

# **Infrastructure Capacity, Pricing and Gateway Competition**

## **Policy considerations**

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# Outline

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## Policy considerations

Reform of pricing and other policies

Case for subsidization

Case for strategic investment aid

## Underlying themes

Importance of considering pricing in conjunction with investment

Scale economies of, and from, infrastructure.  
Possibility of critical mass for investment

Area 3: Competitiveness

Area 8: Investments

# Definition of Gateways

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**Gateway:** A node or link in a transport network. **Not a hub.**

**Nodes:** Seaports, airports, intermodal transfer points...

**Links:** Rail lines, highways...

Here: infrastructure of any type

# Potential arguments for govt action

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To constrain market power

1. To internalize external costs
2. Subsidization
3. Strategic investment aid

# 1. Internalize external transport costs

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## a) Costs borne by general public

- Local emissions and greenhouse gases
- Noise

Not internalized by users, infrastructure managers or service providers

Policy instruments:

Carbon tax (for all economic sectors)

Increase in fuel taxes

# 1. Internalize external transport costs

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## b) Costs borne by users collectively

- Infrastructure wear and tear
- Accidents (in large part)
- **Congestion**

# 1. Internalize external transport costs

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## Costs of road congestion

<b>Region</b>	<b>Components</b>	<b>Annual cost</b>	<b>Source</b>
US: 85 urban areas	Travel delay, fuel consumption	\$US 63 billion	Texas Transportation Institute (2005)
Canada: 9 largest urban areas	Recurring congestion, delay, fuel consumption greenhouse emissions	\$2.3-3.7 billion	Transport Canada (2006)
Greater Toronto	Congestion & shipment delays	\$2 billion+	TD Bank Financial Group, Soberman et al. (2006)
Freight			
US freight transport	Direct user cost	\$US 7.8 billion	FHWA (2005)
BC Lower Mainland	Goods movement	\$500 million	BC Ministry of Transport (2006), BC Trucking Association

# 1. Internalize external transport costs

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*Q: Do high congestion costs warrant government intervention?*

**A: Not in general**

Private infrastructure operators have incentive to internalize costs borne by customers

Minimize total costs =

Infrastructure costs +

Operating costs (freight handling, maintenance) +

Users' costs (time, extra fuel consumption, etc)

Private operators will impose congestion tolls

# 1. Internalize external transport costs

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Qualifications (regarding market power)

- (1) **Price markup** is a percentage of the generalized cost  $\Rightarrow$  operator passes on to customers *more* than the cost of congestion
- (2) **Supply chains**. *Each* operator in a supply chain adds a markup (double marginalization)
  - Truck  $\rightarrow$  rail  $\rightarrow$  freighter  $\rightarrow$  rail  $\rightarrow$  truck
  - Airports + air freight
  - Seaports + shipping lines

# 1. Internalize external transport costs

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## (3) “Self-internalization” of congestion costs by large users

- Airlines with multiple flights at an airport
- Major shipping lines at seaports

Users hold back on volume (monopsony power)

Congestion fees should vary inversely with each user's share of traffic. Contentious.

# Congestion pricing in practice

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## Roads

Few toll roads in Canada

Only Highway 407 imposes congestion tolls

Tolling plans:

BC: Port Mann Bridge, Golden Ears Bridge, other bridges?

Toronto?

Case for road pricing in Canada: Lindsey (2007, “Road tolls for thee”)

Truck tollways (Reason Foundation)

# Congestion pricing in practice

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## Airports

None

Research (Basso & Zhang, Brueckner, Daniel, Morrison & Winston...)

## Seaports

Los Angeles and Long Beach: PierPASS program.  
Traffic Mitigation Fee on peak-period deliveries

Vancouver: Congestion surcharges on containers to be imposed by *major shipping lines*

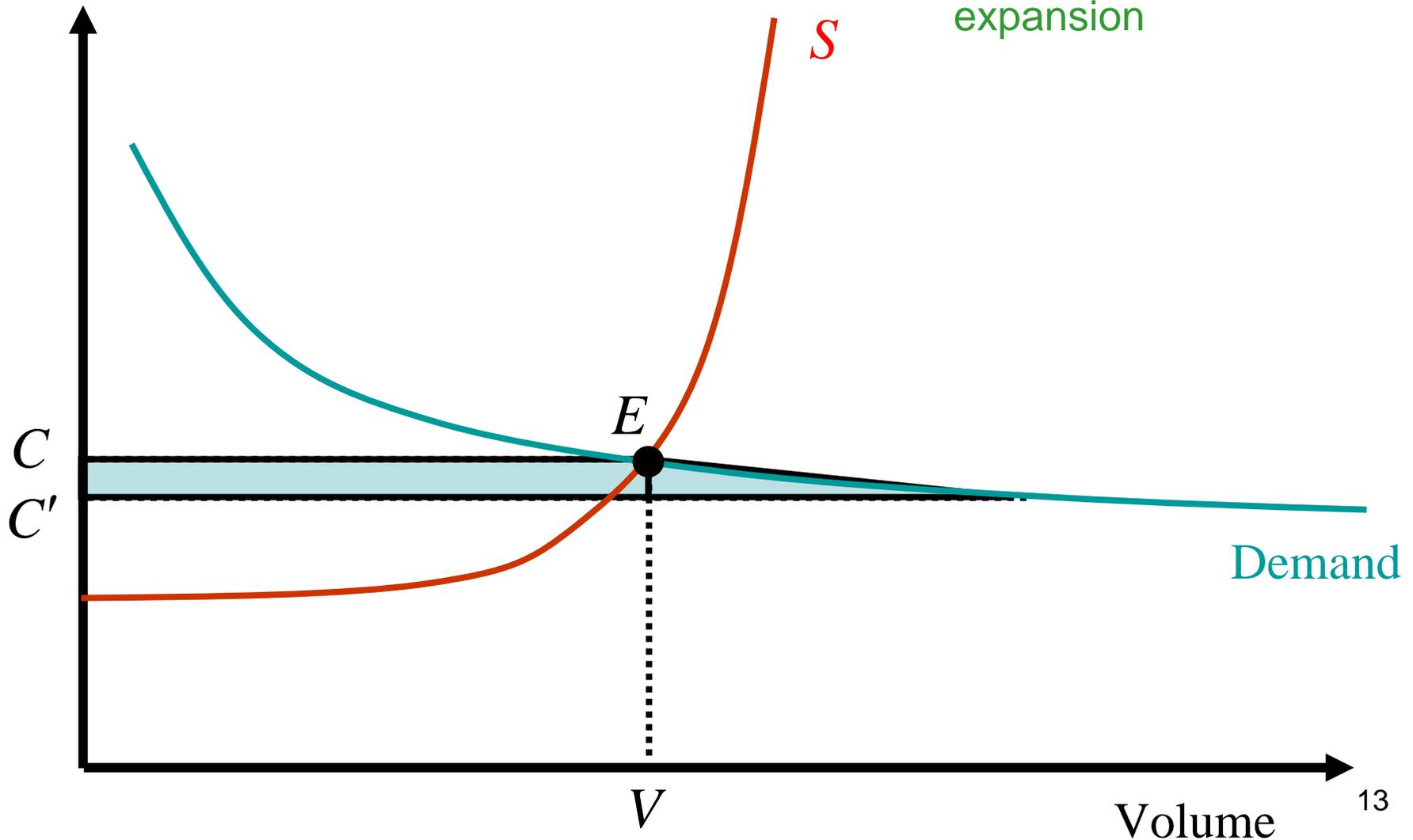
## Rail

Vertically integrated

# Investment benefits with no congestion pricing

Generalized (total) user cost

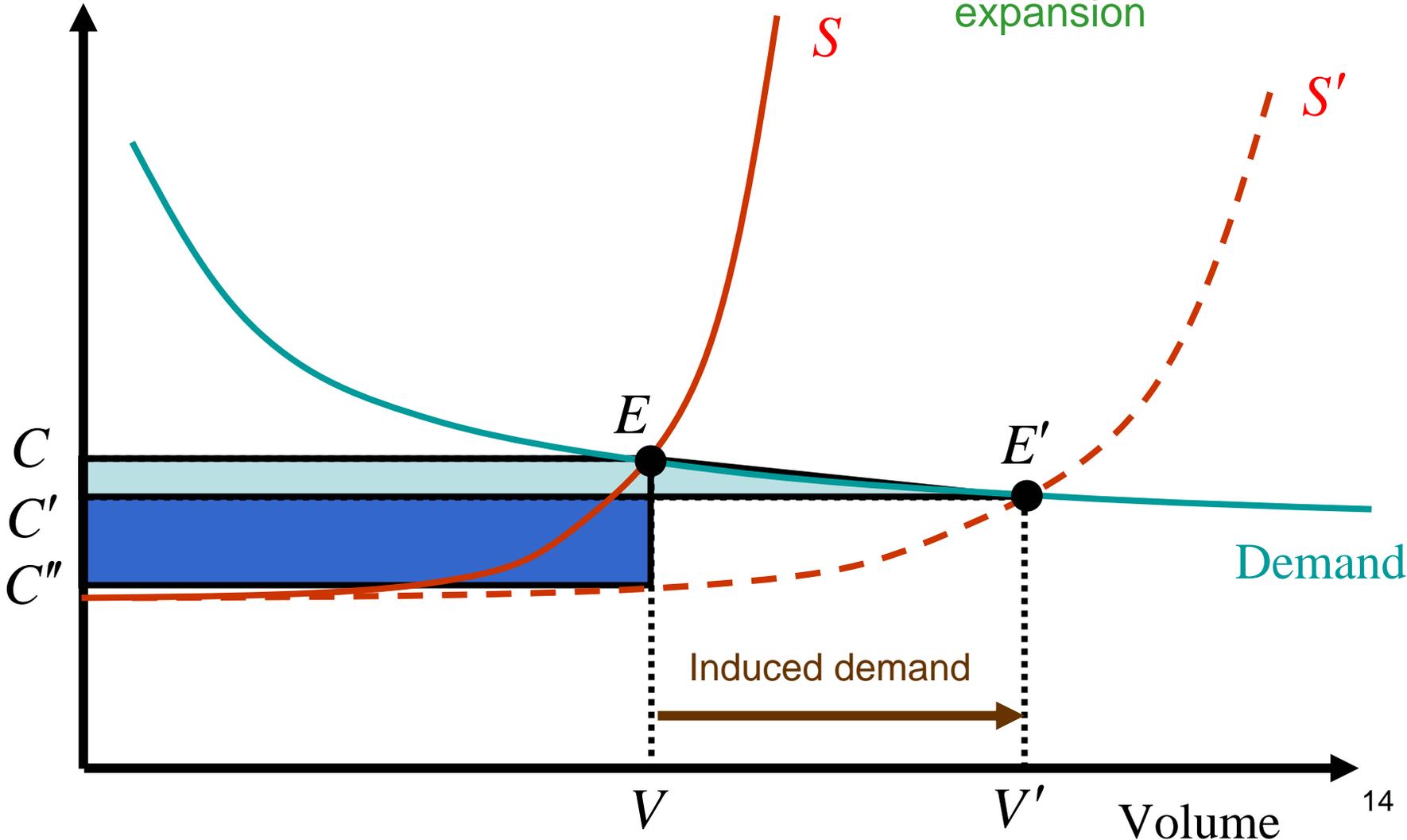
Before capacity expansion



# Investment benefits with no congestion pricing

Generalized (total) user cost

After capacity expansion



## 2. Subsidization: Scale economies

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(Theoretical literature on cost recovery)

### ***Scale economies in infrastructure supply***

**Airports:** Approx. constant scale economies beyond moderate traffic volumes

**Seaports:** Scale economies for at least some components of infrastructure & equipment

### ***Scale economies in infrastructure usage***

**Economies of traffic density:** Airports, liner shipping  
(service frequency)

**Economies of massed reserves:** Randomness in arrival times & service times

**Logistics:** Airport hubs, seaport transshipment centres

## 2. Subsidization: Other considerations

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### ***Capacity indivisibilities***

Low traffic volumes  $\Rightarrow$  deficit

### ***Large users***

Efficient congestion charge reduced  $\Rightarrow$  deficit

### ***Benefits for regional development***

Employment (declining importance. **But may increase employment outside a port**)

Agglomeration economies from local demand for traded goods, thick labour markets, technology spillovers & other positive feedback effects (New Economic Geography)  $\Rightarrow$  **critical mass**

## 2. Subsidization: Other considerations

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### ***Competitors have advantage***

US ports are subsidized

US airports receive more favorable tax treatment

Also European ports...

## 2. Subsidization: Conclusions

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Economies of scale & other factors create a plausible case for subsidies

### Constraints on Canada Port Authorities

- No federal subsidy
- Prohibitions on commercial activities that could provide cross-subsidy
- Limitations on borrowing to finance expansion

# 3. Strategic investment aid

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**Strategic**  Intended to affect decisions of competitors (or partners in supply chain)

## Lessons from literature on strategic trade policy

1. Wide scope for potentially advantageous aid (tariffs, output subsidies ...)
2. Appropriate intervention sensitive to nature of competition
3. Case for aid stronger for **strong** domestic competitors
4. Benefits of strategic aid **diluted** if it induces “undue” competition between domestic producers

# 3. Arguments *for* strategic investment aid

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## 1. Credible

Infrastructure long-lived

## 2. Potential winners

e.g. Port of Prince Rupert:

- Shortest ocean line-haul routes to Asia
- Deep, ice-free, uncongested
- CN rail line congestion free & low grades

## 3. Preempt capacity expansion by rivals

US? Mexico?

## 4. Infrastructure a public good for trade partners

(De Mooij et al 2005; Mun and Nakagama 2006;  
Fukuyama 2006)

### 3. Arguments *for* strategic investment aid

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#### 5. Risks of major infrastructure projects (?)

- Substantial lead times for planning & construction
- High costs, long-lived, irreversible, few alternative uses
- Volatility of freight demand
- Supply disruptions: strikes, equipment breakdowns, bad weather, natural disasters, terrorist attacks ...

### 3. Arguments *for* strategic investment aid

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Q: *Is the private sector systematically biased against large and risky projects?*

Theory: Optimal design capacity increased by uncertainty(?)

Practice: Apparent reluctance to upgrade infrastructure:

“There appears to be a market failure with respect to financing the expansion of freight transport capacity .... Because the private sector is unlikely to devote resources to areas where economic gain is uncertain, it is critical that the risks and rewards related to investments in freight transport infrastructure be characterized, especially as policymakers seek creative public-private partnerships.” (Ortiz et al. 2006: 19)

# 3. Arguments *against* strategic investment aid

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## 1. Costs of accelerated investment

- Diverts resources from regular operations & maintenance (e.g. US railroads)
- Raises costs of other projects
- Overheating economy generally

## 2. Benefits diluted by domestic competition

Between Ports of Vancouver & Prince Rupert?

## 3. Prisoners' Dilemma

Retaliation by other countries?

# Policy lessons and questions

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## Prospective reforms

### Greater reliance on direct user charges

- Road pricing
- Airport congestion pricing(?)

### Changes to policy regarding seaports (Canada Marine Act under review)

- Subsidy?
- Lift prohibitions on commercial activities
- Ease limitations on borrowing

# Policy lessons and questions

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## Q: *How strong is the case for subsidization?*

Size of scale economies

Strength of spillovers (agglomeration economies ...)

Difficulty of determining size of critical mass (if it exists)

## Q: *How strong is the case for strategic investment aid?*

- + Domestic winners (But should government “pick winners”?), preemption, public good, risks
- Overheating, undue domestic competition, Prisoners’ Dilemma

# Policy lessons and questions

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## Dangers of making wrong decisions

**Investment:** Too little or too much. Of the wrong type  
(weakest links)

**Pricing:** Failure to make structural changes

**Lack of marketing, ignoring border-related barriers**

## Lack of coordination between:

- Different transport modes
- Governments and private sector
- Government agencies
- Levels of government

# Policy lessons and questions

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*“In a region so dependent upon trade, there is little coordination in western Canada of port terminal and inland road and rail infrastructure development. [The result is] over or under-utilized infrastructure, missed opportunities and the potential for duplication of investments. An inability to balance supply and demand creates negative and lasting perceptions among users who experience service problems and/or increased costs.”*

(BC Ministry of Small Business and Economic Development and Ministry of Transportation 2005: 11)

*“In many cases, federal and provincial responsibilities overlap and the various regulatory regimes differ. Project developers find themselves dealing with several agencies that make no effort to coordinate....”* (Asia Pacific Foundation of Canada 2006: 25)

# Policy lessons and questions

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Q: How well coordinated are the federal and provincial Asia-Pacific initiatives?

## Transport Canada

- Fast track process
- Partnerships with provincial governments
- Round Tables!