What Should Land Use Agencies Do?

Dr. Catherine T. Lawson
University at Albany

Webinar

July 17, 2019

How Local Land Use Works

- **Formal process for policies and regulations intended to direct community aspirations into the future.**
  - **Land Use planning has a rich history of using data.**
  - **Many datasets are idiosyncratic to a particular jurisdiction.**
- **Background analysis: like-kind circumstances for “best practices” and model language to facilitate efficiencies and effectiveness of actions.**
- **Requires local legislative action to amend or update any existing regulations, plans and policies, or to enact new ones.**
- **Freight is often absent from the set of goals and objectives in land use actions.**

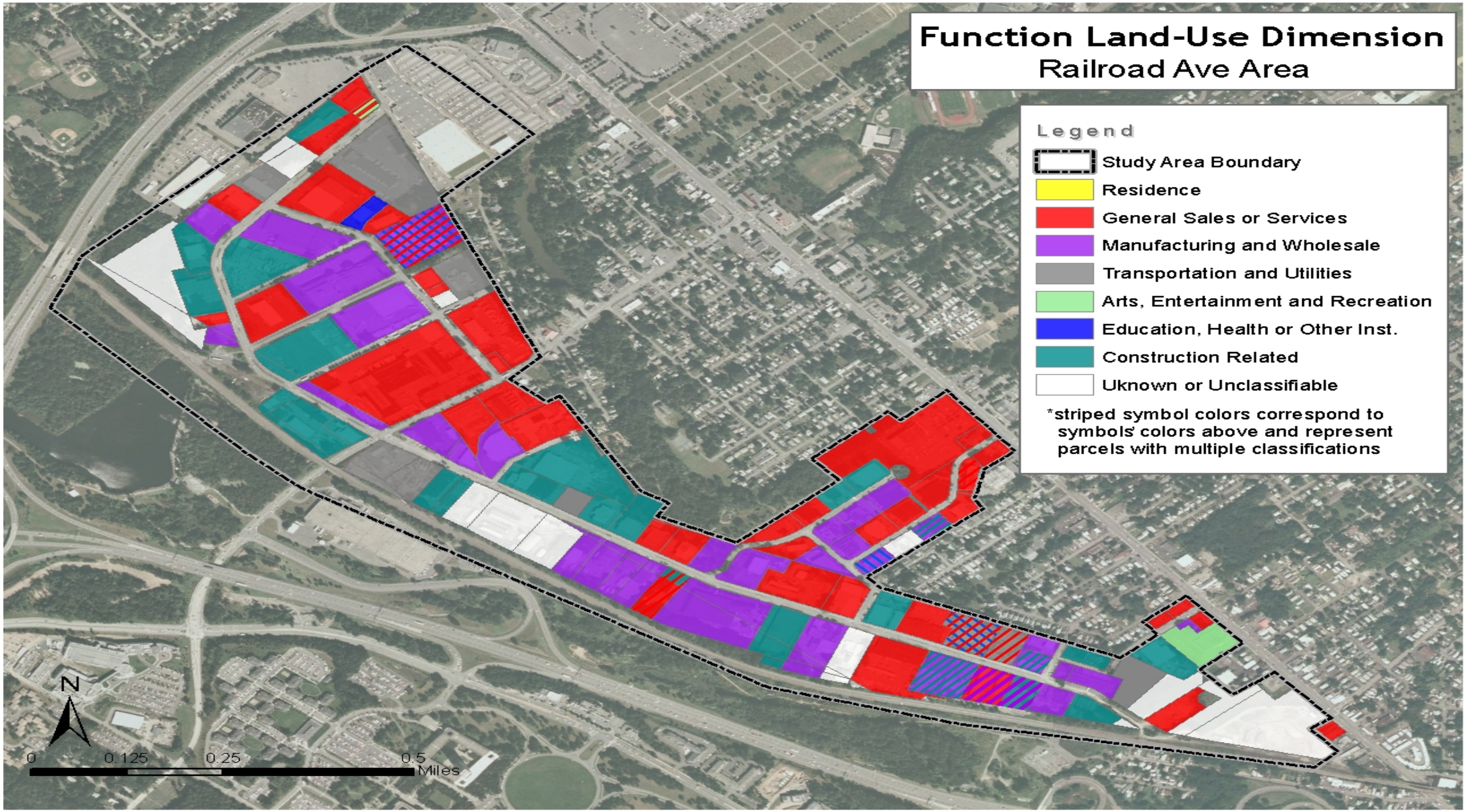
Traditional land use planning tools

- **Euclidean Zoning**
  - **Separates uses to protect public health.**
  - **Broadly describes industrial activities that produce truck trips.**
  - **Has few opportunities to facilitate freight activities, particularly in commercial and residential areas.**
- **Comprehensive Plans**
  - **Solicit public input for a community-wide vision of the future.**
  - **Often exclude freight activities from discussions.**
- **Two dimensional approaches**

1. Get with the program.

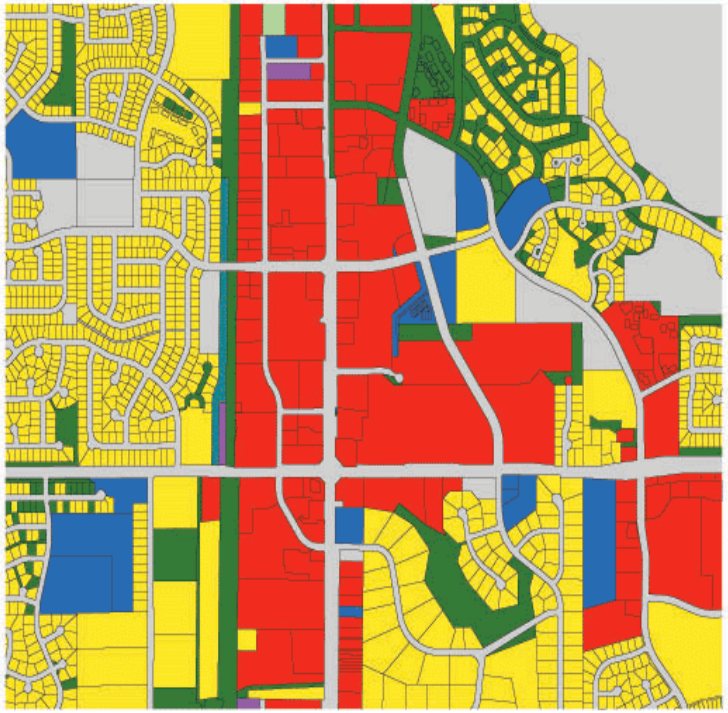
The Data Program

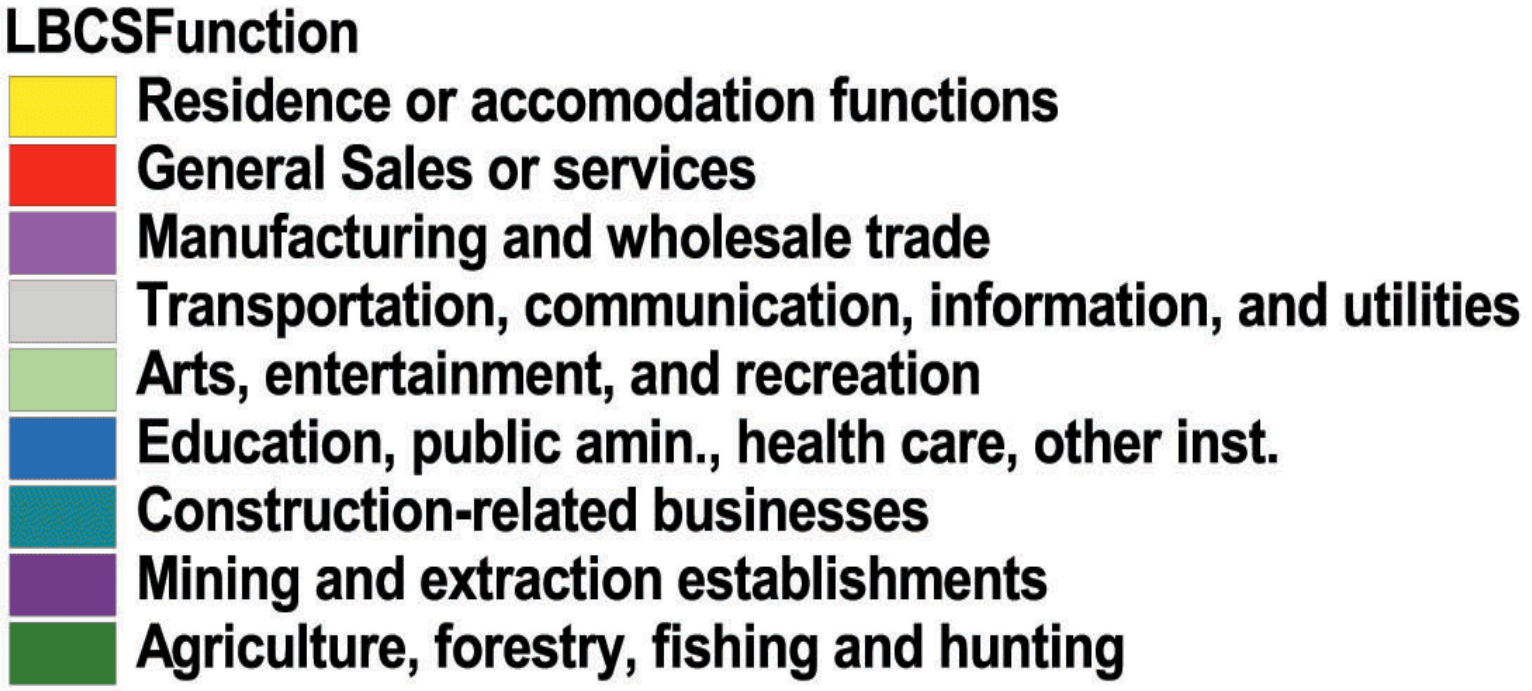
- Every jurisdiction needs an inventory of land use activities for every parcel of land.
- Consider using the Land-Based Classification Standards (LBCS).
  - Developed by FHWA, APA and other federal agencies in 1998.
    - Five harmonized dimensions with codes and definitions based on parcels:
      - Activity
      - Function
      - Structure Type
      - Site Development Characteristics
      - Ownership
    - Available at https://www.planning.org/lbcs/


Function Land-Use Dimension
Railroad Ave Area
Legend
Study Area Boundary
Residence
General Sales or Services
Manufacturing and Wholesale
Transportation and Utilities
Arts, Entertainment and Recreation
Education, Health or Other Inst.
Construction Related
Uknown or Unclassifiable
*striped symbol colors correspond to symbols' colors above and represent parcels with multiple classifications
N
0
0.125
0.25
0.5
Miles

Enhancing the LBCS Data Program

- **Jurisdictions can add estimated freight activities (using freight production/attraction estimation equations) based on land use functions by parcel.**





Transferability Process

- **NCFRP Reports 19 and 37 provide estimation parameters for freight generation (FG), freight trip generation (FTG), and service trip generation (STG) using NAICS codes.**
- **Cross-walk NAICS code information (from commercial source e.g., *Dunn & Bradstreet, InfoUSA*) to LBCS function codes.**
- **Create parcel-based FG, FTG, and STG estimations across the landscape, tied to local jurisdictions, using LBCS + Truck Trips.**
- **Harmonized data makes this enhancement more efficient and cost-effective.**

Trucks integrated into the urban fabric

https://www.minnpost.com/minnesota-blog-cabin/2015/10/want-make-our-transportation-network-more-efficient-create-bustruck-onl/

The National Performance Management Research Data Set (NPMRDS)

- NPMRDS data is a composite of probe data traces captured every 5 minutes for interstate and non-interstate roads.
- All State DOTs and MPOs are responsible for producing their FHWA-required performance measures:
  - Level of Travel Time Reliability (LTTR)
  - Truck Travel Time Reliability (TTTR)
  - Peak Hour Excessive Delay (PHED)

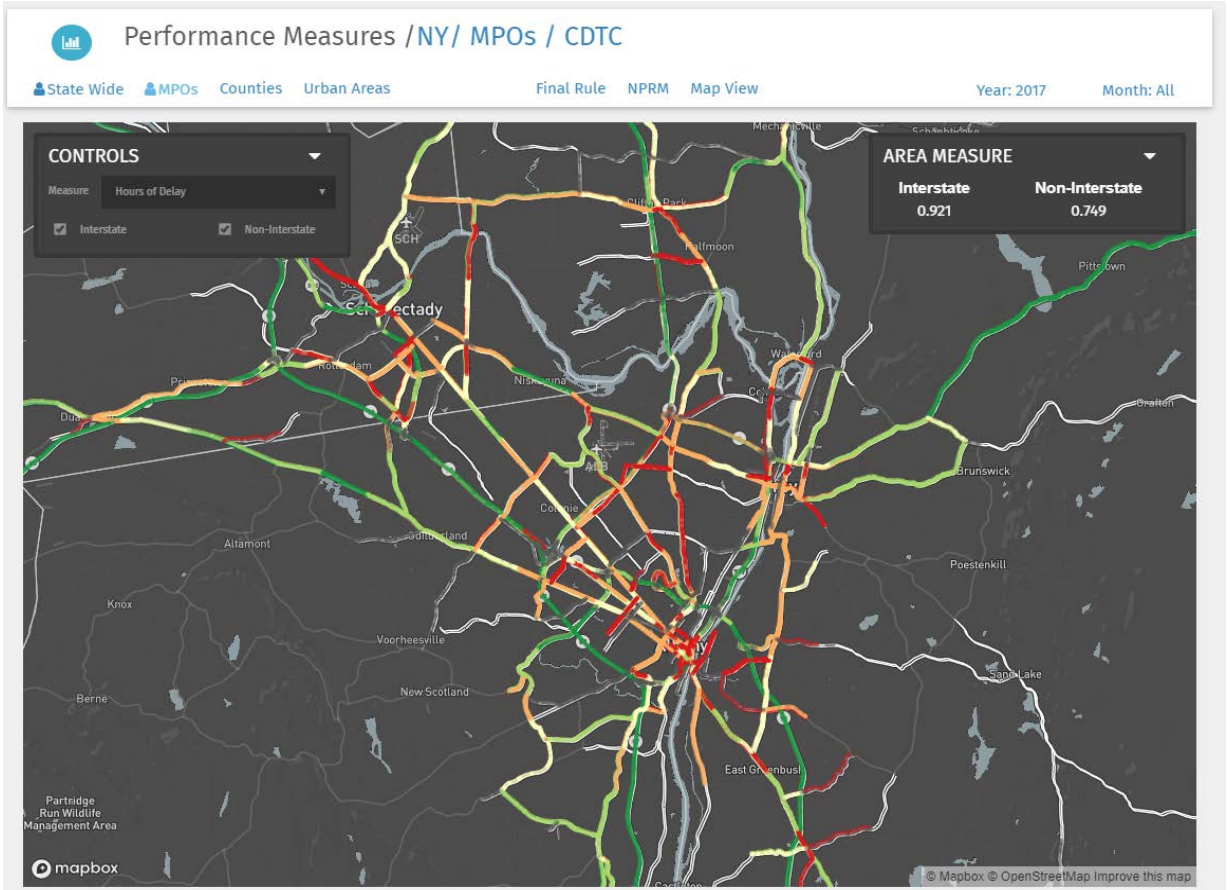
AVAIL

UNIVERSITY AT ALBANY 1844

The National Performance Management Research Data Set (NPMRDS)

Available geographies:

- Statewide
- MPO-level
- County-level
- Network
- Route
- Traffic Message Channel (TMC)
- TMC by block face



The National Performance Management Research Data Set (NPMRDS)

- **Data for all traffic types:**
  - **Cars, single-unit trucks, and tractor trailers**
- **Interstate and non-interstate (free from FHWA to State DOTs and MPOs)**
- **Raw data can’t be shared, but data derivatives could be used by local jurisdictions to monitor traffic behaviors at various time intervals.**
- **Additional local roads are available from commercial vendors (e.g., INRIX, HERE)**
- **Add classification count data for accurate, time-specific volume of trucks.**

2. Adopt proactive planning tools.

NCHRP 08-111 Freight Efficient Land Use (FELU)

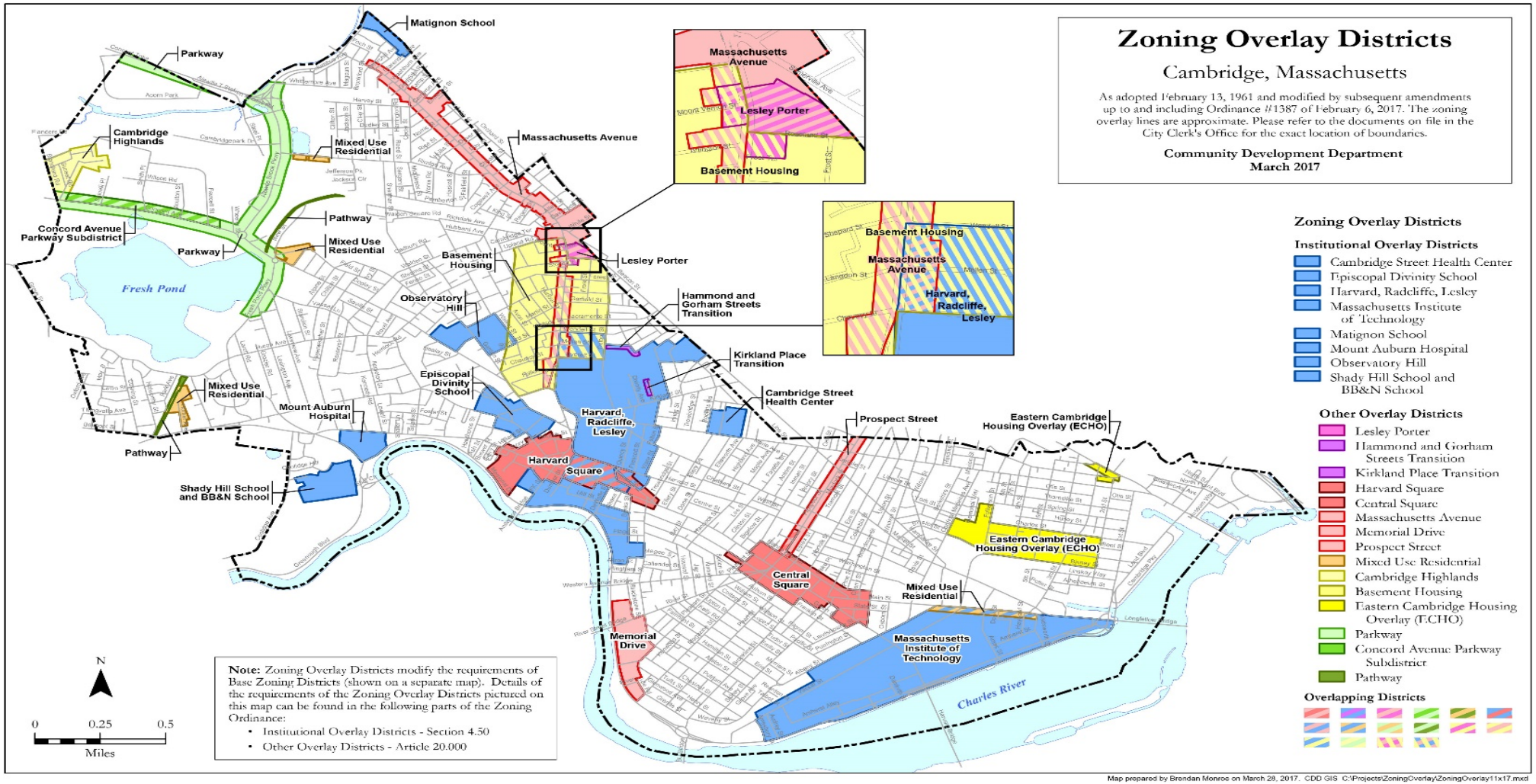
- **Research focus on land use practices and freight:**
  - **Overlays with specific adaptations for freight behaviors**
  - **Form-based/Hybrid codes**
  - **Special Districts**
  - **Logistics Zones**

- **Need for “model language” to facilitate adoption.**
  - **Will require evidence-based data support.**

Overlay Zones

- Easier to enact or amend than Euclidean zoning, but still require local legislative action.
- Less subject to court action.
- Designed to cater to explicit needs.
- Used to address freight issues.
- Case Study
  - Maritime Industrial Zoning Overlay District (MIZOD)

Overlay Zones

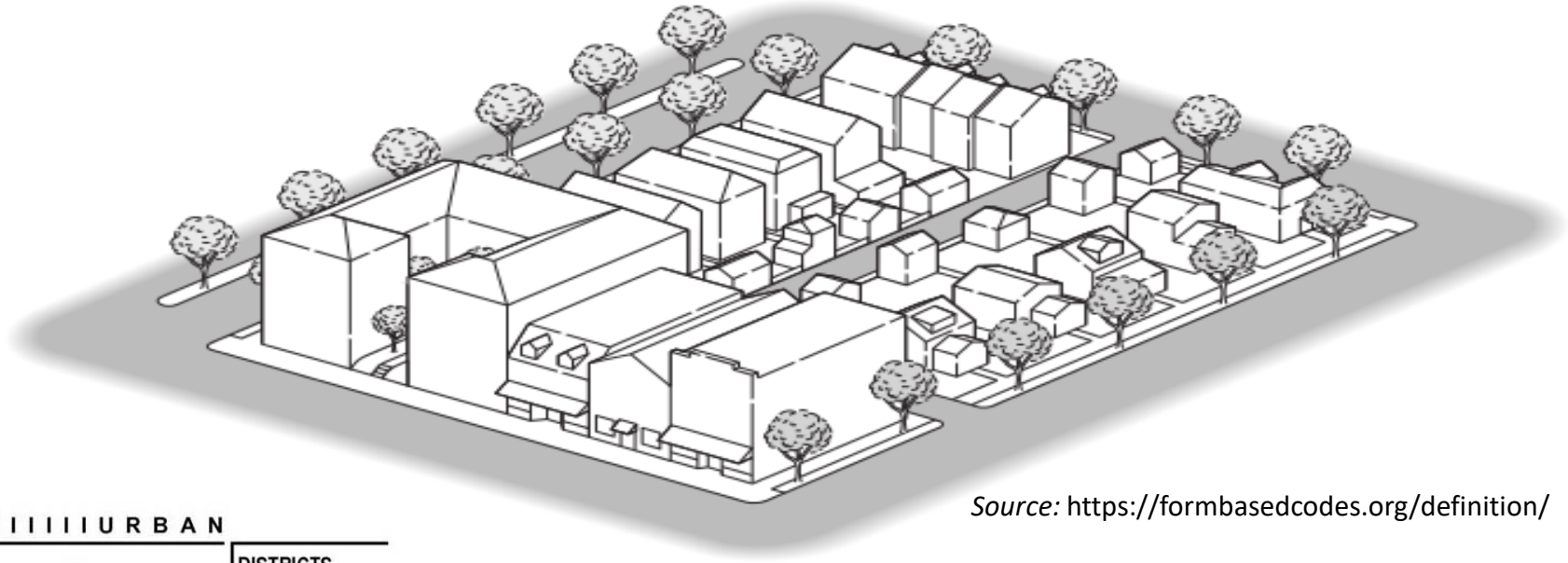


Source: http://www.cambridgema.gov/~/media/Files/CDD/Maps/Zoning/cddmap_zoning_overlay_11x17_201704.pdf?la=en

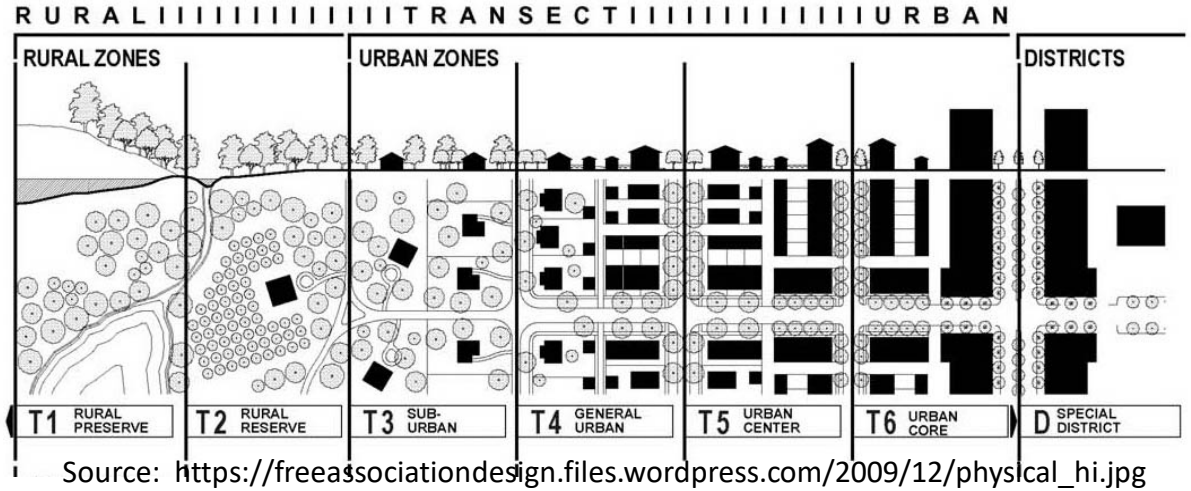
Form-based zoning

- **Attempts to control outcome of development through descriptions and illustrations.**
- **Illustrated in three dimensions.**
- **Requires intensive public outreach to adopt, but reduces need for legislative actions going forward.**
- **Uses a transect concept that marginalizes freight activities.**

Form-based zoning



Source: https://formbasedcodes.org/definition/



Source: https://freeassociationdesign.files.wordpress.com/2009/12/physical_hi.jpg

Hybrid Zoning

- Creates a mix of traditional and form-based zoning.
- Has been successfully used to describe and illustrate freight activities.
- Also requires intensive public outreach to adopt, but reduces need for legislative actions going forward.
- Case Study
  - Albany, New York

Hybrid Zoning

(c) **DIMENSIONAL STANDARDS**

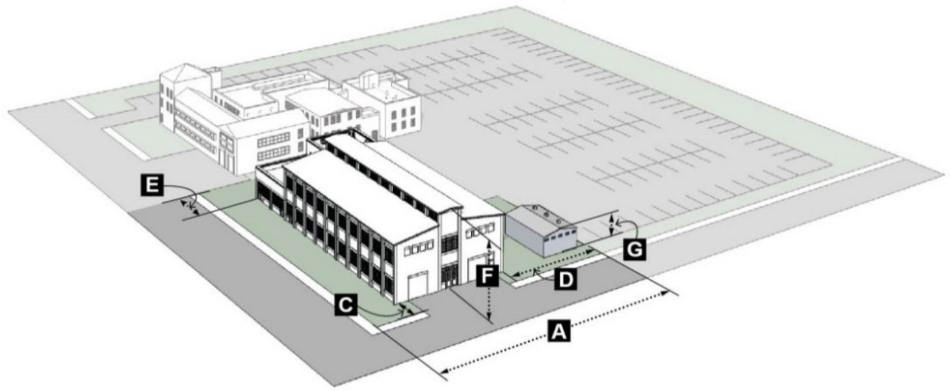


Table 375-2-30: I-1 Light Industrial See Section 375-4(A) for more details		
Lot Standards		
A	Lot width, minimum	25 ft.
B	Impervious lot coverage, maximum	N/A
Setbacks		
C	Front, minimum	0 ft.
D	Side, minimum	10 ft.
E	Rear, minimum	20 ft.
Building Standards		
F	Height, principal building, maximum	2 stories
G	Height, accessory buildings, maximum	N/A

(c) **DIMENSIONAL STANDARDS**

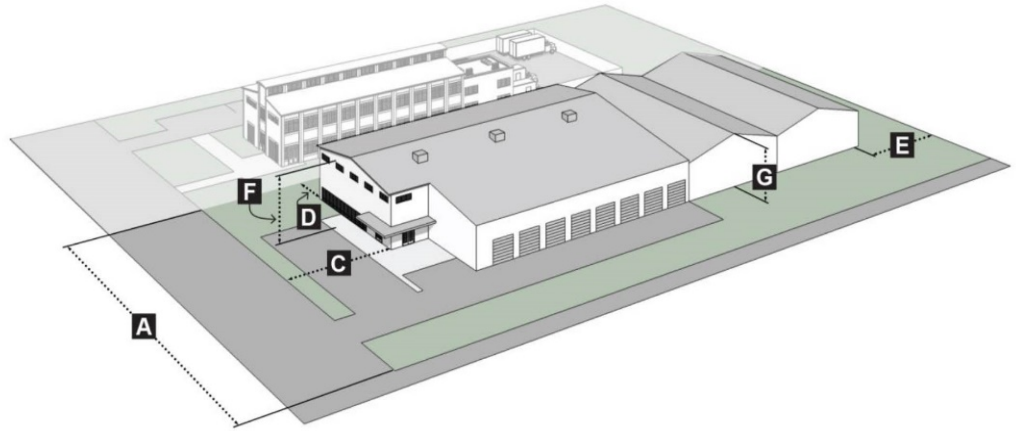


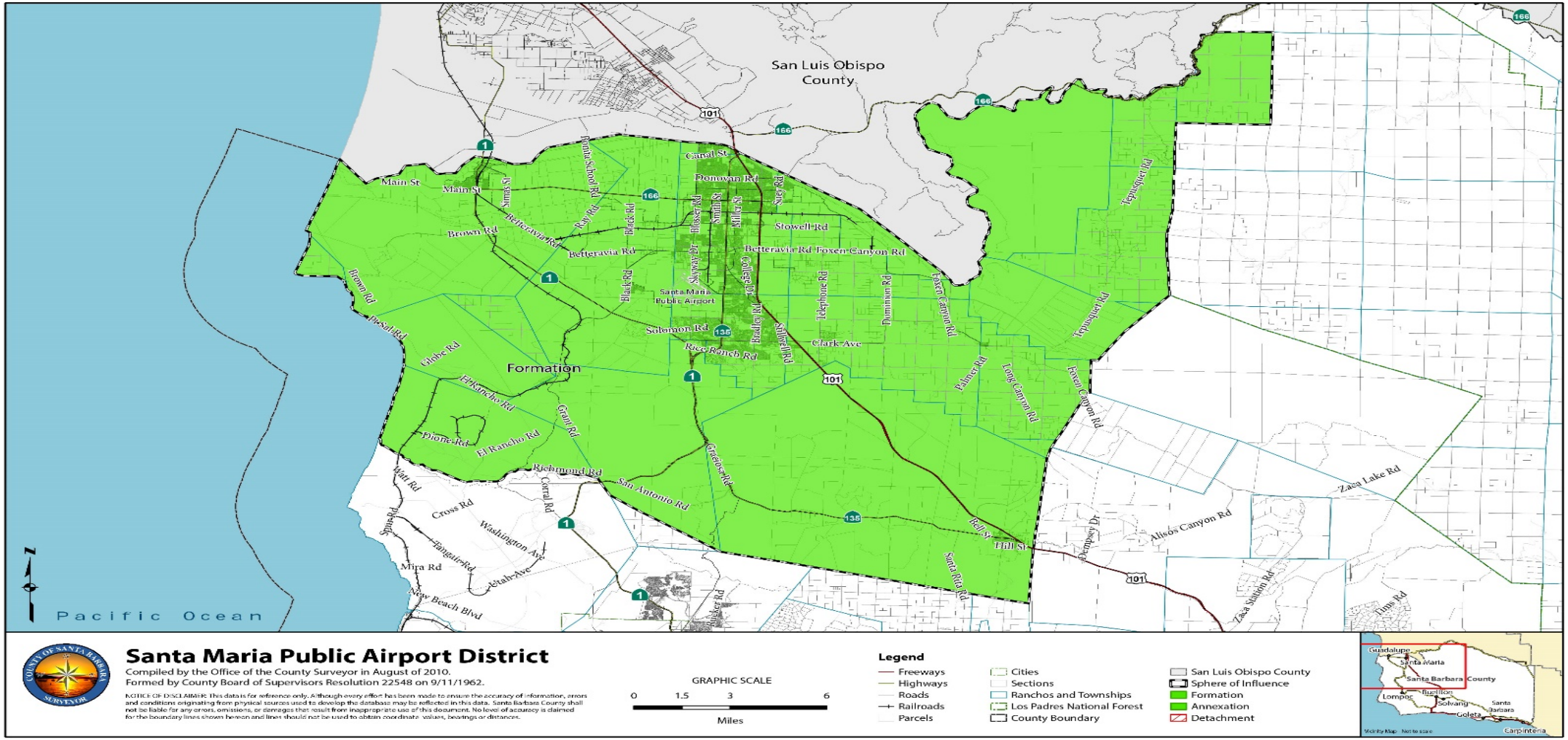
Table 375-2-32: I-2 General Industrial See Section 375-4(A) for more details		
Lot Standards		
A	Lot width, minimum	50 ft.
B	Impervious lot coverage, maximum	N/A
Setbacks		
C	Front, minimum	10 ft.
D	Side, minimum	15 ft.
E	Rear, minimum	40 ft.
Building Standards		
F	Height, principal building, maximum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

Source: Clarion Associates. (2017). *Albany, New York: Rezone Albany*.

Special Districts

- Used for areas within a jurisdiction where freight issues require action.
- Mitigation strategies to reduce conflicts.
- Recognition of specific needs across the district.
- Flexible boundaries to accommodate needs.
- Case Study
  - Portland, Oregon - Freight District

Special Districts



Source: http://surveyor.countyofsb.org/downloads/specialdistrict/Santa_Maria_Public_Airport_District.pdf

Logistics Zones

- Port-centric Logistics Zones
- Logistics Support Zones
- Urban Distribution Centers
- Urban Consolidation Centers
- Freight Villages

https://www.supplychainlog.com/2018/12/09/rs-156-cr-varanasi-freight-village-project-approved/

3. Watch the clock: time matters!

- **Time – the 4th dimension (e.g., shared parking for retail during the day and residential at night).**
- **Identify trucks in congested areas and determine length of congestion and relationship to land uses (e.g., pass-through or locally-generated traffic) - 24/7.**
- **Develop thresholds for overlay zones/districts that trigger more aggressive responses over time to maintain and improve truck traffic by time of day.**
- **Monitor “before & after” land use developments at various times of the day and by different geographic features (e.g., TMC, routes, networks) using probe data-derived metrics.**

4. Implement “Assistive Intelligence” (AI).

- **NCFRP Report 29 describes mobile apps to aid truck activities.**
- **Incentivize participation in site-specific, overlay zone or special district truck mobility programs.**
- **Use AI programs can control which trucks arrive on-site, where and for how long they can park, with two-way apps for scheduling, transactions, and reservations through land use legislation.**

5. Check local hazard profiles.

- Focus on resiliency.
  - All jurisdictions, counties and states need approved FEMA Hazard Mitigation Plans.
  - Identify “disruption-resistant networks” locally.
  - Case Study
    - Seattle’s new “earthquake-proof” tunnel
- Coordinate with freight/land use efforts to prepare for automated trucks: before, during, and after an event.
- Develop local network analytics for hazard warnings.

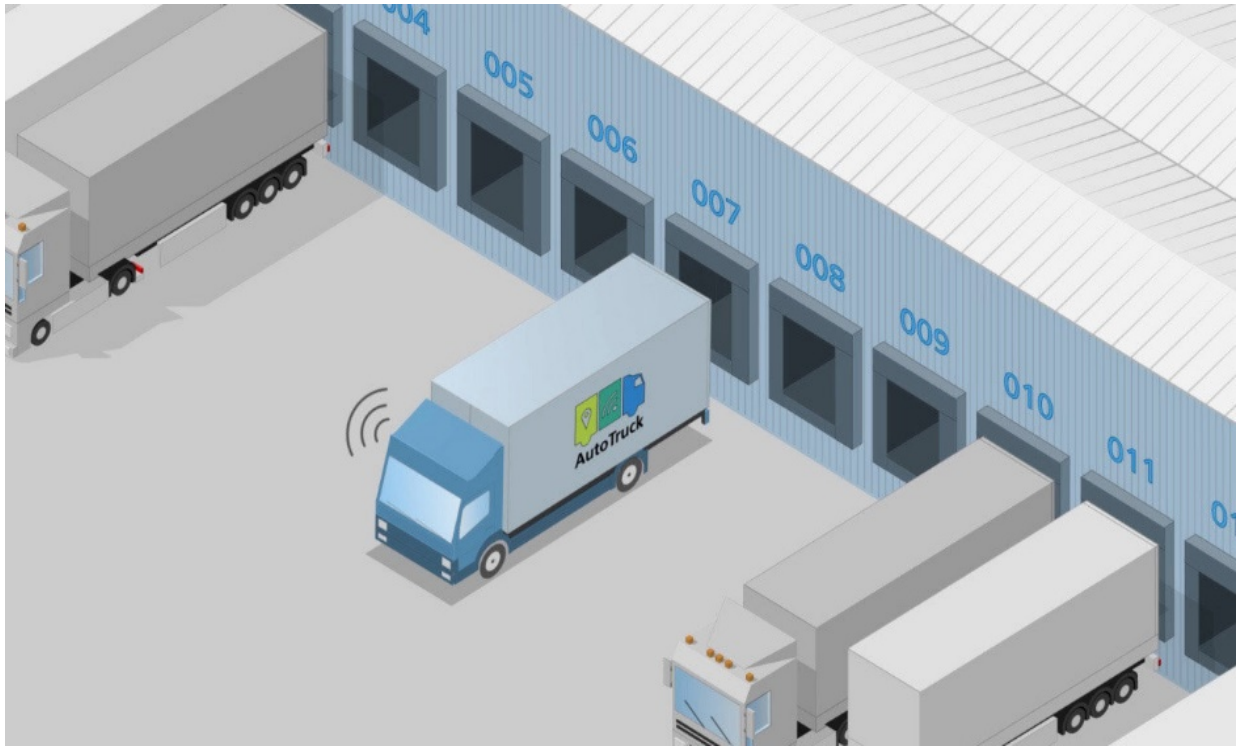
http://stevebarclay.net/work-to-find-a-solution-to-flood-road-problem-is-on-track/

https://www.nytimes.com/interactive/2018/sunday-review/year-in-pictures.html

What do Land Use planners need to do?

- **Access high quality, harmonized data programs for local land use analysis.**
- **Apply innovative land use planning tools, policies, and programs to tackle identified freight challenges.**
- **Pay attention to time and behavioral changes at various times of the day, week, month, and season.**
- **Implement Assistive Intelligence programs as a land use solution.**
- **Understand and incorporate local hazard risks going forward.**

When Land Use planners are ready – Let the automated trucks roll!!



https://phys.org/news/2018-07-autonomous-trucks-logistics-centers.html

https://jalopnik.com/volvos-latest-autonomous-truck-concept-is-just-motors-1829038965

AVAIL

UNIVERSITY AT ALBANY 1844

Questions?

Contact info:

Catherine T. Lawson

lawsonc@albany.edu

Albany Visualization and Informatics Lab (AVAIL)

www.availabs.org