodity Flow Analysis



The movement of freight within the HATS region is conducted primarily by truck. Interstate 81, 83, 76 and other arterials serve as the backbone of the region’s freight transportation system. Interstate 76 connects the region to Pittsburgh and Philadelphia, while Interstate 81 serves as the major north-south corridor connecting the HATS region to Scranton, Wilkes-Barre, and Hagerstown, Md. Interstate 83 connects the region to York and Baltimore. Other important roadways for freight movement include US 11, US 15, US 22, US 322, US 422, PA 114, PA 283, and the Airport Connector, all of which connect the region to the interstate system.

According to 2015 data from PennDOT’s Commodity Information Management System (CIMS), the HATS region is a net exporter of freight. CIMS data indicates that the region annually generates approximately 22 million tons of freight, at a total value of just over \$27 billion. This production of freight contrasts with the nearly 17 million tons received by the region. The growth in freight being received and generated from the region is expected to increase to over 30 million tons and 38 million tons respectively by the year 2040 and is depicted in **Figure 38**.

Figure 38: Tonnage of Freight Movement, 2015-40



Source: PennDOT, CIMS Tool

Table 21 depicts the share of freight tonnage and value that was imported to and exported from the HATS region for both 2015 and the forecast year of 2040. As displayed in the table, freight tonnage is expected to grow significantly with imports increasing by 76 percent to 30.7 million tons and exports increasing by 73 percent to 38.7 million tons. Freight value is also expected to increase, with value of imports increasing by over 133 percent to \$81.3 billion. While the overall value of exports is expected to increase by 28 percent to \$34.8 billion, the value per ton will decrease by 34.6 percent from \$1,244 per ton to \$925 per ton. This is in contrast to the value per ton for imports which will increase by 24.7 percent from \$1,996 per ton to \$2,649 per ton.

Table 21: Value and Tonnage, 2015 and 2040 (Truck, Rail, and Air)

Year	FROM HATS REGION			TO HATS REGION		
	Tons (M)	Value (\$B)	Value/ Ton	Tons (M)	Value (\$B)	Value/ Ton
2015	22.3	\$27.8	\$1,244	17.4	\$34.8	\$1,996
2040	38.7	\$35.8	\$925	30.7	\$81.3	\$2,649
Change	73.2%	28.7%	-34.6%	76.0%	133.6%	24.7%

Source: PennDOT, CIMS Tool

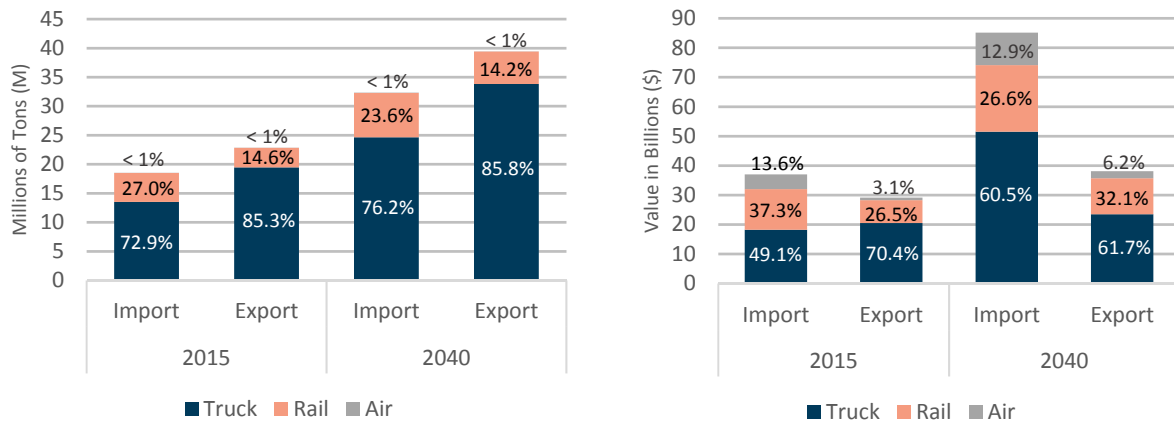
Figure 39 illustrates the share of freight tonnage and value moved by mode. Currently, the tonnage of freight moved by truck accounts for 72.9 percent of imports and 85.3 percent of exports. This share is projected to increase in 2040 to 85.3 percent and 85.8 percent, respectively. The share of freight imported and exported by rail is expected to decrease from its 2015 levels of 27 percent for imports and 14.6 percent for exports to 23.6 percent for imports and 14.2 percent for exports in 2040. Less than 1 percent of all tonnage imported and exported out of the region is by air. This percentage will remain unchanged in 2040.

In terms of value, trucks account for a significantly smaller share. Truck freight accounts for 49.1 percent of the value of imports and 70.4 percent of the value of exports. This share is expected to grow to 60.5 percent for imports but decrease to 61.7 percent for exports. While less than 1 percent of tonnage, air accounts for 13.6 percent of the value of imports and 3.1 percent of the value of exports. The value of air imports is expected to decrease to 12.9 percent, while the value of air exports will increase to 6.2 percent in 2040. In 2015, rail freight makes up 37.3 percent of the value of imports and 26.5 percent of the value of exports. The value of rail freight imported is expected to decrease to 26.6 percent while the value of freight exported will increase to 32.1 percent.

With an increase in freight movement especially on roadways, PennDOT and the MPO will need to be aware of trends relating to bridge and pavement conditions, as well as incident management.



Figure 39: Value and Tonnage by Mode, 2015 and 2040



Source: PennDOT, CIMS Tool

The top destinations and origins for the region’s goods are depicted in **Table 22**. A significant majority of the region’s freight is destined for locations in eastern and south central Pennsylvania, New York, and New Jersey. The most significant destinations include Lancaster County with 3.88 million tons of freight and the Delaware Valley with 2.75 million tons. Other major destinations include neighboring York County and the Illinois portion of Chicago-Naperville-Michigan City BEA. The majority of freight origins are from eastern and south central Pennsylvania and New Jersey. The most significant origins include the Illinois portion of Chicago-Naperville-Michigan City BEA with 1.82 million tons of freight and Delaware Valley with 1.76 million tons.

Table 22: HATS Region: Top Commodity Destinations and Origins, 2015

Destination	Tons (M) Received from HATS	Origin	Tons (M) Imported to HATS
Lancaster County	3.88	Illinois Portion of Chicago-Naperville-Michigan City BEA	1.82
Delaware Valley	2.75	Delaware Valley	1.76
York County	1.58	SEDA-COG	.931
Illinois Portion of Chicago-Naperville-Michigan City BEA	1.32	New Castle County, DE	.910
Lebanon County	1.22	Gloucester County, NJ	.713
New York Portion of New York-Newark- Bridgeport BEA	.901	Williamsport	.589
New Jersey Portion of New York-Newark -Bridgeport BEA	.901	Southwestern Pennsylvania	.555
Southwestern Pennsylvania	.888	New Jersey Portion of New York-Newark -Bridgeport BEA	.544

Regional Freight Plan

Destination	Tons (M) Received from HATS	Origin	Tons (M) Imported to HATS
Lehigh Valley	.660	Franklin County	.539
Maryland Portion of Washington-Baltimore-Northern Virginia BEA	.565	York County	.519

Source: PennDOT, CIMS Tool

The region's top commodities imported and exported by tonnage are depicted in **Table 23**. The most significant commodity being exported from the region (by tonnage) is broken stone or riprap. Warehouse & distribution center and rail intermodal drayage from ramp are also top commodity exports for the region when measured by tonnage. The most significant commodities being imported into the region are petroleum refining products and warehouse distribution center. Freight All Kind (FAK) shipments, rail intermodal drayage to ramp, and broken stone or riprap are also top commodities being imported into the HATS region.

Table 23: Top Commodities Imported and Exported, 2015

Exports	Tons (M) Received from HATS	Imports	Tons (M) Imported to HATS
Broken Stone or Riprap	6.54	Petroleum Refining Products	2.73
Warehouse & Distribution Center	3.17	Warehouse & Distribution Center	2.20
Rail Intermodal Drayage from Ramp	2.58	FAK Shipments	1.60
Semi-trailers Returned Empty	1.17	Rail Intermodal Drayage to Ramp	1.56
FAK Shipments	.957	Broken Stone or Riprap	1.42
Grain	.910	Processed Milk	.756
Primary Iron or Steel Products	.766	Gravel or Sand	.702
Gravel or Sand	.731	Grain	.525
Flat Glass	.575	Misc Industrial Organic Chemicals	.433
Misc. Field Crops	.493	Asphalt Paving Blocks or Mix	.361

Source: PennDOT, CIMS Tool

Motor Carrier

Trucking on roadways is the most common mode of freight movement, accounting for 85 percent of all the region's exports. Compared to rail freight options, trucks are commonly used on freight moves that are more time-sensitive and need only be moved shorter distances. Trucks also offer the door-to-door service that rail freight carriers cannot provide.

Interstate 81 and 76 have segments where trucks account for 25 percent or more of traffic volume. Interstate 81 by far carries the largest volume of truck traffic with most segments carrying between 7,500 to 12,000 trucks, daily. While a lower volume, segments of Interstate 76 carry between 5,000 and 7,500 trucks, daily.



Rail Freight

The region's rail carriers move an estimated 3.34 million tons of freight out of the region. Top commodities being moved by rail include semi-trailers returned empty, FAK shipments, and primary iron or steel products. If not for the rail option, these tonnages would likely be transferred to the region's roadways (or in some cases, lost to the regional economy altogether).

Aviation

While the volume of freight being moved by air is low, the per-ton value of the freight is high. Air carriers move an estimated 5,557 tons of freight out of the region which makes up less than 1 percent of all freight in terms of tonnage. In terms of value, freight moved by air accounts for 3.1 percent of exports or over \$900 million. Top commodities include electrical equipment, drugs, machinery, and transportation equipment. Air allows freight, especially those that are high-value or time sensitive, to be moved quickly to destinations.

Implications of Commodity Flow

The following list provides potential implications indicated by current and forecasted commodity flows to and from the HATS region:

- Trends and forecasts in total Transportation & Warehousing employment for the region would indicate increasing demand for goods movement. The Transportation & Warehousing industry is naturally reliant on the movement of freight for business and the industry's importance to the region's economy is only expected to grow over the foreseeable future.
- Relative stability in the Manufacturing industry indicates consistent truck traffic for movement of manufactured goods in the future.
- Modest increases in Retail Trade point to an increase in truck traffic related to moving retail goods. Increases statewide as well as along the northeast corridor may yield significant increases on the overall regional system, as well as increased frequency of truck trips to distribution centers found in the region.
- Forecasted job gains in the Health Care industry may increase the demand for both truck and air freight, although this industry is not as reliant on freight movement as others.

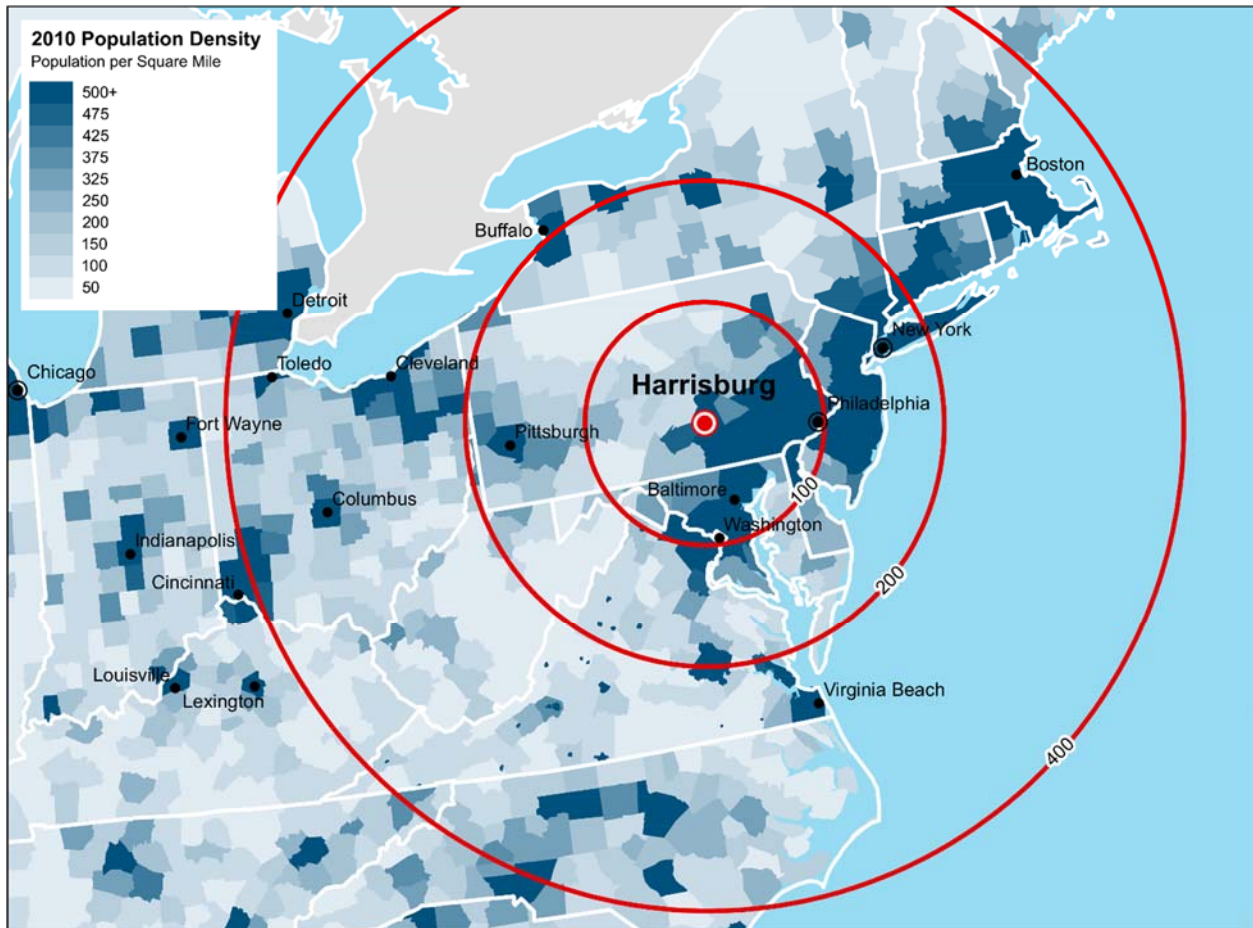
Appendix A contains commodity flow tables for all three HATS counties. The tables depict freight flows by tonnage and value, by mode (truck and rail), and by commodity for both 2011 and the 2040 forecast year.

Universal Freight Trends and Issues

This section of the plan highlights the more universal freight trends and issues that are at work nationally (and in some cases, globally) that are affecting the HATS region. These are summarized here, in no priority order.

Geographic Advantage - The Harrisburg region is within one day’s drive of 40 percent of the U.S. population which represents 60 percent of the nation’s buying power. Additionally within the same day drive radius, motor carriers can also reach over half of the population of Canada. Measured from Harrisburg, the region is 80 miles north of the Port of Baltimore, 100 miles west of the Port of Philadelphia, and 285 miles southeast of Canada’s Peace Bridge.

Figure 40: Distances from Harrisburg (in miles)



The Great Recession – While the economy has improved, it has not entirely recovered to pre-recession levels. The impact of the greatest economic downturn since the Great Depression has affected the economy in profound ways, both nationally and within the HATS region. Over the past decade, the region has experienced a net loss of employment in the types of industries that are generally more freight-reliant, including manufacturing, construction, wholesale and retail trade. Losses in these areas

though have been offset by growth in the industries of Transportation and Warehousing, Health Care and Social Assistance, Education, and Arts, entertainment, and recreation.

Balkanized planning environment – It is no surprise to long-term observers and planning practitioners to learn that Pennsylvania’s planners and decision-makers operate within a segregated environment. Land use functions regarding eminent domain, planning, and zoning are carried out largely at the local (municipal) level, while major public works projects for transportation are planned for and delivered from the state and federal level. Within the HATS region, there are no fewer than 103 different municipalities across the three counties, not including school districts and other utility planning regions. The state owns just under a third of the region’s roadway network, with most of the rest under the jurisdiction of local government. (The region’s counties together own 86 bridges, but no roadway.) Much of the region’s remaining freight network is privately owned and controlled, and thus beyond HATS’ purview.

It is against this backdrop that freight planning must be conducted for a system as complicated as HATS’ freight network. Ensuring that limited transportation dollars are invested effectively means working creatively within the existing framework, whether it be from final rule-makings from FHWA, or the planning enabling legislation that Harrisburg has handed down to local municipalities through the Municipalities Planning Code.

PennDOT’s new transportation secretary has recognized this, and has advocated for a greater planning function within each one of the Department’s 11 engineering districts. New initiatives being launched this year (“PennDOT Connects”) seek to incorporate a greater level of municipal involvement at the earliest stages of the planning and programming process...an opportunity to ensure that the concerns of shippers, carriers, and municipal officials are being aired and considered at the very front end of the project development process.

Freight Funding Silos – Recent federal reauthorization has brought a consolidation of transportation funding programs, or “funding silos.” While HATS received \$244.6 million as part of its base funding allocation for highways and bridges within the 2017 Program, much of the funding was to be obligated for specific project types. Some allow for flexing of funding from mode to mode, but much is designated for specific purposes (e.g., NHPP funds for the enhanced NHS network, CMAQ for mitigating congestion and improving traffic signals, etc.), limiting HATS’ programming functions to within the parameters expressed by Harrisburg and Washington. Other funding the HATS region is eligible to receive is designated for specific *regions*, as is the case with Appalachia Development Highway funds, which can be programmed only for projects in Perry County.

Diminishing Highway Capacity – One of the region’s signature natural features – the Susquehanna River – can be a barrier to freight transportation, with a limited number of crossings. Incidents, special events, or non-recurring congestion can divert traffic to other bridges and quickly overwhelm the system. These bridges are important not only from a freight perspective, but also for security and economic growth.

Railroad Crossing Safety – There are numerous at-grade railroad crossings throughout the HATS region. Most of these are on short lines such as the Middletown & Hummelstown Railroad, and the Gettysburg and Northern. However, there are other notable at-grade crossings of NS on its Shippensburg Secondary



near Mechanicsburg, and on its Pittsburgh Line through Perry County. In the case of the M&H Railroad, the line has four grade crossings on its 7.1-mile system, including one on a limited access portion of US 322 in Derry Township. Regional stakeholders say that more emphasis is needed on safety at these crossings.

Accessibility – Most of Perry County and upper Dauphin County do not enjoy readily available access to the interstates. These areas of the region must rely on arterials for the shipping and receiving of goods. Many motor carriers are hindered after getting off of Interstates or non-Interstate NHS routes and onto secondary roads that are often posted or include bridges that are posted or closed. This creates circuitous routes, adding time and cost.

Changes in international trade – Major geopolitical trends and passage of trade deals, such as the North American Free Trade Agreement (NAFTA) in 1993, and China’s entry into the World Trade Organization (WTO) in 2000 have brokered enormous changes in the state and regional economy. Over the past 25 years, China became a major manufacturer of consumer goods, a rise that coincided with the loss of manufacturing jobs. Since 2005, the HATS region has lost approximately 3,700 manufacturing jobs though it is uncertain whether the loss is due to manufacturing moving overseas or manufacturing not recovering entirely from the recession from 2007-2009. Loss of manufacturing jobs also tends to depress demand for non-manufacturing jobs, meaning that job losses are not just contained to manufacturing.

The results of the 2016 election have yet to fully wend their way into the economy. At the writing of this plan, it is not fully known how policies being contemplated will reverse current trends, if at all. Manufacturing job losses over the past 20 years in states like Pennsylvania, Ohio, and Michigan have suppressed appetites on both sides of the political spectrum for additional trade deals, including the much-debated Trans Pacific Partnership (TPP).

E-Commerce - Consumers are shifting from big box economy to e-commerce economies. Freight trips are becoming more numerous and shorter. These changing business models will create growth in freight movement in general. This is the direction that society is taking our modes of transport.

Increasing Population - The HATS region’s population has increased by 9.9 percent since the turn of the century and by 2.8 percent since the 2010 Census. More people translates into more demand for goods, commodities, and services which will increase overall freight activity in the region. At a macro level, the HATS region is located on the western fringe of the growing Northeast Megalopolis and is in close proximity to the growing Great Lakes region, which extends from Chicago eastward to Erie, Pittsburgh, and Altoona. The region could see increases in freight flows, as goods move within and between these major consumer markets.

Shipping lanes and changing supply chains – Events occurring thousands of miles from the HATS region have very real implications for the movement of freight. For example, the \$5 billion expansion of the Panama Canal in 2016 doubled the capacity of that waterway with the completion of a third set of locks to accommodate a new generation of ever-larger container ships. On the other side of the world in Egypt, improvements to the Suez Canal now allow for two-way travel. (Nicaragua is also exploring the construction of a new canal through that country that would be funded by the Chinese.) Some shippers are using Suez over Panama, while others ship to California ports and use transcontinental trains to

move goods to the east coast. The land bridge option comes at a slightly higher cost, but with a time savings of just over a week that is particularly important for seasonal goods.

Still, in 2015 Panama set a record in the amount of cargo that passed through its locks. The largest ships that could navigate the canal (Panamax vessels) could carry 5,000 TEUs. Newer ships with a carrying capacity of up to 13,000 TEUs are now able to use the canal (even though the very largest ships operating today can carry nearly 20,000 TEUs).

What does this mean for HATS? Whether shippers from the Far East use Suez or Panama, the end result is that east coast ports will get busier. The ports of Baltimore, New York, and Norfolk have initiated plans to dredge their waterway channels and increase port depths. Within Pennsylvania, the \$77 million dredging of the Delaware River Channel to 45 feet will allow for 10,000 TEU vessels to be able to call on ports in Southeast Pennsylvania. At a macro level, major truck and rail corridors between these east coast ports and the HATS region should experience increased demand.

Trailer widths – An issue affecting shippers and carriers statewide (not just in the HATS region) includes that of trailer widths. Once motor carriers get off of primary highways and onto four-digit SR routes, they have to go through what has been described as a “cumbersome” application process in order to obtain approval to use 102” wide trailers. A trailer that is 96” wide is permitted anywhere, but they are no longer the standard, and in fact are now a special order. An option could be to make 102” trailers as standard, then post if not allowed.

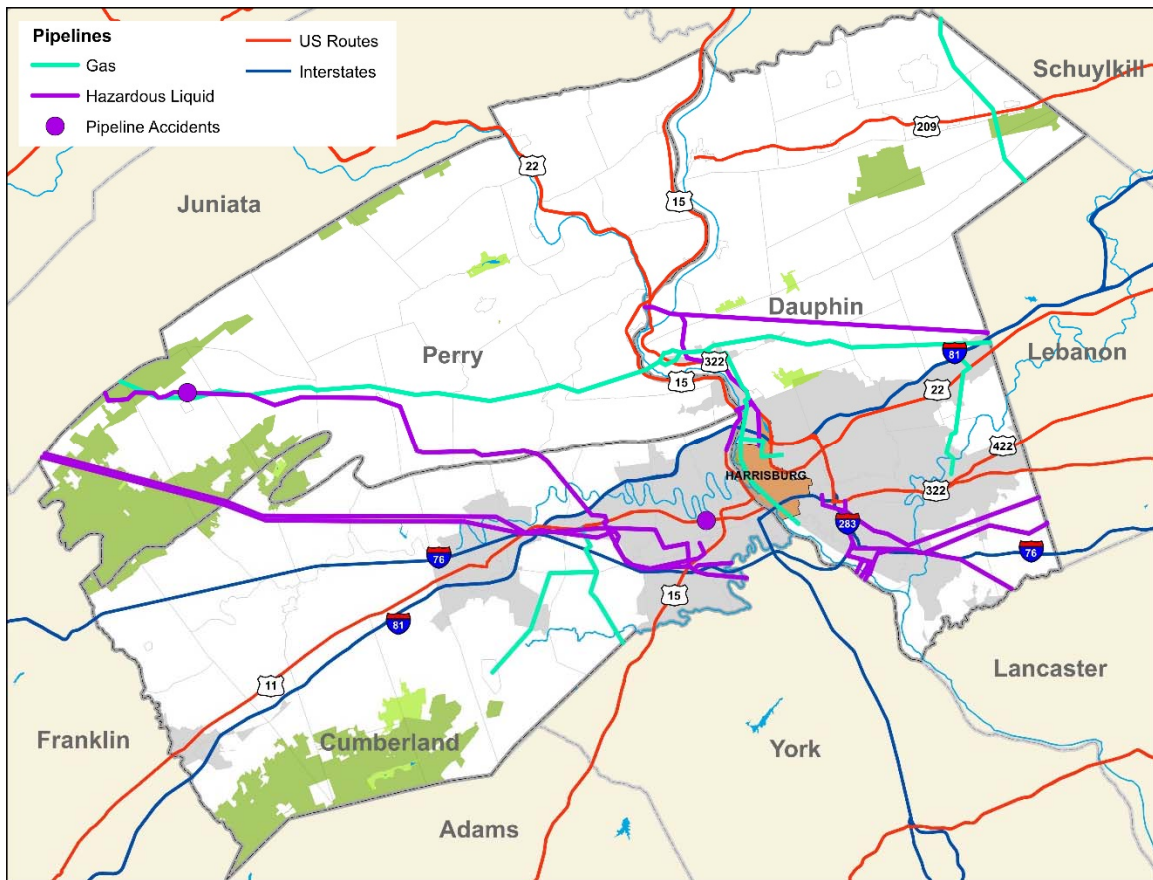
Truck Parking – Problems related to this are extremely complex. Federal hours-of-service regulations imposed by the Federal Motor Carrier Safety Administration permit long-haul truck operators to drive up to 11 hours in an on-duty window of 14 hours after being off-duty for a minimum of 10 consecutive hours. The 11-hour window of “revenue drive time” must frequently be cut short to allow drivers to search for parking. Thus, the issue of parking can make or break the productivity of the load. Having parking that is proximate to the final destination is critical in allowing motor carriers to get into and out of an area or distribution facility for greater efficiency. Most truckers prefer to stop at a private truck stop for their Federally-required 10-hour break, yet many of these truck stops are too far away from urban cores due to the availability and value of land. Private truck stops are preferred but many truckers end up parking on highway on-ramps or off-ramps. This creates challenges as shoulders are meant for temporary parking, and not constructed to handle these loads. In addition to the inevitable pavement distress that is caused, there are also many safety and environmental concerns with this practice. Additionally, there is no clear lead organization that is charged with providing a solution to this complex problem.

Several potential options range from investigating creative uses of right-of-way and looking at the potential of using large venues during off-peak hours, as well as the redevelopment of brownfield sites. Technology solutions are also needed to get real-time parking information pushed out to drivers to make them aware of available existing parking capacity. States can use their freight formula dollars as well as highway safety money to fund solutions to the truck parking challenge, and public-private partnership options can also be explored. “Jason’s Law” – included as part of MAP-21 – dedicated Federal money to help construct, improve, or reopen commercial parking facilities along the NHS.

Ageing Rail Lines – Rail needs to be maintained in a state of good repair. More and more rail cars exceed the 286,000-pound standard and up to 315,000 pounds is needed in order for rail carriers to remain competitive. Most Class I mainlines are capable of carrying 286,000-pound cars, while some can accommodate cars up to 315,000 pounds. Many older rail lines were designed and constructed to carry railcars weighing up to 263,000 pounds. Many smaller railroads do not have sufficient funds to maintain existing lines, or upgrade to the 286K standard, or provide matching funds to leverage the availability of RFAP funding. The M&H short line is an example of a line that is not yet 286-compliant. The operator is looking to get the line improved from handling 263,000-pound cars in order to be Class II compliant.

Pipelines – Pipelines are becoming an important part of the freight network, reducing the reliance on trucks and rail to haul oil, gas, liquids, and other hazardous materials (**Figure 41**). However, the demand for pipelines is dependent on several factors including commodity pricing, storage capacity, and the ability to export. As prices and production increases for oil and gas, it becomes more advantageous to use pipelines to move these goods. When prices and production are lower, imports become the preferred option, reducing the need for pipelines. In some cases, pipelines may not be used at all. In addition, pipelines pose a greater environmental risk when there are accidents or spills.

Figure 41: Pipelines in the HATS Region



Connected and Highly Automated Commercial Vehicles – The first application of this emerging technology is expected to manifest itself within the transit and freight industries. Testing of highly automated commercial freight vehicles is already underway, with the benefits that platooning would have in increasing capacity, and decreasing the number of drivers that are needed in moving an increasing volume of freight. PennDOT policy regarding this restricts the testing of platooning to select trafficways, restricted to two commercial vehicles or three passenger vehicles (although additional vehicles can be added upon request). Testers must arrange for a demonstration with PennDOT staff prior to allowing additional vehicles in a platoon.³

³ Platooning is the use of any equipment, device, or technology that allows a motor vehicle or series of motor vehicles to operate in an autonomous mode, while coupled or joined to a lead vehicle via a wireless connection in a caravan or motorcade.



Stakeholder Engagement

As part of the freight study's stakeholder engagement process, HATS facilitated four freight focus group meetings. The meetings were well attended, and drew 50 participants, overall. A summary of the cross-cutting issues to emerge as a result of this outreach activity is summarized within this section, by mode, and not in any priority order. In addition to the freight focus group meetings, one-on-one interviews were conducted with 4 key freight stakeholders including Norfolk Southern, PA Motor Truck Association, Susquehanna Area Regional Airport Authority, and the Program Director for CDL Training and Testing at Lehigh Carbon Community College Transportation Institute.

Highway/Motor Carrier

Limited Crossings Across the Susquehanna – There are a finite number of lanes providing east-west access across the Susquehanna River and the region. Incidents on I-81, I-83, and the Pennsylvania Turnpike can cause significant delays across the system and affect the local roadway network.

Truck Parking – This is an issue statewide. The state TAC study on this topic may now be over a decade old, yet is still relevant to the HATS region. The 2007 study did note that existing truck stop locations within the region were already operating at capacity. Since the study, several rest areas along Interstates 81 and 83 were closed, further reducing parking options. With limited availability, Truckers often park on exit ramps, sides of roads, in shopping centers, or even in residential neighborhoods. Some stakeholders noted problems with littering or illicit activity at ad hoc parking areas due to the lack of formal rest areas or truck stops within the region.

GPS or mobile applications could provide drivers with real time parking information, allowing them to make appropriate plans or possibly reserve a parking space in advance. Potential Public-private partnerships offer an opportunity for private development of truck stops along the interstate, however current federal and state regulations prohibit the combination of retail and fuel sales on interstates.

Congestion – Congestion is one of the biggest problems facing drivers in the region. Delays and traffic congestion, due to traffic incidents and increases in truck volumes, reduce a driver's available time and limit driving distance. This will be further complicated with the use of the electronic log book.

Truck Routing –Global Positioning Systems (GPSs) commonly direct drivers to the shortest route as opposed to the most practical route. GPSs are not programmed with local weight restrictions. Many of these local and rural roads were not designed for heavy truck traffic, and in some cases lack proper signage. In Marysville, roadways are restricted for 53' trailers, however drivers will still route through the borough. Improved signage on local roadways would better direct drivers to roadways that trucks are allowed to operate on.

Vertical Clearances – Several bridges within the region have been identified with limited clearance issues. To name a few examples, the NS bridge at North Hanover Street in Hummelstown is a single lane bridge that is too low for some trucks to go under. Truckers often have to turn around on residential streets to avoid this underpass. The Grandview Road bridge in Hummelstown has similar challenges, as many motor carriers are forced to turn around. There are similar issues in the region's other counties as well, including the Bloomfield Road underpass of US 11/15 in Duncannon, and the Orange Street



underpass in Carlisle, as well as the Navy Bridge over Trindle Road. Vertical clearance issues are documented into the following table.

Table 24: Selected Vertical Height Clearance Locations

Roadway	State Route	Municipality	Feature Crossed	Height Restriction
South Front Street and Second Street	SR 3009	Harrisburg	CorridorONE	12'6"
Orange Street	PA 641	Carlisle	NS Shippensburg Secondary	12'10"
Trindle Road	PA 641	Hampden	NS Shippensburg Secondary	13'6"
Bloomfield Road	PA 274	Duncannon	US 11/15	13'7"

Source: HATS

Incident Management –Incidents on I-81, I-83, and I-76 can create gridlock conditions for local roadways. In some cases, truckers are routed onto roadways that are too small even for passenger vehicles. Improved signage directing drivers to appropriate alternate routes would help to alleviate gridlock on local roadways during incidents. In addition, coordination between state police and local municipalities regarding road closures and alternative routes needs to be improved.

Signalization – Signal timing is an issue for many municipalities. Signals at the FedEx Facility often result in a backlog of trucks. When Hershey hosts a major event, PA 39 from Hersheypark Drive to Interstate 81's Exit 77 experiences severe back-ups due to the traffic signals. Better use of technology will improve the movement of goods and people.

Structurally Deficient Bridges – There are 126 state-owned structurally deficient bridges within the region. Conditions are generally more acute within Perry County, where nearly one in five of these structures are structurally deficient. Substandard structures can pose as a challenge for “farm-to-market” trips, making freight deliveries more challenging and expensive for the area’s farmers. Several bridges have been damaged by overweight vehicles, including Linton Hill Road, Barnett Woods Road, and Dix Hill Road, just to cite a few examples from Perry County.

Infrastructure –Roadways in the region were not designed to accommodate current truck volumes or loads resulting in poor roadway conditions. While highways have been well maintained, connector roads, such as Industrial Road in Harrisburg, function well, but require roadway improvements or widening.

Truck Crashes –There needs to be a better understanding of what is causing the recent increase in truck crashes. One possible reason is the increase in distracted drivers due to hand held devices. Other factors include high-turnover rates, which has resulted in more inexperienced drivers on the roads.

Permitting – The release of the APPRAS allows drivers to receive overweight permits within a matter of minutes. Holiday restrictions, however pose a challenge to freight haulers. Current restrictions do not

allow for trucks to operate on holidays or the days preceding it. To make up for the lost days, additional trucks are used to transport the same load, adding to number of trucks on the roadways. A statute has been recently proposed to remove the holiday and time restrictions.

E-Commerce – The rise in e-commerce will naturally generate more activity around warehouses and distribution centers, with an even greater number of trucks going into and out of these sites. In some cases, there may be demand for either more or larger warehousing facilities. Increases in activity will impact the surrounding neighborhoods and roadway conditions.

Rail Freight

Funding –For short lines, it is often difficult to come up with matches for grants as many have limited funds. Currently, the funding formula that the Federal government has established is the same for a large railroad company as it is for a very small company. This can be a deterrent when applying for grant funding for improvements. In addition, much of the grant money awarded is being used for maintenance as opposed to expansion. While maintaining current infrastructure is essential for moving freight, it does not help grow the infrastructure.

Reliance on Freight Rail – Many area companies, such as Univar, rely on rail freight to transport goods that cannot be moved efficiently or effectively by truck. Many companies could not be competitive or would be forced to close altogether in the absence of a rail freight option.

At-grade Railroad Crossings – The HATS region has several at-grade railroad crossings that require improvements with most lacking signage or other warning systems. The M&H short line has four at-grade crossings that need to be upgraded, including its crossing of US 322 at Hummelstown. Additionally, there are a few crossings in Perry County that are not adequately equipped to warn motorists of approaching trains.

Trespassing – Trespassing on the region’s rail lines is a serious issue and has led to several train-related fatalities and injuries in Perry County. While Norfolk Southern police are quick to respond, they have a large area to cover.

Hazmat Training – NS provides free training through its Operation Awareness & Response (OAR) program, including table-top exercises and full scale drills. Sessions include a variety of topics, including rail tank cars, locomotive fires, and flammable liquid unit trains. The trainings build lines of communication, provide local officials with the scale involved, and show them how to react or not react to an incident. The MPO should work with NS to promote these trainings to municipal officials.

Eco-engines – Pennsylvania is expected to receive \$110 million for air quality projects from the Volkswagen settlement. NS is in talks with several government agencies, including DEP and PennDOT, about using these funds to replace existing yard engines with eco-engines. Eco-engines, unlike the existing yard engines, do not have to run when temperatures are freezing. Instead, engines are plugged into a warming station. This will keep the engine block warm even when the engine is shut off, helping to improve the overall air quality of the surrounding areas. NS needs support from local municipalities and residents to demonstrate that the project has merit.



Air

Air Freight – Air cargo volume at HIA is up and has been increasing incrementally. This is primarily due to FedEx and UPS. FedEx has three flights out of the airport every day. While UPS has enough cargo to fill over two planes a day (based on data from 2015), there is not enough inbound traffic for them to justify bringing in an empty plane.

Capacity – Currently, HIA lacks the storage capacity to handle the potential cargo that could fly into and out of the area. Once the runway rehabilitation is complete, HIA intends to focus improving cargo capacity. A \$30 million project is planned to expand the cargo apron of the airport.

Information – One of the biggest challenges is figuring out real freight data. Much of the cargo is shipped by private industry, who will not share cargo information. While HIA does know the weight of the goods, it does not know specifics about the products being shipped. TSA does inspect the freight, however freight valued under a certain amount does not have to be reported as detailed.

Funding – While SARAA has received several FAA grants for airside improvements (runway rehabilitation project), they have not been successful in obtaining funds for surface transportation projects, such as improvement to Airport Drive. For these types of projects, SARAA must rely on private and P3 partnership funds. There is an opportunity for HATS to work with SARAA to help support surface transportation improvements at HIA.

Other, Miscellaneous Topics

Hazardous Materials – The transport of hazardous materials is a concern in the HATS region. While warehouses are required to disclose materials that are being stored there, there is no similar requirement once it is in transit. In some cases, truckers will not display the correct placard so they can avoid any posted restrictions – especially on the Turnpike.

Perry County has identified this issue as a key priority in its county hazard mitigation plan. Hazardous materials are transported by train through populated areas such as Marysville, Penn Township, and Duncannon. While not a concern at the moment, M&H may begin hauling hazardous materials across US 322. If this were to happen, emergency management personnel should be given more information about material being moved as well as how to properly respond to an incident.

Land Management – Both shippers and municipal officials voiced a desire for greater work in the area of land use management. Opportunities exist to prevent such trucking-intensive uses from being located next to conflicting land uses. More assistance and training is needed so that future land developments are more properly planned for and consistent with county and regional future land use plans.

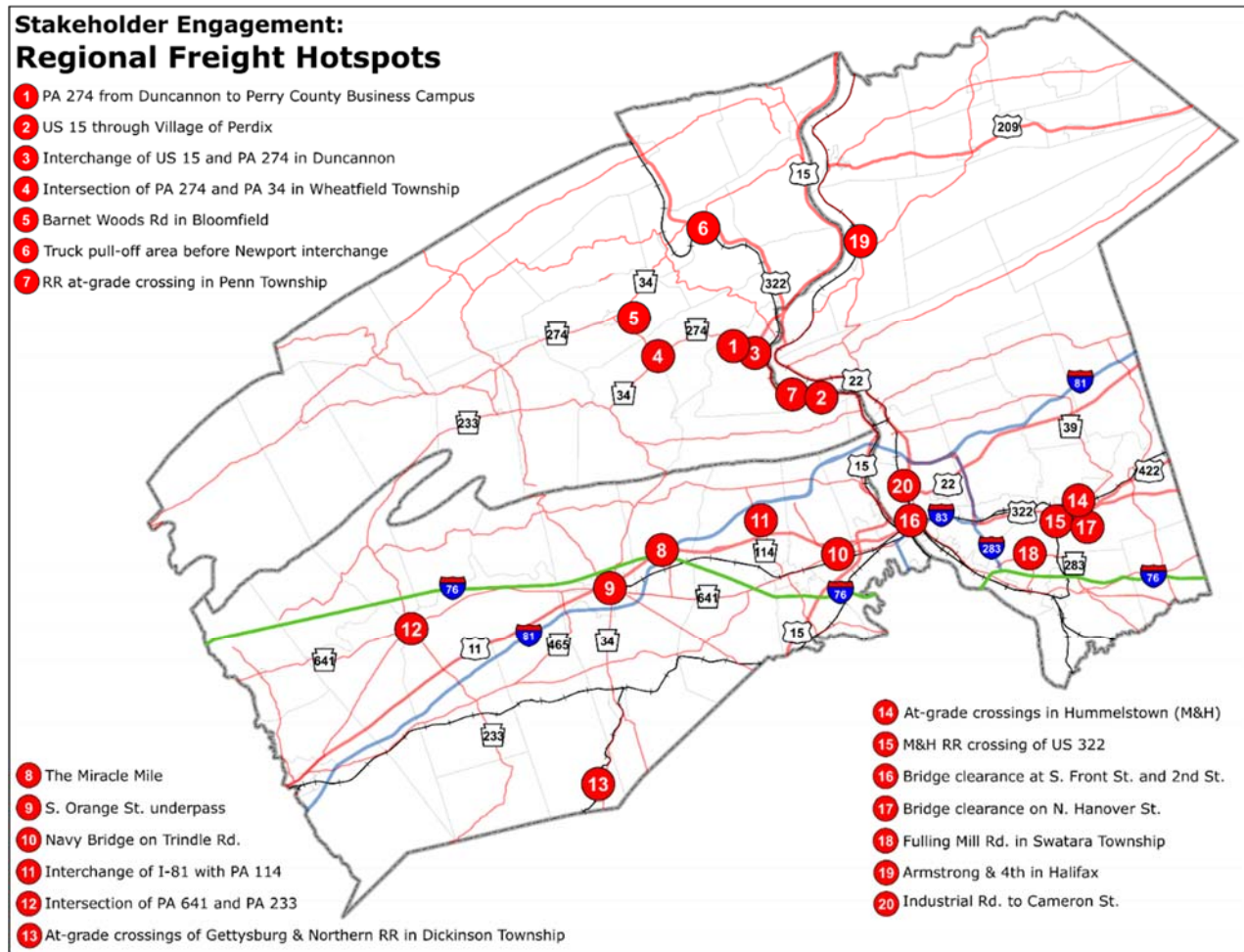
Maintenance and Protection of Traffic – PennDOT needs to improve project coordination and schedules. This, along with defined alternative routes will help keep (freight) traffic moving while roadway and bridge reconstruction are underway. Major improvements on the region's share of the Interstate system include a widening of Interstate 81 to six lanes between the PA 581 Connector and PA 114. Also, there are tens of millions of dollars in improvements currently programmed for Interstate 83

Regional Freight Plan

through Dauphin County. The maintenance and protection of truck traffic during these major construction projects will be vital as PennDOT proceeds with these construction projects.

Freight Planning Hot Spots – Participants at the regional freight focus groups identified many freight “hot spot” locations throughout the region. These are as illustrated in Figure 42, below.

Figure 42: Stakeholder-Identified Regional Freight Hot Spots



Public Participation

The development of Pennsylvania’s first-ever freight plan in 2016 included both public participation and stakeholder engagement. PennDOT employed an online survey platform in May 2014 to capture comments across a variety of topics, including freight concerns. Comments received through the survey process involving the HATS region included the following:



PA On Track – Pennsylvania’s Long Range Transportation Plan Freight Concerns Noted By the Public within the HATS Region

- **Roadway maintenance** – Need for traffic calming measures through downtown Mt. Holly Springs due to freight traffic. Traffic calming needed at E. Main Street (PA 641) and N. Market Street (PA 114). Safety concerns on US 22/322 at Clarks Ferry due to high speeds and crossing traffic.
- **Interstate maintenance** – Exit and entrance ramps on I-81 need to be improved in order to increase safety in heavy merge areas. The exit ramps on PA 581 west need to be extended between US 11 and Creekview Road. Improve roadway conditions on I-81 in Cumberland County.
- **Signing** – Improve signage to better indicate alternative travel routes.
- **Intersection maintenance** – Improve the intersection of PA 274 at Market/Main Street to reduce congestion. Improve intersection and pedestrian access at US 34 and Mill Street.
- **Bridge maintenance** – Replace or repair existing infrastructure including the Walnut Street Bridge and I-81 North Bridge over Conodoguinet Creek.
- **Capacity expansion**- Widen I-81, I-83, US 11 and PA 581 to meet increases in demand. Create express/HOV lanes on I-83 at the York split. Create a new interchange configuration at I-283 S to PA 283, possibly add an additional lane.
- **Operations** – During rush hour, signals cause gridlock at intersections and in some cases back-up traffic on to the interstates. Synchronized signals allow for better flow of traffic and ease congestion. Add ramp signals at PA 581 and Creekview Road.
- **Capital project needs** – The addition of a center barrier will reduce cross over accidents on I-81 in the Carlisle area. Connect Allendale Road to Trindle Road. Create a direct interchange between I-81 and PA Turnpike. Add barrier to prevent cross over crashes in the PA 114 interchange vicinity. Create a full interchange at PA 581 and PA 641.
- **First-and last-mile truck access** – There needs to be more rail to truck transload capabilities. Work with Norfolk Southern to ensure that the connections between the Rutherford and Harrisburg Yards and nearby limited-access highway system are efficient. Create an exit on to connect warehouses near Meadowbrook Road to the PA Turnpike.

Plan Goals, Strategies, and Actions



Plan Goals, Strategies, and Actions

HATS' Freight Plan contains both proposed projects and policy directions. Through the freight planning process, several “common threads” emerged in guiding the regional freight plan update. The policies and projects being advanced by this plan update were shaped by these goal areas. The plan’s goals are further developed in the supporting strategies and actions described below. The freight plan goal statements include:

- Improve Freight System Mobility;
- Improve Freight System Operations;
- Improve Safety on the Regional Freight System;
- Reduce the Environmental Impacts of Freight Movement; and
- Support Economic Growth and Vitality.

Goal 1: Improve Freight System Mobility

The movement of freight is the physical manifestation of our economy. Strategies in support of this theme serve to eliminate the barriers to the movement of freight. Total freight volume being exported from the HATS region is expected to continue to grow, from 22.3 million tons in 2015, to an anticipated 38.7 million tons in 2040. All modes experience congestion along major corridors and at key bottlenecks.

Strategy	Action	Potential Projects (where applicable)
a. Continue making spot improvements to the region’s secondary roads, linking the region’s more rural areas to the interstate system	<ul style="list-style-type: none"> • Use output from freight planning studies and from Project Initiation Forms (PIF) submitted by municipalities 	<ul style="list-style-type: none"> • PA 274 and PA 34, Bloomfield • PA 641 and PA 233, Newville • PA 225 and N 4th St., Halifax • US 322 and Chambers Hill Road, Swatara Township • US 322 and Mushroom Hill Road
b. Coordinate with PennDOT and railroads to address the region’s many railroad bridges and underpasses that feature overhead height restrictions	<ul style="list-style-type: none"> • Prioritize the list of known bottlenecks in the region’s roadway network and develop a plan for their improvement 	<ul style="list-style-type: none"> • SR 3009/ South Front Street in Harrisburg • PA 274 in Duncannon • PA 641/ Orange Street in Carlisle • Milroy Road in Swatara Township • Others on the NS line through Dauphin County

Regional Freight Plan

Strategy	Action	Potential Projects (where applicable)
c. Address future weight restrictions and increase weight standards on rail bridges	<ul style="list-style-type: none"> Support railroads' actions in obtaining 286k-compliance, including offering letters of support to public funding agencies 	<ul style="list-style-type: none"> Any identified by rail system providers
d. Consider funding options toward improving the region's identified Critical Urban and Rural Freight Corridors and NHS Connectors	<ul style="list-style-type: none"> Examine ranking criteria for freight projects 	<ul style="list-style-type: none"> See MPO listing of priority freight segments
e. Address regional interstate capacity, existing freight bottlenecks, and spot improvements	<ul style="list-style-type: none"> Coordinate with PennDOT's Interstate Management Program as future projects are considered Expand other non-highway options for passenger travel 	<ul style="list-style-type: none"> Use of other technology (including autonomous vehicles) may be needed to fully address mobility issues in the region I-81 and I-83 improvements that are in the planning stages and/or initiated
f. HATS should continue to program projects that address system preservation and preventive maintenance needs	<ul style="list-style-type: none"> Coordinate with District 8-0 and the region's municipalities on project needs through the TIP process 	<ul style="list-style-type: none"> various
g. Maintain the region's backlog of structurally deficient bridges at a rate below the state target of 10 percent (structurally deficient by deck area)	<ul style="list-style-type: none"> Target the region's approximately 126 state-owned bridges that are currently SD, particularly those with high AADTT 	<ul style="list-style-type: none"> various
h. Support the SARAA's efforts at expanding cargo space at HIA and improving landside connections	<ul style="list-style-type: none"> Coordinate with the airport manager as ground access improvements are being considered Work with municipalities to mitigate and prevent incompatible land uses that would compromise airport operations 	<ul style="list-style-type: none"> Rehabilitation of Airport Drive and Airport Connector



Strategy	Action	Potential Projects (where applicable)
i. Investigate the potential for new interchanges on the Pennsylvania Turnpike	<ul style="list-style-type: none"> Coordinate with the Pennsylvania Turnpike Commission 	<ul style="list-style-type: none"> Carlisle Route 743
j. Continue to monitor system performance for freight and mobility per the national freight performance measure	<ul style="list-style-type: none"> Coordinate with PennDOT and FHWA as freight performance measurement and reporting is enacted during the FAST Act era 	<ul style="list-style-type: none"> Track and identify new critical freight corridors for possible addition to the CUFC/CRFC system at USDOT's request

Goal 2: Improve Freight System Operations

There are nearly 4,900 linear miles of roadway throughout the HATS region. Very little new capacity has been added in recent years, and most of this new capacity has been on the local system. The role of system operations in transportation planning has only increased over time in light of this, as the industry has sought to harness and integrate the power of technology and crowd-sourced information in improving such various facets of our transportation system as traffic operations, incident response, work zone management, and traveler notification. Investments in transportation operations also yield a favorably high benefit to cost ratio.

Strategy	Action	Potential Projects (where applicable)
a. Promote the Green Light-Go Program to the region's municipalities to improve system reliability and efficiency for motor carriers	<ul style="list-style-type: none"> Support the creation of a regional operations center for traffic signaling in order to better coordinate signals along main corridors 	<ul style="list-style-type: none"> Linkages to Traffic Safety Management Operation (TSMO) programs which address ITS infrastructure and regional operation plans
b. Improve Traffic Incident Management on the region's interstates	<ul style="list-style-type: none"> Coordinate with PennDOT and first responders on a regional traffic incident management plan 	<ul style="list-style-type: none"> Additional signage for alternative routes Accident identification, signage and information on travel times should also be stressed to help reduce traffic congestion Develop consistent protocols for signage and information displays

Regional Freight Plan

Strategy	Action	Potential Projects (where applicable)
c. Address the region's need for truck parking areas	<ul style="list-style-type: none"> Develop additional truck parking capacity through creative use of public land within highway rights-of-way and as project designs are considered Support the PTC's goal of providing expanded truck parking at the Lawn Service Plaza in Conewago Township 	<ul style="list-style-type: none"> Reexamine the 2007 Transportation Advisory Committee truck parking study and its applicability to the HATS region
d. Pursue ITS options for communicating parking information to motor carriers to provide drivers with real time parking information, allowing them to make appropriate plans or reserve a parking space in advance	<ul style="list-style-type: none"> Encourage PennDOT to build parking availability and reservation capabilities into future connected vehicle and vehicle-to-infrastructure (V2I) technology 	<ul style="list-style-type: none"> Creation of an add-on App for GPSs that would provide more specific information to drivers including times to avoid specific areas, parking options in the vicinity, alternative routes, etc. Variable message boards at rest areas and truck stops
e. Reduce congestion related to peak period deliveries	<ul style="list-style-type: none"> Encourage municipalities to offer incentives to shippers for off-peak delivery 	<ul style="list-style-type: none"> Could potentially be accomplished through the CMP process
f. Investigate needs for improving short line rail freight service	<ul style="list-style-type: none"> Collaborate with short line operators and regional chambers in a survey of rail-dependent business 	<ul style="list-style-type: none"> Identify and evaluate needs in cooperation with short line rail providers
g. Address intersections with substandard turning radii	<ul style="list-style-type: none"> Identify and prioritize problem intersections through the TIP update process and "PennDOT Connects" 	<ul style="list-style-type: none"> Airport Drive PA 274 and PA 34, Bloomfield PA 641 and PA 233, Newville PA 225 and N 4th St., Halifax



Goal 3: Improve Safety on the Regional Freight System

Safety is a top priority for HATS and its partners. The regional freight plan seeks to advance policies and projects that will improve the safe movement of goods, as safety is vital not only to haulers, but also to the value of the freight that is being carried. The plan seeks to reduce the number and severity of truck crashes, and improve safety at railroad crossings.

Strategy	Action	Potential Projects (where applicable)
a. Improve at-grade rail crossing safety	<ul style="list-style-type: none"> Develop a prioritized list of at-grade rail crossings for improvement either through new technologies or grade separation 	<ul style="list-style-type: none"> Traffic signal interconnection Illumination Traffic channelization
b. Improve overall rail freight safety	<ul style="list-style-type: none"> Support Norfolk Southern in marketing the availability of its high-level safety training vis a vis hazardous materials Free training is available through NS' Operation Awareness and Response (OAR) program, including table-top exercises and full scale drills 	<ul style="list-style-type: none"> Training sessions are available in Pennsylvania and surrounding states Include local response/SOPs into training to make it more valuable to attend
c. Support Operation Lifesaver and its public awareness campaigns	<ul style="list-style-type: none"> Coordinate with PennDOT's Bureau of Rail Freight on specific support opportunities and needs 	<ul style="list-style-type: none"> Addresses important rail safety considerations such as: trespass prevention; rail crossing safety, etc.
d. Encourage relevant municipalities to adopt (Act 164) Airport Hazard Zoning	<ul style="list-style-type: none"> Educate municipal officials through social media, Local Planning Assistance Program, and formal contact on the needs and benefits of implementing Act 164 zoning 	<ul style="list-style-type: none"> Relevant HATS region municipalities include Camp Hill, Hampden, Lemoyne, New Cumberland, and Royalton Other municipalities include Conoy and East Donegal Township in Lancaster County, and Goldsboro Borough in York County
e. Improve motor carrier safety	<ul style="list-style-type: none"> Identify truck-related crash cluster locations 	<ul style="list-style-type: none"> As identified in the RTP

Regional Freight Plan

Goal 4: Reduce the Environmental Impacts of Freight Movement

Freight movement and freight facilities can impact the natural and built environment in profound ways. HATS encourages the management of the region’s land uses so that the investments it has already made in the regional transportation system are not overwhelmed by poorly planned freight-intensive land uses. An adherence to thoughtful and forward-thinking land use policies can help create an environment where freight can be viewed as “a good neighbor” to the larger community.

Strategy	Action	Potential Projects (where applicable)
<p>a. Ensure there is needed space between incompatible land uses vis a vis freight generators. This could entail open space, or allow for incremental increases in intensity of development</p>	<ul style="list-style-type: none"> • Implement TCRPC’s Regional Growth Management Plan (RGMP) policies in providing transition zones around freight generating sites • Educate municipal officials as to how good land use practices can improve freight and community development linkages 	<ul style="list-style-type: none"> • Work with municipalities during the comprehensive planning process to promote appropriate uses around interchanges and along freight corridors
<p>b. Preserve existing limited real estate availability for rail freight service and promote its viability</p>	<ul style="list-style-type: none"> • Ensure land use policy documents such as the RGMP and county comprehensive plans discourage the use of other land uses (such as residential or commercial) on rail-served properties 	<ul style="list-style-type: none"> • Inventory sites during the RTP update process
<p>c. Minimize the amount of truck travel on lower-order roadways, and avoid local movements on local roads</p>	<ul style="list-style-type: none"> • Ensure county and local comprehensive plans encourage major freight generating uses to locate near rail lines/spurs and major truck routes, such as interstates 	<ul style="list-style-type: none"> • Coordinate with municipalities in the preparation of local comprehensive plans
<p>d. Reduce freight-related emissions</p>	<ul style="list-style-type: none"> • Support Norfolk Southern in its efforts at putting a new class of locomotives (“Eco-engines”) into service for yard operations • Promote the creation of infrastructure that allows for trucks to plug into auxiliary power units 	<ul style="list-style-type: none"> • Identify projects for CMAQ and related funding



Strategy	Action	Potential Projects (where applicable)
e. Improve freight system resiliency	<ul style="list-style-type: none"> Address areas prone to flooding 	<ul style="list-style-type: none"> Identify high priority locations through the RTP and TIP processes

Goal 5: Support Economic Growth and Vitality

Freight is a vital element of the region’s economic vitality. A healthy share of the region’s workforce is employed in occupations related to manufacturing, construction, wholesale, and retail trade...all industries that are reliant on the efficient movement of goods for their success. Planning for freight also directly supports the more than 23,000 workers within the region who are employed within the transportation and warehousing industries. A hallmark of a successful planning program involves the ability of being able to balance the needs of shippers and haulers while protecting the environment. This is a challenge that can only be met through the implementation of a series of strategies that promote sustainable development.

Strategy	Action	Potential Projects (where applicable)
a. Ensure that freight considerations are being made early in the planning process	<ul style="list-style-type: none"> HATS should revise its existing project prioritization process to incorporate freight concerns. This should ideally be in place prior to the development and approval of the 2019 TIP 	<ul style="list-style-type: none"> The roll-out and implementation of PennDOT’s new “PennDOT Connects” policy will also support this strategy
b. Protect community infrastructure	<ul style="list-style-type: none"> Advocate for motor carriers to use commercial GPS units to help with routing issues 	<ul style="list-style-type: none"> Work with Google and other crowd-sourced providers of traffic data
c. Improve the region’s first- and last-mile freight connections	<ul style="list-style-type: none"> HATS should continue working with PennDOT and FHWA on the designation and certification of Critical Urban and Rural Freight Corridors 	<ul style="list-style-type: none"> Identify regionally critical areas and coordinate with municipalities in the preparation of local comprehensive plans
d. Encourage mixed use development in support of freight movement	<ul style="list-style-type: none"> Encourage the development of “logistics villages,” with traveler services and other conveniences for motor carriers through the RGMP 	<ul style="list-style-type: none"> Potential sites to be identified during the RTP update process

Regional Freight Plan

Strategy	Action	Potential Projects (where applicable)
<p>e. Ensure that the region’s roadways represent a current reflection of travel patterns and are operating at an appropriate standard of performance</p>	<ul style="list-style-type: none"> HATS should update its functional classification scheme in collaboration with PennDOT’s Bureau of Planning and Research 	<ul style="list-style-type: none"> Investigate a classification change to: <ul style="list-style-type: none"> PA 114 between I-81 and US 11 in Silver Spring Township US 11 between PA 641 and PA 465 PA 641 from the PA Turnpike to PA 174/Boiling Springs Road
<p>f. Support rail carriers in securing funding where there are demonstrated opportunities for public benefits, including environmental quality, improved safety, mitigating congestion, preserving pavements, job retention and attraction</p>	<ul style="list-style-type: none"> Support the region’s rail carriers in obtaining funding through the Rail Freight Assistance Program (RFAP), capital budget, or other public sources, while balancing municipal concerns 	<ul style="list-style-type: none"> Identify and evaluate short line rail system needs in coordination with municipal planning
<p>g. Ensure that freight planning and plan implementation is being carried out</p>	<ul style="list-style-type: none"> Develop a freight advisory committee as part of the RTP process that includes representation from modal associations, business, and industry 	<ul style="list-style-type: none"> Integrate a freight advisory committee into the routine planning process
<p>h. Assist local municipalities in their freight planning efforts</p>	<ul style="list-style-type: none"> Provide model ordinance language for municipalities to use for truck parking/warehousing/land use, etc. for municipal reference 	<ul style="list-style-type: none"> Coordinate with municipalities in the preparation of local comprehensive plans



Freight Performance Measures

The Federal Highway Administration has finalized six inter-related performance rulemakings to implement the transportation performance management framework established by MAP-21 and the FAST Act. Collectively, these rules address the challenges facing the national transportation system, including

- Improving safety
- Maintaining infrastructure conditions
- Reducing traffic congestion
- Improving the efficiency of the system *and freight movement* (emphasis added)⁴
- Protecting the environment, and
- Reducing delays in project delivery.

The rules establish national performance measures. As such, State DOTs such as PennDOT and its planning partners will be required to establish targets for applicable measures. New and existing plans will document strategies and investments used to achieve the targets, and progress toward the targets will be reported through new and existing mechanisms.

A freight reliability measure will measure travel time reliability on the Interstate system (Truck Travel Time Reliability (TTTR) Index). The measure considers factors that are unique to this industry, such as the use of the system during all hours of the day and the need to consider more extreme impacts to the system in planning for on-time arrivals. The freight measure will be used by PennDOT and its planning partners (including HATS) in assessing the performance of the Interstates in moving freight. The one performance measure regarding freight movement applies only to the Interstate System. The Truck Travel Time Reliability (TTTR) Index is defined as the ratio of the 95th percentile truck travel time to the 50th percentile truck travel time.

TTTR is to be calculated for the following time periods:

Weekdays (Mon-Fri)	Weekends
6am – 10am	6am – 8pm
10am – 4pm	
4pm – 8pm	
Overnight (all days) 8pm – 6am	

Source: USDOT

⁴ This rule became effective on May 20, 2017

The highest TTR ratio of the five time periods shown for a particular roadway segment is used to aggregate reporting segments for the entire Interstate System, which is weighted by segment length.

FHWA recognizes there may be time periods (15-minute bins) where there were no freight vehicle probes, resulting in blank data. For this metric, the Final Rule requires the all-traffic travel time be substituted for the freight vehicle travel time. Time periods when an NHS roadway is closed may be excluded from the calculations.

PennDOT and HATS will be able to draw from the National Performance Management Research Data Set (NPMRDS) as this data set includes truck travel times for the full Interstate system.

PennDOT will establish 2- and 4-year targets for each set performance period. The first set of targets must be established within one year of the final rule, or May 20, 2018. Targets must be reported to FHWA by October 1 of that same year in the guise of a Baseline Performance Report. A subsequent Mid-Performance Period Progress Report is due October 1, 2020, with a Full Performance Period Progress Report due on that date two years afterward, in 2022.



Literature Review

Several reports and studies were examined as part of the regional freight plan update. Below provides a brief description of each as well as its relevance to the HATS region.

- **Truck Parking in Pennsylvania** – While the Pennsylvania State Transportation Advisory Committee (TAC) completed its landmark study on truck parking a decade ago, it remains one of the definitive works on the subject within the state. The report examined the trends and issues facing the state, including expected growth in truck activity, lack of parking capacity, and revised Federal hours-of-service regulations. Using survey data, along with a review of current best practices and interviews with other states and stakeholders, TAC recommended a 12-point strategy that would expand parking capacity, eliminate unsafe parking practices, and foster public private partnerships.

The study identified the HATS region as one of the state’s eight priority regions with unmet truck parking demand. Many parking facilities in the region are near, at, or over capacity, often resulting in motor carriers parking along shoulders and interchanges. This is especially prevalent along I-81, I-76, I-83, and US 15. The study identified I-81 through Cumberland County, I-83, and the Pennsylvania Turnpike through Dauphin County as corridors with unmet truck parking demands. The Pennsylvania Turnpike in fact (eastbound and westbound between Harrisburg and Philadelphia) exhibited the greatest parking shortfall, ranking first and second respectively among the 28 corridors defined in the study.

- **Systemwide Truck Parking Improvement Study** – The study, completed in September 2016, builds upon previous Turnpike parking studies and provides recommendations that would improve trucking parking across the Turnpike system. Recommendations were based on outreach to truck stakeholders, internal PTC collaboration, evaluation of potential sites, and the identification of opportunities to increase truck parking. The study determined that the most realistic options to increase parking would be to expand existing facilities, construct new facilities within the existing Right-of-Way, or develop facilities outside of the Right-of-Way through land swap, lease, or purchase of property. In addition, the use of Intelligent Transportation systems (ITS) would provide real time parking options.

The study identified 38 sites for truck parking expansion, including the Cumberland Valley Service Plaza EB (MP 219.1). It was determined that the eastern section of the Turnpike between Harrisburg to Philadelphia had the greatest truck parking shortage while, the central portion of the Turnpike from Breezewood to Harrisburg has the smallest deficit in terms of parking availability. Because of the low need for parking, the Cumberland Valley Service Plaza was dismissed for consideration for truck parking expansion.

- **Wilmington-Harrisburg Freight Study** – Completed in December 2002, the Wilmington-Harrisburg Freight Study examined the US 30, PA 41, and PA 283 corridors, which had experienced increases in freight traffic, in order to assess current conditions, develop forecasts, and identify enhancements. In addition, the study identified four potential scenarios that would aid in moving



freight along the corridor. The final recommendations provide specific actions as well as areas for future study.

The study concluded that a vast majority of all freight traffic along the corridor comes from locations other than the Ports of Wilmington and Philadelphia. In addition, the majority of origin and destination locations for freight are within counties along the corridor, including Dauphin County. As part of the final recommendations, the plan highlighted several improvements to the study area, including bypasses for US 30 and PA 41, and increased speed/weight enforcement, truck bans, traffic calming measures, and creation of a rail line and intermodal terminal.

- **South Central Pennsylvania Regional Goods Movement Study** – The study, completed November 2006, was a multi-jurisdictional effort by HATS, the Lancaster MPO, the Lebanon MPO, York MPO, Franklin County, and the Adams County RPO to address issues related to the increase in freight movement in the region. The study assessed current freight conditions, developed forecasts, engaged private and public stakeholders, assembled a comprehensive regional freight database, and identified policies and strategies that would enhance freight movement. Recommendations, along with the collected data were expected to aid in future freight planning efforts.

The study identified clustering of the major freight generating industries around cities and boroughs including Carlisle and Harrisburg. It also identified 25 freight bottleneck points in the HATS region with most along I-81, I-83, I-283, US 11, and PA 581. Overall, the study highlighted the need for safe truck parking, along with improvements to the Rutherford, Harrisburg, and Enola Yards and Lemoyne Connector to reduce congestion.

- **PA On Track: Pennsylvania's Long Range & Comprehensive Freight Movement Plan** – Completed in Summer 2016, the Comprehensive Freight Movement Plan was a multi-faceted plan that addressed several freight planning concerns, including: a profile of the state's freight infrastructure, a set of strategic directions (including related performance measures), an analysis of commodity flows by county, by mode, for multiple forecast years. The planning process also included the development of several freight planning tools available for use by both PennDOT and its family of planning partners (including HATS). These included the availability of raw commodity flow data from Transearch, an updated state travel demand model, a Commodity Information Management System (CIMS) Tool, and a Commodity Flow Tool. PennDOT also provided HATS and its counterparts with the results of its May 2014 statewide public participation process, which culminated in a geo-referenced map with over 7,000 points of information left by Pennsylvanians through an online platform.

The plan process also included the acquisition of long-haul truck data from the American Transportation Research Institute (ATRI) that helped identify truck bottlenecks and the top 100 freight generating locations within the state. These data points are included elsewhere within this update of the HATS regional freight plan.

Appendix A: Commodity Flow Tables, by County



Freight data as compiled by IHS Global Insight was acquired by PennDOT and made available for use in this long range transportation plan. It should be noted that the values shown are *modeled numbers*, and are not intended to be exact representations of the tonnage and value of commodities being moved.

For example, data related to rail freight were developed by IHS by using a combination of Surface Transportation Board (STB) and modeled data. The waybill data is a sample of carload waybills for all U.S. rail traffic submitted by those rail carriers terminating 4,500 or more revenue carloads annually. Therefore, to account for fewer than 4,500 carloads, it is necessary to model some of the data. Local knowledge is essential when considering these numbers for planning purposes.

Values are shown for each county by both tonnage and value, and for both 2011 and the forecast year of 2040. Tables show both originating as well as destination freight, by county.

2011 Freight Origins – Cumberland County

Commodity	Tons	Percent	Commodity	Value (Millions)	Percent
2011 Origins by Truck					
Broken Stone or Riprap	1,075,671	53%	Glass Containers	\$105	20%
Bituminous Coal	203,698	10%	Miscellaneous Plastic Products	\$56	11%
Glass Containers	153,076	7%	Miscellaneous Field Crops	\$48	9%
Lumber or Dimension Stock	134,564	7%	Prefab Wood Buildings	\$33	6%
Miscellaneous Field Crops	88,038	4%	Fabricated Structural Metal Products	\$31	6%
Grain	70,683	3%	Biscuits, Crackers or Pretzels	\$27	5%
Miscellaneous Wood Products	46,016	2%	Dairy Farm Products	\$22	4%
Primary Forest Materials	39,765	2%	Miscellaneous Wood Products	\$21	4%
Dairy Farm Products	25,965	1%	Trailer Coaches	\$21	4%
Miscellaneous Sawmill or Planing Mill	25,933	1%	Lumber or Dimension Stock	\$19	4%
All Other Commodities	181,075	9%	All Other Commodities	\$135	26%
2011 Origins by Rail					
Metal Scrap or Tailings	21	97%	Metal Scrap or Tailings	\$0	95%
Rubber or Plastic Scrap	0	2%	Chemical or Petroleum Waste	\$0	3%
Chemical or Petroleum Waste	0	1%	Rubber or Plastic Scrap	\$0	3%
All Other Commodities	0	0%	All Other Commodities	\$0	0%
2011 Origins by Air					
NA					
2011 Origins by Water					
NA					
Total 2011 Origins					
Broken Stone or Riprap	1,075,671	53%	Glass Containers	\$105	20%
Bituminous Coal	203,698	10%	Miscellaneous Plastic Products	\$56	11%
Glass Containers	153,078	7%	Miscellaneous Field Crops	\$48	9%
Lumber or Dimension Stock	134,564	7%	Prefab Wood Buildings	\$33	6%
Miscellaneous Field Crops	88,038	4%	Fabricated Structural Metal Products	\$31	6%
Grain	70,683	3%	Biscuits, Crackers or Pretzles	\$27	5%
Miscellaneous Wood Products	46,020	2%	Dairy Farm Products	\$22	4%
Primary Forest Materials	39,765	2%	Miscellaneous Wood Products	\$21	4%
Dairy Farm Products	25,965	1%	Trailer Coaches	\$21	4%
Miscellaneous Sawmill or Planing Mill	25,933	1%	Lumber or Dimension Stock	\$19	4%
All Other Commodities	181,097	9%	All Other Commodities	\$135	26%

Source: IHS Global Insight; CDM Smith Inc. analysis

Regional Freight Plan

2011 Freight Origins – Dauphin County

Commodity	Tons	Percent	Commodity	Value (Millions)	Percent
2011 Origins by Truck					
Rail Intermodal Drayage from Ramp	5,243,250	39%	Rail Intermodal Drayage from Ramp	\$22,177	68%
Broken Stone or Riprap	3,621,498	27%	Rail Intermodal Drayage to Ramp	\$6,080	19%
Rail Intermodal Drayage to Ramp	1,437,567	11%	Warehouse & Distribution Center	\$1,355	4%
Warehouse & Distribution Center	1,209,949	9%	Candy or Other Confectionery	\$498	2%
Primary Iron or Steel Products	318,572	2%	Primary Iron or Steel Products	\$431	1%
Candy or Other Confectionery	210,308	2%	Air Freight Drayage from Airport	\$259	1%
Miscellaneous Food Preparations, Nec	187,182	1%	Miscellaneous Food Preparations, Nec	\$213	1%
Asphalt Paving Blocks or Mix	177,030	1%	Miscellaneous Electronic Components	\$127	0%
Grain	160,874	1%	Miscellaneous Internal Combustion Engines	\$72	0%
Miscellaneous Field Crops	116,383	1%	Miscellaneous Field Crops	\$63	0%
All Other Commodities	841,270	6%	All Other Commodities	\$1,173	4%
2011 Origins by Rail					
Semi-trailers Returned Empty	1,037,000	34%	Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	\$4,334	62%
Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	856,120	28%	Primary Iron or Steel Products	\$550	8%
Primary Iron or Steel Products	361,534	12%	Miscellaneous Fabricated Textile Products	\$544	8%
Miscellaneous Fabricated Textile Products	116,960	4%	Soap or Other Detergents	\$184	3%
Soap or Other Detergents	105,000	3%	Miscellaneous Printed Matter	\$148	2%
Metal Scrap or Tailings	78,923	3%	Motor Vehicles	\$142	2%
Pickled Fruits or Vegetables	49,030	2%	Mens or Boys Clothing	\$111	2%
Miscellaneous Food Preparations, Nec	41,077	1%	Industrial Pumps	\$108	2%
Sanitary Food Containers	35,360	1%	Miscellaneous Plastic Products	\$75	1%
Miscellaneous Printed Matter	28,600	1%	Sanitary Food Containers	\$61	1%
All Other Commodities	338,420	11%	All Other Commodities	\$786	11%
2011 Origins by Air					
Electrical Equipment	772	16%	Electrical Equipment	\$173	23%
Machinery	672	14%	Pharmaceuticals	\$157	21%
Transportation Equipment	670	14%	Transportation Equipment	\$152	20%
Pharmaceuticals	510	11%	Miscellaneous Manufacturing Products	\$116	15%
Printed Matter	457	10%	Machinery	\$70	9%
Fabricated Metal Products	300	6%	Instrum, Photo Equipment, Optical Eq	\$34	5%
Lumber or Wood Products	231	5%	Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	\$10	1%
Miscellaneous Manufacturing Products	189	4%	Printed Matter	\$10	1%
Instrum, Photo Equipment, Optical Eq	168	4%	Fabricated Metal Products	\$8	1%
Nonmetallic Minerals	139	3%	Industrial Chemicals	\$6	1%
All Other Commodities	662	14%	All Other Commodities	\$19	2%
2011 Origins by Water					
NA					
Total 2011 Origins					
Rail Intermodal Drayage from Ramp	5,243,250	32%	Rail Intermodal Drayage from Ramp	\$22,177	55%
Broken Stone or Riprap	3,621,498	22%	Rail Intermodal Drayage to Ramp	\$6,080	15%
Rail Intermodal Drayage to Ramp	1,437,567	9%	Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	\$4,344	11%
Warehouse & Distribution Center	1,209,949	7%	Warehouse & Distribution Center	\$1,355	3%
Semi-trailers Returned Empty	1,037,000	6%	Primary Iron or Steel Products	\$981	2%
Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	856,212	5%	Miscellaneous Fabricated Textile Products	\$544	1%
Primary Iron or Steel Products	680,106	4%	Candy or Other Confectionery	\$522	1%
Miscellaneous Food Preparations, Nec	228,260	1%	Miscellaneous Food Preparations, Nec	\$264	1%
Candy or Other Confectionery	219,987	1%	Air Freight Drayage from Airport	\$259	1%
Asphalt Paving Blocks or Mix	177,030	1%	Soap or Other Detergents	\$184	0%
All Other Commodities	1,865,839	11%	All Other Commodities	\$3,536	9%

Source: IHS Global Insight; CDM Smith Inc. analysis



2011 Freight Origins – Perry County

Commodity	Tons	Percent	Commodity	Value (Millions)	Percent
2011 Origins by Truck					
Grain	209,398	21%	Miscellaneous Field Crops	\$86	17%
Lumber or Dimension Stock	189,061	19%	Dairy Farm Products	\$84	17%
Miscellaneous Field Crops	157,729	16%	Bread or Other Bakery Prod	\$64	13%
Dairy Farm Products	98,093	10%	Live Poultry	\$47	9%
Broken Stone or Riprap	69,414	7%	Prefab Wood Buildings	\$37	7%
Bread or Other Bakery Prod	26,219	3%	Grain	\$28	6%
Prepared or Canned Feed	25,505	3%	Lumber or Dimension Stock	\$24	5%
Prefab Wood Buildings	23,714	2%	Livestock	\$23	5%
Live Poultry	22,360	2%	Poultry Eggs	\$14	3%
Poultry Eggs	18,550	2%	Miscellaneous Metal Work	\$14	3%
All Other Commodities	158,806	16%	All Other Commodities	\$73	15%
2011 Origins by Rail					
Lumber or Dimension Stock	3,296	87%	Lumber or Dimension Stock	\$3	88%
Paper Waste or Scrap	408	11%	Miscellaneous Fabricated Products	\$0	4%
Miscellaneous Fabricated Products	16	0%	Paper Waste or Scrap	\$0	3%
Textile Scrap or Sweepings	14	0%	Miscellaneous Waste or Scrap	\$0	2%
Metal Scrap or Tailings	12	0%	Prefab Wood Buildings	\$0	1%
Chemical or Petroleum Waste	11	0%	Fabricated Metal Products, Nec	\$0	0%
Prefab Wood Buildings	7	0%	Farm Machinery or Equipment	\$0	0%
Prepared or Canned Feed	7	0%	Prepared or Canned Feed	\$0	0%
Fabricated Metal Products, Nec	4	0%	Miscellaneous Plastic Products	\$0	0%
Miscellaneous Metal Work	3	0%	Metal Scrap or Tailings	\$0	0%
All Other Commodities	7	0%	All Other Commodities	\$0	1%
2011 Origins by Air					
NA					
2011 Origins by Water					
NA					
Total 2011 Origins					
Grain	209,398	21%	Miscellaneous Field Crops	\$86	17%
Lumber or Dimension Stock	192,359	19%	Dairy Farm Products	\$84	17%
Miscellaneous Field Crops	157,729	16%	Bread or Other Bakery Prod	\$64	13%
Dairy Farm Products	98,093	10%	Live Poultry	\$47	9%
Broken Stone or Riprap	69,414	7%	Prefab Wood Buildings	\$37	7%
Bread or Other Bakery Prod	26,219	3%	Grain	\$28	6%
Prepared or Canned Feed	25,511	3%	Lumber or Dimension Stock	\$26	5%
Prefab Wood Buildings	23,722	2%	Livestock	\$23	5%
Live Poultry	22,360	2%	Poultry Eggs	\$14	3%
Poultry Eggs	18,550	2%	Miscellaneous Metal Work	\$14	3%
All Other Commodities	159,281	16%	All Other Commodities	\$74	15%

Source: IHS Global Insight; CDM Smith Inc. analysis

Regional Freight Plan

2011 Freight Destinations – Cumberland County

Commodity	Tons	Percent	Commodity	Value (Millions)	Percent
2011 Destinations by Truck					
Petroleum Refining Products	1,528,523	25%	Petroleum Refining Products	\$1,396	20%
Warehouse & Distribution Center	867,587	14%	Warehouse & Distribution Center	\$971	14%
Broken Stone or Riprap	519,192	9%	Rail Intermodal Drayage from Ramp	\$706	10%
Processed Milk	497,901	8%	Processed Milk	\$441	6%
Gravel or Sand	316,184	5%	Motor Vehicles	\$339	5%
Liquefied Gases, Coal or Petroleum	199,726	3%	Liquefied Gases, Coal or Petroleum	\$162	2%
Rail Intermodal Drayage from Ramp	166,882	3%	Pharmaceuticals	\$157	2%
Concrete Products	138,128	2%	Bread or Other Bakery Prod	\$135	2%
Soft Drinks or Mineral Water	125,476	2%	Miscellaneous Plastic Products	\$104	1%
Asphalt Paving Blocks or Mix	123,019	2%	Motor Vehicle Parts or Accessories	\$95	1%
All Other Commodities	1,591,729	26%	All Other Commodities	\$2,564	36%
2011 Destinations by Rail					
Miscellaneous Industrial Organic Chemicals	317,144	21%	Miscellaneous Industrial Organic Chemicals	\$395	26%
Grain	243,039	16%	Chemical Preparations, Nec	\$252	17%
Pulp or Pulp Mill Products	118,312	8%	Miscellaneous Household Appliances	\$125	8%
Malt Liquors	114,560	8%	Paper	\$110	7%
Gravel or Sand	110,687	7%	Malt Liquors	\$109	7%
Chemical Preparations, Nec	74,520	5%	Plastic Matter or Synthetic Fibers	\$109	7%
Flour or Other Grain Mill Products	59,880	4%	Meat Products	\$68	4%
Soybean Oil or By-products	56,360	4%	Primary Iron or Steel Products	\$61	4%
Paper	55,840	4%	Pulp or Pulp Mill Products	\$59	4%
Fiber, Paper or Pulpboard	54,040	4%	Fiber, Paper or Pulpboard	\$39	3%
All Other Commodities	288,147	19%	All Other Commodities	\$194	13%
2011 Destinations by Air					
NA					
2011 Destinations by Water					
NA					
Total 2011 Destinations					
Petroleum Refining Products	1,528,548	20%	Petroleum Refining Products	\$1,396	16%
Warehouse & Distribution Center	867,587	11%	Warehouse & Distribution Center	\$971	11%
Broken Stone or Riprap	519,192	7%	Rail Intermodal Drayage from Ramp	\$706	8%
Processed Milk	497,901	7%	Processed Milk	\$441	5%
Gravel or Sand	426,871	6%	Miscellaneous Industrial Organic Chemicals	\$430	5%
Miscellaneous Industrial Organic Chemicals	353,304	5%	Motor Vehicles	\$339	4%
Grain	324,137	4%	Chemical Preparations, Nec	\$252	3%
Liquefied Gases, Coal or Petroleum	199,948	3%	Liquefied Gases, Coal or Petroleum	\$162	2%
Rail Intermodal Drayage from Ramp	166,882	2%	Pharmaceuticals	\$157	2%
Concrete Products	138,128	2%	Bread or Other Bakery Prod	\$135	2%
All Other Commodities	2,544,382	34%	All Other Commodities	\$3,601	42%

Source: IHS Global Insight; CDM Smith Inc. analysis



2011 Freight Destinations – Dauphin County

Commodity	Tons	Percent	Commodity	Value (Millions)	Percent
2011 Destinations by Truck					
Rail Intermodal Drayage from Ramp	2,485,507	24%	Rail Intermodal Drayage from Ramp	\$10,513	40%
Rail Intermodal Drayage to Ramp	2,399,790	23%	Rail Intermodal Drayage to Ramp	\$10,150	39%
Warehouse & Distribution Center	1,072,041	10%	Warehouse & Distribution Center	\$1,200	5%
Petroleum Refining Products	1,019,127	10%	Petroleum Refining Products	\$931	4%
Broken Stone or Riprap	658,083	6%	Motor Vehicles	\$204	1%
Gravel or Sand	224,888	2%	Processed Milk	\$185	1%
Asphalt Paving Blocks or Mix	213,006	2%	Plastic Matter or Synthetic Fibers	\$173	1%
Processed Milk	208,678	2%	Air Freight Drayage from Airport	\$160	1%
Concrete Products	169,500	2%	Primary Iron or Steel Products	\$127	0%
Ready-mix Concrete, Wet	123,895	1%	Liquefied Gases, Coal or Petroleum	\$99	0%
All Other Commodities	1,720,228	17%	All Other Commodities	\$2,300	9%
2011 Destinations by Rail					
Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	1,429,319	43%	Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	\$7,235	63%
Miscellaneous Fabricated Textile Products	217,600	6%	Miscellaneous Fabricated Textile Products	\$1,012	9%
Primary Iron or Steel Products	125,511	4%	Tires or Inner Tubes	\$279	2%
Miscellaneous Food Preparations, Nec	114,830	3%	Miscellaneous Hardware	\$220	2%
Wet Corn Milling or Milo	107,840	3%	Household Cooking Equipment	\$197	2%
Small Packaged Freight Shipments	101,240	3%	Games or Toys	\$176	2%
Metal Scrap or Tailings	90,724	3%	Cosmetics, perfumes, Etc.	\$158	1%
Semi-trailers Returned Empty	82,400	2%	Primary Iron or Steel Products	\$142	1%
Lumber or Dimension Stock	76,315	2%	Miscellaneous Food Preparations, Nec	\$141	1%
Sanitary Food Containers	65,200	2%	Motor Vehicle Parts or Accessories	\$137	1%
All Other Commodities	945,087	28%	All Other Commodities	\$1,791	16%
2011 Destinations by Air					
Electrical Equipment	4,841	19%	Miscellaneous Manufacturing Products	\$1,677	39%
Machinery	3,295	13%	Electrical Equipment	\$1,087	25%
Miscellaneous Manufacturing Products	2,739	11%	Pharmaceuticals	\$399	9%
Meat or Poultry, Fresh or Chilled	2,347	9%	Machinery	\$342	8%
Fabricated Metal Products	1,875	7%	Transportation Equipment	\$318	7%
Textile Mill Products	1,564	6%	Instrum, Photo Equipment, Optical Eq	\$309	7%
Instrum, Photo Equipment, Optical Eq	1,516	6%	Fabricated Metal Products	\$52	1%
Transportation Equipment	1,399	5%	Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	\$35	1%
Pharmaceuticals	1,294	5%	Textile Mill Products	\$27	1%
Lumber or Wood Products	1,082	4%	Primary Metal Products	\$25	1%
All Other Commodities	3,581	14%	All Other Commodities	\$78	2%
2011 Destinations by Water					
NA					
Total 2011 Destinations					
Rail Intermodal Drayage from Ramp	2,485,507	18%	Rail Intermodal Drayage from Ramp	\$10,513	25%
Rail Intermodal Drayage to Ramp	2,399,790	18%	Rail Intermodal Drayage to Ramp	\$10,150	24%
Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	1,431,962	10%	Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	\$7,278	17%
Warehouse & Distribution Center	1,072,041	8%	Miscellaneous Manufacturing Products	\$1,678	4%
Petroleum Refining Products	1,019,544	7%	Warehouse & Distribution Center	\$1,200	3%
Broken Stone or Riprap	658,083	5%	Electrical Equipment	\$1,087	3%
Gravel or Sand	225,288	2%	Miscellaneous Fabricated Textile Products	\$1,012	2%
Primary Iron or Steel Products	221,028	2%	Petroleum Refining Products	\$931	2%
Miscellaneous Fabricated Textile Products	217,600	2%	Pharmaceuticals	\$524	1%
Asphalt Paving Blocks or Mix	213,006	2%	Machinery	\$342	1%
All Other Commodities	3,732,495	27%	All Other Commodities	\$7,167	17%

Source: IHS Global Insight; CDM Smith Inc. analysis

Regional Freight Plan

2011 Freight Destinations – Perry County

Commodity	Tons	Percent	Commodity	Value (Millions)	Percent
2011 Destinations by Truck					
Warehouse & Distribution Center	109,467	26%	Warehouse & Distribution Center	\$123	38%
Grain	55,540	13%	Rail Intermodal Drayage from Ramp	\$21	6%
Broken Stone or Riprap	31,560	7%	Petroleum Refining Products	\$18	6%
Gravel or Sand	20,656	5%	Motor Vehicles	\$17	5%
Petroleum Refining Products	19,827	5%	Distilled or Blended Liquors	\$10	3%
Asphalt Paving Blocks or Mix	15,378	4%	Miscellaneous Field Crops	\$8	2%
Miscellaneous Field Crops	14,463	3%	Grain	\$7	2%
Primary Forest Materials	10,757	3%	Motor Vehicle Parts or Accessories	\$4	1%
Distilled or Blended Liquors	9,298	2%	Newspapers	\$4	1%
Ready-mix Concrete, Wet	9,202	2%	Pharmaceuticals	\$4	1%
All Other Commodities	128,148	30%	All Other Commodities	\$110	34%
2011 Destinations by Rail					
Lumber or Dimension Stock	56	26%	Primary Aluminum Smelter Products	\$0	12%
Primary Iron or Steel Products	23	11%	Copper or Alloy Basic Shapes	\$0	10%
Primary Aluminum Smelter Products	15	7%	Primary Copper Smelter Products	\$0	9%
Lime or Lime Plaster	12	5%	Refrigeration Machinery	\$0	8%
Primary Metal Products, Nec	11	5%	Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	\$0	7%
Dog,cat or Other Pet Food,nec	10	5%	Miscellaneous Office Machines	\$0	5%
Paper or Building Board	8	4%	Primary Iron or Steel Products	\$0	5%
Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	8	4%	Miscellaneous Household Appliances	\$0	4%
Paper Bags	8	4%	Lumber or Dimension Stock	\$0	4%
Paper	6	3%	Primary Metal Products, Nec	\$0	4%
All Other Commodities	56	26%	All Other Commodities	\$0	33%
2011 Destinations by Air					
NA					
2011 Destinations by Water					
NA					
Total 2011 Destinations					
Warehouse & Distribution Center	109,467	26%	Warehouse & Distribution Center	\$123	38%
Grain	55,540	13%	Rail Intermodal Drayage from Ramp	\$21	6%
Broken Stone or Riprap	31,560	7%	Petroleum Refining Products	\$18	6%
Gravel or Sand	20,656	5%	Motor Vehicles	\$17	5%
Petroleum Refining Products	19,827	5%	Distilled or Blended Liquors	\$10	3%
Asphalt Paving Blocks or Mix	15,378	4%	Miscellaneous Field Crops	\$8	2%
Miscellaneous Field Crops	14,463	3%	Grain	\$7	2%
Primary Forest Materials	10,757	3%	Motor Vehicle Parts or Accessories	\$4	1%
Distilled or Blended Liquors	9,298	2%	Newspapers	\$4	1%
Ready-mix Concrete, Wet	9,202	2%	Pharmaceuticals	\$4	1%
All Other Commodities	128,362	30%	All Other Commodities	\$110	34%

Source: IHS Global Insight; CDM Smith Inc. analysis



2040 Freight Origins – Cumberland County

Commodity	Tons	Percent	Commodity	Value (Millions)	Percent
2040 Origins by Truck					
Broken Stone or Riprap	6,109,831	38%	Warehouse & Distribution Center	\$3,695	35%
Warehouse & Distribution Center	3,300,941	21%	Rail Intermodal Drayage to Ramp	\$1,626	16%
Gravel or Sand	1,127,750	7%	Miscellaneous Electronic Components	\$384	4%
Dog,cat or Other Pet Food,nec	772,376	5%	Bread or Other Bakery Prod	\$374	4%
Flat Glass	634,431	4%	Iron or Steel Castings	\$301	3%
Grain	556,566	3%	Constr Machinery or Equipment	\$282	3%
Rail Intermodal Drayage to Ramp	384,538	2%	Dog,cat or Other Pet Food,nec	\$280	3%
Prepared or Canned Feed	322,509	2%	Candy or Other Confectionery	\$246	2%
Wood Prod, Nec	252,772	2%	Dairy Farm Products	\$179	2%
Asphalt Paving Blocks or Mix	241,197	2%	Cheese or Special Dairy Products	\$174	2%
All Other Commodities	2,354,588	15%	All Other Commodities	\$2,895	28%
2040 Origins by Rail					
Railroad Cars	20,142	28%	Fabricated Plate Products	\$111	52%
Fabricated Plate Products	13,788	19%	Locomotives or Parts	\$33	15%
Pulp or Pulp Mill Products	11,626	16%	Railroad Cars	\$32	15%
Grain	11,537	16%	Paper	\$10	5%
Paper	5,163	7%	Tires or Inner Tubes	\$7	3%
Empty Equipment, Reverse Route	3,466	5%	Pulp or Pulp Mill Products	\$5	2%
Primary Iron or Steel Products	1,485	2%	Miscellaneous Pottery Products	\$3	1%
Locomotives or Parts	1,468	2%	Manufactured Prod, Nec	\$2	1%
Tires or Inner Tubes	1,250	2%	Flat Glass	\$2	1%
Miscellaneous Pottery Products	444	1%	Grain	\$2	1%
All Other Commodities	2,434	3%	All Other Commodities	\$8	4%
2040 Origins by Air					
NA					
2040 Origins by Water					
NA					
Total 2040 Origins					
Broken Stone or Riprap	6,109,831	38%	Warehouse & Distribution Center	\$3,695	35%
Warehouse & Distribution Center	3,300,941	20%	Rail Intermodal Drayage to Ramp	\$1,626	15%
Gravel or Sand	1,127,841	7%	Miscellaneous Electronic Components	\$384	4%
Dog,cat or Other Pet Food,nec	772,427	5%	Bread or Other Bakery Prod	\$374	4%
Flat Glass	634,750	4%	Iron or Steel Castings	\$302	3%
Grain	568,102	4%	Constr Machinery or Equipment	\$283	3%
Rail Intermodal Drayage to Ramp	384,538	2%	Dog,cat or Other Pet Food,nec	\$280	3%
Prepared or Canned Feed	322,582	2%	Candy or Other Confectionery	\$246	2%
Wood Prod, Nec	252,772	2%	Dairy Farm Products	\$179	2%
Asphalt Paving Blocks or Mix	241,197	1%	Cheese or Special Dairy Products	\$174	2%
All Other Commodities	2,415,354	15%	All Other Commodities	\$3,109	29%

Source: IHS Global Insight; CDM Smith Inc. analysis

Regional Freight Plan

2040 Freight Origins – Dauphin County

Commodity	Tons	Percent	Commodity	Value (Millions)	Percent
2040 Origins by Truck					
Broken Stone or Riprap	11,595,664	53%	Rail Intermodal Drayage from Ramp	\$25,956	76%
Rail Intermodal Drayage from Ramp	6,136,654	28%	Rail Intermodal Drayage to Ramp	\$2,706	8%
Rail Intermodal Drayage to Ramp	639,695	3%	Air Freight Drayage from Airport	\$628	2%
Primary Iron or Steel Products	416,632	2%	Primary Iron or Steel Products	\$556	2%
Warehouse & Distribution Center	414,005	2%	Miscellaneous Electronic Components	\$501	1%
Asphalt Paving Blocks or Mix	384,946	2%	Candy or Other Confectionery	\$494	1%
Ready-mix Concrete, Wet	214,928	1%	Warehouse & Distribution Center	\$463	1%
Candy or Other Confectionery	206,034	1%	Aircraft or Missile Engines	\$211	1%
Concrete Products	203,542	1%	Printing Trades Machinery	\$172	1%
Grain	199,455	1%	Miscellaneous Internal Combustion Engines	\$156	0%
All Other Commodities	1,674,432	8%	All Other Commodities	\$2,436	7%
2040 Origins by Rail					
Semi-trailers Returned Empty	2,320,653	41%	Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	\$8,329	69%
Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	1,645,090	29%	Primary Iron or Steel Products	\$668	6%
Primary Iron or Steel Products	451,810	8%	Industrial Pumps	\$387	3%
Metal Scrap or Tailings	191,455	3%	Miscellaneous Fabricated Textile Products	\$277	2%
Soap or Other Detergents	145,774	3%	Motor Vehicles	\$276	2%
Pickled Fruits or Vegetables	60,971	1%	Soap or Other Detergents	\$255	2%
Miscellaneous Food Preparations, Nec	59,542	1%	Miscellaneous Printed Matter	\$221	2%
Miscellaneous Fabricated Textile Products	59,479	1%	Miscellaneous Plastic Products	\$182	2%
Sanitary Food Containers	56,781	1%	Manufactured Prod, Nec	\$119	1%
Miscellaneous Plastic Products	48,205	1%	Games or Toys	\$108	1%
All Other Commodities	573,964	10%	All Other Commodities	\$1,313	11%
2040 Origins by Air					
Pharmaceuticals	3,288	27%	Pharmaceuticals	\$1,015	43%
Electrical Equipment	2,548	21%	Electrical Equipment	\$572	24%
Machinery	1,761	14%	Miscellaneous Manufacturing Products	\$228	10%
Transportation Equipment	879	7%	Transportation Equipment	\$200	8%
Fabricated Metal Products	727	6%	Machinery	\$183	8%
Lumber or Wood Products	647	5%	Instrum, Photo Equipment, Optical Eq	\$73	3%
Printed Matter	503	4%	Fabricated Metal Products	\$20	1%
Miscellaneous Manufacturing Products	373	3%	Chemicals or Allied Products	\$12	1%
Instrum, Photo Equipment, Optical Eq	359	3%	Printed Matter	\$11	0%
Nonmetallic Minerals	222	2%	Industrial Chemicals	\$9	0%
All Other Commodities	1,022	8%	All Other Commodities	\$31	1%
2040 Origins by Water					
NA					
Total 2040 Origins					
Broken Stone or Riprap	11,595,664	42%	Rail Intermodal Drayage from Ramp	\$25,956	53%
Rail Intermodal Drayage from Ramp	6,136,654	22%	Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	\$8,332	17%
Semi-trailers Returned Empty	2,320,653	8%	Rail Intermodal Drayage to Ramp	\$2,706	6%
Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	1,645,115	6%	Primary Iron or Steel Products	\$1,224	3%
Primary Iron or Steel Products	868,444	3%	Pharmaceuticals	\$1,056	2%
Rail Intermodal Drayage to Ramp	639,695	2%	Air Freight Drayage from Airport	\$628	1%
Warehouse & Distribution Center	414,005	1%	Electrical Equipment	\$572	1%
Asphalt Paving Blocks or Mix	384,946	1%	Candy or Other Confectionery	\$528	1%
Candy or Other Confectionery	219,681	1%	Miscellaneous Electronic Components	\$501	1%
Ready-mix Concrete, Wet	214,928	1%	Warehouse & Distribution Center	\$463	1%
All Other Commodities	3,272,318	12%	All Other Commodities	\$6,802	14%

Source: IHS Global Insight; CDM Smith Inc. analysis



2040 Freight Origins – Perry County

Commodity	Tons	Percent	Commodity	Value (Millions)	Percent
2040 Origins by Truck					
Grain	276,376	18%	Miscellaneous Fabricated Products	\$173	18%
Miscellaneous Field Crops	178,905	12%	Bread or Other Bakery Prod	\$158	16%
Broken Stone or Riprap	148,574	10%	Miscellaneous Field Crops	\$98	10%
Lumber or Dimension Stock	133,735	9%	Dairy Farm Products	\$96	10%
Dairy Farm Products	111,008	7%	Live Poultry	\$54	6%
Concrete Products	98,462	6%	Wine,brandy or Brandy Spirit	\$51	5%
Primary Forest Materials	95,807	6%	Grain	\$36	4%
Ready-mix Concrete, Wet	72,660	5%	Transportation Equipment, Nec	\$28	3%
Bread or Other Bakery Prod	64,716	4%	Livestock	\$27	3%
Prepared or Canned Feed	56,800	4%	Prefab Wood Buildings	\$26	3%
All Other Commodities	307,663	20%	All Other Commodities	\$225	23%
2040 Origins by Rail					
Lumber or Dimension Stock	7,319	86%	Lumber or Dimension Stock	\$6	86%
Paper Waste or Scrap	911	11%	Miscellaneous Fabricated Products	\$0	5%
Miscellaneous Fabricated Products	46	1%	Paper Waste or Scrap	\$0	3%
Chemical or Petroleum Waste	38	0%	Miscellaneous Waste or Scrap	\$0	2%
Metal Scrap or Tailings	38	0%	Prefab Wood Buildings	\$0	1%
Textile Scrap or Sweepings	26	0%	Fabricated Metal Products, Nec	\$0	1%
Prefab Wood Buildings	25	0%	Farm Machinery or Equipment	\$0	1%
Fabricated Metal Products, Nec	15	0%	Miscellaneous Plastic Products	\$0	0%
Miscellaneous Metal Work	13	0%	Metal Scrap or Tailings	\$0	0%
Prepared or Canned Feed	12	0%	Chemical or Petroleum Waste	\$0	0%
All Other Commodities	25	0%	All Other Commodities	\$0	1%
2040 Origins by Air					
NA					
2040 Origins by Water					
NA					
Total 2040 Origins					
Grain	276,376	18%	Miscellaneous Fabricated Products	\$173	18%
Miscellaneous Field Crops	178,905	12%	Bread or Other Bakery Prod	\$158	16%
Broken Stone or Riprap	148,574	10%	Miscellaneous Field Crops	\$98	10%
Lumber or Dimension Stock	141,057	9%	Dairy Farm Products	\$96	10%
Dairy Farm Products	111,008	7%	Live Poultry	\$54	6%
Concrete Products	98,462	6%	Wine,brandy or Brandy Spirit	\$51	5%
Primary Forest Materials	95,807	6%	Grain	\$36	4%
Ready-mix Concrete, Wet	72,660	5%	Transportation Equipment, Nec	\$28	3%
Bread or Other Bakery Prod	64,716	4%	Lumber or Dimension Stock	\$27	3%
Prepared or Canned Feed	56,811	4%	Livestock	\$27	3%
All Other Commodities	308,800	20%	All Other Commodities	\$230	24%

Source: IHS Global Insight; CDM Smith Inc. analysis

Regional Freight Plan

2040 Freight Destinations – Cumberland County

Commodity	Tons	Percent	Commodity	Value (Millions)	Percent
2040 Destinations by Truck					
Warehouse & Distribution Center	2,029,244	22%	Warehouse & Distribution Center	\$2,272	18%
Processed Milk	986,606	11%	Rail Intermodal Drayage from Ramp	\$1,697	13%
Petroleum Refining Products	946,021	10%	Processed Milk	\$873	7%
Broken Stone or Riprap	931,356	10%	Petroleum Refining Products	\$864	7%
Rail Intermodal Drayage from Ramp	401,121	4%	Motor Vehicles	\$548	4%
Gravel or Sand	353,474	4%	Pharmaceuticals	\$434	3%
Soft Drinks or Mineral Water	218,539	2%	Solid State Semiconducts	\$401	3%
Concrete Products	196,707	2%	Bread or Other Bakery Prod	\$262	2%
Grain	160,730	2%	Miscellaneous Plastic Products	\$160	1%
Ready-mix Concrete, Wet	140,078	2%	Motor Vehicle Parts or Accessories	\$152	1%
All Other Commodities	2,689,324	30%	All Other Commodities	\$4,964	39%
2040 Destinations by Rail					
Miscellaneous Industrial Organic Chemicals	418,831	18%	Chemical Preparations, Nec	\$729	25%
Grain	317,634	14%	Miscellaneous Household Appliances	\$525	18%
Chemical Preparations, Nec	215,693	9%	Miscellaneous Industrial Organic Chemicals	\$522	18%
Gravel or Sand	204,665	9%	Malt Liquors	\$185	6%
Malt Liquors	194,003	8%	Paper	\$161	6%
Pulp or Pulp Mill Products	180,450	8%	Plastic Matter or Synthetic Fibers	\$148	5%
Soybean Oil or By-products	94,200	4%	Meat Products	\$102	4%
Paper	81,443	3%	Pulp or Pulp Mill Products	\$90	3%
Fiber, Paper or Pulpboard	80,284	3%	Primary Iron or Steel Products	\$71	2%
Flour or Other Grain Mill Products	79,678	3%	Canned Fruits,vegetables, Etc.	\$59	2%
All Other Commodities	470,887	20%	All Other Commodities	\$299	10%
2040 Destinations by Air					
NA					
2040 Destinations by Water					
NA					
Total 2040 Destinations					
Warehouse & Distribution Center	2,029,244	18%	Warehouse & Distribution Center	\$2,272	15%
Processed Milk	986,606	9%	Rail Intermodal Drayage from Ramp	\$1,697	11%
Petroleum Refining Products	946,053	8%	Processed Milk	\$873	6%
Broken Stone or Riprap	931,356	8%	Petroleum Refining Products	\$864	6%
Gravel or Sand	558,138	5%	Chemical Preparations, Nec	\$729	5%
Miscellaneous Industrial Organic Chemicals	507,909	4%	Miscellaneous Industrial Organic Chemicals	\$608	4%
Grain	478,364	4%	Motor Vehicles	\$548	4%
Rail Intermodal Drayage from Ramp	401,121	4%	Miscellaneous Household Appliances	\$525	3%
Soft Drinks or Mineral Water	218,539	2%	Pharmaceuticals	\$434	3%
Chemical Preparations, Nec	215,693	2%	Solid State Semiconducts	\$401	3%
All Other Commodities	4,117,960	36%	All Other Commodities	\$6,567	42%

Source: IHS Global Insight; CDM Smith Inc. analysis



2040 Freight Destinations – Dauphin County

Commodity	Tons	Percent	Commodity	Value (Millions)	Percent
2040 Destinations by Truck					
Rail Intermodal Drayage from Ramp	6,491,367	30%	Rail Intermodal Drayage from Ramp	\$27,456	43%
Rail Intermodal Drayage to Ramp	6,205,564	28%	Rail Intermodal Drayage to Ramp	\$26,248	41%
Warehouse & Distribution Center	2,230,464	10%	Warehouse & Distribution Center	\$2,497	4%
Broken Stone or Riprap	2,203,835	10%	Petroleum Refining Products	\$873	1%
Petroleum Refining Products	956,555	4%	Solid State Semiconducts	\$440	1%
Concrete Products	332,251	2%	Air Freight Drayage from Airport	\$362	1%
Ready-mix Concrete, Wet	237,556	1%	Pharmaceuticals	\$344	1%
Processed Milk	237,208	1%	Motor Vehicles	\$314	0%
Primary Iron or Steel Products	232,189	1%	Primary Iron or Steel Products	\$311	0%
Gravel or Sand	198,585	1%	Plastic Matter or Synthetic Fibers	\$266	0%
All Other Commodities	2,608,115	12%	All Other Commodities	\$4,607	7%
2040 Destinations by Rail					
Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	2,747,126	47%	Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	\$13,900	68%
Metal Scrap or Tailings	219,418	4%	Games or Toys	\$544	3%
Semi-trailers Returned Empty	184,399	3%	Miscellaneous Fabricated Textile Products	\$515	3%
Wet Corn Milling or Milo	178,409	3%	Tires or Inner Tubes	\$435	2%
Primary Iron or Steel Products	167,505	3%	Household Cooking Equipment	\$414	2%
Small Packaged Freight Shipments	165,776	3%	Orthopedic or Prosthetic Supplies	\$279	1%
Miscellaneous Food Preparations, Nec	163,984	3%	Miscellaneous Hardware	\$272	1%
Lumber or Dimension Stock	143,882	2%	Cosmetics, perfumes, Etc.	\$259	1%
Miscellaneous Fabricated Textile Products	110,658	2%	Miscellaneous Service Industry Machinery	\$257	1%
Sanitary Food Containers	104,699	2%	Refrigeration Machinery	\$250	1%
All Other Commodities	1,606,195	28%	All Other Commodities	\$3,389	17%
2040 Destinations by Air					
Electrical Equipment	17,342	29%	Electrical Equipment	\$3,894	35%
Machinery	9,983	16%	Miscellaneous Manufacturing Products	\$3,066	28%
Miscellaneous Manufacturing Products	5,008	8%	Pharmaceuticals	\$1,377	13%
Pharmaceuticals	4,462	7%	Machinery	\$1,036	9%
Instrum, Photo Equipment, Optical Eq	4,144	7%	Instrum, Photo Equipment, Optical Eq	\$844	8%
Meat or Poultry, Fresh or Chilled	3,766	6%	Transportation Equipment	\$432	4%
Lumber or Wood Products	3,493	6%	Primary Metal Products	\$102	1%
Fabricated Metal Products	2,809	5%	Fabricated Metal Products	\$79	1%
Textile Mill Products	2,404	4%	Textile Mill Products	\$42	0%
Transportation Equipment	1,901	3%	Rubber or Miscellaneous Plastics	\$26	0%
All Other Commodities	5,332	9%	All Other Commodities	\$108	1%
2040 Destinations by Water					
NA					
Total 2040 Destinations					
Rail Intermodal Drayage from Ramp	6,491,367	23%	Rail Intermodal Drayage from Ramp	\$27,456	29%
Rail Intermodal Drayage to Ramp	6,205,564	22%	Rail Intermodal Drayage to Ramp	\$26,248	28%
Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	2,759,301	10%	Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	\$13,950	15%
Warehouse & Distribution Center	2,230,464	8%	Electrical Equipment	\$3,894	4%
Broken Stone or Riprap	2,203,835	8%	Miscellaneous Manufacturing Products	\$3,070	3%
Petroleum Refining Products	956,836	3%	Warehouse & Distribution Center	\$2,497	3%
Primary Iron or Steel Products	399,694	1%	Pharmaceuticals	\$1,831	2%
Concrete Products	332,251	1%	Machinery	\$1,036	1%
Ready-mix Concrete, Wet	237,556	1%	Petroleum Refining Products	\$874	1%
Processed Milk	237,208	1%	Instrum, Photo Equipment, Optical Eq	\$844	1%
All Other Commodities	5,732,323	21%	All Other Commodities	\$13,540	14%

Source: IHS Global Insight; CDM Smith Inc. analysis

Regional Freight Plan

2040 Freight Destinations – Perry County

Commodity	Tons	Percent	Commodity	Value (Millions)	Percent
2040 Destinations by Truck					
Warehouse & Distribution Center	270,662	35%	Warehouse & Distribution Center	\$303	41%
Grain	72,926	10%	Motor Vehicles	\$60	8%
Broken Stone or Riprap	68,013	9%	Rail Intermodal Drayage from Ramp	\$53	7%
Gravel or Sand	30,117	4%	Distilled or Blended Liquors	\$25	3%
Distilled or Blended Liquors	22,992	3%	Petroleum Refining Products	\$20	3%
Petroleum Refining Products	21,588	3%	Solid State Semiconducts	\$14	2%
Ready-mix Concrete, Wet	18,775	2%	Pharmaceuticals	\$13	2%
Prepared or Canned Feed	16,390	2%	Motor Vehicle Parts or Accessories	\$11	2%
Concrete Products	14,933	2%	Grain	\$10	1%
Asphalt Paving Blocks or Mix	14,755	2%	Miscellaneous Field Crops	\$7	1%
All Other Commodities	213,230	28%	All Other Commodities	\$219	30%
2040 Destinations by Rail					
Lumber or Dimension Stock	108	24%	Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	\$0	14%
Lime or Lime Plaster	46	10%	Refrigeration Machinery	\$0	12%
Miscellaneous Shipments N.E.C. excluding Freight Forwarders and Shippers	43	9%	Copper or Alloy Basic Shapes	\$0	9%
Primary Iron or Steel Products	37	8%	Miscellaneous Office Machines	\$0	8%
Primary Aluminum Smelter Products	27	6%	Primary Aluminum Smelter Products	\$0	8%
Paper Bags	21	4%	Primary Copper Smelter Products	\$0	7%
Primary Metal Products, Nec	17	4%	Miscellaneous Household Appliances	\$0	6%
Miscellaneous Household Appliances	15	3%	Paper Bags	\$0	3%
Paper or Building Board	14	3%	Lumber or Dimension Stock	\$0	3%
Refrigeration Machinery	12	3%	Primary Iron or Steel Products	\$0	3%
All Other Commodities	121	26%	All Other Commodities	\$0	27%
2040 Destinations by Air					
NA					
2040 Destinations by Water					
NA					
Total 2040 Destinations					
Warehouse & Distribution Center	270,662	35%	Warehouse & Distribution Center	\$303	41%
Grain	72,926	10%	Motor Vehicles	\$60	8%
Broken Stone or Riprap	68,013	9%	Rail Intermodal Drayage from Ramp	\$53	7%
Gravel or Sand	30,117	4%	Distilled or Blended Liquors	\$25	3%
Distilled or Blended Liquors	22,992	3%	Petroleum Refining Products	\$20	3%
Petroleum Refining Products	21,588	3%	Solid State Semiconducts	\$14	2%
Ready-mix Concrete, Wet	18,775	2%	Pharmaceuticals	\$13	2%
Prepared or Canned Feed	16,390	2%	Motor Vehicle Parts or Accessories	\$11	2%
Concrete Products	14,933	2%	Grain	\$10	1%
Asphalt Paving Blocks or Mix	14,755	2%	Miscellaneous Field Crops	\$7	1%
All Other Commodities	213,693	28%	All Other Commodities	\$220	30%

Source: IHS Global Insight; CDM Smith Inc. analysis



Appendix B: Freight Intersection Studies

FREIGHT INTERSECTION STUDIES



PURPOSE OF THE STUDY

The Harrisburg Area Transportation Study (HATS) selected three intersections in the Tri-County study area that each warranted a detailed review of existing conditions related to large truck movements and the identification of potential remediation concepts, including intersection and regional circulation-focused improvements. The three locations identified by HATS serve as important regional freight nodes and face challenging geometric and physical constraints that pose operational and safety hazards. The project involved four tasks – gathering and interpreting applicable data, documenting and observing existing conditions, outreach to local and state officials and other stakeholders and local freight/logistics operators, and the development of improvement alternatives/concepts.

DESCRIPTION OF ISSUES

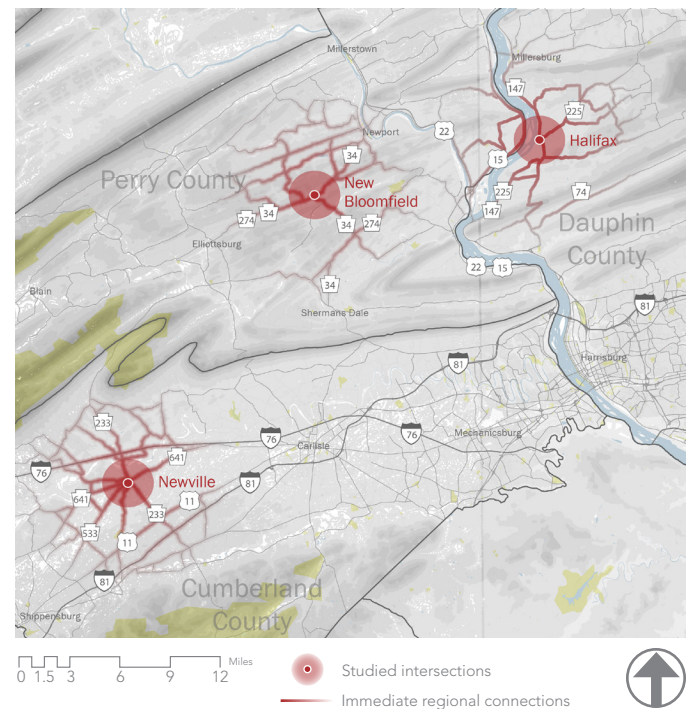
Halifax Borough serves as a critical transportation node in Dauphin County with State Routes 147 and 225 intersecting in the heart of the Borough. This intersection facilitates the movement of several thousand vehicles per day and hundreds of freight movements serving industrial and commercial activity in the region – particularly as it relates to freight movement traveling between U.S. Route 22 and points north of Halifax. However, the intersection's challenging geometry constraints are increasingly problematic due to rising traffic volumes and freight volumes through the intersection. While SR 147 and SR 225 physically intersect at one intersection, the accompanying SR 225/Armstrong Street and SR 225/4th Street intersection that accommodates the routing of the existing State Route alignment through Halifax and provide connections to local streets similarly poses capacity, geometric, and safety concerns.

New Bloomfield's primary intersection of SR 34 and SR 274 provides access to several regional centers of commerce, employment opportunities, and major highways including the Pennsylvania Turnpike, Interstate 81, and U.S. Routes 11, 15, and 22. SR 34 is also the major roadway link between Newport and Carlisle. As such, nearby residents and businesses generate traffic through the intersection. However, the intersection poses significant operational challenges as its center is occupied by the historic Soldiers and Sailors Monument. The Borough of New Bloomfield and area residents hold the monument in high regard and enjoy its presence in

the center of town. However, the existing geometry of the intersection is an operational hazard that challenges the movement of existing traffic flows around the monument and through the borough. This is particularly true with large trucks.

Newville Borough plays a strategic role in Cumberland County's local transportation network and is home to numerous local businesses and residents that rely on the area roadways. Pivotal to this network is Newville's primary intersection of SR 641 and SR 233. This intersection is a rural center for Cumberland County and provides access to regional centers of commerce and employment and major highways including the Pennsylvania Turnpike, Interstate 81, and U.S. Route 11. SR 641 is also the major roadway link between Newburg/Roxbury and Carlisle. However, the intersection's small physical footprint prohibits large trucks from turning from SR 641 east to SR 233 south and SR 233 north to SR 641 west – a desirable freight route considering the intersection's location at the midpoint between the Blue Mountain Interchange (201) of the Pennsylvania Turnpike and Exit 37 of I-81. Despite the prohibition, many trucks continue to make turning moves in the intersection creating operational constraints and hazardous conditions for motorists and pedestrians at the intersection.

STUDIED INTERSECTIONS



HALIFAX

PROPOSED ALTERNATIVES

Alternative 1 – Improved intersection visibility/signage approaching SR SR 225/Armstrong Street @ SR 225/4th Street intersection and SR 147/Main Street @ SR 147/SR 225/4th Street intersection

Alternative 2 – SR 225 truck prohibition between SR 147 and SR 4004 (Rutter Road)

Alternative 3 – Modifying 4th Street and Armstrong Street to one-way traffic patterns to create partial one-way loop

Alternative 4 – Accommodate existing flows by acquiring ROW adjacent to SR 225/Armstrong Street @ SR 225/4th Street intersection and SR 147/Main Street @ SR 147/SR 225/4th Street intersection

Alternative 5 – Adopt Alternative 3 and acquire ROW adjacent to SR 225/Armstrong Street @ SR 225/4th Street intersection, SR 147/Main Street @ SR 147/SR 225/4th Street intersection, and SR 147/2nd Street @ Armstrong Street intersection

PREFERRED ALTERNATIVE

Alternative 3



ALTERNATIVES COMPARISON

	Vehicle Operations/ Safety	Pedestrian Safety	Public Reception	Cost	Parking	Land Acquisition
Alternative 1						
Alternative 2						
Alternative 3						
Alternative 4						
Alternative 5						



NEW BLOOMFIELD

PROPOSED ALTERNATIVES

Alternative 1 – Relocate Main Street to south of monument maintaining the monument’s existing location

Alternative 2 – Shift the monument north to accommodate a modified SR 34/Main Street @ SR 34/SR 274/S. Carlisle Street intersection

Alternative 3A – Relocate monument to Veterans Pathway and implement 4-way stop traffic pattern

Alternative 3B – Relocate monument to Veterans Pathway and implement traffic circle pattern

PREFERRED ALTERNATIVES

Alternative 2



Alternative 3A



Alternative 3B



ALTERNATIVES COMPARISON

	Vehicle Operations/ Safety	Pedestrian Safety	Monument Memorialization	Public Reception	Cost	Parking Removal	Land Acquisition
Alternative 1							
Alternative 2							
Alternative 3A							
Alternative 3B							

moderate strength
 high strength

moderate weakness
 high weakness

NEWVILLE

PROPOSED ALTERNATIVES

Alternative 1 – Discourage illegal truck turning movements through additional police enforcement

Alternative 2 – Improve regional signage informing truck operators of appropriate alternative routes at strategic intersection locations around Newville

Alternative 3 – Accommodate truck turning movements by modifying pavement markings and eliminating adjacent parking spaces

Alternative 4 – Accommodate truck turning movements on adjacent northern (Green Street/Steelstown Road/Kough Road) and southern roadways (SR 533/Cemetery Road) in Newville

Alternative 5 – Discourage truck turning movements and improve pedestrian facilities by constructing curb extensions and bollards at the intersection

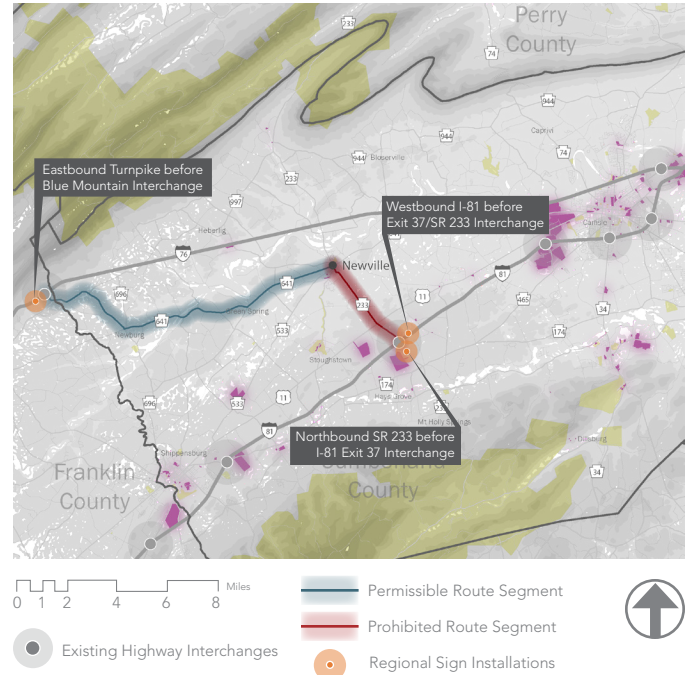
Alternative 6 – Construct a new Turnpike E-ZPass interchange between SR 233 and Carlisle

Alternative 7 – Accommodate truck turning movements by widening the intersection

IMPLEMENTABLE ALTERNATIVE

Alternative 2 was selected as a quickly implementable, lower cost, and highly impactful alternative. Short-term steps to implement longer term concepts (particularly Alternative 6) should be advanced by key stakeholders.

Alternative 2



ALTERNATIVES COMPARISON

	Vehicle Operations/ Safety	Pedestrian Safety	Public Reception	Cost	Parking	Land Acquisition	
Alternative 1							
Alternative 2							
Alternative 3							moderate strength
Alternative 4							moderate weakness
Alternative 5							high strength
Alternative 6							high weakness
Alternative 7							

Appendix C: Analysis of Regional Functional Classification



Analysis of Regional Functional Classification

Overview

One of the activities within the data collection task of the update to the regional freight plan includes that of identifying necessary functional classification revisions to the National Highway System (NHS)⁵ and connections to major intermodal facilities. HATS and PennDOT have maintained a regional functional classification scheme for many years for the purposes of guiding design, performance, and funding eligibility of its nearly 4,900-mile network of roadways throughout the region. From time to time, changes to the functional classification scheme are warranted, given the dynamics of the region, the maturity of the roadway network, and the changes in travel demand and traffic patterns.

Key Considerations for Determining Functional Class

For many areas within the state, roadway functional class designations have not been reviewed or updated for more than a decade. FHWA's *Guidebook on Highway Functional Classification Concepts, Criteria, and Procedures* (2013) builds upon and updates previous guidance documents circulated by FHWA, namely: *Highway Functional Classification: Concepts, Criteria and Procedures* (1989) and the *Updated Guidance for the Functional Classification of Highways Memorandum* (2008). The FHWA guidance and corresponding criteria provided the basis for the draft recommendations included in this memorandum.

FHWA's most recent guidance provides some important criteria changes that may affect functional class designations across the state. PennDOT's Bureau of Planning and Research (BPR) is currently reviewing and assessing the revised guidelines that include the following:

1. All functional classification categories are now recognized in both urban and rural areas. The role of the urban and rural boundary in functional class has changed with the new FHWA guidelines. Historically, a roadway's functional classification would change at an urbanized area boundary with the route being classified one category higher in the urban area. With the new guidelines, the urban/rural boundary does not play a role in the functional classifications and the road should be classified as to how it functions.

Example:

US 22 in Dauphin County currently shifts from an Other Principal Arterial to a Minor Arterial designation east of its intersection with PA 39.

2. Under the older classification guidelines, the Other Freeways and Expressways category only applied to urban areas. With the new guidance, rural roadways that meet the criteria can be designated as Other Freeways and Expressways.

Example:

Portions of PA 283 near the Dauphin/Lancaster County border are classified as Other Principal Arterial due to its location in a rural area.

⁵ It should be noted that MAP-21 expanded the National Highway System (NHS) on October 1, 2012 to include Principal Arterials. This one-time event did not create a link between the NHS and Principal Arterials. Thus, a change to Principal Arterial does not automatically place the segment on the NHS.

- The most recent functional class guidelines differentiate between major collectors and minor collectors in both the urban and rural environments. Previous guidance only considered this division in rural environments, and all collectors in urban areas were classified as Urban Collectors. FHWA guidance now allows urban collectors to be classified as either Minor or Major Collectors with Minor Collectors in urban areas still eligible for federal funding.

Example:	<i>There are currently no Minor Collectors in the Harrisburg urban metropolitan area.</i>
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- The new functional classification system also addresses route continuity to ensure Principal Arterials maintain a “closed loop” system. A Principal Arterial should not end at a road with a lower functional classification.

Example:	<i>US 22 in Dauphin County (Principal Arterial) ends at a PA 39 (Minor Arterial). PA 641 in Cumberland County (Principal Arterial) transitions to a Minor Arterial just west of Mechanicsburg.</i>
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Recommendations for HATS Review

An initial review of the region’s functional class designations has been completed with assistance from HATS staff using available FHWA guidance. The following observations and recommendations are being offered to support future functional class assessments and evaluation by HATS. For context, FHWA has defined the classifications as follows:

Table 25: Functional Classification Definitions

Classification	Description
Interstates	Interstates are the highest classification of Arterials and were designed and constructed with mobility and long-distance travel in mind. These roadways are officially designated as Interstates by the Secretary of Transportation, and are also considered Principal Arterials.
Other Freeways and Expressway	Roadways within this classification look very similar to Interstates. Roadways with this classification have directional travel lanes and are usually separated by some type of physical barrier, and access is limited to on- and off-ramp locations or a very limited number of at-grade intersections.
Principal Arterials	Roadways that serve a large percentage of travel between cities and other activity centers, minimizing travel time and distance. Arterials typically have high traffic volumes and are frequently the route for intercity buses and trucks. They provide a high degree of mobility and carry a higher proportion of travel for long distance trips.
Minor Arterials	Roadways that provide service for trips of moderate length, serve geographic areas that are smaller than their higher Arterial counterparts and offer connectivity to the higher Arterial system.
Collectors (Major and Minor)	Roadways the serve a critical role in the roadway network by gathering traffic from Local Roads and funneling them to the Arterial network. Collectors can be sub-stratified into <i>major</i> and <i>minor</i> categories. Differentiating this sub-categorization is one of the primary challenges in functionally classifying a roadway network.



Classification	Description
Local Roads	This network accounts for the largest percentage of all roadways in terms of mileage, but lowest in terms of total travel volume. They are not intended for use in long-distance travel, and are often designed to discourage through traffic.

FHWA guidance would indicate the HATS region has some flexibility in any re-examination of its functional classification scheme. For example, FHWA notes that Primary Arterials generally consist of 2 to 6 percent of all mileage within a state. Within the HATS region, Principal Arterials entail 127.5 miles, or just 2.6 percent of all network mileage. Minor Arterials on average entail 3 to 7 percent of all mileage, whereas within the HATS region, the figure is closer to 7.5 percent.

Based on the latest FHWA guidelines and the key issues presented in the previous section, a draft set of recommendations has been developed to assist HATS as it moves forward with additional reviews and formal recommendations to PennDOT. Future coordination with PennDOT’s BPR is recommended as some changes to the functional class system may be conducted by PennDOT on a system-wide level to address FHWA’s latest guidance. **Table 26** provides an overview of potential changes to the Harrisburg region’s functional classification scheme.

Table 26: Potential Candidate Functional Classification Changes

#	Co.*	Roadway	Limits	Current FC	Proposed FC	Justification for Change
1	C	PA 114	I-81 to US 11	Minor Arterial	Principal Arterial	On the Federal National Highway Freight Network (NHFN)
2	C	US 11	PA 641 to PA 465	Urban Collector	Minor Arterial	Proposed Critical Urban Freight Corridor (CUFC)
3	D	PA 39	I-81 to US 322	Minor Arterial	Principal Arterial	North-south connection to destinations and Hershey
4	C	PA 641/ West Trindle Rd	PA Turnpike to I-81	Minor Arterial	Principal Arterial	Maintain “closed loop” system for Principal Arterials
5	D	US 22	PA 39 to Dauphin County border	Minor Arterial	Principal Arterial	Functions as Principal Arterial
6	D, P	US 322/22	Duncannon to Clarks Ferry Bridge; US 11/15 to Perry County Border	Principal Arterial	Other Freeway or Expressway	Functions as Other Freeway or Expressway
7	D	PA 283	Toll House Road to Dauphin County Border	Principal Arterial	Other Freeway or Expressway	Functions as Other Freeway or Expressway
8	D,C	Various	Other recommendations for distinguishing urban collectors into major and minor categories may be considered as appropriate.			

* C=Cumberland; D=Dauphin; P=Perry

Additional notes on the recommended locations are provided below:

1. **PA 114 from I-81 to US 11.** This four-lane divided highway provides access from Interstate 81 to US 11 in Silver Spring Township. It carries an ADT of 13,000 and features posted speeds of 55 mph. The roadway is also part of the newly-designated, Federal National Highway Freight Network (NHFN). Minor Arterials in urban areas carry anywhere from 3,000 to 14,000 ADT, according to FHWA guidance.
2. **US 11 from PA 641 to PA 465.** HATS recently proposed designating this corridor as a Federal Critical Urban Freight Corridor, given its role in facilitating the movement of trucks from warehouses outside of Carlisle to the Interstate network. The area has experienced a significant increase in warehousing and distribution activity, thanks to a recent multi-million dollar expansion of Interstate 81's Exit 44, which serves as the area's on- and off-ramp to the national Interstate system. Ritner Highway is posted at 40 mph and carries an ADT of 11,000, well within the bounds of FHWA's recommended 3,000-14,000 ADT for this proposed classification.
3. **PA 39 from I-81 to US 322.** This corridor provides access from Interstate 81 to major attractions in the Village of Hershey and surrounding areas. The corridor features a mix of travel types (mobility and access), and has an ADT of 14,000.
4. **PA 641/West Trindle Road.** West Trindle Road is classified as a Principal Arterial from Mechanicsburg Borough west to its overpass of the Pennsylvania Turnpike. Since there is no change in travel patterns at this point, it is recommended to continue west to its interchange with I-81 to satisfy requirements on maintaining a "closed loop" system for Principal Arterials.
5. **US 22 from PA 39 to County Border.** This recommendation was developed to ensure consistency with FHWA's latest guidance indicating that urban/rural boundaries should not play a role in assigning functional class. US 22 functions in a similar manner to the sections just east of PA 39 but does have lower traffic volumes.
6. **US 322/22 in Dauphin and Perry Counties.** This recommendation was developed to ensure consistency with FHWA's latest guidance. With the new guidance, rural roadways that meet the criteria can be designated as Other Freeways and Expressways.
7. **PA 283 from Toll House Road to County Border.** This recommendation was developed to ensure consistency with FHWA's latest guidance. With the new guidance, rural roadways that meet the criteria can be designated as Other Freeways and Expressways.
8. **Other Recommendations for Collector Designations.** FHWA guidance now allows urban collectors to be classified as either Minor or Major Collectors with Minor Collectors in urban areas still eligible for federal funding. HATS may conduct further assessments to determine if changes should be made to any existing designations.



Next Steps

The above observations and recommendations have been documented to support future functional class assessments and evaluation by HATS at the staff and board levels.

In addition to the technical assessment performed by HATS, there are also procedural requirements involved in administering changes to the region's functional classification scheme. Consensus will be required, not only from HATS and PennDOT, but also with local government as any changes are sought. PennDOT has developed guidance to assist in formally recommending changes to the functional class system.

Michael Baker

I N T E R N A T I O N A L