FREIGHT TRANSPORTATION PLANNING 101

TRANSPORTATION PLANNING ACADEMY 2017

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Stuff We Use Everyday
Journey

What is Freight Planning?

The Importance of Freight

Modes of Freight Transportation

Freight Challenges

The Future of Freight

4
Importance of California

One of the world’s largest economies

Nation’s largest gateway

One-third of economic product and jobs

Over $740 billion in gross domestic product

11% of total U.S. export merchandise value

California feeds America
Note: Major flows include domestic and international freight moving by truck on highway segments with more than twenty five FAF trucks per day and between places typically more than fifty miles apart.
2/3 of Freight is in California

- International Export: 10%
- Domestic Export: From
- International Import: 18%
- Domestic Import: To
- Through: 5%
- Within: 67%
Trends

- Consumer Demand
- Aging Infrastructure
- Competition
- Funding
- Regulations
- Data + Analytics
Supply Chain
TEUs
**Early Containerships (1956-)**
- 500 - 800 TEU
- 137 x 17 x 9 meters
- 6 containers across
- 4 containers high on deck

**Fully Cellular (1970-)**
- 1,000 - 2,500 TEU
- 200 x 20 x 9
- 4 containers high below deck

**Panamax (1980-)**
- 3,000 - 3,400 TEU
- 250 x 32 x 12.5

**Panamax Max (1985-)**
- 3,400 - 4,500 TEU
- 290 x 32 x 12.5

**Post Panamax (1988-)**
- 4,000 - 5,000 TEU
- 285 x 40 x 13

**Post Panamax Plus (2000-)**
- 6,000 - 8,000 TEU
- 300 x 43 x 14.5

**New Panamax (2014-)**
- 12,500 TEU
- 366 x 49 x 15.2

**Post New Panamax (2006-)**
- 15,000 TEU
- 397 x 56 x 15.5; 22-10-8 (not shown)

**Triple E (2013-)**
- 18,000 TEU
- 400 x 59 x 15.5
Benjamin Franklin
(Port of Long Beach)
Distribution Center

Suppliers

Receiving

Sorting

Shipping

Customers

Before Cross-Docking

Suppliers

LTL

Customers

After Cross-Docking

TL

Cross-Docking DC

TL
System Impacts
Curbside Parking

Photo by Anna Bovbjerg, University of Washington
Alleyways

Photos by UW SCTL Center
Deliveries and missed deliveries

Photos by UW SCTL Center (2016)
Loading Zones

Photo by Chris Eaves, Seattle DOT (2016)
Community & Environmental Impacts
Community Impacts

Our Communities

- Environmental justice
- Noise and vibration
- Lighting

Our Environments

- Air pollution
- Health effects
- Congestion
- Quality of life
Aspects of Freight

- Impacts of mega ships
- Inefficiencies created by regulations
- Oversized loads
- Global and domestic competition
- Capacity increases without expansion
Freight Overview

- Modes
- Freight Facilities
- Systems / Networks
- Intermodal

Logistics
Multimodal Integrated Systems

- Trucks
- Trains
- Ocean Carriers
- Cargo Planes
- Cargo Bikes
- Drones
Major Freight Facilities

- Highways
- Seaports
- Railroads
- Air Cargo Airports
- Freight Intermodal Facilities
- Ports of Entry
# Commercial Vehicles

<table>
<thead>
<tr>
<th>Class 1</th>
<th>Class 2</th>
<th>Class 3</th>
<th>Class 4</th>
<th>Class 5</th>
<th>Class 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorcycles</td>
<td>Passenger cars</td>
<td>Four tire, single unit</td>
<td>Buses</td>
<td>Two axle, six tire, single unit</td>
<td>Three axle, single unit</td>
</tr>
<tr>
<td>Predominate mode</td>
<td>Flexible</td>
<td>Create congestion</td>
<td>Generates emissions</td>
<td>Ruin pavement</td>
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</tr>
</tbody>
</table>

- **Class 1**: Motorcycles
- **Class 2**: Passenger cars
- **Class 3**: Four tire, single unit
- **Class 4**: Buses
- **Class 5**: Two axle, six tire, single unit
- **Class 6**: Three axle, single unit
- **Class 7**: Four or more axle, single unit
- **Class 8**: Four or less axle, single trailer
- **Class 9**: 5-Axle tractor semitrailer
- **Class 10**: Six or more axle, single trailer
- **Class 11**: Five or less axle, multi-trailer
- **Class 12**: Six axle, multi-trailer
- **Class 13**: Seven or more axle, multi-trailer
Planning for Commercial Vehicles

- Turning radius
- Height and weight restrictions
- Federal standard routes
- “Last Mile” access
Maritime Transportation

- World gateways
- Highly competitive
- Economic engines
- Largest port complex
- Environmental stewards
California Seaports

- 11 Public ports
- 3 Mega ports
- 1 Private port
- 2 Inland ports
Container Vessels

How big is big?

How many TEUs?
Gerald Desmond Bridge

Built in 1968

What’s hanging?

Major national facility

1970s

Today
New Bridge Rendering

The New Gerald Desmond Bridge
California Freight Rail

- 2 Class I large and 29 Class III small railroads
- Several classification and intermodal yards
- Largest rail yard in the West

Freight carried by rail tends to:
- Travel long distances
- Be heavy or bulky
- Have less value by weight
Planning for Rail

- Truck alternatives
- Shared facilities
- Hazardous loads
- Abandoned rail
High value-to-weight ratio, time-sensitive, long distance

Dedicated freight aircraft or as “belly cargo”

More value per ton than any other mode

Imports exceed exports
How Freight Planning “Fits In”

1. Public
2. Governor
3. California State Transportation Agency
4. Caltrans Directorate
5. Deputy Director of Planning and Modal Programs
6. Division of Transportation Planning
7. Office of Freight Planning
Primary Responsibilities

Includes

- Product development
- Coordination and education
- Programming advocacy
Freight Project

“An improvement that significantly contributes to the freight system’s economic activity or vitality; relieves congestion on the freight system; improves the safety, security, or resilience of the freight system; improves or preserves the freight system infrastructure; implements technology or innovation to improve the freight system or reduce or avoid its negative impacts; or reduces or avoids adverse community and/or environmental impacts of the freight system.”

CFMP 2014
TCIF Projects

Northern California

Seaports
4 projects - $629 million

Railroads
3 projects - $130 million

Grade Separations
1 project - $42 million

Highways
12 projects - $617 million
TCIF Projects

Southern California

Seaports
11 projects - $1.807 billion

Railroads
12 projects - $458 million

Grade Separations
32 projects - $2.417 billion

Highways
17 projects - $1.321 billion
2050 Freight System Vision

Guiding Principles

2030 Statewide Targets
- Efficiency
- Zero Emission
- Competitiveness

9 State Agency Actions

3 Pilot Projects

72 Implementation Steps
Traffic bottlenecks/congestion

Aging/deteriorating infrastructure

Air quality and community impacts

Funding

Increased competition

Increased freight demand

Lack of accurate performance data

Freight Planning Challenges
Solutions?

System of Systems
Solutions?

Incremental Innovations

- Dedicated freight lanes
- Truck platooning
- Off-peak deliveries
- One California
- Asset management program
- Prepare for climate change
- Clean-fuel use coordination
Freight Systems of the Future?

- Electric/Catenary?
- Tubes/Capsules?
Freight Resources

Freight Planning Websites


California Freight Advisory Committee (CFAC) Meetings

- Contact DOTP’s Workforce Development Branch for more information

Caltrans Goods Movement Seminars

FHWA: Talking Freight Webinars

- http://www.fhwa.dot.gov/planning/freight_planning/talking_freight
Questions?

THANK YOU!

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