US Heavy Duty Vehicle Fleets Technologies for Reducing CO_2
An Industry Perspective

Excerpts from presentation to Transportation Research Board

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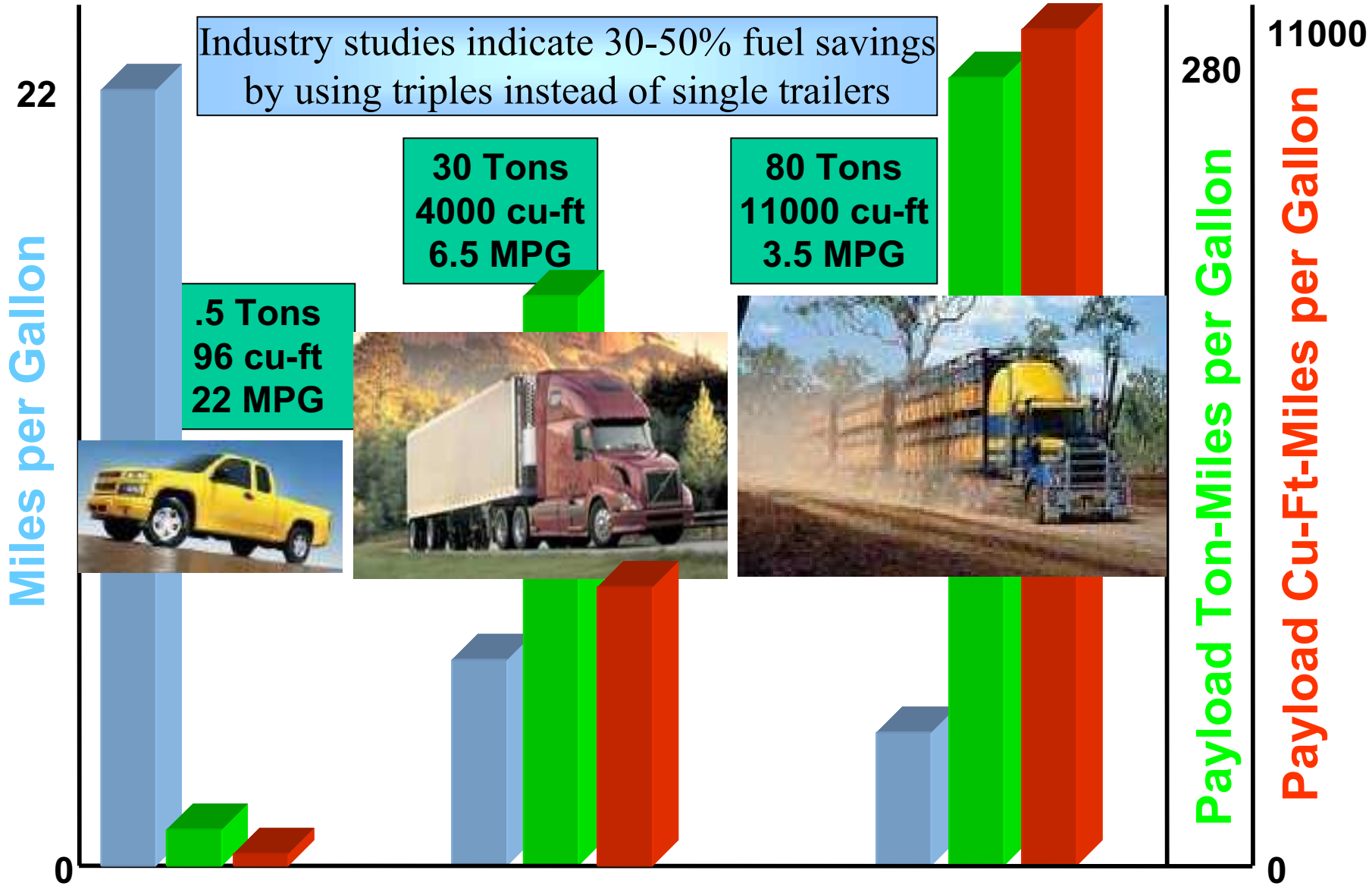
Heavy Duty Vehicle Fuel Efficiency is a Complex Issue

Many types of vehicles with different functions

How to Define & Measure Efficiency?

MPG is not an appropriate efficiency measure



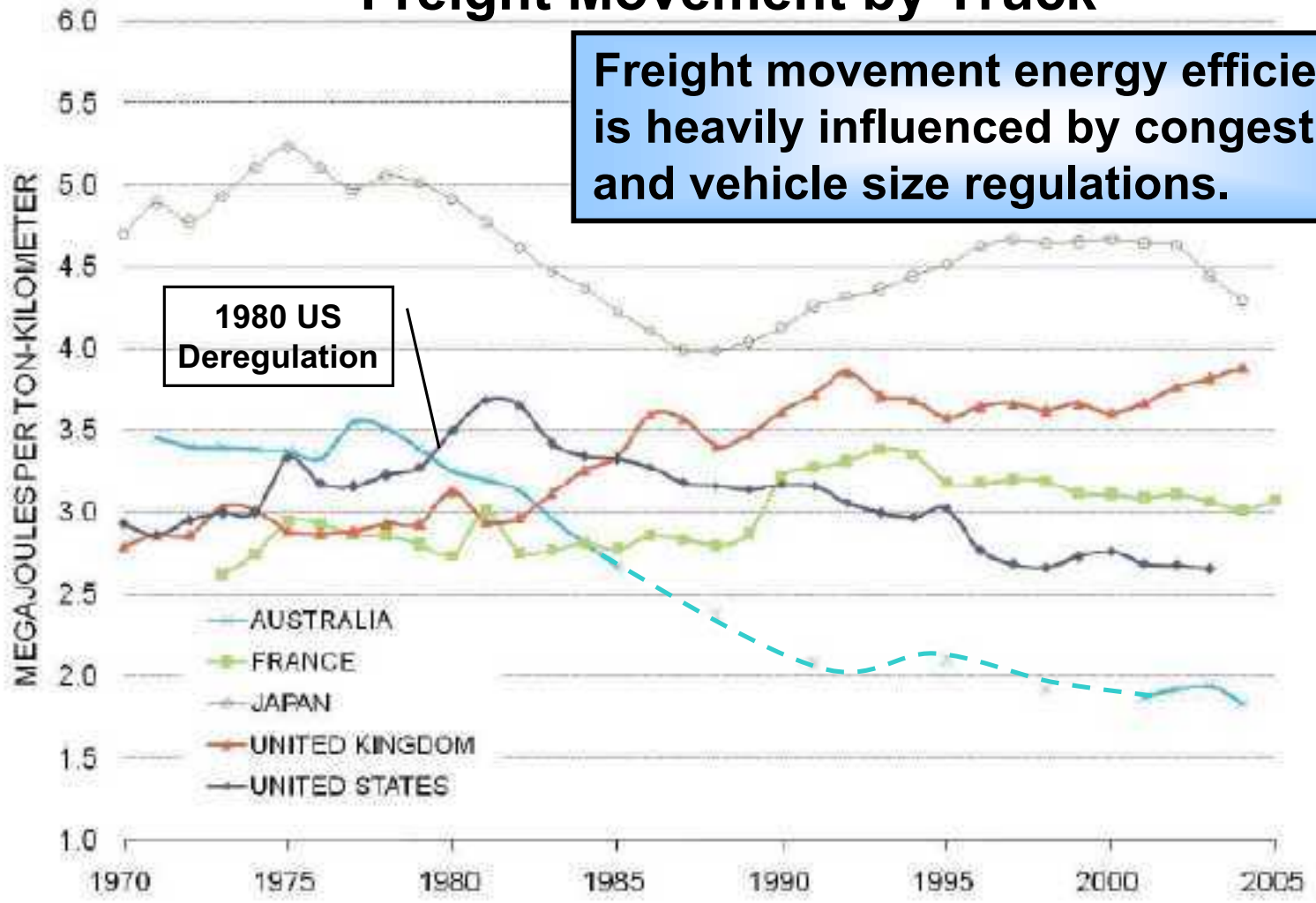
All numbers are approximate

VOLVO

Modal Energy Intensity

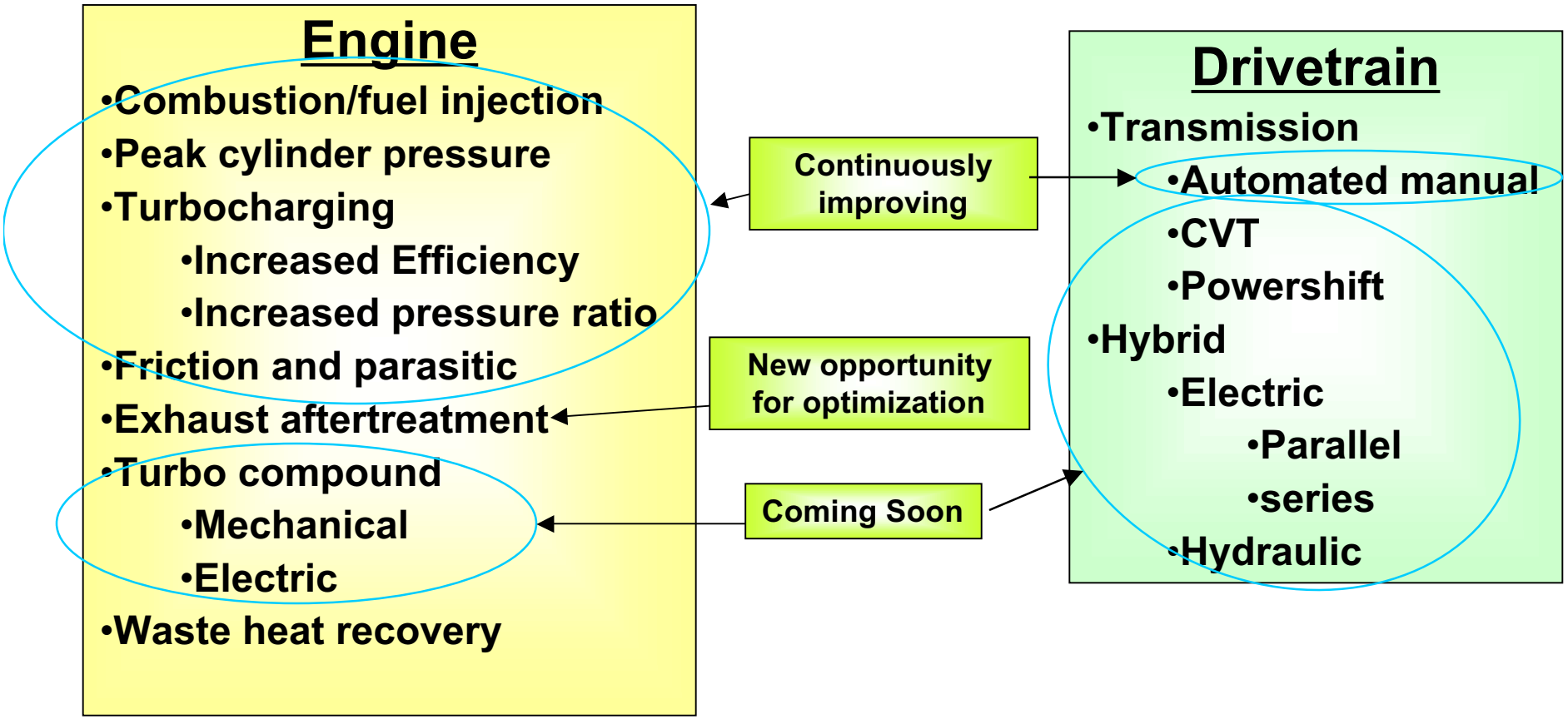
Freight Movement by Truck

Freight movement energy efficiency is heavily influenced by congestion and vehicle size regulations.

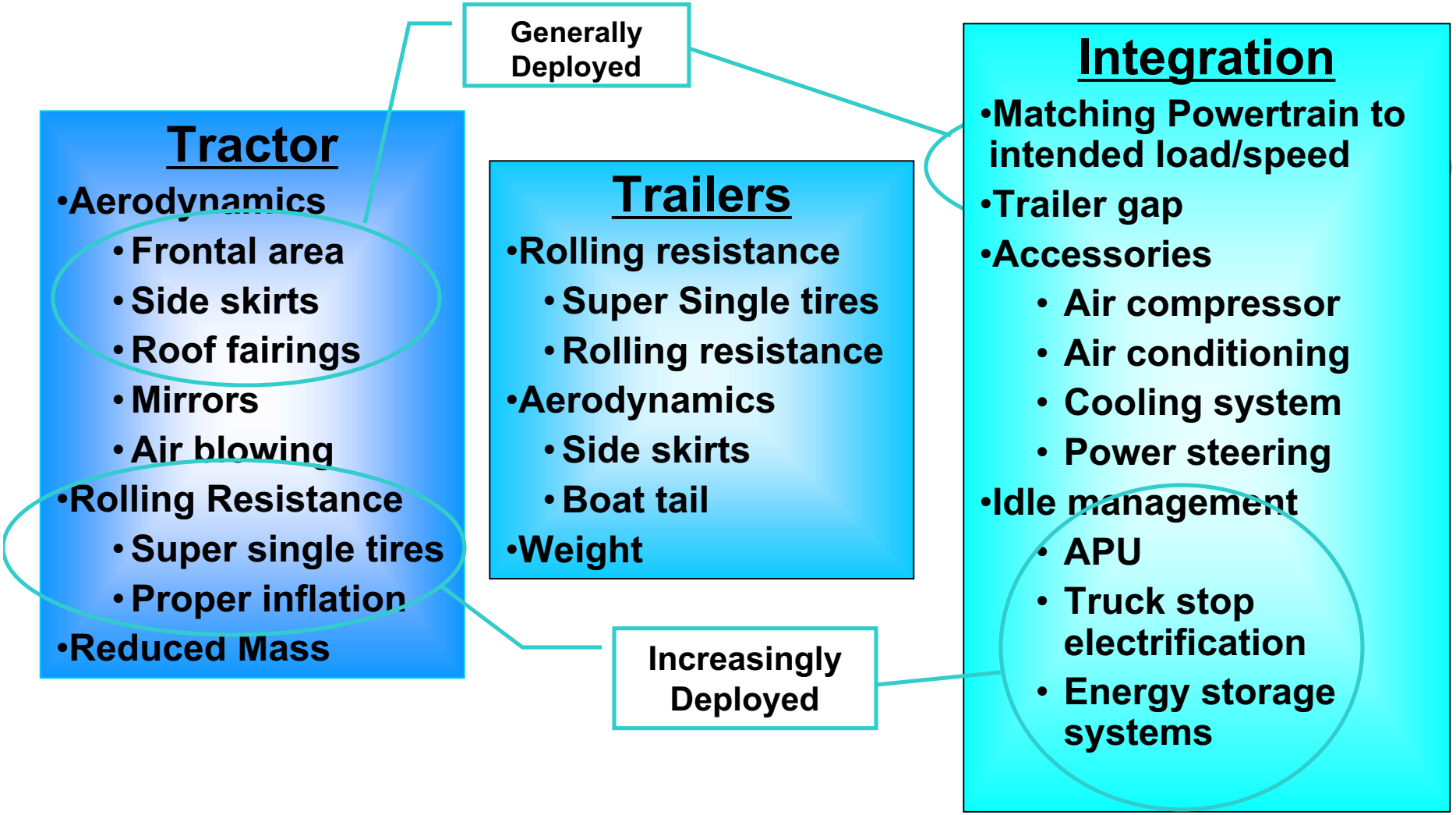


Taken from icct presentation to International Workshop on Fuel Efficient Policies – Paris, June 22, 2007

Key Factors in HD Truck Efficiency
Powertrain



Key Factors in HD Truck Efficiency Vehicle



Key Factors in HD Truck Efficiency
Regulation and Logistic

Regulations and Public policy

- Road Speed limiting
- Weight limits
- Trailer combinations
- Length limits
- Driver Hours of Service
- Congestion mitigation
- Incentives (hybrid)
- Education and support
  - EPA SmartWay program

State-to-state inconsistency is a major barrier to efficient freight movement.

Significant gains have been realized in logistics. Still room for improvement

Logistics

- Load management/backloads
- Route Optimization
  - Congestion Avoidance
  - Distance Minimization
- Vehicle management
  - Road speed limiting
  - Driver management
    - Smart gearing
    - Acceleration control
    - Idle management
  - Cruise management via GPS (anticipating grade and speed limit changes)

Conclusions

- **Commercial trucks have a defined mission to perform.**
- **Long Haul Trucks move freight.**
- **Narrowly defined tractor efficiency**
  - **Could box us into current vehicle configurations that won't move freight most efficiently**
  - **Miss opportunities in logistics.**
  - **Won't deal with trailers or matching trailers to tractors**
  - **Won't meet needs of specialized applications**
- **We must look at mission efficiency, especially freight movement efficiency.**