



Optimizing the Transport Network with PBS

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Presented to:

IRTEENZ

August 21, 2019



The world is changing

In the 1970s energy conservation was driven by perceived decrease in oil reserves – like your bank account was running dry - public policy was developed to address this by changing behavior

Today, the consequences of increased CO₂ in atmosphere are being felt and understood – they are more pervasive and sinister than end of oil.

PBS for Sustainable Transport

Current PBS standards speak to engineering – they do not inform policy makers very well.

- Yes the vehicle is stable, it protects infrastructure, it is compatible with road geometry but we do not measure societal benefit.
- Need to establish comprehensive PBS metrics that communicate social costs and benefits
- Develop PBS metrics that measure goods movement efficiency and societal value at the vehicle and transport system levels.

What can advanced HCV policy do

System category	Benefit Estimate
Improved productivity	44%
Improved safety	2.5 to 5 times*
Reduced fuel consumption	32%
Reduced emissions	32%
Reduced infrastructure consumption	40%
Reduced VMT	44%
Reduced shipper cost	29%

Source: Assessments of Alberta HCV Program- Montufar et.al 2007, Woodrooffe et.al. (2001)

High Capacity Transport System

Represent an evolution towards more efficient and sustainable transport using intelligent science-based policy that:

- Increases cargo capacity
- Reduces truck trips for a given freight task (reduces truck travel)
- Reduces fuel use
- Lowers carbon and NOx emissions
- Reduces road and bridge wear
- Lowers shipping costs
- Improves safety

What we found

- High capacity transport (HCT) has long been an easy target for emotional argument
- The evidence from jurisdictions that have implemented HCT policy has been overwhelmingly positive in terms of safety, emissions reduction, infrastructure wear and societal value
- HCT has been shown to benefit overall transport system efficiency
- Concerns about significant modal shift from rail to HCT have not materialized
- The most significant freight shift has been from smaller to larger trucks - a reduction in overall truck trips.

Policy Maker challenge

How does the policy maker encourage successful HCV practice?

How can politicians and the public be better informed about this evolution in transport technology and its societal benefits?

Legislating decarbonization

- Swedish parliament voted for climate law with the goal of 70 percent reduction in domestic transport GHG emissions by 2030.
- Sweden has allocated EU 30m for a semi-commercial pilot to take electrified roads to the next level by 2021

Smart and balanced Implementation

Policy makers must consider

1. How HCV will contribute to the transport system
2. What policy instruments will yield the greatest benefit
3. How compliance can be assured
4. How to improve public outreach
5. How to measure safety, economic and societal benefits

Implementing HCT programs

- Support and collaboration is required from stakeholders
- Translate the objective benefits of HCVs into language the general population can appreciate and support.
- Limiting the use of HCVs to specific geographical areas or specific roads can help implementation.
- Recognizing that more efficient transport vehicles can help to support carbon reduction commitments.
- Trials and pilot programs coupled with a well-structured independent evaluation studies have proven an effective means of gaining public confidence and gathering credible data on HCV performance.

Regulating very high productivity vehicles

- In some jurisdictions high productivity vehicles operate under “special permit” programs governed by strict operating conditions.
- The structure and enforcement mechanisms of the policy engenders a level of safety consciousness which far exceeds that found in other vehicle classes.
- The principal motivating factor for heightened safety performance is related to the special safety requirements and the ability to revoke permits for safety performance or compliance failure.

Societal implications

In taking a systems approach, it is important to consider the overall societal value that well crafted high capacity transport system policy can provide.

At a minimum, factors to consider include:

- Crash and casualty reduction due to reduced exposure
- Fuel savings from improved efficiency
- Emissions reductions from reduced fuel consumption

Annual US Societal benefits from a 10 percent improvement in transport productivity

Benefit study variable	Injury severity	Reductions assuming 10% reduction in exposure	Estimated annual benefits (\$US Billion)
Estimated safety benefits attributed to a 10% reduction in truck travel distance	no apparent injury	21562	0.20
	possible injury	2,929	0.44
	evident injury	2,724	0.68
	disabling injury	1,453	0.87
	Killed	330	2.54
	Total safety cost saving attributed to 10% reduction in exposure		
Estimated fuel and emissions benefits attributed to a 10% reduction in truck travel distance	Category	Quantity saved	Annual cost saving (\$US Billion)
	Diesel fuel reduction	10.6 billion liters	10.60
	CO2 reduction	28.3 Million metric tons CO2	0.680
Combined benefits	Total estimated annual savings		16.01

Fuel Use and Emissions

Estimated Potential Realistic Improvement in Fuel Efficiency and CO2 Emission Reduction

Aspect	Realistic Gain in Fuel efficiency CO2 Reduction	Level of technical challenge	Technical timeframe and comments
Tires	13%	Moderate	Much of this benefit currently available – remaining benefit expected 5 – 10 years
Aerodynamics	10%	Easy	Much of this benefit currently available – development ongoing
Engine	16%	Difficult	Very challenging and costly to achieve – 15 – 20 years, would likely require regulation
Size & Weight Regulation	30%	Easy	Not limited by technology or development time. Requires policy change only. Politically sensitive.

Future development

- The traditional approach of focusing on the road and vehicle will likely give way to a broader transportation system assessment.
- The task of transporting goods transcends from a single-mode focus to broader transport system optimization.
- It will require a more pragmatic, thoughtful and inclusive decision-making process based on data that balances local, regional and global priorities.
- Some form of sustainability index applicable to all modes of transport would be helpful.



Thank You

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