Planning Can’t Forget Freight

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Freight Planning 101

Freight Technology

Integrating Change
Freight Planning 101
Finding Balance

- **Past**
  - Making trucks move faster
    - Unintended Consequences
- **New Model**
  - Quality of Life
  - Freight = Growing Economy
  - Negative Externalities
  - Finding Balance
    - Net Positive for Society
- **Resiliency**
### How should we think about Freight Mobility

<table>
<thead>
<tr>
<th>Yesterday</th>
<th>Today</th>
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</thead>
<tbody>
<tr>
<td>Regulatory</td>
<td>Economic Development</td>
</tr>
<tr>
<td>Safety</td>
<td>Competitiveness</td>
</tr>
<tr>
<td>Capacity Needs</td>
<td>Investment Prioritization</td>
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<tr>
<td>Moving Vehicles</td>
<td>Moving People &amp; Freight</td>
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<tr>
<td>Vehicle Volumes</td>
<td>System Performance</td>
</tr>
<tr>
<td>Separate Modal Networks</td>
<td>Integrated Freight System</td>
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<td>Separate Modal Movements</td>
<td>Intermodal Connectivity</td>
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<td>Individual Jurisdictions</td>
<td>Commerce Corridors</td>
</tr>
<tr>
<td>Independent Decisions</td>
<td>Partnership with Users</td>
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<tr>
<td>Reactive</td>
<td>Proactive</td>
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What’s Driving Freight Planning

- Freight = The Economy
- Federal and State Regulations
  - Funding
- Safety and Congestion Issues
- Livability
- Private Sector Demands
- Economic Development
- Accountability and Transparency for Investments
Factors Driving Freight Demand

- Demographics
- Technology
- Trade/Industry Growth

- Institutional & Regulatory
- Logistics Industry
- Environmental & Cultural
03
Freight Tech
Freight Tech Trends

- IoT
- Truck Platooning
- Regulatory/Safety
- Electric Vehicles
- Changing Distribution Networks
- Rapid Fulfillment
- FMaaS
- Smart Infrastructure
- Routing
IoT
Synchromodal Transport
- Vertical Integration/Visibility
- Security/Chain of Custody
- EU: Synchromodal Transport
Vehicles
Truck Platooning/CAVs
- I-66 in Manassas
- Blue Water Bridge
  - Army/MDOT/HDR
Regulatory
Safety

- Electronic Logs
- Positive Train Control
Electrified Mobility
Alternative Fuels

- Emerging
  - Driven by Utilities and State DOTs
- Fleets
- Quick Charging
Shifting Distribution Networks
Exhibit 13: Same-day/1-day Amazon coverage in 2014 (in blue) vs. 2018 (expanded coverage areas in maroon)

Source: RBC Capital Markets, RBC Elements, Amazon website
Green light timing is extended to allow the vehicle to cross the intersection.

Smart Infrastructure
Efficiency/Safety

- V2I
- AASHTO SPaT Challenge
- DSRC Radios
- Traffic Signal Interactivity
Routing/ Wayfinding
Smart Routing

- FRATIS
- Truck Parking
- Active Route Management
04
Integrating Change
ITE
Curbside Management Practitioners Guide

- Freight Access – Loading/Unloading
- Freight Zone Pricing
- Off-Peak Delivery and Congestion Pricing
- Delivery Staging Zones
- Urban Consolation Centers
- Loading (around the corner)
Global Street Design Guide

- Speed
- Vehicle Variations
- Freight Networks
- Freight Street Treatments
- Geometry
- Freight Management & Safety
  - Planning, Consolidation Centers, Alleys, Safe Vehicle Design
NCFRP Report 33
Metro Freight Performance

- National Cooperative Freight Research Program
  - Project Panels
- Identified the planning process and tangible ways to improve freight performance
  - Tools
- Land Use Counterpart Underway
  - NCHRP 08-111
Urban Freight Initiatives

**ON-STREET PARKING AND LOADING**
- Frequent Parking and Loading Zones
- Loading and Parking Restrictions
- Peak-Hour Clearways
- Vehicle Parking
- Reservation Systems

**OFF-STREET PARKING AND LOADING**
- Enhanced Building Codes
- Timetables of Parking Space
- Upgrade Parking Areas
- And Loading Docks
- Improved Staging Areas
- Truck Stops/Parking Outside of Metropolitan Areas

**ACCESS AND VEHICLE-RELATED RESTRICTIONS**
- Vehicle Size and Weight Restrictions
- Track Routes
- Engine-Related Restrictions
- Low Emission Zones
- Load Factor Restrictions

**TIME ACCESS RESTRICTIONS**
- Daytime Delivery Restrictions
- Nighttime Delivery Bans

**TRAFFIC, CONTROL, AND LANE MANAGEMENT**
- Restricted Multi-Use Lanes
- Exclusive Truck Lanes
- Traffic Control

**CARGO CONSOLIDATION**
- Urban Consolidation Centers

**INTELLIGENT TRANSPORTATION SYSTEMS (ITS)**
- Real-Time Information Systems
- Dynamic Routines
- Vertical Height
- Detection Systems

**LAST MILE DELIVERY PRACTICES**
- Time Scheduling of Pick-Ups & Deliveries at Large Traffic Generators
- Driver Training Programs
- Anti-Idling Programs
- Pick-Up/Delivery to Alternate Locations

**MAJOR IMPROVEMENTS**
- Ring Roads
- New and Upgraded Infrastructure
- Intermodal Terminals
- Freight Cluster Development

**MINOR IMPROVEMENTS**
- Acceleration/Deceleration Lanes
- Removal of Geometric Constraints at Intersections
- Ramps for Handicarts and Forklifts

**TECHNOLOGIES AND PROGRAMS**
- Emission Standards
- Low Noise Delivery
- Programs/Regulations

**STAKEHOLDER ENGAGEMENT**
- Designate a 'Freight Person' at Key Agencies
- Create a Freight Advisory Committee (FAC)
- Elector-Elected Officials
- Create a Technical Advisory Committee (TAC)
- Create a Freight Quality Partnership (FQP)

**PRICING, INCENTIVES, AND TAXATION**
- Road Pricing
- Parking Pricing
- Incentives: Recognition Programs, Certification Programs, Operational Incentives for Electric/Low Emission Vehicles
- Taxation

**DEMAND MANAGEMENT**
- Voluntary Off-Hour Delivery Programs
- Staggered Work Hours Program
- Receiver-Led Delivery
- Consolidation Program
- Mode Shift Programs

**LAND USE POLICY**
- Relocation of Large Traffic Generators (LTGs)
- Integrating Freight into Land Use Planning Process

**Initiative 1: Ring Roads for Bypass Traffic**

**Description:** The construction of bypasses (high speed ring roads, or byways) to move through-traffic to the peripheries of the urban area. Only viable if they lead to cost savings to carriers.

**Targeted Modes:** Through traffic

**Geographic Scope:** Corridor

**Type of Initiative:** Infrastructure management

**Category:** Improvements

**Primary Objective:** Reduce congestion

**Expected Costs and Level of Effort to Implement:** The cost and effort to construct a new ring road can be very high, involving construction of a new roadway, roadway crossings, and intersections. Such a construction project will involve long-term planning and implementation, elaborate needs assessments, and impact analyses.

**Advantages:**
- Reduce congestion
- Enhance safety
- Environmental sustainability
- Reduce infrastructure damage

**Disadvantages:**
- High probability for unintended consequences
  - May lead to new development outside urban core
  - Environmental impacts on the communities affected by the new road
  - Environmental impacts associated with new construction
- Require very high capital investments
- Require private-sector acceptance

**Typical Example:**
- "Through" Corridors in Atlanta, Georgia, United States

**Related Alternatives:**
1. New and Upgraded Infrastructure
2. Intermodal Terminals
3. Truck Routes
4. Exclusive Truck Lanes

**References:** Manrique et al. 2004, PIARC 2011
### Initiative Selector Tool for Improving Performance

This application has been co-funded by the Transportation Research Board’s (TRB) National Cooperative Freight Research Program: Excellence for Sustainable Urban Freight Systems.

Page supports Google Chrome, Internet Explorer 11, Safari, and Mozilla browsers.

**How to use this application:**
Select aspects of the traffic problems you seek solutions to on the left. The results will contain links to all the unique documents described.

<table>
<thead>
<tr>
<th>Nature of the Problem</th>
<th>Show Selected Initiatives</th>
<th>Clear Selected</th>
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<tbody>
<tr>
<td>☑ Congestion</td>
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<tr>
<td>☑ Inadequate Infrastructure</td>
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<td>☑ Pollution</td>
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<td>☑ Stakeholder Engagement</td>
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<td>☑ Land Use</td>
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**Geographic Scope**

| ☑ Nation               |                           |                |
| ☑ City                 |                           |                |
| ☑ Area                 |                           |                |
| ☑ Corridor             |                           |                |
| ☑ Point                |                           |                |

**Problem Source**

| ☑ Through Traffic      |                           |                |
| ☑ All Traffic          |                           |                |
| ☑ Large Trucks         |                           |                |
| ☑ Urban Deliveries     |                           |                |
| ☑ Large Traffic Generators |                   |                |

**Unique Solutions:** 10

**How it works?**

25

### Initiative 43: Voluntary Off-Hour Delivery Programs

**Description:** Programs that produce a shift of deliveries from regular hours (6:00 a.m. to 7:00 p.m.) to off hours (7:00 p.m. to 6:00 a.m.). As opposed to pricing and regulation schemes, this travel demand management initiative targets receivers as the key decision makers, seeking to convince them to accept deliveries during the less congested off hours through the use of incentives.

<table>
<thead>
<tr>
<th>Targeted mode: Urban deliveries, large traffic generators (LIGs)</th>
<th>Geographic scope: City, area</th>
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<tbody>
<tr>
<td>Type of initiative: Freight demand management: voluntary off-hour deliveries (OHD) program</td>
<td>Primary objective: Reduce congestion and pollution</td>
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**Expected costs and level of effort to implement:** OHD programs require raising funds to provide incentives to receivers. Potential exists to implement a self-supported freight demand management system that uses the revenues raised by a small toll surcharge to finance the incentives. The implementation of the program—whether self-supported or not—requires a multi-layered, multi-stakeholder, collaborative approach to gain substantial business support and to accomplish a large shift to off hours.

**Advantages:**
- Reduce congestion
- Increase efficiency
- Environmental sustainability
- Improve reliability
- Enhance livability

**Disadvantages:**
- Low probability for unintended consequences:
  - May increase perceived noise impact
  - Increase operational costs
- Require fundraising to provide the incentives
- Require very high/low coordination among multiple stakeholders/jurisdictions

**Examples:**
- The City of New York OHD Program, New York, New York, United States (Holguín Veras et al. 2013b; Holguín Veras et al. 2014)

**Source:** New York City Department of Transportation

**Related alternatives:** 1. Low Noise Delivery Programs/Regulations; 2. Daytime Delivery Restrictions; 3. Daytime Delivery Bans; 4. Recognition Programs; 5. Certification Programs
Louisville MPO (KIPDA)
Freight Design Guide

- Design
  - Urban Segment
  - Suburban Segment
  - Rural Segment
  - Urban Intersection
  - Suburban & Rural Intersection
- Access Management
- Innovative Intersection/Interchange Design
- Technology
- Truck Parking