



April 2009
Publication No. FHWA-NHI-XX-XXX

FHWA-NHI-139XXX

Advanced Freight Planning

Sample Participant Workbook



U.S. Department of Transportation
Federal Highway Administration 

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I. Introduction

The National Highway Institute (NHI) course *Advanced Freight Planning* is a two-day course intended to provide advanced, in-depth, hands-on understanding of freight transportation and how freight can be incorporated into state and MPO planning and project programming processes. The course is designed to cover:

- The impact of freight and goods movement on state and local economies;
- The role of transportation in modern business logistics / supply chain management;
- Freight planning and programming best practices with an emphasis on techniques that have been successfully used by other public agencies to bring freight projects from planning to reality; and
- Freight stakeholders and how they can benefit from the public sector planning process.

This course is designed to build upon previous freight planning efforts by providing advanced knowledge about freight planning, such as:

- Why freight is important to local and regional economic competitiveness;
- How non-highway freight modes, such as expedited air cargo, container ship and intermodal rail operate, and what are the trends affecting these modes;
- How to identify, prioritize, develop, and implement freight supportive projects; and
- Global issues affecting modal trends and technology development in the freight transportation environment.

II. Course Overview

Today state and regional planning agencies are increasingly reliant on international trade to support local economic development. Public transportation agencies are being challenged to support modern business supply-chain management through investments and policy actions affecting transportation service providers across all modes. To help American businesses succeed in the global trade environment, government agencies responsible for

transportation planning must foster integrated modal systems by supplying infrastructure and info-structure that can support responsive, reliable transportation for goods in motion.

Over the past several decades there has been growing interest and understanding among federal, state and local governments, as well as the greater business community regarding the impact of freight movements on economic vitality, and the consequences of inadequate or unreliable transportation systems. However, due to a multiplicity of issues and barriers, state and local transportation agencies have struggled to identify, incorporate, and implement freight supportive projects into their planning and project implementation programs.

Historically, private sector stakeholders responsible for material and product transportation and public officials responsible for transportation infrastructure investment, have had little or no interaction aside from economic and safety regulation. While most economic regulation has been dissolved, lingering attitudes have fostered public sector resistance to seek business involvement in the planning process (and resistance within the private sector to get involved). Providing planners with a better understanding of private sector operations and the importance of freight to regional economic success, may foster more interaction between public and private transportation planners and practitioners, and help address the nation's freight transportation needs.

The supply of courses focusing on freight planning is inadequate. Most college level logistics programs cater to the private sector. Developing and marketing this training course is crucial to the advancement of the goals and objectives put forth by FHWA.

Advanced Freight Planning is a two-day course aimed at transportation professionals involved in multi-modal planning and program management. The course provides techniques and strategies designed for those individuals directly involved in the implementation of transportation planning, programming and allocation of resources. The course will be structured to explain to participants why an understanding of freight is important. It will provide participants with the skills needed to identify, prioritize, develop and implement freight supportive projects. It will identify tools and teach skills focusing on:

- "Selling" a freight plan;
- "Doing" a freight plan; and
- "Using" a freight plan.

The "selling" session will focus on identifying to whom, why and how planners need to sell the benefits of freight planning; the "doing" session will focus on adapting planning activities to integrate freight by providing an in-depth

examination of supply chain management and its impact on transportation planning; and, the “using” session will focus on implementing a freight plan in coordination with a long range transportation plan and identifying projects through the planning process that will be programmed into the State or MPO Transportation Improvement Program (S/TIP).

III. Course Goal and Outcomes

Course Goal

The goal of this course is to:

Promote the development of more multi-modal transportation systems by providing public and private sector transportation planners with tools, techniques, and noteworthy practices to further integrate freight and more effectively engage the private sector in the public sector transportation planning and programming processes.

Course Outcomes

At the end of this course, participants will be able to:

- Describe the importance of freight mobility to the economy
 - Discuss how freight transportation needs differ for major industry sectors
 - Describe the role of the freight transportation systems in supporting economic competitiveness
- Discuss major trends affecting various modes of freight transportation, and their potential impacts on regional transportation systems
 - List the factors that influence private sector freight transportation decisions
 - Discuss how private sector needs can inform public sector performance measures
- Demonstrate methods for freight project selection and implementation
 - Summarize methods for identifying and prioritizing freight projects
 - Discuss the benefits of engaging private sector stakeholders in project identification

- List potential funding mechanisms for freight projects

IV. Course Agenda

The course agenda is provided on the following pages. Please note that actual class start times may vary between 8 am and 9 am but will not exceed 8 hours per day.

Table 1: Course Agenda:

Day 1		Length
Time	Lesson Title	(minutes)
8:30 - 9:15	Lesson 1: Introduction and Overview	45
9:15 - 10:05	Lesson 2: Selling the Importance of Freight Planning	50
10:05- 10:25	Break	20
10:25 - 11:25	Lesson 2: Selling Freight Planning (cont.)	60
11:25 - 12:25	Lunch	60
12:25 - 1:25	Lesson 3: Supply Chain and Private Sector Dynamics	60
1: 25-1:45	Break	20
1:45 - 2:30	Lesson 3: Supply Chain and Private Sector Dynamics	45
2:30-3:15	Lesson 4: Doing Freight Planning	45
3:15- 3:35	Break	20
3:35 - 4:00	Lesson 4: Doing Freight Planning (cont.)	25
4:00 - 4:30	Lesson 5: Day 1 Wrap-up Presentation	30

Day 2		Length
Time	Lesson Title	(minutes)
8:30 - 9:00	Lesson 6: First Day Review	30
9:00 - 9:40	Lesson 4: Doing Freight Planning (Exercise)	40
9:40 - 10:00	Break	20
10:00 - 11:20	Lesson 7: Using Freight Planning	80
11:20 - 12:20	Lunch	60
12:20 - 1:10	Lesson 8: Freight Project Implementation	50
1:10 - 1:30	Break	20
1:30 - 2:10	Lesson 8: Freight Project Implementation (cont.)	40
2:10 - 3:10	Lesson 9: Individual Exercise: Action Plan	60
3:10 - 3:30	Break	20
3:30 - 4:30	Lesson 10: End of Course Test Review and Wrap-up	60

V. Course Material

Lesson 7: Using Freight Planning

Lesson 7: Using Freight Planning - Identifying Projects



The first image shows a large industrial warehouse with several semi-trucks parked in front. The second image shows a semi-truck driving on a road at dusk or dawn. The third image shows a cargo plane being loaded with a pallet by a robotic arm on a tarmac.

Learning Outcomes

- Summarize methods for identifying freight projects
- Discuss the benefits of engaging private sector stakeholders in project identification

7.2

Identifying Freight Projects

- Identifying freight needs
- Translating needs into projects



7-3

Identifying Freight Needs

- Review existing transportation plans
- Interview freight stakeholders
- Observe freight routes and facilities
- Analyze existing and new data to identify deficiencies
- Consult economic development agencies

7-4

Translating Freight Needs to Freight Projects

- Define what constitutes a freight project
- Existing and new data use
- Stakeholder input
- Inventory of freight routes and facilities
- Existing plans

7-5

Defining a Freight Project

- Does not have to be explicitly freight oriented
- Any project that has direct impact on improving freight movements
- Evaluating impact on freight of all projects as part of planning process

7-6

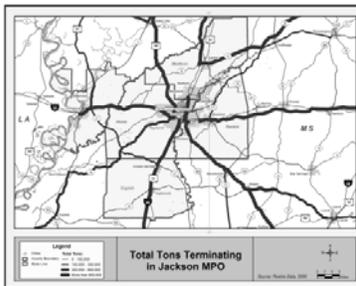
Example- Florida DOT

- All projects requests subject to same documentation
- Documentation requires information on impacts on freight movement
- Projects with freight benefits receive additional consideration in screening process

7-7

Using Data for Identifying Freight Projects

- Commodity flow data
- Origin-destination data
- Establishment data
- Crash data
- Bottleneck and chokepoint identification



7-8

Using Stakeholder Input to Identify Projects

- Identify key transportation infrastructure
- Develop list of safety hotspots
- Identify bottlenecks
- Discuss operational issues
- Respond to public sector analysis

7-9

Example: Mississippi DOT

- Intermodal Committee comprised of short line railroad and river port managers
- Meet quarterly to discuss project needs
- Committee votes on what projects get funded
- DOT funds the program out of programming budget

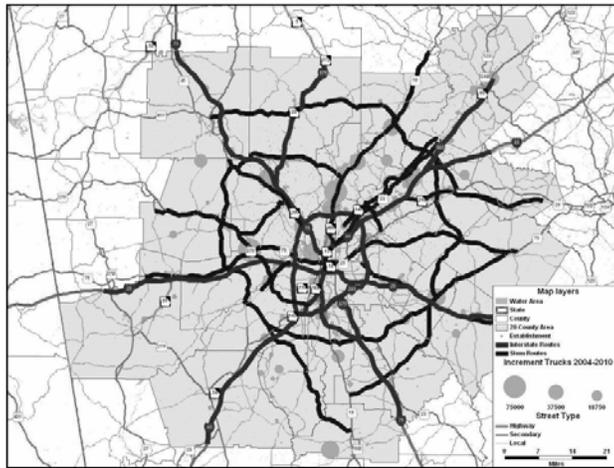
7-10

Using Inventory to Identify Freight Projects

- Designating a freight sub-system
- Documenting connectors to major freight generators
- Integrating land use inventories

7-11

Example – Atlanta Regional Commission



7-12

Impact of Existing Plans on Freight Movements

- Include all transportation projects
- Develop methods for recognizing projects that direct benefits on freight movement
- Incorporate both quantitative and qualitative measures

7-13

Potential Objectives of Freight Projects

- Safety and security
- Mobility/system performance
- Economic development and land use
- Growth management
- Intermodalism
- Environment impacts

7-14

Short-Term Freight Projects

- “Quick start projects”
- Relatively small investments can yield significant returns
- Important because demonstrate commitment
- Often stakeholder driven so build support
- Tend to be localized

7-15

Medium and Long Term Projects

- Larger investments
- More likely to be multi-modal
- Incorporated in TIP and STIPs
- Opportunity for public-private partnership

7-16

Example- Nashville, TN

Problem:
Proposed Actions:

Interim –Install a vehicle height detector system in advance of the overpass

Long-term- Improve clearance by lowering road bed.



Design attributes of bridge create inadequate bridge height

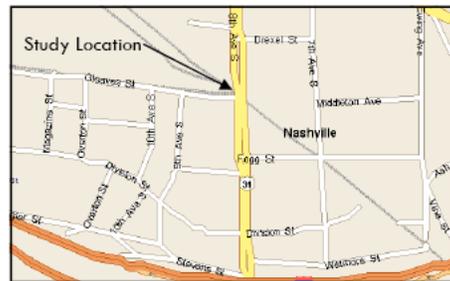
7-17

**NASHVILLE AREA MPO - REGIONAL FREIGHT STUDY
FAST ACTION PROJECTS**

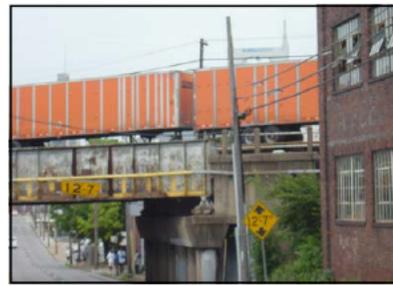
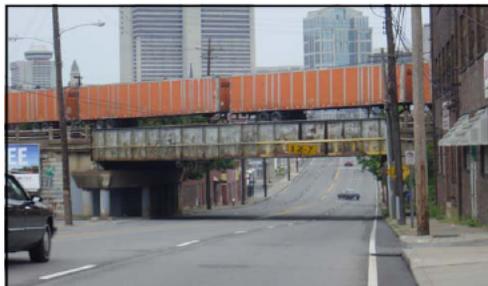
PROJECT #2	8TH AVENUE RAIL BRIDGE
SOURCE	MOTOR CARRIER SURVEY
LOCATION	DAVIDSON COUNTY (NASHVILLE, TN)
JURISDICTION	T.D.O.T.
PROBLEM	DESIGN ATTRIBUTES OF THE BRIDGE CREATE INADEQUATE HEIGHT CLEARANCE FOR TRUCKS.
PROPOSED ACTIONS	<u>INTERIM SOLUTION:</u> STUDY TO DETERMINE THE FEASIBILITY AND DESIGN PARAMETERS FOR THE INSTALLATION OF A VEHICLE HEIGHT DETECTION SYSTEM IN ADVANCE OF OVERPASS IN BOTH DIRECTIONS TO WARN OF CLEARANCE PROBLEMS. <u>LONG-TERM SOLUTION:</u> DETERMINE FEASIBILITY OF IMPROVING CLEARANCE HEIGHT BY LOWERING ROADWAY SECTION.



Eight Avenue South looking south at railroad overpass

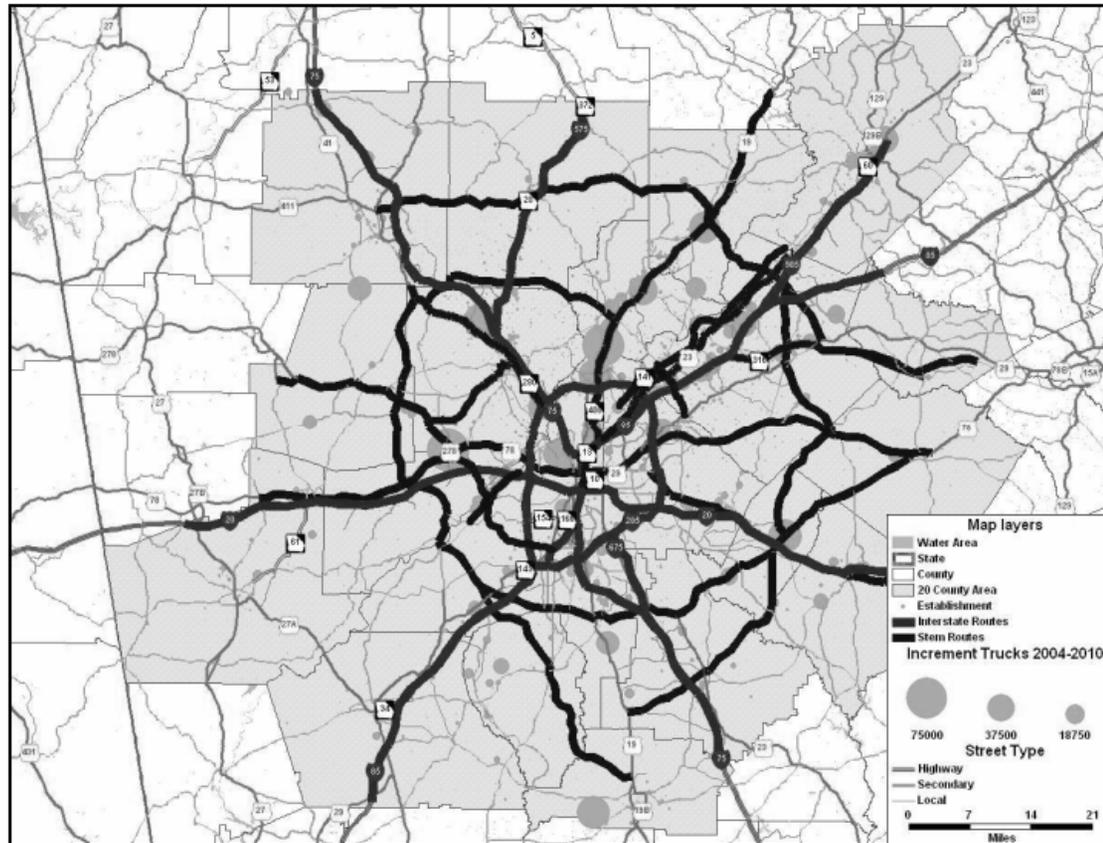


Location Map



Eight Avenue South looking north at railroad overpass looking south on

Example – Atlanta Regional Commission



12-16

Using Freight Planning Exercise

Using Freight Planning Exercise: Identification of Projects



The first image shows a large warehouse or distribution center with several trucks parked in front. The second image shows a large, modern industrial building or facility. The third image shows a cargo ship at a port, with a crane and other equipment visible.

For This Installment

- Identify freight stakeholders for your scenario region- both private and public sector
- Identify a method for engaging those stakeholders
- Identify one short-term and one long-term freight project

7-19

Completing the Exercise

- Use Worksheet E-5, your scenario profile and its partial dataset
- Time allotted: 20 minutes



7-20

Team Reports

- One long term and one short term project
- List stakeholders that you would involve
- Discuss how would you get them engaged



7-21

Review Learning Outcomes

- Summarize methods for identifying freight projects
- Discuss the benefits of engaging private sector stakeholders in project identification

7-22

Acronym and Abbreviation List

AASHTO	American Association of State Highway and Transportation Officials
AADT	Annual Average Daily Traffic
ATA	American Trucking Association
ATRI	American Transportation Research Institute
BTS	Bureau of Transportation Statistics
CBP	Custom and Border Protection
CCC	Chairs Coordinating Committee
CEU	Continuing Education Unit
CFS	Commodity Flow Summary
CSCMP	Council of Supply Chain Management Professionals
DC	Distribution Center
DMV	Department of Motor Vehicles
DOT	Department of Transportation
EIS	Environmental Impact Statement
EIT	Engineer In Training
EJ	Environmental Justice
ELAPP	Environmental Land Acquisition and Protection Program
EMS	Emergency Medical Service
EWGCC	East-West Gateway Coordinating Council
FAC	Freight Advisory Council
FAF	Freight Analysis Framework
FHWA	Federal Highway Administration
GAO	Government Accountability Office
GARV	Grant Anticipation Revenue Vehicle
GDP	Gross Domestic Product
GIS	Geographic Information System
GPS	Global Positioning System
IACET	International Association for Continuing Education and Training
IG	Instructors Guide
ITS	Intelligent Transportation Systems

JIT	Just In Time
KSA	Knowledge, Skills, Abilities
LA/LB	Los Angeles Long Beach
LOS	Level Of Service
L RTP	Long Range Transportation Plan
LTL	Less than Truckload
MAROps	Mid-Atlantic Rail Operations Initiative
MPO	Metropolitan Planning Organization
NAFTA	North American Free Trade Agreement
NCHRP	National Cooperative Highway Research Program
NHI	National Highway Institute
NHS	National Highway System
PE	Professional Engineer
PGMN	Primary Goods Movement Network
PIERS	Port Import Export Reporting Service
PW	Participant Workbook
RFID	Radio Frequency Identification
RIPTA	Rhode Island Public Transit Authority
RISPP	Rhode Island Statewide Planning Program
ROA	Return On Assets
RRN	Regional Research Network
SAFTEA-LU	Safe Accountable Flexible Efficient Transportation Equity Act a Legacy for Users
SAT	Stanford Achievement Test
SCM	Supply Chain Management
SE	Standard Edition
SIB	State Infrastructure Banks
SIS	Strategic Inter-modal System
STB	Surface Transportation Board
STIP	State Transportation Improvement Program
STRAHNET	Strategic Highway Network
TAC	Transportation Advisory Committee
TAZ	Transportation Analysis Zone
TD	Travel Demand
TEU	Twenty-foot Equivalent Unit

TIFIA	Transportation Infrastructure Finance and Innovations Act
TIP	Transportation Improvement Program
TPC	Transportation Processing Performance Council
TRB	Transportation Research Board
VCR	Volume Capacity Ratio
VMT	Vehicle Miles Traveled

Glossary

Term	Definition
Fast Cycle Logistics	The replacement of inventory with information and high performance transportation options
Fishbowl Exercise	Fishbowls are used for dynamic group involvement. The most common configuration is an "inner ring", which is the discussion group, surrounded by an "outer ring", which is the observation group.
Flow Volumes	Freight traffic volumes that flow between facility locations
Freight Planning Toolkit	The tools necessary to start building freight planning practices within your own organization
Freight Turnaround	The process of ending one work cycle and beginning another
ITS	Intelligent Transportation System (ITS) means electronics, communications, or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system. (23 CFR Part 940)
Just-in-Time Delivery	A business model created to reduce overall inventory time delays
Mode Optimization	Freight stakeholders selecting specific transportation modes to effectively maximize profits
Multi-jurisdictional Freight Planning	Effectively planning freight initiatives that are not bounded within any specific observed jurisdiction
National ITS Architecture	A general framework for planning, defining, and integrating ITS. It was developed to support ITS implementations over a 20-year time period in urban, interurban, and rural environments across the country. The National ITS Architecture is available as a resource for any region and is maintained by the USDOT independently of any specific system design or region in the nation.
Point Volumes	The traffic volume that moves in and out of a specific address location
Project ITS Architecture	A framework that identifies the institutional agreement and technical integration necessary to interface a major ITS project with other ITS projects and systems.
Pull Logistics	When product sales pull products through the supply chain
Quick-start Projects	Short-term projects that can be implemented with notable results for the private sector
Route Volumes	Traffic born by a specific route segment of infrastructure
Strategic Planning	The act of following a structured process that leads to a clear and concise definition of a framework for accomplishing the goals and objectives identified during the process.

Supply Chain	The optimal flow of product from site of production through intermediate locations to the final site
Trade Lanes	The directional flow of global trade
Transloading	Emptying or stripping of international containers and transferring the goods into domestic trailers or containers
Wolfe's Paradox	As supply chains become more efficient, they also become more fragile