



# Urban Freight Case Studies: Washington, D.C.

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U.S. Department of Transportation  
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## URBAN FREIGHT CASE STUDIES

The Federal Highway Administration (FHWA), Office of Freight Management and Operations, developed the Urban Freight Cases Studies as a way to document notable practices in urban goods movement. These case studies provide information on freight-related initiatives that mitigate congestion and improve the safety and efficiency of commercial vehicle travel in urban areas. Washington, DC is one of four urban areas selected for study. The other areas are Los Angeles, Orlando, and New York City.

In order to develop the most useful case studies, FHWA conducted an extensive review of freight-related projects and strategies that provide practical information and transferable solutions to the challenges that confront urban goods movement. The project team also conducted site visits and interviews with organizations involved in project implementation, including state departments of transportation (DOTs), metropolitan planning organizations (MPOs), city governments, and private-sector businesses. The results of the site visits and interviews are highlighted here.

### WASHINGTON, DC

Washington, DC is home to a vibrant business district, a large tourist industry, important federal and local government agencies, world-renowned universities, dynamic entertainment centers, mixed-use commercial areas, and high-density residential neighborhoods. The Washington metropolitan area, which includes the District of Columbia and Maryland and Virginia suburbs, has one of the worst traffic congestion problems in the country. According to the Texas Transportation Institute, Washington, DC ranks third in annual hours of delay per traveler.<sup>1</sup> Thus, the management of goods and services delivery is an important issue facing the area.

The primary elements of Washington, DC's freight management, operations, planning, and implementation activities include:

- A *Downtown Curb-space Management Plan* that optimizes curbside utilization,
- The *Washington Convention Center Transportation Operations and Parking Plan* that addresses the management of truck activities at the Convention Center and

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<sup>1</sup> David Schrank and Tim Lomax, Texas Transportation Institute, The Texas A&M University System, *2007 Urban Mobility Report*, available at <http://mobility.tamu.edu>.

## WASHINGTON, DC (continued)

neighborhood concerns, and

- *The District of Columbia Motor Carrier Management and Threat Assessment Study* that provides a framework for the creation of a comprehensive motor carrier management program.

### Geographic Description

Washington, DC is located on the banks of the Potomac River and is bordered by the states of Virginia to the southwest and Maryland to the north and southeast. The city has a resident population of nearly 600,000;<sup>2</sup> however, the city's population rises to over 980,000 during the workweek due to commuters from the surrounding suburbs.<sup>3</sup> The Washington Metropolitan area has a total population of 5.3 million, making it the eighth largest metropolitan area in the country.

The District has 1,500 miles of streets and 245 bridges.<sup>4</sup> By vehicle, Washington, DC is accessible via several major highways, including I-95, I-66, US Route 50, and US Route 1 (Figure 1). Other modes of transportation in and around the District include Amtrak, which provides service into Union Station near the U.S. Capitol, and CSX freight rail. The Washington Metrorail System, commonly known as Metro, serves the District of Columbia and the Northern Virginia and Maryland suburbs. The Washington Metropolitan Area Transportation Authority (WMATA) operates Metro and a comprehensive bus transit system that also serves the metropolitan area.

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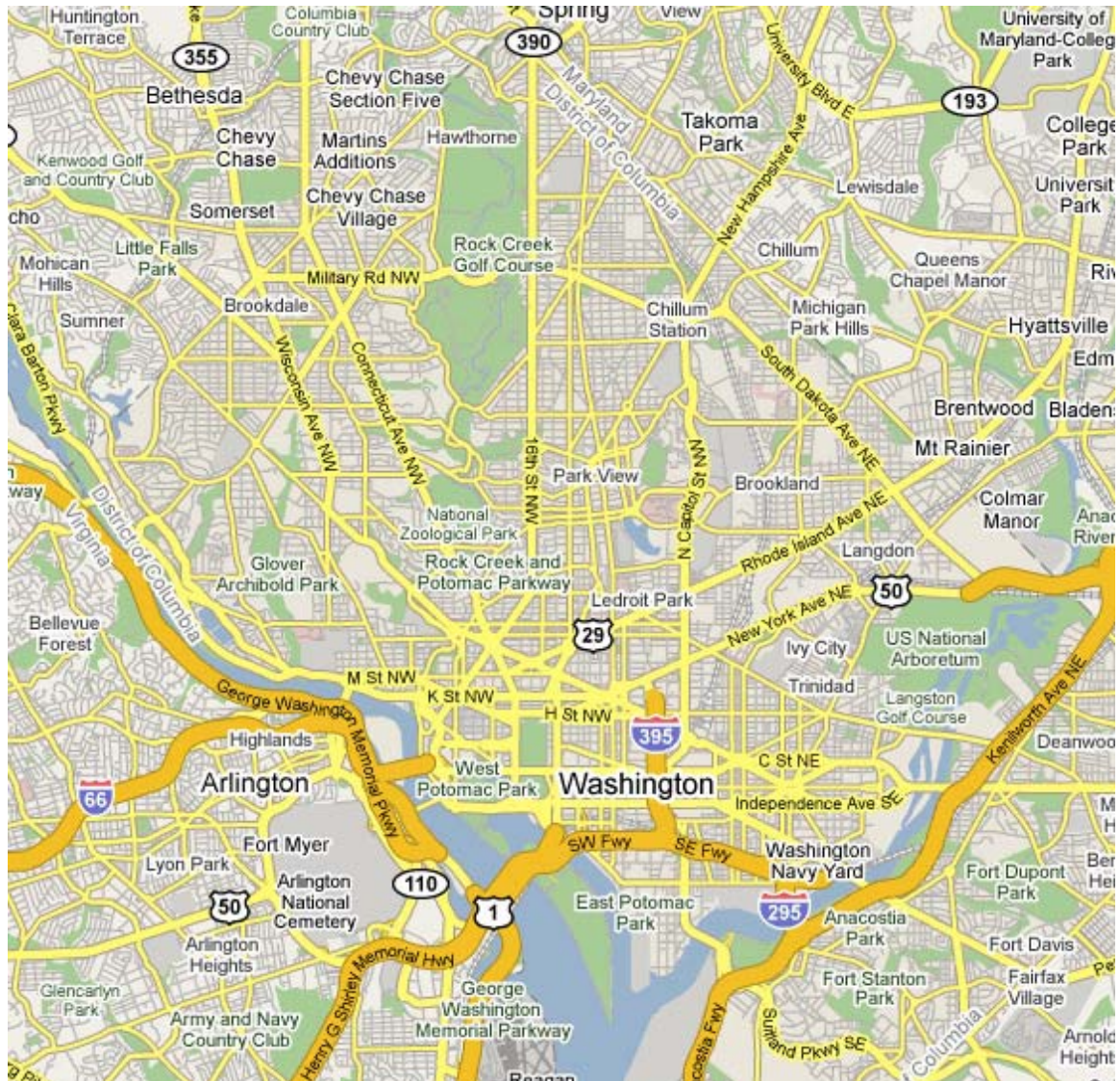
<sup>2</sup> U.S. Department of Commerce, Census Bureau, Population Estimates, Metropolitan Statistical Areas (Washington, DC: 2008).

<sup>3</sup> U.S. Department of Commerce, Census Bureau, 2000 Census: Estimated Daytime Population (Washington, DC: 2005).

<sup>4</sup> U.S. Department of Transportation, Bureau of Transportation Statistics, *State Transportation Statistics 2007* (Washington, DC: 2008), tables 1-1 and 1-7.

## Geographic Description (continued)

Figure 1: Study Area Location Map



Source: Google Maps

### Institutional Involvement

#### ***DISTRICT DEPARTMENT OF TRANSPORTATION (DDOT)***

DDOT's mission is to enhance the quality of life for District residents and visitors by ensuring that people, goods, and information move efficiently and safely, with minimal adverse impacts on residents and the environment. New housing and commercial space, the District's unique and complex set of security concerns, and limited truck management strategies required DDOT to reconsider and redefine its policies for the movement of trucks. To address such issues, DDOT commissioned the *District of Columbia Motor Carrier Management and Threat Assessment Study*.

## ***DOWNTOWN DC BUSINESS IMPROVEMENT DISTRICT (BID)***

The Downtown DC BID is a 140-block neighborhood stretching from the U.S. Capitol to the White House. It focuses on revitalizing the downtown area and making it cleaner, safer, and more vibrant. Property owners in this area tax themselves to purchase services and make capital improvements that supplement those provided by the District.<sup>5</sup> The Downtown DC BID partnered with DDOT, the Golden Triangle BID, and the Washington, DC Department of Public Works (DPW) to develop a curb-space management program that was recommended by the Downtown Congestion Task Force.

## ***WASHINGTON CONVENTION CENTER AUTHORITY (WCCA)***

The WCCA, together with the District DPW and DDOT, jointly agreed to implement recommendations in the 1997 *Transportation Master Plan*, with respect to traffic management near the Washington Convention Center. The *Transportation Operations and Parking Plan* was developed to address traffic control at intersections; routing of trucks, buses, and other vehicles; management of crowds and pedestrian zones; residential permit parking; shuttle bus operations; event-related temporary on-street parking restrictions; and coordination requirements among WCCA, the District of Columbia Government, and WMATA.

## **NOTABLE PRACTICES**

### **Downtown Curb-Space Management Plan**

DDOT partnered with the Downtown DC and Golden Triangle BIDs and DPW to develop the *Downtown Curb-space Management Plan*. The Volpe National Transportation Systems Center (Volpe) provided technical assistance in developing the *Plan*.

The goal of the Downtown Curb-space Management program is to reduce congestion in greater downtown D.C. through five initiatives:<sup>6</sup>

- Reallocation of existing curb-space through regulatory signage,
- Increase commercial vehicle loading space by lengthening loading zones from 40 feet to 100 feet wherever possible,

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<sup>5</sup> Downtown DC Business Improvement District, [www.downtowndc.org](http://www.downtowndc.org).

<sup>6</sup> Discussion of the five initiatives is based largely on Ellen Jones, Arun Chatterjee, and Robert L. Marsili, "A Collaborative Plan for Curbside Freight Delivery in Washington, DC, USA," *ITE Journal*, May 2009.

## **Downtown Curb-Space Management Plan (continued)**

- Introduction of new parking technology,
- Establishment of metered loading zones, and
- Enhanced parking enforcement.

### ***REALLOCATION OF CURB SPACE***

Regulation of curb-space is a challenging process due to the ever-changing and growing demand for use of limited space. Often, curb-space is not utilized as efficiently as possible, and this produces congestion in adjacent travel lanes.

The Downtown DC and Golden Triangle BIDs compiled information on all curb-space signage for the 14 most highly congested downtown corridors and streets identified by DDOT and Volpe. Based on this information, block-face maps in a Geographical Information Systems (GIS) format were created. DDOT and BID staff also observed and analyzed conditions created by the regulations and developed new curb-space regulatory plans for each block face in the priority corridors. New signage has been installed on K and I Streets NW, between 12th and 21st Streets.

### ***LONGER LOADING ZONES***

Developed by DDOT and BID staff, the new regulatory curb-space plans moved commercial loading zones to the approach end of each block wherever possible. This made parking at the curb easier and reduced double parking. The K Street, NW, loading zones also were extended to 100 feet in length wherever possible.

### ***MULTISPACE METERS***

Multispace meters were installed along K Street NW, between 12<sup>th</sup> and 21<sup>st</sup> Streets, to better manage curb parking. Several of the benefits of multispace meters include:

- The meters provide more potential space for vehicles,
- The meters accept both credit cards and coins as payment,
- The meters do not accept payment during hours when parking is illegal, and
- Multispace meters provide more sidewalk space for pedestrians and improve the appearance of the streetscape.

### ***MULTISPACE METERS (continued)***

In the future, multispace meters have the potential to offer congestion-based pricing or a rate structure that varies by time of day or length of stay.

### ***METERED LOADING ZONES***

DDOT observed a high incidence of commercial vans using loading zones for free all-day parking. In addition, DDOT noted that extended loading times for some delivery vehicles indicated that they should be using off-street loading areas, and the 15-minute limit for vehicles using a loading zone was generally disregarded. To encourage more efficient use of loading zones and vehicle turnover rates, metering of loading zones along K Street, NW, was introduced shortly after the installation of multispace meters. Commercial vehicles must now pay \$1 per hour and are limited to two hours.

### ***ENHANCED PARKING ENFORCEMENT***

DPW increased its parking enforcement efforts on K Street, NW, between 12th and 21<sup>st</sup> Street in addition to other curb-space management strategies.

## **Outreach**

### ***STAKEHOLDER WORKSHOPS***

Communication between BIDs, DDOT, and other stakeholders is essential to better organize the use of curb-space on congested streets. All property managers responsible for buildings along the priority corridors were invited to discuss how the curb-space functioned for their buildings' uses prior to developing changes in curb-space regulations. Upon completion of the revised curb-space regulatory plans, stakeholders were given the opportunity to review and share their opinions on the recommended changes to curbside regulations.

### ***COMMUNICATION WITH COMMERCIAL VEHICLE OPERATORS***

To spread the word about changes to commercial vehicle loading zones on K Street, NW, letters were sent to over 300 companies that deliver goods and services in downtown DC. In September 2006, DDOT informed companies of loading zone extensions to 100 feet in many locations and the new requirement to pay for the use of the space. In March 2007, DPW communicated its stepped-up parking enforcement efforts for loading zone and double-parking violations. Property managers along the targeted K Street, NW, corridor



## ***COMMUNICATION WITH COMMERCIAL VEHICLE OPERATORS (continued)***

also received information from DDOT and DPW with the hope that they would spread the word to their tenants and delivery companies.

### ***PUBLIC EDUCATION***

BID personnel, Safety, Hospitality, and Maintenance employees (SAMs), and Golden Triangle Ambassadors received training on the use of the new multispace meters so that they can help the public. The SAMs and Ambassadors distributed an informational brochure on the new meters.

## **Evaluation<sup>7</sup>**

### ***PARKING CITATIONS***

Increased enforcement along K Street, NW, resulted in double the number of violations and citations issued in May 2007 over the previous month. Similarly, the number of violations issued in May 2007 increased by 50 percent over the number issued in September 2006. The increased enforcement and the resulting improvement in the use of on- and off-street loading space is an important factor in the reduction of travel times along K Street, NW.

### ***TRAVEL TIME STUDY***

Car, bicycle, and transit bus travel-time baseline data were collected on five of the District's priority corridors in September 2006. A post-implementation study was conducted on K Street, NW, one of the priority corridors, in May 2007.

Data show a statistically significant reduction in automobile and bicycle travel times along K Street, NW, between 12th and 21st Streets, in May 2007 compared with September 2006. Travel time variability also was reduced after the implementation of congestion management measures. A reduction in bus travel time was notable but not as significant. This could be due to an approximately 11 percent increase in ridership on the Circulator bus in May 2007 compared with September 2006.

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<sup>7</sup> This discussion is based on Ellen Jones, Arun Chatterjee, and Robert L. Marsili, "A Collaborative Plan for Curb-side Freight Delivery in Washington, DC, USA," ITE Journal, May 2009.

## Pending Actions

### ***OFF-STREET LOADING***

Efficient loading practices are a key ingredient in reducing congestion caused by commercial vehicles. It is essential to utilize rear alleys and loading docks wherever available. Illegal parking and the lack of enforcement in alleys preclude the efficient use of the rear access.

DDOT, DPW, the Downtown DC and Golden Triangle BIDs, and affected property managers worked together to identify two pilot locations for the off-street loading project (1629 K and 1666 K Streets, NW). Two on-site inspections were conducted, and an action plan was developed for the agencies.

DDOT's Public Space Administration has provided the plats for the buildings and alleys so all parties know where the lines are between public and private space. The next step is to install more DDOT signage that discourages illegal parking. After installation, DPW will enhance enforcement in the alleys to discourage illegal parking and make way for legitimately loading and unloading vehicles.

Another component of the plan gives parking enforcement officials the authority to ticket vehicles parked without permits on private land. All of these efforts will lead to increased and efficient loading and result in fewer trucks loading at the curb.

### ***SIGNAGE INSTALLATION***

Regulatory curb-side signage is being changed as a part of the curb side management program. Inventories of curbside regulations have been collected for each of the priority corridors and all recommended changes have been made and agreed upon by the Downtown DC and Golden Triangle BIDs, DDOT, and stakeholders. The final steps of this process are the submission of the notices of intent to change the regulatory signage and then the installation of the new regulatory signage. After the signage is installed, DDOT can conduct travel-time studies to evaluate the effectiveness of changes to curbside signage.

## Transportation Operations and Parking Plan

The District is home to the Washington Convention Center, a state-of-the-art facility that opened in 2003 in downtown Washington, DC, that opened in 2003. As described in the Transportation Operations and Parking Plan, the Center has a total floor area of approximately 2.3 million square feet, covering six city blocks on 17 acres, and is the largest building in Washington. Its size allows the simultaneous setup and breakdown of one convention while another one is being held. The Center can hold conventions on consecutive days, and thus produce steady transportation activity from week to week. Not surprisingly, the efficient management of truck activities such as loading, unloading, storage, and security, without negatively affecting neighboring streets, is critical to the successful operation of the Convention Center.

### ***TRUCK OPERATIONS***

The Center has 72 truck loading docks, space to park up to 36 trucks along internal lay-by lanes and ramps, and capacity to store approximately 70 trucks in exhibit halls when not in use. Nearly 180 trucks can be stored within the building.

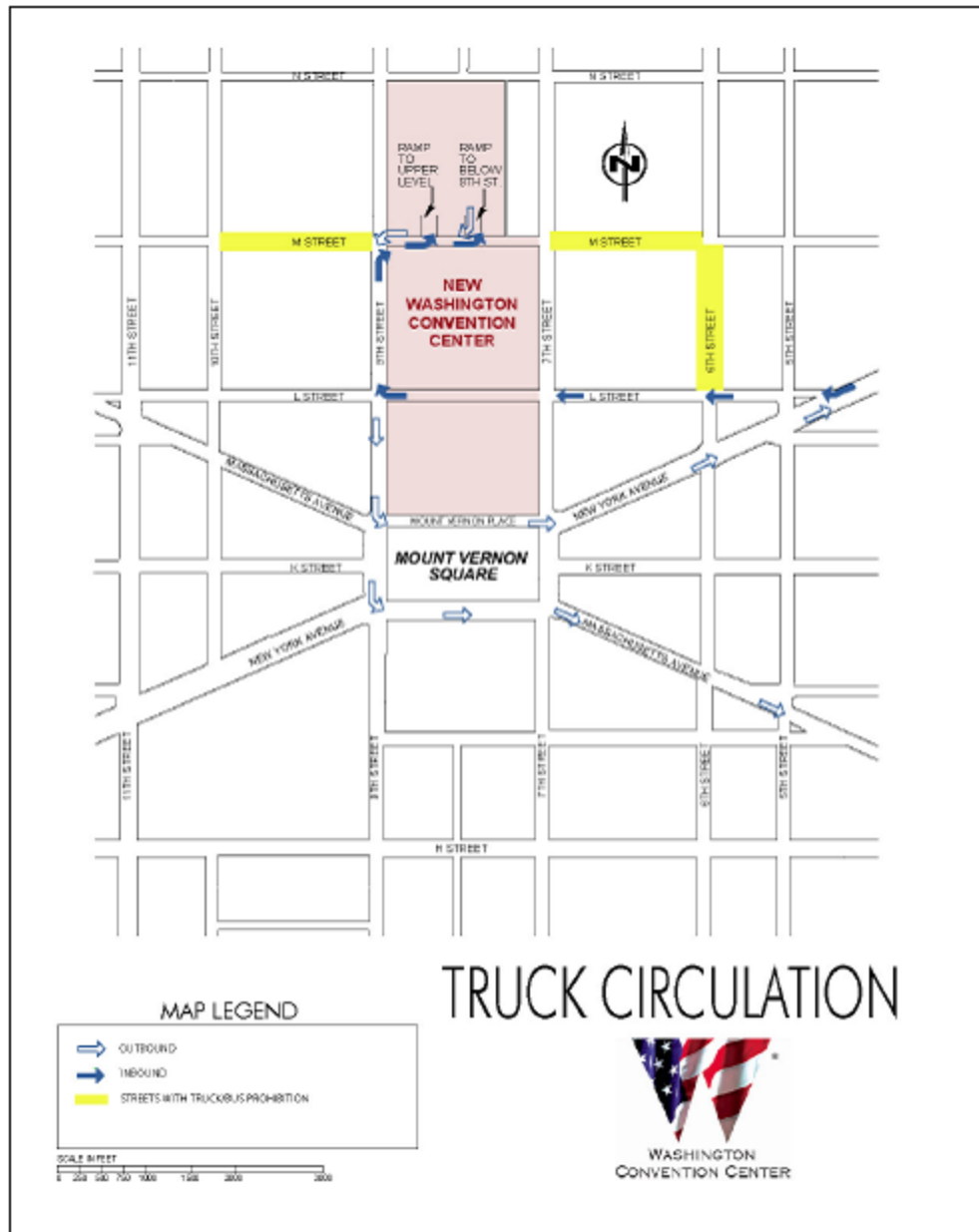
The greatest truck activity, 100 to 140 trucks per day, occurs about 12 days per year. This level of truck activity can be accommodated within the Center by staging truck arrivals and departures throughout the day and utilizing the building's large storage capacity. The Convention Center also has an agreement with RFK Stadium to permit truck marshalling activities at the Stadium on an as-needed and pay-per-use basis. This allows for efficient management of truck traffic without negatively affecting surrounding streets.

Truck operations in and around the Convention Center typically are expected to occur between the hours of 7:00 a.m. and 8:00 p.m. on weekdays and are restricted to specific routes to prevent truck traffic in nearby residential neighborhoods (Figure 2). In addition, trucks are not permitted to park on surrounding streets, and all truck activity is expected to occur in the truck loading and unloading areas within the Convention Center itself. The Convention Center Transportation Manager provides this information to all contractors before an event.

Convention Center public safety personnel enforce truck restrictions on surrounding streets and they monitor truck activity near the Center and report any restricted truck activity to the Metropolitan Police Department.

**TRUCK OPERATIONS (continued)**

**Figure 2: Truck Circulation Plan and Prohibited Streets**



Source: Washington Convention Center Authority, *Washington Convention Center Transportation Operations and Parking Plan* (Washington, DC: 2004), figure 8.1.

## **OUTREACH**

The WCCA Advisory Committee, whose members are appointed by the Mayor's Office, serves as a forum for sharing information on Center activities and discussing issues related to the needs of the neighboring community, parking, and transportation. Meetings typically are held once a month.

## **District of Columbia Motor Carrier Management and Threat Assessment Study**

DDOT commissioned the *District of Columbia Motor Carrier Management and Threat Assessment Study* to address concerns about truck traffic, regulation and enforcement of commercial vehicle parking, and security requirements. The Study recommended the establishment of a Motor Carrier Office within DDOT, the creation of designated truck routes in the city, and the development of short-term and long-term parking strategies.

According to the study, trucks constitute approximately five percent of total vehicle traffic in the District. Many trucks enter the District via Georgia and New York Avenues, where the majority of industrial activity and goods warehousing is concentrated. As a result, these two streets carry high volumes of truck traffic. Trucks constitute approximately 15 percent of traffic on Georgia Avenue and about 12 percent of traffic on New York Avenue.

Small trucks such as courier vans and pickup trucks dominate truck traffic in the District, accounting for almost 90 percent of the truck traffic in the downtown area. The lack of parking spaces for loading and unloading is a major issue for these smaller vehicles.

## **MOTOR CARRIER OFFICE (MCO)**

The Metropolitan Police Department established the Motor Carrier Office with the following responsibilities:<sup>8</sup>

- Serve as the single point of contact for motor carrier-related inquiries.
- Staff the multi-stakeholder Commercial Vehicle Safety Alliance.
- Act as the lead office in designating preferred motor carrier routes and motor

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<sup>8</sup> Metropolitan Police Department, Motor Carrier Safety Unit, personal communication, May 21, 2009.

## ***MOTOR CARRIER OFFICE (MCO) (continued)***

carrier restrictions.

- Oversee the issuance of special permits
- Work with the DDOT Chief Information Officer on motor carrier technologies, including the implementation of Commercial Vehicle Information Systems & Networks (CVISN).
- Work with the Transportation Security Administration, Infrastructure Project Management Administration, DDOT's Traffic Operations Administration, and DDOT's Mass Transit Administration on issues relating to motor carrier traffic, including construction trucks.
- Coordinate with, and provide input to, other government agencies on motor carrier-related issues.
- Coordinate with other local, regional, and Federal agencies as appropriate.
- Identify and manage motor carrier-related funding sources.

## ***DESIGNATED TRUCK ROUTES***

There are no officially designated truck routes in Washington, DC. Instead, there are a number of de facto truck routes that drivers prefer because of roadway geometry, traffic conditions and location relative to trip origins and destinations. Passenger vehicles are heavy users of the de facto truck routes, leading to congestion for both cars and trucks.

The formal designation of truck routes in the District would address many longstanding concerns such as noise and vibration complaints from residents, security concerns around high-risk facilities, congestion, and the need for better information and services for truck operators and their customers. The *Motor Carrier Management and Threat Assessment Study* recommended several trucks routes and restricted truck zones applicable to trucks and rail cars hauling certain categories of hazardous materials (Figure 3). However, the legislation creating the restricted zones was overturned.



## ***PARKING (continued)***

### **Short-term**

- Increase the number of dedicated loading/unloading spaces per block, both on- and off-street. Require one loading space be provided for every 100,000 square feet of commercial space.
- Expand morning parking restrictions to 11 a.m. to accommodate couriers and deliveries of perishable goods.
- Modify curbside signs so that loading zones are reserved for vehicles that are actively loading or unloading goods.
- Implement a maximum time that vehicles can occupy loading zones.
- Encourage building owners to reserve off-street parking spaces for commercial vehicles that are expected to be parked for several hours.
- Step up enforcement of parking regulations, especially those that apply to vehicles that are blocking a traffic lane or that are illegally parked in a commercial vehicle zone.
- Eliminate multiple and confusing signs to clarify parking regulations.
- Publicize the DPW tow-away hotline, which accepts complaints about illegally parked vehicles.

### **Long-term**

- Restrict parking of trucks larger than 2-axle, 6-tire vehicles to off-peak hours.
- Install parking meters for commercial vehicles in restricted spaces to encourage turnover.
- Increase fines for parking offenses.
- Implement a fee system whereby couriers pay a premium to have parking spaces reserved solely for their vehicles during their peak delivery times.
- Implement a permit system for commercial vehicles that occasionally need space all day for doing maintenance and other work in area buildings. These vehicles would be allowed to occupy on-street loading/unloading spaces with a permit even if they are not actively loading or unloading goods. Building owners would be given a limited number of permits for such vehicles.



## MAJOR FINDINGS AND CONCLUSIONS

The following strategies and practices identified in this case study can be implemented in other areas around the country.

- **Longer Loading Zones.** Moving commercial loading zones to the approach end of each block wherever possible would make curb parking easier and thus reduce double parking. Extending loading zones to 100 feet in length wherever possible would increase the supply of curbside commercial loading areas.
- **Metered Loading Zones.** This encourages more efficient use of loading zones and increase vehicle turnover. However, the District's \$1 per hour fee does not provide a sufficient incentive for efficient and expeditious loading behavior. The Downtown Curb-space Management Plan recommended a graduated fee rate similar to the one employed by New York City, which uses an escalating rate structure. The graduated fee rate also would provide a greater incentive to use off-street loading facilities where they exist.
- **Stakeholder Workshops and/or Citizen Advisory Committees.** Stakeholder and Citizen Advisory Committee input is essential to the implementation and continued success of initiatives described in this case study.
- **Public Education.** Educating the public is critical to the success of a new initiative or change to an existing program. It is important to keep the public informed about new technology and provide training when possible.
- **Truck Marshalling.** This concept can be used in other jurisdictions to regulate truck traffic produced by large events that would otherwise create significant congestion on surrounding roadways.
- **Motor Carrier Office.** The creation of a single office or single point of contact would simplify administration, allow parking policy to be adjusted more efficiently in response to observed changes on the streets, and reduce errors caused by miscommunication between agencies.
- **Formal truck-route designations.** The formal designation of truck routes would address common concerns such as noise, vibration, and congestion. It also would remove trucks from side streets and other roadways with inadequate geometry or pavement quality for large trucks, and provide benefits to both truckers and residents.

## MAJOR FINDINGS AND CONCLUSIONS (continued)

- **Parking Strategies.** The following short-term and long-term parking strategies can be implemented in all jurisdictions.

*Short Term:* 1) Formulate required loading space based on the square feet of commercial space; 2) expand morning parking restrictions to accommodate couriers and deliveries of perishable goods; 3) modify curbside signs so that loading zones are reserved for vehicles that are actively loading or unloading goods; 4) implement a maximum time that vehicles can occupy loading zones; 5) encourage building owners to reserve off-street parking spaces for commercial vehicles that are expected to be parked for several hours; and 6) step up enforcement of parking regulations, especially those that apply to vehicles blocking a traffic lane or illegally parked in a commercial-vehicle zone.

*Long-Term:* 1) Restrict parking of trucks larger than 2-axle, 6-tire vehicles to off-peak hours; 2) install parking meters for commercial vehicles in restricted spaces to encourage turnover; 3) increase fines for parking offenses; 4) implement a fee system that requires couriers to pay a premium for reserved parking spaces during their peak delivery times; and 5) implement a permit system for commercial vehicles that occasionally need space all day for doing maintenance and other work in area buildings.

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