Market Trends Impacting Freight Planning and Policy

AASHTO CORT February 19, 2019

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Wide Range of Trends Affecting Freight

POLITICAL
- Funding, trade agreements, interagency cooperation
- Customs and borders
- Int’l trade agreements
- Regulations
- National infrastructure
- Supply chains – global & domestic
- Trade – global & domestic
- Freight needs of industry sectors
- Freight labor markets, education, training
- Shifts in manufacturing
- Investment patterns

SOCIAL
- Consumer demand
- Aging population
- Urbanization
- Migration
- Housing
- Megaregions
- Passenger congestion affecting freight

ECONOMIC
- Global competitiveness, manufacturing & trade patterns, labor markets
- Freight Advisory Committees
- State and local transportation initiatives
- Funding, taxation

TECHNOLOGICAL
- Connected / automated vehicles
- Instrumented supply chains and inventory
- Imagery, sensors, transactions, big data
- Enforcement & safety
- Smart cities & smart infrastructure
- 3D Printing
- Traffic control & loading zones

ENVIRONMENTAL
- Climate change, energy, extreme weather, air quality

Source: CPCS
## Top Freight Operations Issues

<table>
<thead>
<tr>
<th>Industry</th>
<th>Agency</th>
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<tbody>
<tr>
<td>• Driver shortage</td>
<td>• Economic competitiveness</td>
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<tr>
<td>• Hours of service</td>
<td>• Lack of safe truck parking</td>
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<td>• Driver retention</td>
<td>• Railroads</td>
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<td>• ELD mandate</td>
<td>• Fluidity</td>
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<tr>
<td>• Truck Parking</td>
<td>• Safety</td>
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<td>• Compliance, safety, accountability</td>
<td>• “Working on door-to-door instead of interchange to interchange”</td>
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<td>• Driver distraction</td>
<td>• Preparing for CV/AV</td>
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<td>• Transportation infrastructure congestion/funding</td>
<td>• Funding for maintenance / repairs</td>
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<td>• Driver health and wellness</td>
<td>• Lack of industry ‘lead’</td>
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<tr>
<td>• Economy</td>
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Source: ATRI Top Industry Issues 2018, CPCS
Our Focus Today

Potential Freight and Good Movement Trends

- 30,000 Ft View
- E-Commerce
- Longer Trains
- Sensors & Computing
- Federal Policy

What is the Impact on Freight?
What is the Role of Transportation Agencies?
What Actions Should Transportation Agencies Take?
30,000 Foot View

Source: Donald Ludlum
Freight Demand in US

- 326 million residents
  - 128.5 million households
- $19.4 trillion GDP
- VMT Trends
  - Total
  - Single-Unit Trucks
  - Combo-Unit Trucks

Source: Donald Ludlow
Economic Growth Means Growing Freight Demand

Freight Transportation Services Index (TSI) has grown 42% since its low point in 2009
E-Commerce
E-Commerce at the Core of Rapid Changes

- Final 50 feet
- First and last-mile
- Shifting location dynamics
- Changes in facilities and fleets
- Shift to e-commerce
E-Commerce Growth 05’ to 18’

- E-Commerce
- Proportion of Total Retail Sales

Millions

Proportion of Total Retail Sales

Q1 2005 | Q1 2006 | Q1 2007 | Q1 2008 | Q1 2009 | Q1 2010 | Q1 2011 | Q1 2012 | Q1 2013 | Q1 2014 | Q1 2015 | Q1 2016 | Q1 2017 | Q1 2018

E-Commerce Growth:
- 2005: $20,000
- 2018: $140,000

Proportion of Total Retail Sales:
- 2005: 0%
- 2018: 12%
Warehousing

- Historically Low Vacancy Rates
  - New construction
  - Conversion of retail real estate (limited)

Source: CPCS BLS Data
Industrial Real Estate Peak Markets

Source: JLL

2018 (Q2)
Largest US and Canada distribution hubs are Los Angeles-San Bernardino, New York-NJ-Eastern PA, Chicago, Dallas, Toronto, Atlanta

Two things in common: situated in strategic, central locations 2) located in close proximity to major population centers

Two major trends: DC clusters are 1) growing on the periphery and 2) becoming more concentrated

Source: CPCS repository of freight facilities exceeding 300,000 square feet. Note: does not include retail facilities. (e.g. malls)
Mississauga, Ontario

Source: Donald Ludlow
1st Mile/Last Mile & the Last 50 Feet
Sometimes the Final 50-Feet Looks Like This

- Georgetown, Washington, DC
- Curbside deliveries block traffic
- Trucks circle to find spaces
- Emissions, livability
The Future of Final 50-Feet?

PERRY HOMES

A TEXAS TRADITION FOR
1967-2017

WHEN YOUR HOMES ARE BUILT TO LAST,
your company is too.
What does all this mean?

- Logistics facilities represent significant capital investments that are immutable in short/medium term.
- Most land uses are often not synchronized with freight demand, resulting in additional freight VMT, congestion, circuity, emissions, and noise pollution.
- Freight facilities often require a large footprint and have specialized needs such as just-in-time deliveries and 24/7 operations – meaning encroachment by less compatible uses needs to be considered carefully.
- Some communities developing "model freight ordinances" to codify desired attributes of freight access routes and adjacent land uses.
What can be done?

- Some communities developing “model freight ordinances” to codify desired attributes of freight access routes and adjacent land uses
- Traffic operations works with freight planners & carriers to:
  - Identify the truck routes
  - Identify the major generators (e.g. airports, seaports, distribution centers)
  - Assess performance
- Implement measures to improve performance (e.g. signal timing, traveler information, etc.)
- Curbside management strategies and building management strategies in urban centers
Longer Trains
“We love freight rail, but they are not a favorite of local communities because they are exempt from all civil behavior. They don’t care about leaving freight trains idling or backing up over crossings. They take advantage of their exemptions. Even if they are not legally required to behave.”

- State DOT Secretary, January 2019
From 2000 to 2018 carload freight has dropped 19% and intermodal has increased 59%
Shift from West to East Coast Ports

- Megaships + Panama Canal expansion
- East Coast ports closer to US population centers
- Greatest growth on West Coast has been British Columbia ports ($400 to $600 per container advantage to US Midwest)
- West Coast rail intermodal still saves 10 days
New Uptick in Crude by Rail

Thousands of Barrels

Source: CPCS Analysis of EIA Data
What does all this mean and what can be done?

• Railroads will continue to maximize the length of trains to squeeze efficiency out of the system (e.g. ‘precision railroading’)

• Transportation agencies can track blocked crossing issues and locations, understand statutory levers, work with railroads and FRA to improve operations, including sidings, grade separations, crossing closures

• Crude rail volumes will continue to grow as US and Canada continue their trajectory as leading crude producers and as pipeline capacity (especially Canada-US capacity) remains static

• Transportation agencies can monitor crude oil movements and develop an understanding of crude flows and retail petroleum supply chain to improve planning and multimodal coordination
Sensors & Computing
Autonomous Trucks

• Testing:
  • Daimler Freightliner “Inspiration” tested on Nevada state highway and interstates
  • Uber Freight tested in AZ,
  • Waymo tested in CA, AZ, Atlanta

• The technology is ahead of the legal framework
  • How is accident liability established? No legal framework (yet).

• Financially viable when a corridor of states allows the vehicle
  • The potential for platooning is a huge incentive
  • U.S. railroads are concerned (but they are also automating)
Drones Etc.

• Growing interest in novel modes: cargo bikes, drones, robots

• Reality dictates that trucks will remain dominant mode

• Implication is that present (e-commerce demands on streets) and future should be considered
Computer Vision Example at Intersection

Source: Miovision
Chicago Camera Coverage

Source: CPCS analysis of data from Miovision, Fish Transportation Group, AES Services Inc., and Gewalt Hamilton Associates Inc.
Truck Speeds in Chicago from Computer Vision

Source: CPCS analysis of data from Miovision, Fish Transportation Group, AES Services Inc., and Gewalt Hamilton Associates Inc.
Truck Volumes in Chicago from Computer Vision

Source: CPCS analysis of data from Miovision, Fish Transportation Group, AES Services Inc., and Gewalt Hamilton Associates Inc.
• Predict the time and location of train crossings
• Location-based data collected from video imagery, Bluetooth, schedules, multiple sources
• Automated analytics and dashboard visualization
Federal Policy
• The FAST Act is nearing the end of its 2016 to 2020 authorization
• Uncertain future funding and programmatic changes
Next Generation FAST Act Freight Plans

• The FAST Act required state freight plans to spend National Highway Freight Program funds (post Dec. 2017)
• Plans must be updated every 5 years

What will FAST Act Freight Plans Version 2.0 Include?

How have States used their Freight Plan (their first for some)?

What Gaps will Version 2.0 fill?
Electronic Logging Devices & Truck Parking

• Hours of Service (HOS), truck parking, and ELDs ranked 1\textsuperscript{st}, 2\textsuperscript{nd}, and 3\textsuperscript{rd} as truck drivers top concerns in a 2018 survey by ATRI.

• Issues are interrelated with ELDs enforcing HOS and making it more difficult for truck drivers to find truck parking.

Source: Trucker Path
• Statewide truck parking availability at 9am
• Statewide truck parking availability at 3pm
• Statewide truck parking availability at 6pm
• Statewide truck parking availability at Midnight
• Statewide truck parking availability at 3am
Trends, Eh

- Climate Change
- Funding increase
- Canada Infrastructure Bank $35B
- USMCA / Trade
Other Trends

• What else is MOST IMPORTANT today?
• ...
• ...
• ...
• ...
Thank You!

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