

DC'S TRUCK AND BUS ROUTE SYSTEM: DESIGN AND IMPLEMENTATION REPORT

Prepared for

The Policy, Planning and Sustainability Administration

The Department of Transportation

The Government of the District of Columbia

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Introduction:

This report details the process undertaken by the Motor Carrier Division of the Policy, Planning and Sustainability Administration at DDOT to develop a city-wide truck and bus route system for the District of Columbia. The purpose of this project was to improve the management and monitoring of truck and bus traffic in the city under a single, comprehensive regulatory system. Specific routes were designated as part of the truck and bus route system based on a variety of factors, which included engineering characteristics, roadway classifications, planner review, industry feedback, community feedback, field observations and more.

With the adoption of this system, motor carrier traffic in the city has been limited to several primary routes that will ease the flow of traffic, reduce maintenance of roads and improve the operational efficiency of the city's transportation networks. The primary goal, however, was to balance the commercial and logistical needs of the District of Columbia with the quality of life of citizens in the most optimal situation possible.

Truck and bus traffic is essential to the vitality of the District of Columbia and providing a map system that improves the efficiency of this traffic is incredibly important to support current and future growth in the city.

Background

In 2004, the District Department of Transportation (DDOT) commissioned the U.S. Department of Transportation's (DOT) Volpe National Transportation Systems Center (Volpe) to conduct a study of the District's current motor carrier activity which was called the *Motor Carrier Management and Threat Assessment* study. One of the recommendations of the study was to create a Truck Route Map and System in the District of Columbia similar to those that exist for all US states.

The purpose of this recommendation was to address strong concerns within the city regarding truck and charter bus traffic and how it serves our city. While most of the city's truck traffic is destined for locations within DC and consists primarily of small delivery type vehicles (2-axle, 4- and 6-tire vehicles)¹, the city must be able to accommodate and coordinate all types of delivery vehicles given its major economic and transportation role in the region. This will allow the mitigation of concerns that include 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.²

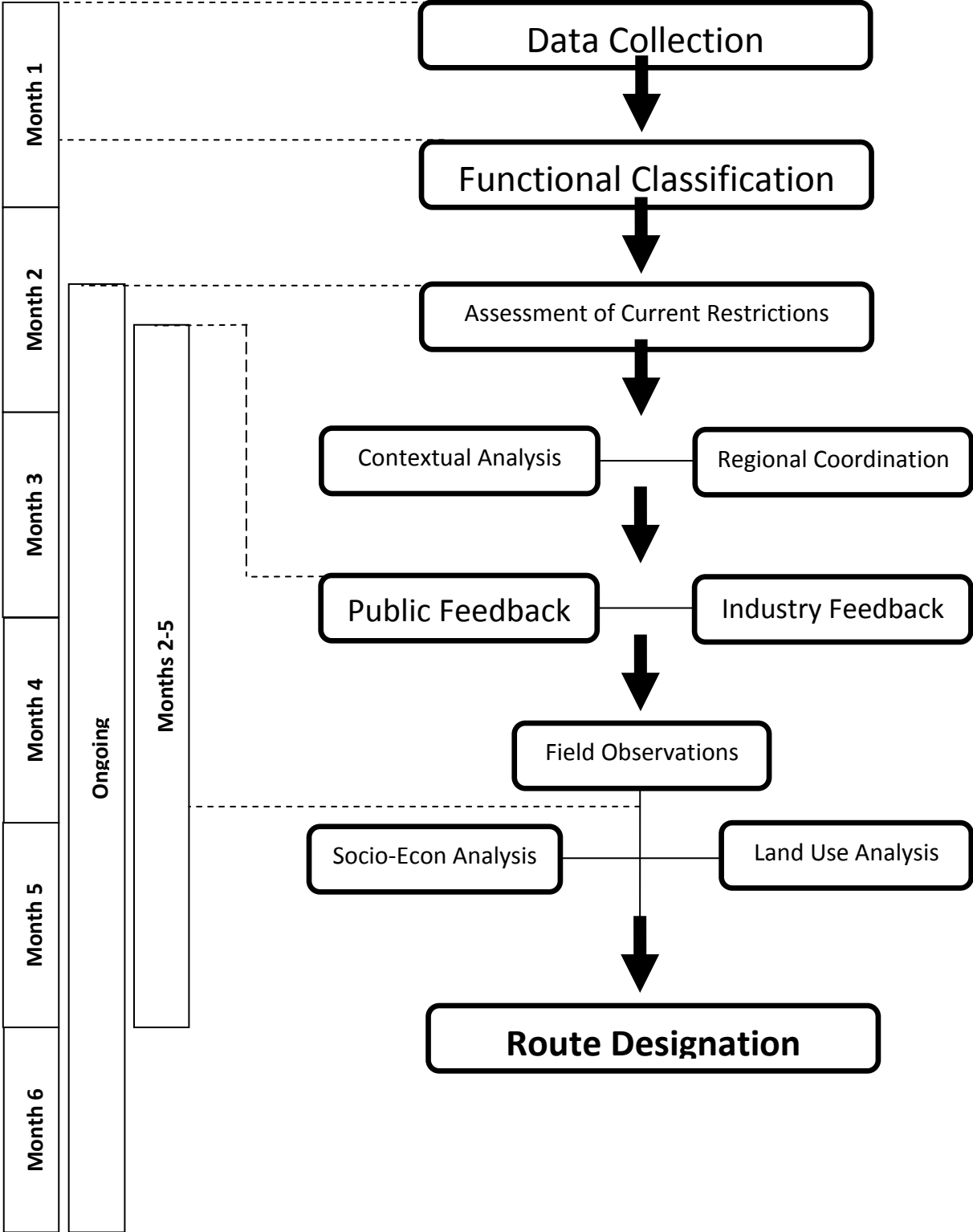
The Truck and Bus Route System summarized by this report closes that long-standing logistical gap and need that has existed in DC for many years.

¹http://ddot.dc.gov/ddot/frames.asp?doc=/ddot/lib/ddot/clayimages/motorcarriermanagment/truck_route_recommendations.pdf

²http://ddot.dc.gov/ddot/frames.asp?doc=/ddt/lib/ddot/clayimages/motorcarriermanagment/truck_route_recommendations.pdf

Truck and Bus Route System Design Process

Process Timeframe



Methodology:

While supplemented with best practice review of other jurisdictions, the design and planning of DC's Truck and Bus Route System utilized primarily an original methodological approach. Numerous elements were considered in an attempt to develop the most holistic perspective possible. The design and analysis was based initially on engineering and planning considerations, but was augmented with neighborhood contextual analysis, commercial considerations, public feedback and practical issues. Indeed, a major concern of the project was the preemptive incorporation of these various elements and a balance of stakeholder interests. Each street was considered from the perspective of the District-wide transportation system as a whole to ensure proper functioning of the Truck Route Map and System. Using this context-based analysis, proposed streets to be included in the system were identified according to the following criteria:

Data Collection

In determining proper roads to serve as truck routes, a series of technical road characteristics were considered for each of the potential routes. Data was collected for four categories- Existing Traffic, Road Characteristics, Connectivity and Safety- and serve as the starting point in the selection process. Using these initial base criteria, the TPPA identified a set of roads within the District of Columbia which could potentially serve in the Truck and Bus Route System.

Data was sourced using the District of Columbia's *Street Inventory System* found at <http://sddotgissvr/sis/>. A complete set of data points is given below.

Existing Traffic

- Actual
- Factor
- Observed
- Annual Average Daily Traffic (AADT)
- % Truck Traffic

Road Characteristics

- Pavement Condition Index (PCI)
- Pavement Type
- Pavement Roughness
- Pavement Thickness
- Lane Width
- Total Width
- # of Lanes

- Bike Lanes
- Parking
- Length
- Direction

Connectivity

- To Major Arterial
- To Major Interstate
- To Commercial Activity

Safety

- Number of Traffic Crashes
- Number of Bicycle Crashes
- Violations
- Pedestrian Traffic

Three specific data measures were given great consideration due to their relevance to the weight and size issues unique to truck and bus traffic. These are:

- Pavement Condition Index (PCI) - based on a scale of 0–100, the number provided the basis of the individual distress types of that particular roadway.
- Pavement type- this explains what type of pavement (i.e. Asphalt, Concrete, Cement etc.) is used on the street.
- Pavement Roughness- also referred to as “smoothness”, this is generally defined as an expression of irregularities in the pavement surface that adversely affect the ride quality of a vehicle. Roughness is an important pavement characteristic because it affects not only ride quality but also vehicle delay costs, fuel consumption and maintenance costs.³

Functional Classification

With the initial data analyzed, the national classifications of the potential routes were then incorporated. All routes included in the initial set of potential routes, as determined by the data characteristics, were then compared against their functional classification type. These types are:

- 1) Interstate
- 2) Other Freeway or Expressway
 - a. National Highway System
 - b. National Network
- 3) Principal Arterial
- 4) Minor Arterial
- 5) Collector
- 6) Local

As indicated in the master data point list above, all routes were considered not just for their own functional classification, but also their connectivity to other major roads. Routes that are classified as part of the Interstate, National Highway System and or National Network were included in the route system as mandated by Federal regulations.

Assessment of Current Restrictions and Signs

Prior to and during the route selection process, it was essential to take note of any available information on the current truck and bus regulation system. Existing designations, restrictions and signs were noted and their locational information incorporated into the selection process. Unfortunately, the District of

³ http://training.ce.washington.edu/wsdot/Modules/09_pavement_evaluation/09-2_body.htm#iri

Columbia has no database making an inventory of these items all but impossible without a commissioned study.

Truck and bus restrictions passed by the DC Government were noted and incorporated into the analysis and system. Nationally mandated restrictions and designations were also incorporated. During the field observation of streets under evaluation, any signs/restrictions/designations were noted by the Motor Carrier Division and incorporated. However, these steps did not provide a comprehensive assessment.

To remedy the situation, the Motor Carrier Division is seeking to commission a study that will inventory the locations, type, and position of all truck and bus signs in the District of Columbia. Once collected, this information will be turned into a single database and incorporated into the Truck and Bus Route System.

Transportation and Neighborhood Context

Following the first two steps, Ward, City and Regional Planners from the PPSA were consulted to receive feedback on the suitability of the potential routes identified from data and functional classification. An explanatory meeting was held with each of the planners to explain the background, purpose and goals of the project and, afterwards, a short review period was held to allow for questions and investigations. Planners were requested to provide information on the transportation, economic and logistical aspects of the potential routes in the context of the respective Wards and the city as a whole. Specific roads were discussed with the planners and an initial proposed set of routes to be included in the Truck and Bus Route System was created.

Regional Coordination

Efforts to incorporate Federal, Virginia, and Maryland truck route systems into DC's system were also made. Whenever a direct incorporation of routes was not possible, an alternative accommodation that should mitigate negative impacts was sought to ensure a functional and efficient regional shipping and transportation network.

Industry Feedback

Both to gain insight into how private companies currently direct their trucks and buses and to determine suitable compromises while developing the system, meetings with private industry representatives (companies, trade groups, etc.) were essential. Emphasis was given on improving operational efficiency for both the District of Columbia and industry and improving the clarity of truck and bus regulations for industry groups. The initial proposed Truck and Bus Route System was discussed with private industry representatives and comments were noted.

Public Feedback

The initial proposed set of bus and truck routes was distributed to all Advisory Neighborhood Commissions for their review. Meetings were arranged with all responding ANC commissioners to

discuss the proposed routes, answer questions and to receive advice on specific neighborhood elements to consider. Meetings were held in all 8 city wards and comments were compiled into a single list. Where no conflict with data, planner feedback or other considerations existed, the ANC comments were immediately incorporated. Other comments that presented some conflict with other recommendations or considerations were marked for further evaluation.

Any route requiring further investigation had the following additional analysis conducted:

Field Observations

The project managers arranged field visits to each of the disputed street s/segments under evaluation. Emphasis was given on congestion, pedestrian traffic, commercial needs, situational fluctuations (i.e. rush hour traffic) and the overall goal of the Truck and Bus Route System. Great weight was also given to the commercial/residential make-up of the respective areas and specific needs (i.e. the existence of a shipping company headquarters).

Land Use Classification

To create a more robust evaluation, land use classification maps were consulted for each street/segment under evaluation. Field observations were compared with the official DC zoning designations of the areas. Again, analysis of the commercial/residential mix of the respective street area was considered. The minimum threshold for inclusion of a street or segment under evaluation in the route system was the designation as a “Commercial Low Density” area or a “Residential Low Density” if there was a specific need identified in the field observations. Areas designated as “Residential Medium Density” and “Residential High Density” were disqualified from inclusion in the system unless mandated by their road functional classification.

Socio-economic Analysis

The final review element for streets or segments under evaluation was current and future socio-economic conditions. Consideration was given for future construction and development initiatives in the areas and current conditions. The goal of this review process was to identify commercial needs vital to the development and sustainability of economic activity in the surrounding area. Commercial streets and residential streets were noted to ensure that no routes were assigned to primarily residential streets without any need for truck traffic. It should be noted, that these conditions will change in future years and a regular re-evaluation held every 3 years is recommended.

Route Designations:

Based on the methodology detailed above, routes were included in the Truck and Bus Route System for the District of Columbia and designated as primary, charter bus only or restricted.

A “**Primary Route**” designation indicates the road is a major arterial roadway that meets technical standards, can handle high truck traffic volumes and or that serve major truck and bus destinations. Additionally, the road may also serve a highly specific functional need identified in field observations.

A “**Restricted Route**” or “**Restricted Area**” designation indicates a road or area may not be used by trucks or buses for any purpose due to security reasons, inadequate capacity or quality of life concerns for residents.⁴

A “**Charter Bus Route Only**” designation indicates roads that may only be used by charter/tourist buses and are mandated by current DC Government regulations.

An additional option not adopted by the project is the “**Limited Use**” designation which would restrict trucks and buses on a street or segment according to a specific criterion (i.e. weight) to address a specific need (i.e. high pedestrian volumes). No such need was identified for any road within DC and combined potential enforcement issues, no such designation was given.

Roads in the District of Columbia that have neither a “Primary Route” or “Restricted Route” designation may have trucks and or buses travel on them, but only for an official business need. All trucks or buses which must travel on a non-designated road must take the most direct access road to their destination, conduct their business (i.e. deliver a package) and take the most direct road back to a Primary Route for travel through the rest of the city.

Challenges:

In the process of selecting the routes for the Truck and Bus Route System, there are many challenges to be faced. One of these challenges is the condition of the roads, which affects if it is able to handle the type of volume needed to support a truck route system. Another challenge is getting both public and private truck companies to agree with a particular route. Some residents may not agree with a particular route because they feel it will affect their residence or business. Additionally, initial improvements may be needed for particular roads in the route system. Challenges such as these are important and are drove our efforts to preemptively address public, private, business and resident concerns by seeking feedback through our outreach efforts with ANC groups, the private sector and DDOT planners.

Deliverables:

Following the design process, the Motor Carrier Division developed three maps detailing the Truck and Bus Route System. Two maps are for internal use- one detailing all truck and bus restrictions in DC, and the second showing all designated routes in the system but that distinguishes them according to type (i.e. National Network versus Charter Bus Only). The third map is for public distribution and shows the Primary Routes, Charter Bus Only Routes, Restricted Areas and Loading Zones, but does not distinguish between the types of roads included in these categories.

⁴ Truck and bus restrictions exist for specific streets and segments in DC government code and those routes have been compiled into a map indicating the location and type of restriction.

In addition to the maps, the project developed official rules to be incorporated into the DC Government code making the route system official.

Future Considerations:

After reviewing the proposed truck route system with the public and private representatives, internal coordination and implementation became the next step. Particular agencies were identified as potential candidates for specific support functions. The Policy, Planning and Sustainability Administration can develop a permitting process for particular routes to be used by trucks and buses; Transportation Operations Administration can monitor the traffic on the routes; and the Infrastructure Project Management Administration can maintain the routes. Also, by continuing to coordinate with VDOT and MDOT on the routes that go to their borders, we ensure the regional truck traffic flows well and enters the District on the proper route.

Another consideration is integrating transponder technology with DDOT. Currently, DDOT is developing this technology for all motor carriers. Using the technology to manage trucks would assist in tracking parking fees for delivery vehicles, observe/manage loading zone times, give real-time parking information, and record the distance truck carriers travel for tax collection purposes.

APPENDIX A

Road Characteristic Definitions

Annual Average Daily Traffic- the total volume of vehicle traffic of a highway or road for a year divided by 365 days

Actual- total annual percentage of trucks identified by traffic counters

Observed- total percentage of trucks identified through field observations

Factor- total percentage of trucks based of analysis derived from actual truck counts.

Percent Truck Traffic- percent share of total traffic comprised of trucks

Pavement Thickness- explains how deep the particular pavement is on a roadway.

Pavement Type- this explains what type of pavement (i.e. Asphalt, Concrete, etc.) is used on the street.

Pavement Condition Index-a numerical index between 0 and 100 and is used to indicate the condition of a roadway

Pavement Roughness- also referred to as “smoothness”, this is generally defined as an expression of irregularities in the pavement surface that adversely affect the ride quality of a vehicle. Roughness is an important pavement characteristic because it affects not only ride quality but also vehicle delay costs, fuel consumption and maintenance costs.

Lane Width- is the average width of a lane in that particular roadway.

Total Width- is the average width of the road including all lanes, shoulders, etc. of that particular roadway.

Number of Lanes- is the average number of lanes including parking lanes, in that particular roadway.

Bike Lane- explains if there are any bike only lanes in that particular road way.

Parking- explains if there are any parking lanes in that particular road way.

Length- explains the length from one particular intersection to another of that particular road way.

Direction- explains if the road way had two ways of flowing traffic or only one way of flowing traffic

Number of Traffic Crashes- number of vehicle crashes that occurred over a specified period of time (usually 1 year)

Number of Bicycle Crashes- number of crashes that involved a bicycle over a specified period of time

Violations- number of traffic rule and law violations

Pedestrian Traffic- number of pedestrians in on a given street or segment for a specified period of time