

***MEMORANDUM***

**DATE** July 8, 2010  
**TO** Transportation Planning and Programming Committee  
of the Boston Region Metropolitan Planning Organization  
**FROM** Arnold J. Soolman, CTPS Director  
**RE** Work Program for: 2010 Freight Study – A Profile of Truck Impacts

**ACTION REQUIRED**

Review and approval

**PROPOSED MOTION**

That the Transportation Planning and Programming Committee of the Boston Region Metropolitan Planning Organization vote to approve the work program for 2010 Freight Study – A Profile of Truck Impacts in the form of the draft dated July 8, 2010.

**PROJECT IDENTIFICATION**

**Unified Planning Work Program Classification**

Technical Support/Operations Analysis Projects

**CTPS Project Number**

11139

**Client**

Boston Region MPO

**CTPS Project Supervisors**

*Principal:* Karl Quackenbush

*Manager:* Mike Callahan

**Funding**

MassDOT 3C PL Highway Planning Contract #59796

## **IMPACT ON MPO WORK**

This is MPO work and will be carried out in conformance with the priorities established by the MPO.

## **BACKGROUND**

An efficient freight transportation system is an important contributor to a strong economy. Motor freight transportation is also a significant contributor to congestion and crashes, and accelerates the deterioration of roads and bridges. These are among the reasons federal transportation legislation encourages metropolitan planning organizations (MPOs) to consider freight movements and issues during the metropolitan transportation planning process.

The findings of MassDOT's draft State Freight and Rail Plan reinforce the importance of studying freight movements in the Boston region. The draft Plan predicts that freight volumes in the state will increase 70 percent between 2007 and 2030. Freight transportation relies on the same road and rail networks that people use to access their everyday needs. Therefore, the predicted increase of freight volume will add congestion to a regional transportation system that is already strained during peak hours, and will affect system performance of both freight and passenger travel.

The projected increase in freight volume will have a particularly acute effect on the highway system. It is estimated that 94 percent of the current freight volume in Massachusetts is moved by trucks. The statewide plan also predicts that the truck mode share will increase between 2007 and 2030. Recommended by the draft State Freight and Rail Plan are several investments that support shifting freight, when feasible, from trucks to trains and ships in order to mitigate some of the harmful effects of trucking in Massachusetts. While increasing the share of freight moved by other modes would yield benefits for the region's road network, trucks will most likely continue to distribute the vast majority of freight within the Boston Region MPO area. Therefore, better understanding the general nature of truck movements, and their effects on the transportation system, is an important first step to prepare for the anticipated increase of freight traffic in the region.

This study will examine how, where, and to what extent trucks affect the region's transportation system. It will provide a profile of truck impacts in the region containing information about truck volumes, truck-involved crashes, and truck emissions. Knowledge about the impact of trucks will be useful to the MPO when considering the freight benefits of projects and it will provide a foundation from which to conduct future freight planning.

## OBJECTIVES

The principle objectives of this work program are:

1. To examine how, where, and to what extent trucks affect the region's transportation system.
2. To improve the Boston Region MPO staff's capacity to conduct freight planning and analyze projects and programs for their freight benefits.

## WORK DESCRIPTION

The work required to accomplish the study objectives has been grouped into five tasks:

### **Task 1 Estimate Existing Truck Volumes by Movement Type**

The CTPS truck model will be used to estimate the share of the total volume of truck traffic in the Boston region traveling inbound, outbound, through, and internally.

#### ***Product of Task 1***

A table depicting the inbound, outbound, internal, and through shares for truck traffic.

### **Task 2 Identify Areas in the Region with High Truck Volumes**

***Subtask 2.1*** Highway segments in the region with relatively high truck volumes will be identified using a database of highway classification counts conducted by MassDOT's Highway Division. Staff may conduct counts in additional locations if desirable. This analysis will focus on large trucks, with six wheels or more, rather than smaller trucks such as pickups and vans.

***Subtask 2.2*** The CTPS truck model will be used to estimate truck trip ends at the geographical scale of transportation analysis zones. This will produce a picture of where trucks are going in the region and where they may be causing the greatest burden. The model will also be used to predict truck trip ends in 2030 based on the MetroFuture land use plan.

#### ***Products of Task 2***

- Maps depicting locations with relatively high volumes of large trucks on the region's highway network
- Tables depicting truck volumes as a fraction of total volume at key locations in the region during the peak travel hour and on a daily basis
- A map depicting the density of truck trip ends in the region by transportation analysis zone

### **Task 3 Identify Areas with High Truck Crash Rates**

Crash data are not typically disaggregated by type of vehicle. In this task, Boston Region MPO staff will use the MassDOT Registry of Motor Vehicles Division's crash database to analyze data on crashes involving large trucks. Locations with a relatively high truck crash rate will be identified. These locations will be plotted spatially in related to truck traffic volumes to ascertain whether the crash rate is proportional to those volumes or not. Crashes involving heavy trucks will also be studied to determine if these crashes result in greater property damage and more severe injuries than crashes that do not involve trucks.

***Products of Task 3***

- Maps depicting locations with relatively high numbers and rates of truck crashes
- A table depicting the value of property damage and injuries resulting from truck crashes relative to all other crashes

**Task 4 Estimate the Share of Transportation-Related Greenhouse Gas Emissions, and Other Mobile Source Emissions, Generated by Trucks**

The CTPS truck model will be used to estimate the annual vehicle-miles of travel (VMT) of trucks of various use categories. Emissions factors will be applied to the VMT estimates to estimate the annual emissions of various pollutants produced by trucks.

***Products of Task 4***

- Tables depicting estimated emissions and estimated VMT from various truck categories

**Task 5 Document the Results**

The results of Tasks 1 through 4 will be documented in a technical memorandum.

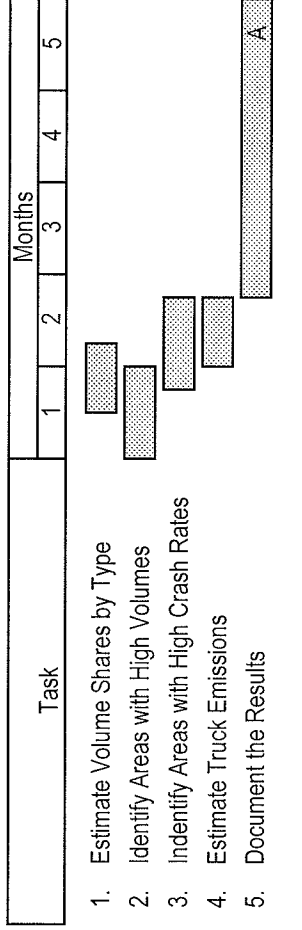
**ESTIMATED SCHEDULE**

It is estimated that this project will be completed five months after the notice to proceed is received. The proposed schedule, by task, is shown in Exhibit 1.

**ESTIMATED COST**

The total cost of this project is estimated to be \$39,993. This includes the cost of 19.0 person-weeks of staff time, overhead at the rate of 88.99 percent, and travel costs. A detailed breakdown of estimated costs is presented in Exhibit 2.

**Exhibit 1**  
**ESTIMATED SCHEDULE**  
**2010 Freight Study – A Profile of Truck Impacts**



Products  
 A: Technical memorandum

Exhibit 2  
**ESTIMATED COST**  
 2010 Freight Study – A Profile of Truck Impacts

**Direct Salary and Overhead** **\$39,763**

Task	Person-Weeks					Total	Direct Salary	Overhead (@ 88.99%)	Total Cost
	M-1	P-5	P-4	P-3	P-2				
1. Estimate Volume Shares by Type	0.2	0.0	0.0	1.5	0.4	0.0	2.1	\$1,969	\$4,182
2. Identify Areas with High Volumes	0.0	2.5	0.0	0.0	2.0	0.0	4.5	\$5,069	\$10,766
3. Identify Areas with High Crash Rates	0.0	0.0	3.0	0.0	1.5	0.0	4.5	\$4,397	\$9,338
4. Estimate Truck Emissions	0.2	0.0	0.0	1.5	0.5	0.0	2.2	\$2,045	\$4,343
5. Document the Results	1.0	0.0	1.0	0.0	3.0	0.7	5.7	\$5,242	\$11,134
<b>Total</b>	<b>1.4</b>	<b>2.5</b>	<b>4.0</b>	<b>3.0</b>	<b>7.4</b>	<b>0.7</b>	<b>19.0</b>	<b>\$18,723</b>	<b>\$39,763</b>

**Other Direct Costs** **\$230**

Travel \$230

**TOTAL COST** **\$39,993**

**Funding**  
 MassDOT 3C-PL Highway Planning Contract #59796