XXIV[th] WORLD ROAD CONGRESS
Mexico City 2011

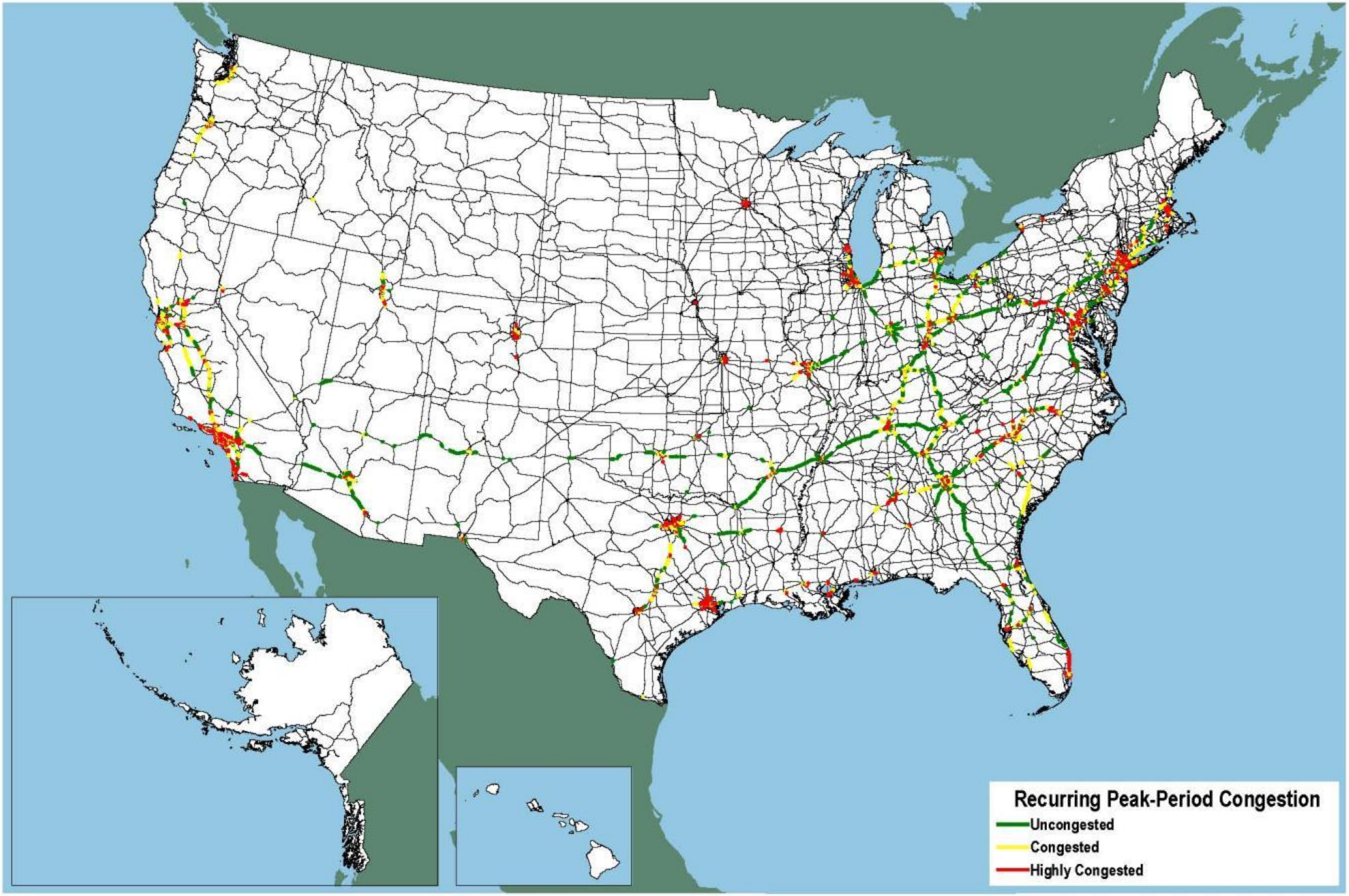
POTENTIAL EFFECTS OF HIGHER CAPACITY VEHICLES

Stephen Perkins

- International Transport Forum at the OECD
- Head of Research
- stephen.perkins@oecd.org

International Transport Forum

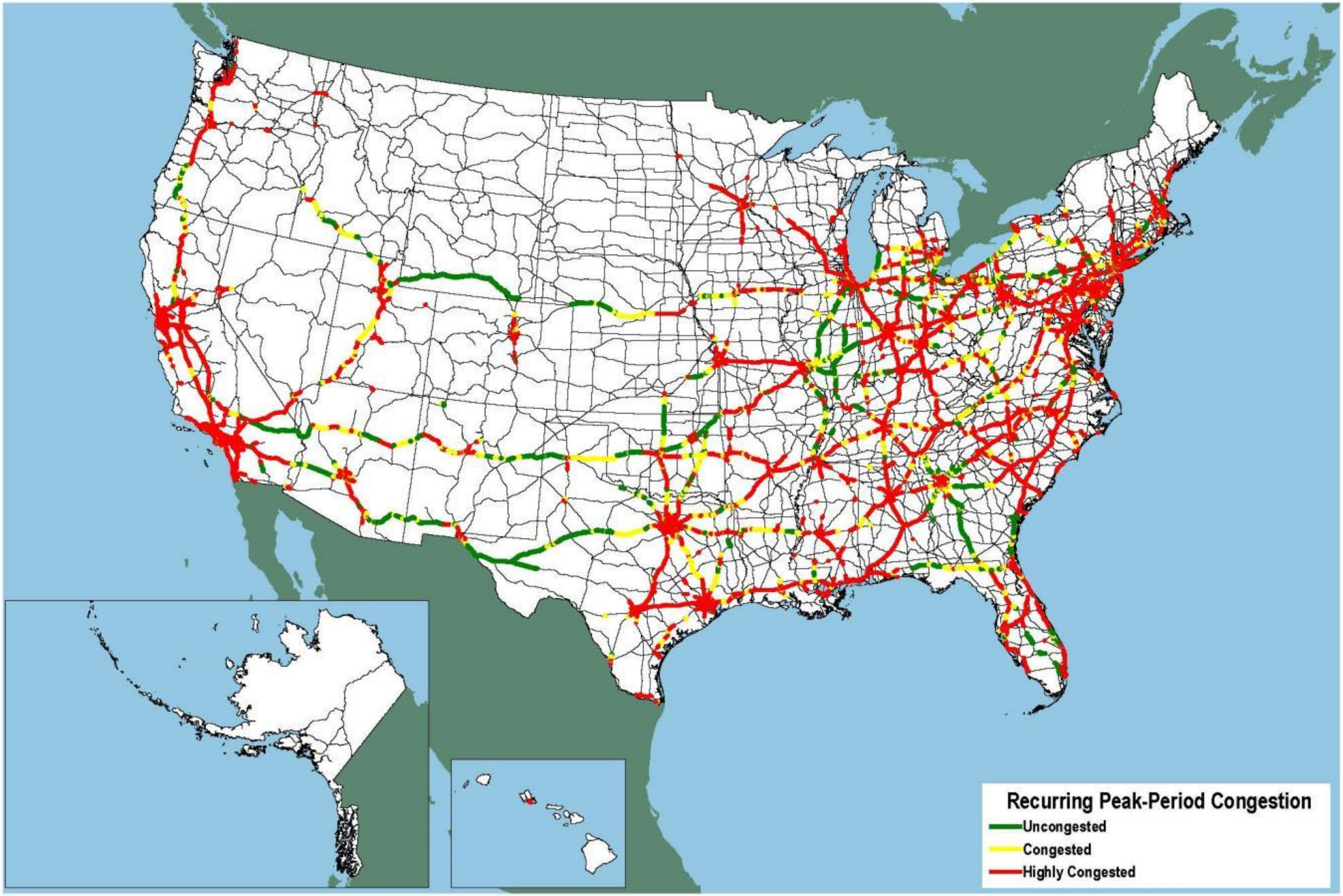
Peak-Period Congestion on High-Volume Truck Portions of the National Highway System: 2002



Note: High-volume truck portions of the National Highway System carry more than 10,000 trucks per day, including freight-hauling long-distance trucks, freight-hauling local trucks, and other trucks with six or more tires. Highly congested segments are stop-and-go conditions with volume/service flow ratios greater than 0.95. Congested segments have reduced traffic speeds with volume/service flow ratios between 0.75 and 0.95.

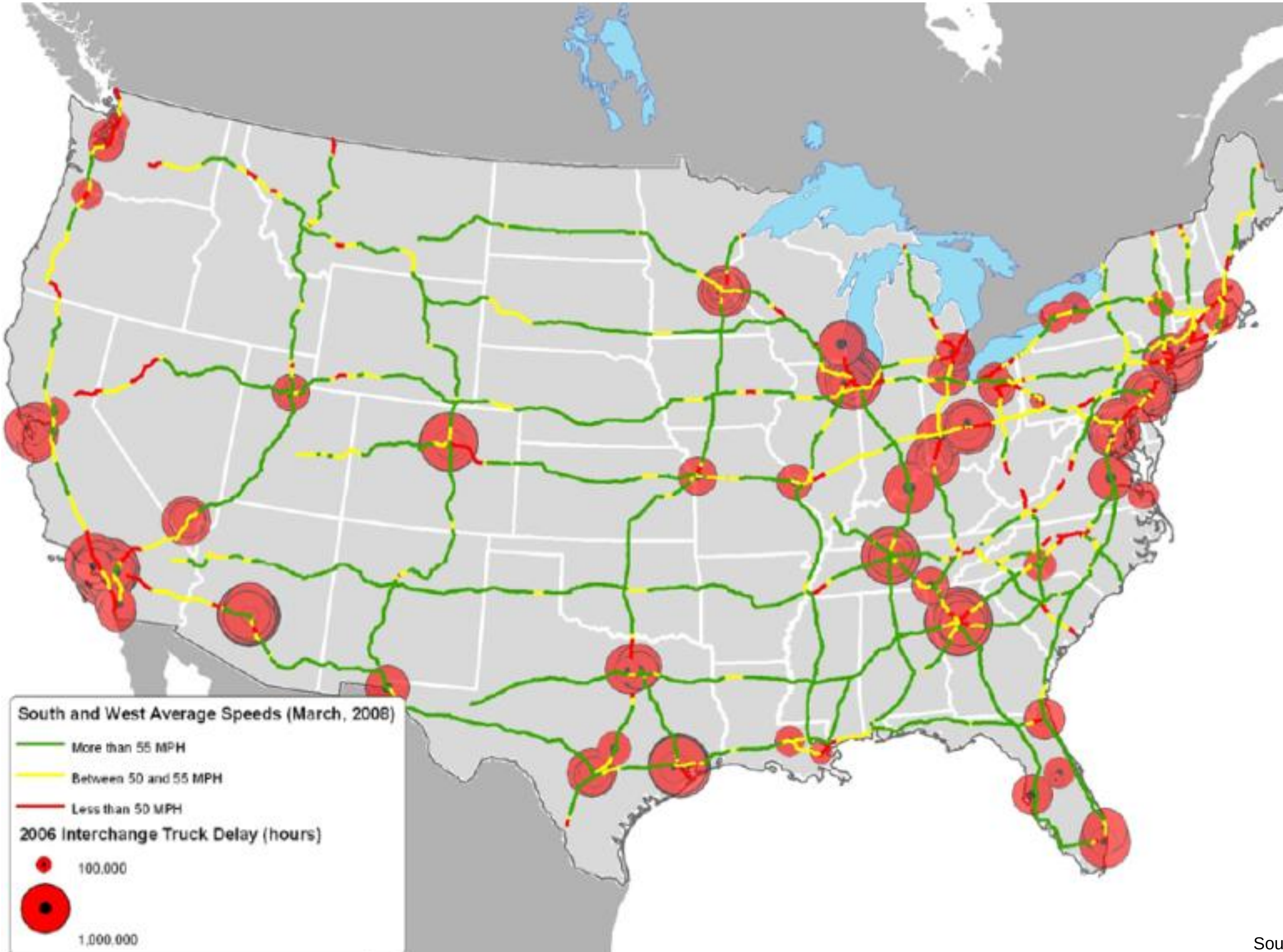
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 2.2, 2007.

Peak Period Highway Truck Congestion: 2035



Source: US FHWA

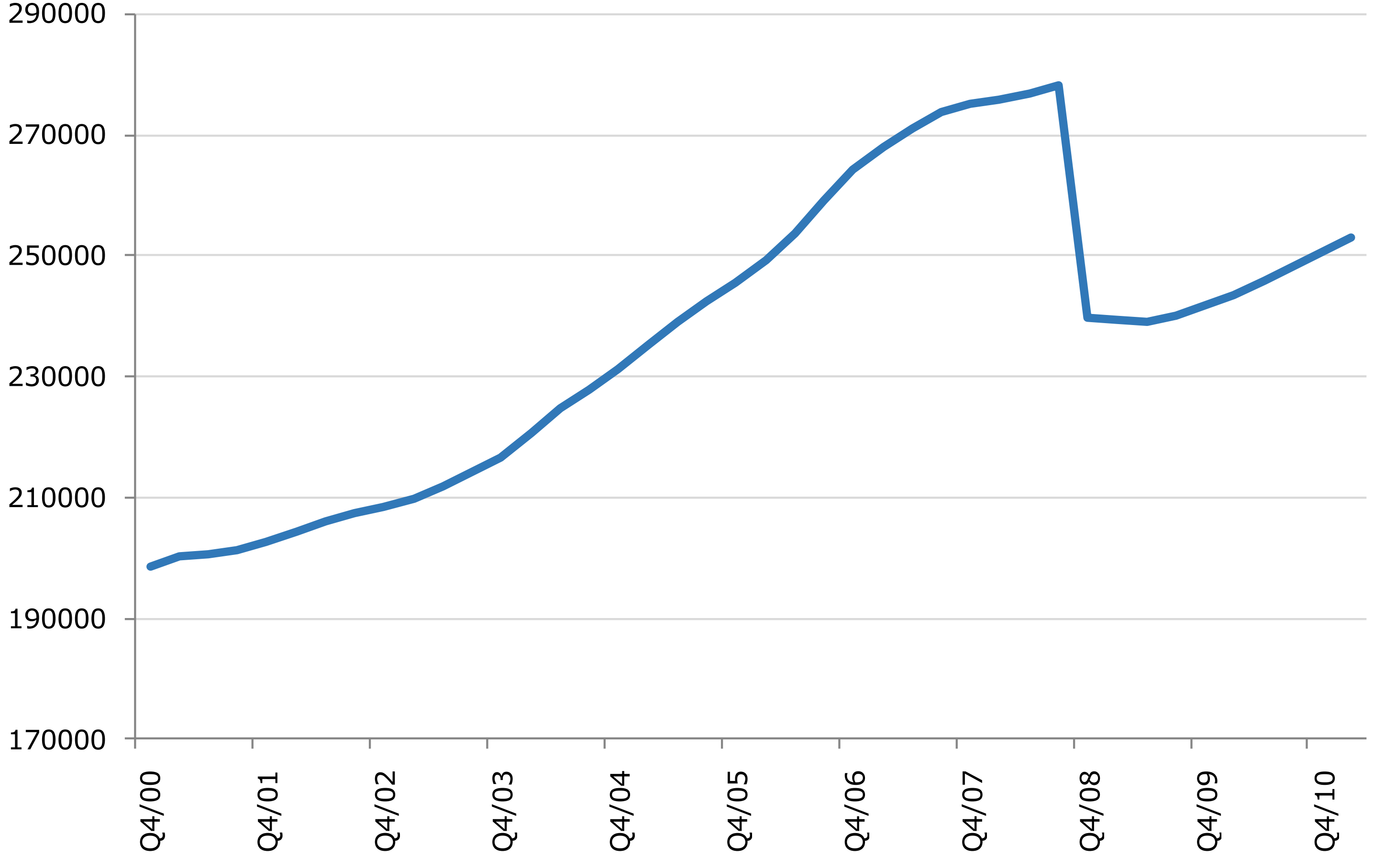
US Highway Freight Bottlenecks: Truck Hours of Delay: 2006



Source: US FHWA

National and international road freight in the EU

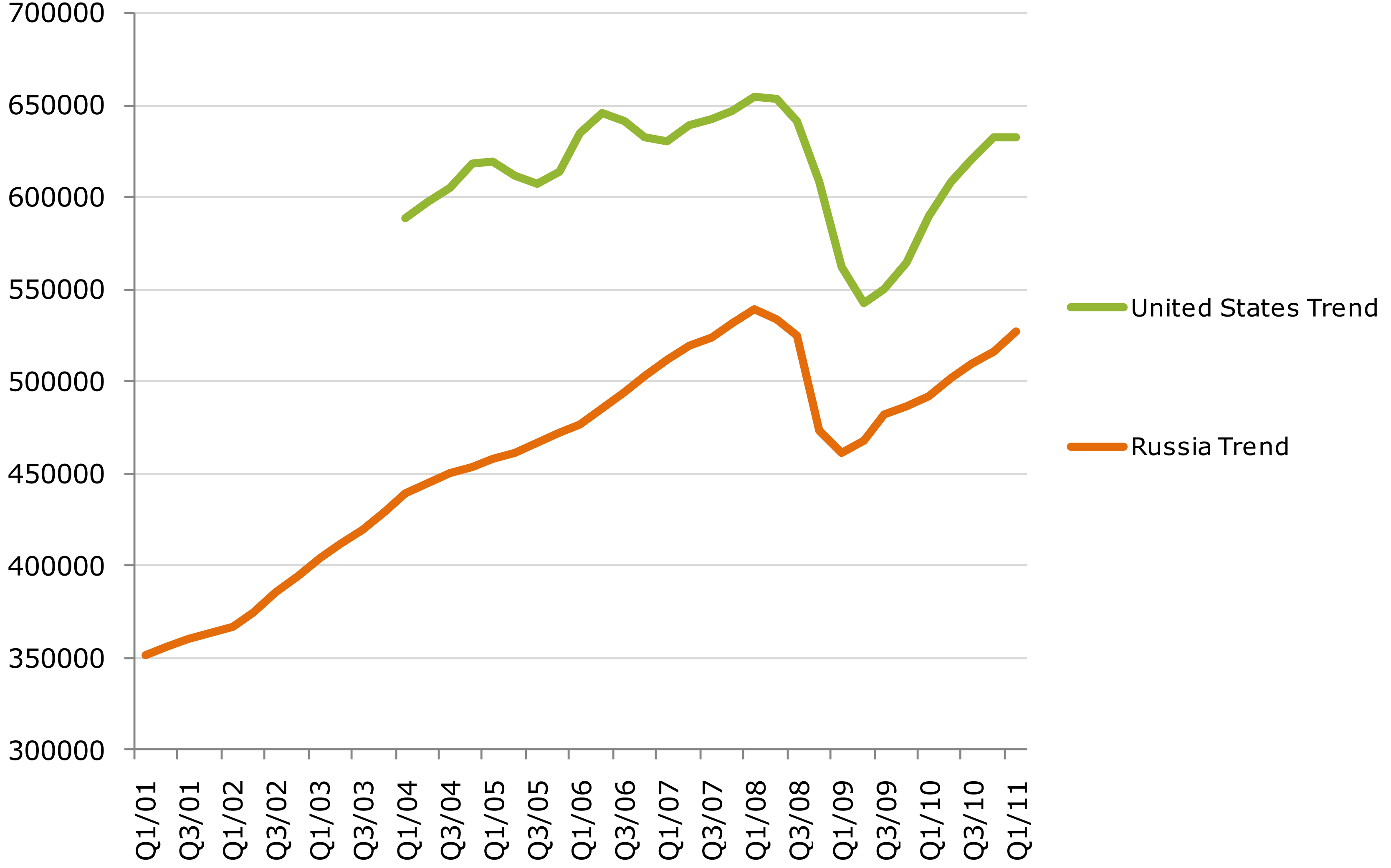
(Million tonne-km, trend, seasonally adjusted)



Source: ITF Statistics

National and international rail freight in the United States and Russian Federation

(Million tonne-km, trend, seasonally adjusted)

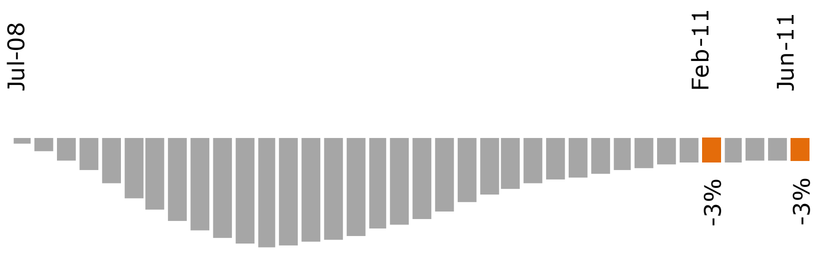


Source: ITF Statistics

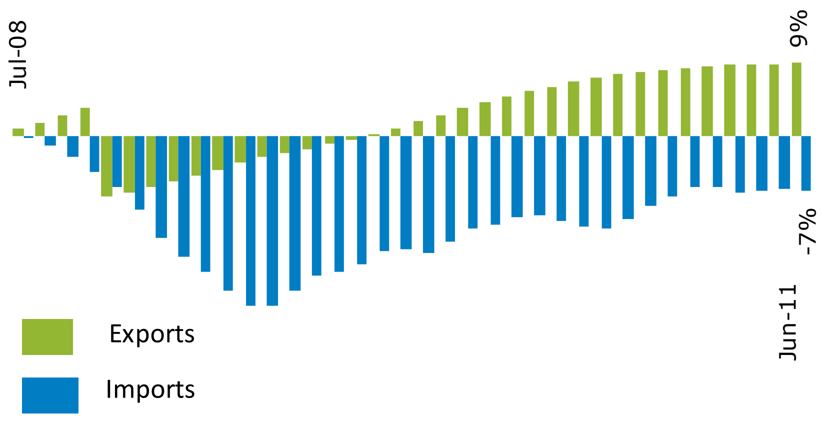
External trade, percentage change from pre-crisis peak Jun-08

(Tonnes and current values, monthly trend, seasonally adjusted)

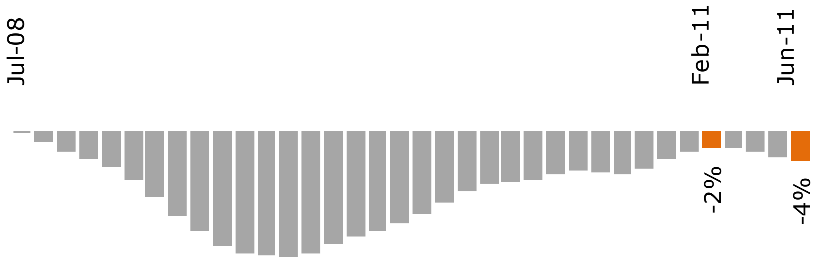
EU 27 trade by sea, total (tonnes)



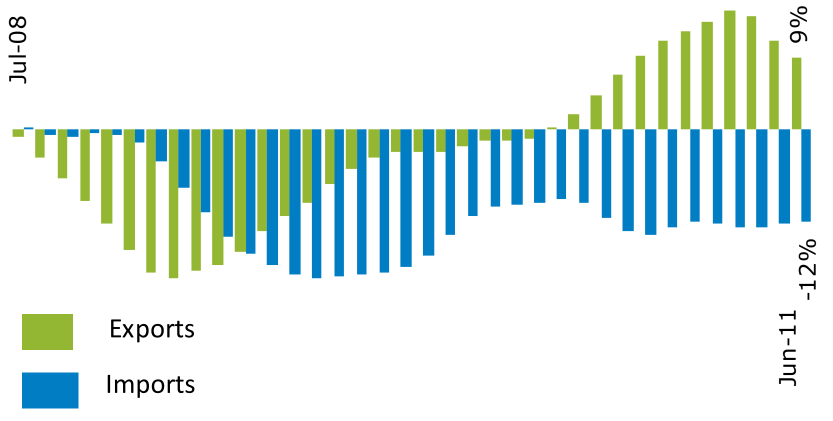
EU 27 trade by sea, imports and exports (tonnes)



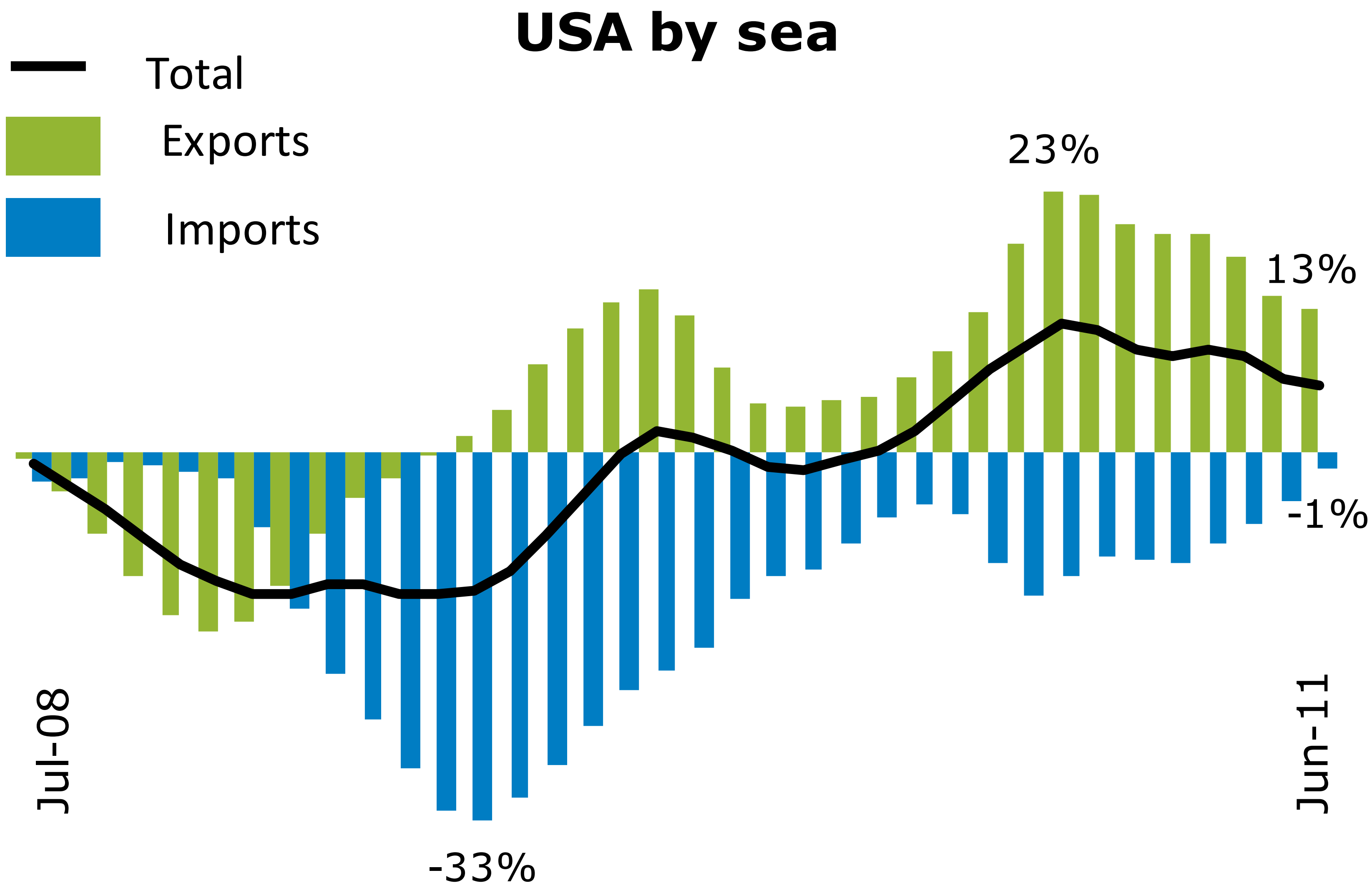
USA trade by sea, total (tonnes)



USA trade by sea, imports and exports (tonnes)



United States external trade with Asia, percentage change from pre-crisis peak Jun-08



Responses to Congestion

- Build
- Inform
- Manage
  - electronic distance charges
  - port gate pricing
- Higher capacity vehicles

Conditions for Introduction of HCVs

- Safety
  - lane departure warning
- Axle and bridge loading limits
- Network access limits
  - geometry / weight
- GPS monitoring

European Case: Two HCVs replace three conventional trucks

Conventional trucks:

40t or 44t, 16.5 m

40t, 18.75 with trailor

European Modular System trucks:

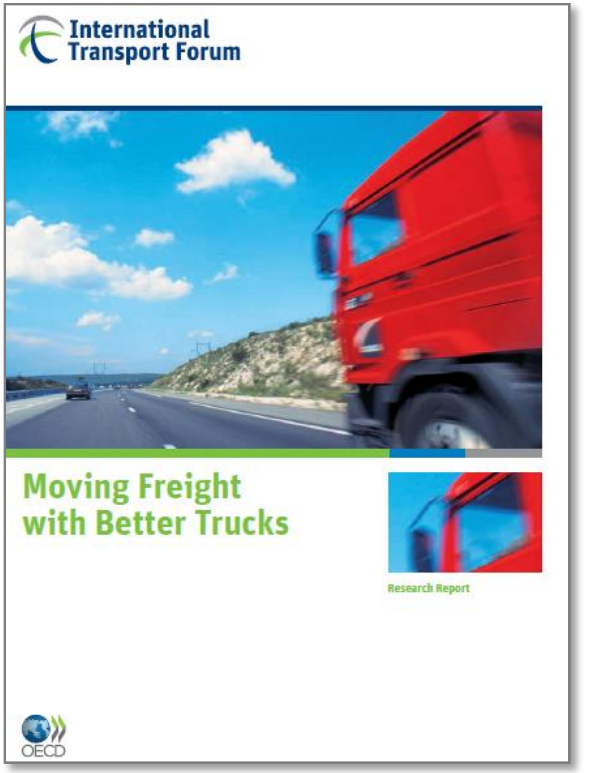
60t, 25.25m

Impacts of Introducing HCVs

- Fewer trucks, less congestion and emissions
- Profits for early adopters

- Then competition will bring down prices
- Stimulate growth

- Increase tkm
- Undermine benefits?
  - congestion relief
  - CO_2 emissions
- Shift from rail?



European Studies

- TRL 2008

  Longer and Heavier Vehicles,

  Effects in the UK
- TML 2008 (EC)

  Effects of Adapting Weights and Dimensions
- JRC 2009 (EC)

  Introducing Mega-Trucks
- EC Consortium (ongoing)

  Effects of Adapting Weights and Dimensions

TRL 2008

- 60 t trucks
- NPV of benefits 1 – 6.5 billion pounds
- Infrastructure investment costs unknown.
- 25% reduction in CO_2 emissions per tkm, with little rebound effect
- Modal shift from rail large in some markets, especially deep sea containers

  8-18% of all rail tkm migrating to 60 t trucks

TML 2008

- 60 t trucks
- Benefits greater than costs
- 12% reduction in CO_2 emissions overall
- Modal shift from rail small overall, 4%, though could be large in some markets
  from inland waterways, 3%

Criticism

• underestimated elasticities, and therefore induced road freight growth and modal shift

Elasticities

- Graham and Glaister 2004
- Found wide range of estimates depending on commodities and markets, relatively few studies
- (TML figure within the central range if a little low)
- And also modelling approach, long and short term often confused
- No firm conclusion
- Road price to rail demand cross elasticities, even less research, extremely dependent on market

Criteria for Modal Choice

- Transit times
- Cost
- Reliability
- Frequency
- Flexibility
- etc.

Transferability of results

- New EC study by market
- Road-rail cross elasticities very variable
- Sensitive to relative size of market shares
- UK therefore maybe extreme case in Europe
- European results will <u>not</u> be exportable to North America, Australia, Japan …..

International Transport Forum

Thank you.