

# *Separate Lanes for Autos & Trucks: When, Where, and Why*

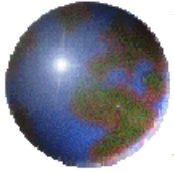
by

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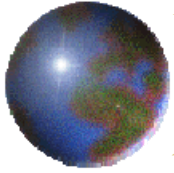
Reason Foundation

<http://reason.org>



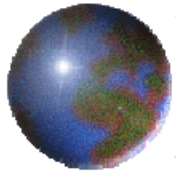
## *Overview of presentation*

- Traditional case for general purpose (GP) lanes.
- Non-GP lanes in USA today
- Reasons for cars-only lanes
- Reasons for truck-only lanes
- Other considerations:
  - Different values of time
  - Safety
  - Environment



## *Traditional case for GP lanes:*

- Greater capacity
  - Single lane performance limited by slowest vehicle.
  - Hence, hourly throughput per lane lower than for multi-lane highways.
- Lower cost
  - “Lumpiness” of lanes makes it difficult to match lane capacity to subset of total traffic.

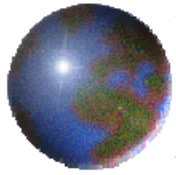


## *Cars-only lanes in the USA (1)*

Parkways, mostly in Northeast

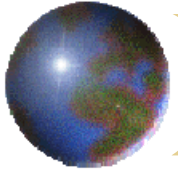
- ✚ Winding, tree-lined, scenic
- ⊕ 10-ft. lanes (vs. today's 12 ft.)
- ✚ Low overhead clearances
- ⊕ Lower speeds—40-50 mph
- ✚ Often toll-financed

Most still in operation, usually de-tolled



# *Hutchison River Parkway (NY)*

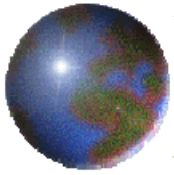




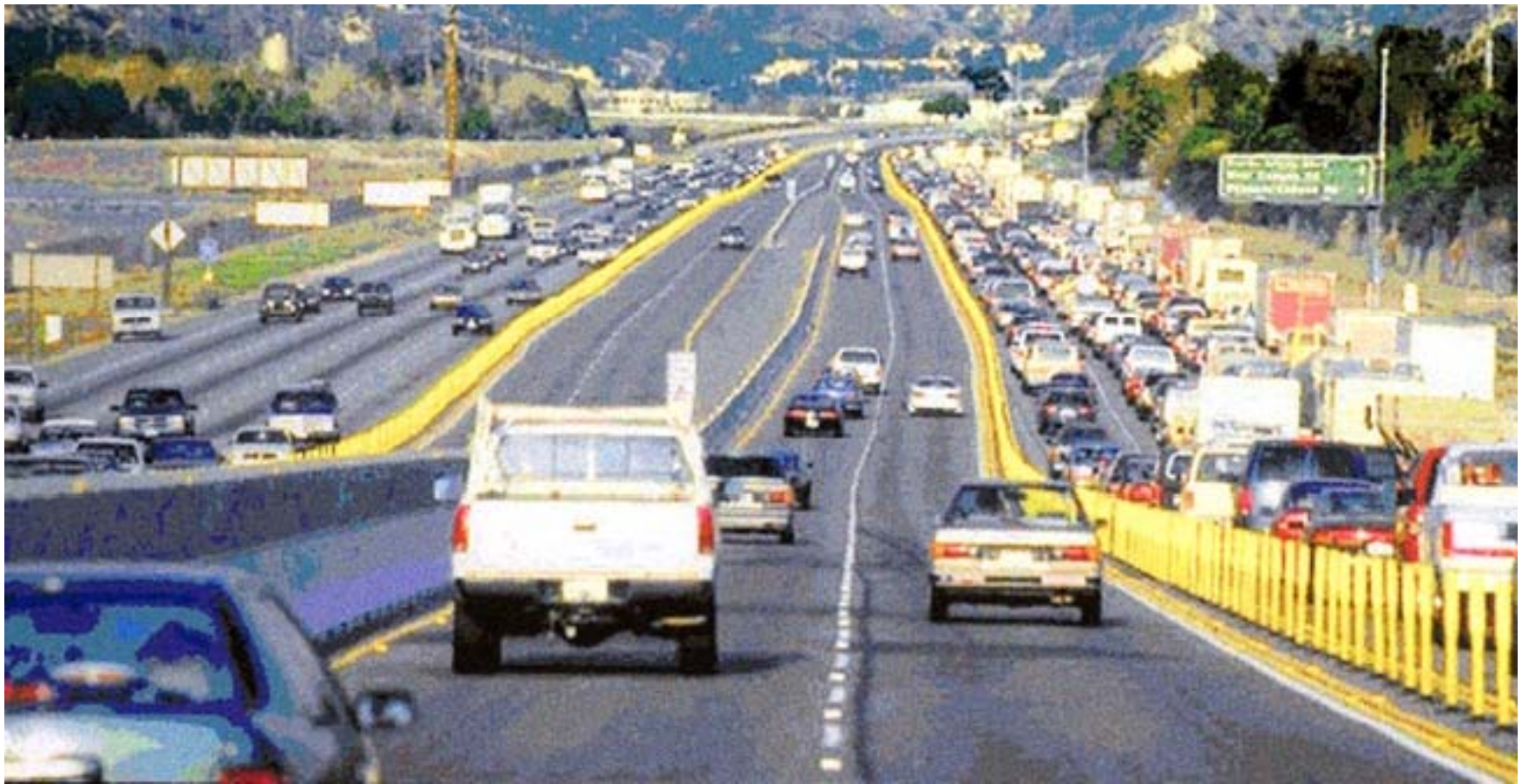
## *Cars-only lanes in the USA (2)*

### HOV (high occupancy vehicle) lanes

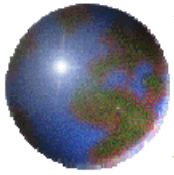
- Began as busways, but large excess capacity.
- Opened to vanpools, and then to carpools (predominantly 2-person).
- Most either have too little or too much traffic.
- HOT (high occupancy/toll) lanes sell excess capacity to paying customers.
- Federal policy now encourages conversion of HOV to HOT lanes.



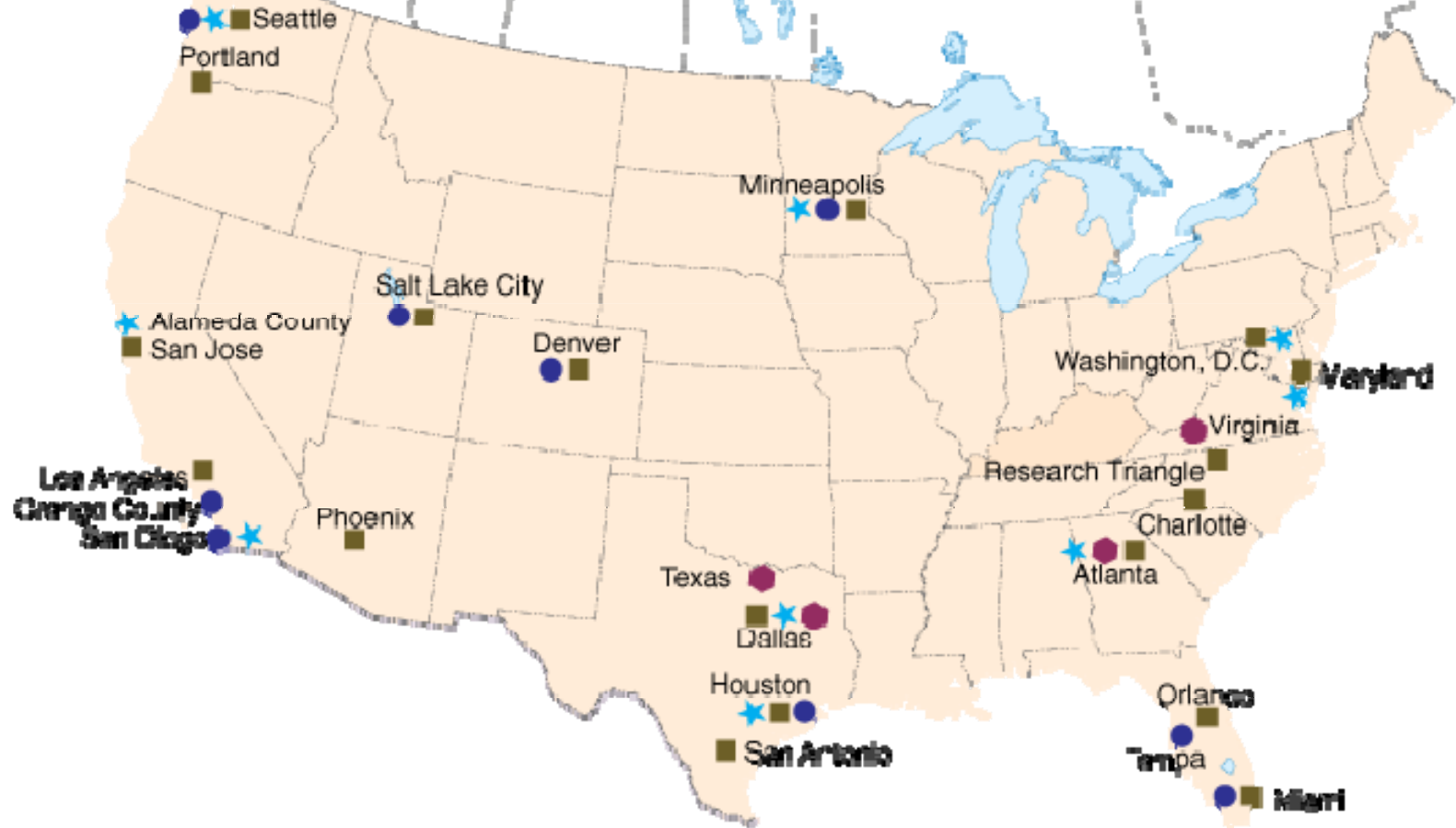
# *91 Express Lanes, Orange County, California*





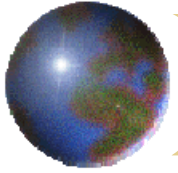


# *Priced lanes projects, 2009*



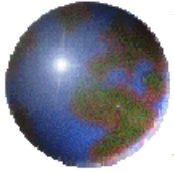
- Managed lanes in operation
- ★ Managed lanes being implemented
- Proposals being considered
- Feasibility studies





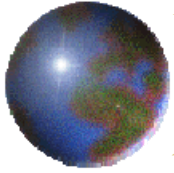
## *Truck-only lanes and roadways*

- ❖ New Jersey Turnpike “dual sections”
- ❖ Climbing lanes for trucks
- ❖ 1995 Minnesota proposal for truck-only highway, Winnipeg to Duluth
- ❖ 2002 Reason study: truck-only toll lanes configured for super-heavy trucks
- ❖ 2007 federal study of truck-only lanes for I-70 reconstruction in Midwest



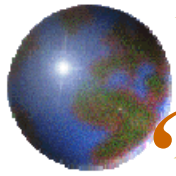
# *Proposed truck lanes on I-70*





## *Reasons for cars-only lanes (1)*

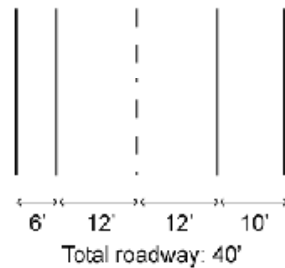
- Traditional design standards assume high speeds and serving all users (including large trucks).
- Urban expressways mostly operate at low speeds; could have narrower lanes if not serving trucks.
- Ng and Small argue that the same ROW and cost could provide more capacity under cars-only “narrow” standards.



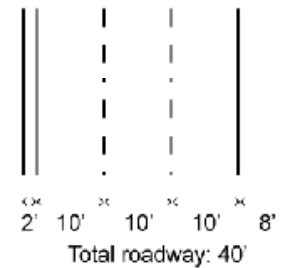
# “Narrow” roadways examples

## Example expressways (one direction)

(i) “Regular” expressway

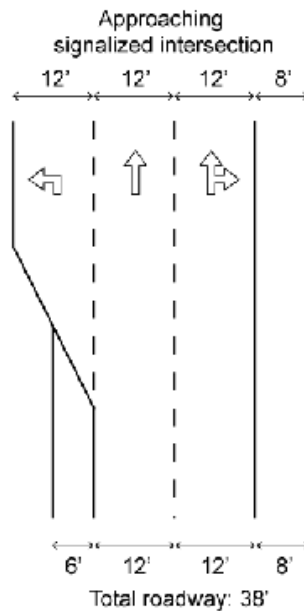


(ii) “Narrow” expressway

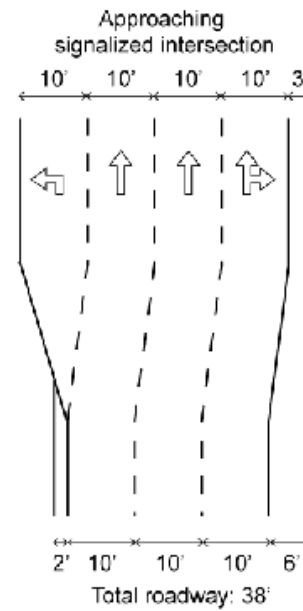


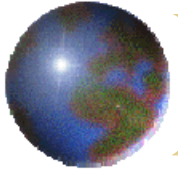
## Example urban streets (one direction)

(i) “Regular” urban street



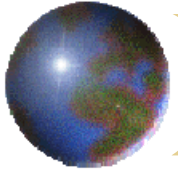
(ii) “Narrow” urban street





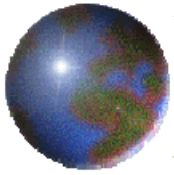
## *Reasons for cars-only lanes (2)*

- Narrower, cars-only roads could make use of untraditional ROW, adding new links to urban highways.
  - Underused rail lines (Houston, Dallas)
  - Drainage channels (Dallas, Orange County, CA)
  - Power line corridors (proposed in Maryland)
- Compatible with express bus, if curb-guidance technology used.

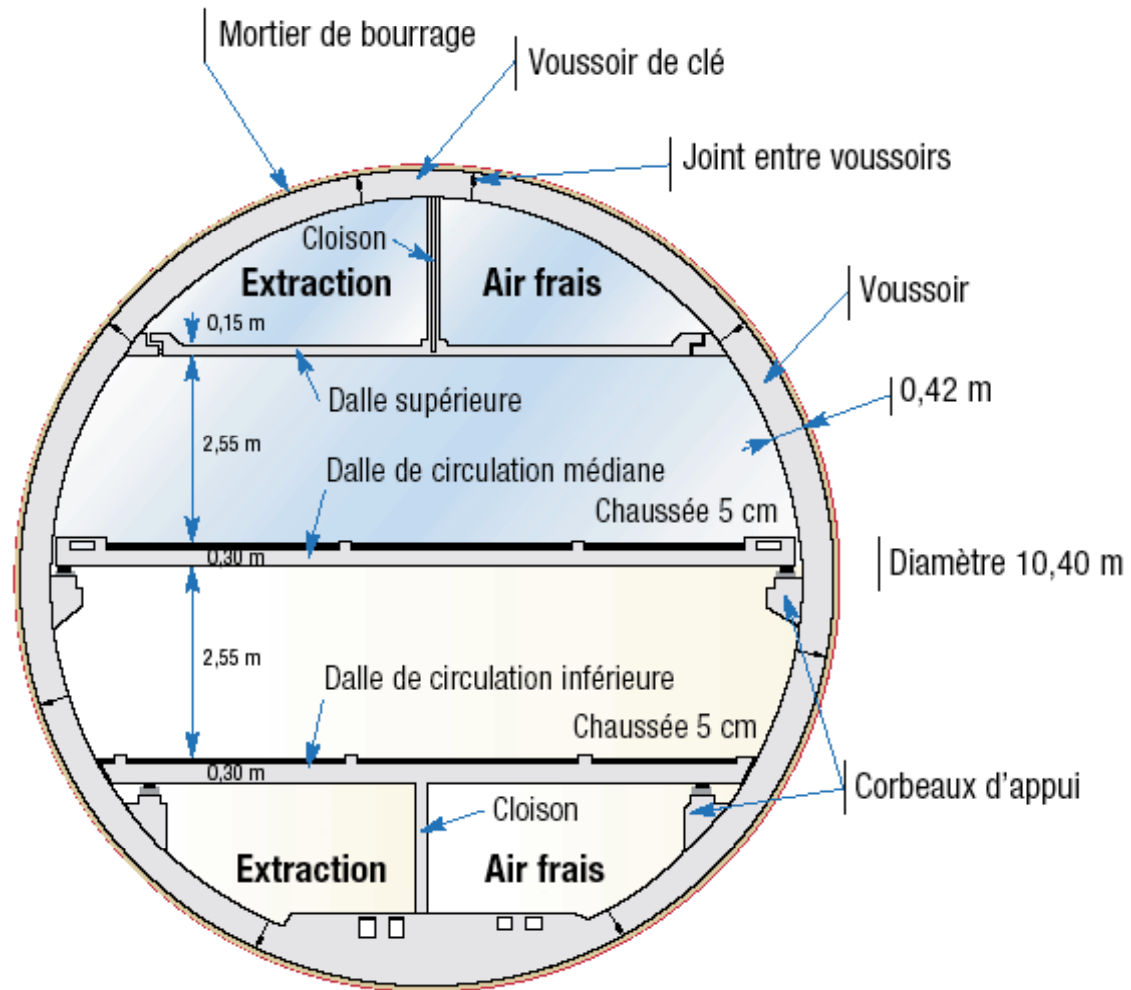


## *Reasons for cars-only lanes (3)*

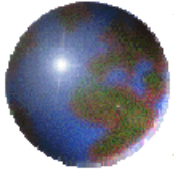
- ❖ Lower clearance heights permit retrofitting urban expressways with added capacity.
  - ❑ Circular tunnel cross-section can accommodate double-deck cars-only lanes.
  - ❑ Double-deck cars-only lanes could fit beneath existing U.S. Interstate overpasses.



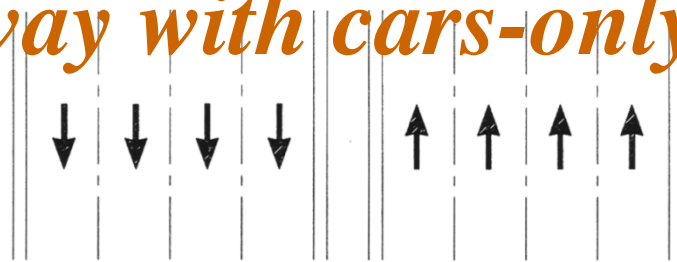
## *Double-deck, cars-only tunnel (Paris)*



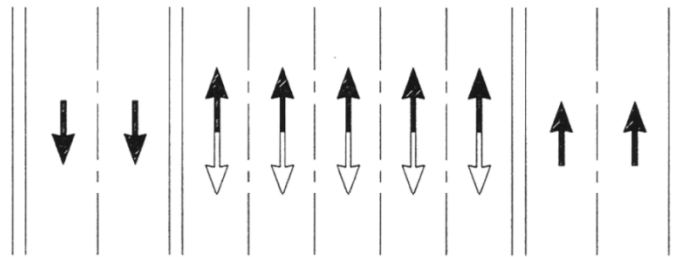




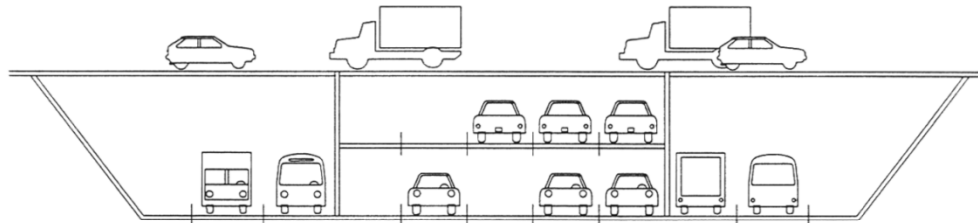
# *Retrofit freeway with cars-only lanes*



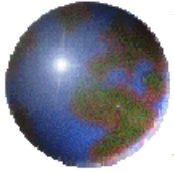
EXISTING 8-LANE FACILITY  
PLAN VIEW



PROPOSED CONCEPT  
PLAN VIEW

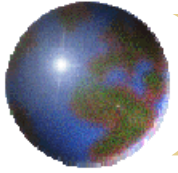


PROPOSED CONCEPT  
CROSS-SECTION



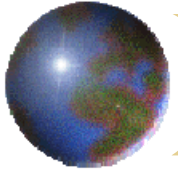
## *Reasons for truck-only lanes*

- Productivity gains: lanes can be designed for heavier weights and multi-trailer configurations.
- In urban areas, priced truck lanes let trucks avoid congestion, make more trips per driver shift.
- Highway system cost savings, due to less pavement damage to non-truck lanes, and lower cost to rebuild non-truck lanes.



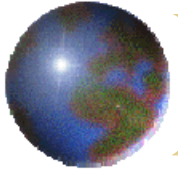
## *Different values of time*

- Recent commuter studies find large variations in value of time (VOT) and value of reliability (VOR).
- The same commuter may have different values for the “same” trip from one day to the next.
- Long-time critic Douglas Lee concedes the case for separate lanes if there are “very heterogeneous values of time.”



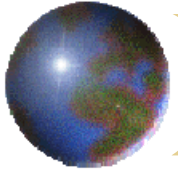
## *Values of time and reliability in urban trucking*

- Buffer Index measures value of trip-time reliability; important for just-in-time delivery logistics.
- Los Angeles toll truck lanes studies find very high VOR and VOT for drayage trucking, from ports to inland distribution centers.
- Combined value for this truck segment estimated at \$73/hour.
- With toll of 86¢/mile, time savings worth 5-10 times the toll.



## *Safety considerations in separating cars from trucks*

- ❖ Safety studies of “narrow” GP lanes are ambiguous.
- ❖ “Active Traffic Management” advised for new narrow-lanes cars-only roadways.
- ❖ Car-truck accidents cause about 5,000 U.S. deaths/year, with car responsible for 55%.
- ❖ Further planned increases in light-vehicle fuel economy will continue to down-size cars.

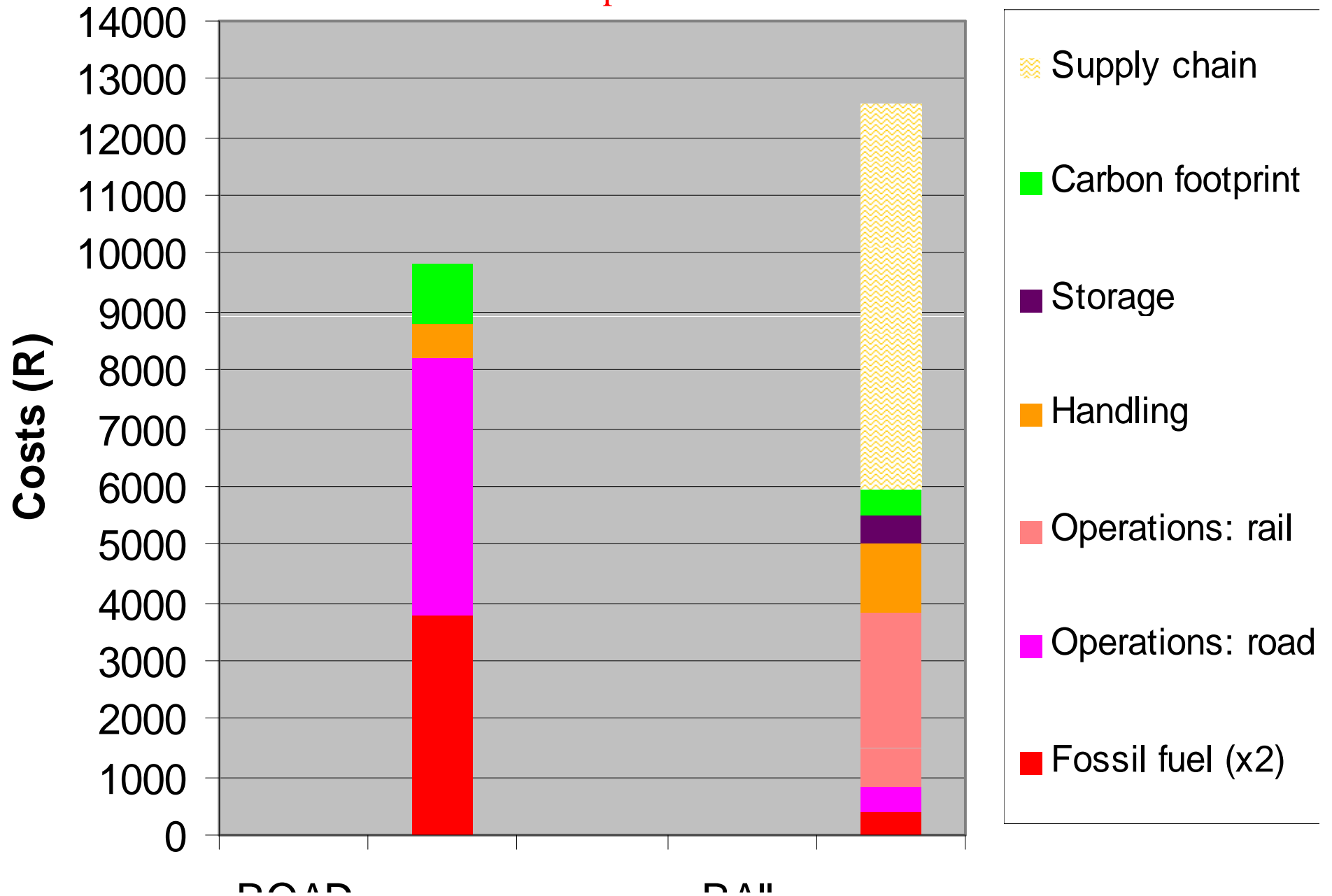


## *Environmental issues with truck-only lanes*

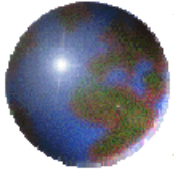
- US 2007 diesel standards will slash NOx and particulate emissions of future truck fleets.
- Multi-trailer rigs yield greater ton-miles per BTU of energy use.
- Automated platooning on truckways can further increase energy productivity.
- Total costs of truckway less than total cost of new rail line, in South Africa study (Arup).

# ROAD vs RAIL (supply chain costs @ 1.5 x tpt costs)

Current fossil fuel prices x 2



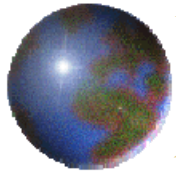




## *Conclusions*

Four cases where non-GP lanes should be considered:

- “Narrow” cars-only lanes retrofitted to urban expressways.
- New car/bus lanes on narrower, un-traditional rights of way in urban areas.
- Truck-only toll lanes on selected urban and inter-city corridors.
- Truck-only toll roads as alternatives to new rail in selected corridors.



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