Webinar Participants

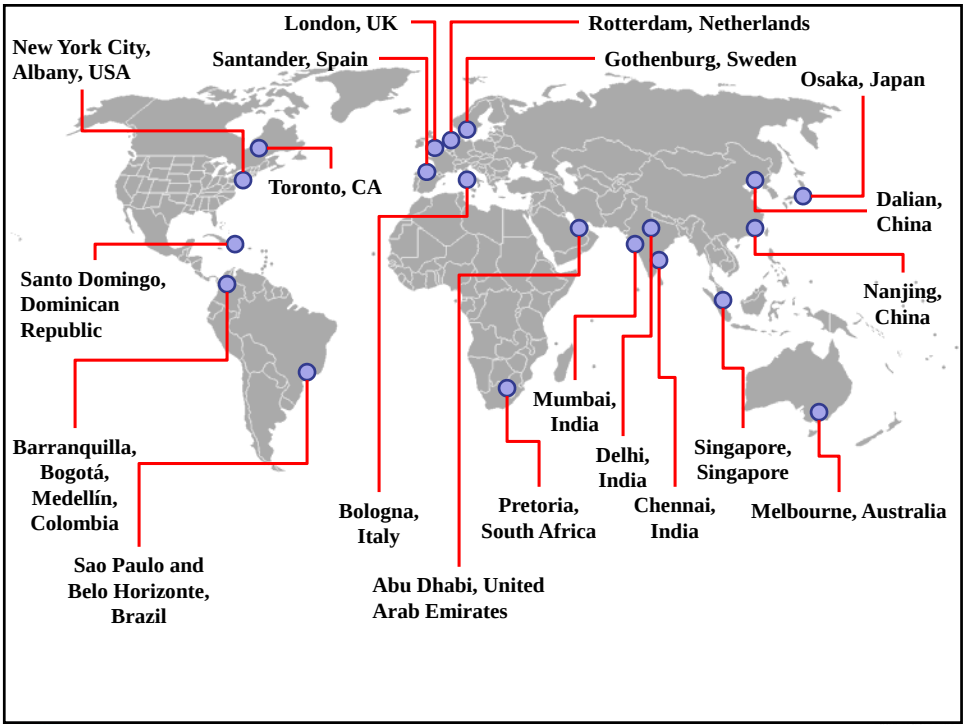
Mechanics of the seminar

- The webinar is being recorded, the URL will be sent out to participants and posted at www.coe-sufs.org
- Participants from the US and Canada can:
  - Use Adobe Connect to receive the audio (PRIMARY method)
  - Dial 1-888-446-7584, access code 1120583
- International participants can:
  - Use Adobe Connect to receive the audio (PRIMARY method)
  - Use Skype or similar to dial 1-888-446-7584, code 1120583
  - Dial 212-372-3742 (caller paid call)
- Submit questions using the Chat feature

The VREF Center of Excellence for Sustainable Urban Freight Systems (CoE-SUFS)

CoE-SUFS

- Funded by the Volvo Research and Educational Foundations (VREF)
- Main Goal: To jumpstart an integrative process, involving cities, private sector, and researchers to develop new freight systems paradigms that:
  - Are sustainable
  - Increase quality of life
  - Foster economic competitiveness and efficiency
  - Enhance environmental justice



CoE-SUFS Dissemination Programs

- **Peer-to-Peer (P2P) Exchange** to share global best practice cases and real world examples of sustainable urban freight systems

- Next P2P (September 24th, 2014):
  - Freight Trip Generation Patterns in Developing Countries
  - Gitakrishnan Ramadurai, IIT-Madras
  - Ivan Sarmiento, Universidad Nacional de Colombia - Medellín

- **Workshops** to bring together public/private sectors and academia, to jointly work to address urban freight issues
  - **Upcoming:** Colombia and Mexico

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Logistical Sprawl: Spatial patterns of logistics facilities and their impacts on metropolitan areas

Laetitia Dablanc - IFSTTAR
Anne Goodchild – U. of Washington

Acknowledgements

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- Transportation Northwest and the Harry Bridges Center for Labor Studies
- Students Derik Andreoli, Dina Andriankaja, Victoria Farr, Adeline Heitz, Scott Ogilvie, Nicolas Raimbault, Hans Williams

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Objectives

- Understanding spatial patterns of the location of warehouses in large metropolitan areas – US and Europe
- Calculating indicators of logistics sprawl
- Analyzing the way local practitioners address logistics sprawl

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More warehouses in large metropolitan areas

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- A huge increase in the number of warehouses and distribution centers
  - Los Angeles: +207% between 1998 and 2009 (number of 'warehouses' NAICS 493)
  - Atlanta: +203% between 1998 and 2008
  - Seattle: +249% between 1998 and 2009
  - Paris region: +50% square footage between 2001 and 2009
- Statistical issues
  - NAICS 493: ill-placed mini-storage facilities? (Jacubicek and Woudsma, 2014)

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- Mega distribution centers of up to 2 million sq feet in well connected large urban areas (Cidell, 2010; Andreoli et al., 2010)
- The location of WHs and DCs is more indifferent to transportation costs than before
  - Trucking costs have fallen from 38 cents to 28 cents a ton-mile b/w 1980 and 1999 (Glaeser and Kohlhase, 2004) (all in 2001 dollars)

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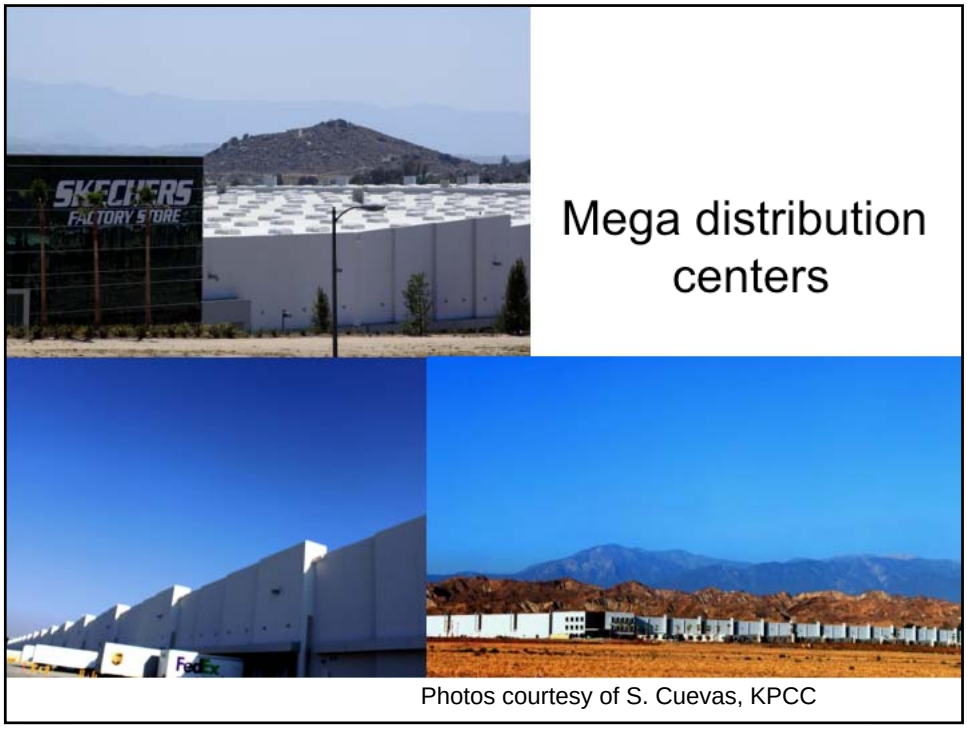
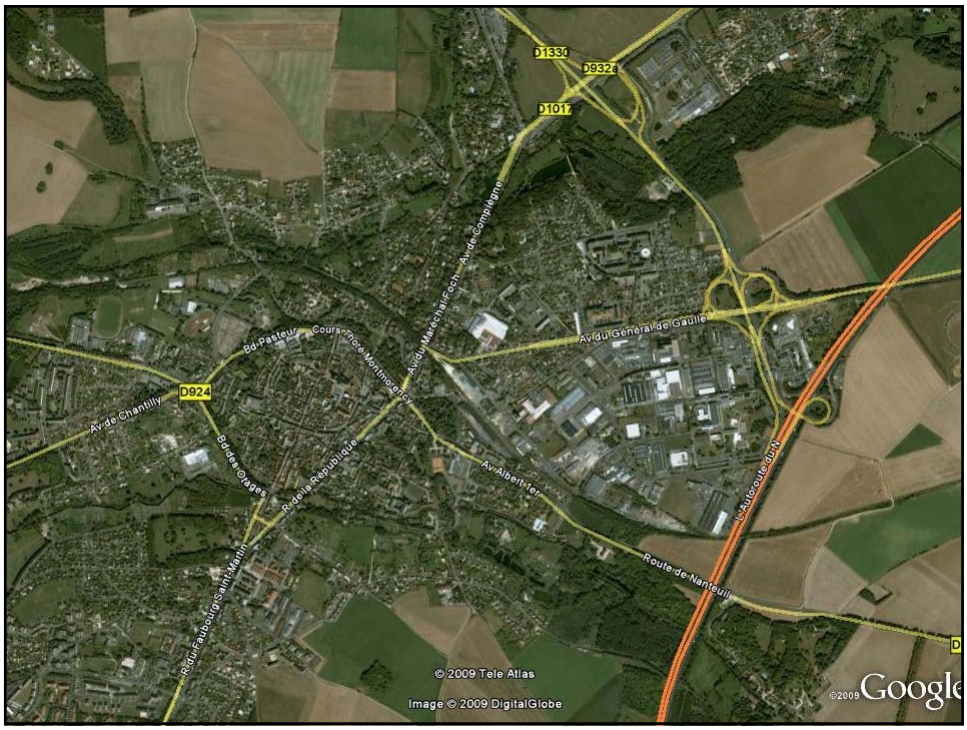
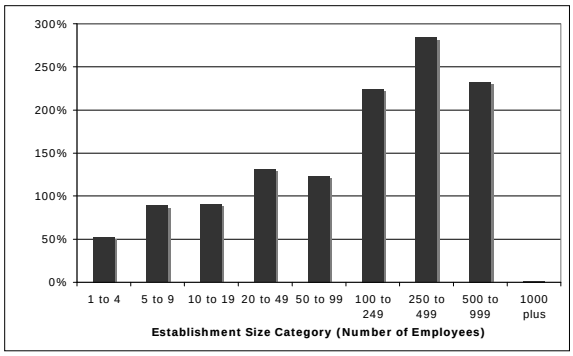


Photos courtesy of S. Cuevas, KPCC



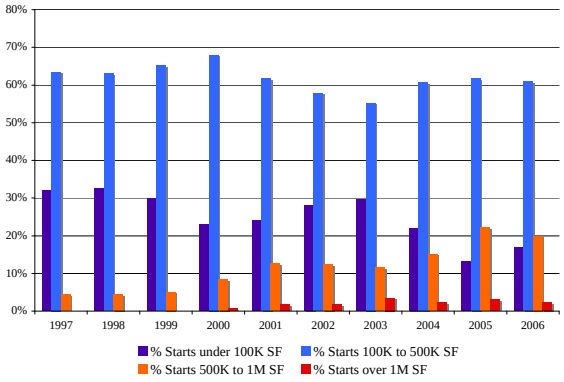
Warehouse Growth by Establishment Size (1998-2009)

15



Prologis US Warehouse Starts by Square Footage

16



More warehouses because...

- Technology improvements allowing larger scale management and operation
- Increased logistics content of industries and activities
- Serving global supply chains and the processing of international shipments
- Serving new urban markets: e-commerce, same day delivery

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Increased logistical content of traditional activities: City of Vernon, CA

Business type	Growth rate 2002-2011	% of warehousing SIC
Garment Warehouse	+1300%	From 0% to 56%
Cold Storage	+136%	From 64% to 73%
Produce Distribution	+130%	From 0% to 22%
General Merchandise-Warehouse	+124%	From 12% to 60%
Food Distribution	+100%	From 29% to 29%
Garment Wholesale	+80%	From 0% to 11%
General Merchandise/Wholesale	+35%	From 24% to 55%
Produce Broker/Wholesale	+30%	From 0% to 15%
Storage	+28%	From 47% to 64%
Warehouses	+8%	From 22% to 41%
Distribution	-20%	From 1% to 28%
Trucking/Freight/Delivery	-24%	From 1% to 1%
Wholesale	-25%	From 6% to 23%
Meat Distribution	-37%	From 25% to 20%
Food Warehousing	-50%	From 10% to 0%
Furniture/House Wholesale	-57%	From 0% to 33%
Records Storage	-60%	From 0% to 100%
Fabric/Textile warehouse	-80%	From 0% to 0%
Fabric/Textile wholesale	-83%	From 0% to 0%
Import/Export	-87%	From 20% to 50%

Dablanc, from Vernon business listings

Processing shipments from global supply chains

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- Containers arriving from Asia to LA/LB ports
  - 25% stays in the L.A. area (up from 12% in 2000)
  - 75% leaves the region—half of which has been transloaded (up from one third in 2000)
- Need for local warehouses/distribution centers

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New urban markets

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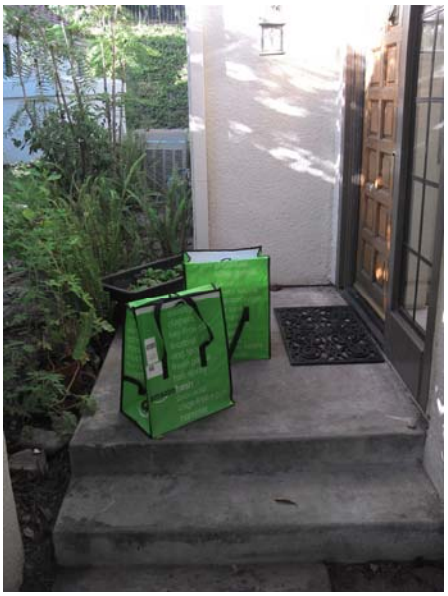
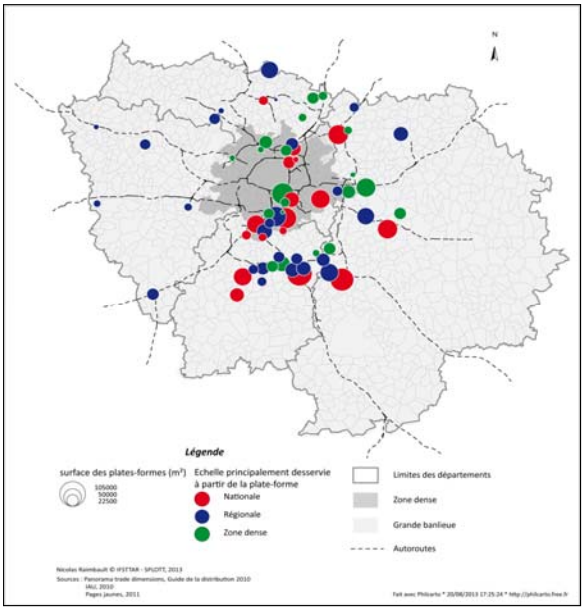


- Amazon Fresh
- Order made late at night and delivered at 6am the next morning
- High quality of service at a very low price
- Requires a local/regional fulfillment center

Amazon fulfilment center in San Bernardino, CA

Large retailers' DCs in the Paris region



Source: N. Raimbault

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Many DCs are spatially isolated, few are in logistics parks

Many DCs serving national or European markets are located in rather central areas: no logic of truck-mile reduction

Every year, 10% of the 60 distribution centers of Carrefour French supply chain change location or are closed

The geography of Carrefour distribution centers has changed 100% within ten years only (N. Raimbault)

Warehousing in mega-regions

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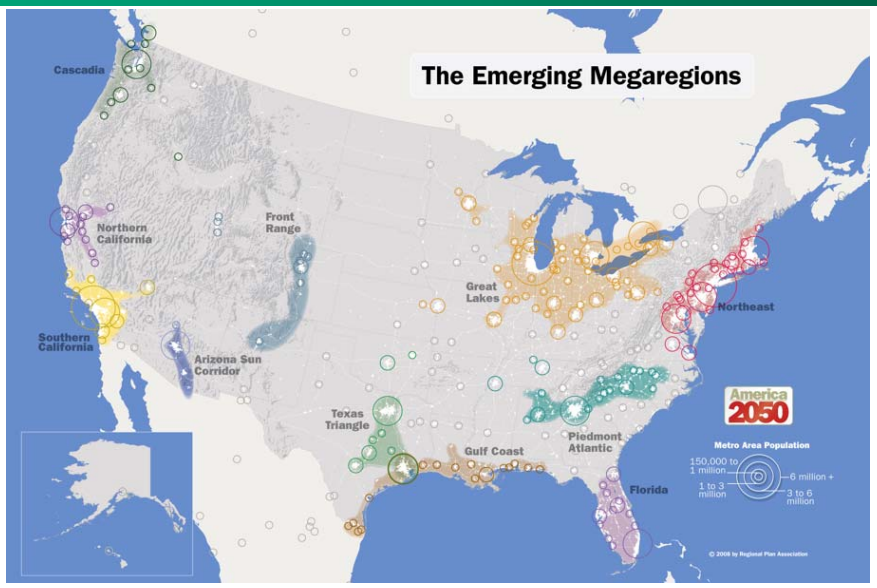
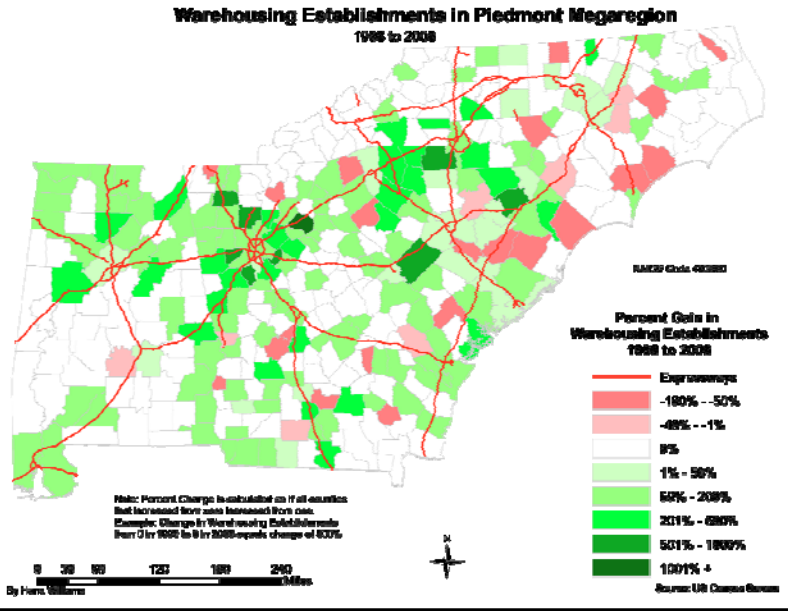
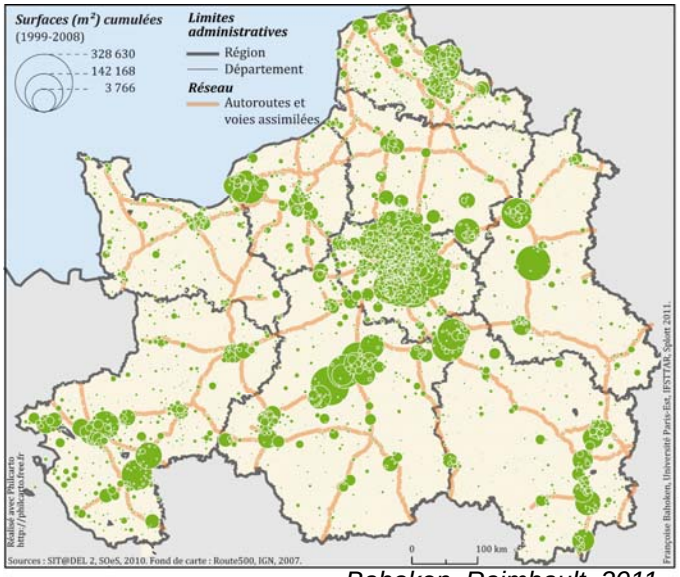
- Mega-regions are large “networks of connected metropolitan centers and their surrounding areas... spatially and functionally linked through environmental, economic and infrastructure interactions” (Ross, 2009)
- Logistics facilities developing faster in mega-regions than in other areas
- Within mega-regions, logistics facilities developing faster in large cities than in medium size cities and rural areas
- Example in Piedmont Atlantic around Atlanta and in the Parisian Basin around the Paris region

25


The Emerging Megaregions
Cascadia
Northern California
Front Range
Great Lakes
Northeast
Southern California
Arizona Sun Corridor
Texas Triangle
Piedmont Atlantic
Gulf Coast
Florida
America 2050
Metro Area Population
150,000 to 1 million
1 to 3 million
3 to 6 million
6 million +

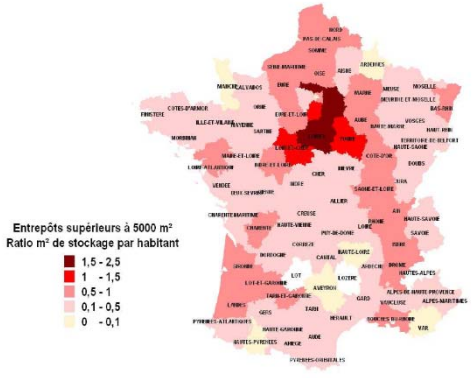
26


Warehousing Establishments in Piedmont Megaregion
1998 to 2008
Percent Gain in Warehousing Establishments 1998 to 2008
Expressways
-100% - -50%
-49% - -1%
0%
1% - 50%
51% - 200%
201% - 500%
501% - 1000%
1001% +



Bahoken, Raimbault, 2011

Paris region = 200 million sq ft of warehouses
= a fourth of all France WH floor area



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Warehousing Location Quotients by State: 1998 and 2006

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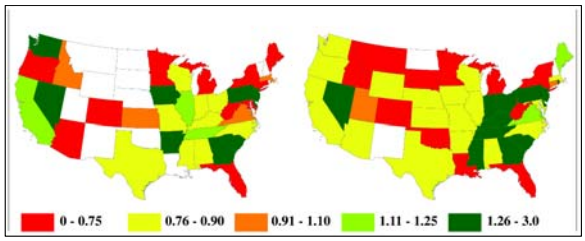
(Source: U.S. Census County Business Patterns)



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More warehouses in large metro areas because...

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- Large consumer base and workforce (need for 0.30 to 0.50 employees/1000 sq ft of warehouse)
- Transportation infrastructure nodes, gateway cities
- Large supply of logistics real estate

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Logistics sprawl

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- The spatial decentralization of logistics facilities in metropolitan areas
- Differentials in land prices, needs for modern facilities and large parcels, availability of road infrastructure, need for connectivity with other major consumer markets

Los Angeles, warehouses, 1998-2009

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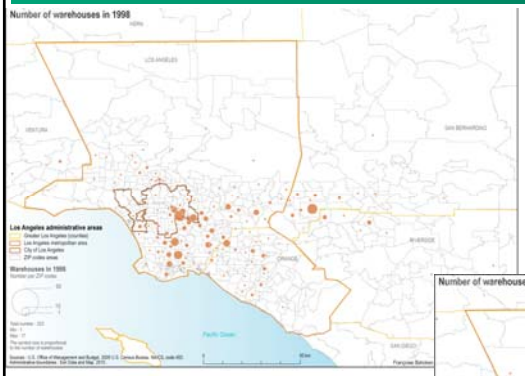
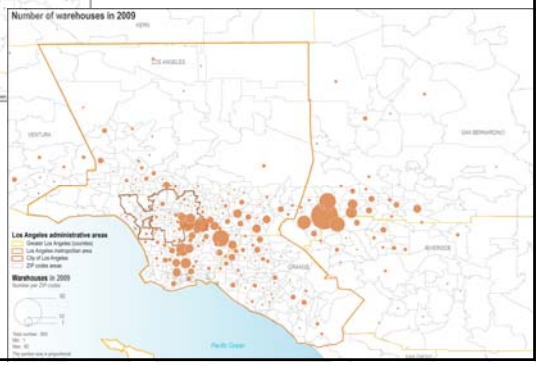


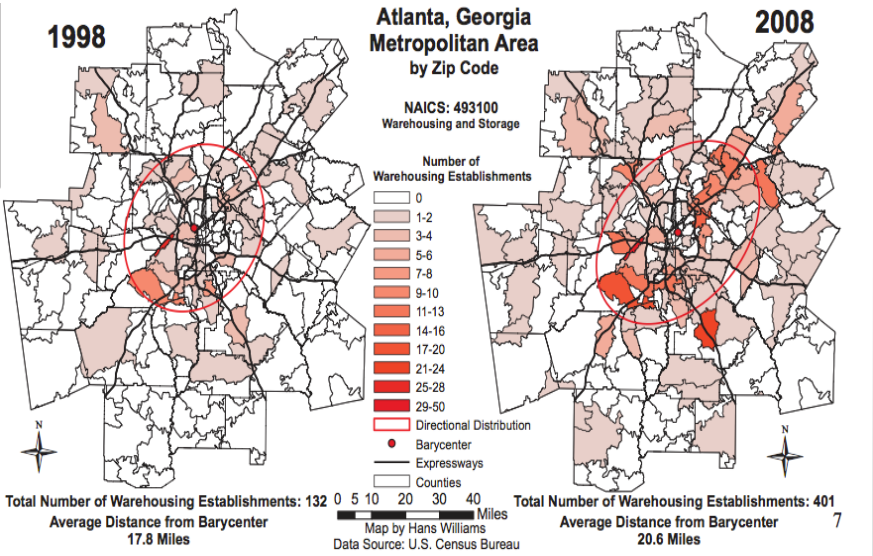


(NAICS 493)

Dablanc and Farr, 2012

Atlanta, warehouses, 1998-2008

33



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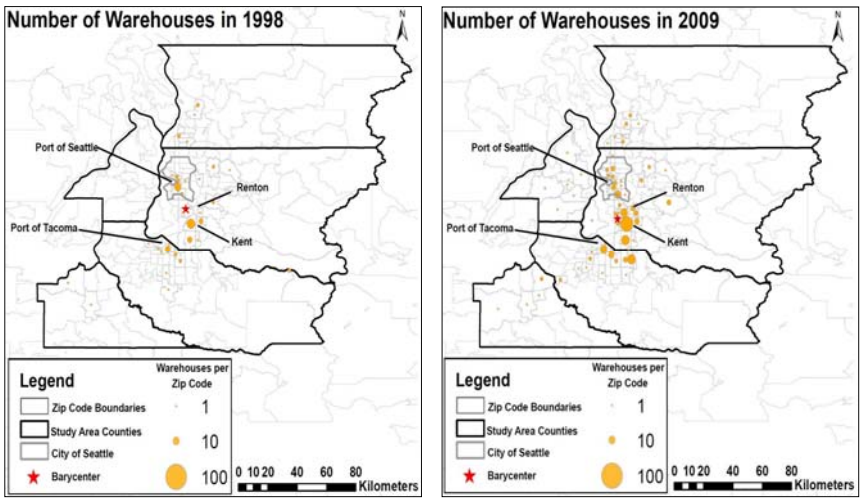
Seattle, warehouses, 1998-2009

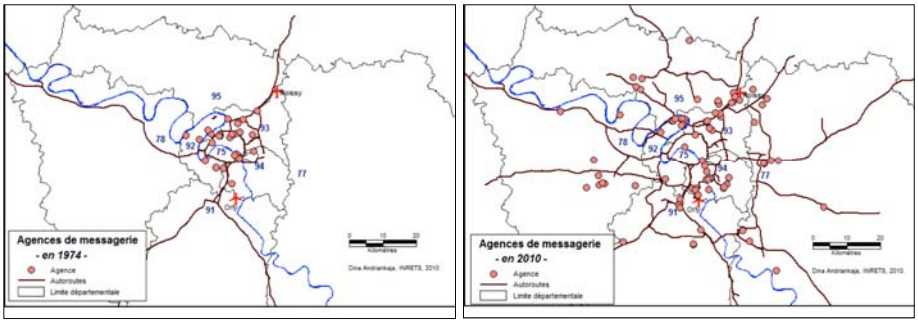
34



NAICS 493
Goodchild and Ogilvie

Paris, parcel and express cross-docking terminals, 1974 and 2010

35



Dablanc, Andriankaja, 2011

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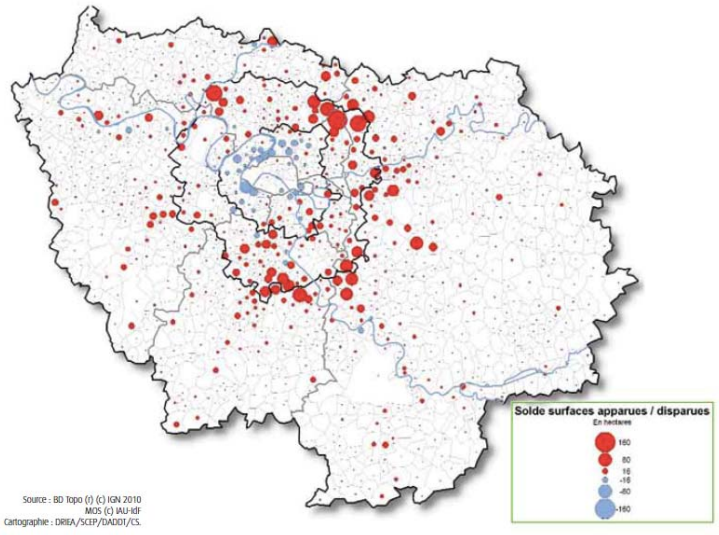
Paris, warehouses, 1987 and 2008: hectares built (red) and hectares lost (blue)

36



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- The average distance of terminals to their barycenter (center of gravity) has increased:
  - by 3 miles in Atlanta (from 17 to 20 miles)
  - by 6 miles in Los Angeles (from 26 to 32 miles)
  - by 7 miles in Paris (from 4 to 11 miles – much longer period)
  - by -0.8 miles in Seattle (from 12.8 to 12.0 miles)
- The same sprawl indicator for all establishments (representing economic activities in general) has increased:
  - by 1.3 miles in Atlanta
  - by 0.1 mile in Los Angeles
  - by 1.3 miles in Paris
  - by 0.2 miles in Seattle

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- Except for Seattle, logistics activities decentralized more than economic activities in general
- This can result in more truck-miles to connect urban destinations to and from freight terminals => more energy, more CO_2
- Calculation with actual truck traffic data for the Paris case study (parcel and express transport industry): net annual impact of +16,000 tons of CO_2 due to 'logistics sprawl'

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Lack of Logistics Sprawl in the Puget Sound

- Equidistant from Ports of Seattle and Tacoma
  - Moving north or south would increase access costs
- Constrained geography
  - Little east/west growth potential due to mountain and water features
  - Limited road network
- 1990 Washington Growth Management Act
  - Concentrates growth in designated regions
  - Reduces potential for sprawl

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Various local strategies towards warehouses in Atlanta and L.A.

- Trying to prevent logistics growth in traditional manufacturing areas: Vernon in Los Angeles
- Looking at logistics as a way to revitalize manufacturing areas: Fulton Industrial Boulevard in Atlanta, Rancho Dominguez in L.A. (County–Employment Protection Districts)
- Looking at logistics as a strategic sector for accelerated local economic growth: Henry County in Atlanta, Moreno Valley and other Inland Empire communities in Los Angeles

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- Diversifying from logistics, introducing more job intensive logistics (repair, e-commerce), new manufacturing: Gateway Cities, L.A.
- Looking past logistics: turning to office and high rise development, Gwinnett County in Atlanta
- After pushing logistics out for decades, promoting new freight terminals back in the urban core: City of Paris. City of Atlanta?

Municipalities and warehouses in the Paris region

- 618 municipalities (over 1281) have warehouses
- 42 municipalities concentrate 50% of WH floor area (= concentration)
- The remaining 50% on 576 municipalities (= sprawl)

(N. Raimbault)

Four categories of municipalities (N. Raimbault) [43]

- Integration: 50% of WH floor area built since 1985
  - No conflict, isolated WH or well accommodated in multi activity industrial parks
- ''Servant'' communities: 15%
  - poorer municipalities, used to be manufacturing
- Local economic development: 20%
  - Large logistics parks, dynamic logistics real estate development projects in suburban/exurban municipalities
- National initiatives: 15%
  - Multimodal logistics parks, freight villages, inland ports

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Conclusions

- Dramatic growth and change in the warehousing industry (e.g. technology, consumer behavior)
- Evidence of a geographic shift in terms of where warehouses are located and the geographic scale of the regions that they serve
- Evidence some land use planning tools that could be effective at targeting where warehouse growth occurs
- More case studies to come, in the US as well as in Europe

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Thanks! Questions?

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