Project Objectives

- Practical guidance for agencies on integrating freight into livable communities
- Document state of the practice
- Incorporate social equity considerations
- Provide case study perspectives
Factors that make a community livable create conditions that increase freight demand while reducing freight access.

**The Paradox**

Complication:
In addition to being affected by livability measures, freight itself affects livability in a variety of ways.
Where livability is a priority or goal of the planning process, freight runs the risk of not being considered except as an afterthought or as something to be excluded.

VS.

Because livability includes economic prosperity, freight will play a role in the community—it cannot be ignored.

Compromises:

Because of the necessity of freight, a balance needs to be struck between creating livable communities and allowing access for deliveries/pickups.
Urban Freight Challenges

Access, parking, and loading
Traffic congestion
Roadway geometry
Intermodal conflicts
Policy-related problems

Menu of Options

Parking and Loading
Infrastructure Planning and Design
Land Use Management
Traffic and Delivery Management
Incentives
Stakeholder Engagement
I-4/Selmon Expressway Connector

- Increases efficiency of freight movement
- Reduces adverse effects of heavy truck traffic
- Allows community roadways to be redesigned for increased livability

Voluntary Off-Peak Deliveries

- Reduce peak-hour congestion
- Reduce intermodal conflicts
- Reduce emissions
- Improve freight operational efficiency

Source: Rensselaer Polytechnic Institute, 2013
Case Studies

Major Truck Routes on the NHTS: 2040

Portland, OR
Albany, NY
Savannah, GA
Tampa, FL
San Antonio, TX

Lessons Learned

Education and Stakeholder Engagement
Information on Trends and Needs
Integrated Transportation and Land Use
Understanding Freight Trends & Needs

SH130 bypass route around San Antonio and Austin

Intended to relieve congestion for cars and trucks on I-35

However, a large proportion of traffic is destined for the city and does not utilize the route

Education and Outreach
Education and Outreach

Albany
Tampa
Portland

For Further Information

“Integrating Freight into Livable Communities”
National Institute for Transportation and Communities
NITC-RR-752
http://nitc.trec.pdx.edu/research/project/752

Kristine M. Williams
Center for Urban Transportation Research
University of South Florida
kwilliams@cutr.usf.edu
813-974-9807

Alexandria Carroll
Center for Urban Transportation Research
University of South Florida
aecarroll@cutr.usf.edu
813-974-5746
FREIGHT AND LIVABILITY POLICY FRAMEWORK FOR THE TAMPA BAY REGIONAL STRATEGIC FREIGHT PLAN

March 31, 2016

STRATEGIC FREIGHT PLAN PURPOSE

- Improve freight mobility, safety and operations
- Position region for economic prosperity
  - accessibility to freight activity centers
  - freight and land use compatibility
- Position region for funding opportunities

Provide a safe, secure, effective and efficient freight transportation system that fosters the economic vitality and livability of the Tampa Bay Region
FREIGHT NETWORK

- Freight Activity Centers
  - Manufacturing and distribution clusters
  - Seaports
  - Airports
  - Railroad hubs

FREIGHT NETWORK

- Regional Freight Activity Centers
Regional Freight Activity Centers
- Railroads and Sea Lanes

Regional Freight Activity Centers
- Railroads and Sea Lanes
- Limited Access Facilities
FREIGHT NETWORK

- Regional Freight Activity Centers
- Railroads and Sea Lanes
- Limited Access Facilities
- Regional Freight Mobility Corridors

FREIGHT NETWORK

- Regional Freight Activity Centers
- Railroads and Sea Lanes
- Limited Access Facilities
- Regional Freight Mobility Corridors
- Freight Distribution Routes
• Regional Freight Activity Centers
• Railroads and Sea Lanes
• Limited Access Facilities
• Regional Freight Mobility Corridors
• Freight Distribution Routes
• Freight Activity Center Streets
POLICY FRAMEWORK

- Tampa Bay Regional Strategic Freight Plan included a policy framework for freight planning that supports the economic and quality of life goals for the region
  - Understand the nature and geography of urban form and freight activities
  - Identify where freight activity conflicts with land uses and associated activities
  - Identify freight projects and roadway design strategies that are supportive of corridor function and land use context

STRATEGY CONSIDERATIONS

- Freight facility function
- Freight and land use compatibility
- Shared uses of corridor
- Corridor capacity and operational issues
### Freight Facility Function

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>Freight Facility Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility</td>
<td>Connectivity</td>
</tr>
<tr>
<td>Limited Access Facilities</td>
<td>P</td>
</tr>
<tr>
<td>Freight Mobility Corridors</td>
<td>P</td>
</tr>
<tr>
<td>Freight Distribution Routes</td>
<td>S</td>
</tr>
<tr>
<td>Freight Activity Center Streets</td>
<td>L</td>
</tr>
</tbody>
</table>

P = Primary  S = Secondary  L = Limited

### Policy Framework

- **Community Oriented Area**: Emphasize livability (pedestrian, bicycle, car movements)
- **Diverse Activity Area**: Address conflicts between freight movements and livability concerns and are sensitive to local contexts
- **Low Activity Area**: Emphasize freight movements

Freight Activity

Livability
## Livability Areas

<table>
<thead>
<tr>
<th>Livability Indicators</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station areas (1/2 mi buffer)</td>
<td>3</td>
</tr>
<tr>
<td>Livable FLUs</td>
<td>2</td>
</tr>
<tr>
<td>Industrial FLUs</td>
<td>-1</td>
</tr>
<tr>
<td>CHAs</td>
<td>1</td>
</tr>
<tr>
<td>Activity Centers</td>
<td></td>
</tr>
<tr>
<td>Hillborough</td>
<td>2</td>
</tr>
<tr>
<td>Primary</td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>1</td>
</tr>
<tr>
<td>Tampa Business Centers</td>
<td>2</td>
</tr>
<tr>
<td>Urban Villages</td>
<td>1</td>
</tr>
<tr>
<td>Plant City</td>
<td></td>
</tr>
<tr>
<td>Midtown</td>
<td>1</td>
</tr>
<tr>
<td>CCC Regional Anchors Tier</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>1</td>
</tr>
<tr>
<td>High</td>
<td>2</td>
</tr>
<tr>
<td>Freight Activity Centers</td>
<td>-1</td>
</tr>
</tbody>
</table>

### Hi 3 or more
- Medium 1 to 2
- Low -1

---

## Freight Areas

<table>
<thead>
<tr>
<th>Freight Indicators</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freight Activity Centers Intensity</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>2</td>
</tr>
<tr>
<td>Medium</td>
<td>2</td>
</tr>
<tr>
<td>High</td>
<td>3</td>
</tr>
<tr>
<td>Industrial FLUs</td>
<td>-1</td>
</tr>
<tr>
<td>Percent Truck Traffic</td>
<td>0</td>
</tr>
<tr>
<td>&lt; 3%</td>
<td>0</td>
</tr>
<tr>
<td>3-5%</td>
<td>1</td>
</tr>
<tr>
<td>5-10%</td>
<td>2</td>
</tr>
<tr>
<td>&gt; 10%</td>
<td>3</td>
</tr>
<tr>
<td>High Truck Traffic (over 10%)</td>
<td></td>
</tr>
</tbody>
</table>
- Medium 2 to 3
- Low 1

---

### Hi 4 or more
- Medium 2 to 3
- Low 1

---

Renaissance Planning
FREIGHT ROADWAY DESIGN CONSIDERATIONS

- Implement Regional Strategic Freight Plan
- Resource that sets context and considerations for implementing roadway design options for trucks
- Helps planners and engineers select designs that balance goods movement and livability objectives

CONTEXT AND DESIGN INTENT
FRDC PURPOSE AND APPLICABILITY

- Design manuals and guides are typically organized by design element.
- Context and function lead to appropriate specifications.

FRDC PURPOSE AND APPLICABILITY

- The FRDC helps designers consider how land use context and freight facility function help guide design intent.
- Design intent informs the selection of appropriate strategies that influence design element specifications.
1. Typical Section Configurations
2. Intersection Approach Configurations
3. Right Turn Treatments
4. Median Nose Treatments
5. Pavement Bulb-Outs and U-Turns
6. Access Management and Truck Parking
7. Traffic Control Devices
8. Signal Phasing

DESIGN STRATEGY PROTOTYPES

Right turn treatment
What characteristics are likely to be context-appropriate?
Median nose treatments

Pavement bulbouts and U-turns
DIVERSE ACTIVITY AREA

- Bicycle lanes provide offset from curb and more turn space for trucks
- Tapered curbs also provide more turn space
- Tapered medians provide more turn space

FREIGHT ROADWAY DESIGN CONSIDERATIONS

- Integrated into the FDOT Complete Streets Policy
- Referenced in FDOT handbooks and guidance documents
- Being considered for possible refinement to the Plans Preparation Manual
Planning for Freight in the City of Portland, Oregon

Bob Hillier
Freight Planning Coordinator
Portland Bureau of Transportation

The Four R’s of Portland Freight

The combination of the four R’s help make Portland a global gateway for moving goods.

Rivers ♦ Roads ♦ Rails ♦ Runways
PORTLAND FREIGHT MASTER PLAN

- Establishes a freight classification system
- Recommends 30 programmatic actions based on three core themes:
  - Mobility
  - Livability
  - Healthy Economy
- Identifies $4.7 billion in infrastructure improvements:
  - Street and Highway
  - Bridge
  - Rail and Marine
  - System Management and Operations
- Establishes Portland Freight Advisory Committee
**STREET CLASSIFICATIONS**

<table>
<thead>
<tr>
<th>Freight Street</th>
<th>Primary Activity</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Classification</td>
<td>Heavy Freight</td>
<td>Goods Delivery</td>
<td>Services</td>
</tr>
<tr>
<td>Regional Truckway</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Priority Truck Street</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Freight District Street</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Major Truck Street</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Truck Access Street</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Local Service Street</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

- **Primary Activity**: ●
- **Secondary Activity**: ●
- **Limited Activity**: ●

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**Portland Sustainable Freight Strategy**

**Why a Sustainable Freight Strategy?**
- **Climate Action Plan**: Improving freight movement efficiency is a key objective in meeting the Portland’s urban form and mobility goals.
- **Greater Density**: Increase in the overall volume of goods delivered.
- **Customer Needs**: Continued demand for convenient and reasonable cost delivery services.

**Project Work Scope (3 Main Components):**
1. **Case Study Research**: Identify what sustainable freight practices are being implemented in other urban areas.
2. **Stakeholder Interviews**: Identify what local carriers and shippers are doing to improve their efficiency.
3. **Project Working Group**: Engage public and private sector freight transportation and sustainability interests to recommend solutions.
Case Study Research

Categories of Sustainable Freight Strategies:

• Urban Consolidation Centers
• Clean Vehicle Technology
• Low Emission Zones
• Off-Hours Deliveries
• Last Mile Solutions

Urban Consolidation Centers

Urban Consolidation Centers (UCC)

• A facility located near a city center that performs various logistic functions (one-stop shop):
  - break-bulk (inbound)
  - load consolidation (outbound)
  - stocking
  - customer collection
  - product handling and pricing
• Inbound shipments are transferred from large trucks and consolidated into smaller vehicles for local delivery.

Potential Benefits:
• Improved efficiencies in local deliveries.
• Reduced heavy truck volumes in the central city.
• Reduced emissions, fuel consumption and noise.
### Urban Consolidation Centers

**Cont’d**

**Key Findings:**

- Must weigh benefits against capital and operating costs (Expensive to operate and maintain)
- Adding another link in the supply chain can increase delivery time and costs.
- Limited success with publically operated UCCs due to low throughput volumes, ongoing requests for public financial support and poor customer serve.
- Difficult for a single urban center to handle a wide range of goods with different handling and storage requirements.
- Most urban freight already consolidated at intra-company level or by carriers.
- The Central Eastside Industrial District already serves as an platform for freight consolidation by providing a centralized location for private warehousing and distribution companies to operate in Portland’s central city.

**Pacific Coast Fruit Company conducts break-bulk activities for larger inbound shipments, which are then consolidated into smaller vehicles for local delivery.**

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### Clean Vehicle Technology

**Key Findings:**

- Common goal is to reduce environmental impacts (diesel emission, noise, roadway damage).
- Ability to compete with gas/diesel equivalent vehicles (price performance ratio, reliability, maintenance).
- Mostly applicable for small package “last-mile” deliveries due to limited payload capacity and delivery range.
- Best if combined with Urban Consolidation Centers (UCCs)
- Provide incentives/advantages (i.e., preferential on-street loading space).
- Implement/enforce access restrictions and regulations (i.e., limit heavy freight vehicles in central city areas)

**FedEx and others are experimenting with medium duty electric delivery vehicles.**
Low Emissions Zones

Objective:
- Improve air quality by setting stricter vehicle emission standards within a designated area. Vehicles not meeting standards are either banned, or their operators are charged fees for driving in the zone.

Findings:
- Over 100 European cities have established LEZs (e.g., Berlin, Copenhagen, London). LEZs are effective for improving air quality.
- Air quality improvement results from fleet turnover and adopting cleaner technology rather than a reduction in traffic volumes.
- Implementing LEZ policy can impose substantial costs on carriers through expensive retrofits and new vehicle purchases.
- LEZ policy may result in exporting pollution by simply redistributing vehicle emissions to areas with less stringent regulations.
- In the US, air quality is regulated by the EPA on a regional airshed basis and a LEZ-based scheme for the central city would have likely have limited measurable benefits in reducing regional emissions.
- Existing EPA regulations significantly improve diesel emissions over time.

Off-Hour Deliveries

NYC Off-Hour Truck Delivery Pilot Program

Goal:
- Reduce daytime freight conflicts with other road users by shifting deliveries to off-hours with lower congestion levels.
- Improve carrier efficiency through higher average travel speeds, lower service times and reduced parking cost.

Findings:
- 70% of carriers in pilot program didn’t change behavior citing customer needs.
- 90% of deliveries are made during the daytime indicated customer demand determines when goods are delivered.
- Carrier savings are not large enough to compensate for additional costs to receivers.
- Need to provide financial incentives to receivers who incur additional costs for off-hour deliveries.
- Use unattended or keyed entry to allow receivers to accept off-hour deliveries without incurring additional staff costs.
“Last Mile” Solutions

The “Last Mile” is the final link in the supply chain that delivers goods to a receiver’s home, business or other delivery point. Last mile delivery accounts for 28% of all transportation costs.

Objective:
Reduce the delivery failure rate and increase operating efficiencies for parcel delivery service.

Collection/Delivery Point Network:
Attended delivery system that consists of designated locations where packages can be delivered or picked up by a carrier. Receiver is notified when package is available.

Locker Banks:
Unattended delivery points where carriers leave packages and customers are responsible for retrieving them. Examples include the DHL PackStation system in Germany.

Findings:
- Splitting the last mile between carriers and receivers can reduce carrier costs from failed deliveries.
- Can reduce VMT and vehicle emissions if retrieved by non SOV mode.

Stakeholder Interviews

• Stakeholder Interviews:
  - Dry goods suppliers
  - Beverage distributors
  - Grocers
  - Produce suppliers
  - Bike delivery company
  - Downtown building management firms
  - Parcel/package delivery (UPS/FedEx)
  - State sustainability program managers

• What We Heard:
  ➢ Sustainability is directly associated with productivity; fewer trip and delivery miles are achieved with full loads.
  ➢ Carriers reduced their carbon footprint by improving fleet performance.
  ➢ Customers already adapt their shipping/receiving schedules to avoid peak hours of traffic.
  ➢ Inadequate supply of on-street loading and unloading spaces erode efficiency.
  ➢ Restricting truck size does not necessarily lead to efficiency. One large truck can be more sustainable than multiple smaller trucks with respect to fuel use, emissions produced, and the number of on-street loading areas needed.
What We Learned

- Greater density will increase the overall volume of goods delivered in the Central City with trucks carrying the vast majority of those goods.

- The private sector selects the most cost-effective mode of transport based on cost, reliability and customer needs. Trucks typically offer the most flexibility making many goods dependent on truck movements.

- The public sector has two primary means to improve freight delivery:
  1. Allocation and use of public right-of-way space
  2. Regulatory authority over land use and development

- There is no Single Simple Sustainability Solution - private sector logistic providers will continue to seek the most cost-effective solutions based on economic efficiencies and customer needs.

- The public sector, through its regulatory authority over public right-of-way space and land use, can help create the environment for logistic service providers to capitalize on system efficiencies.

Recommended Actions

- Prepare a Truck Loading and Parking Plan for the central city (currently in progress)

- Pilot an Off-Hour Delivery Program (TBD).

- Update zoning to allow freight distribution districts and increased employment density (part of Portland Comprehensive Plan update).

- Create incentives for electric-hybrid delivery vehicles (grant funding pending).

- Make heavy rail, barge, and multi-modal freight options more attractive (on-going coordination with Port and other heavy freight service providers).
Questions?

For more information contact:

Bob Hillier @ 503 823-7567 or e-mail @ Robert.hillier@portlandoregon.gov or www.portlandonline.com/transportation/freight