Growth Potential for Rail Freight in Short Distance Markets

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Growth Potential for Rail Freight in Short Distance Markets

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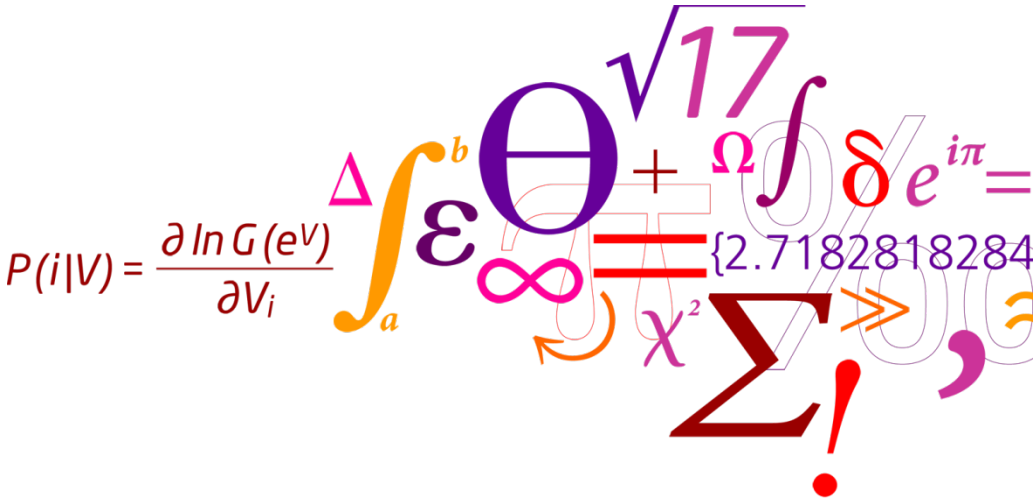


DTU Transport
Department of Transport

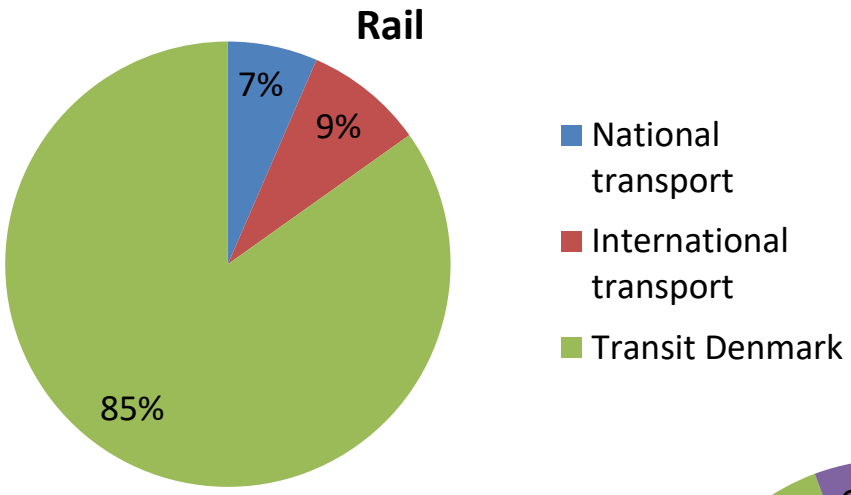
Short Haul Rail Freight

- Defined
- Cost Structure
- Functioning Routes Today
- Success Factors
- Further Research

Short Haul

- Small Flows Over Short Distances
  - SFSD
  - Less than 500 km, Bärthel & Woenius, 2004
- Dominant Mode: Road
- 46% of EU Transport
- Aarhus to Copenhagen, 307 km (land)
- Hamburg to Copenhagen, 472 km (land)

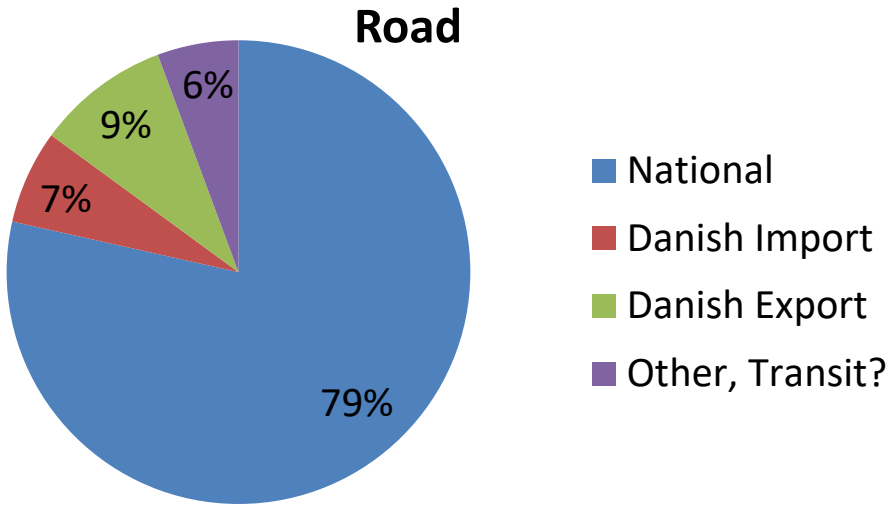
Rail Freight in Denmark



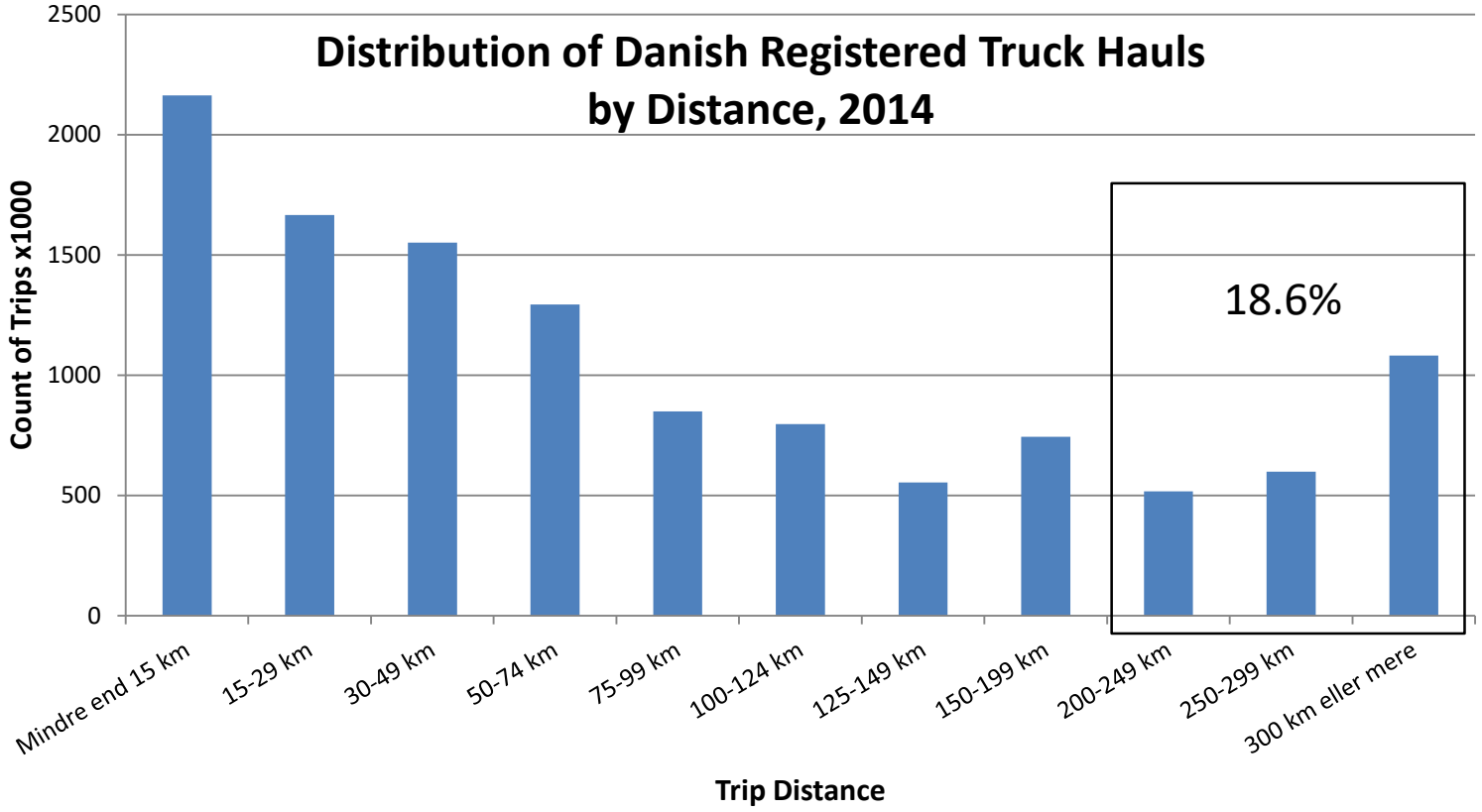
Unknown:

What is the distance distribution of the national traffic?

How much of “national” traffic is international connection?



Average statistics 2013 Q1 – 2015 Q2
Danmarks Statistik, ton kilometers



*We do not have similar data for foreign trucks operating in Denmark

Short Haul Rail Modes

- Carload Freight (Enkeltvogn)

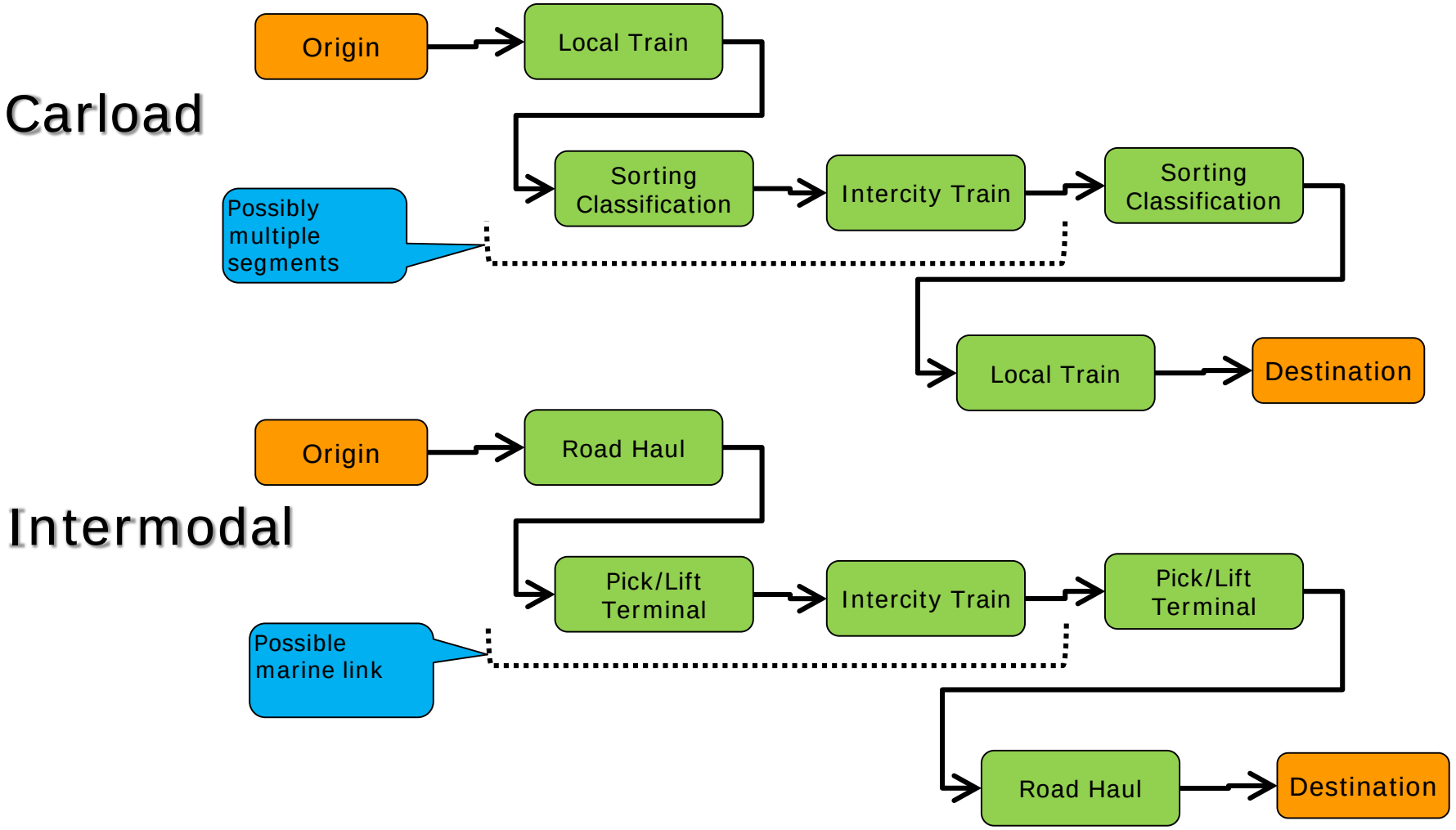
- Intermodal
  - Trailer on Flatcar (TOFC)

  - Container on Flatcar (COFC)

Popular Assumptions

- Intermodal is
  - less expensive
  - less complicated
- Modern, successful services are pure intermodal
- Modern supply chain has no use for rail freight
- All of this is ”proven”

Cost Structure of Modes

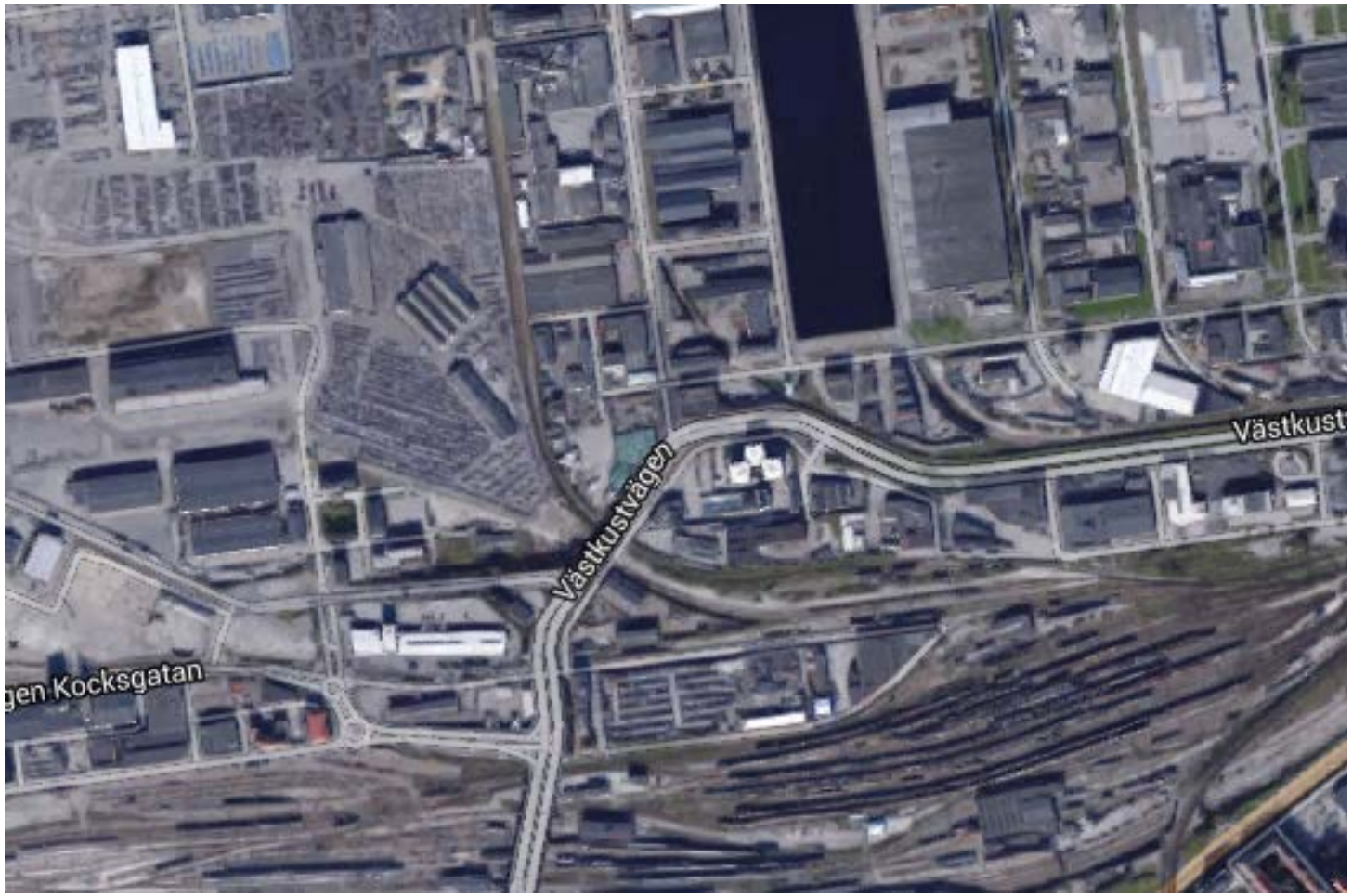


A Few Words on Carload

- Intermodal DOES NOT reduce the handling of freight
- Unknown: What is the equivalent cost traffic level between intermodal and carload?
- Greatly ignored in Denmark
  - A victim of bad service
  - Nearly all private freight sidings in Denmark are out of service
  - Needs to be evaluated separately
- Carload still represents 50% of volume in European Union (EU 27)*

*Musso & Piccioni (2014), UIC (2009)

How Do You Explain This?



And This,


Glostrup
The only functioning private siding in København

And This?

The Road Competition

- Driving hours a significant factor
- EU regulations allow 9-10 hours of driving per day
  - A roundtrip Aalborg to Malmö (2x 343 km, ferry)
  - A roundtrip Aalborg to Hamburg (2x 447 km)
  - NOT Hirtshals to Hamburg (2x 513 km)
  - NOT Mälmo to Stockholm (2x 613 km)
- Rail becomes time competitive when journeys require driver rest

Pricing in Denmark

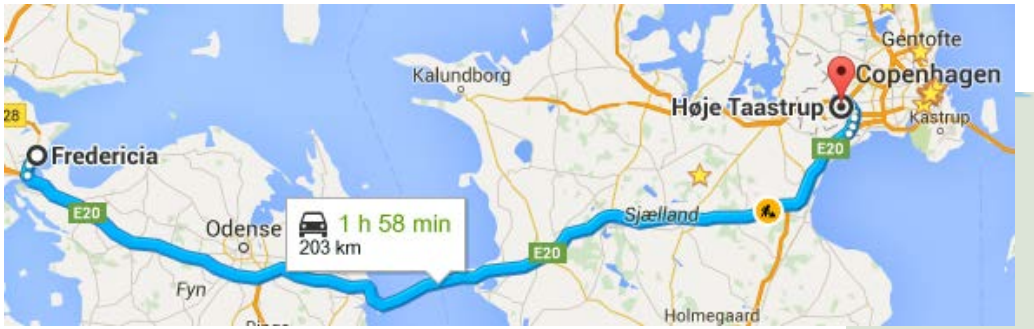
- Road haul, 7 DKK/km (foreign driver)
- Rail haul, 3,5-4,5 DKK/km
- ”Lift” trailer, 300 DKK
- Local trailer haul, approx. 800 DKK
  - 25 km (Høje Taastrup to Amager, Lyngby)
    - 35 km, Høje Taastrup to Nordhavn
    - 48 km, Høje Taastrup to Hillerød
  - 32 DKK/km (Danish driver)
  - Includes significant idle time
- Total terminal costs, 2200 DKK
  - About 700 km break even
  - Often more than the rail haul cost

Some Short Haul Rail Systems

- Port of Gothenburg
  - On dock rail loading
  - Traffic less than 500 km
  - 121 trains per week (daily service)
- Carlsberg Beer Train
  - Fredericia to Høje Taastrup
  - 203 kilometers, 10 trains per week, 300 trailers
  - Saves 800 DKK toll* each direction
  - *Carlsberg owns Fredericia "terminal"*
- Florida East Coast
  - Jacksonville to Miami, Florida
  - 556 kilometers (short by American standards)
  - Most traffic continues long distance by road

*estimated discount

The Routes


Gentofte
Copenhagen
Kalundborg
Høje Taastrup
Kastrup
Fredericia
E20
Odense
1 h 58 min
203 km
Sjælland
Fyn
Holmegaard


WI
MI
IN
Chicago
Cleveland
PA
To New York City, NY
IL
IN
OH
Cincinnati
MO
WV
KY
VA
Nashville
Memphis
TN
Charlotte
NC
MS
Atlanta
SC
GA
AL
To Dallas, TX
Charleston
Savannah
Jacksonville
Orlando
Cocoa
FL
Fort Pierce
Port of Palm Beach
Fort Lauderdale
Miami
4-5 day transit
2-3 day transit
1-2 transit
10 hr transit
FEC track


Sundsvall
SWEDEN
NORWAY
Insjön
Gävle
Avesta
Fagersta
Oslo
Hallefors
Kristinehamn
Örebro
Karlstad
Eskilstuna
Stockholm/
Arsta
Åmål
Katrineholm
Stockholm/
Södertälje
Hallsberg
Norrköping
GOTHENBURG
Falköping
Jönköping
Nässjö
Vaggeryd
Jönsvik
187 km
340 km
DENMARK
Helsingborg
Århus

The American standard, not feasible in Europe due to electrification catenary.

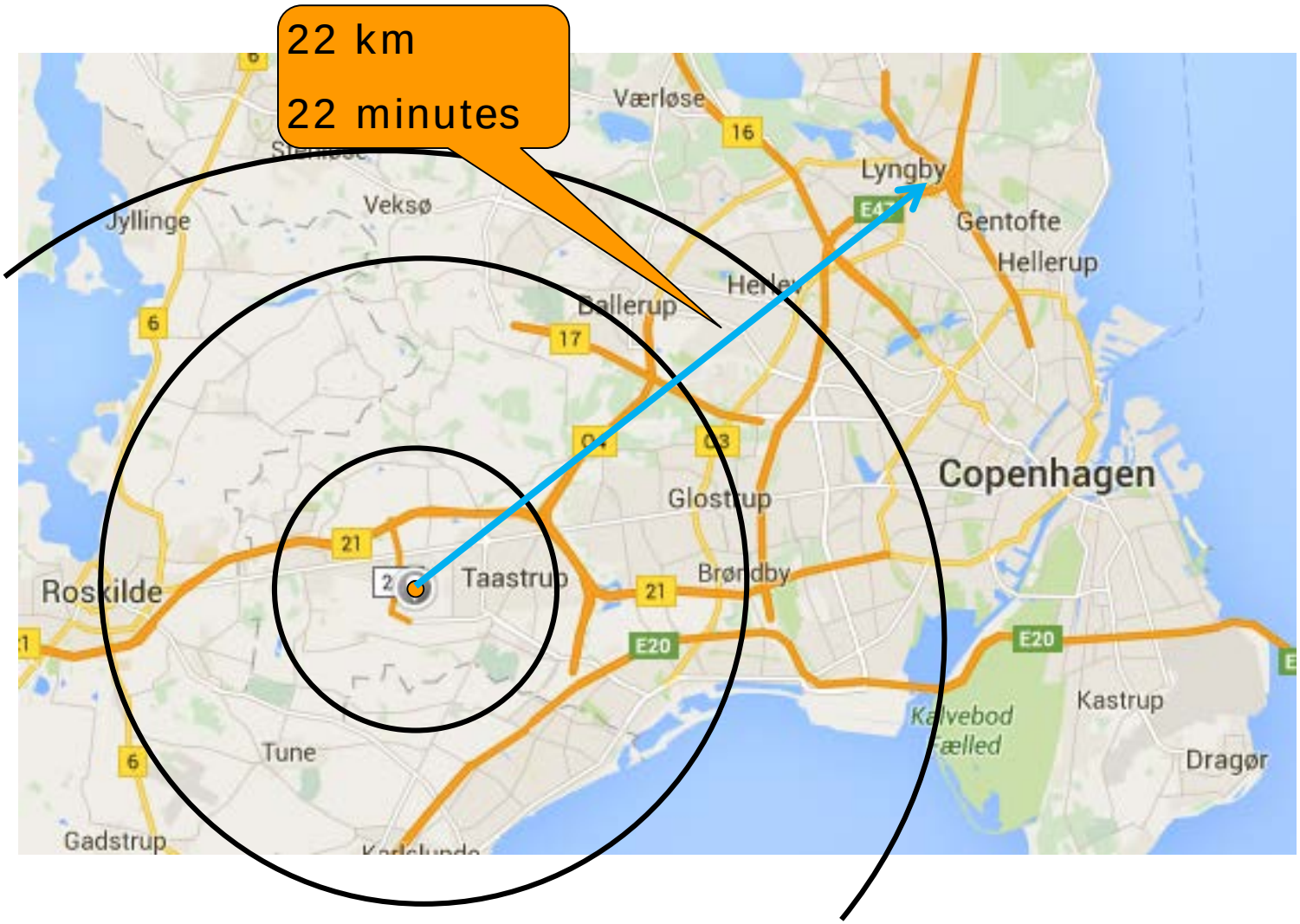

Florida East Coast
410

Note

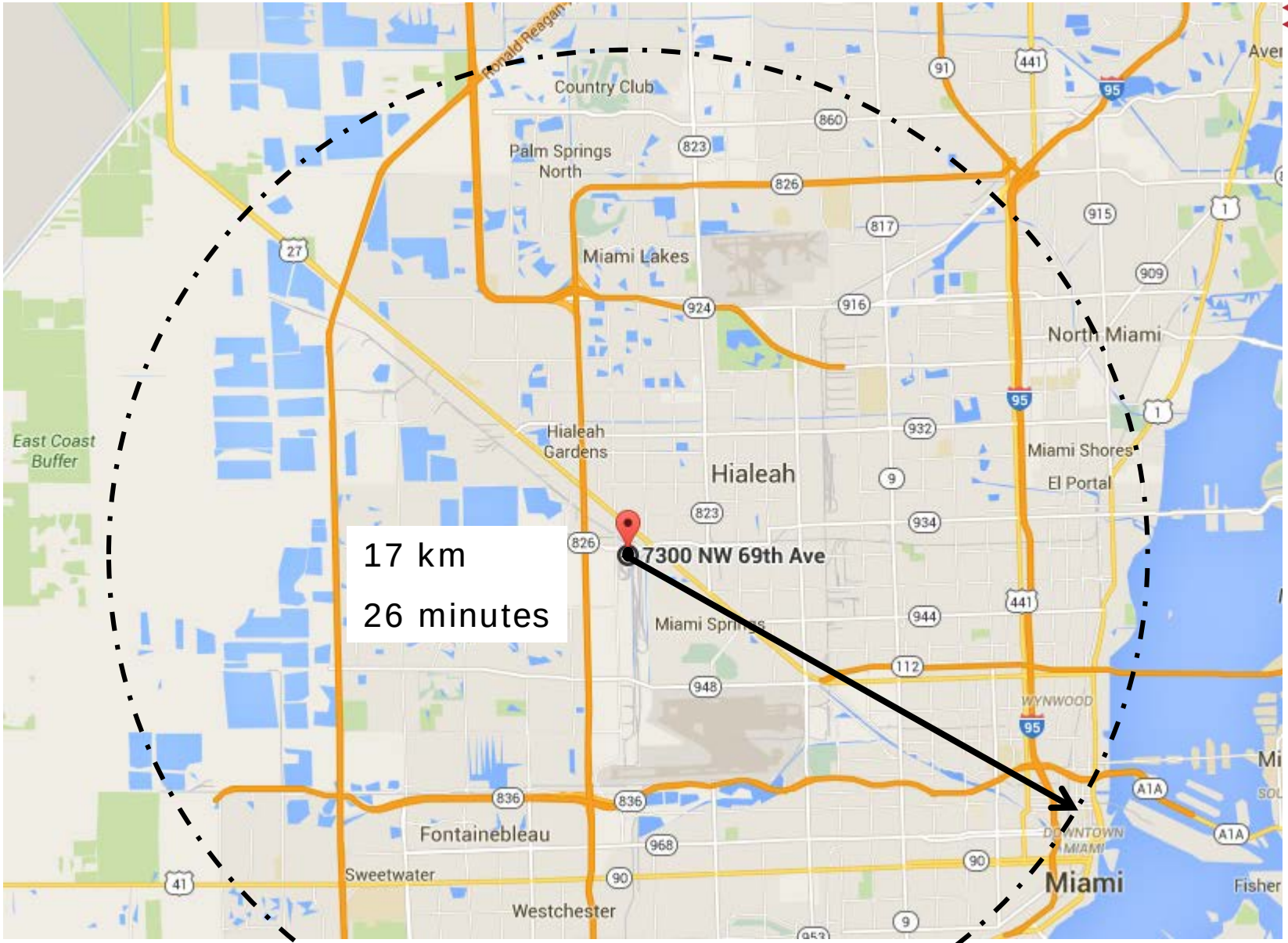
- Length of tracks
- Active loading as well as storage
- Proximity to city

Terminals Drive Success

- More than half of the cost
- Placement in network flow critical
  - Close to origin/destination – or –
  - As part of optimal road haul route plan
- Efficient “lift” necessary
  - Fully utilized facility, lower unit cost
  - Regular, evenly distributed traffic
- Low cost local road haulage
  - Minimize haulage distance
  - Plan trips to minimize non-revenue distance
  - Fully utilize vehicle fleet



København has a low density of industrial development


17 km
26 minutes
7300 NW 69th Ave
East Coast Buffer
Country Club
Palm Springs North
Miami Lakes
Hialeah Gardens
Hialeah
North Miami
Miami Shores
El Portal
Miami Springs
Fontainebleau
Sweetwater
Westchester
Miami
WYNWOOD
DOWNTOWN MIAMI
Fisher

Terminal Design for Low Cost

Carlsberg, Germany

DB Schenker

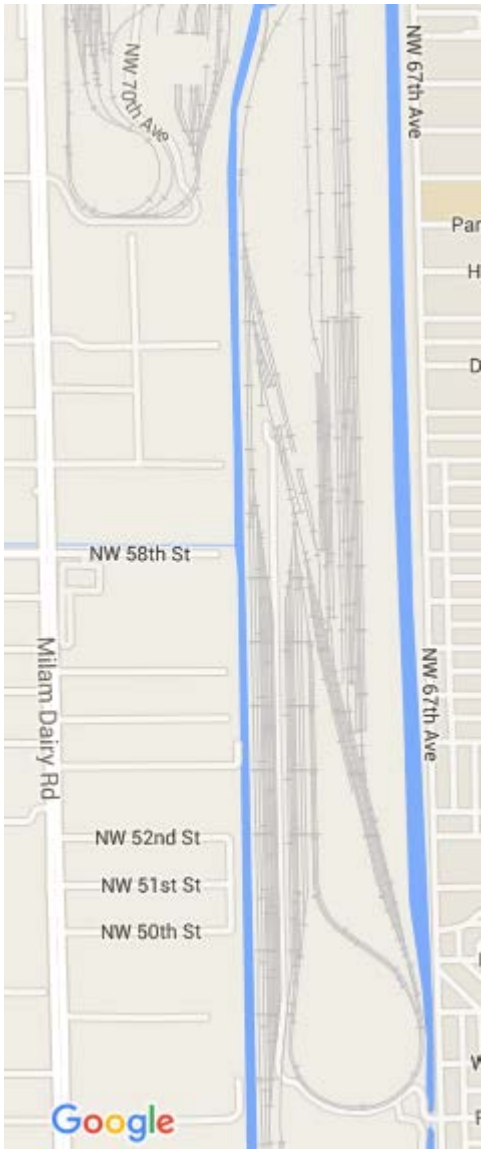
Høje Taastrup

(København)

BAD

Florida East Coast

GOOD



Terminal Efficiencies

- Better utilization of terminal
  - Higher volume, higher utilization
  - Lower unit cost
- More efficient local haul
  - Scheduling of routes
  - No waiting delivery
  - Coordinate separate delivery and pickup trips
- Significant economies of scale
- Eliminate the terminal
  - Carload freight
  - Direct shunting of container to customer

Gothenburg


Kockarnas Kök &
Catering Plenk AB
Älvsborg Roro AB
Älvsborgshamnen
APM Terminals
Gothenburg AB
DFDS Tor Line AB
Logent Ports &
Terminals AB

Sådan!

- This is not intermodal
- At Frederica, this is carload freight
- If this is the success story…
  - More private sidings should be encouraged
  - Intermodal should be re-defined

Lessons

- Success in short distance rail freight frequently means some components of carload freight
- Origin or destination is a private siding
  - No road haulage
  - No terminal transaction or agent fees
  - Port of Gothenburg, on dock rail
  - Carlsberg, origin is customer siding
- Specifics of intermodal advocacy should be adjusted

Research Ideas

- Optimal Location of Terminals
  - Minimize local haul
  - Optimal transport network
- Optimal Intermodal Service Design
  - Consider freight flows
  - Consider driving hours regulations
- Terminal Management
  - Optimal local haul planning
  - Optimal flow and process time
- Economies of Scale
  - Estimate and forecast cost reductions from volume increases, new business

Unkowns, Research Ideas?

- What is the distance distribution of the national traffic?
  - How much is viable for short distance rail?
- Can we forecast viable rail services from economic and freight flow data?
  - Can we identify opportunities?
  - Can we influence policy?

Summary

- Short haul rail freight succeeds with elements of traditional service
- Too much policy is based on
  - Subjective opinion
  - Inaccurate perception of service structure
- Opportunities for
  - Applied research
  - Consulting
  - Education programs in supply chain
- Active topics of interest at DTU Transport

Thank You


100069 7
NYDES ISKOLD
I 150 LANDE
That calls for a Carlsberg
TUBORG
CDKA 100069 7