CAMBRIDGE SYSTEMATICS

Enhancing Consideration of Freight in Regional Transportation Planning

final

report

prepared for

National Capital Transportation Planning Board of the Metropolitan Washington Council of Governments

prepared by

Cambridge Systematics, Inc.

May 2007

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About This Report

Under the guidance of the Transportation Planning Board (TPB) and with the cooperation of TPB member jurisdictions, this report lays the ground work for enhanced freight activities within the Metropolitan Washington Council of Governments/Transportation Planning Board (COG/TPB) structure. Prepared in early 2007, this report provides a profile of the region's freight system characteristics, including its multimodal transportation network and facilities, such as distribution centers, that support goods movement. Based on a scan of freight activities at metropolitan planning organizations across the country, knowledge of local conditions, and the existing COG/TPB structure, this report also recommends future freight planning activities for the MPO, including staffing and committee structure. Following a brief *Executive Summary,* the report presents more detailed information on each of the following topics:

Chapter 1 – Context of State and Local Freight Planning Activities. This chapter summarizes recent and ongoing freight activities and studies by regional transportation agencies to provide a context for potential regional freight planning activities.

Chapter 2 – Washington Regional Freight Profile. Building on publicly available information, this chapter presents an initial overview of the goods movement characteristics of the Washington region, including commodity flows, infrastructure, and important freight facilities. This chapter describes the role of freight in the region's economy and summarizes recent trends. This chapter also presents a series of **Freight Facilities Maps** depicting the regional freight system and an initial inventory of freight generators. It concludes with a discussion of freight safety and security in the region.

Chapter 3 – Recommendations on Future Activities and Committee Approach. Recommendations on the future freight planning activities of COG/TPB are provided in this chapter, including the role and placement of a freight committee within the organization. This chapter also provides guidance on Unified Planning Work Program (UPWP) tasks, committee meetings, interagency coordination, and other activities that will enhance freight consideration in the Metropolitan Planning Organization's (MPO) planning process.

Chapter 4 – Recommendations on Stakeholder Outreach Activities. This chapter delivers additional recommendations to COG/TPB on approaches to broadening the reach of its freight planning activities to external stakeholders, including shippers and carriers in the region. Strategies for effectively engaging the freight community are provided.

Chapter 5 – Data Sets and Analytical Tools. This chapter presents the data sets and analytical tools utilized in the Washington Regional Freight Profile and briefly describes other data sets and analytical tools that COG/TPB might consider for future acquisition to advance freight planning.

This report was developed by Cambridge Systematics, Inc. with support from Fitzgerald Halliday, Inc. A Freight Study Advisory Group was organized for this effort and provided critical guidance the study. The Advisory Group consisted of Mark Rawlings and Rick Rybeck of the District of Columbia Department of Transportation (DDOT); Rick Johnson of the Maryland Department of Transportation (MDOT); Erik Johnson and Valerie Pardo of the Virginia Department of Transportation; and Michael Eichler, Andrew Meese, and Patrick Zilliacus of COG/TPB staff.

Executive Summary

Over the past few years, the U.S. Department of Transportation has placed increasing emphasis on freight planning at the metropolitan planning organization (MPO) level, as metropolitan areas face increasing pressures from growing freight traffic through their highways, railroads, seaports, and airports. Much of the growth in freight is occurring against a backdrop of continued growth in nonfreight passenger movement, which presents even greater challenges to metropolitan transportation systems. As a result, many MPOs have engaged in freight planning activities, and the most recent Federal transportation bill the Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA-LU) identifies freight planning as a key consideration for MPOs.

As the designated MPO for the Washington, D.C. metropolitan area, the National Capital Region Transportation Planning Board of the Metropolitan Washington Council of Governments (COG/TPB) has responsibility for addressing freight planning in the regional transportation planning process. While this region is not a large freight generator, from the standpoint of producing goods, its large population and vibrant economy demand a responsive freight system. Moreover, the region lies at the crossroads of several important national freight corridors and its highways and rail systems accommodate high volumes of through traffic. Freight traffic is a necessary part of any healthy economy. As consumers of goods, it is important to recognize our dependence on the movement of goods, and understand how the efficient flow of commodities can benefit everyone. Today, movement of goods to, from, and through the region is adversely affected by mounting highway and rail congestion. In order to preserve the region's economic competitiveness, it is incumbent upon the COG/TPB and its partners to plan for congestion relief benefiting both freight and passenger mobility. This study's assessment of freight planning activities in the COG/TPB region is intended to guide future freight planning activities.

Several freight-related transportation planning initiatives are underway in the region, including efforts by both the States of Virginia and Maryland to create statewide multimodal freight plans. It is important that COG/TPB stay abreast of these initiatives, give input when needed, and possibly capitalize off the work being done. By dedicating a portion of its resources to freight planning, COG/TPB has the potential to benefit greatly from other agencies' freight planning efforts, as well as be the driver behind identifying and funding freight projects of regional significance.

The COG/TPB region's freight profile is reflective of its economy. The Washington D.C. Metropolitan Region is a service-oriented economy. As such, it is primarily a consumer of goods, not a producer of goods. Approximately 222 million tons of goods, worth $200.5 billion is transported to, from or within the Washington, D.C. Metropolitan Region

annually. It is estimated that, in addition to the 222 million tons moving to, from, and within the region, 314 million tons of goods travel through the region, worth approximately $1.2 trillion.

The top freight commodity being transported to, from, or within the region by weight is gravel. This is followed closely by natural gas, selected coal products (used for some regional power generation), and products of petroleum refining (excluding gasoline, aviation fuel, and fuel oil). Gravel is the top commodity by weight moving into the region. Waste/Scrap materials is the top commodity by weight moving out of the region.

The value of freight moving inbound to the region is nearly twice that of the value of freight moving outbound. This fact is reflective of the Washington, D.C. Metro Region's consumer and service-based economy and its relatively small manufacturing sector. Machinery, textile/leather, and electronics are the top freight commodities moving to, from, or within the region by value.

The COG/TPB region's freight transportation system is served by a variety of modes. Approximately three quarters of freight traveling to, from, or within the Washington, D.C. region is transported by truck. The remainder of goods is transported by rail, air, water, or a combination of modes. Each mode of transportation has characteristics that are appropriate for the movement of one type of commodity or another. For example, rail is well suited for moving heavy, low-value freight traffic. In the Washington, D.C. region the top commodities by weight being transported by rail are gravel and coal. In contrast, air transportation is well suited for transporting light, high-value, time sensitive goods. In the Washington, D.C. region the top commodities by value being transported by air are electronics and precision equipment.

A number of transportation facilities constitute the COG/TPB's freight transportation system. Major highways serving the Washington, D.C. Metropolitan region include I-95, I-270/I-70, I-395, I-66, and U.S.-50. Major rail lines run east-west and north-south through the region and are served by two Class I railroads, Norfolk Southern and CSXT. All of the region's major international airports handle air cargo, with Dulles and BWI handling the majority of freight. A small portion of goods is transported by water in the region. The Washington, D.C. region is situated between two major ports, the Port of Baltimore in Maryland, and the Port of Hampton Roads/Norfolk in Virginia. It is clear, when looking at the Washington, D.C. Metro Region's top trading partners, that both ports play a large part in goods movement in the Washington, D.C. region. The majority of the Washington, D.C. Metro Region's top trading partners are located in the Mid-Atlantic region of the U.S., primarily in Maryland and Virginia, with Baltimore and Norfolk being two of the top trading partners with the Washington, D.C. Metropolitan Region.

Looking to 2030, the COG/TPB region is projected to experience a significant growth in freight, often times at a higher rate of growth than that projected for the country as a whole. All transportation modes are projected to move more tonnage to, from, and within the region by 2030. Air cargo tonnage is projected to rise the fastest, growing by nearly 500 percent. Also, in 2030, the direction of freight is projected to shift slightly. More freight is projected to flow to and from the region, while slightly less freight will be traveling within the region (internal movements).

Given the freight generating activity occurring in the COG/TPB region, this study recommends ways for COG/TPB to orient its planning activities to more fully account for goods movement. Such initiatives are being undertaken at other MPOs around the country and serve as possible examples for COG/TPB. There are a variety of ways to integrate freight planning into the transportation planning activities of an MPO. For COG/TPB this study recommends establishing a freight subcommittee that would report to the TPB and would have both public and private stakeholders. In addition, this study suggests that COG/TPB formally identify a Freight Coordinator on staff. This person would be the designated freight point-of-contact within the MPO. Initially, this would not be a full-time position, but could evolve into as such depending on the demands placed on COG/TPB to participate in future studies of large magnitude.

One of the things that makes freight planning different from other types of MPO planning activities is the necessary engagement of the private freight community and public stakeholders. As a starting point for outreach efforts at COG/TPB, this study outlines a number of possible activities that may be undertaken, including the creation of a freight contact list, the coordination of freight events, creating a section dedicated to freight planning on the COG/TPB web site, and conducting a stakeholder survey. In addition, to help advance COG/TPB's freight planning activities, this study suggests possible datasets, both public and private, that COG/TPB may use when planning for freight transportation. Data sets collected for use in this report will be provided to COG/TPB, accompanied by details about what is included in each dataset, how it may be used, what limitations there are on the data, and where COG/TPB can find the most current information.

To maintain the active, consumer economy of the COG/TPB region it is necessary to have reliable service and the consistent availability of goods. The consideration of freight when planning for the region's transportation system will help ensure that goods are able to flow efficiently.

1.0 Context of State and Local Freight Planning Activities

1.1 Introduction

The National Capital Region Transportation Planning Board (TPB) at the Metropolitan Washington Council of Governments (COG) serves as the Metropolitan Planning Organization (MPO) for the Washington, D.C. region. The TPB planning region encompasses county and municipal jurisdictions in two states – Maryland and Virginia – and the District of Columbia. With a population of more than four million residents, the COG/TPB area is one of the largest multistate MPOs in the nation. Transportation planning in this complex region requires collaboration and consistent communication in order to coordinate efforts of regional stakeholders to enhance mobility. While the COG/TPB is known for its highly advanced passenger transportation planning efforts, the MPOs efforts in regional freight transportation planning have been relatively limited. This study is one of the COG/TPB's current initiatives to move freight planning forward in the region.

In the spirit of the regional collaboration and communication that COG/TPB is trying to foster, this section outlines the recent and ongoing freight planning activities of the state-level jurisdictions within its boundaries: Washington, D.C., Maryland, and Virginia. The intent of this document is to provide the regional context of public sector freight planning activities to assist COG/TPB and its member jurisdictions in their individual and collective efforts to enhance goods movement mobility.

1.2 Washington, D.C.

As the seat of the United States government, Washington, D.C. is the center of a prosperous region that continues to experience above-average job growth. The District of Columbia has a high concentration of service and government employment, but lacks major freight generating facilities (e.g., maritime port). Consequently, Washington, D.C. does not generate as much freight as similarly sized cities with more developed manufacturing or freight infrastructure (i.e., Baltimore). Nonetheless, freight transportation is a critical element supporting the District of Columbia's economic vitality. Trucks deliver paper, food, and retail goods to those who work and live in the capital; rail brings coal, gravel, and other materials needed for energy generation and construction. Both modes move printed material, waste, and other commodities from Washington, D.C.

To ensure that freight movement remains efficient, reliable, and safe, the District Department of Transportation (DDOT) and its partners – such as the National Capital Planning Commission (NCPC) – have recently undertaken freight related studies to examine current operations and future demands for goods movement.

District Department of Transportation Freight Planning Activities

According to the District Department of Transportation (DDOT), a key transportation system strategy for the District of Columbia is to "Promote business in the District by addressing goods movement through improved loading facilities and by improving rail as an alternative to moving goods into and out of the city." Within the DDOT, several offices are involved in freight-related activities. DDOT leadership (Office of the Director) is actively engaged in freight issues, including the recent Rail Realignment Study and other ongoing efforts. The Office of the Director is also active in freight-related transportation security planning. On a day-to-day basis, DDOT's Transportation Policy and Planning Administration is the primary lead on freight planning activities, including oversight and coordination of freight-related studies that affect Washington, D.C. The Policy and Planning Administration staff represent DDOT's freight issues within the I-95 Corridor Coalition which coordinates several multistate freight studies, including the Mid-Atlantic Rail Operation Study. DDOT is also active on the American Association of State Highway and Transportation Officials' (AASHTO's) Standing Committee on Rail Transportation and Standing Committee on Highway Transport.

In addition, the Infrastructure Project Management Administration is responsible for improvements, including freight-benefiting improvements. Finally, the Public Space Permitting Office, under the Public Space Management Administration at DDOT is responsible for providing permits to overweight and oversized vehicles. DDOT is currently seeking a Motor Carrier Coordinator to provide additional support on freight and trucking issues.

Washington, D.C. Freight-Related Studies

The following bullets summarize recent and ongoing freight studies focused on the District of Columbia.

- **Motor Carrier Management and Threat Assessment Study, August 2004.** The Volpe National Transportation Research Center completed this study for DDOT to fulfill four goals: 1) develop a comprehensive Motor Carrier Management Program for the District of Columbia to improve truck operations and safety within the city; 2) review and modify truck routes to protect neighborhoods from unnecessary truck traffic; 3) review and modify truck loading and unloading operations and policies to improve deliveries and reduce traffic congestion; and 4) address security concerns related to truck operations within the District of Columbia. The recommendations of this study included the establishment of a new truck route system to reduce truck traffic on

residential streets and to enhance security on the National Mall and other sensitive locations. The study also recommends increased institutional transparency, coordination, and leadership to address trucking issues in the District. Most important to COG/TPB's current freight efforts, the Volpe study recommends regional collaboration to address congestion management and truck routing. To date, Washington, D.C. has made progress toward the Volpe study goals by banning through shipments of ultra hazardous materials by truck and rail within a two-mile radius of the National Mall. However this law is not currently enforced due to an injunction by CSXT and awaits further legal determination. Other recommendations from the Volpe report await implementation by DDOT's Motor Carrier Coordinator.

- **Freight Railroad Realignment Feasibility Study, April 2007.** The Freight Railroad Realignment Feasibility Study, sponsored jointly by the District of Columbia Department of Transportation and the National Capital Planning Commission, examined operational, freight market, safety, and security characteristics of the existing north-south freight-rail alignment that makes it way through the center of the District of Columbia. An important factor considered in the study is the movement of hazardous materials by rail. Railroads currently operate under a Washington, D.C. law passed in the wake of September 11, 2001 which banned the movement of "ultra hazardous materials" by truck or rail within 2.2 miles of the U.S. Capitol without special permit[1].

  The study, funded by a U.S. Department of Homeland Security grant, identified three alternative alignments which could potentially provide a number of benefits to the Metropolitan Washington region. Specifically, a tunnel alternative through the center of Washington, D.C. was identified, and two routes that cross the Potomac River into Southern Maryland to reconnect with the existing mainline near Jessup, Maryland. The main benefits resulting from the various alternative alignments include real estate redevelopment opportunities, reduced truck VMT, and reduced travel times for freight and passenger rail service. The realignment study also anticipates reduction of the terrorist risk associated with through shipments of hazardous materials.

  The recently released study is non-binding and its results and potential future steps are under consideration. Moving forward, DDOT and NCPC will look to Federal and regional partners to provide funding and/or support for additional study of freight and passenger rail alternatives. The next step in this process may include a financing study and/or an Environmental Impact Statement (EIS) potentially leading to the development of a final alignment. Because of the significant impact any of the proposed alignments could have on passenger and freight movement in the region, COG/TPB staff should continue to follow the progression of this initiative.

[1] District of Columbia Code, Title 8, Subtitle C, Chapter 14 – Hazardous Materials Transportation (DC ST D. I, T. 8, Subt. C, Ch. 14)

1.3 Virginia

Several nationally important freight facilities are located in the Commonwealth of Virginia, including the Port of Hampton Roads, Dulles Airport, and the Virginia Inland Port. These facilities have positioned Virginia as an emerging national center for distribution. To support economic development and mobility efforts associated with freight, the Commonwealth has taken an active role in freight planning over the past several years and is nationally recognized for several large-scale and innovate freight planning projects, including the I-81 toll and rail proposals. Within the Washington, D.C. Metropolitan Area, the Commonwealth continues to lead or actively participate in several major freight planning efforts outlined below.

Virginia Freight Planning Activities

Freight planning activities within the Commonwealth of Virginia are divided among its modal transportation agencies. The Commonwealth's Multimodal Transportation Planning Office is charged with facilitating the implementation of VTrans2025, Virginia's Statewide Multimodal Long-Range Plan and currently is leading Virginia's Statewide Multimodal Freight Plan effort which is an outcome the VTrans2025 Action Plan. The Multimodal Office coordinates the freight planning efforts of several state agencies, including the Virginia Port Authority (VPA) and the Virginia Department of Rail and Public Transportation (DRPT) and the Virginia Department of Transportation (VDOT). In addition to the Statewide Multimodal Freight Plan, the agencies are currently working with the newly formed Virginia Freight Advisory Committee, supporting efforts of the I-95 Corridor Coalition's Intermodal Program Track, planning for port and rail improvements, and coordinating with the state's metropolitan planning organizations and planning district commissions on regional freight planning initiatives. In the case of COG/TPB, VDOT's Northern Virginia Region and DRPT are involved in freight planning coordinating activities.

Virginia Freight-Related Studies

Virginia has a number of important studies and projects underway or recently completed. The goal of these studies to help ensure that citizens receive the highest level of service possible when it comes to delivering goods across the Virginia's transportation network, and that the Commonwealth remains a desirable conduit for the global distribution of goods to market.

Statewide Studies

- **Virginia Statewide Multimodal Freight Study, Phase 1, (Underway).** To build on and supplement other work, the Virginia Department of Transportation and VTrans (the Commonwealth's ongoing long-range transportation planning effort) have undertaken the Virginia Statewide Multimodal Freight Study, a program of multidisciplinary investigations focused on freight. The study is intended to:

  - Compile available freight information – which exists in multiple places, from multiple sources – and fill in gaps, to tell the story of Virginia's entire intermodal freight transportation system;
  - Identify current needs and projected future needs for each mode, for the system as a whole, and for designated multimodal corridors of critical interest;
  - Develop an understanding of the contributions that freight makes to Virginia's economy, and the real economic benefits and costs of improving – or failing to improve – Virginia's freight transportation system;
  - Form substantial, implementable recommendations and solutions for state planning and programming;
  - Address the critical roles that other levels of government and the private sector can and must play; and
  - Be grounded in a comprehensive outreach effort that reaches a full range of public and private stakeholders, to promote sound recommendations and effective buy-in.

To date, COG/TPB staff have taken an active role in supporting the ongoing Virginia freight planning effort through the administration of surveys to private freight shippers located in Northern Virginia. As this study progresses, COG/TPB should continue to engage and communicate with VDOT staff to ensure that both agencies benefit from the collective information they are developing on freight transportation in the TPB member jurisdictions in the Commonwealth. Presently, coordination between agencies is being facilitated through the presence of VDOT staff on the TPB freight study advisory committee. This relationship should continue into the future.

Highway – I-95

Interstate Highway 95 has been the focus of several studies sponsored by the Commonwealth of Virginia to determine, among other things, how capital and operational improvements can enhance traffic flow on the region's busiest transportation corridor. Because of its importance as a regional freight corridor, improvements resulting from these studies affect truck operations between Washington, D.C. and Richmond.

- **The I-95 Corridor Study, July 2003.** The I-95 Corridor Study is a planning-level study to address operational and safety concerns, as well as future capacity requirements, for the I-95 mainline and the three existing interchanges. The study area includes 13.5 miles of I-95 in Hanover County and Ashland, Virginia, including interchanges with

Route 802, Route 54, and Route 30. The study develops a number of Preferred Concepts, analyzes current (2003) and future year traffic volumes, investigates operational and geometric deficiencies, and develops interim and long-term solutions for meeting travel demands up to 2025. The overall recommendation of this study is for the stakeholders of the I-95 corridor in the study area to consider the Preferred Concepts outlined in the Final Report as well as the interim and long-term solutions outlined.

- **The I-95 Collector-Distributor Access Feasibility Study, March 2002.** The I-95 Collector-Distributor Access Feasibility Study examines the feasibility of providing collector-distributor lanes and additional access to I-95 in the greater Fredericksburg area. The study area extends from the proposed interchange at Route 627 in Stafford County to Route 606 in Spotsylvania County. The study evaluates the impacts and benefits to regional traffic of additional access, and provides an overview of the environmental impacts associated with collector-distributor (C-D) lanes and additional access. The study identifies improvements to existing interchanges as well as viable locations for new interchanges. Three options were advanced for further study.

- **The I-95 Extension of HOV Lanes Study, March 2002.** The I-95 Extension of HOV Lanes Study explores whether an extension of the existing High Occupancy Vehicle (HOV) lanes would be an effective strategy to accommodate future peak commuter demands in the I-95 corridor from the Prince William County line south to the vicinity of Route 3 in the City of Fredericksburg. Two build alternatives are examined, but the study determines that the potential role of an HOV facility will need to be examined further in the context of regional roadway and transit system improvements, such as new interchanges and/or C-D facilities along I-95 and/or improvements and extensions to rail and bus transit services.

- **The Capital Beltway Study, January 1997.** The Capital Beltway Study began in 1995. It was initiated with the intention of gaining a more comprehensive understanding of the current problems and future transportation needs along the Capital Beltway in Virginia. The project area consists of I-495 in Fairfax County, between the I-95/I-395/I-495 interchange and the American Legion Bridge (total length – 14 miles). A 12-lane High Occupancy Toll (HOT) concept was put forward as the preferred alternative.

  On June 29, 2006, the Federal Highway Administration issued a Record of Decision (ROD) for the Capital Beltway Study. The ROD represents the final document in the NEPA process for this study.

- **The I-95/I-395 HOV Restriction Study, February 1999.** The I-95/I-395 HOV Restriction Study examines the feasibility and impacts of making changes in HOV operations on I-95/I-395 between the 14th Street Bridge and the Prince William County/Stafford County line. The study addresses increasing traffic congestion in a corridor that serves over 200,000 vehicles per day. Among the options considered is the possibility of changing the HOV requirements from three to two person carpools, either on the entire system, or just outside the Beltway. The study also considers

changes in HOV restricted time periods, provision of a third HOV-lane on I-395, and the addition of new HOV ramps. The study determined that any change to HOV operations would bring both positive and negative impacts. In addition, the study identified some relatively minor changes that could be made to improve the efficiency of the HOV system, as well as several potential areas for future study.

What these studies suggest is that while there has been significant attention to I-95 corridor planning, work has largely focused on meeting passenger needs at a subregional level. Passenger improvements will, of course, benefit trucks by reducing background traffic. However, the body of work does not provide any guidance with respect to a truck-oriented, corridor-level strategy.

Highway – I-66

I-66 is a critically important freight link between Northern Virginia, points west, and the I-81 corridor. Although trucks are restricted from using I-66 inside the Capital Beltway, this study is of interest:

- **I-66 Multimodal Transportation and Environmental Study – Purpose and Needs Report, 2003.** The Virginia Department of Transportation and the Department of Rail and Public Transportation initiated the I-66 Multimodal Transportation and Environmental Study (I-66 Study) for improving mobility along the I-66 corridor from just west of the I-66/I-495 (Capital Beltway) interchange in Fairfax County to the I-66/U.S. Route 15 interchange near Haymarket in Prince William County. Multimodal transportation improvements in the I-66 corridor were selected in an earlier Major Investment (planning) Study (MIS) to enhance safety and to provide increased capacity for current and projected future travel demands.

As with I-95, freight will be a beneficiary of these efforts, but planning for I-66 has not explicitly focused on truck movements at the corridor level.

Other Studies

- **Highway – Route 29 Corridor Study Phases II and III.** The Route 29 Corridor Study covers the area from the North Carolina border to I-64 just south of Charlottesville and makes up Phases II and III of the statewide U.S. Route 29 Development Study. Phase I was completed in fall 1997 and covered the area from Charlottesville to Warrenton. Further action to implement the recommendations will be subject to funding and programming specific projects through the normal allocation process under VDOT's Transportation Development Plan, detailed environmental studies to the National Environmental Policy Act, and detailed engineering, and design studies.

  Projections suggest that U.S. 29 will be increasing in importance as a freight route. Continued urbanization between Northern Virginia, Charlottesville, and points south will increase the need for freight services in this corridor.

- **Virginia Railway Express Strategic Plan, May 2004.** The Virginia Railway Express (VRE) strategic plan calls for a continued expansion of service to serve strong ridership growth in the Washington, D.C. suburbs of Northern Virginia. Many of the improvements affecting VRE are encompassed in the Mid-Atlantic Rail Operations Study, report for the NS line extending west from Alexandria, Virginia, to Manassas, Virginia and for the CSXT line extending south from Washington, D.C., to Richmond, Virginia. This would support a substantial increase in VRE ridership by 2010 from a current average of 14,000 trips per day up to a target of 18,000 trips per day. The results of this study informed the Freight Railroad Realignment Feasibility Study and highlight the importance of passenger rail, in general, to freight planning. Passenger rail impacts freight movement in the region because increases in passenger service reduce freight-rail capacity and have the potential to shift certain commodities from rail to highway.

1.4 Maryland

The State of Maryland's numerous freight facilities are important in serving the freight needs of the COG/TPB region. The warehousing and distribution facilities of Central Maryland – especially the Jessup/Elkridge area located just north of the COG/TPB region – generate a high percentage of the truck trips to Metropolitan Washington. The State also is home to several nationally important freight facilities, including the Port of Baltimore. Like Virginia, the State of Maryland currently is engaged in several important freight studies affecting the COG/TPB region. In addition to its involvement in the ongoing Mid-Atlantic Rail Operations Study, Maryland is sponsoring the Maryland Statewide Freight Plan, which considers freight needs across the State.

Maryland Freight Planning Activities

Maryland

Similar to Virginia, freight planning activities in Maryland are spread across several offices within Maryland's transportation agencies. Most statewide and regional freight planning activities are coordinated by the Maryland Department of Transportation (MDOT) Office of Planning with support from the Office of Freight Logistics. These two Offices participate in regional studies and the I-95 Corridor Coalition's Intermodal Program Track, which is the chief sponsor of the Mid-Atlantic Rail Operations Study and the Mid-Atlantic Truck Operations Study, and is discussed below. Specialized staff in the Office of Freight Logistics provide support for Maryland's multimodal freight network (rail, truck, air, water) and is the State's major resource for all freight logistics matters. The Office of Freight Logistics also is responsible for coordinating freight and passenger rail operations, including track sharing and leasing for MARC service, a role that was formerly played by the Maryland Transit Administration. In addition to these efforts,

individual MDOT Administrations are engaged in freight-related planning activities on a continuous basis, including the State Highway Administration, the Port Administration, and the Aviation Administration, although their activities and interaction with COG/TPB are more limited.

Baltimore Metropolitan Council (BMC)

Beyond MDOT and its modal administrations, the Baltimore Metropolitan Council (BMC) has been engaged in freight planning activities adjacent to the COG/TPB region and is another important regional partner. For several years, BMC has maintained a Freight Movement Task Force as an Advisory Committee of the Baltimore Regional Transportation Board. COG staff members regularly attend these meetings and have gained valuable insight into the greater Washington-Baltimore region's freight activities and issues. BMC continues to develop technical freight studies to address current issues and meet SAFETEA-LU requirements. The MPO recently completed a truck parking study (described at more length below) and is currently developing a multimodal regional freight profile utilizing county-level TRANSEARCH data for its member counties.

Maryland Freight-Related Studies

The State of Maryland currently is engaged in several freight studies that affect the Washington, D.C. region. The following bullets describe these efforts:

- **Maryland Statewide Freight Plan, Underway.** The purpose of this plan is to provide a comprehensive overview of the State's current and long-range freight planning activities and investments, identify current and future freight system deficiencies, and recommend achievable capital planning solutions. When completed, this plan will serve as an input to the Maryland Transportation Plan. Activities include commodity flow forecasting, economic forecasting, stakeholder outreach and coordination, freight transportation system condition and performance assessment, development of implementation strategies, and multimodal benefit/cost evaluation.

  This important freight planning effort considers freight trends, systems, commodities, and needs on two scales: statewide and regional. For the regional effort, the COG/TPB area is covered by the "Suburban Washington-COG/TPB" freight region comprised of Frederick, Montgomery, and Prince George's Counties. For the purpose of the Maryland Statewide Freight Plan, Charles County, Maryland was not included in the "Suburban Washington-COG/TPB" freight region. A portion of urbanized area of Charles County is, however, part of the TPB region. This county should be considered part of the COG/TPB freight region for future analysis. Throughout the course of the planning effort, two regional outreach meetings will be organized with stakeholders in these counties in order to assess current and future freight system needs.

  Like the ongoing Virginia statewide freight planning effort, the Maryland Statewide Freight Plan is relevant to the freight work that COG/TPB undertakes because it

considers freight demand and system needs of several TPB member jurisdictions. As the Maryland effort moves forward, COG/TPB staff should coordinate with Maryland DOT staff to leverage their respective freight planning activities to more efficiently serve their constituents and produce planning materials that provide mutually beneficial guidance. Presently, coordination between agencies is being facilitated through the presence of MDOT staff on the TPB freight advisory committee. This relationship should continue into the future.

- **Baltimore Rail Tunnel Studies, August 2005.** Following the Howard Street tunnel fire of a CSXT train in 2001, the Federal Railroad Administration sponsored a study to identify alternative alignments to provide modern (double-stack clearance) infrastructure to more efficiently and safely move freight-rail traffic through the Baltimore City. The study recommended three potential alignments, each with its own costs and benefits. Because the study was principally an engineering analysis, the State of Maryland is preparing to sponsor another study of the Baltimore Tunnels to provide additional detail to policy-makers, including a more in-depth analysis of the benefits, costs, and economic impacts of a new rail investments.

  This ambitious project is nationally and regionally significant and could result in profound impacts on freight movement and the location of freight facilities in the Baltimore and Washington regions. Because so much of the freight movement generated in the Washington region originates from distribution centers and freight facilities in the Baltimore region, COG/TPB staff should carefully follow the developments of the Baltimore tunnel studies to stay apprised of potential impacts on TPB member jurisdictions.

- **Port of Baltimore Landside Access Study, 2006.** Major activities associated with this effort included: compiling available data on highway and rail system conditions and volumes, collecting new traffic volume and origin/destination (O/D) data for the Port of Baltimore truck traffic, identifying current (near-term) critical needs, and projecting future (2010 and 2025) highway and rail needs; evaluating the effect of local transportation costs (including truck tolls) on short-haul movements and determining the relative economic impact of potential highway and rail investments; and developing summary recommendations and project deliverables. This study is ultimately important to the Washington region because Baltimore is the closest port and supplies the National Capital region with many waterborne commodities, including chemical and petroleum products.

- **Baltimore/Washington International Airport Air Cargo Assessment, November 2003.** The Maryland Aviation Administration (MAA) of the Maryland Department of Transportation developed this broad strategic approach to the issue of how best to accommodate air cargo at Baltimore/Washington International Thurgood Marshall Airport (BWI). Information compilation and analysis were conducted for the following topics:

  – The role and future of air cargo moving through BWI Airport in the context of the overall goods movement system of the State of Maryland;

  - Economic benefit and justification of BWI air cargo activities focusing on key commodities for the State of Maryland and its producers, shippers, and consumers; and
  - Origins and destinations of air cargo traffic through Maryland and the critical modes and routes that provide air cargo collection and distribution within the larger Maryland intermodal transportation system.

  In addition, the study identified potential niche markets that could be diverted or attracted to BWI, focusing on markets that provide economic benefit to the State of Maryland and effectively utilize the State's intermodal transportation system. As COG/TPB develops regional air cargo plans in the future, this study from MDOT has the potential to provide a basis for developing new data and analysis of the region's air cargo patterns in a way that serves the needs of air cargo customers regionwide.

- **Baltimore Metropolitan Council Truck Parking Partnership Study, October 2006.** Nationally, several factors have resulted in a shortage of truck parking near metropolitan distribution centers and on the country's chief freight corridors. These factors include the change in Federal Motor Carrier Safety Administration Hours of Service regulations – which require drivers to spend more time resting during long-haul trips; and the overall increase in the number of trucks which results in crowding at rest areas where truck have traditionally stopped. Baltimore has been severely impacted by a truck parking shortage, which forces trucks to park in unsafe locations along highways. To identify innovative ways of alleviating these conditions, BMC sponsored a study to recommend solutions to improve safety and operations of truck parking. Truck parking issues are not unique to the Baltimore metropolitan region. Many metropolitan areas around the U.S. face similar issues. Because these conditions are similar to those experienced in the Washington, D.C. metropolitan area, the findings of the study may have applicability to the COG/TPB region.

1.5 Multistate Activities

Transportation infrastructure in the Mid-Atlantic states ties together the economies of several states in a relatively small geographic area. Rail and highway systems across several states provide mobility to meet needs of citizen and business constituents. For more than 10 years, the I-95 Corridor Coalition has officially advocated on behalf of regional transportation agencies and has coordinated many pooled-fund studies to examine freight-related topics. As a member of the Coalition and given its multijurisdictional membership, COG/TPB should follow the activities of the Coalition regarding goods movement to remain aware of projects potentially effecting the MPO. The most recent and relevant multistate projects have all been sponsored by the I-95 Corridor Coalition and include:

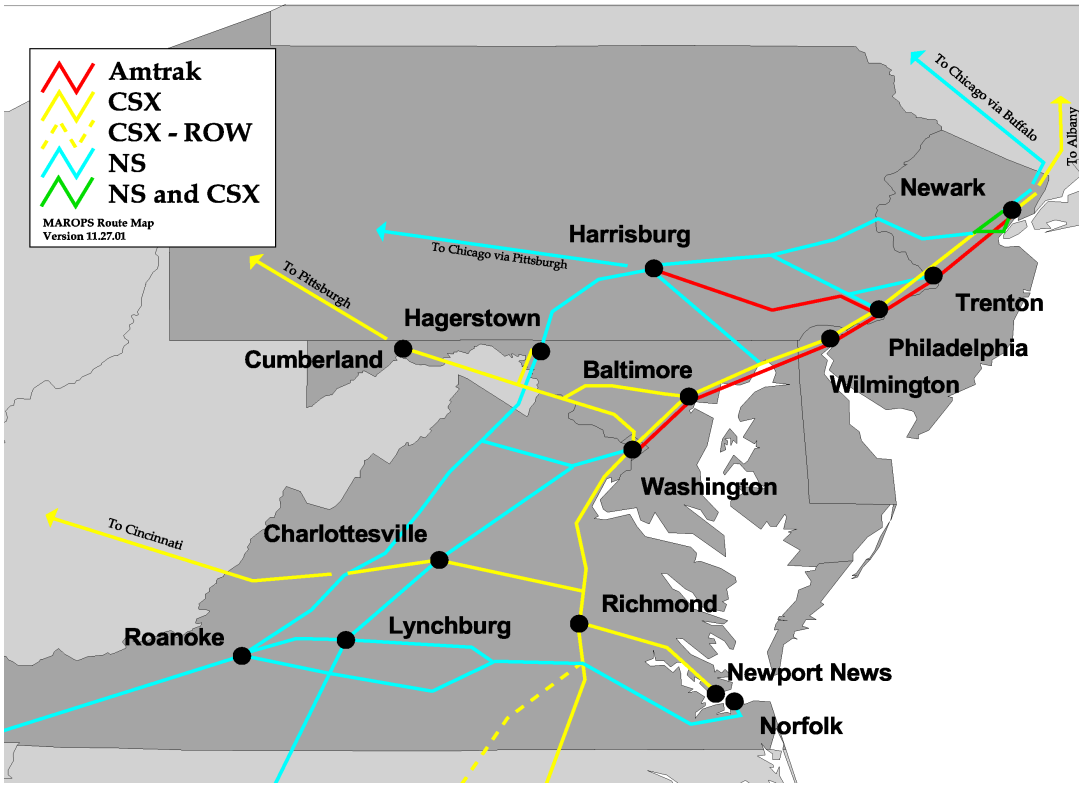
- **Mid-Atlantic Rail Operations Study (MAROps), April 2002.** The MAROps Phase I study was a ground-breaking initiative led by the I-95 Corridor Coalition and

supported by five Mid-Atlantic states (PA, NJ, DE, MD, and VA) and three railroads (Amtrak, CSX, and Norfolk Southern). MAROps examined the operational efficiency and capacity of the rail lines parallel to I-95 and I-81, with the goal of identifying strategies to increase the efficiency and attractiveness of rail (for both passengers and freight) and reduce pressure on I-95, I-81, and other major multistate highway corridors (see Figure 1.1 below). MAROps recommended a 20-year, $6.2 billion public-private investment program to implement 71 chokepoint elimination projects across the five states. The MAROps projects supplement the improvements that have been envisioned under the I-81 program.

The MAROps program recommends several rail infrastructure improvements for the Washington region, including replacement of the Long Bridge, the only mainline Potomac River crossing, and replacement of the Virginia Avenue Tunnel. These projects and others in the metropolitan region would add rail capacity and positively effect regional transportation by shifting both passengers and freight from the region's highways to rail. As the MAROps II study (described below) progresses, COG/TPB should remain apprised of the prioritization of projects within or near its boundaries, especially those that may potentially receive funding and/or enter the capital programming schedules of Maryland, Virginia, or the District of Columbia and require placement within the MPOs long-range transportation plan (LRTP).

Upon the successful completion of the first MAROps Study, the I-95 Corridor Coalition commenced a second phase (MAROPS II) detailed below. The Coalition also expanded the geography of East Coast rail planning through several additional multi-state studies including: the Northeast Rail Operations Study, or NEROps, and Southeast Rail Operations Study, or SEROps.

Figure 1.1 Mid-Atlantic Rail Network



Source: Cambridge Systematics, Inc.

- **Mid-Atlantic Rail Operations Study II (MAROps II), Underway.** Building on the first MAROps study, the second phase will prioritize projects and more fully assess benefits to help structure potential financing partnerships to implement projects. This effort is now underway, led by the I-95 Corridor Coalition and sponsored by Maryland, Delaware, Virginia, New Jersey, and Virginia with three railroads (Amtrak, CSX, and Norfolk Southern). Ultimately, the study should provide momentum toward implementing MAROps projects and will emphasize the importance of regional cooperation in rail planning.

- **Mid-Atlantic Truck Operations Study (MATOps), Underway.** This newly launched study by the I-95 Corridor Coalition provides an opportunity to investigate the regional highway transportation as a system and begin to address systemwide issues that cut across jurisdictional boundaries. It builds on the rail-related operational studies already being conducted by the Coalition (MAROps, MAROps II, Northeast Rail Operations Study, or NEROps, and Southeast Rail Operations Study, or SEROps) and will help the Coalition and its member agencies better understand the issues affecting the region's transportation system as a whole. In addition, the consensus-driven approaches to address key highway bottlenecks can be used by other states and MPOs to address similar issues in their own regions. Finally, by encouraging dialogue among key regional stakeholders, the I-95 Corridor Coalition will be better able to understand and address issues of regional significance.

1.6 Local Jurisdiction Recommendations

In general, COG/TPB member city or county-level jurisdictions are not continuously engaged in freight planning efforts—at least not at the same level as DDOT, MDOT, and VDOT/VDRPT. Local transportation and planning agencies may be engaged in some activities related to the management of freight operations, including truck routing designation and safety/size and weight compliance, but they generally lack dedicated freight staff and may only address freight issues on an ad hoc basis (such as the recent Rail Realignment Study). Nonetheless, local member jurisdictions within the COG/TPB region can contribute to the success of freight planning and to the overall greater understanding of freight issues. This section presents several ideas on how local jurisdictions might contribute to regional freight planning.

In 2007, the National Cooperative Highway Research Program issued the Guidebook for Freight Policy, Planning, and Programming in Small and Medium Sized Metropolitan Areas (Report 570) to assist small and medium sized MPOs in the enhancement of their freight planning programs. While it is largely targeted at MPOs, it does provide useful guidance that municipalities may also employ to both address local issues and to increase the success of a regional freight planning program. Using these suggestions, both regions and their local communities can craft policies and actions to better plan for and accommodate the realities of freight transport, ensuring the economic health and vitality of the region while addressing the issues that arise.

If municipalities can further engage in freight planning, the region and the local communities within the region will reap greater benefits from the planning process, potentially addressing controversial issues, bringing stakeholders to the table, and educating others as to the issues and the realities of freight transportation needs.

Local governments (counties and municipalities) can engage in a variety of general freight planning activities to make regional freight planning more successful. These efforts will not only assist the regional effort but are also intended to enhance the outcome of their own municipal planning efforts and products.

These measures might include:

- **Recognize Freight Systems and Planning as Vital for Quality of Life and Economy**. Freight transportation allows deliveries of all goods as well as overnight packages. It is a key factor in statewide and metropolitan economic competitiveness and vitality. Finally, freight transportation is an important consideration in business attraction and retention decisions. In short, without the transport of goods, our economies at all levels would grind to a halt. Education of local communities and citizens to this reality is an important first step in addressing issues.

- **Gain Understanding of Freight Needs and Issues**. If local governments take the initiative to better understand freight needs and issues, it is possible to design and conduct an economical and efficient freight planning process that can be integrated with conventional transportation planning. Meeting the needs in the freight network also often benefits the traveling public (which is the market typically served in transportation planning). Examples of this might include the siting of freight transfer facilities or truck stop rest areas or the designation of truck routes.

- **Identify Freight In Your Jurisdiction**. Identify the key freight facilities, industries, freight generators, and consumers; understand their transportation needs; and be cognizant of the current political environment regarding freight (anti-truck, neighborhood complaints, large volume of through traffic, etc.).

- **Identify Freight Stakeholders in Your Area**. Identify the major freight "players" in your area or community, including key freight service providers (e.g., trucking companies, steam ship lines, barge operators, railroads, airlines); key freight service buyers (e.g., shippers and receivers); and other stakeholders (e.g., third-party logistics providers, brokers, forwarders). Interacting with these important economic interests and putting them in contact with COG/TPB and can greatly enhance the region's understanding of and planning efforts for freight needs.

- **Determine How Freight Planning Can Fit into Your Organization.** Evaluate how your previous planning activities may fit within a regional freight planning program, and how your own municipality's planning activities and regulatory framework may affect freight transport in and through your community; evaluate the degree to which freight interests have been integrated into current policy, planning, and programming activities; identify available funding sources; and determine available staff resources for freight planning in terms of time, interest, and expertise.

Local governments, especially those that participate in the COG/TPB processes will benefit from learning about and championing these aspects related to freight. Thus, when freight planning is implemented at the regional level, the local governments can provide the most useful and relevant input as it is incorporated into regional transportation planning. A region and its local communities are tied together as a system in terms of transportation needs and solutions. Working together to identify and address issues and openly discuss alternatives is the heart and soul of the planning process and the key to achieving agreement in setting program and policy directions for the future.

W.J. Ford and Julius Gorys support and expand upon a number of the strategies identified in the NCHRP guidebook in their September 2004 paper, entitled "The Case for Municipal Freight Audits." Specifically, Ford and Gorys state that a municipality can incorporate freight into their master planning by conducting a detailed freight analysis to assess the capability of their road system to accommodate freight in their local jurisdiction.

In summary, integrating freight planning into local transportation planning is ultimately a best practice for local governments as part of their own transportation planning efforts. Doing so will most effectively address local issues and will also improve the likelihood that local and regional issues which are identified as part of the process can be addressed in COG/TPB plans (Long Range Plan, Transportation Improvement Program, and Unified Planning Work Programs), benefiting the region as a whole.

1.7 Conclusion

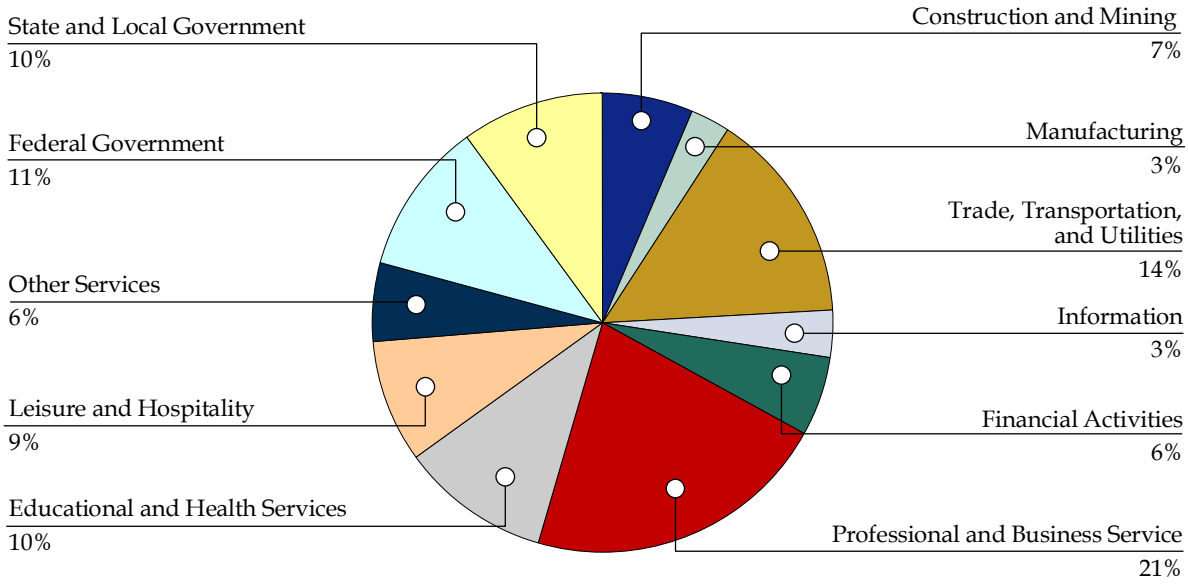
Several freight transportation studies, by the District, Maryland, Virginia, and the I-95 Corridor Coalition, present important upcoming opportunities for the jurisdictions of the COG/TPB region to collaboratively work towards improving freight mobility. The solutions that the District, Maryland, and Virginia adopt for their rail and highway networks will have major impacts on freight operations and infrastructure in the entire region. COG/TPB should continue to engage in these activities to stay informed of regional freight initiatives and needs and to offer its knowledge of conditions affecting goods movement. To this end, COG/TPB should move forward with forming a freight subcommittee to coordinate this activity.

2.0 Washington Region Freight Profile

2.1 Role of Freight in the Washington, DC Region

The COG/TPB region depends on the movement of goods and supplies to keep its economy functioning. Like all dynamic metropolitan regions, the COG/TPB region consumes and produces a wide variety of goods. Figure 2.1 shows the breakdown of employment by industry in the Greater Washington, D.C. region. It is clear the region has a service driven economy, with approximately 75 percent of its workforce employed in the government, information, or service sectors. As such, the Metropolitan Washington, D.C. region primarily consumes goods, rather than produces them.

Figure 2.1 Employment by Industry



Source: Greater Washington Initiative (GWI) Analysis of Bureau of Labor Statistics and Maryland Department of Labor, Licensing and Regulation (DLLR) data, 2005.

To maintain this active, consumer economy, it is necessary to have reliable service and the consistent availability of goods. The purpose of this freight profile is to gain an understanding of goods movement in the COG/TPB region. It is intended to serve as a basis from which COG/TPB can continue to plan for freight and ensure that goods move efficiently.

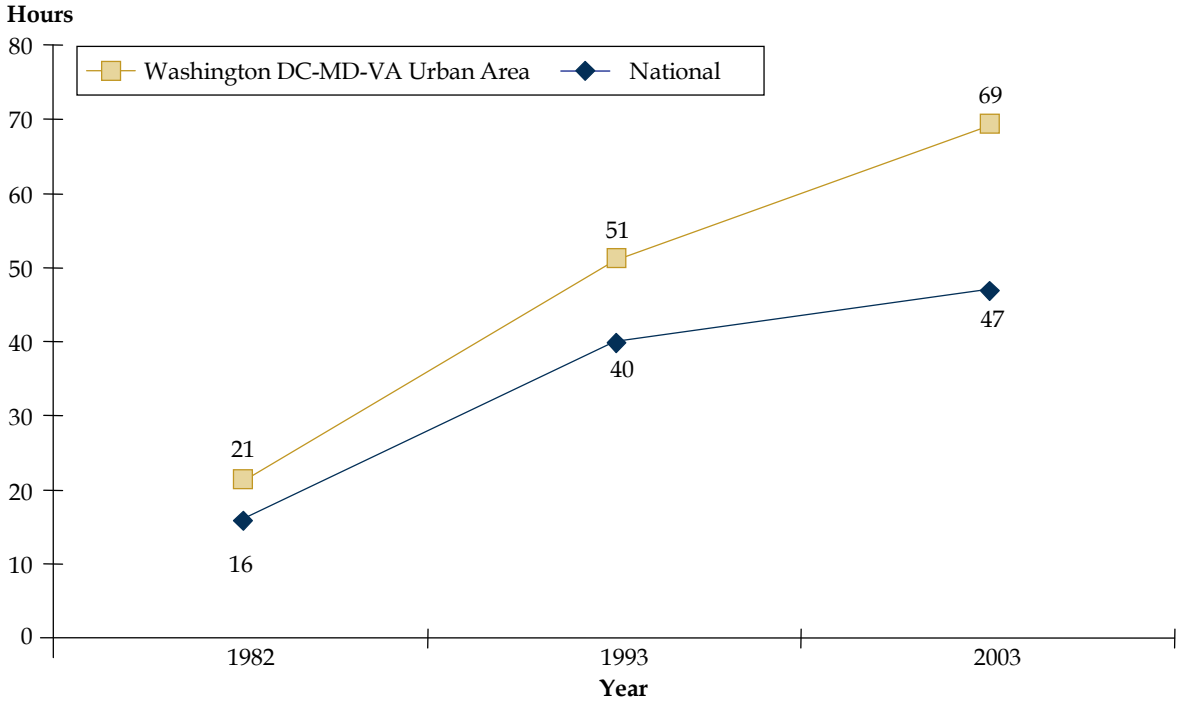
Congestion on the region's highways or railways results in increase costs for consumers and businesses and is a great threat to the region's competitiveness. Just as traffic congestion adversely affects the movement of people in the region, traffic congestion also impedes the movement of freight in the region. The effects of congestion, wasted time, wasted fuel, an increase in air pollution, eventually trickles down to consumers, resulting in higher prices for both consumers and businesses.

Economic supply chains have changed over the years, reflecting just-in-time logistic patterns. Just-in-time logistic patterns depend on reliable transportation systems to keep freight moving, eliminating the need for companies to keep large amounts of inventory on hand. If goods are unable to move efficiently, then shippers and receivers will be forced to compensate for this loss of efficiency by changing business strategies, ultimately factoring higher transportation costs into the end price consumers pay for goods. From the opposite perspective, if transportation costs are lowered, and the transportation system operates efficiently, shippers and receivers will realize savings that are typically passed on to consumers in the form of lower prices. It is in everyone's best interest to have a high-functioning, efficient transportation system.

Cost of Congestion

Nationally and regionally, delay and costs due to congestion have risen significantly over the past 20 years. In 2003, the Texas Transportation Institute (TTI) estimated that the annual delay per peak traveler in the United States was 47 hours, or nearly two days of a person's life per year. On a national scale, TTI estimated, in 2003, 2.3 billion gallons of fuel were wasted due to congestion. The cost of fuel combined with the cost of time resulted in a price tag of $63.1 billion lost annually to highway congestion. As demonstrated in Figure 2.2, these conditions have worsened at a higher rate in the Washington, D.C. Metropolitan area. In 2003, TTI estimated that the average annual delay per traveler was 69 minutes. This is nearly 50 percent higher than the national average. Indeed, out of 85 very large urban areas, the Washington, D.C. metro area was ranked the third worst for congestion. Over a 20-year timeframe, from 1983 to 2003, TTI reported that the metro area's delay per traveler grew rapidly, second only to Atlanta, Georgia, and followed by Dallas-Fort Worth, Los Angeles, and Chicago for worsening highway conditions.

Figure 2.2 Annual Delay Per Traveler



Source: Texas Transportation Institute, 2005 Annual Urban Mobility Report.

While it is obvious how congestion costs individual drivers time and resources, it is less obvious how the delay of freight affects individual consumers. Freight costs shippers and receivers time and money, which the shippers, carriers, and receivers eventually pass on to consumers and businesses in the form of higher prices.

The effects of congestion do not stop at the region's boundaries. The Washington, D.C. region receives a significant amount of traffic passing through the region en route between distant destinations, such as Florida to New Jersey. If the region's transportation system is congested, this translates into costs which negatively affect consumers and economies far beyond the region's borders. This is especially true along the I-95 corridor, running north-south along the eastern seaboard, where congestion is prevalent.

As demonstrated above, planning for the movement of freight is extremely important; everyone is affected by it. However, through forethought and consideration of goods movement in transportation planning, COG/TPB can help address the impacts of congestion and increase the reliability of goods getting to where they need to be on time. Less congestion and more reliability means consumer prices will be lower, customers will be satisfied, and the region's economy will continue to be vibrant and competitive.

Freight traffic is a necessary part of any healthy economy. As consumers of goods, it is important to recognize our dependence on the movement of goods, and understand how the efficient movement of commodities can benefit everyone.

2.2 Regional Commodity Flows

Goods movement in the Washington, D.C. region is characterized by a high dependence on truck transportation, and because of its large consuming population and relatively small manufacturing sector, most goods are imported to the region with a small percentage of exports. Through movements comprise a significant share of total freight tonnage. These summary observations are based on a more detailed analysis described below.

Freight Analysis Framework

The commodity flow analysis for this study utilizes the most recent version of a publicly available freight data set, the Freight Analysis Framework (FAF) Version 2.2. FAF was developed by the Federal Highway Administration's Office of Freight Management and Operations, drawing from the 2002 U.S. Census Bureau's Commodity Flow Survey data and other publicly available datasets. The Freight Analysis Framework contains commodity flows between states, regions, and major international gateways. Data is displayed by origin and destination, mode, commodity class, current and future tons, and current and future value. Given that the COG/TPB region does not have a major international port, only domestic data was evaluated.

Within the Freight Analysis Framework, there are 114 designated FAF zones. Typically the FAF zones are based around freight generating metropolitan areas. Origins and destinations are either one of the zones, the "remainder" of the State, or the entire state name, in cases where there are no metropolitan freight generating regions identified in the State. For example, in the State of Virginia there are five possible origin or destinations, four metropolitan FAF regions: Richmond, Virginia MeSA, Virginia Beach-Norfolk-Newport News, VA-NC MeSA (Virginia Part), or Washington-Baltimore-Northern Virginia, DC-MD-VA-WV CSA (Virginia Part) and then the "Remainder of Virginia." In contrast, West Virginia is listed simply as West Virginia. There are no separate zones identified within the State and therefore no remainder category.

The COG/TPB region is contained in all or part of three FAF zones: Washington-Arlington-Alexandria, DC-VA-MD-WV MeSA (D.C. Part), Washington-Baltimore-Northern Virginia, DC-MD-VA-WV CSA (Virginia Part), Washington-Arlington-Alexandria, DC-VA-MD-WV MeSA (Maryland Part). For the purpose of this study we analyzed all records that had either its origin or destination as one of these three FAF zones. From this point onward, when referring to FAF data, the three regions listed above will be referred to together as the "Washington, D.C. Metro Region." It should be noted that the collective geographic area of the three FAF zones listed above is larger than the TPB region. Jurisdictions included in the FAF zones, but which are not part of the COG/TPB region, include Clarke, Fauquier, Frederick, Spotsylvania, Stafford, Warren, and Winchester Counties and the City of Fredericksburg in Virginia, and Calvert, Charles, and St. Mary's Counties in Maryland. See Figure 2.3 for an illustration of where the FAF zones overlap the TPB boundaries.

Figure 2.3 Washington, D.C. Metropolitan FAF Regions*

Source: Freight Analysis Framework, FHWA, 2002.

* See Appendix A for a complete national listing of FAF zones

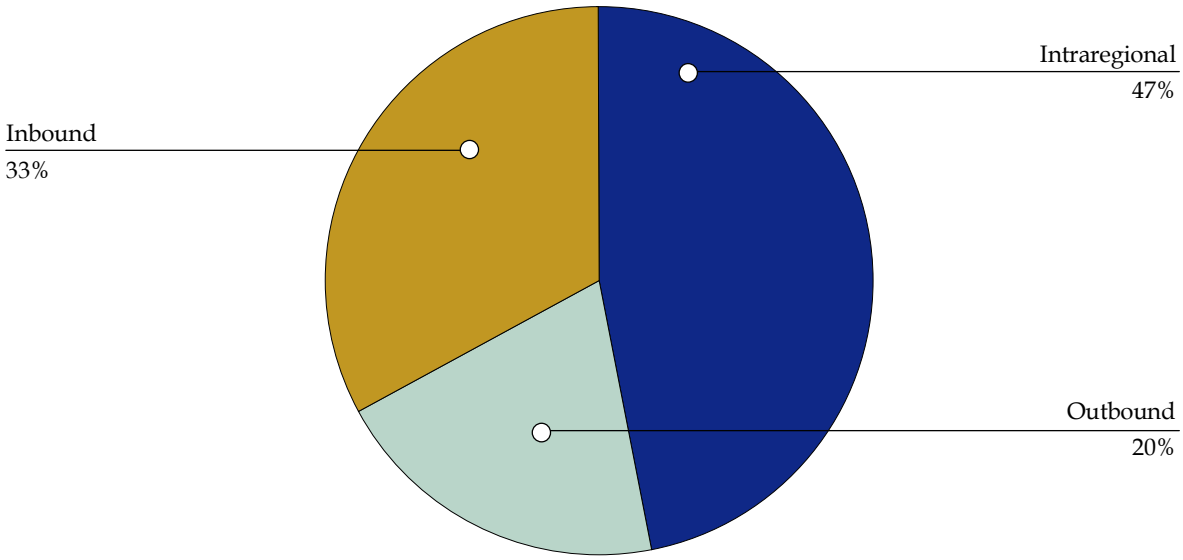
The FAF data is best used for macro-level analysis. It is good source of data for painting a broad picture of domestic and international freight flows. However, as the level of analysis becomes more precise, the results of the data become less reliable. This is particularly true for the FAF growth projections by commodity and mode. Another limitation of the FAF is that it only provides origins and destinations. As a result, it is not possible to know what and how much of certain commodity passes "through" a region. It is only possible to understand inbound, outbound, and intraregional commodity flows. This is a significant limitation, particularly when analyzing freight flows in the COG/TPB region where, based on other studies, through traffic is significant.

Judging from other studies conducted by Cambridge Systematics for Maryland, Virginia, and the District of Columbia, the metropolitan Washington, D.C. region receives a large amount of "overhead" or "through" freight traffic which is not part of the FAF data. As a result, the results of FAF-based commodity flows for the COG/TPB region significantly underestimate the amount of total freight traffic in the region.

Inbound, Outbound, and Intraregional Freight Movements

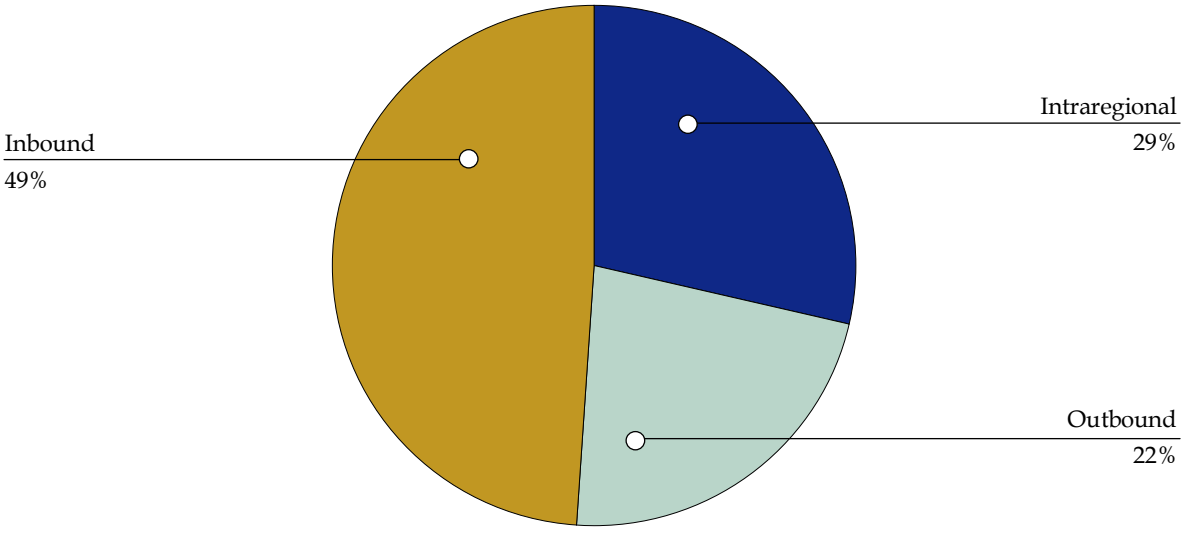
According to FAF, 222,106,000 tons of freight moved in the Washington, D.C. Metro Region in 2002, worth $200.5 billion. Of this total, 73,526,000 tons, worth $98 billion, were inbound movements that originated outside the region (Pennsylvania to Washington, D.C., for example). Approximately 44,274,000 tons, worth $45 billion, moved outbound from the region. Internally, 104,306,000 tons, worth $57.5 billion, were moving solely within the region (having both an origin and destination within the region). Figure 2.4 illustrates the Washington, D.C. Metro Region's freight tonnage by direction. The greatest amount of freight by tonnage, 47 percent, was moved within the region (internal). Figure 2.5 illustrates the value of freight being moved in the Washington, D.C. Metro Region. The greatest amount of freight by value, 49 percent, is moving inbound. The value of the freight moving inbound to the region is nearly twice that of the value moving outbound. This fact is reflective of the Washington, D.C. Metro Region's consumer and service-based economy and its relatively small manufacturing sector.

Figure 2.4 Washington, D.C. Metro Region Freight Movements by Tonnage
Inbound, Outbound, Intraregional , 2002



Source: Freight Analysis Framework, FHWA, 2002.

Figure 2.5 Washington, D.C. Metro Region Freight Movements by Value
Inbound, Outbound, Intraregional, 2002



Source: Freight Analysis Framework, FHWA, 2002.

As stated earlier, the tonnage and value derived from the FAF data significantly under represents the true tonnage and value of tonnage moving in the Washington, D.C. Metropolitan region. To better understand and estimate the amount of "through" traffic moving through the region the study team consulted ongoing work on the Maryland Statewide Freight Plan. As a part of the Maryland Statewide Freight Plan, freight flows in the three Maryland counties included in the COG/TPB region, Montgomery County, Frederick County, and Prince George's County Maryland, were analyzed separately.

The total freight tonnage moving "through" Montgomery, Frederick, and Prince George's counties was 313.8 million tons, valued at nearly $1.2 trillion, and representing 86 percent of all freight movements in the three counties. Approximately 70 percent of the through tonnage was carried by truck. Likewise, the recently published Freight Railroad Realignment Feasibility Study Report, released jointly by the National Capital Planning Commission and DDOT states that 99 percent of all rail traffic in the District of Columbia is "through" traffic. This estimate is based off of the 2005 Surface Transportation Board Carload Waybill Sample. Given the results of these two studies, we approximate that a similar amount of freight traffic in the COG/TPB region is "through" traffic, anywhere between 60 to 80 percent, weighing approximately 314 million tons and worth around $1.2 trillion. Figures 2.6 and 2.7 illustrate the estimated significance of through traffic to the COG/TPB region.

Figure 2.6 Estimated* COG/TPB Region Freight Movements by Tonnage
All Directions

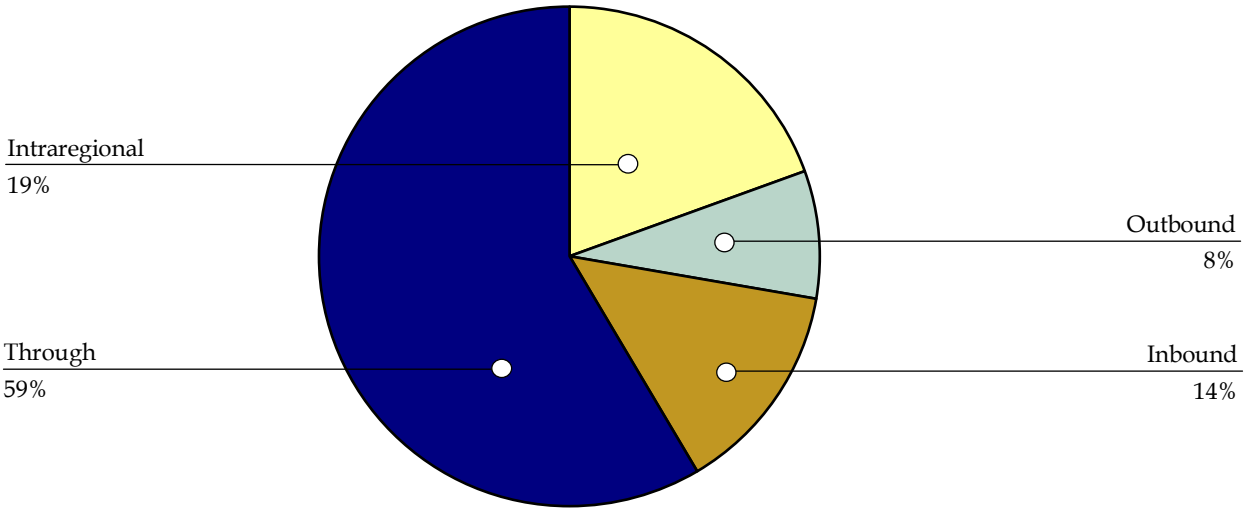
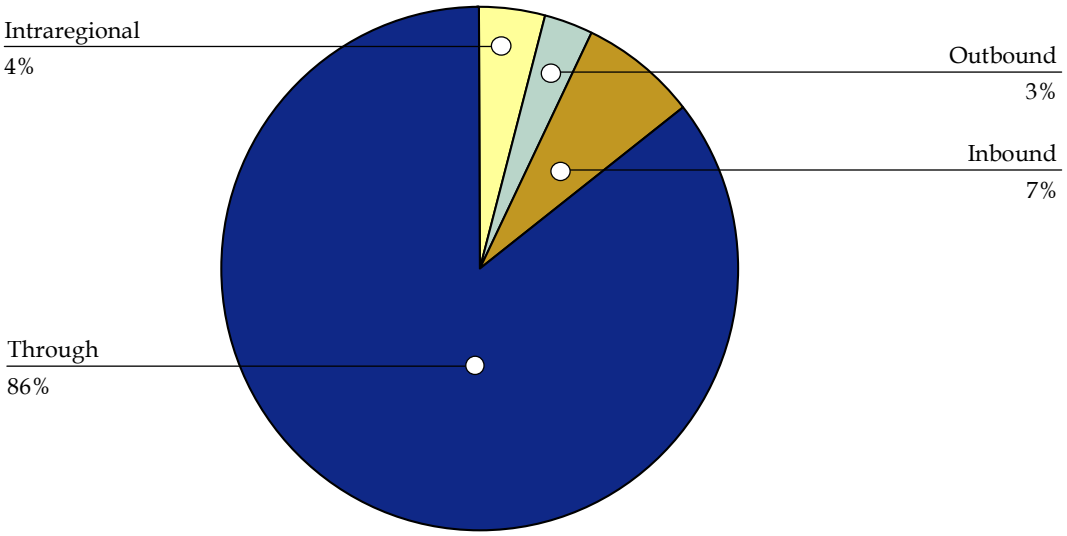


Figure 2.7 Estimated* COG/TPB Region Freight Movements by Value
All Directions



* Estimates are based on 2 Sources: Inbound, Outbound, and Intraregional numbers are based on 2002 FAF data. Through traffic is based on 2003 estimate in Draft Maryland Freight Profile, 2007.

Freight Movement by Mode

While trucking predominates freight movement in the region, commodities moved by rail, water, and air cargo are critical to the regional economy. This section breaks down commodity flows for each mode based on the FAF data and other publicly available data sources. See Appendix B for a complete list of commodity descriptions by 4-digit Standard Classification of Transported Goods (SCTG) Codes.

Truck

Trucks carry the majority – approximately 76 percent – of the goods to, from, and within the region. In 2002, trucks moved 170,209,000 tons of freight valued at $160 billion in the Washington region. The most prevalent commodity moved by truck is gravel. In the region, trucks move 46,656,000 tons of gravel annually. The majority of the gravel, 67 percent, is internal movement within region. Following gravel, the waste/scrap materials category is the second highest tonnage commodity transported in the region. In 2002, approximately 16,538,000 tons of waste/scrap material were transported to, from, and within the region. The majority of this commodity, 76 percent, is transported outside the region by truck. Table 2.1 shows the top commodities, by weight, transported by truck to, from, and within the Washington, D.C. Metro Region.

Table 2.1 Top Commodities Transported by Truck To, From, and Within the Washington, D.C. Metro Region
by Weight, 2002

Commodity	Thousands of Tons	Percent		
		Inbound	Outbound	Intraregional
Gravel	46,656	23%	10%	67%
Waste/Scrap	16,538	9%	76%	14%
Nonmetal Mineral Products	16,433	38%	18%	44%
Natural Sands	12,407	17%	9%	73%
Wood Products	10,484	29%	24%	47%
Unknown	7,812	32%	18%	50%
Gasoline	6,626	16%	13%	72%
Mixed Freight	5,963	47%	22%	31%
Other Agricultural Products	4,993	30%	19%	51%
Other Foodstuffs	4,890	51%	19%	30%

Source: Freight Analysis Framework, FHWA, 2002.

The top commodity by value, moving by truck in the region, is machinery. About $22.4 billion worth of machinery is moved annually, followed by textiles/leather ($16.4 billion), mixed freight ($14.3 billion), and electronics ($12.2 billion). Most of these commodities are split relatively equally, between traffic moving inbound, outbound, and within the region. Table 2.2 shows the top commodities, by value, being transported by truck to, from, and within the Washington, D.C. Metro Region.

Table 2.2 Top Commodities Transported by Truck To, From, and Within the Washington, D.C. Metro Region

by Value, 2002

Commodity	Millions of Dollars	Percent		
		Inbound	Outbound	Intraregional
Machinery	22,481	40%	19%	41%
Textiles/Leather	16,372	29%	36%	35%
Mixed Freight	14,282	44%	26%	30%
Electronics	12,019	43%	31%	27%
Printed Products	7,830	33%	42%	26%
Unknown	7,220	32%	18%	50%
Motorized Vehicles	7,195	55%	26%	19%
Wood Products	6,853	31%	30%	39%
Other Agricultural Products	5,999	68%	10%	22%
Pharmaceuticals	5,777	85%	8%	7%

Source: Freight Analysis Framework, FHWA, 2002.

Rail

Rail shipments moving to, from, and within the region comprise a relatively small portion of all freight movements in the region, only about 5 percent. Approximately 11,151,000 tons of freight is moved annually by rail. Like truck, this total excludes through traffic with accounts for more than 90 percent of the region's rail tonnage. Rail is well suited to carry low-value, heavy commodities that are traveling long distances. It is not typically used as a mode of transport for items being transported intraregionally. The top commodities by weight moving by rail in the Washington Metro Region are coal and gravel. About 7,166,000 tons of coal imported into the region every year by rail and 2,462,000 tons of gravel is transported inbound, outbound, and within the region. Table 2.3 shows the top commodities, by weight, being transported by rail to, from, and within the Washington, D.C. Metro Region.

Table 2.3 Top Commodities Transported by Rail To, From, and Within the Washington, D.C. Metro Region
by Weight, 2002

Commodity	Thousands of Tons	Percent		
		Inbound	Outbound	Intraregional
Coal	7,166	100%	0%	0
Gravel	2,462	75%	3%	21%
Coal-n.e.c*.	297	100%	0%	0
Natural Sands	293	0%	100%	0
Plastics/Rubber	204	85%	15%	0
Wood Products	192	100%	0%	0
Base Metals	156	93%	7%	0
Newsprint/Paper	103	100%	0%	0
Motorized Vehicles	86	100%	0%	0
Nonmetal Mineral Products	76	100%	0%	0

Source: Freight Analysis Framework, FHWA, 2002.
* not elsewhere classified

The top commodities by value transported to, from, and within the region by rail include, automobiles, coal, plastics/rubber, and wood products. Motorized vehicles, imported to the region by rail, are valued at $337 million and coal, also headed inbound by rail, is valued at $236 million. Table 2.4 shows the top commodities, by value, being transported by rail to, from, and within the Washington, D.C. Metro Region.

Table 2.4 Top Commodities Transported by Rail To, From, and Within the Washington, D.C. Metro Region

by Value, 2002

Commodity	Millions of Dollars	Percent		
		Inbound	Outbound	Intraregional
Motorized Vehicles	337	100%	0%	0%
Coal	236	100%	0%	0%
Plastics/Rubber	137	83%	17%	0%
Wood Products	107	100%	0%	0%
Coal-n.e.c.*	100	100%	0%	0%
Base Metals	72	73%	27%	0%
Textiles/Leather	38	100%	0%	0%
Newsprint/Paper	33	100%	0%	0%
Other Foodstuffs	31	100%	0%	0%
Gravel	24	23%	6%	71%

Source: Freight Analysis Framework, FHWA, 2002.
* not elsewhere classified

Air

Unlike rail commodities, air cargo is typically high in value, light in weight, and time-sensitive. The FAF combines all freight movements that are either made by air or by truck to or from the region's airports. The FAF regions being analyzed for the purpose of this study do not include BWI, which is technically not located within the COG/TPB region. The numbers in Table 2.5 reflect air cargo traffic at Dulles and DCA. Nearly all commodities transported by air in the Washington, D.C. Metro Region are inbound. The highest value air cargo commodity moving into the region is electronics. Electronics, moving to, from, and within the region are valued at $3 billion, followed by precision equipment valued at $684 million. Table 2.5 shows the top commodities, by value, being transported by air or by truck to or from and airport in the Washington, D.C. Metro Region.

Table 2.5 Top Commodities Transported by a Combination of Air and Truck To, From, and Within the Washington, D.C. Metro Region
by Value, 2002

Commodity	Millions of Dollars	Percent		
		Inbound	Outbound	Intraregional
Electronics	3,033	90%	10%	0%
Precision Instruments	684	100%	0%	0%
Transportation Equipment	424	54%	46%	0%
Pharmaceuticals	267	90%	10%	0%
Motorized Vehicles	183	100%	0%	0%
Machinery	153	99%	1%	0%
Miscellaneous Manufacturing Products	134	99%	1%	0%
Printed Products	133	90%	10%	0%
Textiles/Leather	33	92%	8%	0%
Nonmetal Mineral Products	28	98%	2%	0%

Source: Freight Analysis Framework, FHWA, 2002.

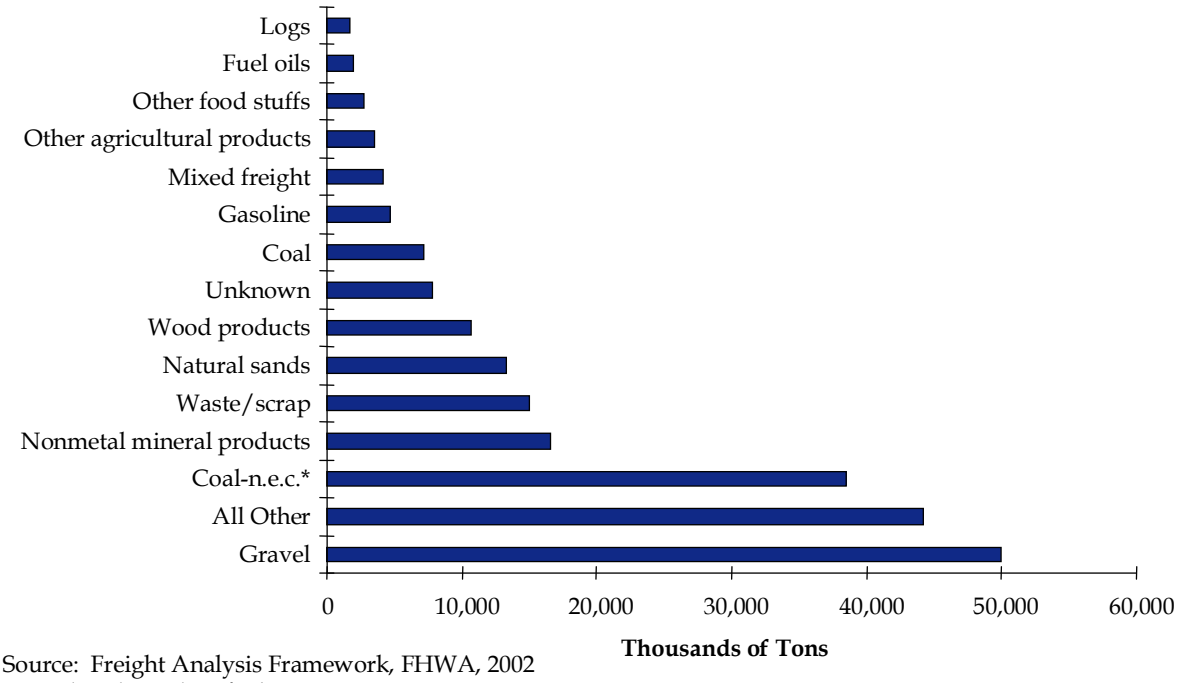
Water

Only a very small amount of freight is transported on the Washington, D.C. Metro Region's waterways. According the FAF and data from the U.S. Army Corps of Engineers Waterborne Commerce data, approximately one million tons of goods, worth $69 million dollars are moved by water. The top waterborne commodities include gravel and natural sands, which are mostly moved internally. According to FAF, printed products are exported from the region, and alcoholic beverages are imported by water to the region.

Freight Movement by Commodity

Overwhelmingly the top freight commodity transported to, from, or within the region by weight is gravel. Nearly 50 million tons of gravel is transported to, from, or within the region annually. Gravel is followed closely by 38.5 million tons of natural gas, selected coal products, and products of petroleum refining, excluding gasoline, aviation fuel, and fuel oil (categorized as coal n.e.c.). Figure 2.8 shows the top commodities, by tonnage, being transported to, from, or within the Washington, D.C. Region.

Figure 2.8 Top Commodities Transported To, From, and Within the Washington D.C. Region by Tonnage, 2002

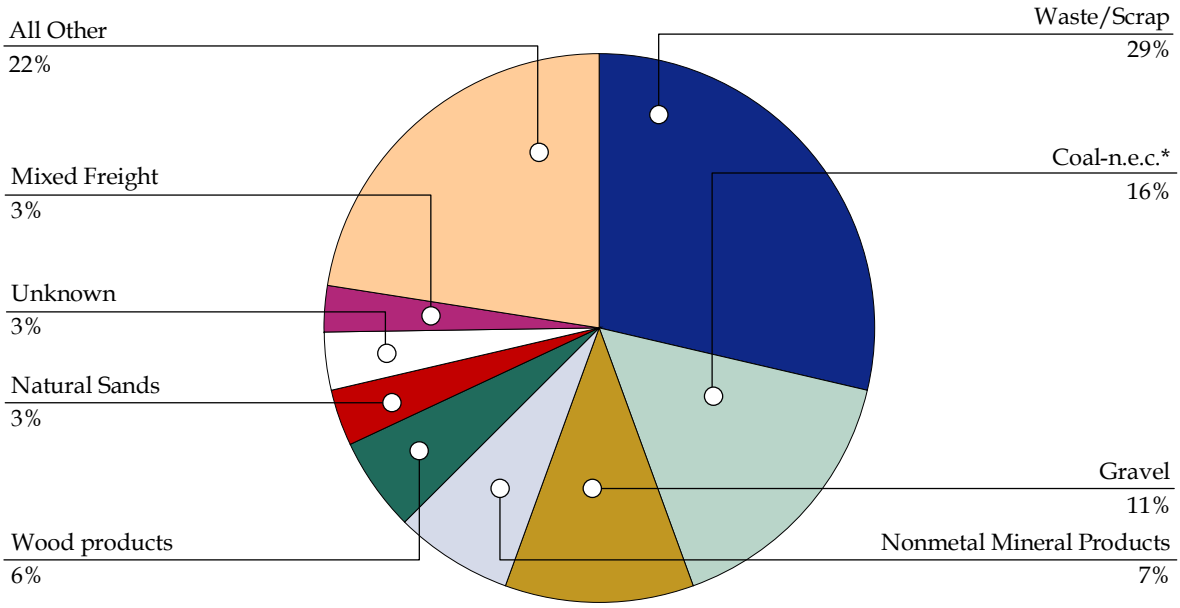


Source: Freight Analysis Framework, FHWA, 2002
* not elsewhere classified.

By weight, the Washington region's commodity composition resembles the national profile in several important ways. Nationally, gravel is the leading commodity while coal, nonmetalic minerals, and sands are also among the top commodities. The Washington region differs from the national profile because it lacks some of the agricultural tonnage (cereal grains) but has a much higher proportion of waste and scrap tonnage.

Waste and Scrap materials comprise the largest commodity by weight moving outbound, from the region. About 12.6 million tons of waste and scrap are transported out of the region each year. Figure 2.9 illustrates the top commodities, by weight, being transported from the region.

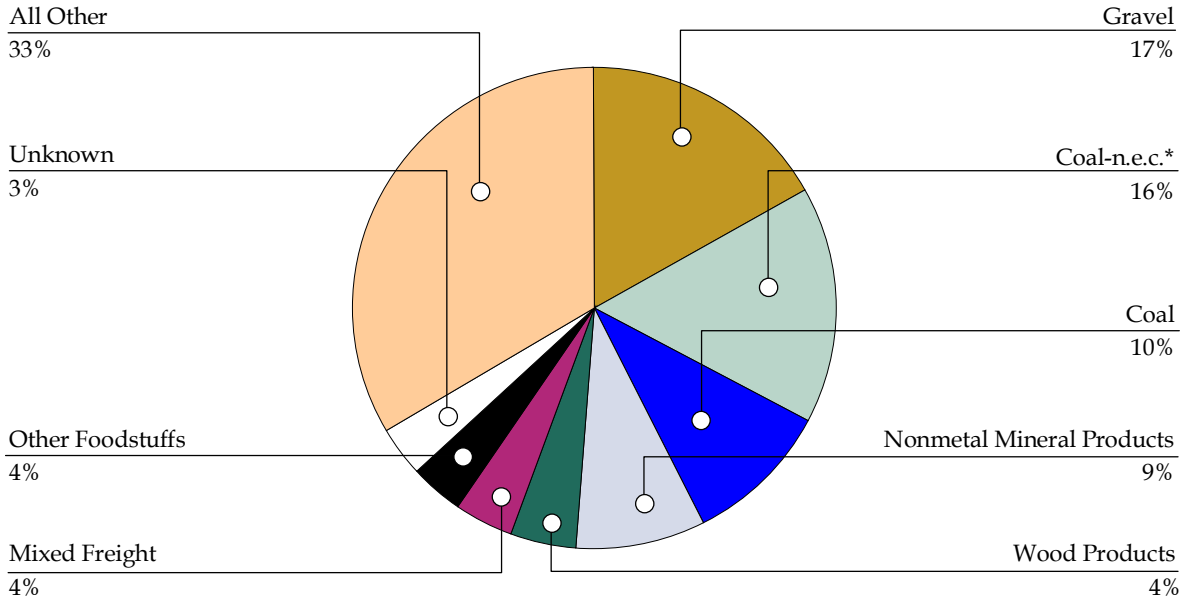
Figure 2.9 Top Commodities Transported from Washington, D.C. Metro Region by Tonnage, 2002



Source: Freight Analysis Framework, FHWA, 2002.
* not elsewhere classified

Gravel is the top commodity by weight moving into the region. Approximately 12.5 million tons of gravel is imported into the region each year. This is followed by the commodity coal n.e.c. Figure 2.10 shows the top commodities, by weight, being transported to the Washington, D.C. Metro Region.

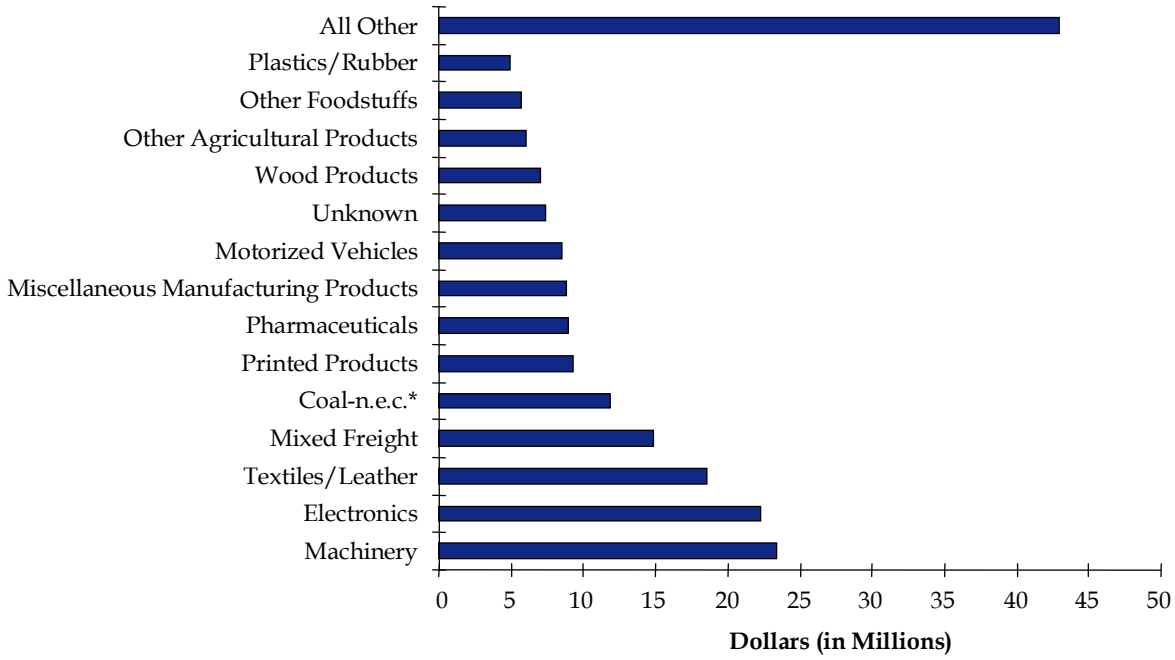
Figure 2.10 Top Commodities Transported to Washington, D.C. Metro Region by Tonnage, 2002



Source: Freight Analysis Framework, FHWA, 2002.
* not elsewhere classified

While no single commodity completely dominates the "value" category, machinery is as at the top of the list of total value moved in the region with more than $23.4 billion moved annually. This is followed closely by $22.3 billion of electronics, and $18.6 billion of textile/leather products. Figure 2.11 illustrates the top commodities, by value, moving to, from, or within the Washington, D.C. Metro Region.

Figure 2.11 Top Commodities Transported To, From, and Within the Washington, D.C. Metro Region by Value, 2002

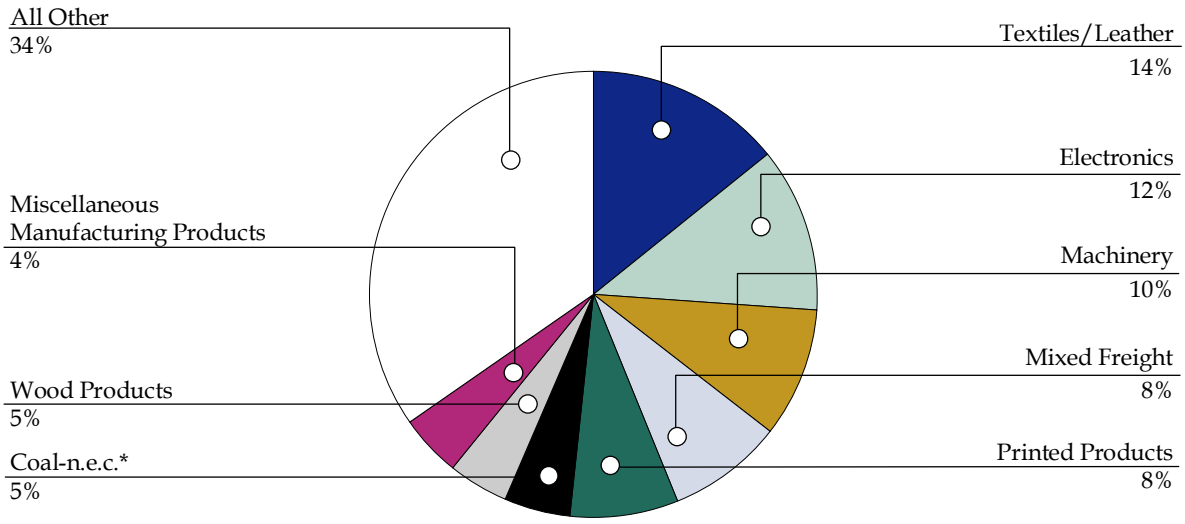


Source: Freight Analysis Framework, FHWA, 2002.
* not elsewhere classified

By value, the Washington region's commodity composition is similar to the national profile with high dollar values for machinery (#2 nationally), electronics (#1 nationally), and mixed freight (#3 nationally). The region differs with higher-than-national levels of textiles and coal and lower-than-national levels of food commodities and motor vehicles, by value.

Among the region's exports, the textile/leather category ranks highest with approximately $6.3 billion in goods moved in 2002. This is followed by $5.4 billion of electronics and $4.3 billion of machinery. Figure 2.12 shows the top value export commodities moving outbound from the Washington, D.C. Metro region.

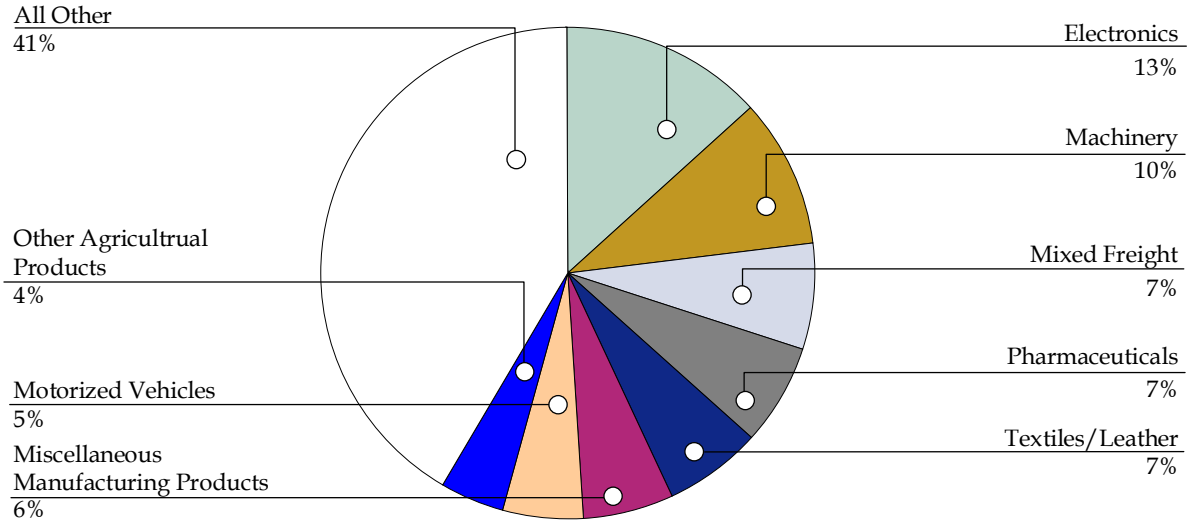
Figure 2.12 Top Commodities Transported from Washington, D.C. Metro Region by Value, 2002



Source: Freight Analysis Framework, FHWA, 2002.
* not elsewhere classified

The total value of commodities imported to the region is nearly double the value of commodities leaving the region. $13.1 billion of electronic are transported to the region annually, along with $9.6 billion of machinery and $6.8 billion of mixed freight. Figure 2.13 illustrates the top commodities, by value, moving to the Washington, D.C. Metro Region.

Figure 2.13 Top Commodities Transported to Washington, D.C. Metro Region by Value, 2002



Source: Freight Analysis Framework, FHWA, 2002.

Metropolitan Washington, D.C. Trading Partners

The Washington, D.C. Metro region trades with many regions and states across the United States, but the region's top partners, by weight, are primarily located along the Mid-Atlantic coast, with a few partners located further west. Figure 2.14 shows the region's top trading partners by weight.

Figure 2.14 Top Washington, D.C. Metro Region Trading Partners by Weight, 2002

Source: Freight Analysis Framework, FHWA, 2002.

The majority of freight tonnage, approximately 24 million tons, moves between Baltimore and the Washington region. This is followed by 21.2 million tons of goods moving between the region and the outlying areas of Virginia. The outlying areas, or remainder of Maryland, is the third trading partner. Table 2.6 contains additional detail on Washington, D.C. region trading partners.

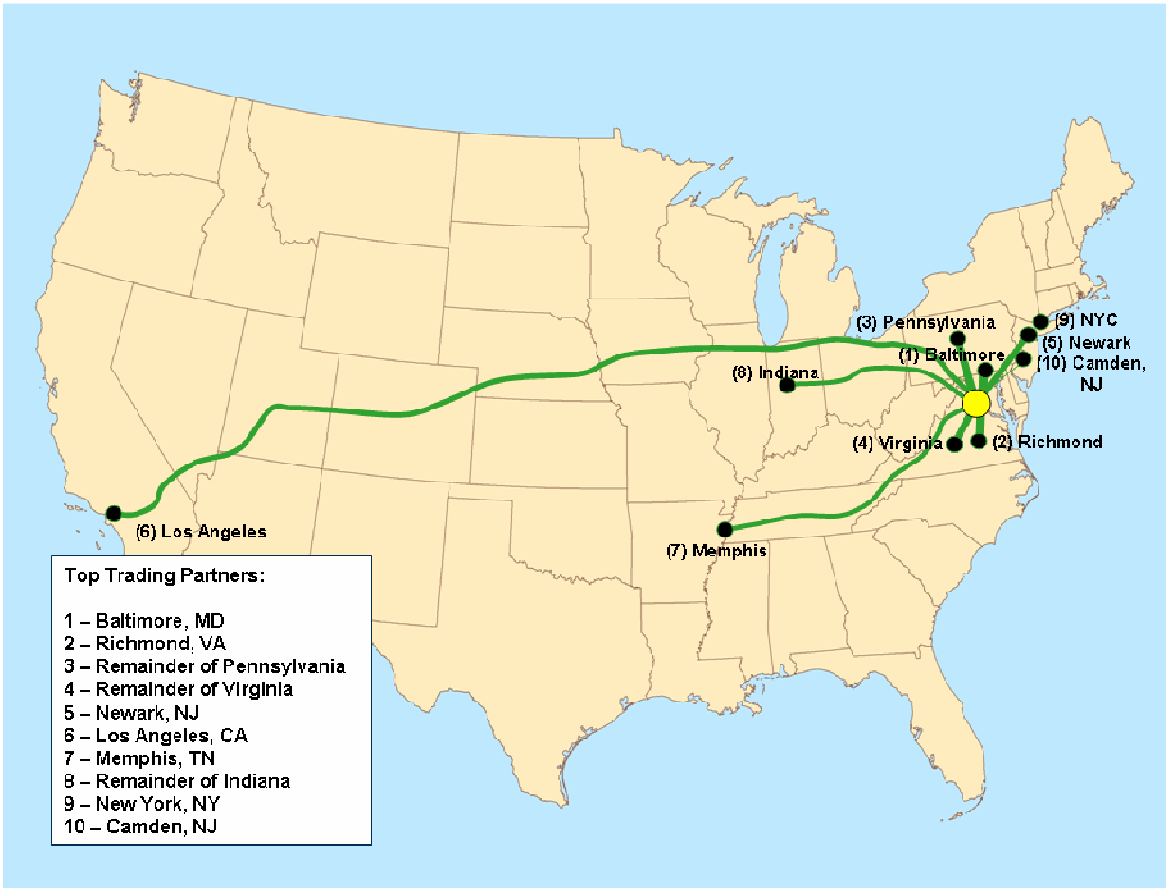
Table 2.6 Top Trading Partners with Washington, D.C. Metro Region *by Total Tonnage, 2002*

Region	Thousand of Tons
Baltimore, Maryland	24,232
Remainder of Virginia	21,179
Remainder of Maryland	8,943
Richmond, Virginia	8,744
West Virginia	8,375
Remainder of Pennsylvania	7,665
Remainder of Indiana	4,892
Minneapolis, Minnesota	3,121
Pittsburgh, Pennsylvania	2,912
Norfolk, Virginia	2,213

Source: Freight Analysis Framework, FHWA, 2002.

The Washington, D.C. Metro Region's top trading partners by value are also primarily located on the Mid-Atlantic Coast. However, some are located much further away, such as the Los Angeles metropolitan area. Three of the top six trading partners, by value, have major international container ports. The Port of Los Angeles-Long Beach, the Port of Baltimore, and Port of Newark-Elizabeth are among the top 20 container ports in the world. Typically containers are used to ship high-value goods and the pattern of top value trading partners reflects the global supply chain of internationally manufactured goods being imported to Washington, D.C. region consumers and businesses.

Figure 2.15 Top Trading Partners by Total Value, 2002



Source: Freight Analysis Framework, FHWA, 2002.

Baltimore is also the Washington, D.C. Metro Region's top trading partner by value. The two adjacent metropolitan regions exchange approximately $15.4 billion of goods each year. Richmond, Virginia follows, with $6.7 billion of annual trade with the Washington region. Table 2.7 shows the top trading partners, by value, with the Washington, D.C. Metro Region.

Table 2.7 Top Trading Partners with Washington, D.C. Metro Region
by Total Value, 2002

Region	Millions of Dollars
Baltimore, Maryland	15,392
Richmond, Virginia	6,735
Remainder of Pennsylvania	6,456
Remainder of Virginia	5,122
Newark, New Jersey	3,488
Los Angeles, California	3,238
Memphis, Tennessee	2,562
Remainder of Indiana	2,432
New York, New York	2,371
Camden, New Jersey	2,366

Source: Freight Analysis Framework, FHWA, 2002.

The Washington region's top trading partner by inbound tonnage is Baltimore. Baltimore ships 17.3 million tons of goods to the D.C. Metro region annually. Table 2.8 lists top trading partners with the Washington, D.C. Metro region by inbound tonnage.

Table 2.8 Top Trading Partners with Washington, D.C. Metro Region *by Inbound Tonnage, 2002*

Region	Thousands of Tons
Baltimore, Maryland	17,262
Remainder of Virginia	8,238
Richmond, Virginia	7,741
West Virginia	7,282
Remainder of Pennsylvania	5,035
Remainder of Indiana	4,829
Pittsburgh, Pennsylvania	2,425
New Orleans, Louisiana	1,593
Indianapolis, Indiana	1,529
Remainder of Maryland	1,154

Source: Freight Analysis Framework, FHWA, 2002.

The Washington, D.C. Metro region's top trading partner by outbound tonnage is the remaining, or outlying portions of Virginia. The D.C. Metro Region transports 13 million tons of goods to this region annually. Table 2.9 shows the top trading partners with the Washington, D.C. Metro Region by Outbound Tonnage.

Table 2.9 Top Trading Partners with Washington, D.C. Metro Region *by Outbound Tonnage, 2002*

Region	Thousands of Tons
Remainder of Virginia	12,942
Remainder of Maryland	7,789
Baltimore, Maryland	6,970
Minneapolis, Minnesota	2,953
Remainder of Pennsylvania	2,630
Norfolk, Virginia	1,327
West Virginia	1,093
Richmond, Virginia	1,004
New York, New York	805
Philadelphia, Pennsylvania	765

Source: Freight Analysis Framework, FHWA, 2002.

The Washington, D.C. Metro region's top trading partner by inbound value is Baltimore. About $15.4 billion of goods are transported from Baltimore to the D.C. Metro Region annually. Table 2.10 shows the top trading partners with the Washington region by inbound value.

Table 2.10 Top Trading Partners with Washington, D.C. Metro Region *by Inbound Value, 2002*

Region	Millions of Dollars
Baltimore, Maryland	15,392
Richmond, Virginia	6,735
Remainder of Pennsylvania	6,456
Remainder of Virginia	5,122
Newark, New Jersey	3,488
Los Angeles, California	3,238
Memphis, Tennessee	2,562
Remainder of Indiana	2,432
New York, New York	2,371
Camden, New Jersey	2,366

Source: Freight Analysis Framework, FHWA, 2002.

The Washington, D.C. Metro region's top trading partner by outbound value is also Baltimore. Although significantly less than the amount of goods being transported from the Baltimore region to the D.C. region, $9.8 billion of goods are transported from the Washington, D.C. region to the Baltimore region. Table 2.11 shows the top Washington, D.C. Metro Region trading partners by outbound value.

Table 2.11 Top Trading Partners with Washington, D.C. Metro Region *by Outbound Value, 2002*

Region	Millions of Dollars
Baltimore, Maryland	9,837
Newark, New Jersey	3,085
Philadelphia, Pennsylvania	2,759
New York, New York	2,742
Remainder of Maryland	2,468
Remainder of Pennsylvania	2,051
Remainder of Virginia	1,726
Remainder of California	1,538
Richmond, Virginia	1,499
Norfolk, Virginia	1,389

Source: Freight Analysis Framework, FHWA, 2002.

Future Trends

Looking to 2030, the COG/TPB region is projected to experience a significant growth in freight, often times at a higher rate of growth than that projected for the country as a whole. According to FAF, the Washington, D.C. metropolitan region is projected to see the amount of tonnage moving to, from, and within the region increase by 110 percent and the growth in value increase by 145 percent. This is compared to a national increase in tonnage projected to be around 70 percent and a national increase in the value of freight movements, projected to rise by 116 percent by 2030.

All transportation modes are projected to move more tonnage to, from, and within the region by 2030. Air cargo tonnage is projected to rise the fastest, growing by nearly 500 percent. Rail tonnage, by contrast, is projected to grow by 50 percent while the forecast truck tonnage growth rate is 106 percent. This is in contrast to national projections which foresee truck and rail both growing around 70 percent.

Most commodity movements in the Washington, D.C. Metro Region are predicted to grow significantly, with the exception of textile/leather, which is expected to decrease by

41 percent. High-value commodities, like pharmaceuticals, mixed freight, electronics, and motorized vehicles are expected to grow the most, both from a tonnage standpoint and a value standpoint. This is consistent with national trends.

Also, in 2030, the direction of freight is projected to shift slightly. More freight is projected to flow to and from the region, while slightly less freight will be traveling within the region (internal movements). At the same time, the value of outbound and intraregional freight is projected to decrease, while the value of inbound freight is projected to increase.

2.3 Regional Freight Transportation System

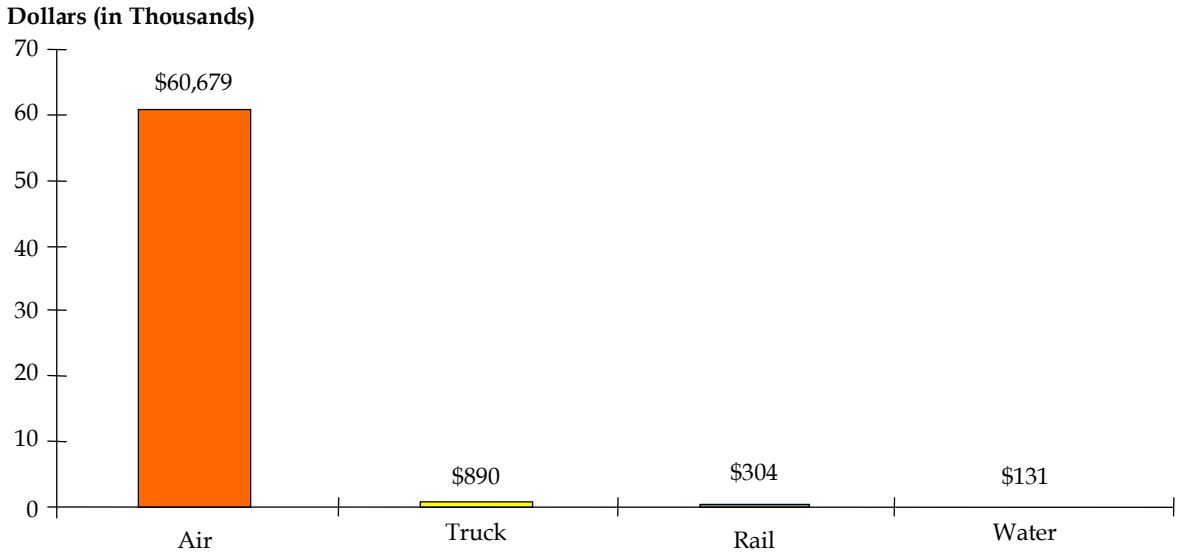
The growth in freight in the region will depend, in part, on the ability of the highway, rail, water, and air facilities to accommodate increased demand. This section provides an overview of the Washington region's freight-related physical transportation infrastructure.

Air

Air cargo is the fastest-growing segment of the nation's freight movement system according to the Bureau of Transportation Statistics. According to the Federal Aviation Administration's Aerospace Forecast Fiscal Year 2006-2017, expansion in domestic and international air cargo markets by United States commercial carriers are collectively expected to experience average annual growth of 5.2 percent from 2005 to 2017. Such growth may have implications for the role of airports that serve the study area.

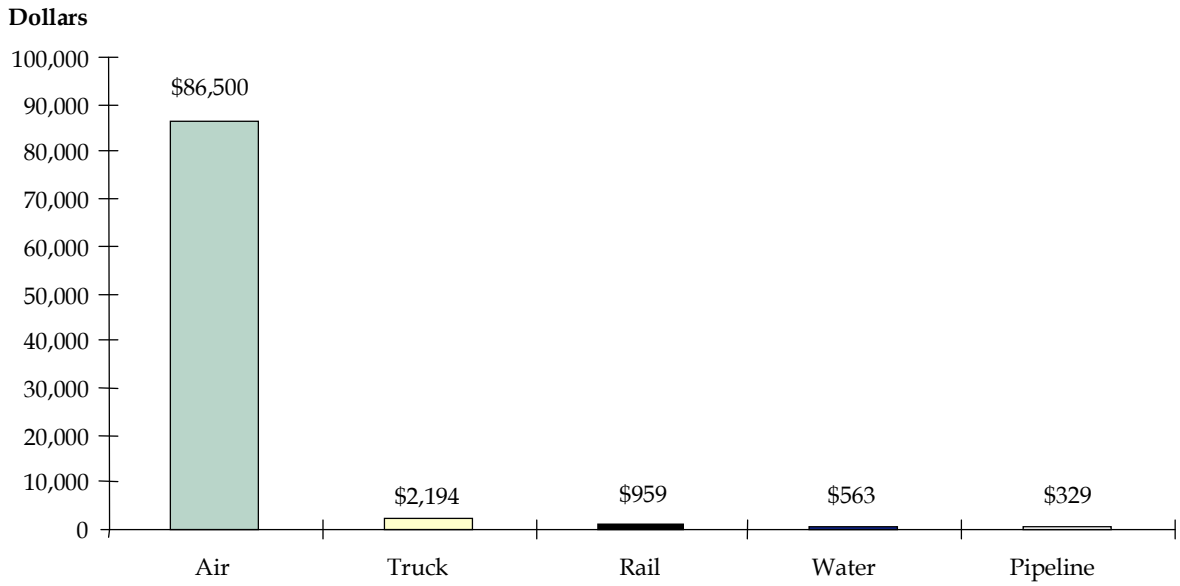
Although air freight accounts for less than 1 percent of domestic tonnage, it accounts for a disproportionately high percentage of the total value of goods. Freight transported by air dominates other modes on a value-per-ton basis as shown on Figure 2.16 and Figure 2.17.

Figure 2.16 Average Value Per Ton of Domestic U.S. Freight
2000



Source: Reebie Associates' TRANSEARCH and U.S. DOT Freight Analysis Framework Project.

Figure 2.17 Average Value Per Ton of U.S. International Freight
2001

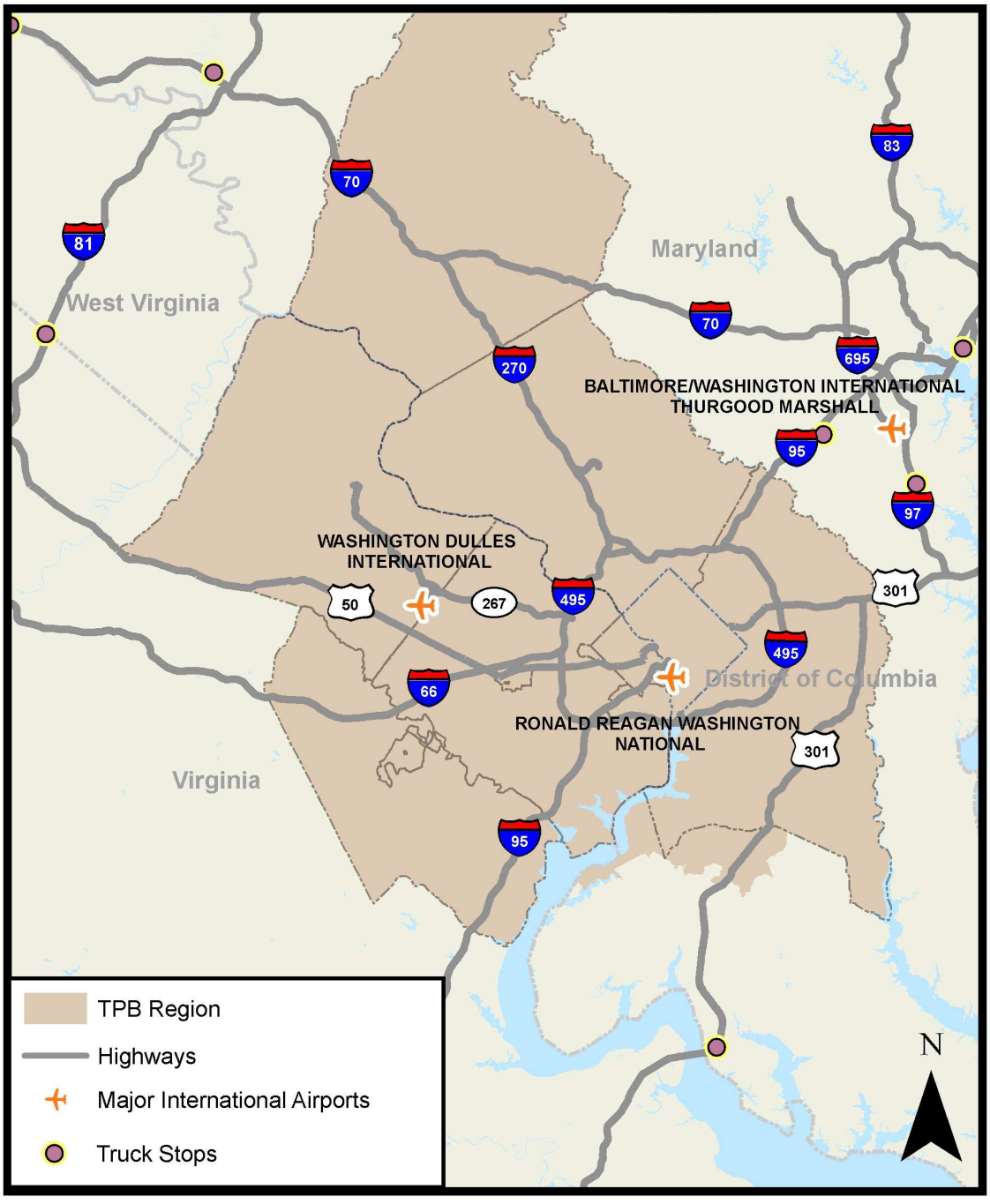


Source: U.S. DOT, Bureau of Transportation Statistics.

Compared to its modal counterparts, air transport offers the competitive advantage of speed in long-haul markets and flexibility, since cargo can be transported in commercial cargo holds, or the belly, of passenger airlines or on aircraft designed exclusively to carry freight. With freight traffic growing about 6 percent per year worldwide, according to Boeing World Freight Forecast, air cargo shipments offer a time-sensitive solution to high-value goods like computer components, pharmaceutical and medical supplies, and perishable commodities. Furthermore, changes in supply chain logistics have made shippers more reliant on air-freight express delivery services, such as United Parcel Service (UPS) and Federal Express (FedEx), to meet just-in-time deliveries.

The airports servicing the COG/TPB region include Baltimore/Washington International Thurgood Marshall Airport (BWI), located in Maryland, as well as Dulles International Airport (IAD) and Ronald Reagan Washington National Airport (DCA), both located in Virginia (see Figure 2.18). These airports compete for Mid-Atlantic air cargo market share, providing state-of-the-art warehouse and ramp facilities as well as other specialized services such as, refrigerated and heated areas to accommodate perishable items, foreign trade zone, bonded storage capabilities and United States Fish and Wildlife Service inspection.

Figure 2.18 Air Cargo Airports in the Washington Region



Source: National Transportation Atlas Database, Bureau of Transportation Statistics, U.S. Department of Transportation, 2006.

Baltimore/Washington International Thurgood Marshall Airport (BWI)

Ten cargo buildings provide 414,906 square feet of warehouse space at BWI and are located in three clusters. The airport's historic and forecasted air cargo growth is consistent with national trends as total BWI air cargo grew at an average rate of 5.9 percent annually between 1982 and 2002. Total BWI air cargo has grown at 4.4 percent annually since 1990. Domestic cargo grew at 5.8 percent and international cargo grew faster, at 11.6 percent. BWI's 2005 fourth quarter results show that the airport moved 261,198 metric tons of freight, of which 254,701 metric tons was domestic and 6,495 metric tons were international. These results include FedEx mail, which is reported as freight. FedEx accounts for more than two-thirds of all BWI air cargo movements, and is the single largest influence in determining how BWI serves the Maryland market. Overall, freight activity at BWI is heavily oriented to domestic cargo and to integrated carriers.

The airport's ground access is characterized by good highway connections and linkages to regional air cargo generators in Baltimore and Washington.

Dulles International Airport (IAD)

IAD handles more outbound air cargo than any other airport in the COG/TPB region and, according to the Bureau of Transportation Statistics, serves as one of top 20 international air cargo gateways in the United States. In the Washington region and beyond, the Dulles' position as an international air cargo hub is bolstered by its growing schedule of direct wide-belly international flights to Europe, South America, Asia, and Africa. This schedule, which makes Dulles among the top international passenger airports in the United States, also benefits the regional economy by providing time-sensitive transportation to the region's high-tech and information businesses and its consumers, which benefit from a variety of higher-value imported goods, including fresh flowers and fish.

Figure 2.19 Dulles Airport FedEx Facility

Source: Cambridge Systematics, Inc.

The airport has recently experienced strong cargo growth, especially international, despite lower mail shipments (much of which presumably shifted to BWI). According to IAD air traffic statistics, total mail shipments being handled at IAD have steadily declined since 1999, while other freight activities have grown at a rapid rate. Domestic freight shipments handled by IAD increased by 55 percent between 1990 and 2006. At the same time, International freight shipments at IAD increased by 388 percent. The IAD air cargo gateway is positioned in the technology-oriented Dulles Corridor and near the I-270 corridor, offering industries in these areas good access to international and domestic connections.

Ronald Reagan Washington National Airport (DCA)

DCA's share of the Washington, D.C. Metro Region's air cargo market is limited due to its size (860 acres) and capacity. Since 1990, the total amount of freight moved through DCA has declined by 82 percent. The most dramatic reduction in air cargo has been mail shipments, declining 98 percent since 1990. The recent BWI Air Cargo Study for MDOT found, through its interviews with air cargo shippers, that DCA is a good alternative for

domestic shipments that require same-day delivery due to its full schedule of early morning flights. Even with this preference by some shippers, DCA's air cargo market share continues to fall.

The greatest challenge facing COG/TPB member jurisdictions regarding air cargo is the ability to provide reliable ground access to meet the demands of high-value shippers. Highways serving all three airports will continue to see increased demand and declining performance as the region's population expands.

Highway

The highway system is the most important freight transportation infrastructure system serving Greater Washington. The region's highways accommodate more than 76 percent of freight by tonnage and 80 percent of freight by value inbound, outbound, and within the Washington Metropolitan Area. Based on analysis of truck count data from recent studies and from VDOT and MDOT, the region's Interstate Highways carry the greatest volumes of trucks and serve as the critical freight arteries, linking regional distribution centers to national and international freight centers. This section highlights the freight characteristics of the key highways of the Washington region, including connections to other United States regions, key trading partners, and truck volumes.

I-95

Interstate 95 runs north-south along the entire eastern seaboard of the United States, from Maine to Florida. In the COG/TPB region, the I-95 corridor is the region's transportation spine, connecting Baltimore, Maryland to Washington, D.C. and Washington, D.C. to Richmond, Virginia. The FAF data shows both Baltimore, Maryland and Richmond, Virginia as being significant trading partners with the Washington, D.C. Metro Region. It is likely a high percentage of the freight moving between these regions moves by truck on Interstate I-95. More importantly, I-95 serves as the "Main Street" for the most populous region of the United States, linking the urbanizing region from Hampton Roads to Boston. For much of its distance it is the only viable freight route connecting large cities (such as Washington and Richmond) The trucking community is increasingly concerned about the performance of I-95 and degrading reliability. Where possible, trucks choose parallel routes such as I-81 to avoid congestion and delays.

I-95 has been the focus of numerous studies, particularly in the context of freight planning. The I-95 Corridor Coalition is an alliance of transportation agencies, toll authorities, and related organizations. The coalition provides a forum for multistate/jurisdictional interagency cooperation and coordination. There are no major truck prohibitions on I-95 in the TPB region.

According to COG/TPB traffic volume projections, traffic volumes in the I-95 corridor will increase significantly by 2030. North of Washington, D.C., toward Baltimore, traffic volumes are projected to double. South of Washington, D.C. through Springfield, Virginia and further south, traffic volumes are projected to increase by over 200 percent.

I-495

Interstate 495, otherwise known as the Capital Beltway, is a circumferential highway encompassing Washington, D.C. and connecting a number of significant radial highways, including I-95, I-395, I-295, I-270, U.S. 50, and I-66. The most important portion of the Beltway for freight movement is the portion co-signed I-95/I-495 from Springfield, Virginia to Beltsville, Maryland via the Woodrow Wilson Bridge. This portion carries the highest truck volumes and connects major regional freight generators.

According to a 2004 study by the American Highway Users Alliance, Unclogging America's Arteries: Effective Relief for Highway Bottlenecks, two of the top 20 highway bottlenecks in the country are on I-495. The interchange between I-95 and I-270 was ranked 7th worst in the nation, with 19,429 hours of delay occurring annually. The I-95/I-495 interchange was ranked 15th worst, with 15,035 hours of delay occurring annually. There are no major truck prohibitions on I-495.

Traffic volumes on I-495 are projected to increase by a modest amount in 2030. Increases between 10 to 25 percent are forecasted, with certain areas seeing far higher traffic volumes. Roads connecting to I-495, including the I-95/I-495 interchange, are projected to see much higher increases in traffic volumes, sometimes higher than double the existing volumes.

I-395

Interstate 395 connects Downtown Washington, D.C. with the Virginia suburbs and the I-95 corridor. The route features one of the most heavily traveled high-occupancy vehicle (HOV) lanes in the country that provide two additional off-peak lanes and often accommodate long-distance trucks, especially those carrying refuse between the Northeast and landfills in Virginia. A truck restriction on I-395 does not allow trucks carrying hazardous material to enter the Third Street Tunnel, near the U.S. Capitol complex. I-395 is an important access route for retail deliveries and construction material for Washington, D.C. and the inner suburbs of Northern Virginia. Increasingly, with congestion on I-95, trucks use I-395 as an alternative route through the COG/TPB region.

I-66

Interstate 66 runs from Washington, D.C., west, toward Front Royal, Virginia. Trucks are restricted on all of I-66 within the I-495 Beltway. Nevertheless it is an important corridor to consider because of its connection to the Virginia Inland Port, a major inland intermodal facility, serving rail and trucks, located in Front Royal, Virginia. In 2030 traffic volumes are projected to increase by over 100 percent on I-66, particularly in sections outside of the beltway.

I-270 / I-70

Interstate I-270 runs north of Washington, D.C., through Maryland, where it joins I-70 at Frederick, Maryland. I-70 then continues north to Hagerstown, Maryland, a major freight generating cluster located just outside the Washington, D.C. Metro Region. There are a number of high-value, freight generating businesses located along this corridor in the TPB region. There are no major truck restrictions on I-270 or I-70 in the TPB region.

It is anticipated that the I-270 and I-70 corridors will see a significant change in traffic volumes by 2030. According to COG/TPB data, the Washington, D.C. suburbs will see a severe increase in traffic volumes. Portions of I-70, running between Baltimore and Frederick, Maryland, are projected to see traffic volumes increase by at least 100 percent. Heading north on I-70, toward Hagerstown, traffic volumes are projected to increase anywhere between 50 to 100 percent.

U.S. 50

U.S. Route 50 runs coast-to-coast between Ocean City, Maryland and West Sacramento, California. In the COG/TPB region U.S. 50/301 is a major freight corridor carrying traffic east from New York Avenue in Washington, D.C. to the eastern shore of Maryland.

In Washington, DC trucks are prohibited on U.S. 50 west of 15th St., NW and the Theodore Roosevelt Bridge. In Virginia, no trucks over eight tons are allowed on U.S. 50 from Fairfax Circle (at the Fairfax City/Fairfax County border) to Fort Myer Drive, and from Fort Myer Drive to the DC/VA border (at the west end of the Theodore Roosevelt Bridge).

U.S. 50 is expected to see significant growth in traffic volumes west of Washington, D.C. Areas around Dulles airport will likely see 50 to 100 percent growth in traffic, with areas west of the airport seeing even greater increases in traffic volumes. East of Washington, D.C., in the U.S. 50/301 corridor, modest growth in traffic is projected by 2030, but not nearly as much as west of the District.

U.S. 301

Running roughly parallel to U.S. 1 and I-95 for much of the East Coast, U.S. 301 is an important alternative route to I-95 for the Washington region. South of Fredericksburg, Virginia, U.S. 301 diverts east of I-95, crossing the Potomac River via the Governor Harry W. Nice Memorial Bridge near Dahlgren, Virginia and joining U.S. 50 near Bowie, Maryland.

U.S. 29

Connecting the Winston-Salem-Greensboro region of North Carolina to Washington, D.C and north to Baltimore, the U.S. 29 corridor is the principal north-south freight highway on the Virginia piedmont. U.S. 29 parallels I-81, but serves primarily as the freight connector between several important cities including Danville, Lynchburg, and Charlottesville and the Washington/Baltimore regions.

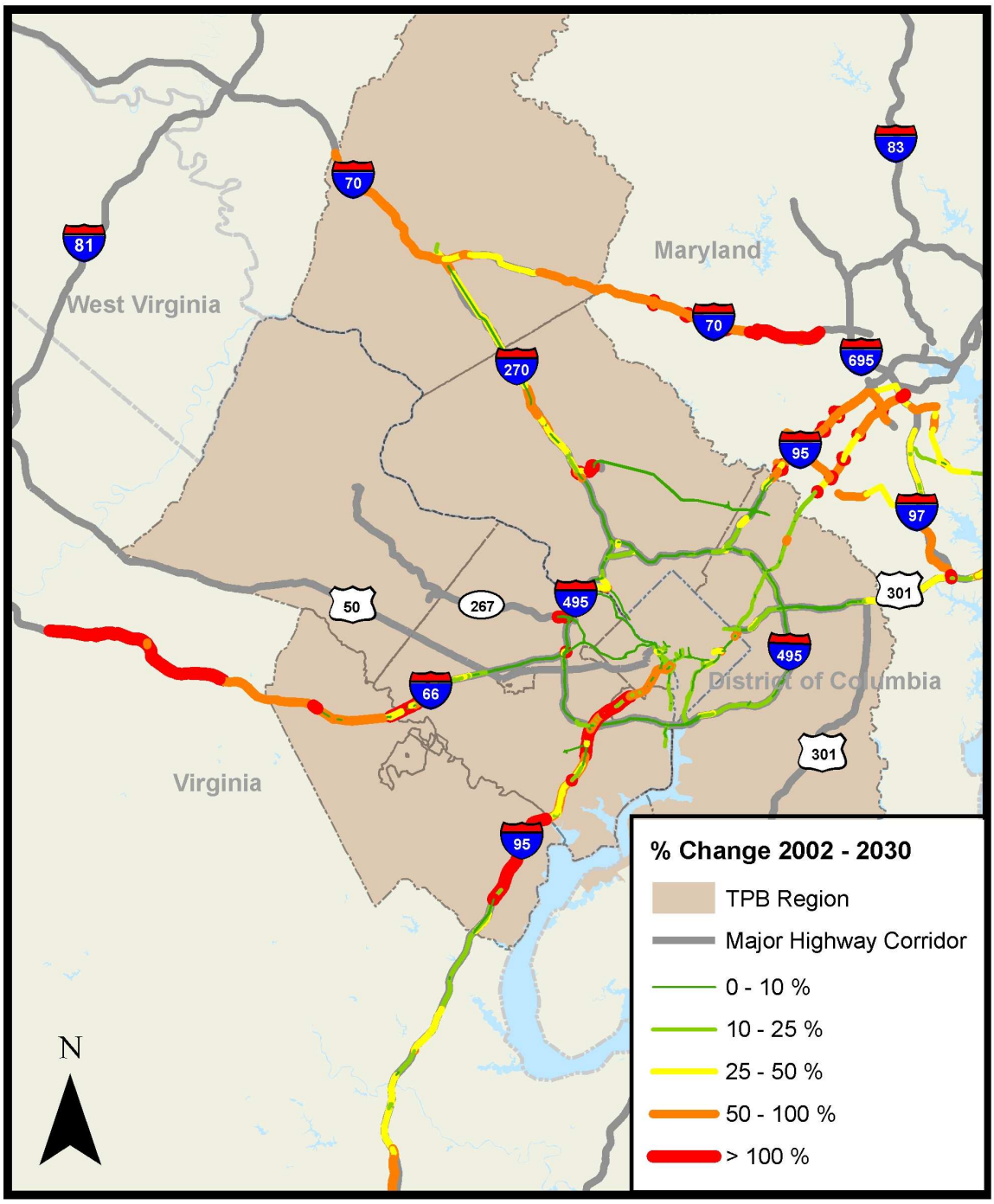
Projected Performance of Highway System in COG/TPB Region

Based on COG/TPB traffic models, congestion is expected to increase significantly in the COG/TPB region by 2030. Overall traffic volumes are projected to increase by 45 percent, from 2002 to 2030, with daily speeds dropping from 35 miles per hour to 29 miles per hour. Most of the increase in traffic volumes will occur in the suburbs of Maryland and Virginia. Heavy truck volumes are projected to increase by 38 percent from 2002 to 2030; medium truck volumes are projected to increase by 47 percent from 2002 to 2030; and the volume of through trucks is projected to increase by 14 percent from 2002 to 2030. The increase in traffic volumes, regardless of vehicle class, will certainly affect the movement of goods in the region.

Figure 2.20 Truck Traffic on I-95

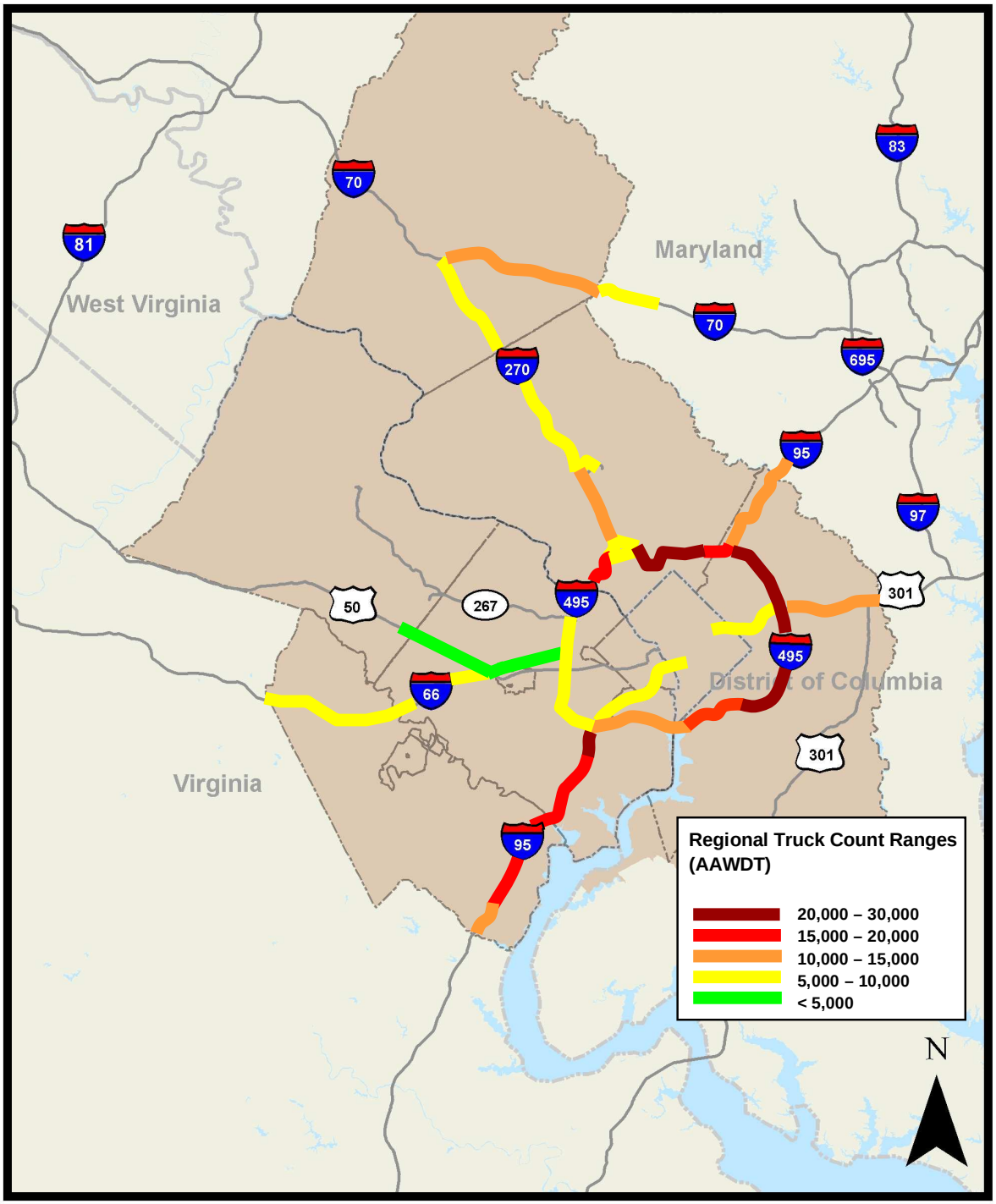
Source: Cambridge Systematics, Inc.

Figure 2.21 Estimated Regional Traffic Volumes



Source: COG/TPB

Figure 2.22 Estimated Regional Truck Counts



Source: Virginia Department of Transportations, Maryland Department of Transportation, District of Columbia Department of Transportation, COG/TPB.

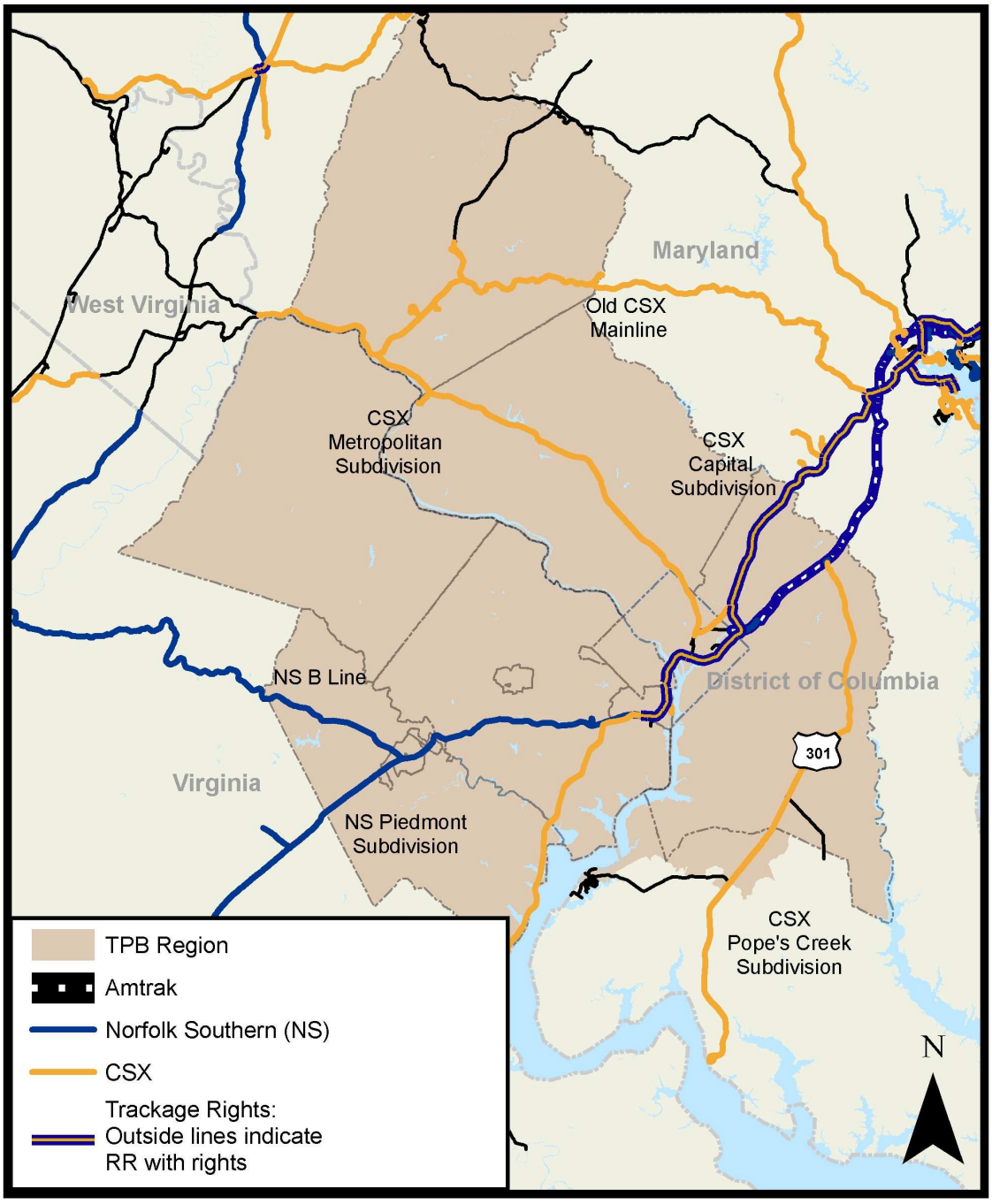
Rail

The freight-rail system in the COG/TPB region consists of main lines and branch lines owned and operated by three railroads; two Class I Railroads, Norfolk Southern (NS) and CSXT, and one passenger railroad, Amtrak. Most of the freight traffic traveling by rail in the COG/TPB region is overhead traffic, moving through the region, rather then originating or terminating in the region. Traffic typically moves north south along the capital subdivision or Richmond, Fredericksburg, and Potomac (RF&P) subdivision, paralleling I-95, east-west on the Metropolitan Subdivision, paralleling I-270, east-west on the B Line, paralleling I-66, or east-west on the Norfolk Southern Piedmont Subdivision.

CSXT

CSXT routes traffic through the COG/TPB region north-south along the RF&P Subdivision, running very near Interstate 95, and east-west, along the Metropolitan Subdivision, out to Point of Rock, Maryland and Harpers Ferry, West Virginia. CSXT's north-south corridor is part of a much larger corridor running the entire eastern seaboard, generally paralleling I-95. Interference between passenger and freight traffic is a persistent problem facing the northeast section of this corridor, between Boston, Massachusetts and Richmond, Virginia. Major CSX terminal locations are located in Baltimore, Maryland to the north, Cumberland, Maryland to the west, and Richmond, Virginia to the south of the COG/TPB region.

Figure 2.23 Washington, DC Region Trackage Rights and Ownership



Source: National Transportation Atlas Database, Bureau of Transportation Statistics, U.S. Department of Transportation, 2006.

Norfolk Southern (NS)

The majority of tracks owned by NS are located west of Washington, D.C. NS has trackage rights over the CSX and Amtrak-owned tracks running through Washington, D.C., but typically NS routes its traffic around Washington to avoid delay. NS does share a portion of its line with the Virginia Railway Express (VRE) commuter service on the Manassas line, but this interference is minimal compared to CSXT's conflict with commuter and intercity rail on the RF&P, Metropolitan Subdivision, and Capital Subdivision lines. Major NS terminals are located in Harrisburg, PA to the north and Linwood, North Carolina to the south of the COG/TPB region.

Figure 2.24 Shirley Industrial Park, Springfield, Virginia

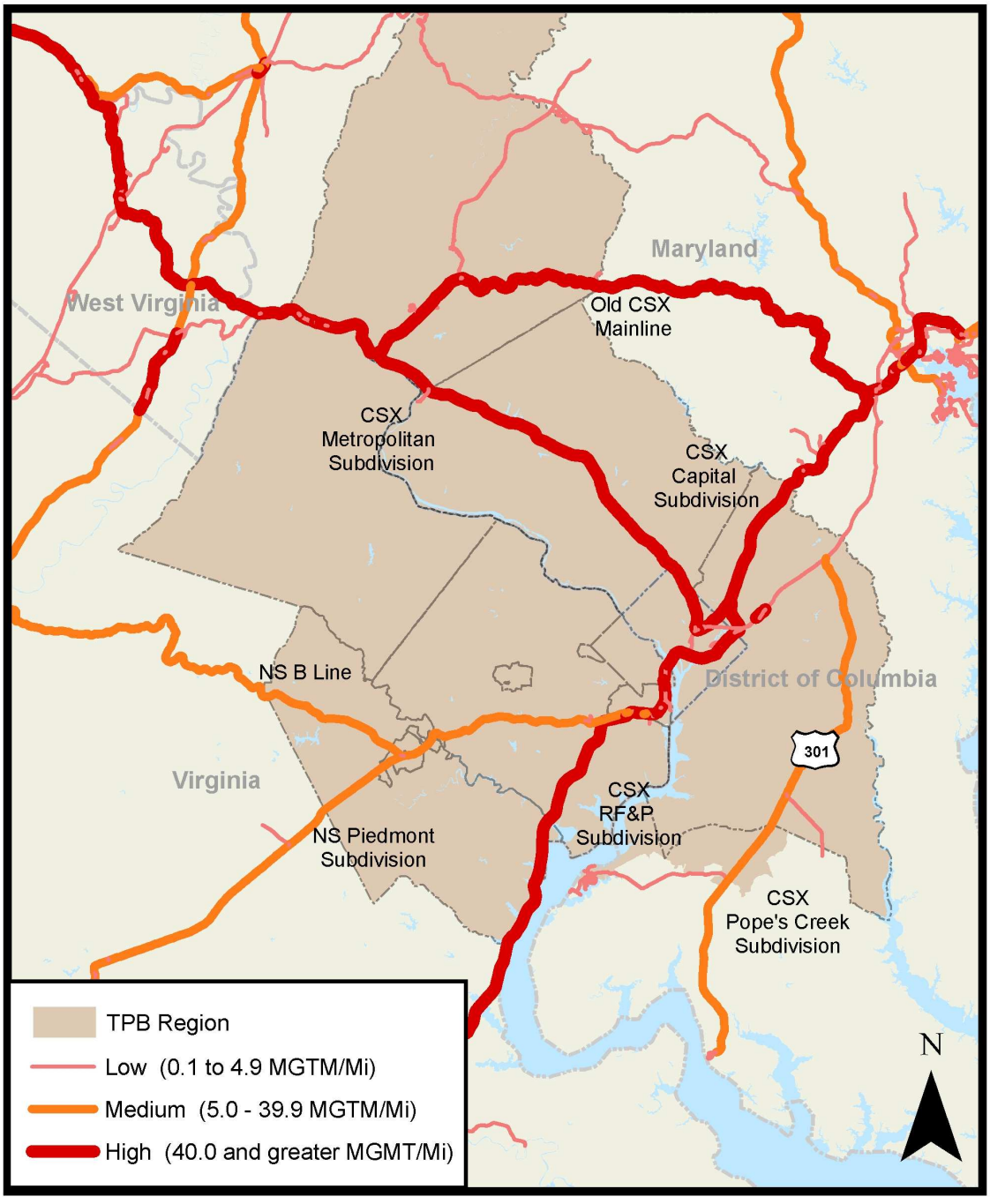
Source: Cambridge Systematics, Inc.

Rail System Performance

Significant congestion problems exist on rail lines located in the COG/TPB region. Rail congestion is not unique to the COG/TPB region, but it does have a significant affect on the movement of goods in the region. A study released by the I-95 coalition, the *Mid-Atlantic Rail Operations Study (*see Chapter 1 for study description*),* identified several chokepoints along the I-95 corridor. Identified chokepoints include the Virginia Avenue Tunnel, located in downtown Washington, D.C., where train clearance concerns prevent freight trains from being double-stacked. Additionally, the Long Bridge, crossing over the Potomac River, has inadequate track capacity. Passenger and freight traffic conflicts are prevalent in this section of the rail system.

The majority of traffic on the region's rail lines are on CSX's north-south and east-west lines. According to Federal Railroad Administration data, the I-95 rail corridor carries anywhere between 60 to 100 million gross ton-miles per mile (MGTM/mile) of goods. Areas near Harper's Ferry, West Virginia support the greatest volume of rail traffic, over 100 million gross ton-miles per mile. Figure 2.25 shows the density of rail traffic on the COG/TPB region's rail lines. Density is defined by million gross ton-miles per mile of goods. The areas of track with the most million gross ton-miles per mile of goods are considered to have the most density. Because rail is used primarily to transport heavy commodities, like coal and gravel, rail density provides an estimation of the most heavily used rail corridors in the region.

Figure 2.25 Washington, DC Region Rail Density



Source: National Transportation Atlas Database, Bureau of Transportation Statistics, U.S. Department of Transportation, 2006.

Water

There are very few local ports in the region handling freight. Major ports near the Washington, D.C. Region include the Port of Baltimore, to the north, and the Port of Hampton Roads/Norfolk, to the south. Within the Washington, D.C. Metro Region a small amount of freight utilizes small ports on the Anacostia River, primarily gravel, printed materials, and some alcoholic beverages.

Pipeline

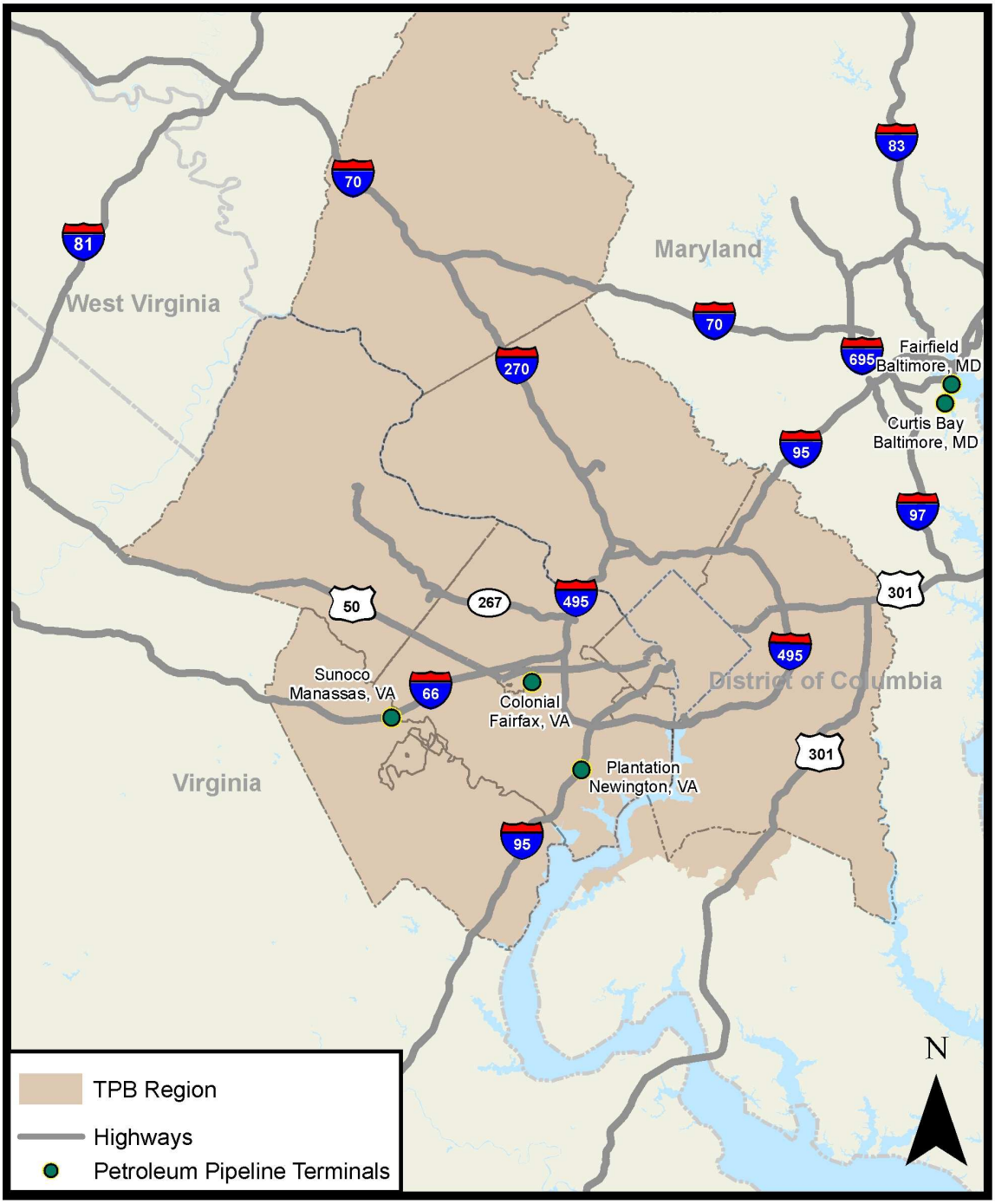
Five major petroleum pipeline terminals operate in the Washington, D.C. Metro Region. Three are located in Virginia: Plantation Pipeline Terminal in Newington, Virginia; Sunoco Pipeline Terminal in Manassas, Virginia; and Colonial Pipeline Terminal in Fairfax, Virginia. Two additional pipeline terminals are located in Baltimore, Maryland, the Fairfield Terminal and the Curtis Bay Terminal.

Petroleum products moving through the region's pipelines move extremely slow compared to other products being transported in the region. Typically petroleum products move between three to five miles per hour, with speeds reaching their peak when there is a large volume of material being transported. According to Colonial Pipeline, it typically takes anywhere between 14 to 24 days for a batch of petroleum products to move from Houston, TX to New York Harbor.

Figure 2.26 Newington Terminal, Newington, Virginia

Source: Cambridge Systematics, Inc.

Figure 2.27 Washington DC Region Petroleum Pipeline Terminals

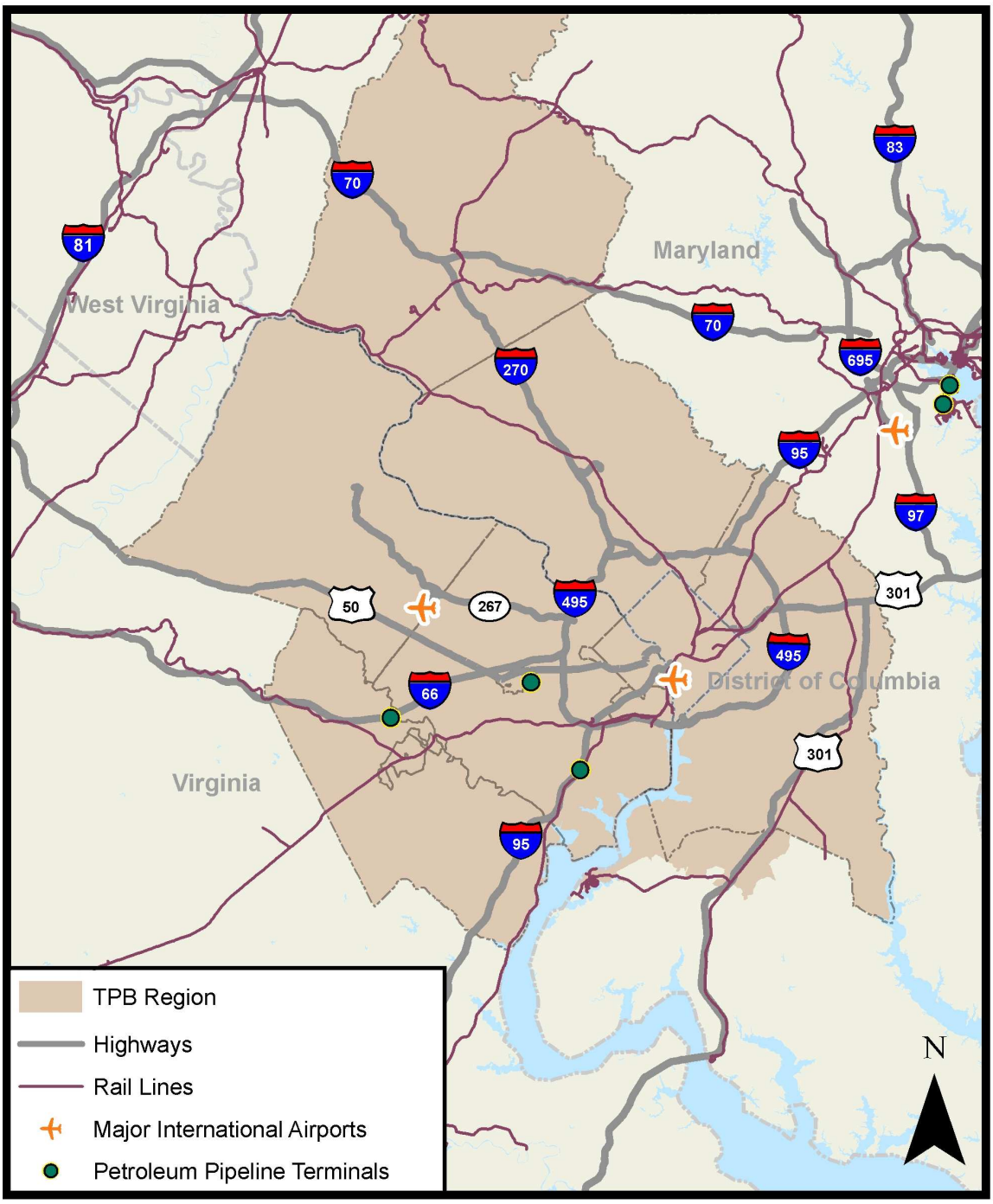


Source: COG/TPB.

2.4 Freight Facilities Map

The following map, prepared for this project, reflects each of the aforementioned systems and consolidates them into a single map. The importance of the map is to demonstrate the importance and extent of the region's multimodal freight system.

Figure 2.28 Washington Regional Freight Transportation System



Source: National Transportation Atlas Database, Bureau of Transportation Statistics, U.S. Department of Transportation, 2006 and COG/TPB.

2.5 Regional Freight Generators

While the freight infrastructure system carries goods moved in the region, freight generators – including distribution centers and manufacturing centers – accommodate the freight in a different way, through transfer, repackaging, intermodal exchange, and other activities. Collectively, the region's freight generators are powerful drivers of freight traffic demand and are often located near major freight infrastructure facilities. In order to highlight the characteristics of freight generators, this section discusses them at two levels, the facility level and the cluster level.

Freight Facility Inventory

Freight facilities are individual sites, terminals, and buildings that generate freight transportation activity. Through this study, COG/TPB will receive a database of nearly 400 regional freight facilities to form an initial freight facilities inventory and map. The facility list was developed from various sources, including:

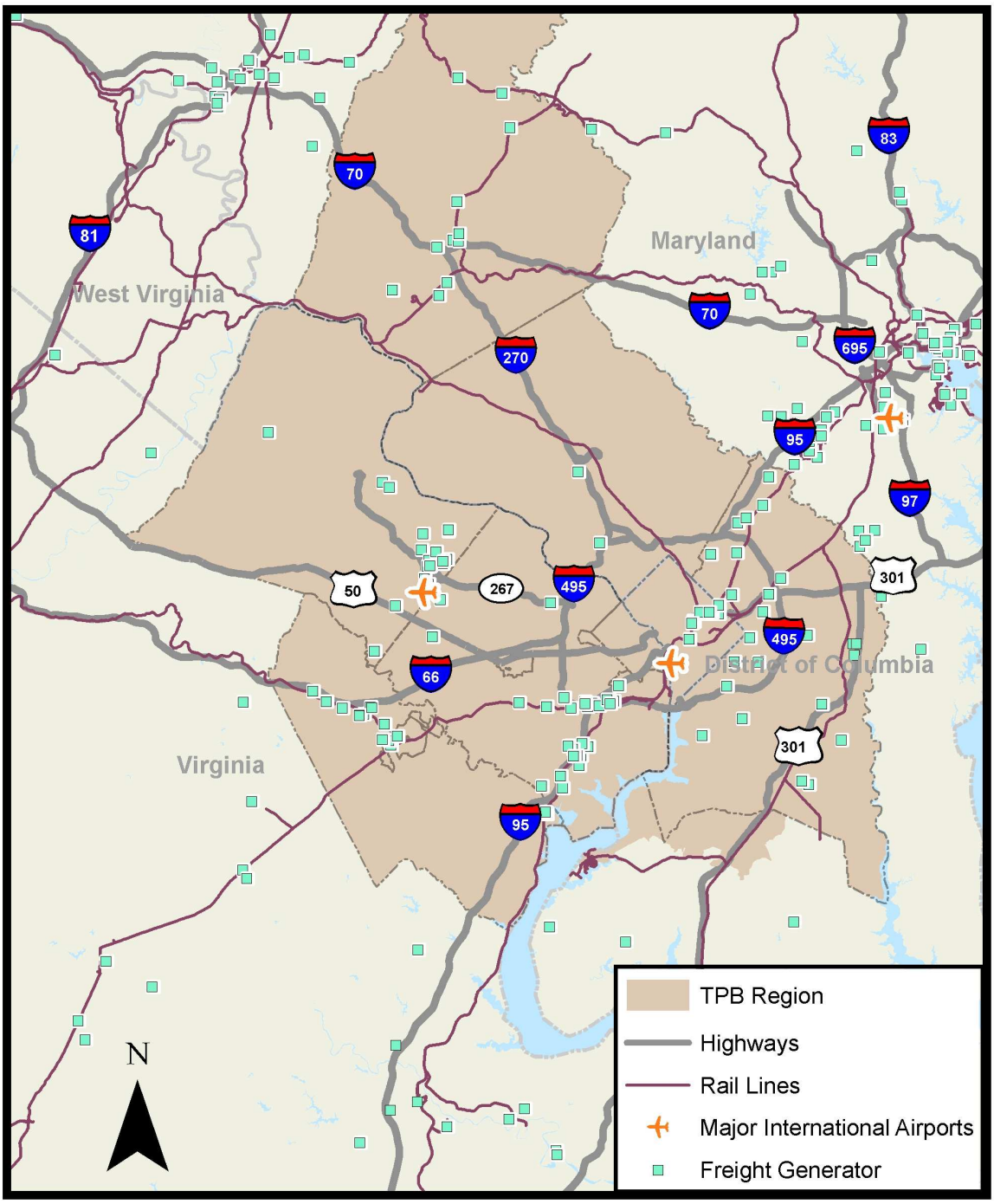
- The Bureau of Transportation Statistics' Intermodal Terminals Database;
- Lists of mining and mineral operations provided by the Minerals Information Team, U.S. Geological Survey;
- A listing of petroleum pipeline terminals from COG/TPB staff;
- The recent Motor Carrier Threat Assessment Study conducted for DDOT by the Volpe Transportation Center;
- Lists of major warehouse and manufacturing facilities from local and state economic development agencies;
- Facilities from railroad and trucking company web sites; and
- Field reconnaissance.

During the course of gathering this information, the project team collected a large number of potential freight facilities but distilled the entire list into a smaller set of freight facilities based on the type of facility, the number of employees, the modes, and the industries using the facility. The result is a initial freight facilities inventory that should serve COG/TPB staff in subsequent freight planning activities and in the development of a more refined inventory in the future.

Figure 2.29 Safeway Distribution Center, Upper Marlboro, Maryland

Source: COG/TPB

Figure 2.30 Washington, DC Region Freight Facilities

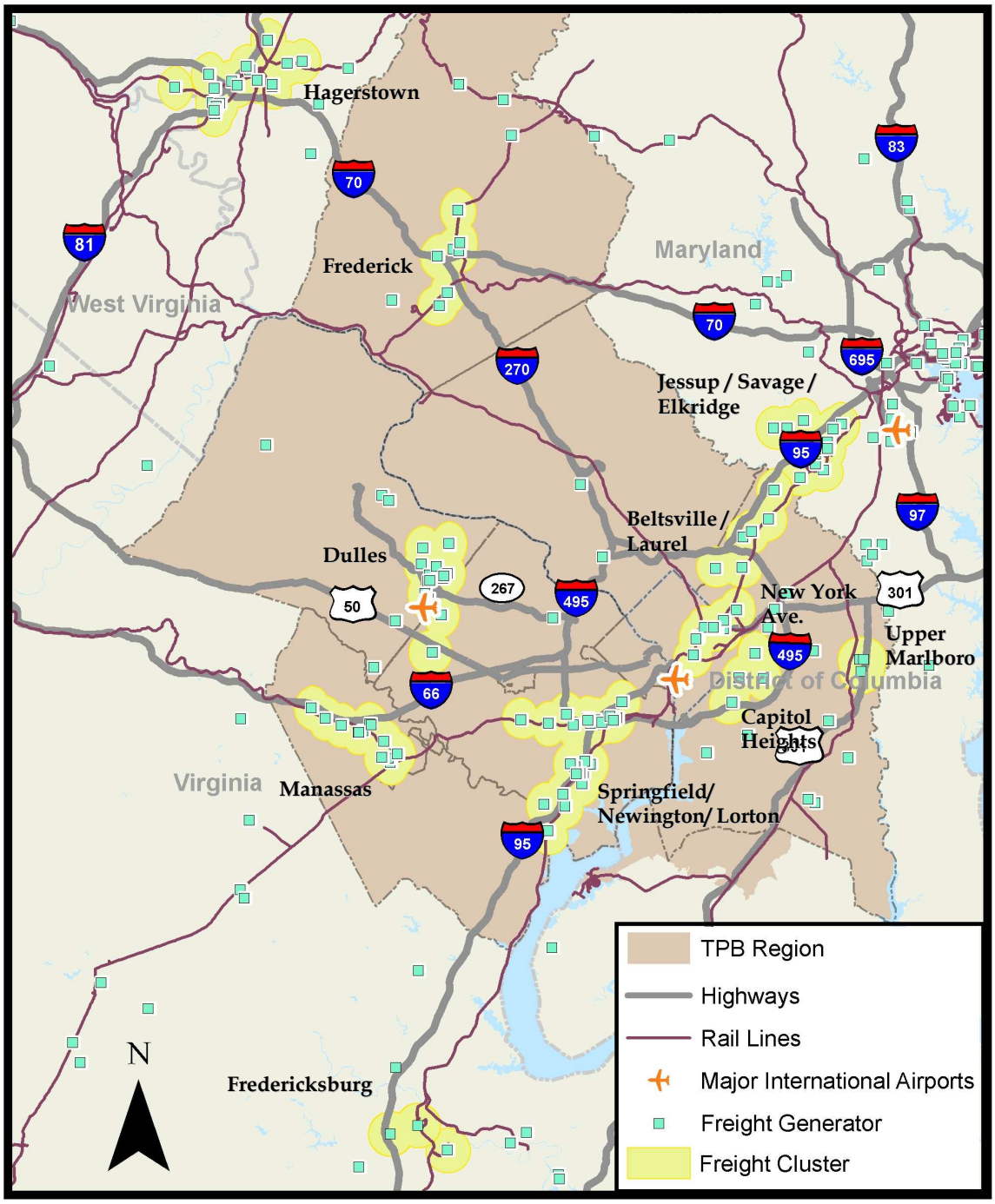


Source: BTS, COG/TPB, MD Dept. of Business and Economic Development, Fairfax County Economic Development Authority, Hagerstown-Washington County Economic Development Commission, Prince George's County Economic Development Corporation, Howard County Economic Development Authority, Prince William County Dept. of Economic Development.

Regional Freight Clusters

The second level of analysis of freight facilities is at a cluster level, where numerous freight generating land uses are grouped in close proximity, usually near major transportation facilities. These clusters express a general snapshot of the current freight-related land use in the region and highlight how freight-related land use and transportation facilities relate to one another. This section offers a brief overview of major freight clusters in this region by jurisdiction. This overview and accompanying map represent a the first attempt to identify and classify major freight clusters observable from publicly available data and would benefit from additional refinement.

Figure 2.31 Washington, D.C. Region Freight Clusters



Source: BTS, COG/TPB, MD Dept. of Business and Economic Development, Fairfax County Economic Development Authority, Hagerstown-Washington County Economic Development Commission, Prince George's County Economic Development Corporation, Howard County Economic Development Authority, Prince William County Dept. of Economic Development.

Washington, D.C.

New York Avenue Cluster. New York Avenue is the main highway freight route into and out of the District of Columbia. The D.C. Motor Carrier Management and Threat Assessment Truck Study (2004) notes that there is very little through truck movement in D.C. Major distribution facilities serving businesses in the District are located outside of the city, in the suburbs of Maryland and Virginia. Goods are typically transported by large trucks to transfer facilities in the vicinity of New York Avenue, where the they are loaded onto smaller trucks, box trucks and step vans, and prepared for distribution to the District's local businesses.

Businesses located along this corridor include food, beverage, and linen distributors. These distributors make multiple trips per day to serve customers in the city. The Washington Times newspaper's headquarter and printing facility is located at the Maryland/Washington, D.C. border on New York Avenue. Central sorting facilities for parcel delivery operations and waste management facilities are also located in this corridor.

Virginia

Springfield/Lorton/Newington Cluster. Multiple transportation routes converge in Springfield, Virginia and the area is a prime location for a multitude of freight-related facilities. Three Interstate Highways, I-395, I-495, I-95 come together at the Springfield Interchange and a Norfolk Southern rail line, serving both commuter and freight traffic, runs east-west through Springfield. The Shirley Industrial Park, located just inside the I-495 beltway, and served by a rail spur, has a number of freight generating companies located within it, including Virginia Concrete, Southern Iron Works, Office Movers, Canon, and Stevenson Printing. In Newington, a concentration of warehouses, flex industrial space, and a major petroleum pipeline terminal generate significant truck traffic.

Dulles Airport Cluster. Within the airport grounds there are six air cargo facilities, served by companies, including UPS, Air Cargo, Inc., Fritz Companies, Cargo Service Center, FedEx, Masterpiece International, and numerous airlines. Outside of the immediate airport facilities, there are warehouse, trucking, freight forwarding, and distribution service companies. The region is well served by highways. U.S. 50 runs just outside the airport and connects with I-66 and I-495.

Manassas Cluster. Manassas is located just off of I-66 and I-95 and a major Norfolk Southern rail line, serving both commuter and freight traffic. Several high-tech manufacturing companies are located in Manassas, including, Micron Technology, a state-of-the-art semiconductor manufacturing facility, BAE Systems, a manufacturer of radiation-hardened microprocessors, and Mediatech, Inc., a manufacturer of life science products. Food distribution facilities are also present including, U.S. Foodservice, Inc., McLane Food Service Distribution, and Martin-Brower Company. Payne Publishing

produces printed materials. Aerojet Arban & Carosi, Inc. manufacturers concrete. Universal Dynamics, Inc., Provides manufacturing of dryers, material handling systems and auxiliary equipment for the plastic industry. Atlantic Coast Cotton, Inc., provides distribution of imprintable sportswear.

Fredericksburg Cluster. An emerging center for warehousing and distribution serving the Washington, D.C. metropolitan region, the City of Fredericksburg and surrounding Stafford and Spotsylvania Counties have recently attracted several large retailers, including CVS and McLane.

Maryland

Jessup/Elkridge/Savage Cluster. Jessup, Elkridge, and Savage, Maryland are located directly between Washington, D.C. and Baltimore, Maryland, just off of I-95. Although these cities are outside of the COG/TPB boundaries, the area is significant to the Washington, D.C. Metro Region because of its intensive freight generating industries. The Maryland Food Center Authority is a public, state authority that manages a 400-acre site, in Jessup, Maryland, dedicated to the distribution of food products. Businesses situated on-site include Giant Food, SYSCO Food Services, T.A. Baltimore South, Merchants Terminal, BTS Distribution Centers, Terminal Corporation and the Maryland Wholesale Produce and Seafood Markets. According to the Authority, "virtually every category of fruit, vegetables, and seafood are processed, packaged, and distributed through the Maryland Food Center into the Mid-Atlantic region."

Although the food industry dominates the area, other freight-related businesses are clustered nearby. Trucking, transportation, and warehousing centers are located in the Jessup/Elkridge/Savage region, including the Jessup Auto Terminal, an intermodal automobile transfer site, where newly manufactured automobiles are transferred from train to truck for distribution.

Beltsville/Laurel Cluster. Beltsville and Laurel are located just south of the Jessup, Elkridge, and Savage, along the I-95 corridor and the capital subdivision rail line. Freight generators, similar to those in Jessup and Maryland, are located in this corridor. One major freight generator is Dreyer's Grand Ice Cream, located in Laurel, Maryland.

Capitol Heights Cluster. Capitol Heights is located just inside the I-495 Beltway, near U.S. 50 and I-295, adjacent to Southeast D.C. PepsiCo Company is located nearby in Forestville, Maryland and a major U.S. Postal sorting facility is located directly in Capitol Heights.

Upper Marlboro Cluster. This cluster is located on U.S. 301 south of the Beltway near Upper Marlboro, Maryland in Prince George's County. The cluster is characterized by several large distribution facilities including a regional Safeway grocery warehouse.

Frederick Cluster. Frederick is located at the junction of I-270, I-70 and U.S. 15. High-tech defense and biomedical industries are prevalent in this area, but there are also more traditional freight generating businesses, including Structural Systems, a manufacturer of

prefabricated paneling and interior materials and Toys "R" Us warehouse/distribution facility.

Hagerstown Cluster. Hagerstown is a located off of I-270, just north of Frederick, Maryland on the Pennsylvania/Maryland border. Both Norfolk Southern and CSX serve the area. Like the Jessup/Savage/Elkridge, this cluster is not located directly in the COG/TPB region, but is nearby and generates a significant amount of freight into the Washington region. Industries located in the Hagerstown area include Volvo Power train North America, Staples Distribution Center, FedEx Ground, UPS, and Good Humor-Breyers Ice Cream, Inc.

2.6 Safety and Freight Movement in the Region

The previous sections have provided an overview of the current freight conditions and characteristics in the Washington region, including the infrastructure, the commodities, and the freight generators. Another important aspect of this profile, especially given the emphasis in SAFETEA-LU, is the consideration of freight transportation safety in the Washington region. Safety is a critical component of regional long-range transportation planning under Federal SAFETEA-LU requirements. The topic is complex with a diversity of stakeholders involved, and must be addressed at all levels of government, Federal, state, regional, and local, as appropriate. The ongoing freight planning activity for metropolitan Washington should take safety issues into account, focusing on those aspects of safety that especially lend themselves to being addressed at a metropolitan level.

Truck Safety

Truck safety has been discussed over time at COG and TPB, notably recently at a 2003 COG Regional Safety Forum and the ad hoc Truck Safety Task Force that supported planning for this event (in concert with a Virginia statewide Truck Safety Task Force). The Truck Safety Task Force was formed in response to a request from United States Congressman Frank R. Wolf to address issues of truck safety relevant to the Washington Metropolitan Area and its local jurisdictions. The Task Force worked throughout 2003, and its findings were presented at the November 20, 2003 forum. These findings provide important input to the upcoming freight planning activities.

At the forum, truck safety was identified as a public safety concern in the region, with 166 of the traffic fatalities in 2002 in Virginia, Maryland and the District of Columbia involving large vehicles. Nationwide 12% of fatal crashes involved trucks and buses. Most crashes involving trucks happened on weekdays between 7 a.m. and 5 p.m. High crash locations were generally found near exit ramps.

A number of issues were identified in the forum, which will inform the ongoing regional freight planning activities.

- **Motor Carrier Inspection and Enforcement**. Inspections address a number of issues, including both vehicle safety issues (such as bad brakes) and driver issues (such as limits on hours of service). Resources for inspections are limited, and tend to be on major roadways where most trucks are, causing concerns for secondary roadways. There was also a stated need for better information sharing among involved agencies, for certification, training, and funding of local agencies carrying out motor carrier safety activities, and for expanded implementation of enforcement technology.

- **Driver Licensing.** Issues included standardization of Commercial Drivers License (CDL) programs to include reviews of training, conviction records and testing, better information sharing between law enforcement agencies, especially regarding chronic offenders, and need for certification, training and funding of local agencies carrying out motor carrier safety activities.

- **Technology and Engineering**. Numerous promising technologies were identified, including various automated vehicle control mechanisms designed to prevent crashes, automated inspection and enforcement technologies, weather and traveler-information aids to truck drivers, safety warning systems for truck drivers and dispatchers, advanced weigh-in-motion systems, and roadway-based changes meant to improve safety. Also, though not a focus of the 2003 forum, safety-oriented civil engineering and traffic engineering solutions are of interest.

- **Motorist Education.** A large percentage of drivers, especially automobile drivers, do not appropriately share the road with big trucks. Issues included basic information as the stopping distance trucks need, the blind zones around large rigs ("no zone"), or the space required to make turns. A number of organizations were identified that could assist with the education of truck drivers and motorists, as well as mass media to reach automobile drivers. A public education campaign would require both significant funding and regional cooperation.

Additionally, it has been proposed that TPB form a Transportation Safety Subcommittee, in part to advise development of the Federally required safety component of the regional long-range transportation plan. It will be important to provide opportunities for information sharing and collaboration between the freight planning and safety planning efforts and committees.

Rail Safety

Rail safety is another goods movement safety consideration that is important to the Washington region. Nationally, the most important rail safety issue is related to grade crossing safety. In the Washington region, most of the freight-rail facilities are grade-separated, which is the single most important way of mitigating auto or pedestrian accidents. Overall, the region has below-average grade-crossing accidents because of the

high number of grade-separated track miles. In the COG/TPB region, state-administered programs are dedicated to mitigating unsafe crossings and organizations such as Operation Lifesaver actively educate the public and work toward solutions to high accident locations.

The other important aspect of rail safety is related to derailments, especially of hazardous materials. In this area, rail has a very good national safety record, especially relative to trucks. Still, derailments occasionally require evacuations, such as those resulting from the CSXT Howard Street Tunnel incident in Baltimore in 2001. Emergency responders from jurisdictions along regional rail lines have plans in place to mitigate injuries resulting from hazardous materials spills, especially those of toxic inhalants (TIH). Recently the NCPC/DDOT Rail Realignment Feasibility Study addressed rail safety related to hazardous materials and highlighted the need for continued coordination with the railroads and local responders.

2.7 Freight Security Considerations

The terrorist attacks of September 11, 2001 elevated the issue of transportation security to the forefront of planning efforts by public agencies and private freight carriers. Along with safety, the latest U.S. surface transportation bill—SAFETEA-LU—requires states and metropolitan areas to consider transportation security requirements in their planning processes and chief planning documents. There are many components to transportation security, including driver credentials, vehicle security, and infrastructure security for both private (freight railroads) and public (highways) owned facilities. While transportation infrastructure is vulnerable to attack, one of the most potentially dangerous scenarios involves a deliberate spill of hazardous materials—especially toxic inhalants (TIH) carried by truck or train. It should be emphasized that TIH shipments comprise a very small share of the hazmat shipments and that hazardous materials altogether are a relatively small proportion of total freight tonnage. Despite the potential risks associated with hazardous materials transportation, the Washington metropolitan region consumes many types of substances classified as hazardous materials, including gasoline products and chlorine, which is a toxic inhalant, and is used to purify drinking water.

Overall, trucks carry more hazardous materials (nationally around 52 percent of tonnage) versus rail (5 percent) with most of the remaining share on waterborne vessel and pipeline (10 percent and 32 percent, respectively)[1]. For the Washington region it is difficult to account for the exact share of hazardous material shipments, especially toxic inhalants. The FAF indicates that the total share of chemical substances is about 1 percent of inbound, outbound, and internal tonnage in the Washington region (excludes through).

[1] Bureau of Transportation Statistics. National Transportation Statistics. U.S. Hazardous Materials Shipments by Transportation Mode, 2002.

Recent COG/TPB truck count studies show that 1 to 6 percent of trucks display hazardous materials placards, only a fraction of which are TIHs.

Given the symbolic importance of the national capital region and its institutions, transportation security has become an increasingly important consideration in transportation planning activities following the terrorist attacks of September 11, 2001. In the Washington, DC region, the potential threat posed by hazardous materials shipments continues to generate debate and study on the appropriate actions to mitigate the catastrophe that would occur with a hazmat release in a dense urban environment. Local jurisdictions, including DDOT and NCPC both recently studied hazardous materials transportation issues through two major studies. In the first study, the District Department of Transportation commissioned the Volpe National Transportation Systems Center to conduct the Washington, DC Motor Carrier Management and Threat Assessment (2004). The report recommended several general actions that would positively influence the security of hazardous materials, including better communication of truck routes to drivers, tracking of truck activity, and a long-range plan for freight movement. The second study, also sponsored by DDOT but jointly managed by the National Capital Planning Commission (NCPC), addressed the feasibility to relocate existing freight rail lines-tracks that carry hazardous materials through the monumental core of Washington—to more secure alignments that mitigate exposure to deliberate or accidental rail accident. The study identified the threat of a chemical release of chlorine gas, the most common TIH carried by rail. As mentioned in Section 1 of this report, the District of Columbia and CSXT are currently awaiting appeals court action on the DC law that prohibits through shipments of ultra hazardous materials by truck or by rail within 2.2 miles of the U.S. Capitol without a special permit.

Moving forward, there may be continuing regional discussions on hazardous materials shipment.

3.0 Recommendations on Future Activities and Committee Approach to Freight Planning

3.1 Introduction

The last two Federal surface transportation bills, the Transportation Equity Act for the 21st Century (TEA-21) and the Safe, Accountable Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), highlighted the importance of goods movement to the United States economy. Both acts encouraged states and metropolitan areas to engage in freight planning activities to facilitate the safe and efficient movement of goods. State departments of transportation and metropolitan planning organizations (MPOs) have responded by dedicating new resources – both staff and funding – to raise the profile of freight planning through specific activities such as the formation of freight stakeholder committees and/or freight planning studies, plans, and initiatives. Before this push to formalize and elevate freight within transportation organizations, states and MPOs – especially those with large freight generators such as major ports, manufacturing clusters, or warehousing and distribution centers – engaged in various freight-related activities on a less formal basis.

The National Capital Region Transportation Planning Board (TPB) of the Metropolitan Washington Council of Governments serves as the Metropolitan Planning Organization (MPO) for the Washington, D.C. region and has responsibility for addressing freight planning in the regional transportation planning process. To date, the Committee with the most activities related to freight has been the Transportation Planning Board Technical Committee. The TPB Technical Committee provides technical resources to the TPB during the decision-making process and has a number of Subcommittees that inform the TPB Technical Committee on special topics, including aviation, bicycle/pedestrian, travel forecasting, transportation scenarios, and travel management. The TPB process has included freight planning functions in the context of travel demand modeling for trucks, through its regional management and operations activities (MOITS), and through participation in regional freight-oriented studies.

Given the dedicated freight funding in COG/TPB's draft Fiscal Year (FY) 2008 Unified Planning Work Program (UPWP), and the Federal requirements for freight planning formalization, this chapter outlines preliminary recommendations to COG/TPB on the organization of its freight plan. The chapter commences with a series of case studies of freight planning organization and committee structure in other similar MPOs and progresses to recommendations specific to COG/TPB.

3.2 MPO Freight Structure Case Studies

Cambridge Systematics conducted a scan of MPO freight planning programs, focusing specifically on the position of freight advisory committees or task forces within the MPOs. MPOs were chosen based on a similar population size, geographic size, or freight profile as COG/TPB. For example, the Southeast Michigan Council of Governments (SEMCOG) and the Delaware Valley Regional Planning Commission (DVRPC) were chosen for their similar population and geographic size, while the Mecklenburg-Union Metropolitan Planning Organization (MUMPO) and METROPLAN ORLANDO were chosen because of their similar freight profile to COG/TPB, both are located inland of a major port and both have service driven economies.

Results reveal that the majority of freight planning programs work in concert and receive direction from a governing body. And, while internal MPO staff and hired consultants conduct the technical functions, it is the governing body that helps to shepherd freight plans and strategies within the MPO. Table 3.1 summarizes the results of this scan and the rest of this section presents the findings for individual MPOs.

Table 3.1 Comparison of MPO Freight Program Structures

		Staffing	Committee Structure		
Metro Area	MPO	Points of Contact	Freight-Dedicated Committee, Subcommittee or Task Force	Freight Covered by Existing Committees or Subcommittees	Committee Meeting Frequency
Atlanta	Atlanta Regional Commission (ARC)	1	●		Quarterly
Baltimore	Baltimore Metropolitan Council (BMC)	1	●		Quarterly
Chicago	Chicago Area Transportation Study (CATS)	1	●		Ad hoc, 3 to 4 times per year
Charlotte	The Mecklenburg-Union Metropolitan Planning Organization (MUMPO)	Unknown		●	N/A
Dallas-Fort Worth	North Central Texas Council of Governments (NCTCOG)	2	●		Ad hoc, 3 to 4 times per year
Detroit	Southeast Michigan Council of Governments (SEMCOG)	Unknown	●		Ad hoc, 3 to 4 times per year
New York City	New York Metropolitan Planning Council (NYMTC)	2	●		Monthly
Orlando	METROPLAN Orlando	1	●		Unknown
Philadelphia	Delaware Valley Regional Planning Commission (DVRPC)- Philadelphia Metropolitan Area	1	●		Quarterly
San Francisco	Metropolitan Transportation Commission (MTC)	1		●	N/A
Seattle	Puget Sound Regional Council (PSRC)	2	●		Bimonthly

Atlanta Regional Commission (ARC) – Atlanta, Georgia

The Freight Advisory Task Force (FATF) is fully incorporated in the ARC freight planning program and initiatives given the Atlanta region's position as a hub for goods movement and freight distribution. With quarterly meetings, membership includes both public and private freight representatives from the railroad, trucking, and aviation industries as well as chambers of commerce and community improvement districts. The Task Force's Goals and Objectives are shown in Table 3.2.

Table 3.2 ARC Freight Advisory Task Force Goals and Objectives

Goals	Objectives
• Improve goods and services movement in the region. • Improve reliability of goods movement. • Minimize the cost of goods movement. • Improve characteristics of transportation system for freight movement.	• Provide input on policies and improvements for freight mobility. • Identify freight mobility characteristics and needs. • Highlight the significance of freight to the region. • Improve safety of the transportation system. • Prioritize freight transportation needs and investments.

Baltimore Metropolitan Council (BMC)

Similar to COG/TPB, a number of BMC committees and advisory groups focus on specific freight-related technical and policy areas and report to the Baltimore Regional Transportation Board. However, BMC maintains a permanent advisory group, the Freight Movement Task Force (FMTF), to support the regional transportation planning process by representing interests of the freight community across all modes (truck, rail, air, and waterway). The FMTF meets quarterly with leadership provided by both the private and public sector. FMTF's focus areas include: improving communications among public and private sector freight stakeholders; identifying short-term impediments to and recommending improvements for the efficient, effective, environmentally sensitive, and safe movement of freight; and providing input into the allocation of long-term transportation resources for freight. The FMTF is an active advisory group. Recently the FMTF released a truck parking study (see chapter 1). They are beginning work on a freight profile.

Chicago Area Transportation Study (CATS)

The Intermodal Advisory Task Force (IATF) is composed of both private and public sector members who discuss freight interests as well as issues related to planning, operations, governance, and technology. The IATF also has a subcommittee on research and planning. The IATF mission is:

- To identify, assess and respond to issues and opportunities affecting intermodal transportation facilities and resources and the intermodal movement of goods;

- To pursue the spirit and the letter of the Intermodal Surface Transportation Efficiency Act (ISTEA) and the Transportation Equity Act for the 21st Century (TEA-21), notably in the areas of data acquisition and management; the definition and promotion of freight projects; ensuring a regular intermodal component in the Regional Transportation Plan (RTP); advocating a regular allocation of planning funds from the Unified Work Program (UWP) to freight-related research; managing/orchestrating relations with other freight advocacy groups in the region;

- To offer a regular forum for the exchange of information on intermodal industry business practices and developments and, similarly, information on developments in public sector planning and programming that impact the industry;

- To provide a mechanism for effective participation in the transportation planning process by agencies, businesses and persons involved in the freight intermodal transportation sector; and

- To provide input into the planning and programming process with respect to the intermodal movement of goods.

Delaware Valley Regional Planning Commission (DVRPC) – Philadelphia Metropolitan Area

DVRPC's Delaware Valley Goods Movement Task Force is a freight advisory committee that represents both public and private sector interests. It was established to maximize the goods movement capabilities of the Delaware Valley by "sharing information and technology between public and private freight interests, promoting the region's intermodal capabilities and capacity, and developing and implementing a regional goods movement strategy." The Task Force, co-chaired by PennDOT and DVRPC, advises the DVRPC Board on all goods movement issues, studies and projects (Table 3.3).

Table 3.3 DVRPC's Goods Movement Task Force Purpose, Focus, and Objectives

Purpose and Focus	Objectives
Purpose – Maximize the Delaware Valley's position in the global economy by promoting local freight operations and implementing a regional goods movement strategy. **Focus** – The movement of freight and the region's freight transportation network comprised of highways, railroads, ports, airports, and intermodal facilities.	• Insure the participation of the freight industry in the planning process. • Identify improvements to facilitate the safe and efficient movement of freight. • Implement regional congestion and intermodal management programs. • Improve communications, and data and technology sharing.

Three subcommittees – Data, Planning, and Shippers – report to the Delaware Valley Goods Movement Task Force. The Data Subcommittee is responsible for BTS and FHWA Freight Movement Analysis, Transportation Management Systems, and Freight Lines and TravelSmart bulletins; the Planning Subcommittee is responsible for Transportation Improvement Program, Horizons Long-Range Plan, and Terminal Access Studies; and the Shippers Subcommittee is responsible for the Rail Weight Limit Study, Rail Freight Assistance Programs, and the Traffic Club of Philadelphia. Goods Movement Task Force meetings are conducted on a quarterly basis, with subcommittee meetings held as warranted.

The Mecklenburg-Union Metropolitan Planning Organization (MUMPO) – Charlotte, North Carolina Metropolitan Area

Like the economy of the Washington, D.C. metropolitan area, Charlotte, North Carolina's regional economy is dominated by service sector activities, including banking and finance. There is no formal committee or task force specifically dedicated to freight at MUMPO. However, a Technical Coordinating Committee composed of representatives from local governments and agencies as well as State agencies are charged with evaluating and providing recommendations to the MUMPO Board. MUMPO's *Public Involvement Plan* details a number of strategies MUMPO seeks to implement in order to enhance public outreach and involvement with the freight industry in the regional transportation planning and decision-making process.

METROPLAN ORLANDO

The Transportation Technical Committee (TTC) advises the METROPLAN ORLANDO Board on technical matters related to transportation. Appointed by local governments, the TTC is composed of transportation planners and engineers and meets monthly to review and evaluate transportation plans and programs. The TTC is tasked with providing recommendations to the METROPLAN ORLANDO Board based on technical sufficiency, accuracy, and completeness of all plans and programs. In addition, a Freight Mobility Working Group (FMWG) composed of public and private industry stakeholders provides input to the METROPLAN ORLANDO Board. FMWG meets quarterly and is charged with the following:

- Identify freight and transportation problems and solutions;
- Improve both short-term and long-term freight planning to make all modes more cost-effective; and
- Provide awareness of the critical social and economic impact of freight, goods and services movement on Central Florida's communities.

METROPLAN ORLANDO, the Florida Department of Transportation, and the Brevard MPO initiated a Freight, Goods, and Services Mobility Strategy Plan and established a Freight Mobility Steering Committee to guide and oversee the effort. This Steering Committee is a subgroup of the FMWG and was charged with monitoring progress of the study on a monthly basis.

Metropolitan Transportation Commission (MTC)

Regional goods movement at MTC is a component of the agency's planning activities in the Northern California's Bay Area but there is no specific committee or task force dedicated to freight. Issues related to freight planning are largely absorbed by the several of MTC's standing transportation committees, namely the Operations Committee and the Planning Committee. The MTC Operations Committee considers matters related to transportation system management and operational activities while the Planning Committee handles issues related to MTC regional, corridor-level, and other planning activities.

North Central Texas Council of Governments (NCTCOG)

The Regional Transportation Council (RTC) is the independent transportation policy body of the Metropolitan Planning Organization that reports directly to the Executive Director and Executive Board. The RTC, which meets monthly, is composed of elected or appointed officials and transportation provider representatives. The RTC oversees the

metropolitan transportation planning process and, by extension, NCTCOG's comprehensive Goods Movement program.

The Intermodal, Freight, and Safety Subcommittee reports directly to the RTC on issues related to improving the flow and safety of goods movements in the region, as well as the use of existing rail freight corridors for commuter rail service. Intermodal and freight representatives are included in the Subcommittee and represent various private sector interests.

To support this subcommittee, NCTCOG has established a comprehensive Goods Movement program, including several staff. The Goods Movement program includes a Freight Bottleneck Study Technical Workgroup to evaluate rail and truck bottlenecks and develop potential solutions for incorporation in a future Mobility Plan update. The study is coordinated with the Texas Department of Transportation's Trans Texas Corridor planning and reports to the Intermodal, Freight, and Safety Subcommittee of the RTC.

Another NCTCOG transportation committee, the Surface Transportation Technical Committee is an independent committee that reviews, comments on, and prepares recommendations regarding surface transportation planning and funding in the area, which include freight.

New York Metropolitan Planning Council (NYMTC)

NYMTC's Freight Transportation Working Group participates in regional freight planning and was established "to expand and to enhance the freight planning process in the NYMTC region to meet the needs of shippers, receivers, and ultimately the general population through less congested roads, less pollution, and less expensive products and services." Composed of public and private stakeholders, the Freight Transportation Working Group is involved in developing policies and plans to improve regional freight transportation and gives consideration to the impacts on communities. Objectives of the Freight Transportation Working Group include:

- Develop a regional freight planning process encompassing multimodal freight facilities, warehousing, storage facilities, distribution points, and urban goods distribution, with a special emphasis on the Port and on working with local municipal officials and community/advisory boards with regard to land use considerations;

- Integrate public and private sector plans and programs for the improvement of the freight transportation system;

- Pursue priority short-term actions; and

- Organize the Working Group to participate in the *Year 1 Plan of Action.*

Puget Sound Regional Council (PSRC)

PSRC's Transportation Policy Board advises the Executive Committee on transportation-related matters, which in turn reports to the General Assembly of member jurisdictions. A number of advisory committees provide recommendations on regional issues, such as the BNSF Corridor Preservation Study Advisory Committee. The Regional Freight Mobility Roundtable is a collaborative effort to provide a mixed forum that includes public and private members to define and recommend actions serving freight mobility needs through central Puget Sound area (Table 3.4).

Table 3.4 PSRC's Regional Freight Mobility Roundtable, Objectives, Products, and Mission

Objectives	Products
• Frame issues of concern to the freight community and serve as an advocate for policies and improvements to freight and goods mobility.	• Recommendations and strategies for short- and long-term improvements to the regional and multimodal freight transportation system.
• Review data and information used in freight analyses and planning.	• Regional freight movement strategy (a collaborative freight mobility "business plan").
• Participate in the transportation planning and investment decision processes, recognizing the need for coordination between personal and freight mobility.	• Formal testimony to regional and state long-range transportation planning, and ongoing input to Federal, state, corridor and subarea-level programs.
• Educate policy-makers about the interdependence of freight and passenger systems and the significance of freight mobility to the continued growth of the regional economy.	
• Serve as the sounding board for the sponsors and all participant organizations on freight concerns and issues.	

Mission

To engage leaders in the central Puget Sound region in a public/private partnership for our economy and, as a critical part of this, for the mobility of freight and goods. To provide the freight movement community with a voice, and to advance the region's freight movement in a reliable, multimodal and intermodal, efficient, cost-effective, safe and environmentally responsible manner.

Southeast Michigan Council of Governments (SEMCOG)

The Regional Freight Task Force at SEMCOG is charged with helping to ensure that freight issues are integrated into the regional transportation planning process. Freight practitioners, both public and private, are represented on the committee to broaden the focus of regional freight planning to more comprehensively consider all freight modes. The Regional Freight Task Force is charged with outlining future enhancements to the regional freight strategy, creating public awareness, and identifying problems and potential solutions. The Regional Freight Task Force is involved in SEMCOG's activities (i.e., 2030 Regional Transportation Plan) and is intended to provide a multisector freight partnership between the freight community and SEMCOG.

3.3 Critical Success Factors

Based on the above review of MPO freight planning programs, and drawing from recent NCHRP reports[1] on freight planning, policy, and programming, we have outlined a list of factors that are common to many successful MPO freight planning programs.

- **Link to Existing Planning Processes –** Activities undertaken by a dedicated freight committee should feed directly into the core MPO transportation planning process (i.e., Long-Range Transportation Plan, Transportation Improvement Program, and Unified Planning Work Program) and not be an isolated function. Linking freight planning and policy to existing transportation planning and programming processes translates into a higher likelihood that they will receive attention over the long-term when they are "mainstreamed" alongside existing projects.

- **Centralize Freight Responsibilities –** Within the MPO, limit the number of freight-related committees so that freight technical expertise is not spread across the organization. Rather, establish a central body that advocates for, evaluates, and guides freight initiatives.

- **Engage the Private Sector –** Actively reach out and involve private sector freight industry stakeholders who have traditionally been absent from the transportation decision-making process, such as shippers, carriers, and freight processors. Engaging a mixture of key regional freight interests early on can be helpful when trying to gain support from stakeholders for a particular project or policy.

[1] Information from this section primarily adapted from National Cooperative Highway Research Program (NCHRP) Report 570: *Guidebook for Freight Policy, Planning, and Programming in Small- and Medium-Sized Metropolitan Areas*.

- **Educate People about the Importance of Freight Planning –** Make the case for freight planning to decision-makers and the general public. Show linkages between freight infrastructure investments and public benefits, i.e., congestion reduction, safety, air quality improvement, reduction in maintenance costs. When evaluating freight issues, it is important for all parties to understand there will be benefits and challenges. Be transparent and clear about how they will accrue to different interest groups.

3.4 Recommendations to COG/TPB

Based on the review of national MPO activities and given the role of freight in the Washington region, this section outlines recommendations on organizing COG/TPB to enhance its freight planning efforts. The recommendations of this chapter include establishment of a stand-alone freight subcommittee.

Establishment of a Freight Subcommittee

The TPB Technical Committee and some of its subcommittees, such as the aviation subcommittee, currently address aspects of freight transportation, albeit indirectly. In order to consolidate these functions and formalize freight planning, it is our recommendation that COG/TPB establish a Freight Subcommittee as a way to drive freight initiatives and specific studies or projects within the MPO. Initiatives may be new to the MPO process, such as Baltimore's consideration of truck parking, or may be in conjunction or coordination with activities of existing committees, such as the air cargo and ground access studies of the Aviation Technical Subcommittee. Freight planning differs from passenger transportation planning in some important ways (see Figure 3.1). As a result, we believe it warrants its own subcommittee.

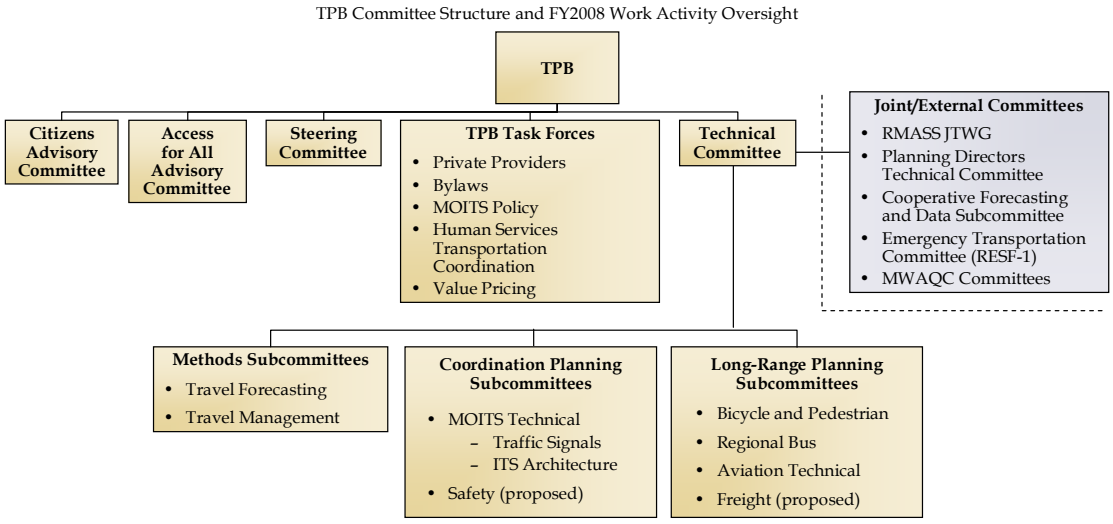
The Freight Subcommittee should lead freight-related planning activities but should ensure continuing coordination with related activities of other committees, subcommittees and task forces, in particular congestion management planning. The relationship between freight and congestion reduction strategies is important because of the potential impacts on the regional economy with regard to freight operations and facilities locations.

Overall, the MPO has considerable latitude in chartering the Freight Subcommittee to meet the specific needs of the MPO's freight program. Indeed, a number of structural changes are under consideration by the TPB Committee. Under a revised committee structure, the Freight Subcommittee would be considered a Long-Range Planning Subcommittee and would report directly to the TPB Technical Committee (see Figure 3.2).

Figure 3.1 Passenger versus Freight Transportation Planning Characteristics

Passenger Planning	Freight Planning
Most passenger infrastructure is publicly owned and controlled	Private industry (ports, railroads, terminals, pipelines), own and control part of the system
Passenger trip generation well understood and documented	Freight movements sensitive to market forces, difficult to forecast
More available data	Fewer sources of data
Can typically be coordinated on a regional or local basis (small percent of intercity trips)	Requires multi-jurisdictional cooperation (higher percentage of long-distance trips)
	Freight uses the system differently; carrier perspective differs regarding problems (e.g., chokepoints) and solutions

Figure 3.2 Conceptual COG/TPB Freight Subcommittee Structure



Establishing a Freight Subcommittee dedicated to the region's freight transportation planning raises the profile of freight issues throughout the MPO so that they receive due consideration during regional project prioritization. Furthermore, once established, a Freight Subcommittee ensures long-term commitment to the freight planning process. It

is also important that consideration be given to operational and short-range issues to keep momentum within the Freight Subcommittee and to achieve buy-in from stakeholders.

Freight Subcommittee Composition

Consideration should also be given to the composition of the Freight Subcommittee. We recommend the COG/TPB Freight Subcommittee be composed of both public and private stakeholders. The subcommittee should act as a mechanism for facilitating dialogue around issues related to freight, developing freight aspects of regional transportation plans, assisting in the review of freight-related transportation projects, and informing and educating the general public about freight activities. It should operate around the principle of consensus building. Freight-knowledgeable representatives from TPB member governments – local jurisdictions, state DOTs, and WMATA should be invited to participate as public stakeholders (e.g., members of the Freight Planning Study Advisory Working Group, which was formed to oversee this Freight Planning Support Contract). Private sector freight stakeholders and consultants engaging in freight planning, should also be invited to participate. Private sector freight industry representatives are particularly good to have on a Freight Subcommittee, because of their first hand knowledge of logistics, etc. In return, the consultants and the private sector freight stakeholders will be able to keep posted on the latest developments with the region's freight planning process, thereby informing the work they are doing (Table 3.5).

Table 3.5 Potential Membership in Freight Subcommittee

Public Stakeholders	Private Stakeholders
• TPB member jurisdictions. • Freight planning liaisons from MDOT, VDOT, DDOT. • General Services Administration (GSA) representatives. • Federal Highway Administration (FHWA) representatives.	• Class I railroad representatives (CSXT, NS). • Aviation representatives e.g., Dulles air cargo representative). • Integrated carrier representatives (e.g., UPS, FedEx). • Trucking Association representatives Maryland, Virginia).

Furthermore, consistent meetings with a regular format will help to ensure that freight concerns are addressed proactively. It would be beneficial for the Freight Subcommittee to meet on a semi-annual or quarterly basis, with meetings occurring more frequently while the subcommittee is becoming established. Involving the private sector stakeholders in the Freight Subcommittee is a feature that will be unique to this transportation subcommittee. An emphasis should be placed on being transparent and objective, building trust between public and private stakeholders, being efficient, and

ultimately making all participants, but particularly the private sector participants, feel they are receiving something in exchange for their participation.

Specific accomplishments/progress will be necessary to keep the subcommittee engaged in the process. The subcommittee and MPO staff should be flexible from year to year to ensure that the freight program focus is current and relevant. COG/TPB should make sure that freight stakeholder meetings are held in a time efficient manner and produce tangible results. This can be accomplished through a number of means, including tackling issues that are considered to be the "low-hanging fruit," in order to show progress. The success of initial stakeholder meetings is a critical success factor in encouraging ongoing participation. Conducting efficient, effective freight meetings requires significant amounts of pre-planning and preparation, usually with MPO personnel assuming an organizational role.

The recent NCHRP report *Guidebook for Freight Policy, Planning, and Programming in Small- and Medium-Sized Metropolitan Areas* prepared by Cambridge Systematics offers timely recommendations for effective engagement of private freight stakeholders. The following table was extracted from that report and should provide COG/TPB with additional ideas relating to organizing and maintaining interest of private participants (Table 3.6).

COG/TPB Freight Personnel

It is further recommended that COG/TPB formally identify a Freight Coordinator on staff. This person would be the designated freight point-of-contact within the MPO. The Freight Coordinator should have strong communication, interpersonal, and analytical skills. Ideally the Coordinator will have industry knowledge, with the ability to see the big picture. The staff member must have the ability to work well with politicians, private sector freight professionals, and the MPO subcommittees and Board, while communicating the importance of freight to the public. The person in this position would serve as the staff contact for the Freight Subcommittee, arranging meetings, coordinating the agenda, and providing information and reports as needed to keep the subcommittee informed of relevant projects. Accordingly, the Freight Coordinator would participate on steering subcommittees, attend periodic meetings of major freight studies in the region, such as the NCPC Freight Rail Realignment Feasibility Study, or participate in off-site freight stakeholder meetings. Essentially, the freight coordinator should remain connected to the freight community, while also serving as a liaison between the technical COG/TPB staff and the Freight Subcommittee. Internally, COG/TPB should make a concerted effort to get staff interested and/or knowledgeable about freight planning issues.

Initially, this may not be a full-time position but could evolve into as such depending on the demands placed on COG/TPB to participate in future studies of large magnitude.

Table 3.6 Effective Freight Outreach: Common Problems and Potential Solutions

Common Issue	Potential Solution
Differing planning horizons. Private sector freight stakeholders often consider the public transportation planning process to be too long and cumbersome to warrant their attention, choosing instead to focus on short-range operational and profit goals.	**Create quick-fix projects.** Creating early success stories is a critical success factor to securing freight stakeholder interest. This generally involves identifying and delivering early, quick-fix projects that establish program success. Projects meeting quick-fix criteria often consist of maintenance-type projects (e.g., additional turn lanes, widening lane shoulders, traffic signal timing, etc.) that can be completed within a short time and without major funding requirements. Because MPOs do not have direct control over these resources, they must solicit them from the appropriate agency (state, county, or city) to support this strategy.
Personnel turnover in the private sector. Interest by stakeholder firms is often dependent on individual interest. Industry turnover can have a negative impact on ongoing participation.	**Focus stakeholder outreach efforts on firms and individuals with long-term and strategic commitments to the community.** Target firms include those with company headquarters and major operations located within the region. Such firms are likely to ensure that replacement personnel are provided when necessary. Target individuals include leaders within the freight industry that have demonstrated interest in community activities. Development of a regional freight profile can help identify these individuals. Such individuals are likely to continue participation in the process even if they leave current firms.
Time constraints. Time constraints of the private sector freight industry hinder the ability to fully commit to the public transportation planning process.	**Hold focused meetings and outreach events.** MPOs must make sure that freight stakeholder meetings are held in a time efficient manner and produce tangible results. The success of initial stakeholder meetings is a critical success factor in encouraging ongoing participation. Conducting efficient, effective freight meetings requires significant amounts of pre-planning and preparation, usually with MPO personnel assuming an organizational role.
Proprietary issues. Private sector freight stakeholders often worry about protecting company/client trade secrets and information that could affect a firm's competitiveness, as such they limit the amounts and kinds of information shared.	**Understand and respect competitive concerns.** All MPO freight data collection efforts must acknowledge and address privacy and confidentiality concerns in all stakeholder communications. MPOs should be sure of the kind of data they require before making requests of the private sector. In many cases, direct observations of traffic activities (e.g., truck counts, etc.) are just as useful as specific freight shipment data.

4.0 Recommendations for Stakeholder Outreach Activities

4.1 Introduction

Because many freight assets are owned by the private sector and because freight activity spans jurisdictional boundaries, freight outreach with both private and public sector stakeholders is a critical element in any successful regional transportation planning program. Input from shippers, receivers, drivers, regulators, and trucking companies, all of whom have practical experience with freight issues, will help the Freight Subcommittee to clearly identify and prioritize issues and pose possible solutions. In order to effectively reach and interact with companies that transport goods to, from, and through the COG/TPB region, it is important to understand the various and differing perspectives and customize an outreach program that is responsive to the overall goals.

New Federal regulations adopted this year in fact call for Metropolitan Planning Organizations like the TPB to provide "freight shippers [and] providers of freight transportation services [among other specified parties]…with reasonable opportunities to be involved in the metropolitan transportation planning process." (23 CFR 450.316) Outreach to the freight community can thus be seen as part of a larger regional effort to include interested parties from various sectors in the transportation planning process in a meaningful way.

4.2 Key Outreach Recommendations

Based on these factors and knowledge of freight outreach activities in similarly sized MPOs, the following activities are suggested for a comprehensive outreach program for COG/TPB to obtain input on freight issues and, perhaps more importantly, on solutions for these issues.

Freight Subcommittee

The Freight Subcommittee will be one of the primary catalysts for outreach to both private and public sector stakeholders. Members of the Freight Subcommittee represent a link to both private sector industries and to public sector representatives and should serve as a conduit of information in both directions.

Create and Maintain Contact Lists

In addition to the Freight Subcommittee private members, COG/TPB should involve a wider group of goods movement constituents in ad hoc outreach activities. The first step in this process is the development of a contact list of stakeholders. As the outreach process progresses, it will be important to develop a list with contact name, title, organization, street address, phone, and e-mail address of persons involved in the freight industry. A special note should be made of individuals who indicate an interest in becoming active in freight issues. This contact list of freight stakeholders should be maintained in a spreadsheet or database which can be sorted by type of stakeholder (e.g., large shipper, freight hauler, trucking company, railroad, regulatory agency, driver, etc.) A list similar to the list described above already has been developed for the Virginia Department of Transportation. Furthermore, the Maryland Department of Transportation intends to develop a freight contact list. Both of these efforts provide a base from which COG/TPB can work from. COG/TPB will need to continue to work closely with the District of Columbia Department of Transportation to expand its contact list so it encompasses the entire region.

4.3 Additional Outreach Options

In addition to forming a Freight Subcommittee and creating and maintaining a comprehensive contact database, there are a variety of outreach activities that may be undertaken. A successful outreach plan will be flexible enough to allow for changes midstream as the COG/TPB freight planning process unfolds. Regardless of the outreach method selected, it is important that the message clearly articulate the reason and mission for the freight stakeholder outreach effort, giving sufficient background information and context to engage the interest of possible stakeholders. One option is for COG/TPB is to set up a freight program for the long-term solicitation of input to freight issues and concerns. Pursuing this option may benefit the COG/TPB because it may more fully integrate freight interests and stakeholders into the regional planning process. Some possible outreach activities and tools include, but are not be limited to, the following.

Personal Contacts

A dedicated COG/TPB staff contact could meet, either in person or by phone, with key private sector stakeholders. Having a dedicated point of contact may help stakeholders better understand what they are engaged in and what they are handling on a daily basis, and to generally promote the freight planning effort.

Conduct Regional Freight Stakeholder Activities

Once the initial outreach steps are completed, key individuals representing various facets of the freight industry may be invited to participate in a regional freight stakeholder activity, such as a roundtable or a "freight breakfast," where they could interact with transportation officials and discuss pressing issues. To help make the experience be effective and memorable, an agenda and a strong introductory speaker may help get participants focused on key issues and to emphasize the importance of freight in the planning process. This first event has the potential make a lasting good impression to provide momentum for future activities. One option is to make events like this by invitation only to a targeted group of participants with a clear indication of the benefit of interacting with transportation decision-makers, including COG/TPB, VDOT, DDOT, and MDOT staff and TPB members. Limiting the number of participants and engaging a transportation/freight professional as a facilitator is one way to facilitate maximum interaction and discussion between private and public stakeholders to move freight issues and needs forward. Ultimately, this event will provide a starting place for future activities, including those related to identifying capital and operational improvements to alleviate needs.

Stakeholder events offer an opportunity to identify "champions" for various aspects of freight movement who can continue their involvement with COG/TPB and articulate needs in the agency's regional planning activities. In other words, this might be a good vehicle for helping to flesh out the membership of the subcommittee. Based on the outcome of the first stakeholder event, COG/TPB has the option to choose to move forward with additional activities like establishing quarterly or semiannual meetings.

Stakeholder Survey

One way to gauge interest areas is through a survey that seeks to address key regional freight issues. COG/TPB can review samples of stakeholder surveys conducted in other regions and create a draft for the Metro Washington area. A draft survey could be reviewed after focus groups are conducted to help ensure that issues surfacing throughout the freight planning process are represented in the survey. A draft survey form has been developed and is included in section 4.3 Stakeholders' Survey Recommendations. While termed a survey, this effort is likely to entail more of an interview format in order to capture input and clarify the issues of those involved in all aspects of the freight industry.

Web Site Revisions

Use of visual and interactive resources may help facilitate the outreach process. COG/TPB may consider developing a special freight section on the COG/TPB web site with information about data, events, participation (i.e., how to get involved), and a comments section for issues and concerns.

Newsletters/Fact Sheets

Regular updates, such as newsletters and fact sheets, offer COG/TPB an opportunity to periodically communicate with freight stakeholders. Newsletters with updates of current events and happenings in the freight planning sector can easily be posted on a web site. Fact sheets that identify freight characteristics and issues also can be published and distributed by mail or electronically. Development of a contact list can help when distributing this material.

Other Outreach Considerations

Many stakeholders, particularly those in the private sector, must have a *reason* to participate in the COG/TPB outreach process. To improve the outreach process, it may be beneficial to demonstrate to stakeholders that the outreach process is worthwhile. A basic motivator for private sector firms is economic, as these entities exist to produce profits for investors. While it also is in the long-term interest of firms to be good corporate citizens, economic considerations often provide the strongest linkage between corporate activities with the community and, therefore, serve as the strongest predictor of continued and engaged stakeholder interest.

Traffic organizations, chambers of commerce, and local organizations can often assist the outreach process by suggesting firms and individuals with appropriate skills and interests. These organizations may know of individuals interested in participating in freight planning activities who could potentially act as freight champions. Such outreach to local chambers, traffic clubs and logistics organizations is a basic element in stakeholder outreach efforts.

4.3 Stakeholders' Survey Recommendations

Survey Methodology

This draft survey has been developed for the Metropolitan Washington Council of Governments/National Capital Region Transportation Planning Board to administer to freight stakeholders within the COG/TPB region. The generally stated purpose of the survey is to learn about freight issues and possible solutions in the COG/TPB region directly from those involved in freight movement.

Type of Survey

This survey methodology and survey instrument has been prepared so that it can be administered by COG/TPB staff primarily by telephone. Some surveys also may be conducted through personal interviews. While termed a "survey," this instrument has been developed to be more of an "interview" process to gather anecdotal responses from a sampling of freight stakeholders, rather than a scientifically formulated survey.

Survey Target Respondents

It is intended that this survey be targeted to a sample subset of the following:

- Area businesses that ship or receive a substantial amount of goods to, from, or within the COG/TPB region;
- Trucking companies, including some who deal in mail/package delivery;
- Rail companies;
- Air freight services; and
- Shipping industry associations or representatives.

Survey Mission

To obtain information from those in involved in the movement of freight as to their primary issues and concerns along with their opinions as to actions to be taken to alleviate those concerns.

Survey Purpose

- To identify the issues of those who ship in the COG/TPB area vis-à-vis:
  - Facility concerns (roads, railroads, airports, ports, etc.);
  - Operational concerns (congestion, capacity, safety, costs); and
  - Regulatory or policy concerns/challenges/barriers.
- To elicit possible solutions/suggestions from the freight community on these issues, particularly vis-à-vis what actions or activities COG/TPB might undertake to facilitate the efficient and safe movement of freight in the region.
- To familiarize respondents with COG/TPB's mission in the freight arena and let them know how they can find out more.
- To identify stakeholders who have an interest in becoming involved in a Freight Stakeholders Committee or who are willing to assist COG/TPB is pursuing a specific project or activity.
- To help expand the contact list of freight stakeholders in the region by asking respondents for additional contacts who might be interested in the COG/TPB process.

Interview Methodology

- Most of the questions are designed to be open-ended, but in some cases "multiple choice" categories are provided for later ease of compilation.

- Generally speaking, it is advise that the interviewer not "lead" the respondent toward any of the available answers, but instead interviewer may help to clarify the question if the respondent has difficulty understanding.

- Over time, the interviewer may ascertain that certain answers are often repeated, in which case they can be added as "multiple choice" options for later ease in compilation – but these will still not be read to the respondent to "lead" the answers.

Compilation

- It is anticipated that the responses to this interview survey will be compiled into a technical memorandum gathering and summarizing the results of the interviews. The memorandum would consist of:

  - Methodology;
  - Description of respondents as a whole (breakdown by type);
  - Summary of key and secondary issues; and
  - Summary of desired actions to improve freight movement.

COG/TPB FREIGHT SURVEY
Survey Instrument

Information to be filled out by interviewer:

Name of Firm/Agency/Organization:_____

Name of Contact:_____

Phone #:_____

E-mail address:_____

Beginning of Interview:
I am calling on behalf of the Metropolitan Washington Council of Governments. COG/TPB is the organization charged with coordinating transportation improvements in the region. Are you familiar COG/TPB's role or with the area which falls under COG/TPB jurisdiction? Interviewer to (include brief description here if respondent is unfamiliar with COG/TPB).

As part of its long-range planning efforts, the Metropolitan Washington Council of Governments is seeking information from freight industry representatives as to issues, concerns, challenges, and possible solutions. As I'm sure you know, freight volumes continue to grow and some of our systems, in the region and in the nation, for handling the needs of freight-related transportation may not have kept pace with the need. Your firm (agency) (organization) has been identified as having interest in freight transport. We would like to ask you to participate in a brief survey interview. COG/TPB will use the information from this survey, along with other data and input, to help craft policies and programs and facility improvements to increase the efficiency and effectiveness of the regional transportation system for the movement of freight. May we take a little of your time now on this survey? (If not, may I call you back? When?)

Basic Information about Stakeholder:
(First we want to ask you a few questions about your own organization and then we'll ask for your views about freight transport conditions and needs).

1. What is the nature of your business or organization?
   - **a.** Shipper/Receiver
   - **b.** Freight handling company
     - **1.** long-haul
     - **2.** short-haul
     - **3.** drayage
   - **c.** Freight industry organization
   - **d.** Warehouse/distribution center/freight forwarder
   - **e.** Other_____

2. In your line of business, what mode(s) of transportation do you represent? (Check all that apply).
   - **a.** Rail
   - **b.** Truck
   - **c.** Air
   - **d.** Other?_____

3. What do you consider your geographic service area?
   - **a.** Metro Washington
   - **b.** Multiregional
   - **c.** Nationwide
   - **d.** International

4. How many people do you employ? _____

5. How many tons of freight annually does your firm (organization) move on an annual or daily basis?

_____

6. What is the annual or daily value of the freight you move?

_____

7. In general terms, what is your prediction regarding the growth of freight by mode in the metro Washington region?

	Trucking	**Rail**	**Air**	**Waterborne**
No growth or decline				
Slow growth				
Moderate growth				
Rapid growth				
Sporadic/inconsistent growth				
Don't know/can't say				

Freight Issues and Concerns: ***Now we want to ask you a few questions related to what you see as the freight issues and possible solutions in the metro Washington area).***

8. In general, how satisfied are you/your organization with the transportation situation in the Metro Washington region? (***If prompted***, interviewer can note that this can refer to any aspect of transportation: facilities, operations, costs, etc.)

- **a.** Very satisfied
- **b.** Somewhat satisfied
- **c.** No real opinion
- **d.** Somewhat dissatisfied
- **e.** Quite dissatisfied

9. Within the Metro Washington region, what are the most significant challenges or concerns your business or facility faces in freight movement? These could be physical, operational, regulatory, or institutional. They could be local, regional, or nationwide.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

10. What improvements are needed? These could be infrastructure improvements, regulatory changes, institutional changes or any other type of change).

_____
_____
_____
_____

11. Would you be willing to participate in the COG/TPB planning process in any way? *(Interviewer should have a list of the various ways the respondent can get involved and should note the respondent's specific interest, if an affirmative response).*

a. Yes
b. No
c. Maybe

12. How do you think transportation agencies in the region can best address freight issues in the region?

_____
_____
_____
_____
_____
_____
_____
_____

13. Do you participate in industry associations or other organized collaborative activity aimed at improving freight infrastructure or policy? If so, which organization?

- **a.** List some here (????)
- **b.** Etc.

14. Have you changed how you receive/ship goods in the last five years? If yes, how and why?

_____
_____
_____
_____
_____
_____

15. Finally, prior to this conversation, were you familiar at all with COG/TPB and the role it plays in the region?

- **a.** Yes
- **b.** No
- **c.** Somewhat

The interviewer should provide some basic information re: COG/TPB's role and mission and refer the respondent to the COG/TPB web site. The interviewer should close with a sincere thank you to the respondent and a reminder as to how to get involved and find out more.

5.0 Data Sets and Analytical Tools

5.1 Introduction

This chapter provides a brief overview of publicly and commercially available freight data that could supplement the Metropolitan Washington Council of Government's (COG/TPB) existing data. Currently COG/TPB has access to a limited collection of freight data. To increase its capacity to plan for freight, we suggest COG/TPB acquire additional freight-related data sets, some of which will be provided through this study.

The newly acquired freight data will help COG/TPB understand how freight demands and the regional economy impact one another, identify key infrastructure and operational improvements needed for optimal freight mobility, and determine the impact freight could have on the region's infrastructure maintenance needs. In essence, the collection and compilation of freight specific data will assist COG/TPB in making informed transportation decisions.

Freight data is available through a variety of sources and is provided in various formats, i.e., maps, databases, tables, etc. Much of it must be collected from separate sources and compiled to fully understand the region's freight activity. The data sets listed in the "Publicly Available Freight-Related Data Sets for Use in this Study" section were used to develop the regional freight profile for the COG/TPB region (Chapter 2) and to build a freight facilities initial inventory and map (Chapter 2).

In addition to the freight data sources listed below, COG/TPB has provided several base layers—such as jurisdictional boundaries—that are not freight-related per se, but provide a regional context for national freight datasets.

5.2 Existing COG/TPB Freight-Related Data Sets

COG/TPB maintains several data sets with potential application in freight planning analysis. The data sets include an inventory of truck-restricted routes, petroleum pipeline terminals, and truck stops, all of which were utilized in this study to describe the region's freight characteristics (Chapter 2). Another rich source of freight-related data for freight planning applications is the COG/TPB regional transportation model. For the purposes of this study, COG/TPB staff provided several freight-related outputs to help characterize regional freight demand and the performance of key freight corridors now and in the

future (2030). This section provides a brief summary of existing COG/TPB data sets and details their potential application to future activities.

Loaded Highway Network Files (2002 and 2030)

- **Source**: COG/TPB
- **Year**: 2006
- **Description:** The highway network files contain average annual daily traffic statistics by highway segment for all vehicles, including commercial vehicles for a base year (2002) and a future year (2030). Trucks were not provided separately because COG/TPB is currently updating the medium and heavy truck component of its regional transportation model (explained below). The information provided in this data set was developed as part of the TPB's most recent Air Quality Determination work in support of the 2006 Constrained Long-Range Plan (CLRP) and its five-year Transportation Improvement Program (2007-2012 TIP).
- **Application:** This study utilizes the highway assignment to show traffic growth on the region's highways and to highlight the change in volume on key freight corridors.
- **Caveats:** This is a very detailed file with traffic growth for local roads. For the purposes of freight analysis, higher functional classifications should be the focus of analysis.

Summary of Modeling Metrics (2002 and 2030)

- **Source**: COG/TPB
- **Year**: 2006
- **Description:** Accompanying the highway network, COG/TPB also provided summary tables and statistics describing the current and future performance of the region's highway system, including data on 'Medium' (2 axles, 6 tires) or 'Heavy' (3 or more axles) trucks. Key statistics are provided for internal and external travel markets, demographics, and vehicle miles traveled (VMT) by vehicle class.
- **Application:** Modeling metrics are used in this study to describe regionwide truck VMT trends and trip lengths.
- **Caveats:** None.

Medium and Heavy Truck Survey Data

- **Source:** COG/TPB
- **Year:** 2003
- **Description:** The medium and heavy truck survey data provides information about the origins and destinations of the region's medium (2-axle, 6-tire) and heavy (3+ axle, semi-trailer) trucks. Specifically, it provides information about truck movements that originate within the region and terminate outside the region, truck movements that originate outside the region and terminate inside the region, and truck movements with the origination and termination point outside the region, but which travel through the region. The data are available in tabular format.
- **Application:** This study did not utilize the truck survey or count data but future freight activities should take advantage of this rich source of information to describe trends, origins and destinations, and performance of key facilities.
- **Caveats:** Ongoing and future survey efforts may supplement this existing data set.

Regionwide Truck Restricted Routes

- **Source**: COG/TPB
- **Year:** 2007
- **Description:** The Regionwide truck restricted routes data set is a geospatial line dataset showing the various truck restrictions placed on the region's roads. Restriction designations include no trucks, no trucks over 40 feet long, no through trucks, no trucks over 8 tons gross, no truck combinations over 65 ft., no through tractor trailers, no trucks over 4 wheels, no hazmats, no trucks over 13 feet in height.
- **Application:** This study utilizes this data to create a map of restricted truck routes.
- **Caveats:** None.

Petroleum Pipeline Terminals

- **Source:** COG/TPB
- **Year:** 2007
- **Description:** The COG/TPB pipeline dataset is a point geospatial dataset with the name of petroleum and gas distillates pipeline terminals in the Washington, DC metropolitan region.
- **Application:** This study utilizes this data as part of the regional freight facilities inventory and map.
- **Caveats:** None.

Regionwide Truck Stops

- **Source:** COG/TPB
- **Year:** 2007
- **Description:** The COG/TPB truck stop dataset is a point geospatial dataset with the name of truck stops in the Washington, DC metropolitan region.
- **Application:** The importance of this data set is to highlight the locations where truck are refueling or truck drivers are parking to rest. Truck stop locations are becoming more important as the number of trucks increases and the availability of parking continues to decline relative to the growth of trucks in the region. In the future, this data set would be useful if COG/TPB decides to explore the truck parking issue more fully as it relates to safety and air quality. Most truck stops in the Washington, DC region do not utilize new technologies, such as IdleAir, to reduce pollution from parked trucks.
- **Caveats:** This file may need to be updated frequently to account for new facilities and changes to existing facilities.

5.3 Publicly Available Freight-Related Data Sets for Use in this Study

Various freight-related data sets are maintained across many Federal government agencies. The Bureau of Transportation Statistics is the primary disseminator of transportation data, including freight systems data. Other sources, including the U.S. Census Bureau and the U.S. Geological Survey support several other data sets, including those related to employment and land use, that are helpful in freight transportation planning. This section summarizes some of the principal sources of publicly available freight data.

National Highway Planning Network (NHPN)

- **Source**: Federal Highway Administration (FHWA)

  http://www.bts.gov/publications/national_transportation_atlas_database/2006/

- **Year**: 2006

- **Description**: The National Highway Planning Network is a network-wide geospatial line dataset of the nation's major highway system. The NHPN consists of interstates, principal arterials, and rural minor arterials. Attributes associated with this dataset include road name, mileage, functional classification, rural vs. urban classification, designation as an intermodal facility connector, road owner, and subnetwork designation for the National Highway System.

- **Application:** The most important potential use for the NHPN is its ability to display in map format truck data from the Highway Performance Monitoring System (HPMS) to show the current and future year number of trucks. The I-95 Corridor Coalition is currently developing a multi-state data layer using HPMS data on the NHPN that might benefit future COG/TPB freight and general transportation planning activities, especially concerning major corridors.

- **Caveat:** These data are reasonably accurate for mapping high-level HPMS data, but lack geographic accuracy for subregional studies (will not overlay to MWCOG's more precise road network).

Railway Network

- **Source:** Federal Railroad Administration (FRA)

  http://www.bts.gov/publications/national_transportation_atlas_database/2006/

- **Year:** 2006

- **Description:** The Rail Network is a geospatial line dataset of the nation's railway system at the 1:100,000 scale. Attributes associated with this data set include length, railroad ownership, railroad trackage rights, status of rail line, ie. abandoned or active, and railroad classification code.

- **Application:** This study utilizes the FRA data in two mapping applications, one showing the ownership and trackage rights of railroads, the other showing the tonnage density (or relative tonnage volume) of freight carried over rail lines. These are the principal applications available with this data set.

- **Caveat:** These data are reasonably accurate for mapping high-level FRA data, but lack geographic accuracy for subregional studies. The FRA ownership data and line density data have not been updated for performance or abandonments since 2000.

Intermodal Terminals Facilities

- **Source:** U.S. Department of Transportation, Research and Innovative Technology Administration's Bureau of Transportation Statistics (RITA/BTS)

  http://www.bts.gov/publications/national_transportation_atlas_database/2006/

- **Year:** 2006

- **Description:** The Intermodal Terminals Facilities dataset is a geospatial point dataset designed to provide information about intermodal facilities. Attributes include name of facility location, primary function of facility, mode affiliated with the facility, indication of whether a mail carrier is associated with the facility, and a list of other major businesses associated with the facility.

- **Application:** This database provided some of the sites included for the initial freight facilities inventory and map for this project. In the future, it is possible to use this database to map thematically the modes using the facilities for transfer. For example, many of the terminals are truck-to-rail; some are rail-to-water; etc.

- **Caveats:** Major national sources were consulted to assemble this data set. It is not exhaustive and was completed in 2003. Because of the changing nature of freight transportation, it may require updating to improve accuracy.

Ports

- **Source:** U.S. Army Corps of Engineers (USACE)

  http://www.bts.gov/publications/national_transportation_atlas_database/2006/

- **Year:** 2006

- **Description:** The U.S. Army Corps of Engineer's ports dataset is a geospatial point dataset that contains physical information on commercial facilities at the principal U.S. Coastal, Great Lakes and Inland Ports. Attributes include information on ownership, purpose of use, commodities handled, description of related storage facilities, and railway connections serving the wharf.

- **Application:** This study utilizes the USACE ports file to show the location of principal ports. There is an accompanying file that could be used in the future to show the primary commodities or purpose of each port in addition to its location.

- **Caveats:** Accompanying attribute data on type of cargo and purpose of port may be out of date and require updating.

U.S. Military Installations

- **Source:** U.S. Department of Defense (DOD), Office of Economic Adjustment

  http://www.bts.gov/publications/national_transportation_atlas_database/2006/

- **Year:** 2006

- **Description:** This geospatial polygon dataset contains the boundaries and location of U.S. military installations. Data attributes include, name of military installation, facility description, and Base Realignment and Closure status.

- **Application:** For this region, the location of military installations is important for transportation planning purposes as these are major generators of personal and sometimes freight trips.

- **Caveats:** Due to the ongoing Base Realignment and Closure (BRAC) process, some data on DOD properties may be subject to change.

Hazardous Material Routes

- **Source:** Federal Motor Carrier Safety Administration

  http://www.bts.gov/publications/national_transportation_atlas_database/2006/ or http://hazmat.fmcsa.dot.gov/nhmrr/index.asp

- **Year:** 2006

- **Description:** There are two types of data associated with this source. The first is a geospatial line dataset showing hazardous material routes. The second is a route registry by state that gives updated information regarding hazardous material routes, including which hazardous materials are allowed and which routes are the preferred routes.

- **Application:** Hazmat routes can be used for various freight, safety, and security applications. In the future, the Transportation Research Board's Hazardous Materials Cooperative Research Program should provide additional guidance to states and MPOs on HAZMAT routing and studies.

- **Caveats:** Like other data from BTS, newer versions may be available each year for update. Similar to the NHPN network, this line file may not match MWCOG's street network on a subregional level.

Public Use Airports

- **Source:** Federal Aviation Administration (FAA)

  http://www.bts.gov/publications/national_transportation_atlas_database/2006/

- **Year:** 2006

- **Description:** The Public Use Airports database is a geographic point dataset of U.S. aircraft landing facilities. Attributes include name of facility, facility type, distance from the nearest central business district (CBD), direction of airport from CBD, whether it is a customs international airport, if it has military landing rights, or if it is a joint use aircraft facility.

- **Application:** This study utilizes this data source to show the location of major airports.

- **Caveats:** This is a simple point file and does not show the extent of the runways or the airport properties or provide linked data on traffic or cargo statistics.

Mining

- **Source:** U.S. Geological Survey (USGS)

  http://www.nationalatlas.gov/

- **Year:** 2002-2003

- **Description:** The mining dataset is a geographic point dataset showing the location of mineral operation in the U.S. Attributes include company name, operator's name, type of operation, and the mineral produced or processed by the mine. For the purpose of the COG/TPB study, industrial, construction, sand and gravel, crushed stone, and non-ferrous metal processing plants were included.

- **Application:** Mining operations, especially gravel quarries, tend to intensively use truck, rail, or waterborne transportation. This data set is used in this study to map the locations of mining operations in the Washington region, which is significant because gravel is one of the top commodities moved in the region.

- **Caveats:** This file may require updates and is subject to frequent change. Please consult the National Atlas website for USGS updates. Also, this file may not contain all quarries, including some smaller facilities.

Freight Analysis Framework (FAF)

- **Source:** Federal Highway Administration (FHWA)

- http://ops.fhwa.dot.gov/freight/freight_analysis/faf/index.htm

- **Year:** Released 2006, based on 2002 Commodity Flow Survey

- **Description:** FAF estimates current and future commodity flows between states, sub-state regions, and major international gateways. The FAF commodity origin-destination database includes information about the weight (tons) and value of commodities moving between regions, the mode of transportation used to move the goods, and the types of commodities being shipped. It is built entirely from public data sources. Key sources include the 2002 Commodity Flow Survey (CFS), developed by the Census Bureau, U.S. Department of Commerce, and the Bureau of Transportation Statistics (BTS), U.S. Department of Transportation; Foreign Waterborne Cargo data, developed by the U.S. Army Corps of Engineers.

- **Application:** As explained in Chapter 2 of this report, the FAF data are the primary source of publicly available commodity flow data for the region. The limitations of this data for application to ongoing COG/TPB freight planning activities include the lack of calculated through tonnage and value and the lack of

geographic granularity or congruency with COG/TPB boundaries or member jurisdictions. The through tonnage and value could be calculated by creating a new origin-destination matrix and using a routing estimation procedure. The allocation of origin-destination data to subareas is more complicated although the FHWA is currently in the process of disaggregating FAF data in order to create estimated assignments to the FAF network (subset of the NHPN focused on freight routes) to update an assignment of the first FAF version in 1998. Once complete, the FAF network assignment will facilitate high-level or multi-state freight planning applications but is less helpful for MPO-level planning because of inconsistencies in routing.

- **Caveats:** The greatest weakness of the FAF 2.2 release is its inability to provide through traffic for each region. Also, the regions available are not suitable for subregional (county) analysis as the are aggregated to state-level MeSA sections. Finally, the data were derived from the 2002 Commodity Flow Suryey and may not reflect current trends. FHWA is endeavoring to update the data using a forecasting methodology to bridge between the CFS, which is performed by the U.S. Census Bureau once every 5 years (2007 is underway).

5.4 Publicly Available Freight-Related Data Sets for Potential Future Use

Several additional publicly available dataset were not acquired for this study that may be useful in future freight planning activities. Those data sets are described below.

Carload Waybill Sample

- **Source**: U.S. Department of Transportation, Surface Transportation Board (STB)

  http://www.stb.dot.gov/stb/industry/econ_waybill.html

- **Year:** Annually updated

- **Description:** The Surface Transportation Board's (STB) Carload Waybill Sample (Waybill Sample) is a stratified sample of carload waybills for rail shipments. It identifies the railroad carrier, weight (tons), value, type of commodity, and route. There are two types of datasets created from the waybill data, the Confidential Waybill File and the Public Use Waybill File. The Confidential Waybill File is a movement specific file, available only under certain conditions. The Public Use Waybill File has less detail, but is available to the general public.

- **Application:** The Carload Waybill Sample data are most useful in rail studies and other rail applications and provide a rich and detailed source of rail-based

commodity flows. Future freight-rail studies and planning applications may benefit from this dataset.

- **Caveats:** Extreme care should be taken with this file to preserve the confidentiality of the data for individual shippers and railroads. State DOTs typically have a point of contact to receive the data from STB; MPOs may need to justify its use and receive permission from STB in order to obtain the data from their state counterparts or directly from the STB.

Vehicle Inventory and Use Survey (VIUS)

- **Source:** U.S. Census Bureau, U.S. Department of Commerce, and the Bureau of Transportation Statistics (BTS), U.S. Department of Transportation http://www.census.gov/svsd/www/vius/products.html

- **Year:** 2002, updated every 5 years.

- **Description:** The Vehicle Inventory and Use Survey provides information on the nation's truck fleet at the state level, including the characteristics of size, weight, and axles. Data is available in tabular format.

- **Application:** The VIUS data are most useful in examining trends of commercial vehicle use and truck weights, including which industries are using certain types of trucks and the distances they are driving.

- **Caveats:** Like the FAF and CFS, these data are collected once every 5 years and may not reflect current trends.

5.5 Commercial Freight-Related Data Sets for Potential Future Use

In addition to the publicly available data sets described in this chapter, there are several important and widely used commercial freight data sets. The most commonly used for freight planning analysis is the TRANSEARCH dataset produced by Global Insight. Its characteristics, applications, and limitations are described in depth below.

TRANSEARCH

- **Source**: Global Insight

  http://www.globalinsight.com/TradeTransportation

- **Year:** Annual data available about 15 months after end of period

- **Description (and caveats)**: The TRANSEARCH database is one of the most widely used commercial sources of freight movement data in the U.S. It is used by leading freight carriers and public sector agencies. The TRANSEARCH dataset is built from various freight data sources, both public and private. It provides detailed U.S. and cross-border origin-destination freight shipment data at the state, Business Economic Area (BEA), county, metropolitan area, and zip-code level detail by commodity type and major modes of transportation. It comes in tabular format, but can be applied spatially to transportation geospatial networks. Forecasts of commodity flows for up to 25 years also are available.

  TRANSEARCH data are generally accepted as the best available commodity flow data and are commonly used by states, metropolitan planning organizations (MPOs) and FHWA in conducing freight planning activities. However, it should be noted that there are some limitations to how this data should be used and interpreted:

  - **Mode limitations –** The Rail Waybill data used in TRANSEARCH is based on data collected by Class I railroads. The waybill data contains some information for regional and short-line railroads, but only in regards to interline service associated with a Class I railroad. This is important to Maine, as it does not have any direct service from a Class I railroad. The rail tonnage movements provided by the TRANSEARCH database, therefore, are conservative estimates.

  - **Use of Multiple Data Sources –** TRANSEARCH consists of a national database built from company-specific data and other available databases. To customize the dataset for a given region and project, local and regional data sources are often incorporated. This incorporation requires the development of assumptions that sometimes compromise the accuracy of the resulting database. Different data sources use different classifications; most economic forecasts are based on SIC codes while commodity data are organized by STCC codes. For example, the U.S. Bureau of Census' Vehicle Inventory and Use Survey has its own product codes that must be assigned to STCCs to convert truck commodity flows to truck trips. These and other conversions can sometimes lead to some data being mis-categorized or left unreported.

  - **Data Collection and Reporting** –The level of detail provided from some specific companies when reporting their freight shipment activities limits

the accuracy of TRANSEARCH. If a shipper moves a shipment intermodally, for example, one mode must be identified as the primary method of movement. Suppose three companies make shipments from the Midwest U.S. to Europe using rail to New York then water to Europe. One company may report the shipment as simply a rail move from the Midwest to New York; another may report it as a water move from New York to Europe; the third may report the shipment as an intermodal move from the Midwest to Europe with rail as the primary mode. The various ways in which companies report their freight shipments can limit the accuracy of TRANSEARCH.

- **Limitations of International Movements –** TRANSEARCH does not report international air shipments through the regional gateways. Additionally, specific origin and destination information is not available for overseas waterborne traffic through marine ports. Overseas ports are not identified and TRANSEARCH estimates the domestic distribution of maritime imports and exports. TRANSEARCH data also does not completely report international petroleum and oil imports through marine ports. This is a concern to a state like Maine, which receives large amounts of petroleum through its major marine ports from Canada. Finally, TRANSEARCH assigns commodity data only to the truck, rail, air, and water modes, though a large percentage of foreign imports (by weight) consist of oil and petroleum products – commodities that are frequently shipped via pipeline to storage and distribution points.

PIERS (Port Import Export Reporting System)

- Source: Commonwealth Business Media, Inc.

  http://www.piers.com/

- **Year:** Updated Monthly

- **Description:** The Port Import/Export Reporting Service (PIERS) dataset reports trade shipment statistics for cargo movements between ports in Mexico and South America to major trade partners around the world. It is one of the most comprehensive databases on U.S. foreign waterborne imports and exports. Data comes in tabular format but can be applied spatially to geospatial transportation networks.

- **Application:** For MPOs and state agencies, PIERS is most useful in mapping and tracking supply chain characteristics and route characteristics of inland shipments of international shipping containers. The data can be purchased at the zip code level and allow for mapping of origins and destinations of containers by U.S. maritime port.

- **Caveats:** PIERS data are useful, but expensive. For a region like Washington, the PIERS data may not be necessary unless required by a detailed study of container movements or warehousing.

InfoUSA

- **Source:** InfoUSA.com Inc.

  http://www.infousa.com/

- **Year:** Daily updates

- **Description:** InfoUSA provides information on businesses, including commodity codes, number of employees, business addresses, and annual sales volume. Geographic coordinates can be purchased at an additional cost so the data can be geocoded and plotted onto a map as points.

- **Application:** InfoUSA is helpful in freight planning because it allows analysts to filter and map likely freight-generating industries based on commodities produced, employment, and other characteristics. The Rail Realignment Feasibility Study used InfoUSA data to demonstrate the location of regional clusters of manufacturing industries, for example. InfoUSA can also be used as an input to freight modeling because the data characteristics of employment and/or square footage by facility can be used to estimate freight flows by commodity.

- **Caveats:** Care should be taken when assigning or deriving freight generation rates based on employment or square footage because some locations may be headquarters (administrative) and may not generate freight commensurate with rates identified through NCHRP and other studies.

5.6 Data Updates

It is important to keep datasets up to date. Well-informed decisions depend on it. With this in mind, we encourage COG/TPB to perform a periodic review of its freight data to assure it is current. A number of websites simplify this task by centralizing the publicly available freight data. Many of these websites are listed above with the corresponding description of the data. In addition, the U.S Department of Transportation Federal Highway Administration (FHWA), Freight Management and Operations website (http://ops.fhwa.dot.gov/freight/freight_analysis/data_sources.htm) is an excellent source of information.

6.0 Conclusion

The completion of this study positions COG/TPB well for future freight planning activities. It represents a considerable step forward for the agency and provides a solid foundation to build on. It is anticipated that freight planning efforts at COG/TPB will evolve over time, starting modestly and growing as resources become available. COG/TPB is in a position similar to other MPOs of its caliber. It has excellent transportation planning capabilities and can now look toward integrating goods movement analysis into its transportation planning efforts.

As indicated in this report, an understanding of goods movement is critical to a region's transportation planning efforts. Improved tools and a more sophisticated understanding of economic costs and benefits is allowing the transportation planning community to give additional consideration to the movement of goods when planning transportation systems.

By collecting freight related data, developing an initial freight profile, and considering staffing, programming, and outreach opportunities COG/TPB will be positioned to continue to make informed transportation decisions. The region's transportation system has many interdependent elements, all of which need to be considered, including the safe and efficient transportation of goods.

Appendix A

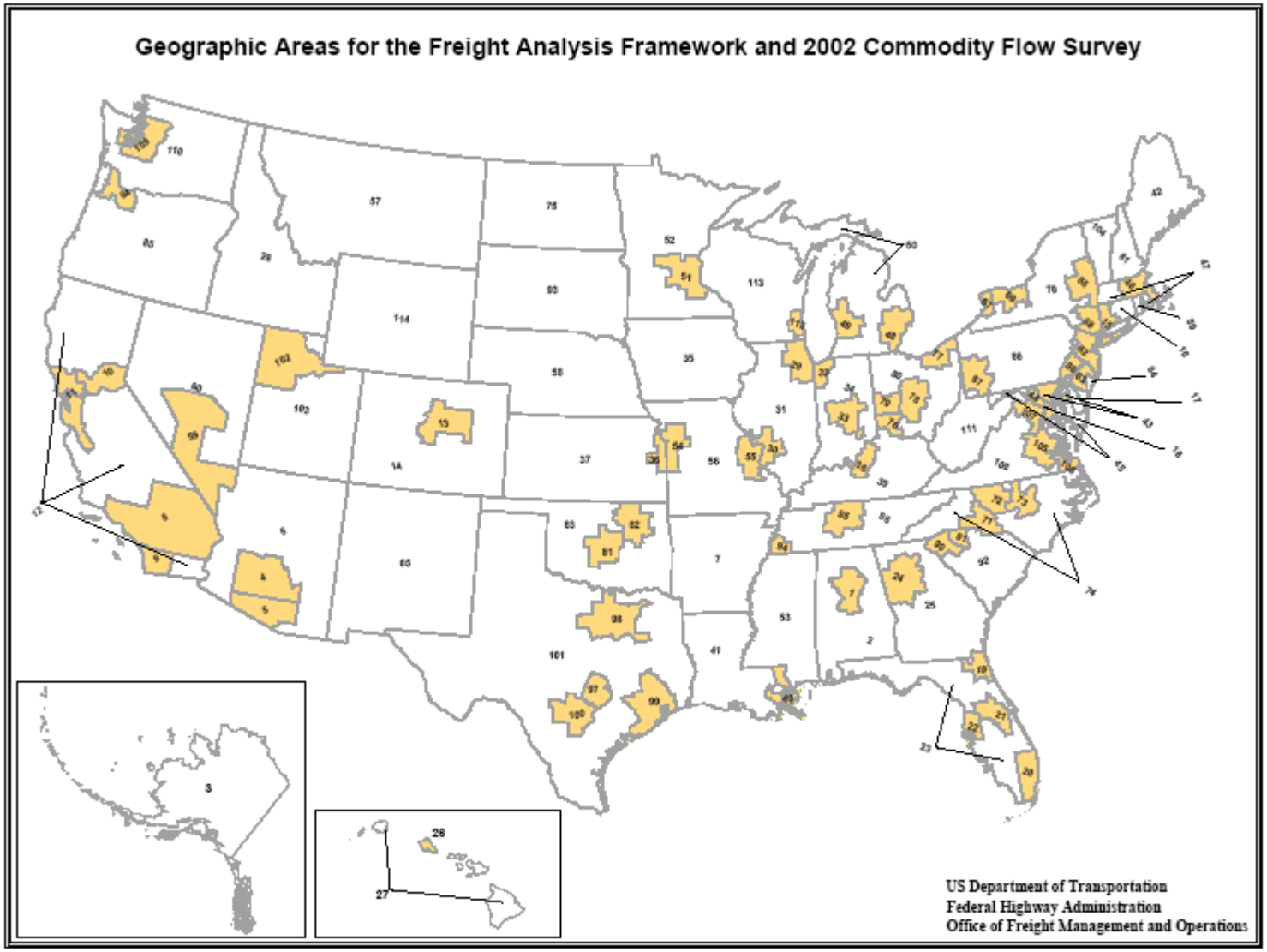
FAF Zones

ID Number	Zone	Location of Zone
1	Birmingham-Hoover-Cullman, AL CSA	Alabama
2	Remainder of Alabama	Alabama
3	Alaska	Alaska
4	Phoenix-Mesa-Scottsdale, AZ MeSA	Arizona
5	Tucson, AZ MeSA	Arizona
6	Remainder of Arizona	Arizona
7	Arkansas	Arkansas
8	Los Angeles-Long Beach-Riverside, CA CSA	California
9	San Diego-Carlsbad-San Marcos, CA MeSA	California
10	Sacramento--Arden-Arcade--Truckee, CA-NV CSA (CA Part)	California
11	San Jose-San Francisco-Oakland, CA CSA	California
12	Remainder of California	California
13	Denver-Aurora-Boulder, CO CSA	Colorado
14	Remainder of Colorado	Colorado
15	New York-Newark-Bridgeport, NY-NJ-CT-PA CSA (CT Part)	Connecticut
16	Remainder of Connecticut	Connecticut
17	Delaware	Delaware
18	Washington-Arlington-Alexandria, DC-VA-MD-WV MeSA (DC Part)	District of Columbia
19	Jacksonville, FL MeSA	Florida
20	Miami-Fort Lauderdale-Miami Beach, FL MeSA	Florida
21	Orlando-The Villages, FL CSA	Florida
22	Tampa-St Petersburg-Clearwater, FL MeSA	Florida
23	Remainder of Florida	Florida

24	Atlanta-Sandy Springs-Gainesville, GA-AL CSA (GA Part)	Georgia
25	Remainder of Georgia	Georgia
26	Honolulu, HI MeSA	Hawaii
27	Remainder of Hawaii	Hawaii
28	Idaho	Idaho
29	Chicago-Naperville-Michigan City, IL-IN-WI CSA (IL Part)	Illinois
30	St Louis, MO-IL MeSA (IL Part)	Illinois
31	Remainder of Illinois	Illinois
32	Chicago-Naperville-Michigan City, IL-IN-WI CSA (IN Part)	Indiana
33	Indianapolis-Anderson-Columbus, IN CSA	Indiana
34	Remainder of Indiana	Indiana
35	Iowa	Iowa
36	Kansas City, MO-KS MeSA (KS Part)	Kansas
37	Remainder of Kansas	Kansas
38	Louisville-Elizabethtown-Scottsburg, KY-IN CSA (KY Part)	Kentucky
39	Remainder of Kentucky	Kentucky
40	New Orleans-Metairie-Bogalusa, LA CSA	Louisiana
41	Remainder of Louisiana	Louisiana
42	Maine	Maine
43	Baltimore-Towson, MD MeSA	Maryland
44	Washington-Arlington-Alexandria, DC-VA-MD-WV MeSA (MD Part)	Maryland
45	Remainder of Maryland	Maryland
46	Boston-Worcester-Manchester, MA-NH CSA (MA Part)	Massachusetts
47	Remainder of Massachusetts	Massachusetts
48	Detroit-Warren-Flint, MI CSA	Michigan
49	Grand Rapids-Wyoming-Holland, MI CSA	Michigan
50	Remainder of Michigan	Michigan
51	Minneapolis-St Paul-St Cloud, MN-WI CSA (MN Part)	Minnesota
52	Remainder of Minnesota	Minnesota
53	Mississippi	Mississippi
54	Kansas City, MO-KS MeSA (MO Part)	Missouri
55	St Louis-St Charles-Farmington, MO-IL CSA (MO Part)	Missouri
56	Remainder of Missouri	Missouri
57	Montana	Montana
58	Nebraska	Nebraska
59	Las Vegas-Paradise-Pahrump, NV CSA	Nevada

60	Remainder of Nevada	Nevada
61	New Hampshire	New Hampshire
62	New York-Newark-Bridgeport, NY-NJ-CT-PA CSA (NJ Part)	New Jersey
63	Philadelphia-Camden-Vineland, PA-NJ-DE-MD CSA (NJ Part)	New Jersey
64	Remainder of New Jersey	New Jersey
65	New Mexico	New Mexico
66	Albany-Schenectady-Amsterdam, NY CSA	New York
67	Buffalo-Cheektowaga-Tonawanda, NY MeSA	New York
68	New York-Newark-Bridgeport, NY-NJ-CT-PA CSA (NY Part)	New York
69	Rochester-Batavia-Seneca Falls, NY CSA	New York
70	Remainder of New York	New York
71	Charlotte-Gastonia-Salisbury, NC-SC CSA (NC Part)	North Carolina
72	Greensboro--Winston-Salem--High Point, NC CSA	North Carolina
73	Raleigh-Durham-Cary, NC CSA	North Carolina
74	Remainder of North Carolina	North Carolina
75	North Dakota	North Dakota
76	Cincinnati-Middletown-Wilmington, OH-KY-IN CSA (OH Part)	Ohio
77	Cleveland-Akron-Elyria, OH CSA	Ohio
78	Columbus-Marion-Chillicothe, OH CSA	Ohio
79	Dayton-Springfield-Greenville, OH CSA	Ohio
80	Remainder of Ohio	Ohio
81	Oklahoma City-Shawnee, OK CSA	Oklahoma
82	Tulsa-Bartlesville, OK CSA	Oklahoma
83	Remainder of Oklahoma	Oklahoma
84	Portland-Vancouver-Beaverton, OR-WA MeSA (OR Part)	Oregon
85	Remainder of Oregon	Oregon
86	Philadelphia-Camden-Vineland, PA-NJ-DE-MD CSA (PA Part)	Pennsylvania
87	Pittsburgh-New Castle, PA CSA	Pennsylvania
88	Remainder of Pennsylvania	Pennsylvania
89	Rhode Island	Rhode Island
90	Greenville-Anderson-Seneca, SC CSA	South Carolina
91	Spartanburg-Gaffney-Union, SC CSA	South Carolina
92	Remainder of South Carolina	South Carolina
93	South Dakota	South Dakota
94	Memphis, TN-MS-AR MeSA (TN Part)	Tennessee
95	Nashville-Davidson--Murfreesboro--Columbia, TN CSA	Tennessee

96	Remainder of Tennessee	Tennessee
97	Austin-Round Rock, TX MeSA	Texas
98	Dallas-Fort Worth, TX CSA	Texas
99	Houston-Baytown-Huntsville, TX CSA	Texas
100	San Antonio, TX MeSA	Texas
101	Remainder of Texas	Texas
102	Salt Lake City-Ogden-Clearfield, UT CSA	Utah
103	Remainder of Utah	Utah
104	Vermont	Vermont
105	Richmond, VA MeSA	Virginia
106	Virginia Beach-Norfolk-Newport News, VA-NC MeSA (VA Part)	Virginia
107	Washington-Baltimore-Northern Virginia, DC-MD-VA-WV CSA (VA Part)	Virginia
108	Remainder of Virginia	Virginia
109	Seattle-Tacoma-Olympia, WA CSA	Washington
110	Remainder of Washington	Washington
111	West Virginia	West Virginia
112	Milwaukee-Racine-Waukesha, WI CSA	Wisconsin
113	Remainder of Wisconsin	Wisconsin


Geographic Areas for the Freight Analysis Framework and 2002 Commodity Flow Survey
US Department of Transportation
Federal Highway Administration
Office of Freight Management and Operations

Appendix B

Standard Classification of Transported Goods (SCTG)

Cereal grains
Wheat
Corn, except sweet
Other cereal grains

Other agricultural products
Fresh or chilled potatoes (Irish potatoes), except sweet
Fresh or chilled vegetables, except potatoes (Irish potatoes)
Dried vegetables
Fresh or chilled citrus fruit
Fresh or chilled edible fruit, except citrus
Dried fruit
Fresh or dried nuts
Soya beans
Oil seeds and nuts, except olives and soya beans
Bulbs, live plants, and seeds for sowing n.e.c.
Fresh-cut flowers
Unmanufactured tobacco
Raw cotton not carded or combed
Other

Animal feed and products of animal origin, n.e.c.
Cereal straw or husks and forage products
Inedible flours, meals, and pellets of meat, fish, or seafood, and greaves
Bran, sharps, and other residues of cereals or leguminous plants
Oil cake and other solid residues from the manufacture of vegetable fats or oils
Other
Dog or cat food put up for retail sale
Other including complete feeds, premixes, bird seed, fish food, and feed supplements

Meat, fish, seafood, and their preparations
Fresh, chilled, or frozen, except poultry
Fresh, chilled, or frozen poultry
Meat, salted, in brine, dried, or smoked, edible flours and meals, and pig and poultry fat, not rendered
Fish, except live, and seafood, except preparations
Of meat, including poultry
Of fish or seafood

Milled grain products and preparations, and bakery products

Wheat flour, groats, and meal
Malt
Other
Pasta, including stuffed, canned, frozen, or dried, and couscous
Breakfast cereal foods, rice cakes, and similar prepared foods obtained by swelling or roasting of cereals or cereal products
Other
Baked snack foods
Frozen baked products
Perishable or dry baked products

Other prepared foodstuffs and fats and oils

Milk and cream
Cheese and curds
Ice cream or ice milk and their novelties, water ices, and sherbets
Other
Frozen vegetables and vegetable preparations
Processed or prepared vegetables, except frozen, dried, or milled
Processed or prepared fruit and nuts, except dried
Juices except those fortified with vitamins or minerals, but including mixtures
Coffee, tea, and spices, except unprocessed coffee and unfermented tea
Animal fats and oils and their fractions, not chemically modified
Fixed vegetable fats and oils and their fractions, not chemically modified
Chemically modified fats and oils, prepared edible fats, and animal or vegetable waxes
Flours and meals of oil seeds, except of mustard
Cane, beet, and other sugars in solid form, sugar syrups not containing added flavoring or coloring matter, and molasses
Confectionery
Cocoa beans, paste, butter, and powder, and cocoa preparations
Sauces, mixed condiments and seasonings, prepared mustard, and mustard flours and meals
Soups and broths and their preparations and baby or dietetic food preparations
Syrups and concentrates, and flavoring powders, extracts, or essences
Other
Sweetened or flavored water
Other

Alcoholic beverages

Malt beer
Wine and other fermented beverages
Undenatured ethyl alcohol of a strength by volume of 80 percent volume or higher and denatured ethyl alcohol of any strength
Undenatured ethyl alcohol of an alcoholic strength by volume of less than 80 percent volume, spirits, and liqueurs and other spirituous beverages

Tobacco products

Cigarettes
Other

Monumental or building stone
Calcareous monumental or building stone
Monumental or building stone, except calcareous and dolomite

Natural sands
Silica sands and quartz sands, for construction use
Silica sands and quartz sands, for uses other than construction, and other sands

Gravel and crushed stone
Limestone and chalk (calcium carbonate)
Gravel and crushed stone, except dolomite, slate, and limestone

Nonmetallic minerals, n.e.c.
Salt
Natural calcium phosphates, natural aluminum-calcium phosphates, and phosphatic chalk
Dolomite
Sulphur, except sublimed, precipitated, and colloidal
Clays
Other

Metallic ores and concentrates
Iron ores and concentrates
Copper
Other

Coal
Non-agglomerated bituminous coal
Non-agglomerated anthracite
Non-agglomerated lignite, except jet
Agglomerated coal

Gasoline and aviation turbine fuel
Gasoline
Aviation turbine fuel (types A and B)

Fuel oils
Fuel oils

Coal and petroleum products, n.e.c.
Lubricating oils and greases containing by weight 70 percent or more of petroleum oils or oils obtained from bituminous minerals
Refined petroleum oils and oils obtained from
Liquefied natural gas
Liquefied gaseous hydrocarbons, except liquefied natural gas
Gaseous hydrocarbons in a gaseous state
Coal coke, petroleum coke, and retort carbon
Petroleum asphalt
Bituminous mixtures based on natural asphalt, natural bitumen, petroleum asphalt, mineral tar, or mineral-tar pitch, and tarred macadam
Other

Basic chemicals

Sodium hydroxide (caustic soda) and potassium hydroxide (caustic potash)
Sublimed, precipitated, or colloidal sulphur
Inorganic acids, except nitric and phosphoric
Aluminum oxide and aluminum hydroxide
Industrial gases
Sodium or potassium compounds, n.e.c.
Metal compounds, n.e.c.
Other
Cyclic hydrocarbons
Acyclic alcohols
Phenols, phenol-alcohols, aldehydes, cyclic polymers of aldehydes, paraformaldehyde, ketones, and quinones
Organic acids
Organic chemicals, n.e.c.

Pharmaceutical products

Pharmaceutical products

Fertilizers

Animal or vegetable fertilizers and fertilizers produced by the mixing or chemical treatment of animal or vegetable products
Nitrogenous mineral or chemical fertilizers
Phosphatic mineral or chemical fertilizers
Potassic mineral or chemical fertilizers
Other

Chemical products and preparations, n.e.c.

Paints and varnishes
Vegetable tanning or dyeing extracts and coloring matter, tannins and their derivatives, putty and other mastics, animal coloring matter, powdered glass, household dyes, specialty preparations for paint, glass, and similar bases, and inks
Essential oils and resinoids, and perfumery, cosmetic, or toilet preparations
Soap, organic surface-active agents, cleaning preparations, polishes and creams, and scouring preparations
Photographic film, plates, paper, paperboard, or textiles, and chemical preparations for photographic use
Insecticides, rodenticides, fungicides, herbicides, anti-sprouting products, plant-growth regulators, disinfectants, and similar products, in packages for retail sale or as preparations or articles
Other chemical products and preparations

Plastics and rubber

Plastics in primary forms, rubber in primary forms or sheets, and unvulcanized compounded rubber
Manmade fibers and plastics basic shapes
Articles
Tires and related products
Other

Logs and other wood in the rough
Logs for pulping (pulpwood)
Logs for lumber
Other

Wood products
Wood chips or particles
Lumber
Wood continuously shaped along any of its edges or faces and shingles and shakes
Veneer sheets and sheets for plywood
Particle board, fiberboard, and similar board of wood or other ligneous materials
Plywood, veneered panels, and similar laminated wood
Builders joinery and carpentry of wood, except shingles and shakes
Other wood products

Pulp, newsprint, paper, and paperboard
Mechanical wood pulp
Non-dissolving grades of soda or sulphate chemical wood pulp
Other
Newsprint in large rolls or sheets
Paper
Paperboard
Paper
Paperboard

Paper or paperboard articles
Toilet paper, facial tissues, paper towels and napkins, sanitary napkins and tampons, disposable diapers, and similar household, sanitary, or hospital articles of paper pulp, paper, cellulose wadding, or webs of cellulose fibers
Packing containers of paper, paperboard, cellulose wadding, or webs of cellulose fibers
Other

Printed products
Printed books, brochures, leaflets, and similar printed products
Newspapers
Journals and periodicals
Advertising material, commercial or trade catalogues, and similar printed products
Printed or illustrated postcards, messages, or announcements, and printed cards bearing personal greetings
Other

Textiles, leather, and articles of textiles or leather
Textile fibers, processed but not spun or made into yarn
Yarns and thread, except specialty yarns, such as metallized or gimped
Broadwoven fabrics, except made of metallized yarn
Knitted or crocheted fabrics
Textile clothing and accessories, and headgear, except safety
Narrow-woven fabrics and related products
Carpets and other textile floor coverings

Household furnishings
Other
Footwear
Leather and articles, luggage of related materials, and dressed furskins and articles

Nonmetallic mineral products
Hydraulic cements
Refractory cements, mortars, concretes, and ceramic products
Ceramic construction products
China, porcelain, and other ceramic household or personal articles
Other
Glass in sheets or profiles
Containers of glass used for transporting or packing goods
Other
Worked monumental or building stone and articles
Articles of asphalt or of similar material
Plaster and articles of plaster or of compositions based on plaster
Non-refractory mortars and concretes
Articles of cement, concrete, or artificial stone
Other

Base metal in primary or semi-finished forms and in finished basic shapes
Iron and steel in primary forms, in semi-finished forms, or in powders or granules, and ferro alloys
Flat-rolled products of iron or steel
Bars, rods, angles, shapes, sections, and wire, of iron or steel
Copper
Aluminum
Other

Articles of base metal
Pipes and tubes
Pipe and tube fittings
Structures and parts, except prefabricated buildings
Nails, screws, bolts, nuts, washers, staples except in strips, and similar fastening articles
Hand tools and cutlery, except of precious metals
Interchangeable tools for hand- or machine-tools
Locks, mountings and fittings, racks and similar fixtures, and automatic door closers, of base metal
Containers of a capacity not exceeding 300 liters, except containers for compressed and liquefied gas
Other

Machinery
Spark-ignition reciprocating internal-combustion engines for motor vehicles, of a cylinder capacity exceeding 1000 cubic centimeters
Other internal-combustion engines
Parts of internal-combustion piston engines
Turbines
Boilers, nuclear reactors, and non-electric motors except internal-combustion piston engines

Pumps for liquids
Air or vacuum pumps and air or other gas compressors
Fans and ventilating or recycling hoods incorporating a fan
Air-conditioning equipment
Refrigerating or freezing equipment
Lifting, handling, loading, or unloading machinery and equipment
Moving, grading, levelling, scraping, excavating, tamping, compacting, extracting, or boring machinery for earth, minerals, or ores, pile-drivers and -extractors, and snow-ploughs and -blowers
Dishwashing machines, machinery for cleaning or drying bottles or other containers, machinery for aerating beverages, and packing or wrapping machinery including for filling, closing, sealing, capsuling, or labelling containers
Agricultural, horticultural, forestry, and poultry- or beekeeping machinery
Textile manufacturing machines and household, commercial, or industrial laundry and sewing machines
Machine-tools, except for semiconductor devices, for working hard materials
Powered hand-tools, pneumatic, hydraulic, or with a self-contained electric or non-electric motor
Machines and apparatus, and wire, rods, tubes, plates, electrodes and similar products used for soldering, brazing, or welding
Ball or roller bearings, transmission shafts and cranks, bearing housings and plain shaft bearings, gears and gearings, ball and roller screws, gear boxes and other speed changers, flywheels and pulleys, and clutches and shaft couplings
Other

Electronic and other electrical equipment and components, and office equipment
Electric motors, generators, generating sets, and rotary converters
Electric or electronic transformers, static converters including rectifiers, and inductors
Electric cooking appliances
Electro-mechanical or electro-thermic domestic appliances, except cooking appliances
Telephone or telegraph switching apparatus, except parts
Other
Electronic entertainment products, except parts
Computer equipment
Office equipment
Prepared unrecorded media for audio, video, computer, or other uses
Pre-recorded media
Transmission apparatus for radio or television broadcasting, radio transmission and reception apparatus, radar apparatus, radio navigational-aid apparatus, and radio remote-control apparatus, except radio broadcast receivers and parts
Electronic parts
Parts of the goods of SCTG 354 and 357
Primary and storage batteries
Apparatus for switching or protecting electrical circuits or for making connections to or in electrical circuits, and boards, panels, consoles, desks, cabinets, or similar bases equipped with these apparatus
Other

Motorized and other vehicles (including parts)

Motor vehicles for the transport of less than 10 people except motorcycles, armored fighting vehicles, snowmobiles, golf carts and similar vehicles, and parts
Motor vehicles for the transport of goods, except parts
Road tractors for semi-trailers, except parts
Tractors, except road tractors, work tractors, and parts
Motor vehicles for the transport of people with a seating capacity of 10 or more persons, except parts
Special-purpose motor vehicles, except parts
Motor vehicle chassis fitted with engines and separately shipped bodies
Motorcycles, bicycles, and other cycles
Trailers and semi-trailers
Other
Parts and accessories for motor vehicles except for motorcycles and armored fighting vehicles

Transportation equipment, n.e.c.
Locomotives and rolling stock, railway track fixtures and fittings, mechanical or electro-mechanical traffic-signalling equipment, and inter-modal containers
Aircraft, except parts
Spacecraft and suborbital and spacecraft launch vehicles, except parts
Parts of aircraft and spacecraft
Parachutes, rotochutes, aircraft-launching gear, deck-arresters, and flight simulators
Pleasure or sporting vessels
Commercial ships and boats and floating structures

Precision instruments and apparatus
Optical elements, instruments, and apparatus, except photographic and photocopying equipment and optical instruments and apparatus for measuring or checking
Photographic cameras, image projectors, enlargers and reducers, projection screens, negatoscopes, and apparatus and equipment for film developing
Photocopying and thermocopying apparatus
Navigational instruments and appliances except radar and other radio-type navigational-aid apparatus
Surveying, hydrographic, oceanographic, hydrological, meteorological, geophysical, drawing, or mathematical-calculating instruments and appliances
Apparatus based on the use of X-rays or alpha, beta, or gamma radiation
Electromedical equipment
Other
Instruments and apparatus for measuring or checking electrical quantities
Industrial process-control instruments
Other

Furniture, mattresses and mattress supports, lamps, lighting fittings, and illuminated signs
Household or office furniture
Other furniture
Lighting equipment including for transportation equipment but except for motor vehicles, and lamps, lighting fittings, and illuminated signs

Miscellaneous manufactured products
Arms

Munitions and ammunition
Toys and games
Sporting equipment
Clocks and watches
Prefabricated buildings
Writing or drawing instruments and inked ribbons and pads
Precious metal forms and shapes, pearls, precious or semi-precious stones, and articles, and coins
Other

Waste and scrap
Slag, ash, and residues
Of ferrous metal
Of nonferrous metal, including precious
Sawdust and wood waste and scrap
Of paper or paperboard
Other

Mixed freight
Mixed freight
Commodity unknown

Source: Bureau of Transporation Statistics