Transportation White Paper

Congestion Pricing for Downtown Seattle

Presentation to Washington Transportation Commission
December 17, 2019
- The City of Seattle has been examining congestion pricing as well as other means of generating revenues.
- Uber is participating nationally in efforts to better understand the promise of congestion pricing.
- The City recently released a phase 1 report examining congestion pricing for downtown.
- Uber commissioned a white paper on the topic from ECONorthwest.
Examine a fair and efficient toll policy for downtown Seattle that maximizes the benefits of the existing infrastructure.

- Avoid tolls that are too high or too low
- Easy to understand and communicate
- Fair

Contribute to the City’s evaluation of congestion pricing.

The White Paper addresses all the study objectives outlined in the City’s Phase 1 Report.
A well designed downtown congestion toll yields significant benefits:

- 30% reduction in travel time during peak travel hours
- $90 million in annual household travel time savings
- 4% increase in transit usage without increases to transit supply
- $130 million in annual gross revenues
- Most tolls paid by high-income commuters
- Strong coherence within core downtown.
- Secondary zones on the west, east and south of downtown.
- Zones could have different toll rates and/or start and end times.
- Tolls vary by hour of the day
- Vehicles pay the toll no more than once per day
- The toll paid is for the highest toll hour of the day
CONGESTION ON URBAN STREETS

- **Urban Networks**
  - Prone to hyper-congestion (a condition where the effective capacity of the network declines)
  - Unlike freeways there are many intersecting queues
  - A downtown network can share performance characteristics of a single queue

- **Tolling Implications**
  - Should toll the hyper-congested state (more severe congestion)
  - Toll would need to be time-of-day specific
  - Simplified toll structure can still yield large benefits
  - Tolls paid by users will offset the time savings to users as a whole
Overview of Analytic Approach

- **Uber Movement Speeds**
  - $n. = 2.05$ million

- **Road Network Characteristics**
  - $n. \approx 15,000$ links

- **Uber Movement Travel Times**
  - $n. = 13.19$ million

- **PSRC SoundCast Trip/Tour Files**
  - $n. = 5.77$ million

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Data Transform and Processing in Python, R, and QGIS

- **Toll zone, traffic volumes, delays, and optimal tolls**
- **Travel activities related to downtown toll zone**

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Analysis of demand for access to downtown toll zone

- Estimates of travel response and gross revenue
Uber speeds data summarizes facility performance.
- Filtered by day of week, hour of day.
- Mean speeds, standard deviations, other points in the distribution.

Data retrieved from Uber Movement, (c) 2019 Uber Technologies, Inc.
Optimal tolls can be estimated from data about speeds, volumes, and nature of delay on road segments.

Starting with a fixed estimate of demands.
AUTO TOUR REDUCTIONS
▪ Close-in, shorter distance, auto tours respond more to tolls.

▪ This is an expected result of a cordon/area charge.
Transit tours would likely increase where transit service is already competitive.

Adding more transit services could yield additional transit tours.
Hours of Auto Travel Time With and Without Pricing: 30% Time Savings In Peak
Average Toll Paid per Tour by Income Decile

![Chart showing average toll paid per tour by income decile with mean, 5th percentile, and 95th percentile for each decile.](image)
AVERAGE TOLLS
$50 M of $130 million to advance mobility fairness

- e-purse program: $80/month for downtown workers at or below regional median income.
- Toll credits/vouchers for auto trips for essential services, such as medical visits, by low-income drivers.
- $25 monthly mobility dividend to all Seattle low-income households.
Toll Plus e-Purse Share of Income for an Average Downtown Employee by Income Decile
Share of Toll Revenue by Regional Household Income Decile
Cordon/Area charges are not an ideal form of pricing, but still can yield benefits if carefully designed.

A toll system for downtown streets can also be designed to address questions of fairness.

Key features of fair and efficient congestion pricing include:

- Area toll levied on all vehicles
- Tolls vary by time of day, adjusted quarterly
- Mobility e-purse program at 30% of gross revenues to mitigate impacts on those earning below median income