



# Express Lane Networks: Effectiveness and Acceptance

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# Overview

- Low-cost highway capacity expansion
- Express lane pricing concepts
- Results of analysis of costs, benefits and revenues

# Cost of Highway Capacity Expansion

Major Urbanized Areas	Normal Cost	High Cost
Highway construction cost/ lane mile*	\$13.4 M.	\$55.9 M.
Daily traffic volume in peak periods (5-6 hours/day)	10,000 vehicles	10,000 vehicles
Const. cost per vehicle per mile	\$1,340	\$5,590
Const. cost for 20-mile round trip	\$26,800	\$111,800
Annualized const. cost for 20-mile trip**	<b>\$1,742</b>	<b>\$7,267</b>
Cost for 20-mile trip per working day	\$7.00	\$29.00
Gas tax paid for 20-mile trip (2 cents/mile)	<b>\$0.40</b>	<b>\$0.40</b>

\*Source: FHWA, in 2006 dollars

\*\*Annualization factor 0.065 assuming a 5.25% discount rate and 30-years

# Active Traffic Management (ATM) with Shoulder Travel Lane



# But New Issues Arise

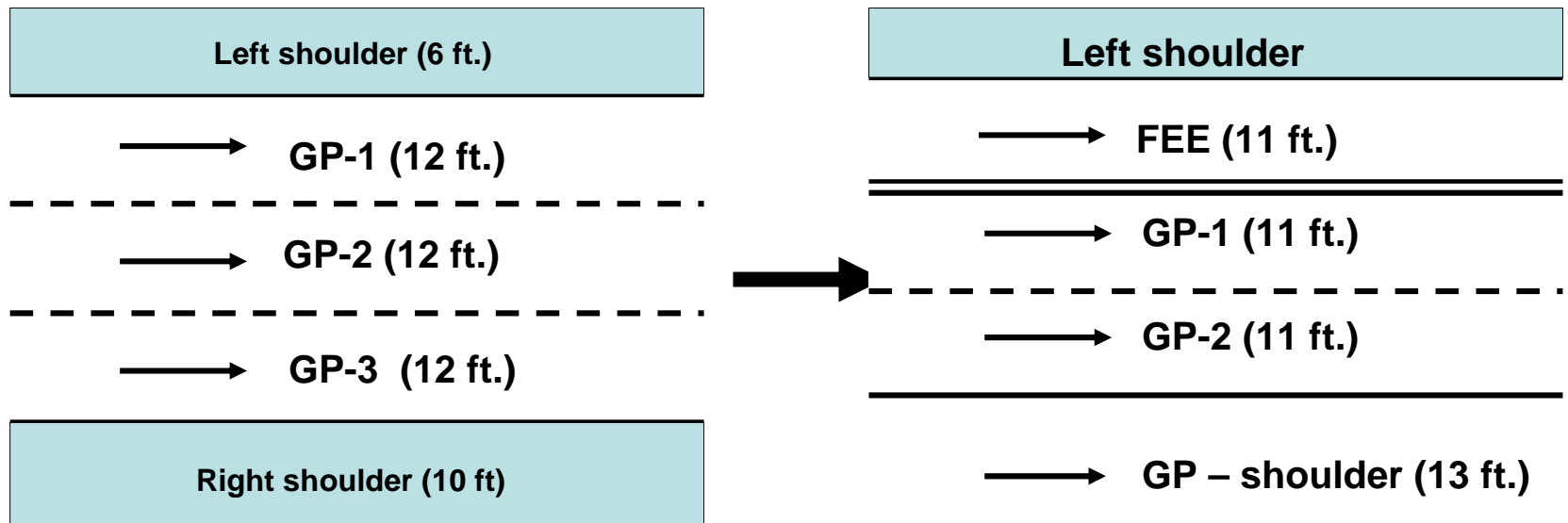
- **Safety concerns:**
  - Driver understanding
  - Emergency response
- **Pilot tests:**
  - Minneapolis I-35W
  - Seattle SR 520

# Overview

- Low-cost highway capacity expansion
- **Express lane pricing concepts**
- Costs, benefits and revenues

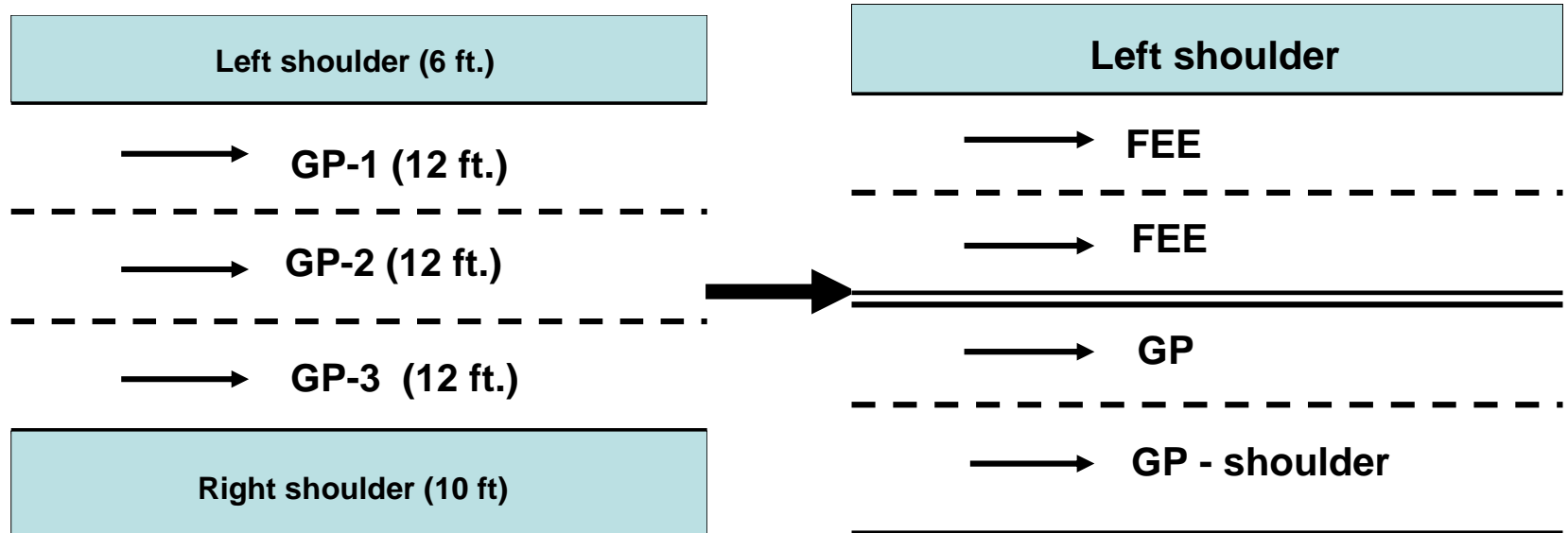
# Single Priced Lane

## Flexible and Efficient Express (FEE) Lane



# Two Priced Lanes

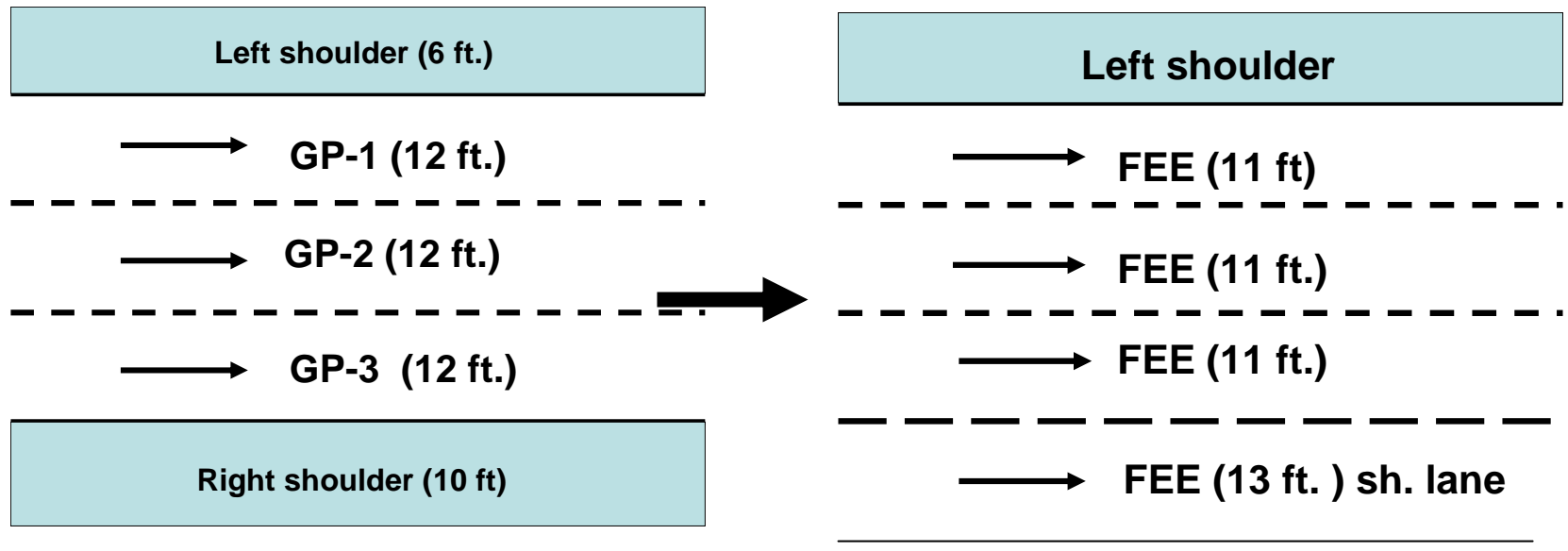
## FEE Lanes plus fee credits





# All Lanes Priced

## FEE Highways with credits



# Overview

- Low-cost highway capacity expansion
- Express lane pricing concepts
- **Costs, benefits and revenues**

# Costs

## ■ Capital costs:

- Overhead lane controls
- Shoulder improvements
- Tolling infrastructure

## ■ Operating costs:

- Active traffic management
- Tolling and crediting operations

# Benefits

## ■ Traveler benefits:

- Delay reduction
- Travel time reliability
- Fuel savings

## ■ Social benefits – reductions in:

- Air pollution and GHG emissions
- Noise and water pollution, and other externalities

# Sketch Planning Analysis

- Account for induced travel demand due to increase in capacity
- Toll rates set to maintain 55 mph speed

# Regionwide Impacts

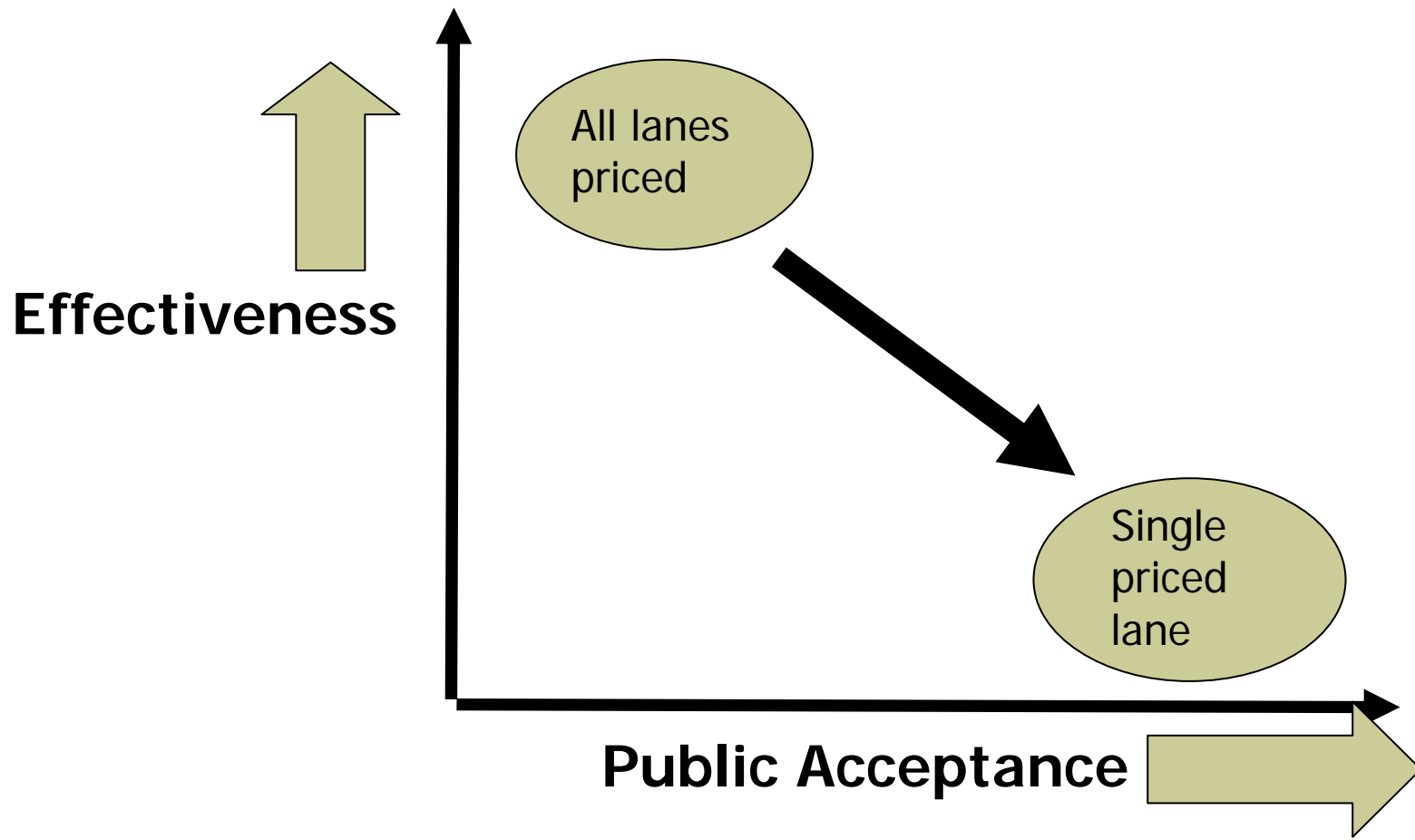
## **Prototypical large city:**

- About 3 million population
- 300-mile controlled access highway network
- 1,800 lane-miles

# Effectiveness of Pricing Concepts

	1 FEE lane	2 FEE lanes	4 FEE lanes
Toll for 10-mile trip	\$5.27	\$3.71	\$1.97
Annual revenues	\$0.5B	\$0.9B	\$1.0B
Annual user benefits	\$0.5B	\$0.9B	\$2.0B
Peak period CO2 emissions	-5%	-15%	-39%

# Effectiveness vs. Acceptance





# Conclusions

- Effectiveness dramatically increases with number of priced lanes
- Surplus for credits or transportation investment with more priced lanes
- Segregating traffic into priced and unpriced lanes increases operational issues
- Further discussion is needed, particularly with regard to safety issues

# Analytical Details

## ITE Journal, September 2009:

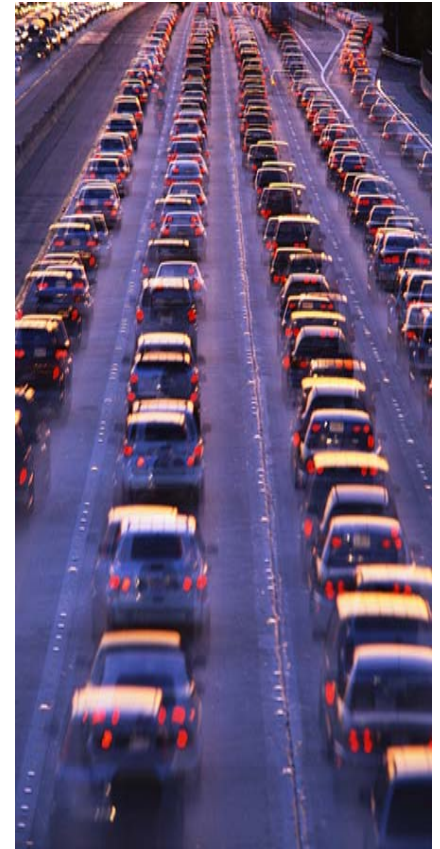
### Creating a Network of Express Lanes in Metropolitan Areas

By

Patrick DeCorla-Souza &

John Halkias

(pp 40-46)



# For More Information on Pricing

## **FHWA Office of Innovative Program Delivery:**

[www.fhwa.dot.gov/ipd](http://www.fhwa.dot.gov/ipd)

## **FHWA Office of Operations:**

[http://ops.fhwa.dot.gov/  
tolling\\_pricing/index.htm](http://ops.fhwa.dot.gov/tolling_pricing/index.htm)



# Contact Information

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