

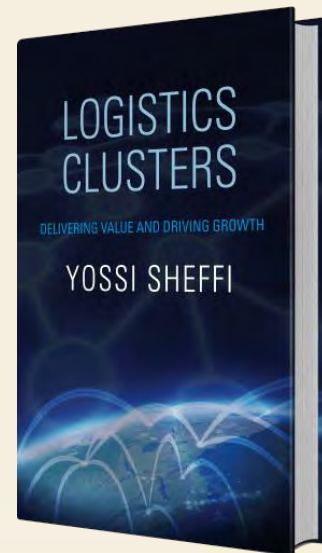


15th TRANS Middle East
AQABA 2018

Logistics Clusters: Delivering Value and Driving Growth

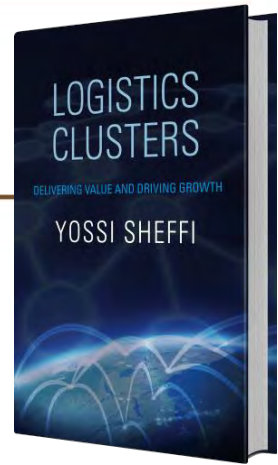
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Professor, Civil and Environmental Engineering, MIT
Professor, Institute of data Science and Society, MIT
Director, MIT Center for Transportation and Logistics



Main Points

- Why companies cluster?
- Logistics clusters - examples
- The feedback loop
- Advantage of logistics clustering
- Success factors
- Environmental calculus



Industrial Clusters

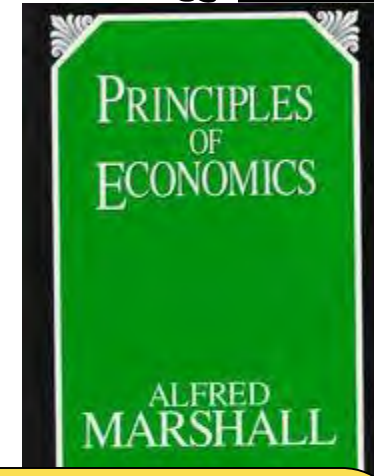
- Silicon Valley
- Hollywood
- Wall Street
- Napa and Sonoma Valleys
- Fleet Street
- “Bio-Cambridge”



Literature

- Alfred Marshal, *Principles of Economics* (1920): “Positive externalities of co-location.”
 1. Knowledge sharing
 2. Supply base
 3. Labor pool
- Michael Porter, *Economic Competition, Harvard Business Review* (1998)
 1. Increased productivity
 2. Increased pace of innovation
 3. High pace of new business formation

“...if one man starts a new idea, it is taken up by others and combined with suggestions of their own; and thus it becomes the source of further new ideas.”



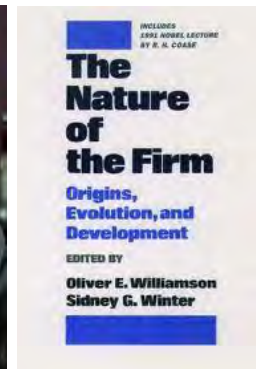
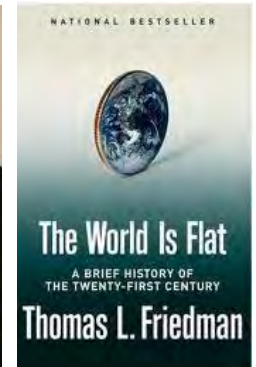
Why Clusters?



Economists are Asking:

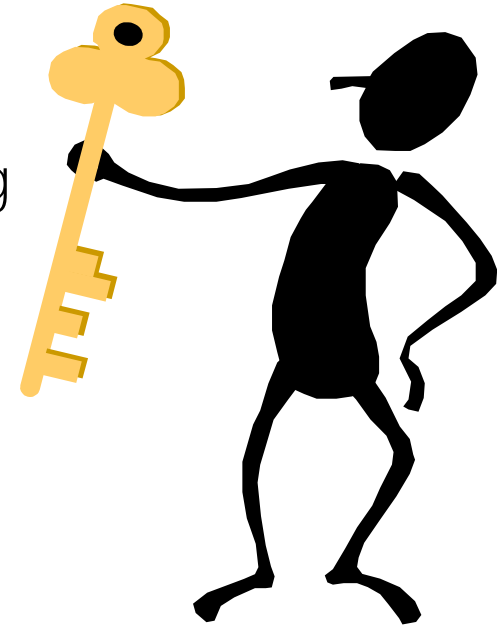


1. **Why cluster? Isn't EDI, video-conferencing, visibility software, etc, enough for communications?** (remember Tom Friedman?)
2. **If this is not enough, why don't companies in a cluster acquire each other more than we see?** (remember Ronald Coase?)



Why Clusters?

- Natural resources (coal field, weather, a harbor)
- A pool of specialized labor
- Suppliers and subsidiary services including Research and education
- Trust/Collaboration tacit knowledge exchange
- Government lobbying

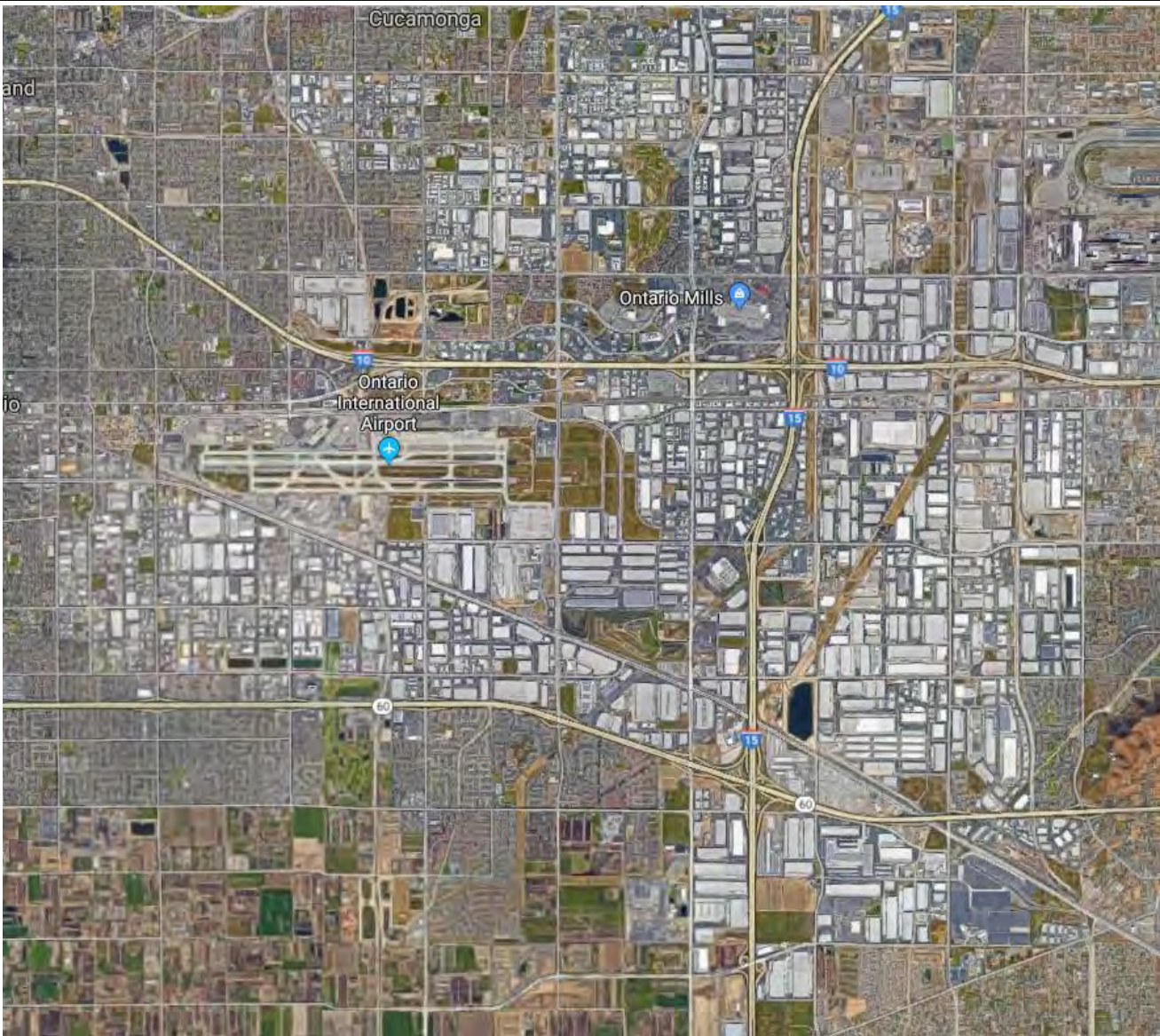


Are clusters an optimal point between slow behemoths with scale and nimble competitors with not enough resources?

Logistics Clusters

- Singapore
- Holland
- Zaragoza
- Memphis
- Panama
- Jolliet





East Los Angeles

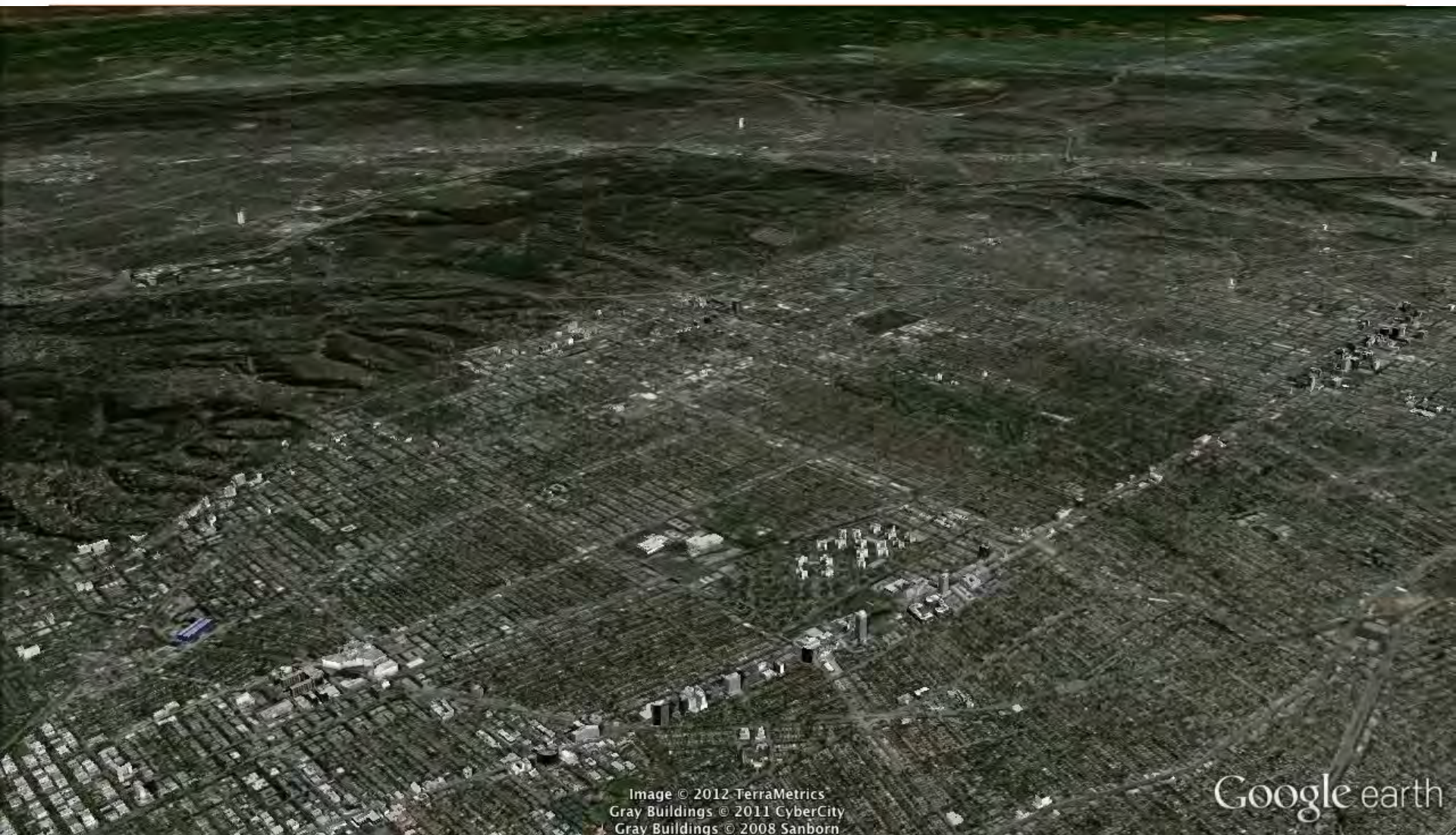


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Gray Buildings © 2011 CyberCity
Gray Buildings © 2008 Sanborn

Google earth

Plataforma Logistics de Zaragoza (PLAZA)

- 2002
- 2003
- 2004
- 2005
- 2007
- 2009



Logistics clusters development

Why are governments all over the world developing logistics clusters?



The Elixir of Self-Development

For any industrial cluster:

- The larger it is \Rightarrow the more attractive it is \Rightarrow the larger it grows.

For logistics clusters:

- Even more so.

Result: a self-reinforcing positive feedback loop

As Logistics Clusters Grow

- Transportation

Better transportation service
Lower transportation costs

- Time

- Higher

- More

- Liquidity

- Services

- Carriers

More logistics operations
move into the park

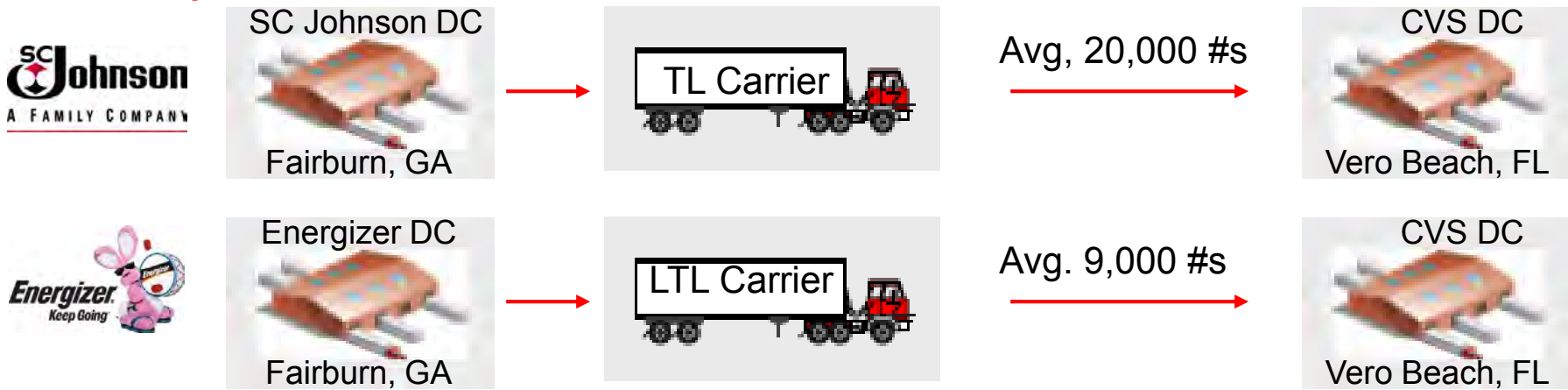
Also:

More carriers move in;
more services are offered

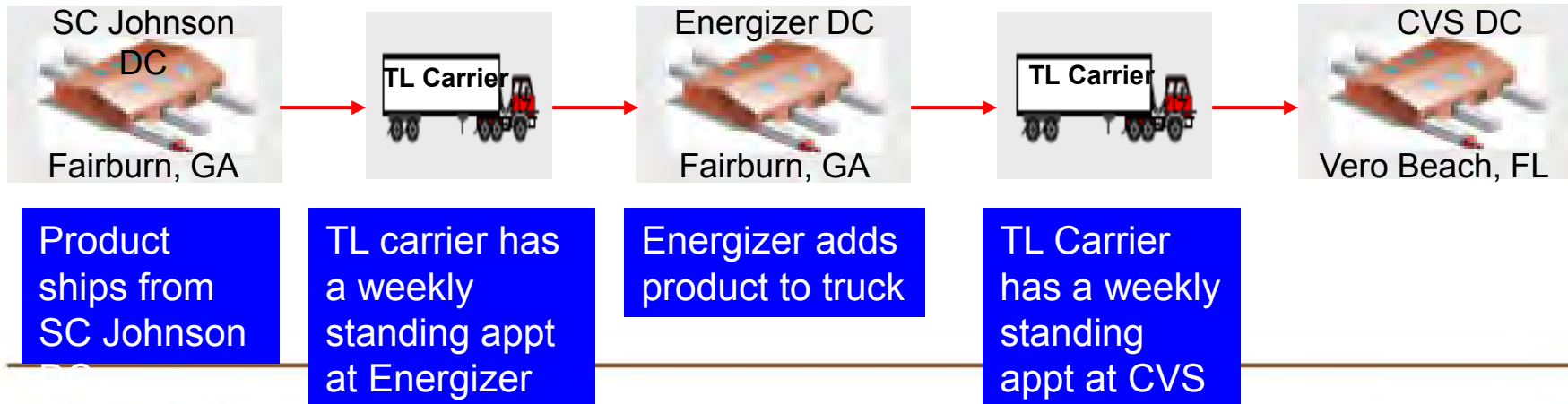


Horizontal Collaboration (SC Johnson & Energizer)

Pre-Project:



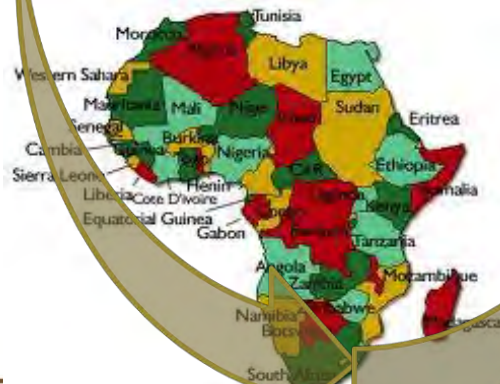
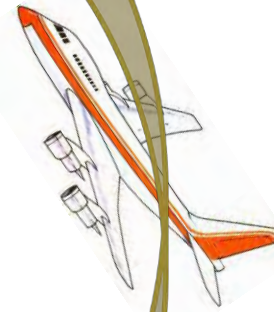
Project:



Example:



and **ZARA**



Advantages of Logistics Clustering

- Spikes management
 - Planned
 - Unplanned



- Cutoff times



- Fast replenishment/Inventory

“Thanks to the location of our Global Distribution Center in Memphis, Future Electronics is able to extend the cut-off times for next order to midnight Eastern Standard Time.”



Logistics Clusters: A Jobs Engine

- The port of Rotterdam
 - 90,000/>66,000 jobs
- Louisville Airport:
 - 69,000 jobs
 - \$2.6 billion payroll
 - \$349 million in local taxes
- Memphis International Airport
 - 220,000 jobs (95% in cargo operations)
 - More than 1 out of 3 jobs in metro Memphis
- AllianceTexas
 - > 350 companies
 - 45,000/83,000 jobs



Logistics Cluster Jobs

Logistics

- Blue collar
 - Warehouse, transportation
- White collar
 - Information technology, CSR, executive



Value added

- Repair technicians
- Light manufacturing; tagging, retail displays



Attracted manufacturers

- Sub-clusters



Economic Benefits of Logistics Clusters -



- **Most logistics jobs are not “offshoreable.”**
 - High service in a JIT economy requires local distribution
 - Late stage customization is best performed locally
- Employment and social justice
 - Logistics clusters offer employment opportunities to a full range of workers including low-skilled
 - **Logistics services value “on the floor” experience and thus promote from within leading to middle class and higher workers income.**
- logistics services feed multiple industries, making the region (and the jobs) less vulnerable to specific industry downturns
- Additional jobs
 - Logistics clusters lead to value added operations requiring high level skills and high salaries
 - Logistics clusters attract manufacturing which requires the low cost **and high service transportation offerings (“sub clusters”)**

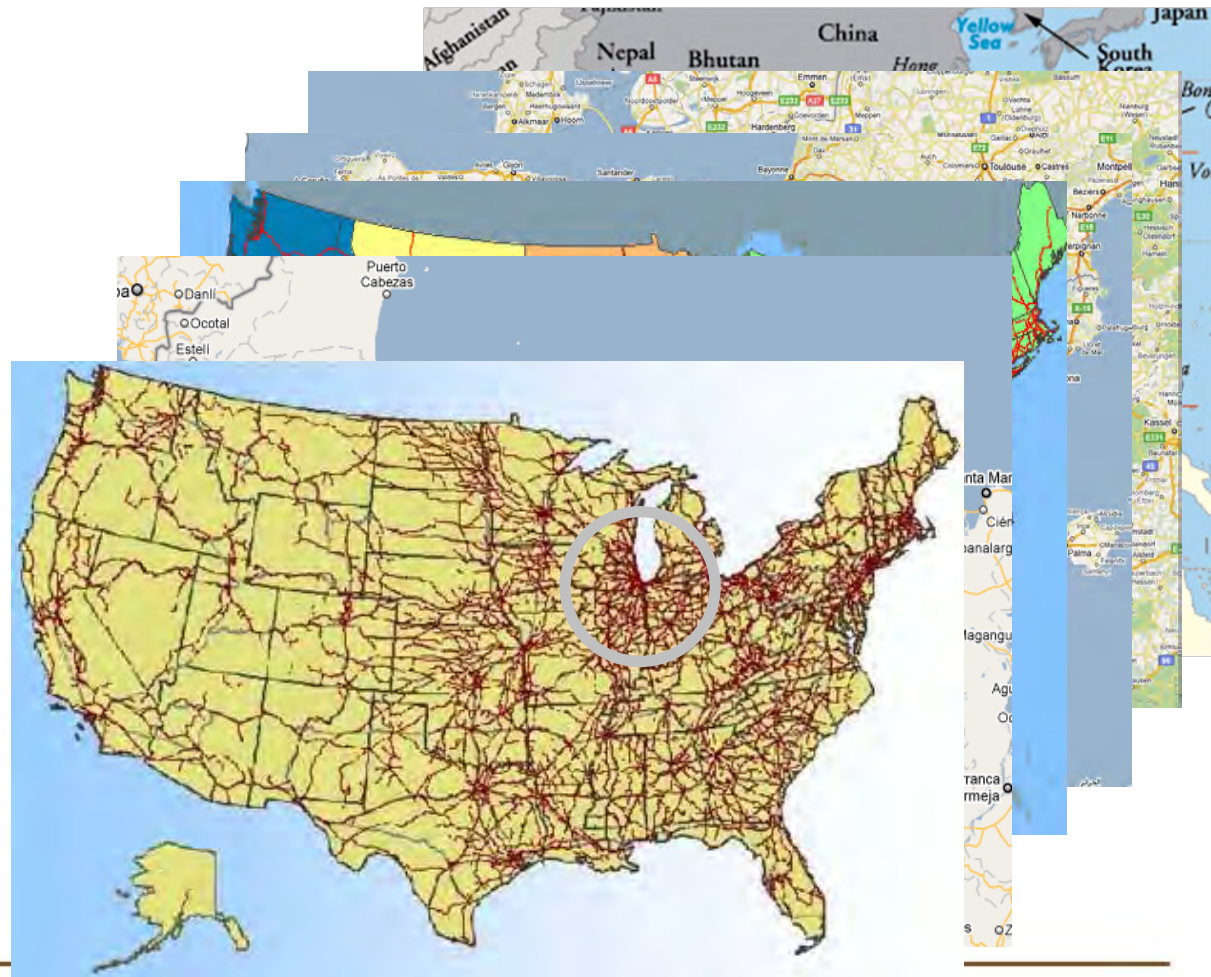
Value Added Activities

- Postponement/customization
- Return and repair
- Medical supplies
- Video Producers
- Second Hand Heavies



Success factors: Natural Environment - Geography

- Singapore
- Holland
- Zaragoza
- Memphis
- Panama
- Chicago



Success factors: History and Culture

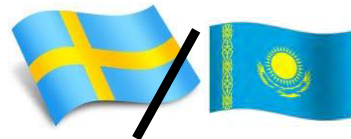
- Singapore
- Holland
(East India Co.)
- Zaragoza
- Memphis
- Panama
- Chicago



Role of Government



- Logistics-friendly government
 - Dutch vs. Italian VAT; Alliance*Texas Triple Inv tax Exemption (city, county, school district)
 - Bonded warehouses, free trade zones
 - Government efficiency
 - Container export: Sweden 6 days vs. Kazakhstan 93 days
 - Import trade transaction: Germany \$800 vs. Namibia \$3,000
 - Warehouse set up: Finland & Korea 60 days vs. Russia 528 days



Role of Government

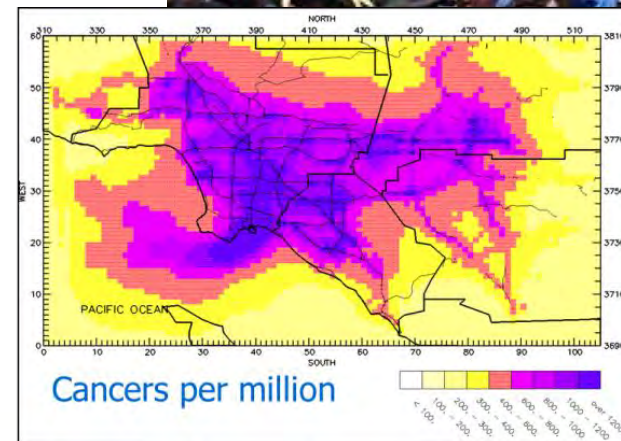
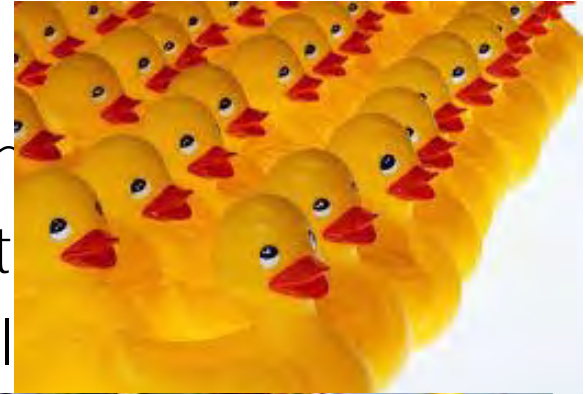


- Creating assets
 - Public investment – shared infrastructure
 - Permitting land use & asset development
 - Attracting private investment
 - Incentives, subsidies, taxes
- Collaboration and Mediation
 - Institutions for collaboration (chambers, logistics **associations,...**)
 - Preferential trade agreements
 - Marketing (Dutch, German, Belgian, Logistics promotions)



The Downside

- Group-think
- Example: Akron and bias tires vs. n
- The Big Three vs. foreign manufact
- Clusters may cause an increase in l
- labor shortage
- Environmental issues



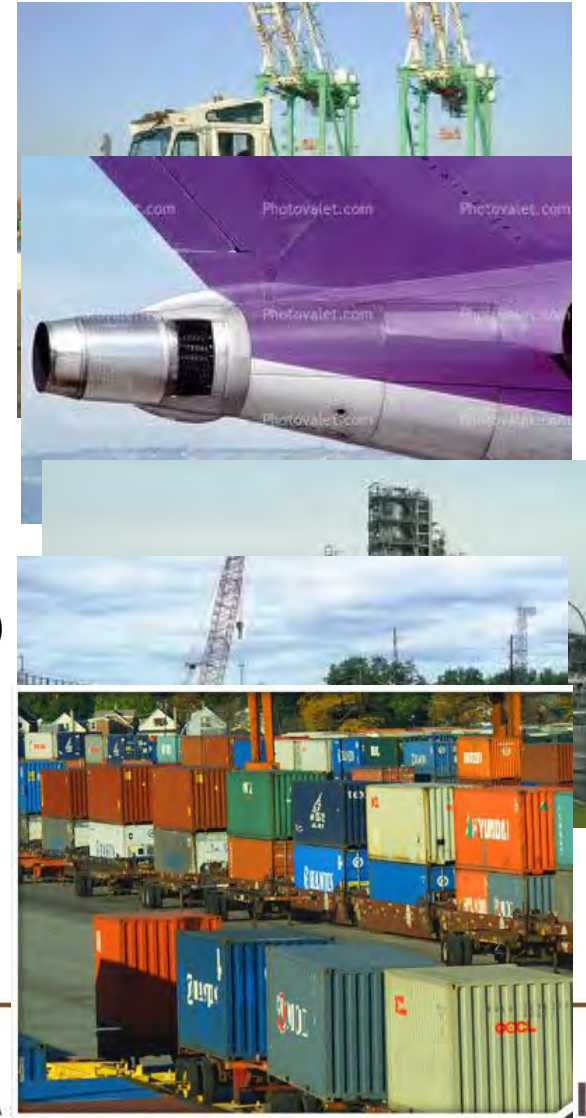
The Real Sustainability calculus



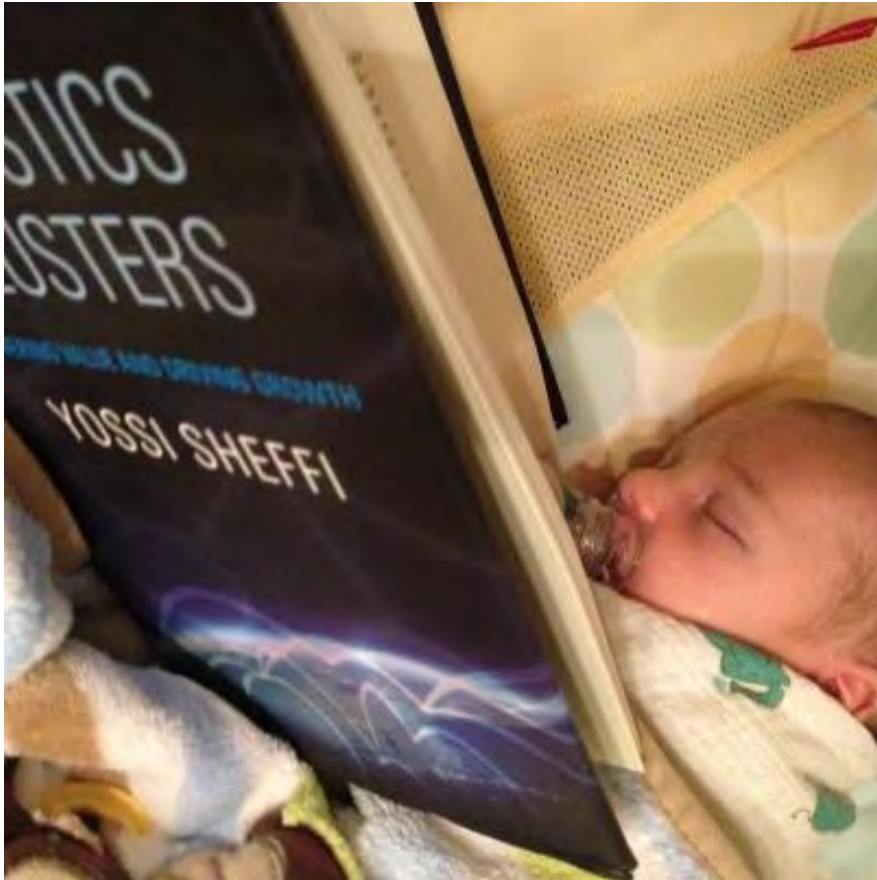
- Globally logistics clusters reduce transportation carbon footprint
 - Hub-to-hub flows use larger conveyances at higher utilization -> lower global carbon footprint
 - Clustering increases opportunities for collaboration through increasing utilization -> lower local carbon footprint
 - Clustering enables intermodal transportation -> lower global carbon footprint
- In addition: local pressure creates impetus for environmental improvements

Environmental Innovation Hubs

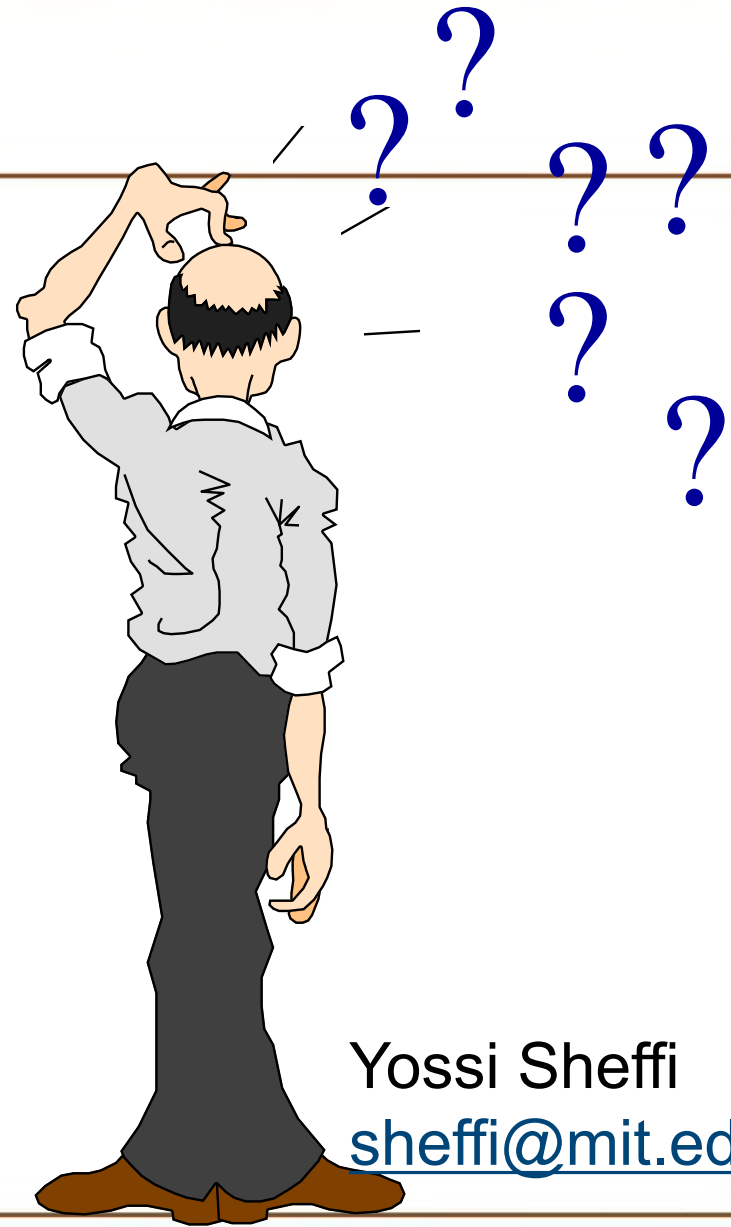
- LA Port:
 - Truck regulations
 - Alternative fuel trucks (electric, hybrid, LNG, CNG...)
- FedEx
 - Alternative fuels delivery trucks
 - “Hushkit”
- Singapore
 - Docking ships on electricity
 - Largest biodiesel plans (with Rotterdam)
- Chicago
- Intermodal
 - Core of inland logistics clusters
 - Rail GHG emissions/TM $\cong 1/3$ Truck GHG emission/TM



Questions?



Logisticsclusters.mit.edu



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New Kansas City (Edgerton) Logistics Cluster



New Kansas City (Edgerton) IM Yard

