

# Options to Reduce Freeway Congestion

## A Case Study of the Pottstown Expressway (US422)



*This research has been undertaken as part of Australia's Sustainable Built Environment National Research Centre (SBEnc) and funded by The Pottstown Area Health and Wellness Foundation in collaboration with State Representative Joe Ciresi, Member of the Pennsylvania House of Representatives.*

# Aim of Project

- The aim of the research is to provide an overview of various options to respond to congestion issues on the Route 422 to inform decision making.
- The 422 is an ideal site for the investigation into congestion relief options as it has clear congestion issues, experiences both high and low temperature extremes, there is a railway and water way running parallel, and there is adequate verge space.
- Lessons can inform approaches across the State.





# Lane Widening



# Lane Widening

## Pro

Well established method  
for increasing capacity of  
motorways

## Con

Short term improvements  
and added pressure to  
connecting system

Cost and Effectiveness	Development Potential	Environmental Benefits	Job Creation Potential
High Cost, Low Impact	None	Negative	None



# High Occupancy Vehicle (HOV) Lanes



Highway 101 HOV Lane, Marin County

# High Occupancy Vehicle (HOV) Lanes

## Pro

Encourages carpooling  
and shared transit  
options

## Con

Unlikely to perform  
better than general-  
purpose lane

Cost and Effectiveness	Development Potential	Environmental Benefits	Job Creation Potential
Low Cost, Little Impact	None	Minor	None



# Shuttle Bus Services



Emery-Go-Round Shuttle Service in Emeryville, California

# Shuttle Bus Services

## Pro

Ability to be demand responsive and provides effective feeder services

## Con

Can be seen as a low socio-economic option and have low ridership

Cost and Effectiveness	Development Potential	Environmental Benefits	Job Creation Potential
Low Cost, Low Impact	Very Little	Some	None



# Shared Water Transport (Fast Ferries)



New electric ferry being used in Bangkok

# Shared Water Transport (Fast Ferries)

## Pro

Takes advantage  
of an underutilised  
waterway

## Con

Will require  
expensive capital  
upgrades

Cost and Effectiveness	Development Potential	Environmental Benefits	Job Creation Potential
High Cost, Low Impact	Some	Some	Medium

# Shared Air Transport



Concept Uber air taxis designed by French aerospace company, Safran



# Shared Air Transport

## Pro

Urban airspace is relatively unused and multi-layered

## Con

Small carrying capacity and noise, safety and control issues

Cost and Effectiveness	Development Potential	Environmental Benefits	Job Creation Potential
High Cost, Low Impact	None	Negatives	Small

# Single Rail Overhead Service (Monorail)



Tokyo Monorail passing through Tennōzu in Shinagawa

## E. Single Rail Overhead Service (Monorail)

### Pro

Faster construction times with a smaller physical footprint

### Con

Medium carrying capacity and more expensive than railway

Cost and Effectiveness	Development Potential	Environmental Benefits	Job Creation Potential
High Cost, High Impact	Some	Considerable	Medium



# Trackless Trams



Trackless Tram in Yibin, China

# Trackless Trams

## Pro

Cheaper than light rail and better than rapid bus system

## Con

Requires dedicated corridor and not in Western cities

Cost and Effectiveness	Development Potential	Environmental Benefits	Job Creation Potential
Low Cost, High Impact	High	Considerable	Large

# Commuter Rail Services



Brightline, a new private-public partnership commuter rail line in Florida



# Commuter Rail Services

## Pro

High capacity and infrastructure is in place for railway and stations

## Con

Current line does not offer passenger services

Cost and Effectiveness	Development Potential	Environmental Benefits	Job Creation Potential
Low Cost, High Impact	High	Considerable	Large

# Car-pooling



A typical collection point in San Francisco for commuter car pooling

# Car-pooling

## Pro

Low cost with decent  
congestion reduction  
potential

## Con

Need to create better  
booking tools and provide  
safety controls

Cost and Effectiveness	Development Potential	Environmental Benefits	Job Creation Potential
Low Cost, Some Impact	None	Some	None



# Tele-commuting



# Tele-commuting

## Pro

Reduces business  
operating costs and  
enhances localization

## Con

Less able to manage  
productivity, and does  
not work for all

Cost and Effectiveness	Development Potential	Environmental Benefits	Job Creation Potential
Low Cost, Some Impact	None	Some	None

# Pottstown Congestion Relief Options

Options	Cost	Effectiveness	Development Potential	Environmental Benefits	Job Creation Potential
<b>A. HOV Lanes</b>	Low	Little	None	Minor	None
<b>B. Shuttle Bus</b>	Low	Low	Very little	Some	Small
<b>C. Fast Ferries</b>	High	Low	Some	Some	Medium
<b>D. Air Transport</b>	High	Low	None	Negatives	Small
<b>E. Monorail</b>	High	High	Some	Considerable	Medium
<b>F. Trackless Trams</b>	Low	High	Considerable	Considerable	Large
<b>G. Commuter Rail</b>	Low	High	Considerable	Considerable	Large
<b>H. Car Pooling</b>	Low	Some	None	Some	None
<b>I. Tele-commuting</b>	Low	Some	None	Some	None



# Initial Findings

## **Best-Suited Option for Investigation:**

*A combination of a rapid Commuter Rail service with a system of Trackless Trams in connected towns feeding into stations, supported by Telecommuting and Car Pooling...*

***... Creating 21<sup>st</sup> Century Boulevards...***

# Initial Findings



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