NATIONAL ACADEMIES Sciences Engineering Medicine

TRB TRANSPORTATION RESEARCH BOARD

TRB Webinar: Fostering Sustainability through Freight-Efficient Land Uses

July 10, 2023

2:00 – 3:30 PM

PDH Certification Information

1.5 Professional Development Hours (PDH) – see follow-up email

You must attend the entire webinar.

Questions? Contact Andie Pitchford at TRBwebinar@nas.edu

The Transportation Research Board has met the standards and requirements of the Registered Continuing Education Program. Credit earned on completion of this program will be reported to RCEP at RCEP.net. A certificate of completion will be issued to each participant. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the RCEP.

ENGINEERING
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AICP Credit Information

1.5 American Institute of Certified Planners Certification Maintenance Credits

You must attend the entire webinar

Log into the American Planning Association website to claim your credits

Contact AICP, not TRB, with questions

Purpose Statement

This webinar will provide actionable guidance on how to integrate freight land-use policy and management with transportation efforts to foster efficient land uses.

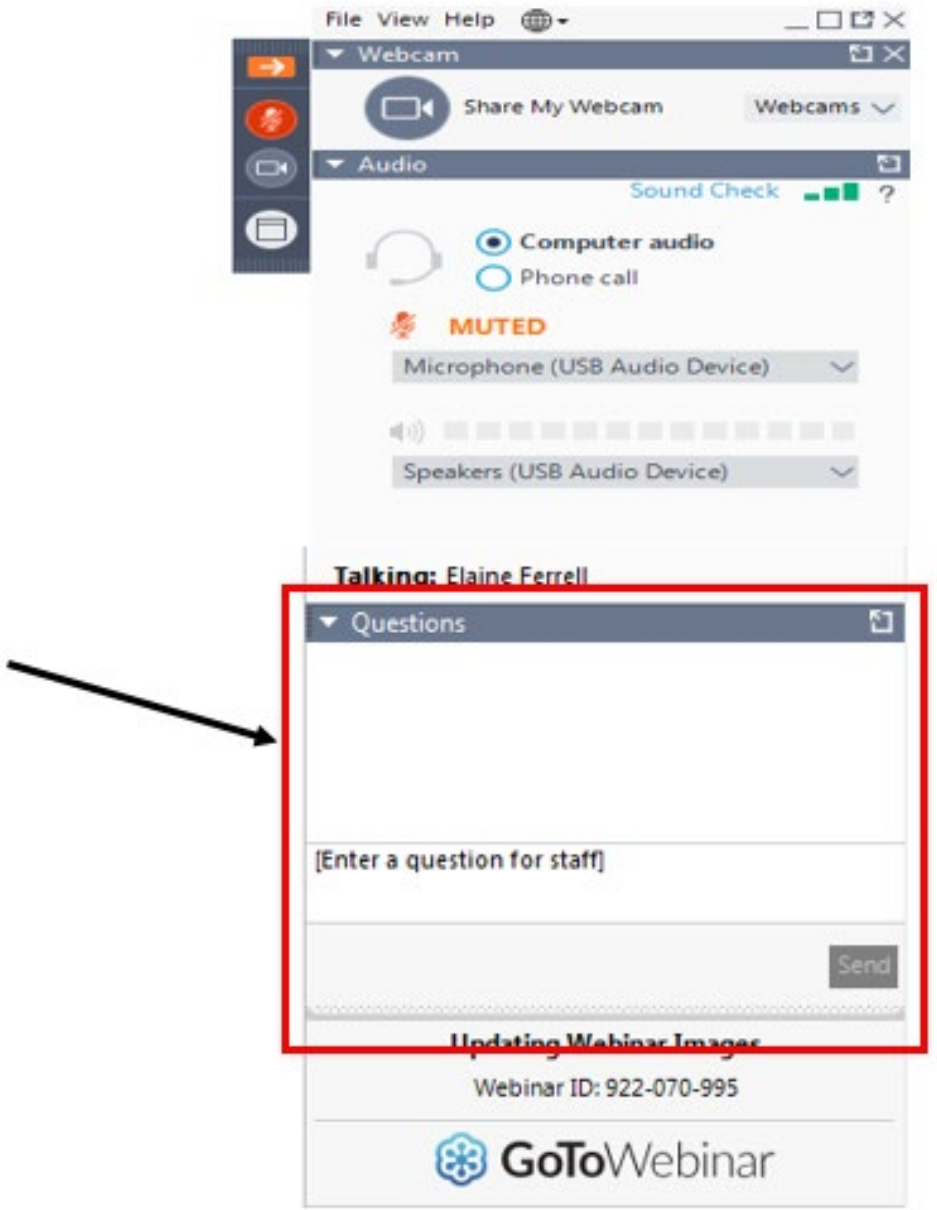
Learning Objectives

At the end of this webinar, you will be able to:

- Leverage comprehensive various policy, and management efforts to foster freight efficient land uses

Questions and Answers

- Please type your questions into your webinar control panel
- We will read your questions out loud, and answer as many as time allows



Today's presenters

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Fostering Sustainability through Freight Efficient Land Uses

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Outline of Presentation

- Freight Efficient Land Uses (José Holguín-Veras)
  - Motivation and Goal
  - Definition and Principles
  - Examples
  - Transportation Decision Support Tools
- FELUs and Existing Land-Use Planning Tools (Catherine T. Lawson)
- Transportation & Land Use Planning Paradox (Daniel Haake)
- Questions and Answers

Freight Efficient Land Uses: Definition, Principles, and Transportation Decision Support Tools

José Holguín-Veras,

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Motivation and Goals of Transportation and Land-Use Policy

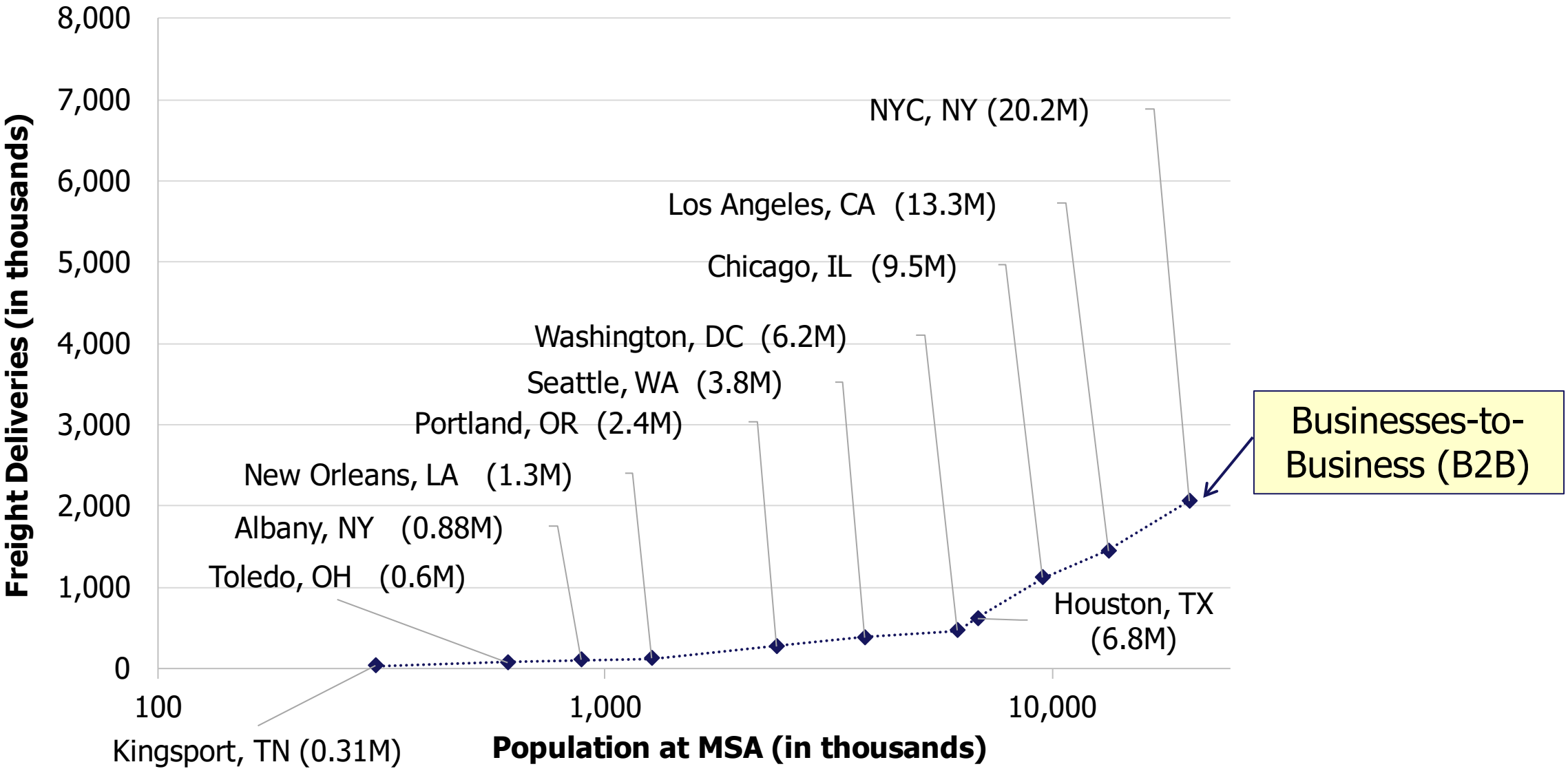
Reducing the Environmental Footprint of Cities is Essential

"Cities are responsible for more than 70 percent of global fossil-fuel carbon dioxide emissions."

https://climate.nasa.gov/news/2161/nasa-partners-target-megacities-carbon-emissions/

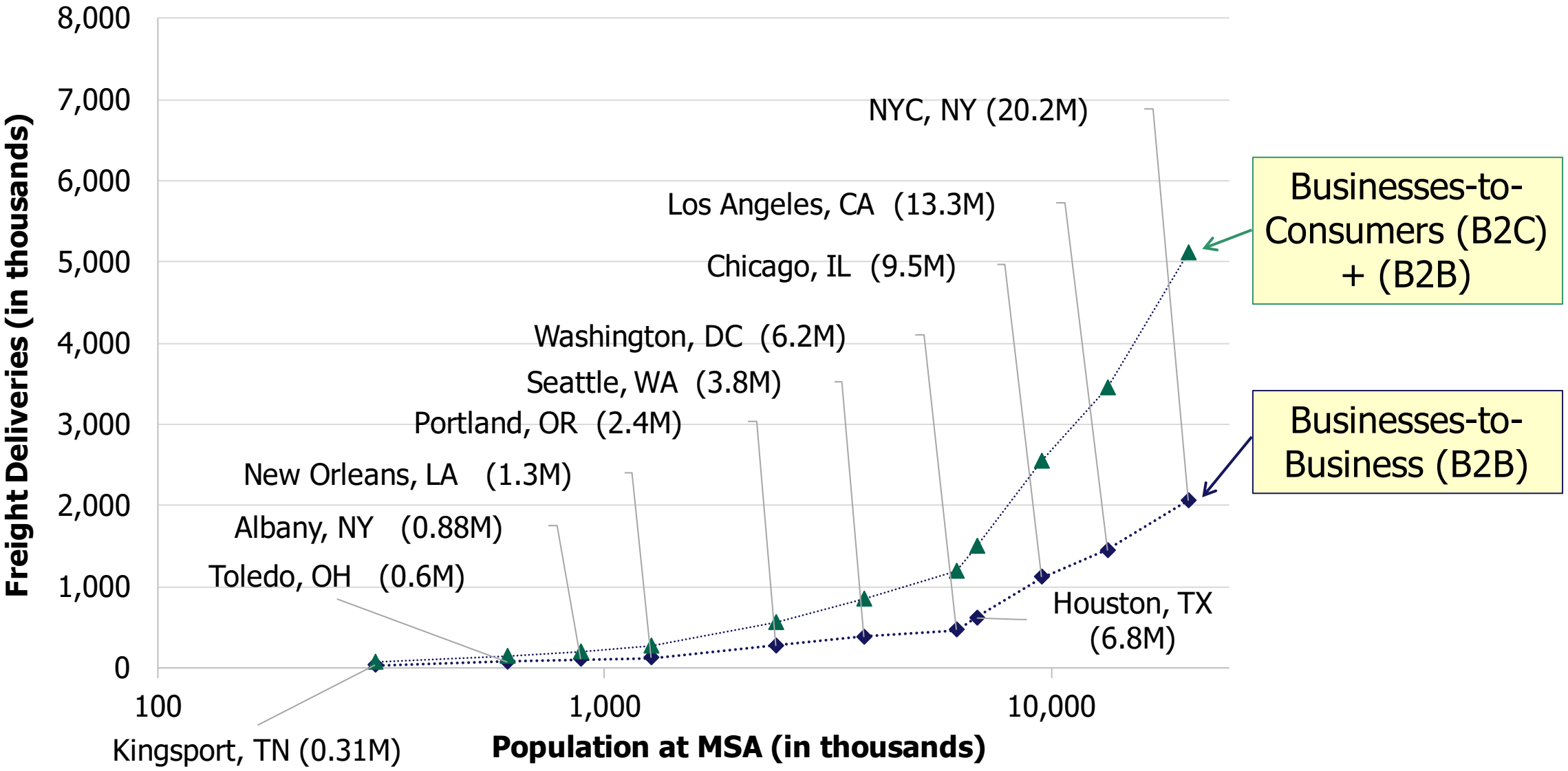
Johannesburg
Lagos
Paris
London
Kinshasa
Sao Paulo
Rio de Janeiro
Buenos Aires
New York
Bogota
Chicago
Lima
Mexico City
Los Angeles

This is What It Used to Be (Before Ecommerce)



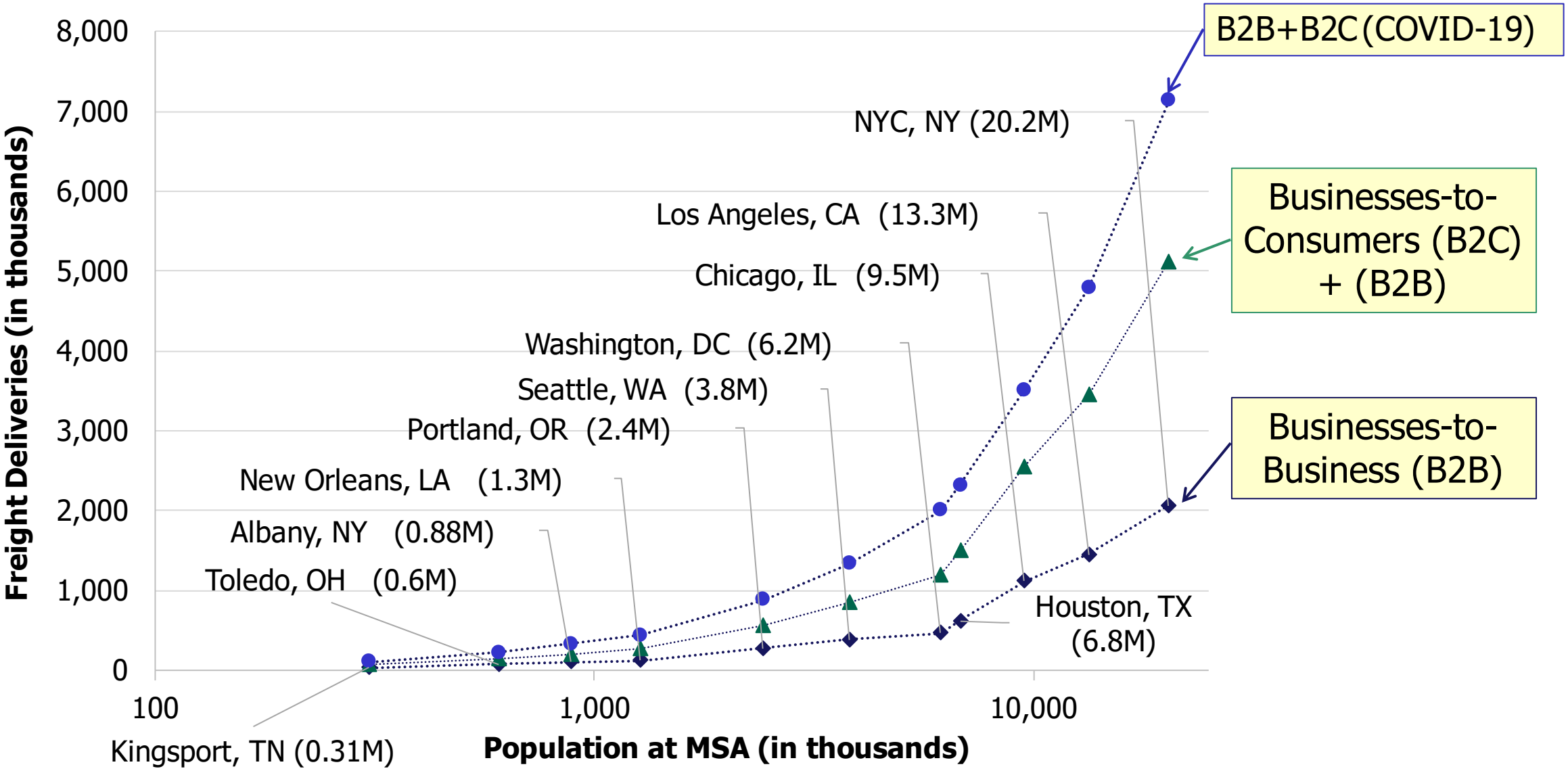
Estimates produced by the Freight and Service Trip Generation Software (FASTGS)

This is What It Became with Ecommerce (Before COVID-19)



Estimates produced by the Freight and Service Trip Generation Software (FASTGS)

This is What Became with Ecommerce (During COVID-19)



Estimates produced by the Freight and Service Trip Generation Software (FASTGS)

Goal of Transportation and Freight Land Use Policy…

- **Goal**: To help **maximize the benefits associated with the production and consumption of physical goods** and **help minimize the negative externalities created by the associated freight vehicle traffic**.
- To reach the goal, these **objectives** must be achieved:
  - Facilitate a seamless integration of freight activity into urban/suburban/rural fabrics
  - Help achieve quality of life and livability
  - Enhance economic competitiveness and efficiency
  - Reduce congestion, emissions, and related externalities
- Proactive freight land-use policy is more important than ever…

Freight-Efficient Land Uses (FELUs): Definition and Principles

Freight-Efficient Land Uses: An Aspirational Concept

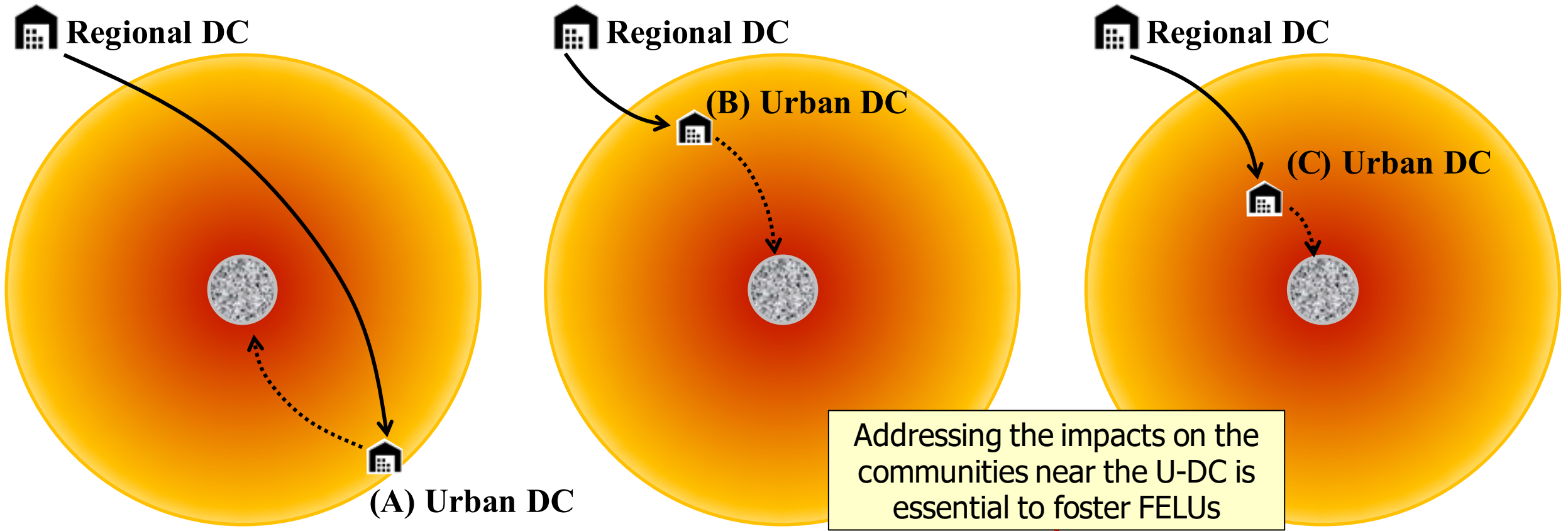
- **Freight-Efficient Land Uses (FELUs)** are the land-use patterns that: *minimize the social costs (private plus external costs) associated with both the supply chains and the economic activities that consume and produce goods, at all stages of production and consumption; including reverse and waste logistics*
  - **Private Costs**: The production/logistics/facility costs incurred by the business and infrastructure operators, such as labor, land or buildings, equipment to operate DCs, and operation of freight vehicles
  - **External Costs**: The impacts both positive and negative that affect those who are not directly involved in the activity, such as communities are congestion, pollution, noise, security, accidents, and aesthetic degradation produced by freight activities

FELU Principles

FELU Principles

- Provide guidance, to be adapted to the local conditions:
  - ***Minimize Social Costs***, to reduce the private and external costs of supply chains and their stages;
  - ***Foster Compactness of Supply Chains***, to reduce the distance traveled at supply chain stages, up and downstream;
  - ***Mitigate Supply Chain Externalities***, to reduce or eliminate, the externalities at supply chain nodes and Large Traffic Generators (LTGs);
  - ***Seek Appropriate Solutions***, to recognize and account for local conditions; and
  - ***Engage Stakeholders***, to ensure their view and concerns are addressed.

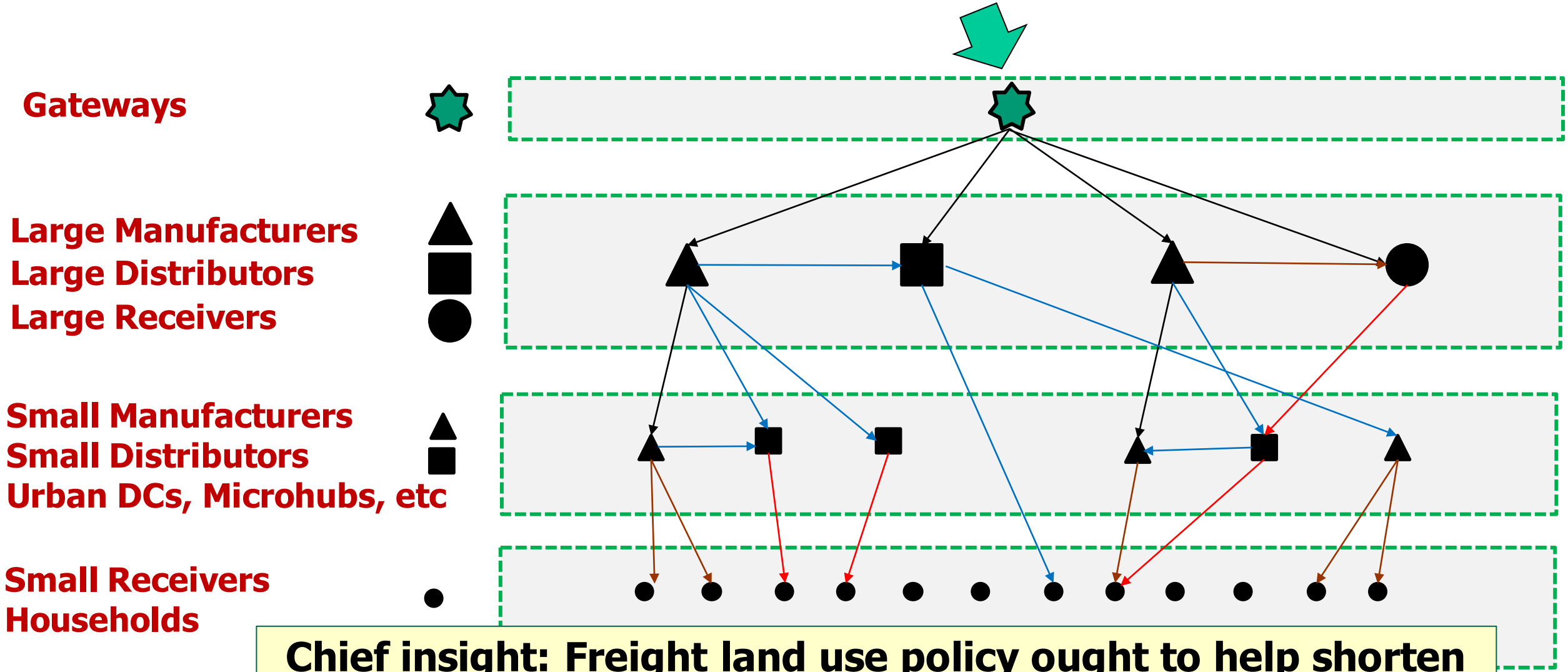
Principle #1: Minimize Social Costs Along Supply Chains



Addressing the impacts on the communities near the U-DC is essential to foster FELUs

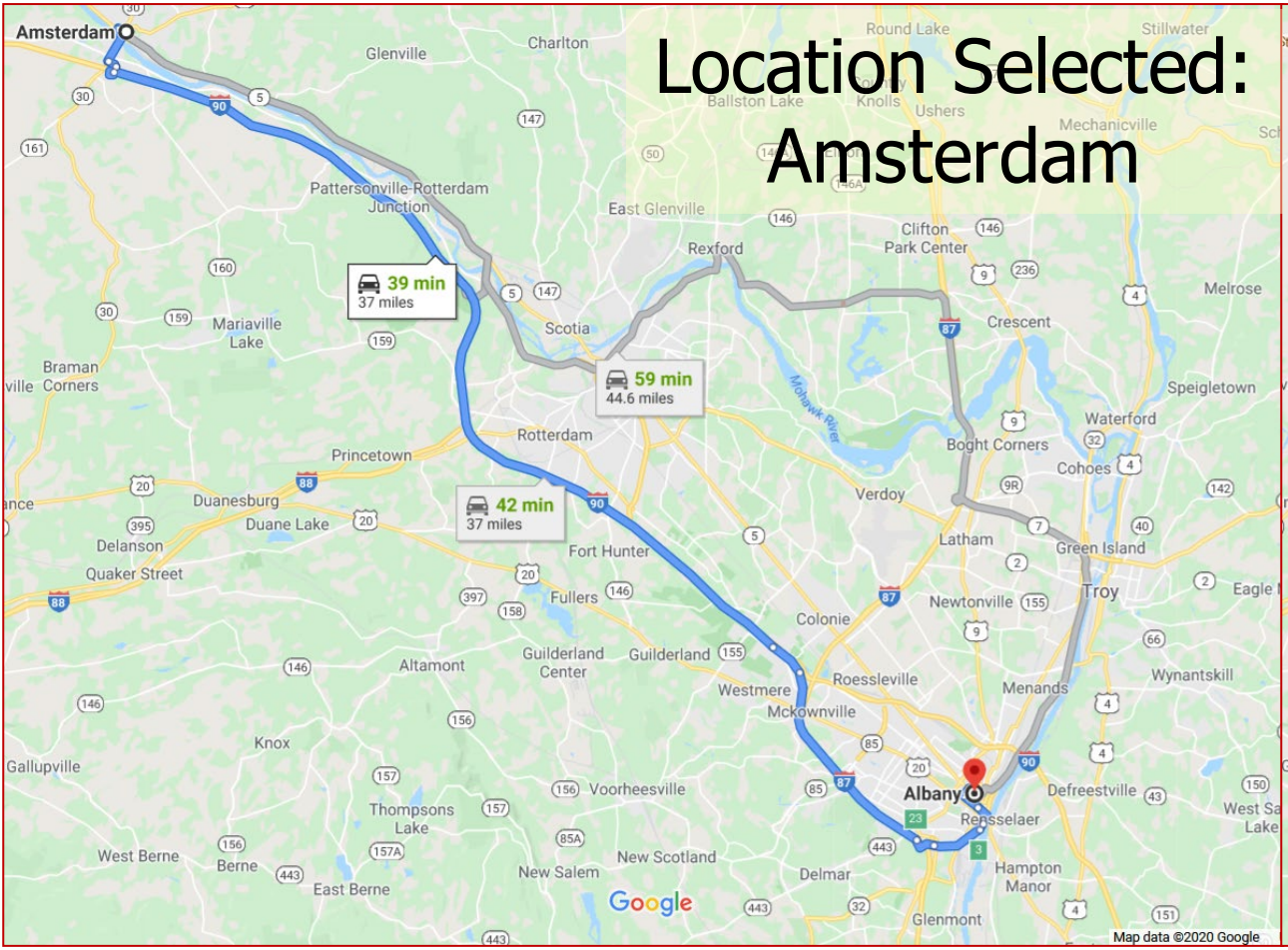
Long journeys from R-DC to U-DC and from R-DC to city center Bad for private sector Bad for the city Minimal impacts on communities near the U-DC	Shorter journeys from R-DC to U-DC and from R-DC to city center Better for private sector Better for the city Larger impacts on communities near the U-DC	Shorter journeys from R-DC to U-DC and from R-DC to city center Even better for private sector Even better for the city Even larger impacts on communities near the U-DC

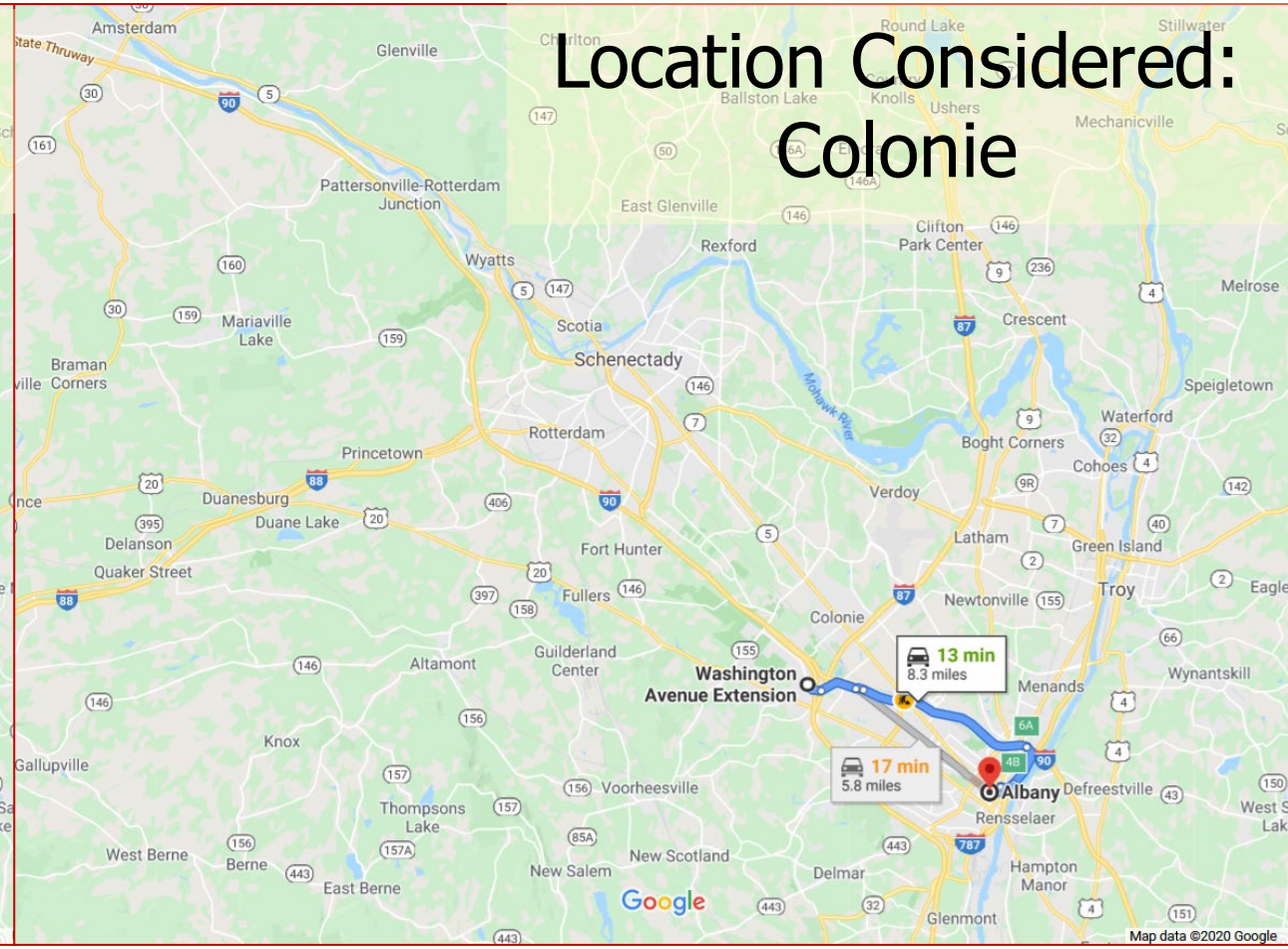
Principle #2: Foster Supply Chain Compactness



Chief insight: Freight land use policy ought to help shorten the physical separation between the stages of supply chains

Example: Location of a Last Mile DC in the Albany NY Region





Probably larger and more convenient, but farther away from the delivery area →
Likely to add 800,000 freight VMT/year

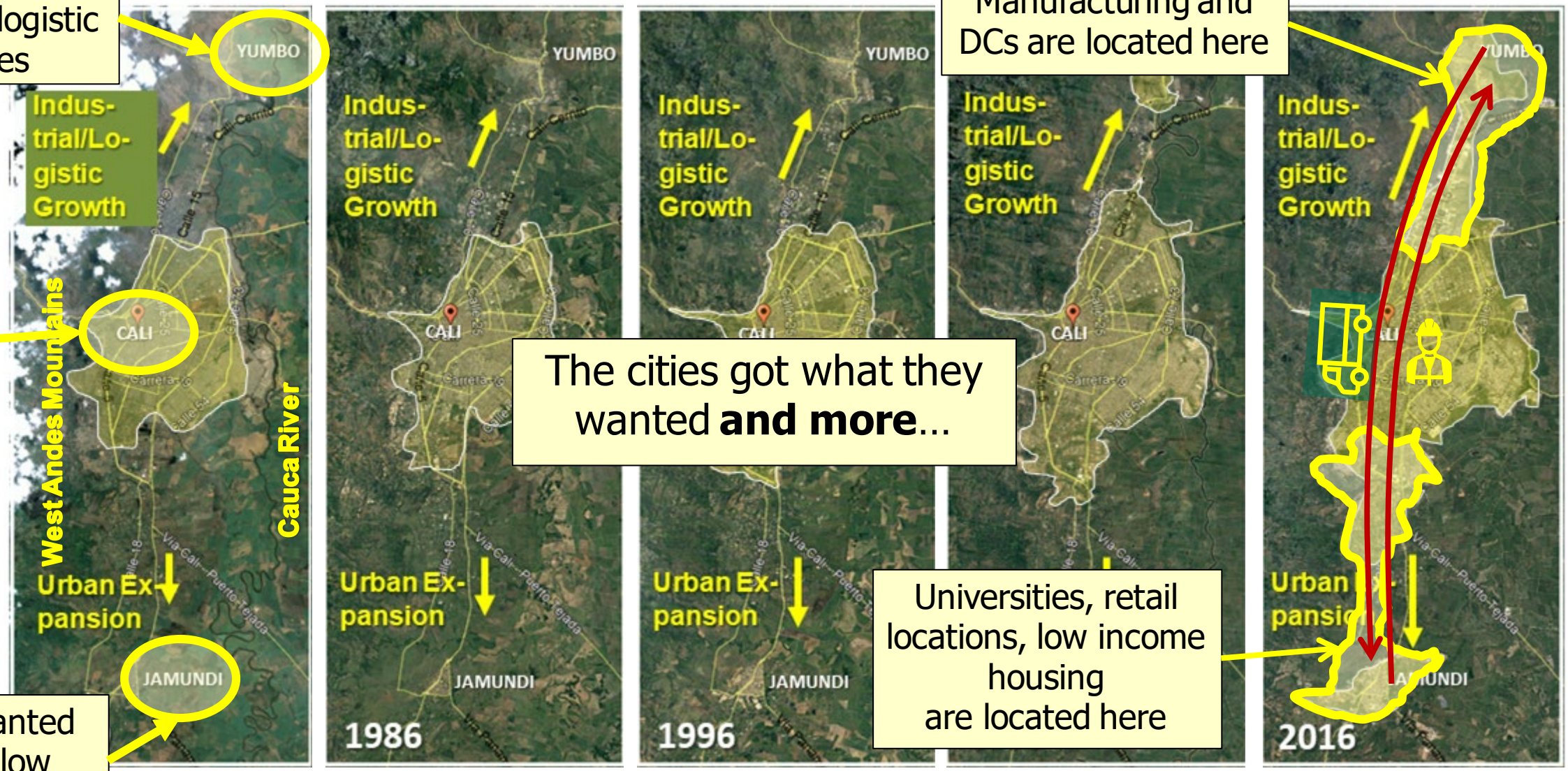
Centrally located, closer to delivery area

An Example of the Impacts of Segregation of Land Uses…

Yumbo wanted industrial / logistic activities

Cali wanted to get rid of them…

Jamundi wanted to attract low income housing

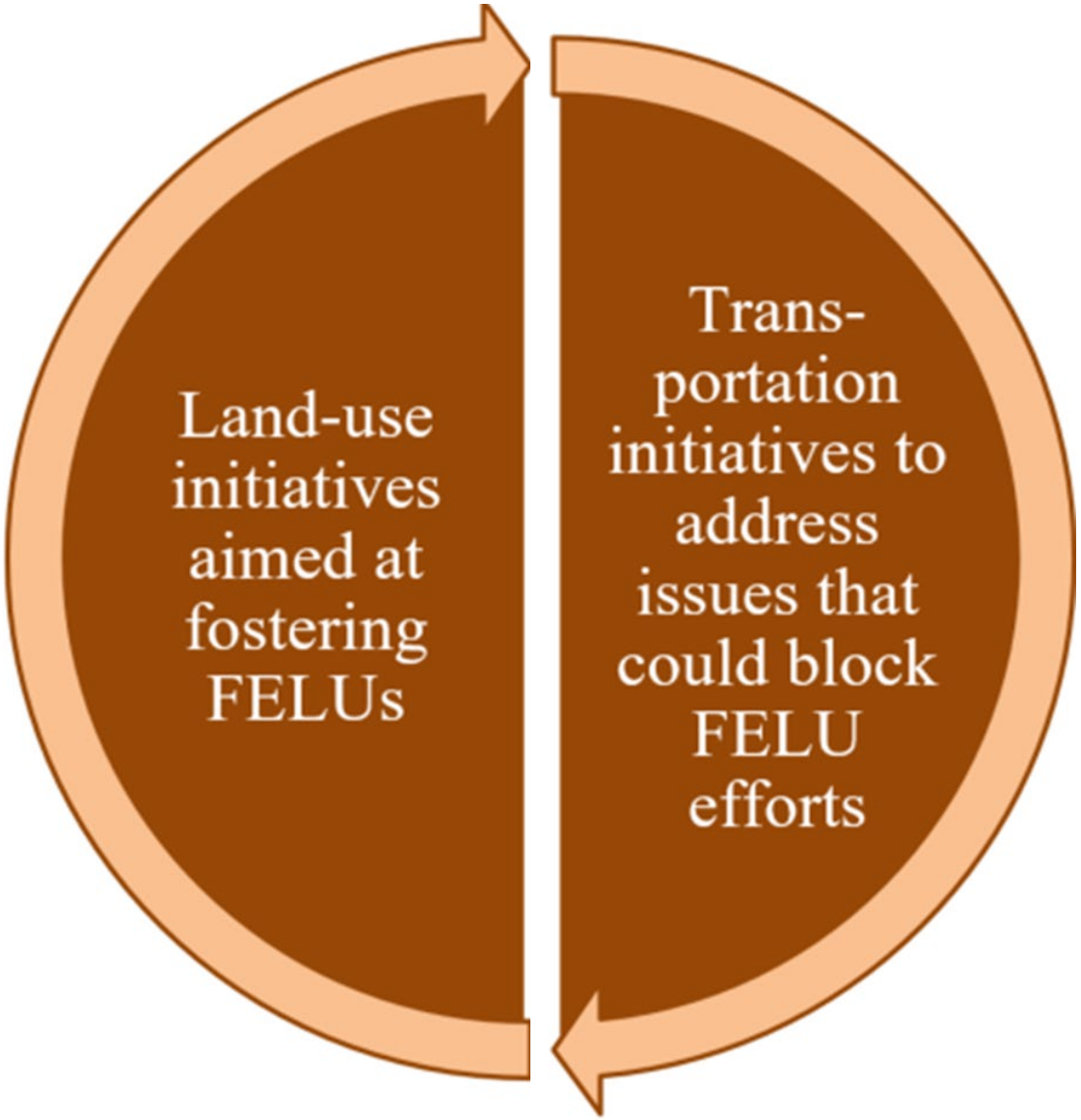


The cities got what they wanted **and more**…

Manufacturing and DCs are located here

Universities, retail locations, low income housing are located here

Principle #3: Mitigate SC Externalities, Particularly at LTGs



Principle #4: Seek Appropriate Solutions

- Be careful of transplanting "solutions" … but learn from others
- Carefully consider the unique aspects of the case at hand
- All cities and metropolitan areas are different in one way or another

Principle #5: Engage Stakeholders

- It is essential to involve all stakeholders in the search for solutions
- Engage early and continuously
- Consider the use of pilot tests to assess the worthiness of a concept

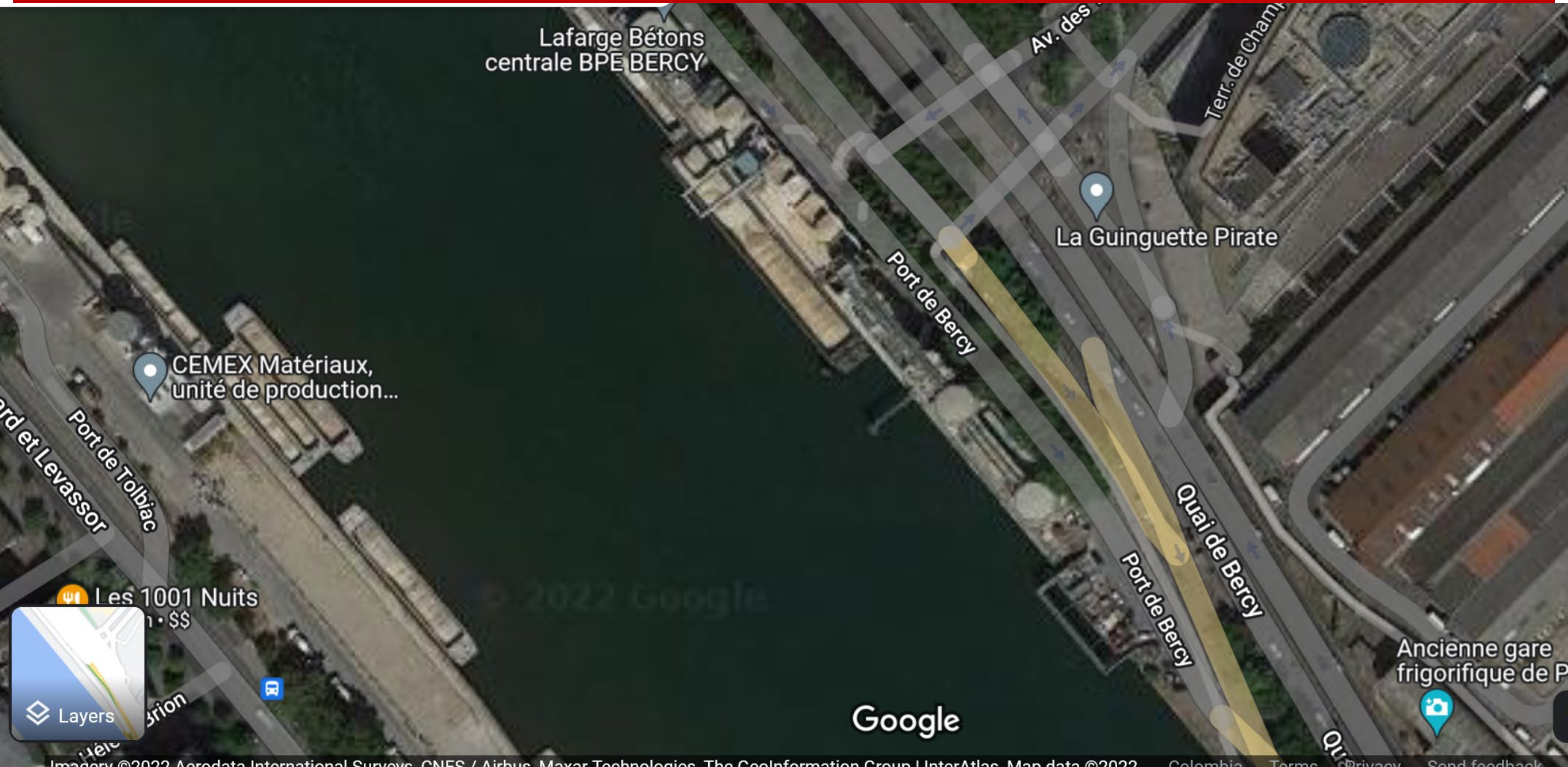
Is it Really Possible to foster FELUs?

City of Paris

Impossible? Not Quite, Take a Look at the City of Paris

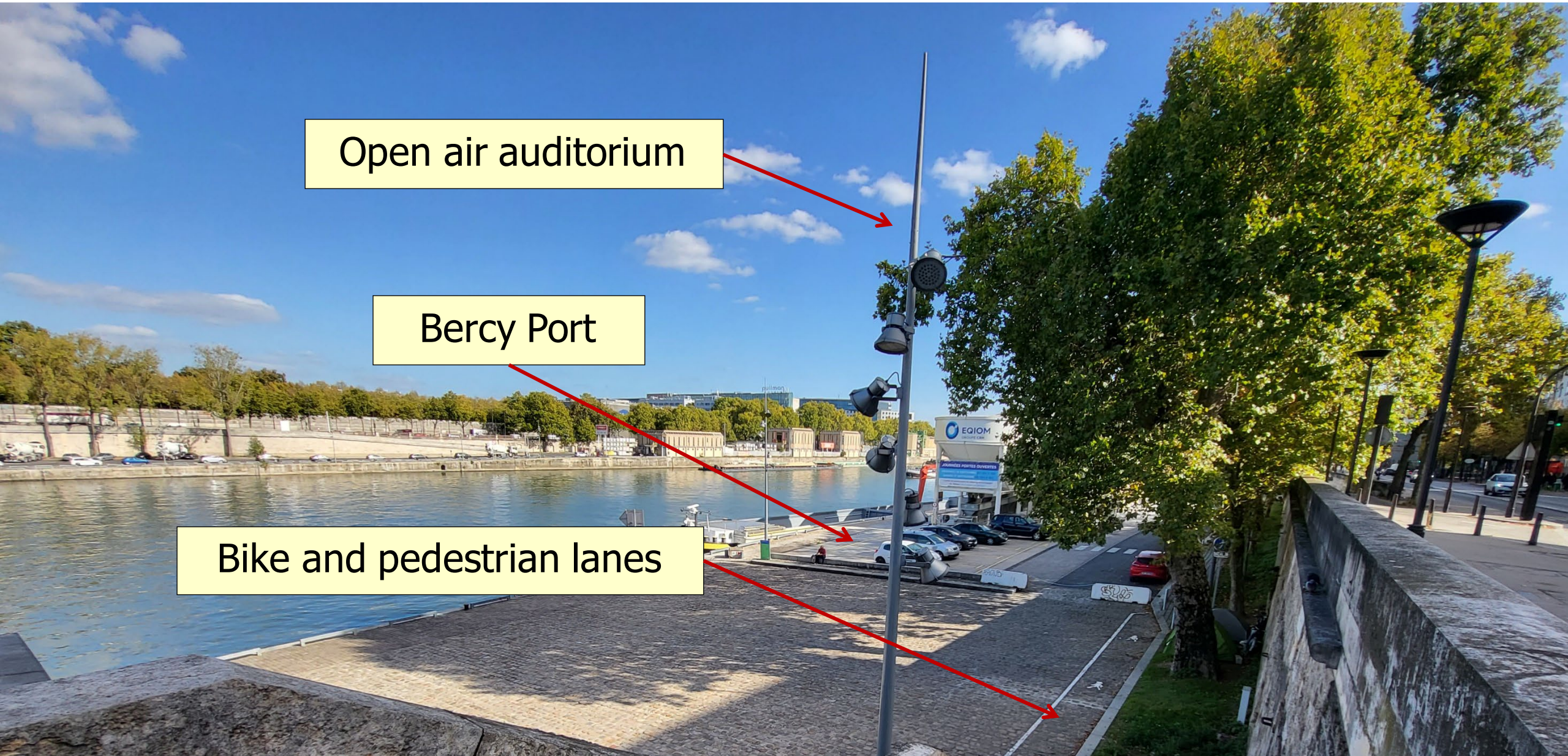
Source: Diziain, D., R. B. and L. Dablanc (2012a). "How can we Bring Logistics Back into Cities? The Case of Paris Metropolitan Area " Procedia - Social and Behavioral Sciences 39: 267 – 281.

Port Bercy, Paris



Port Bercy, Paris

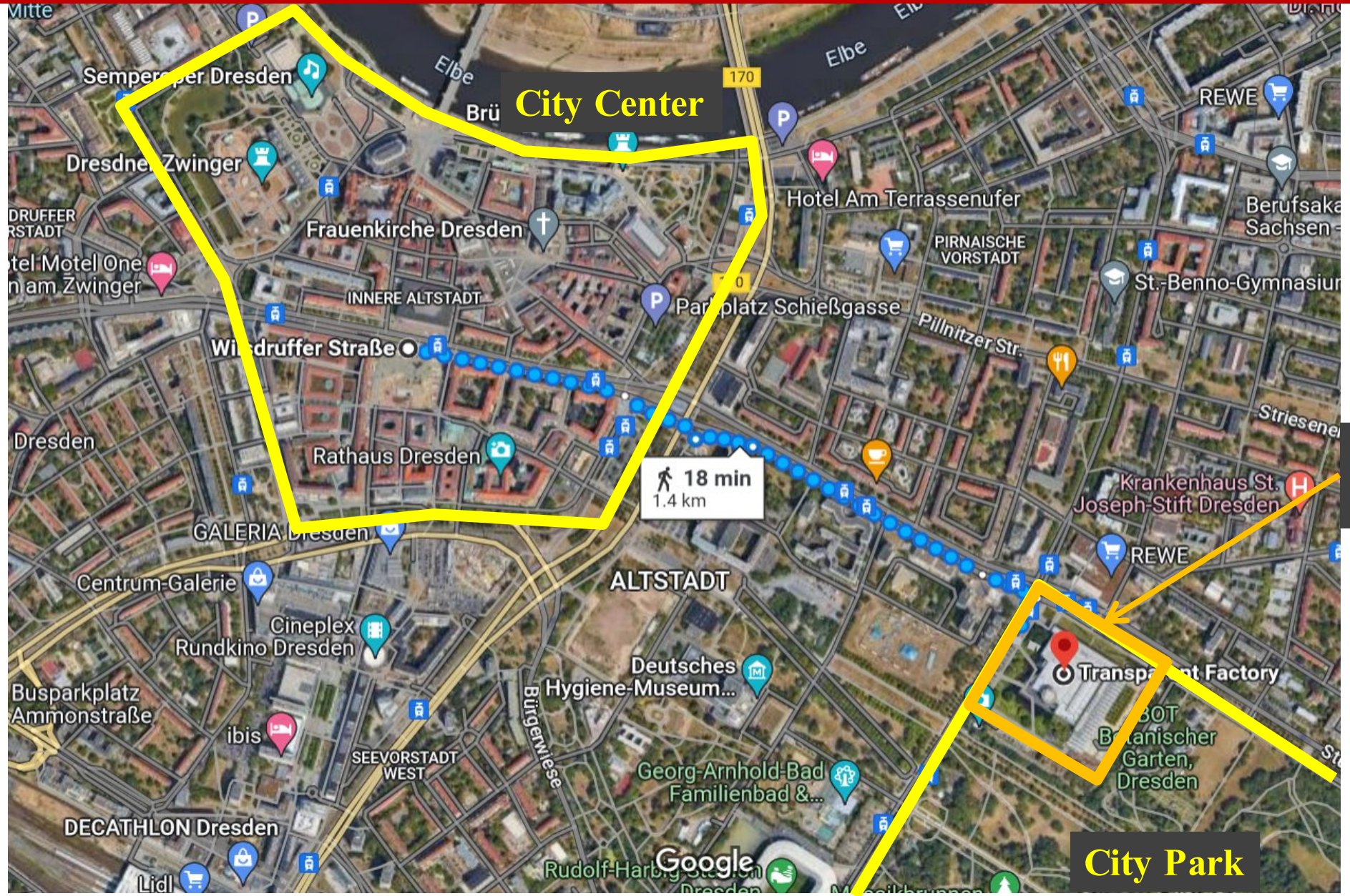
Port Bercy, Paris



The Transparent Factory at Dresden, Germany

Electric Vehicles are Assembled at The Transparent Factory

Dresden City Center

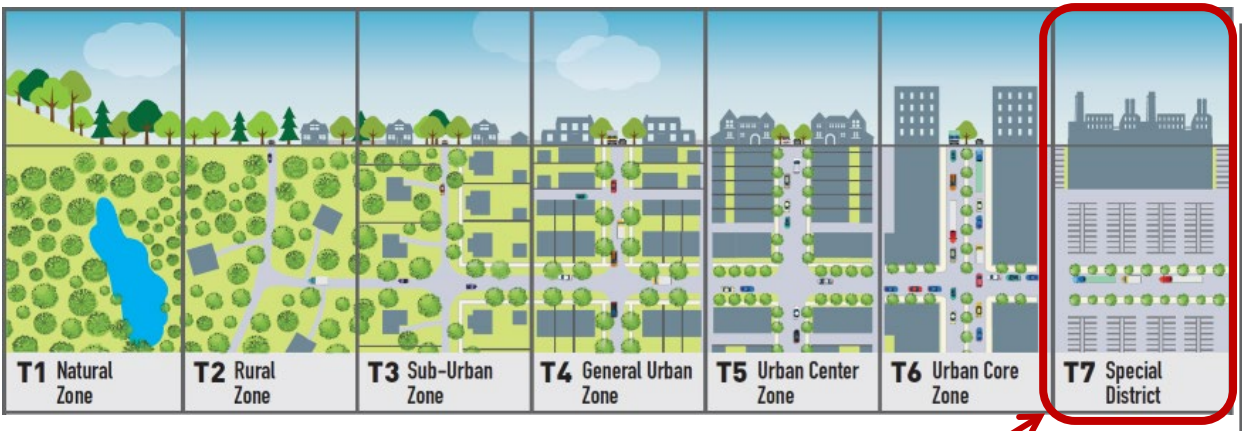



Elbe
Neustadt
Government quarter
Historic Inner City
Transparent Factory
Great Gardens
Botanical gardens

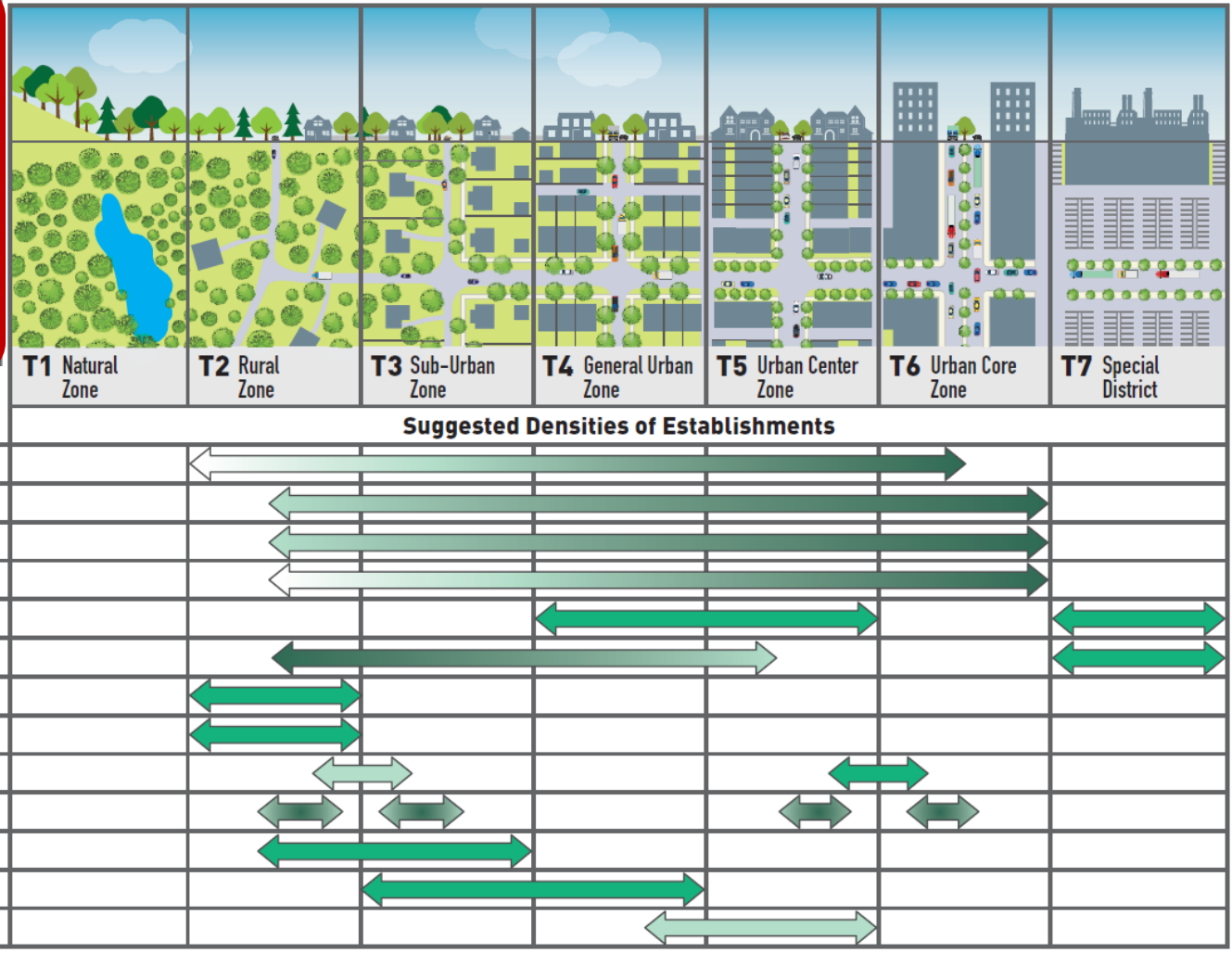
Transportation Decision Support Tools

FELU Urban-to-Rural TRANSECT

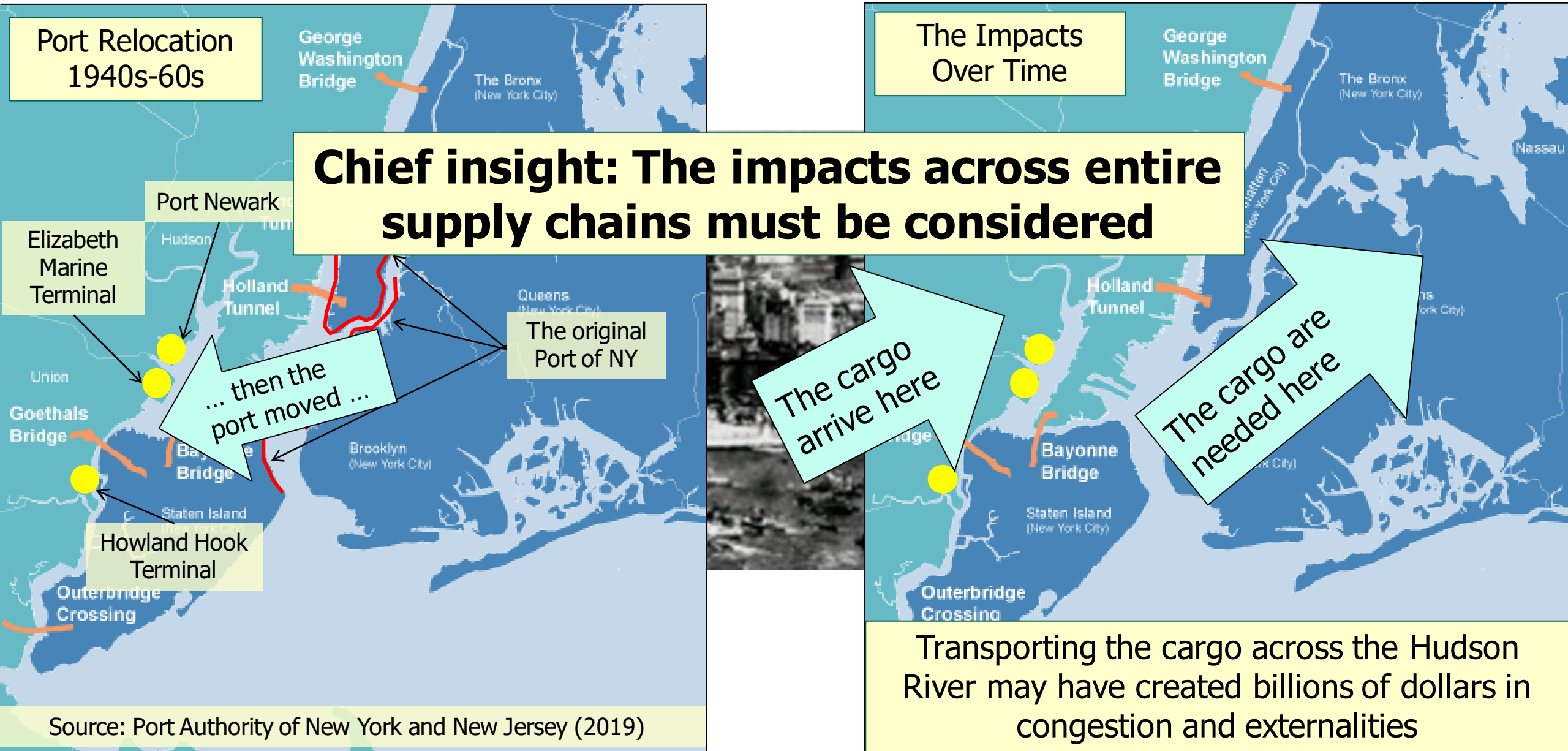
FELU Urban-to-Rural TRANSECT



Instead of Segregation, Seamless Integration is what is needed



The Effects of Extreme Segregation: Port of New York

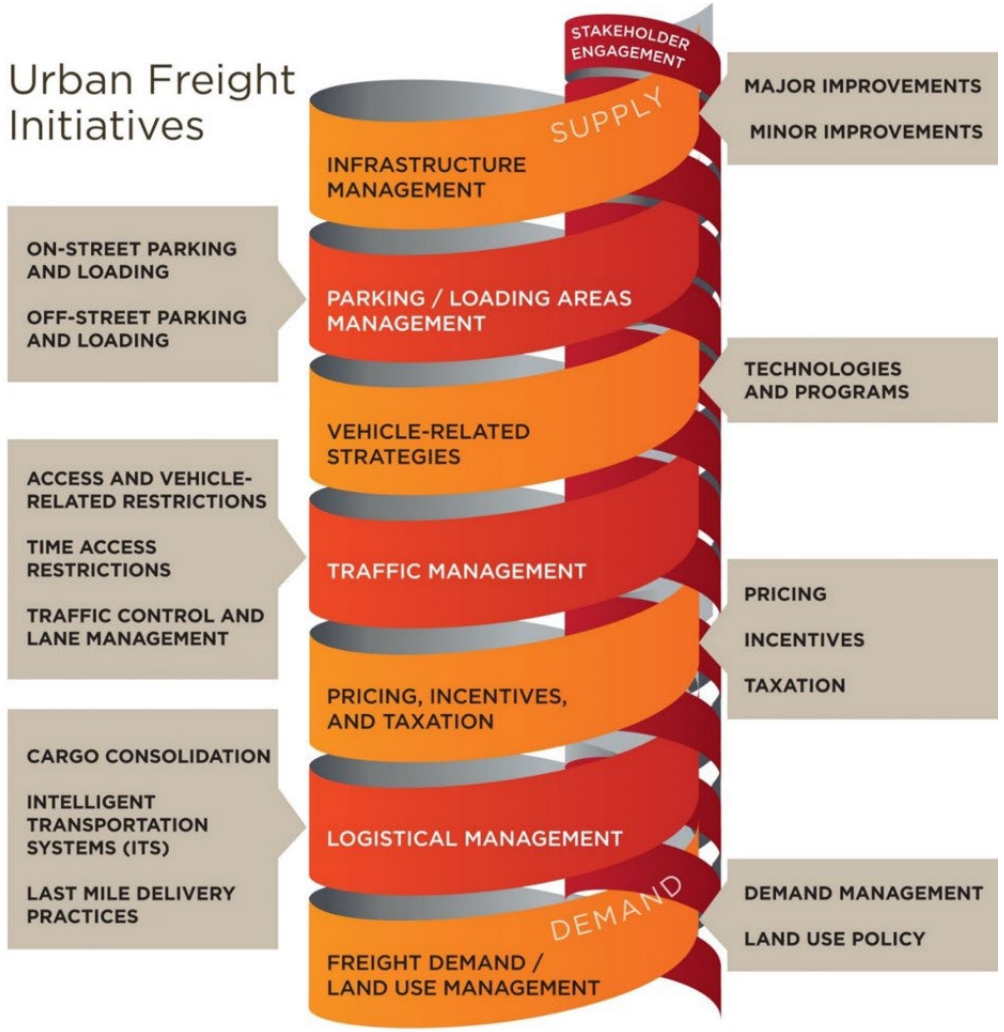


Source: Port Authority of New York and New Jersey (2019)

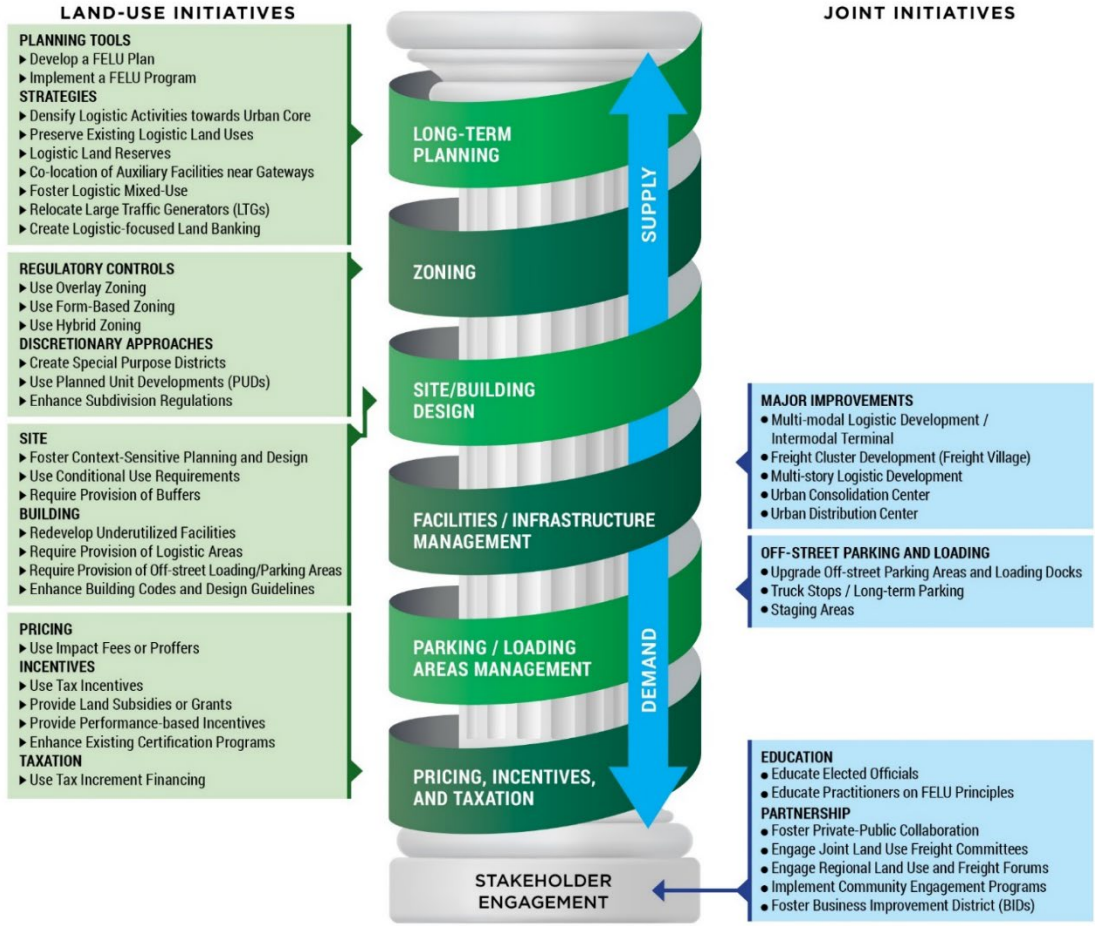
Catalog of FELU and Transportation Initiatives

Catalog of Initiatives Builds on RPI's Previous Research

- NCFRP 33 "Improving Freight System Performance in Metropolitan Areas"



- NCHRP 08-111 "Planning for Freight-Efficient Land Uses: Methodology, Strategies, and Tools"

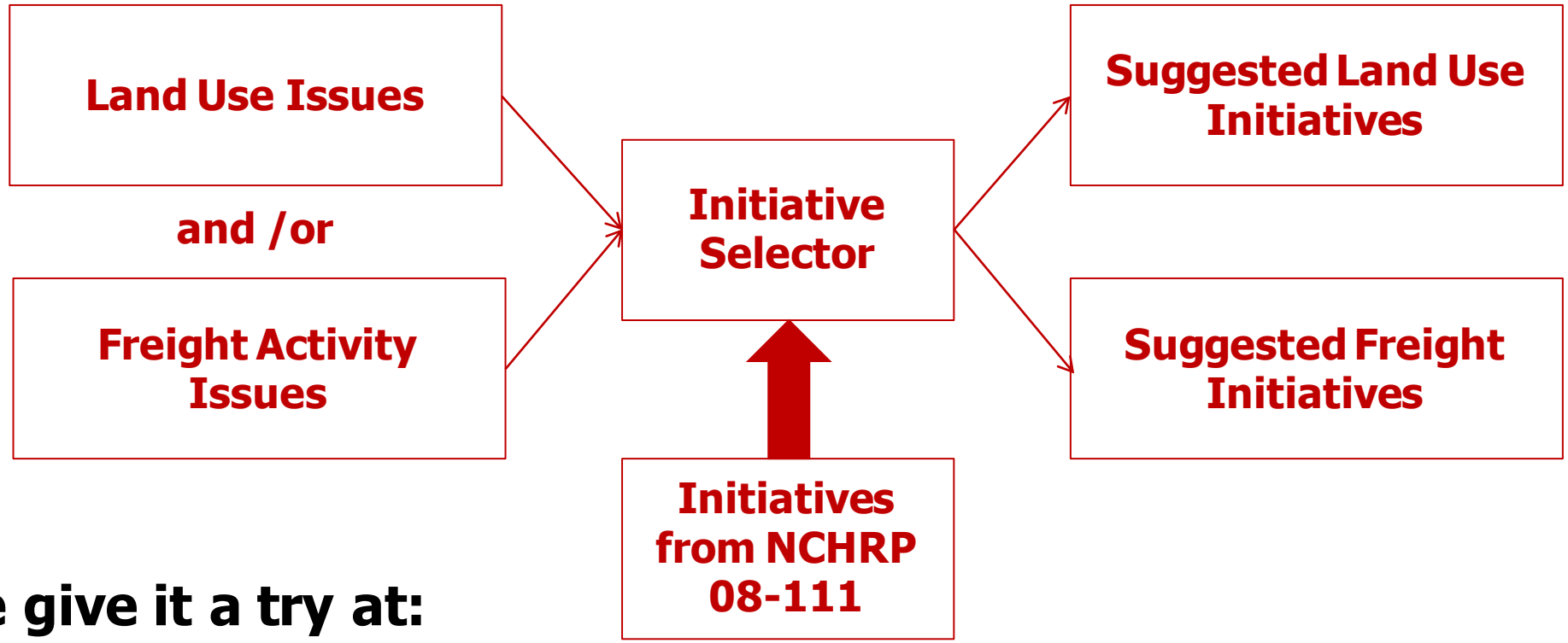


FELU Initiative Selector

Please give it a try at:
https://cite.rpi.edu/iselector/

FELU Initiative Selector: Basic Concept

- To provide suggestions on potential Land Use and Freight Initiatives, that could help solve or mitigate Land Use and Freight Issues
- Inspired on the one developed for NCFRP Report 33



Please give it a try at: https://cite.rpi.edu/iselector/

Landing Page: https://cite.rpi.edu/iselector/

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ABOUT US TEAM NEWS TRAINING & OUTREACH RESEARCH SOFTWARE & TOOLS COE-SUFS CONTACT US

Type of Initiatives

- ☐ Energy
- ☐ Land Use
- ☐ Stakeholder Engagement
- ☐ Transportation

Initiative Selector for Fostering Freight System Performance, Energy Efficiency, and Freight-Efficient Land Use

This application has been co-funded by the Transportation Research Board's (TRB) National Cooperative Freight Research Program Project - Improving Freight System Performance in Metropolitan Areas and the VREF Center of Excellence for Sustainable Urban Freight Systems.

Select aspects of the traffic problems you seek solutions to on the left. The results will contain links to all the unique documents describing potential solutions.

Search within results

Select	Initiative Name	PDF	Initiative Type	Public Investment	Private Investment	Implementation Time	Risk of Unintended Consequences	Group
No data available in table								

Showing 0 possible solutions

Once you specify the issue(s), you get suggestions…

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Type of Initiatives

- ☐ Energy
- ☑ Land Use
- ☐ Stakeholder Engagement
- ☐ Transportation

Nature of the Problem

- ☐ **Select All**
- ☐ Congestion
- ☐ Livability Issues
- ☑ Logistics Sprawl
- ☐ Noise
- ☐ Pollution
- ☐ Safety
- ☐ Systematic Inefficiencies

Geographic Scope

- ☐ **Select All**
- ☐ City/MSA
- ☐ Area

Initiative Selector for Fostering Freight System Performance, Energy Efficiency, and Freight-Efficient Land Use

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Select aspects of the traffic problems you seek solutions to on the left. The results will contain links to all the unique documents describing potential solutions.

View Selected | Clear Selected | Search within results

Select	Initiative Name	PDF	Initiative Type	Public Investment	Private Investment	Implementation Time	Risk of Unintended Consequences	Group
☐	Co-Location of Auxiliary Facilities Near Major Gateways	PDF	Land Use	Low / High	Low / High	Medium / Long	Low	Long-Term Planning
☐	Create Logistic-Focused Land Banking	PDF	Land Use	Low / High	None	Medium / Long	Low	Long-Term Planning
☐	Create Special Purpose Districts	PDF	Land Use	Low	Low / High	Short	Moderate	Zoning
☐	Densify Logistic Activities Towards the Urban	PDF	Land Use	Moderate / Very	High	Medium / Long	Low / Moderate	Long-Term

Create Special Purpos

Description: Special districts or special purpose districts with def
meet the specific needs of a given area. Most districts are develop
particular business activity. These districts can have governing bo
for example, restrict certain building types, or support truck traffi
of freight, reduce logistics sprawl, and enhance livability.

Geographic scope: City/MSA, Area, Corridor, Parcel | **Initiati**

Problem source: Inadequate infrastructure, Large trucks, Large t

Expected costs and level of effort: Implementation of special di
consider the local needs of an area, which may require a moderat
governing body, so efforts may include selecting board member
regional master plans. Costs of creating a special purpose district a
and governing body.

Stakeholders involved: Local communities, Developers, Region
lative Branch

Time to fruition: 6-10 years

Advantages:
- Supports localized needs
- Offers more timely and responsive planning than larger governmental areas
- Enhances freight efficiency

Disa
- Re
- Ca

Examples:
- Special Hunts Point District in South Bronx, New York. This d
the food sector and provides a buffer between industry and res

Source: (City of Ne

- Freight District in Portland, Oregon. This district designates st
cess by, for example, removing geographic constraints. (City o

Related land use initiatives: Overlay Zoning to Foster FELU, H
Initiatives, Freight Cluster Development

Complementary transportation initiatives: Parking and Loadi
ment Initiatives

References: (City of Portland 2006, City of New York 2008, S
Local Agency Formation Commission 2019)

Develop a Freight-Efficient Land Use (FELU) Plan

Description: A FELU plan integrates freight activity considerations into a land-use plan so that potential negative impacts from freight activities can be identified at an early planning stage and mitigation plans can be implemented in advance. Addressing logistics land use through comprehensive planning will improve the efficiency of freight activity, and allow land use to be harmonized for all economic sectors while minimizing costs due to externalities caused by freight transportation.

Geographic scope: City/MSA, Area, Corridor | **Initiative group:** Long-Term Planning: Planning Tools

Problem source: Inadequate infrastructure, All traffic, Urban deliveries, Double parking, Other parking issues, Sidewalk conflicts, Incompatible land use

Expected costs and level of effort: The main effort to develop a FELU plan is engaging stakeholders, since the cost of developing the plan is low. However, the cost of implementing a land-use plan fluctuates depending on the geographic area. Commonly, land costs in urban areas are considerably high. These larger upfront investments of the public sector are balanced with the significant reduction of externalities such as VMT or emissions. High levels of effort and coordination among all stakeholders are required to accurately and effectively plan for logistic land uses.

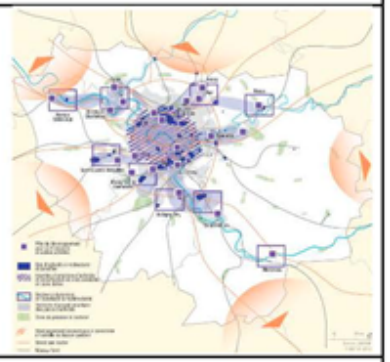
Stakeholders involved: Local Communities, Producers, Receivers, Departments of Transportation, Regional Planning Agencies, Planning Commission

Time to fruition: 6-10 years

Advantages:
- Organizes future land development
- Increases employment opportunities
- Decreases costs for goods and services
- Beneficial to local economy
- Improves community livability

Disadvantages:
- Extensive stakeholder coordination is necessary
- The plan has to be revised and updated over time
- Promotion of education of elected officials to demonstrate the impact of a FELU plan is necessary

Examples:
- Paris, France. Three regional plans were developed and reserved areas for freight infrastructure and (re)development in the metropolitan region. This allows the interaction between logistic intensive land uses and the rest of land uses. (Dablanc, 2015b)



Source: (Dablanc, 2015b)

Related land use initiatives: All land-use initiatives

Complementary transportation initiatives: All transportation initiatives

References: (Federal Highway Administration, 2012b; Dablanc, 2015b)

vards the Urban Core

reight traffic. Allocating spaces for logistical facilities
acilities and retail locations. Complementary to this
ics of roads to allow large vehicle trucks to serve the
ncies, logistics sprawl, livability issues due to freight

tive group: Long-Term Planning: Strategies

or logistics facilities. Also, to control the activities on
logistic activities. Lastly, it might be necessary some
or the private firms they must be willing to relocate to
r in the city center. And, lastly cost of operations will
n cores.

rs, Developers, Regional Planning Agencies, Building

advantages:
Higher facility costs
Potential opposition from local residents
May result in increased urban congestion

of logistics facilities into the city. The latest Parisian
as (Dablanc 2017). In addition, there has been a re-
s—in urban areas as a micro-distribution center. As an
cility, now operated by Chronopost express—a private
deliveries are done using a fleet of electric and diesel

blanc 2017)

gistic Mixed-Use, Urban Distribution Centers, Multi-
ties

initiatives

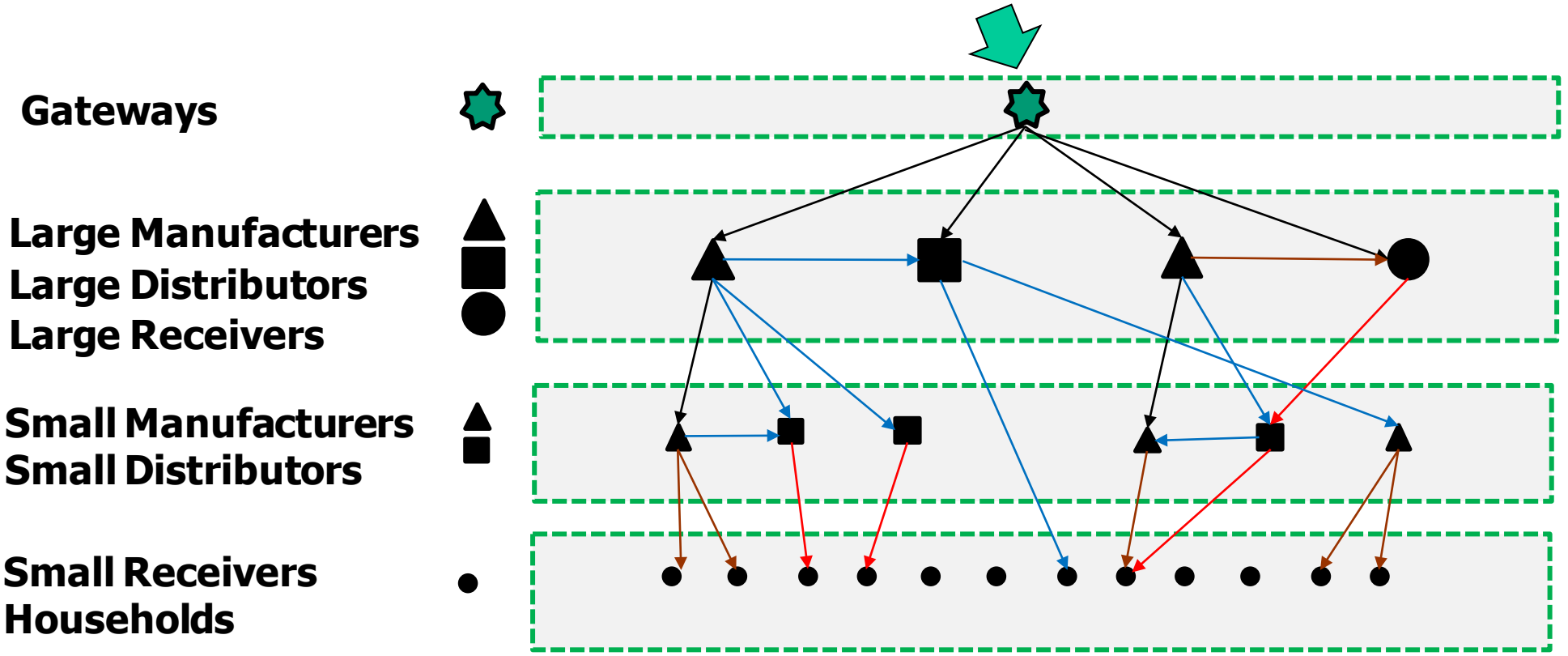
Behavioral Micro-Simulation (BMS)

Background of BMS

- First developed using funding from USDOT for the design of policies to foster off-hour deliveries (OHD)
- The BMS simulates delivery/pick-up tours that match FTG by ZIP Code
- The BMS was successfully used to identify the optimal set of policies that supported the NYC Off-Hour Delivery project
- The BMS was a finalist for the prestigious Edelman Award for operations research and analytics

Behavioral Micro-Simulation (BMS-FELU)

- The BMS-FELU considers the various stages of the supply chains at the level of detail required to analyze effectiveness of FELU initiatives



- It reads employment transportation network data and produces estimates of land-use efficiency

Inputs

- FTG by industry sector (NAICS) and Transportation Analysis Zones
- Number of delivery stops per tour by industry sector
- Travel time TAZs to TAZs

Outputs

- A summary of the statistics for cost, by sector and echelon, of the results of the simulation
  - Gateways → Average total cost per each NAICS of destination
  - Remaining echelons → Per NAICS of origin, averages and standard deviations of total cost, line haul and local cost
  - Per echelon, total freight VMTs, and total number of trips and tours

Freight and Service Trips Generation Software (FASTGS)

—Funded by Rensselaer and the Volvo Research and Educational Foundations—

FASTGS available at https://cite.rpi.edu/software-and-tools/

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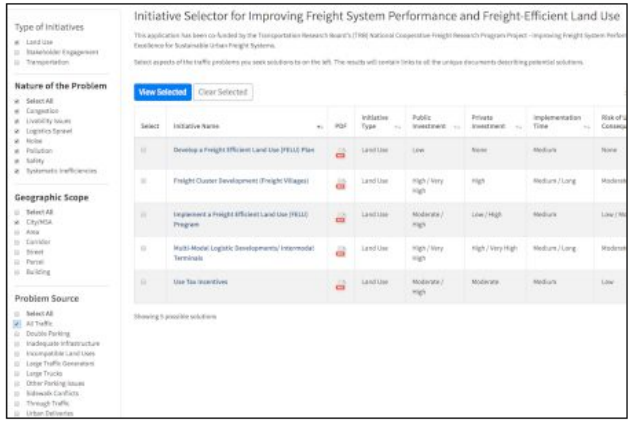
Software & Tools



Ways to improve freight system performance

The **Initiative Selector for Fostering Freight System Performance, Energy Efficiency, and Freight-Efficient Land Use** acts as an easy-to-use web-based tool to suggest potential initiatives for practitioners to fix urban freight problems.

- Presents a decision-support system for solving issues related to urban deliveries
- Proposes several freight demand, parking, and infrastructure management recommendations, and vehicle-related strategies
- Provides solutions that foster energy efficiency and freight-efficient land use
  Summarizes advantages, disadvantages, and level of costs for various implementation levels and time frames

Estimating freight and service demand

The **Freight and Service Activity Trip Generation Software (FASTGS)** estimates the number of daily freight deliveries, freight shipments, and service trips attracted at the establishment or ZIP Code level.

This software helps to:

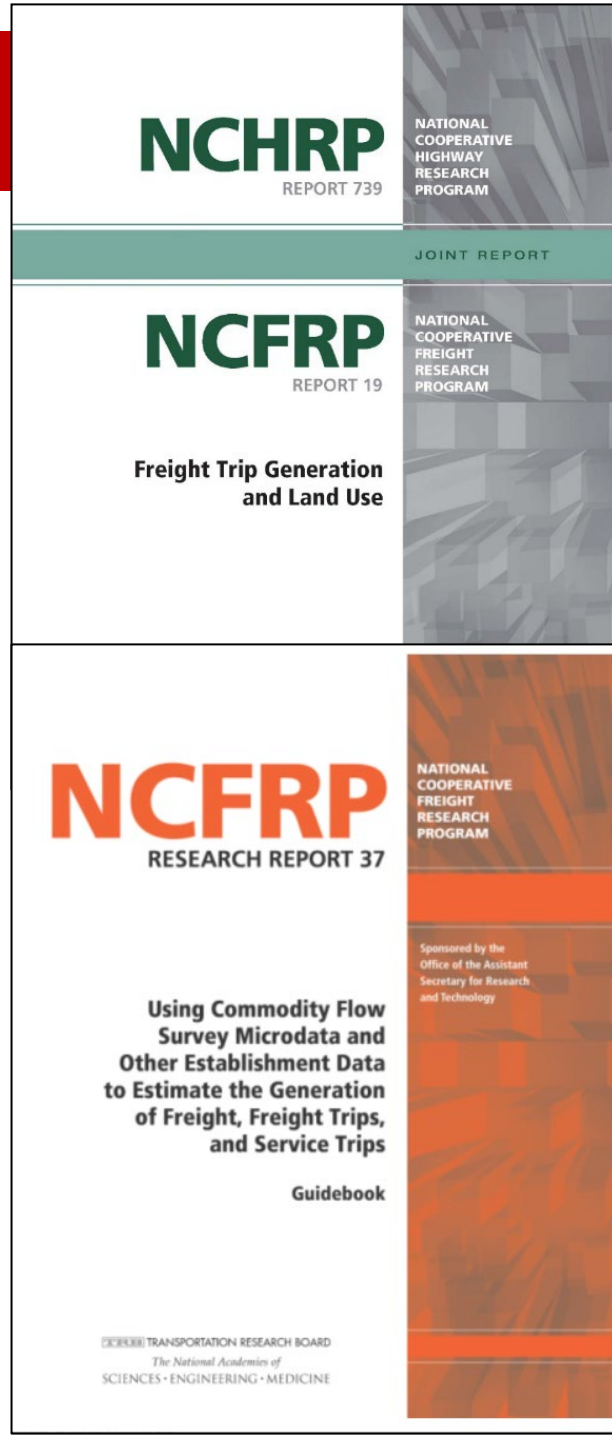
- Understand the amount of freight and service activity in a building or an area
- Understand freight pattern changes over time
- Estimate curb parking demand

Freight Trip Generation Techniques

- Based on Establishment Surveys
  - Collected data about deliveries received and shipments sent
  - Models to predict deliveries and shipments using employment
  - Freight-Trip Generation estimated from deliveries/ shipments
  - More accurate, flexible, and transferable than any other model
  - Available at the level of two- and three-digits NAICS

$$FTA = \frac{FD}{CF_{FTA}} = \frac{\text{Deliveries Received}}{\text{Avg. Deliveries per trip}}$$

$$FTP = \frac{FS}{CF_{FTP}} = \frac{\text{Shipments Sent Out}}{\text{Avg. Shipments per trip}}$$



FELUs and Existing Land-Use Planning Tools

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FELU Initiatives Provide Multiple Paths

Planning and Programming	Legal	Zoning	Site	Building	Pricing, Taxation, and Incentives
♦Do Nothing ♦FELU Plan ♦FELU Program ♦Densify logistic activities ♦Preserve logistic land use ♦Preserve land near logistical facilities ♦Foster Logistic mix-use ♦Relocate LTGs ♦Land Banking	♦Do Nothing ♦Building Codes ♦FELU supportive guidelines for design ♦PUDs ♦Enhance subdivision regulations	♦Do Nothing ♦Overlay zones ♦Form-based zoning ♦Hybrid zoning ♦Special Purpose Districts	♦Do Nothing ♦Reuse under-utilized facilities ♦Minimal size for logistical areas ♦Buffer zones, setbacks, planting strips ♦Physical access requirements ♦Minimum off-street loading/ parking areas	♦Do Nothing ♦Internal access for handling cargo ♦Freight elevators	♦Do Nothing ♦Impact Fees ♦Tax incentives ♦Tax increment financing ♦Land subsidies ♦Performance-based incentives ♦Certification programs

Stakeholder Engagement

♦Educate elected officials
♦Joint Land Use and Freight Committees
♦Educate practitioners
♦Private-Public Sector Partnerships
♦Regional Land Use and Freight Forums
♦Implement Community Engagement Programs

Implementation Tools

Tools

These tools range from policy changes (comprehensive plans), regulatory controls (zoning and building codes), discretionary approaches (subdivision control ordinances) and quasi-regulatory tools (business improvement districts).

Regulatory Controls

- Building Codes
- Zoning Codes
- Overlay Zones
- Form-based Zones
- Hybrid Zoning Codes

Discretionary Approaches

- Design Guidelines
- Planned Unit Developments
- Subdivision Regulations

Policy Tools

- Comprehensive Plans
- Master Plans

Quasi-regulatory Tools

- Business Improvement District
- Commercial Reservation Service

Regulatory Control Strengths/Weaknesses

Approach	Strengths	Weaknesses
New Building Code Regulations	Assurance that structures will have internal accommodations for anticipated freight activities	Long and drawn-out process. May be difficult to meet necessary requirement of "health, safety, and welfare"
Modify zoning codes	Updated language better matches development outcomes to freight activity needs	Can be long process with community resistance and political hurdles – individual zoning change for a particular development is long and costly ordeal, often ending in the dissolution of the development proposal
Applying overlay zones	Accomplishes same goals as complete zone modification	Is often less controversial as concept has champions with limited impacts on other developments
Applying form-based zoning	Produces structures and open spaces specifically crafted by the community	Community influences have proven to reject freight activities where they are needed and assign them to the remote edges of the region, causing significant externalities
Applying hybrid codes	Maintains more traditional approval process but includes detailed drawings and descriptions to ensure outcomes	Community influence is lessened due to traditional procedures, and freight activities can be adequately placed within the region if the leadership is aware of the role of freight and the need to accommodate freight activities

Discretionary Approach Strengths/Weaknesses

Approach	Strengths	Weaknesses
Adopting design guidelines	Used to maintain uniform appearance of developments and has the regulatory rigor to ensure enforcement before developments are approved	Little evidence that design guidelines for freight have been developed – would require task- force to provide model for adoption
Planned Unit Development	Well-establish process for accommodating large-scale development requiring special features or flexibility	Requires a developer to take on the burden of developing freight- responsive development – would require development of example language to encourage implementation
Subdivision Regulation	Well-established process for large-scale developers	Would require sample language to reduce burden on developers

Policy and Quasi-Regulatory Strengths/Weaknesses

Approach	Strengths	Weaknesses
Comprehensive Plan	Updates are conducted on a regular basis, providing an opportunity to address the needs of freight within the policies, goals, objectives and action plans	While the policies, goals, objectives, and actions plans can be adopted, they have no power of enforcement unless the underlying zoning (or overlays) are also adopted
Master Plans	Well-establish process for accommodating moderate to large-scale development requiring special features or flexibility	In order to effect change, Master Plan policies, goals, objectives and action plans need to be enforceable by a jurisdiction
Business Improvement Districts	With sufficient leadership, can accomplish any set of policies, goals, objectives or actions within its charter	Lack of leadership and cooperation makes BID ineffective
Commercial Services	Emerging solution to managing space with tracking and tracing capabilities	Must be commercially viable and offer sufficient profit, which could require costs higher than parties would be willing to pay

Hybrid Zoning for Active Freight Functions

(c) **DIMENSIONAL STANDARDS**

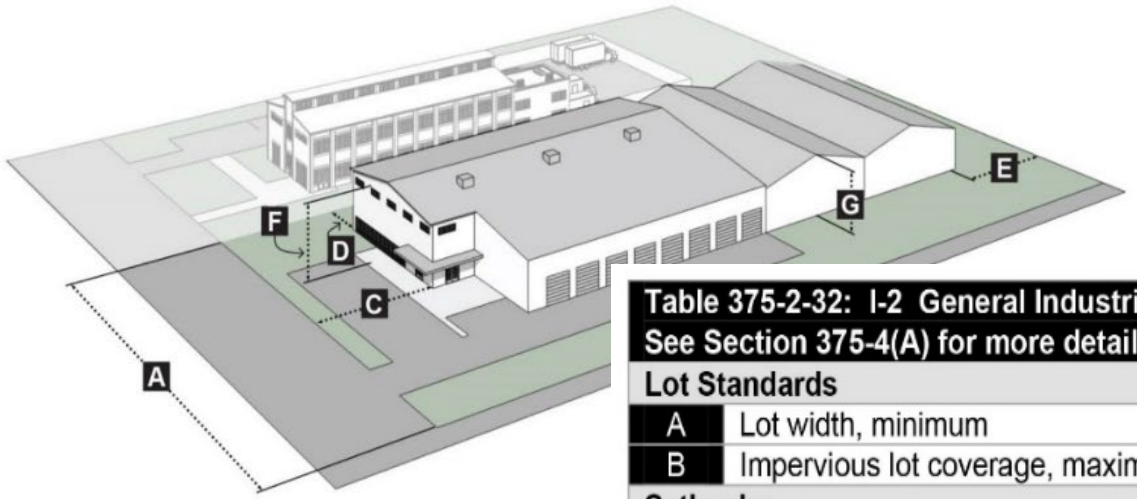

Table 375-2-32: I-2 General Industrial See Section 375-4(A) for more details		
Lot Standards		
A	Lot width, minimum	50 ft.
B	Impervious lot coverage, maximum	N/A
Setbacks		
C	Front, minimum	10 ft.
D	Side, minimum	15 ft.
E	Rear, minimum	40 ft.
Building Standards		
F	Height, principal building, maximum	6 stories
G	Height, accessory buildings, maximum	N/A

Source: Clarion Associates (2017)

Transportation & Land Use Planning Paradox

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Cambridge Systematics

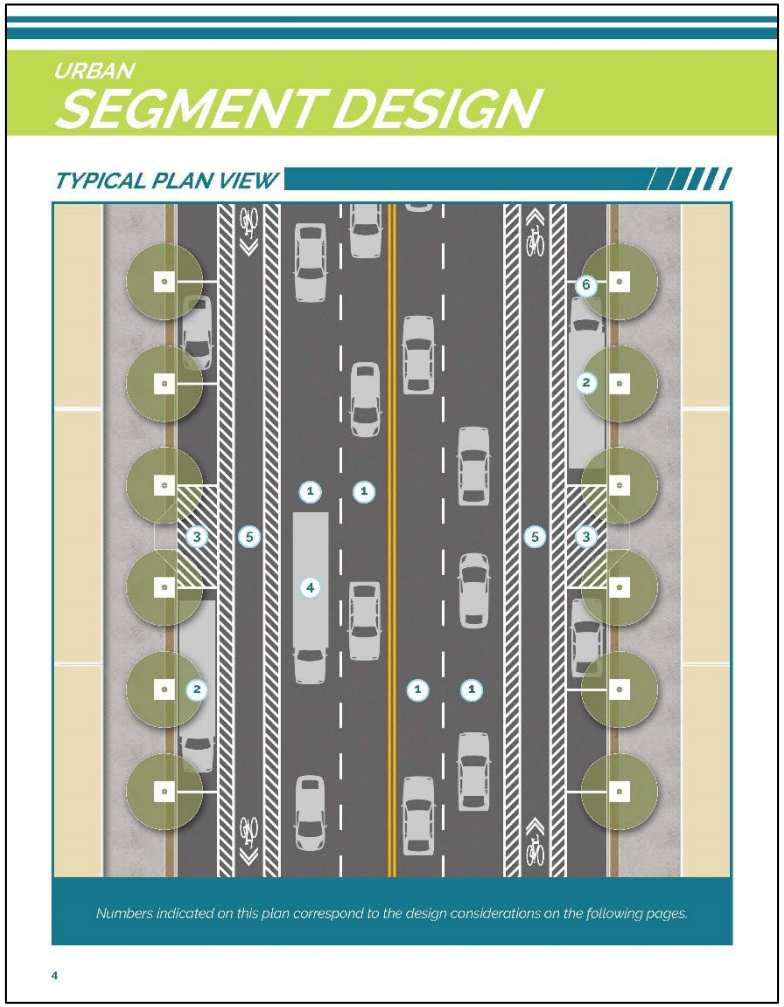
Transportation Planning

Federal-Driven Transportation Process

- Long Range & Metropolitan Transportation Plans
- STIP/TIP
  - Programming Documents
- Six-Year Plans
- Obligation Lists
- Planning and Implementation Processes are Linked

Metropolitan Planning Organizations

- Regional Coordination and Conveners
- Large MPOs (TMAs)
  - Funding Streams
  - Drive Change (i.e., Complete Streets)
- Make "large" transportation decisions
  - Professional Staff and Methodology
  - Multi-jurisdictional Boards
- Very Deliberate and Accountable Process



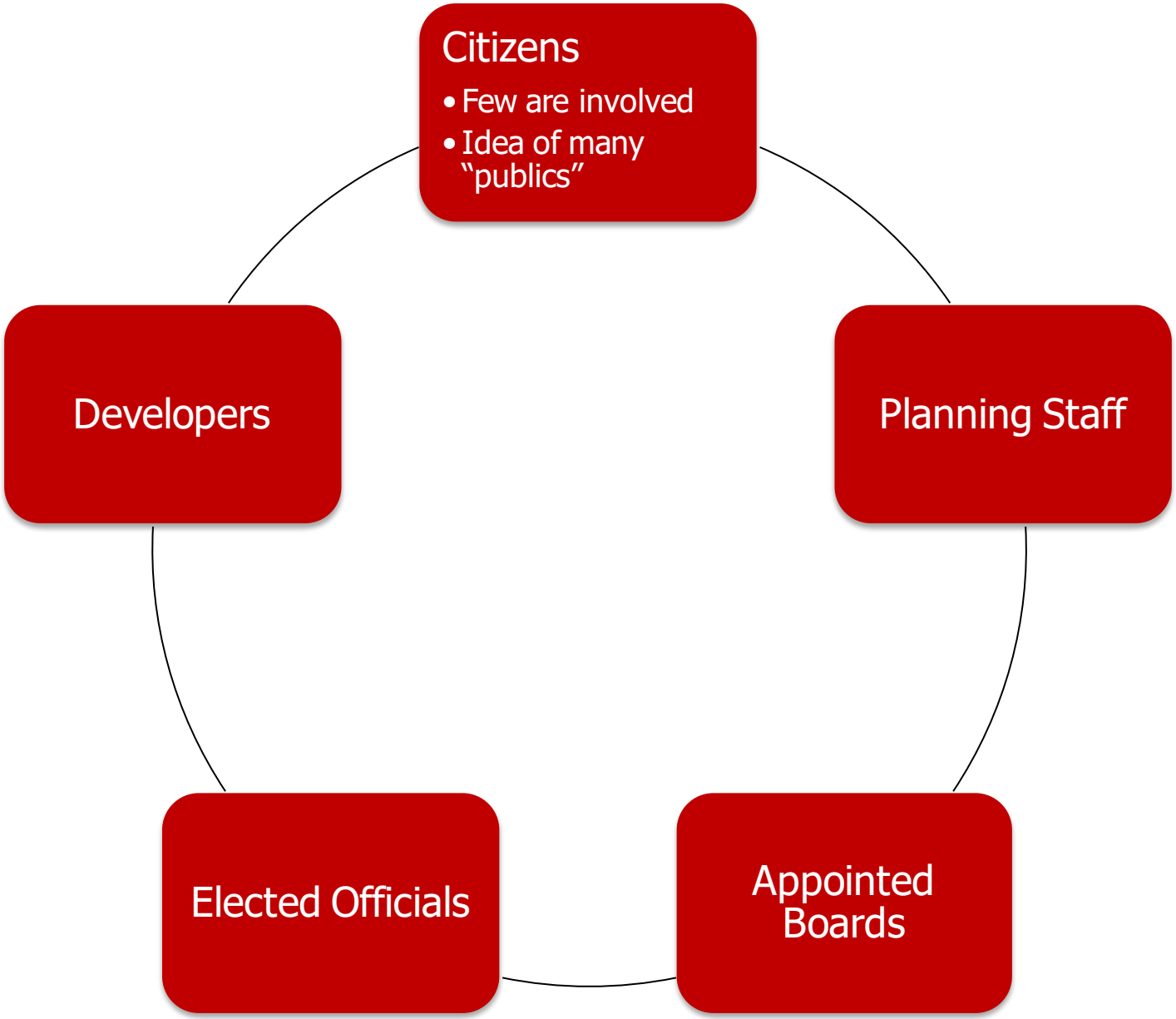
KIPDA Regional Freight
Mobility Plan and Design Guide

Contrast: Lane Use Planning

Lane Use Planning

- Overall Process *Seems* Linear
  - Comprehensive Plans (Long Term Vision)
    - Not necessarily tied to zoning, Optional in some cases.
  - Zoning (Current Planning)
  - Enforcement
    - Court Action
- State-by-State Differences
  - State enabling statues
  - Home vs. Dylan's Rule
- Community-by-Community Differences
  - Each with their ordinance
  - Might not be coordinated with their neighbors

Many Stakeholders



Complications

- Politics
- Conflicting Visions and Motivations
  - Appointed Boards
  - Divided Communities
  - Elected Officials
- Exurban Communities
  - Staffing and Budget
  - Training and Approach
- Concentration of Decision-making
- Individual Political Will vs. Regional Decision-making

Fundamental Disconnect

- Disconnected Processes
  - Temporal
  - Governance (Federalism)
    - Unintended consequence, no formal tie between processes (generally)
    - Except land use as a model input
  - Decision-making – Particularly by whom
- Results
  - Results in a "Chicken or the Egg" paradox
    - Land use decisions are driving inefficient transportation decisions
      - Increased VMT, congestion, emissions, lower quality of life
  - Becoming a real issue
    - E-Commerce, alternative delivery methods, etc.

What is next?

- Next Step in Freight Planning: Land Use Planning
  - Freight Transportation Planning: Started in the 1990s
    - FHWA P2P Exchanges, Freight Partnership Meetings, TRB Committees
    - Today: Mature Profession
  - Freight-related land use planning is still in its infancy
    - APA Freight Policy Guide, NPC Sessions, Articles
    - Comprehensive plans and ordinances
  - Planning profession and practitioners have a responsibility
    - NCHRP projects like this and many others

Concluding Remarks

Key Conclusions

- The chief goal of freight land-use policy should be to maximize the benefits of production and consumption of physical goods, and minimize the negative externalities produced by the resulting traffic
  - This could be accomplished by means of a gradual process seeking to:
    - *Minimize Social Costs*; *Foster Compactness of Supply Chains*; *Mitigate Supply Chain Externalities*; *Seek Appropriate Solutions*; and *Engage Stakeholders*
- It is important to exploit the synergies and complementarity of transportation and land-use initiatives
- There is a number of decision support tools that could help you: FELU Urban-to-Rural TRANSECT, FELU Initiative Selector, Freight and Service Trips Generation Software, and the FELU Behavioral Micro-Simulation

Acknowledgements

- NCHRP: Dr. William Rogers, and Project Panel
- Rensselaer Polytechnic Institute:
  - Cara Wang,
  - Diana G. Ramirez-Rios,
  - Juvena Ng,
  - Jeffrey Wojtowicz
- University at Albany
- HDR
- ATRI
- Caliper

Thanks

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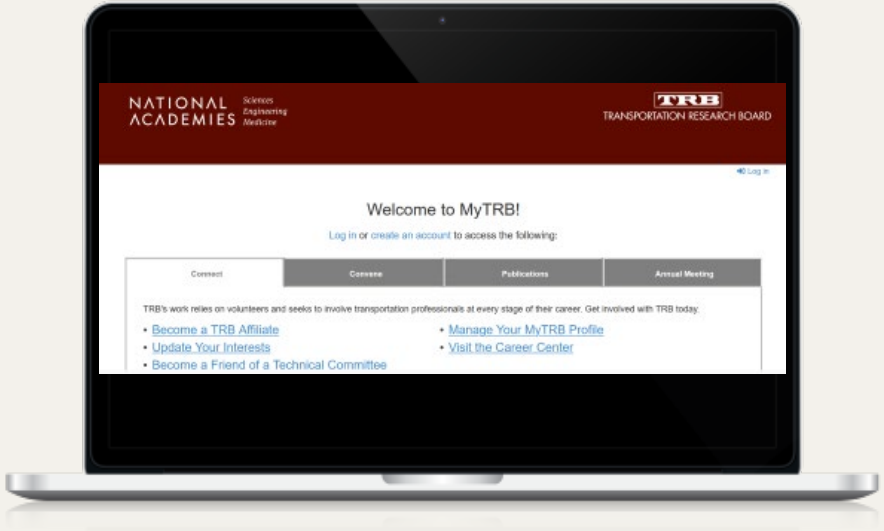

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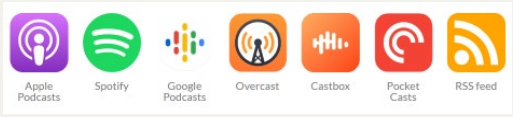

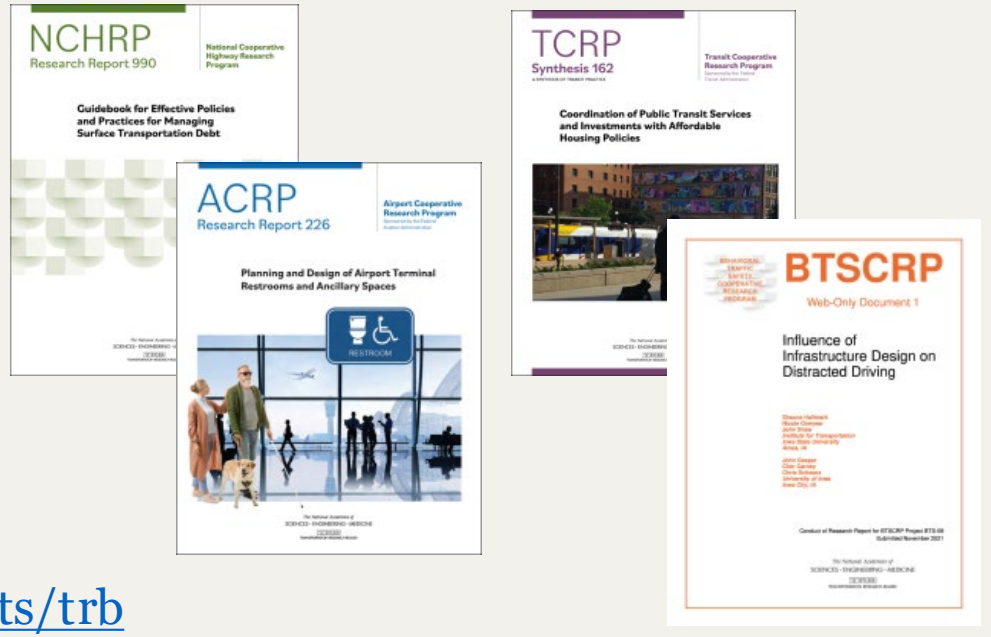

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