

Factors Influencing Shared vs. Private Rides

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U.S. Department of Transportation
Federal Highway Administration

Ridehailing vs. Ridesharing

Private Rides

- UberX
- Standard Lyft
- Taxi

Shared Rides

- UberPool
- Shared Lyft
- Via

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Why Ridesharing?

- Ridehailing occupancy impacts the number of vehicles on the road.
- Sharing may:
 - Alleviate congestion
 - Reduce vehicle miles traveled (VMT)
 - Improve travel time and travel time reliability for all road users
 - Reduce vehicle emissions
 - Support economic growth
- Private ridehailing may yield the opposite outcome.



Methodology and Data

Survey Questions to Transportation Network Company (TNC) Users:

- Trip purpose
- Personal characteristics
- Travel behavior

Appended Data:

- Trip cost and travel time
- Built environment characteristics
- City-specific data



Methodology and Data: Sample Survey Question

Which one of these choices would you have taken for your recent trip by TNC?

A **17 to 20 minute**
shared trip that cost
\$8

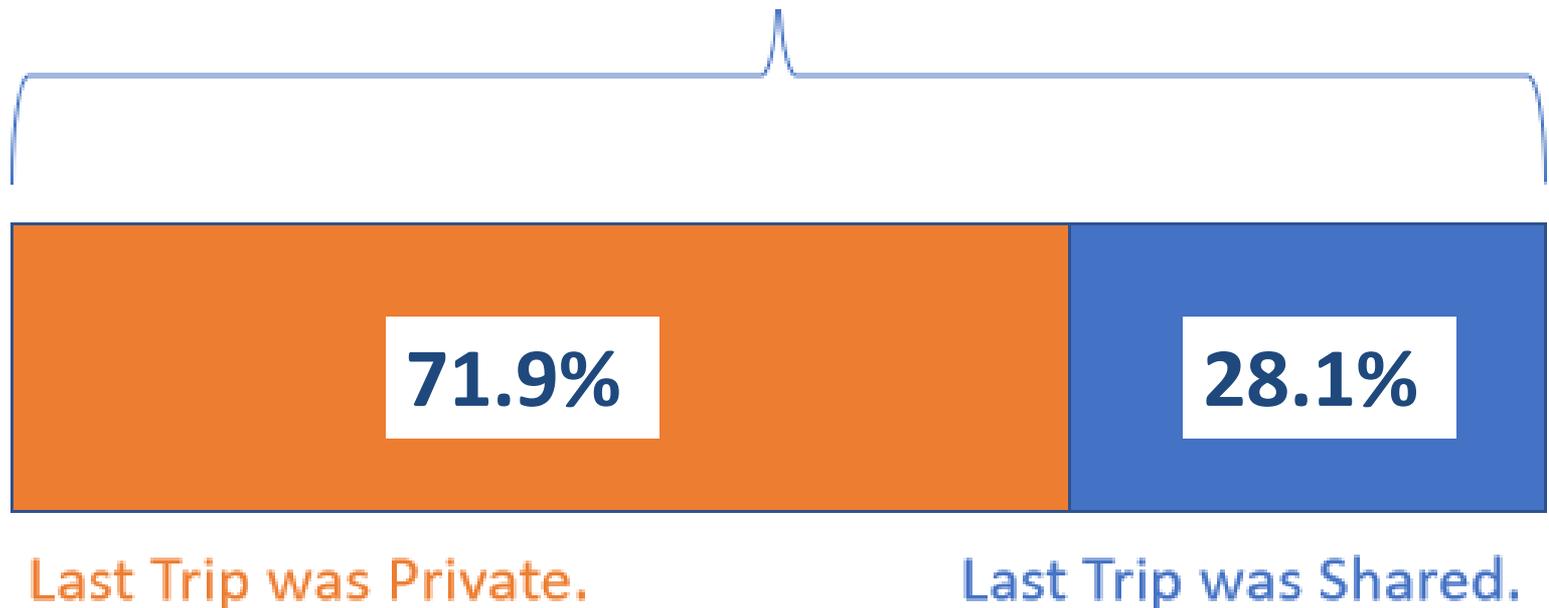
A **15 to 17 minute**
shared trip that cost
\$7

A **11 minute** private
trip that cost
\$11



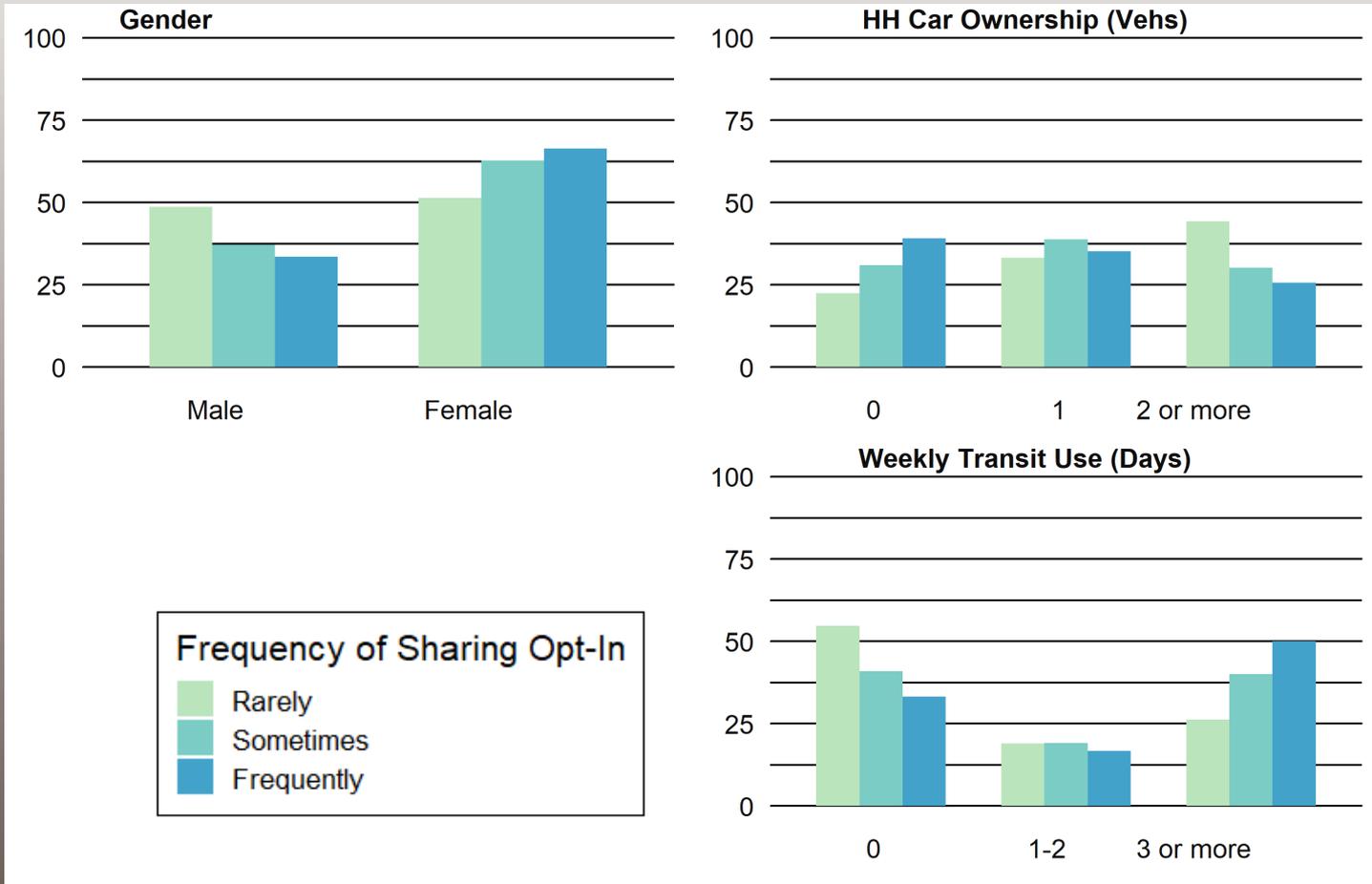
National Survey Results Usage Summary

4,365 Transportation Network Company (TNC) Users



National Results: Market Segmentation (User)

Percentage



National Results: Market Segmentation (User, continued)



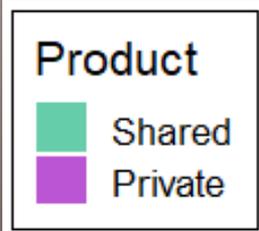
Frequency of Sharing Opt-In

- Rarely
- Sometimes
- Frequently



National Results: Market Segmentation (Trip Type)

Percentage



National Results: Price Sensitivity

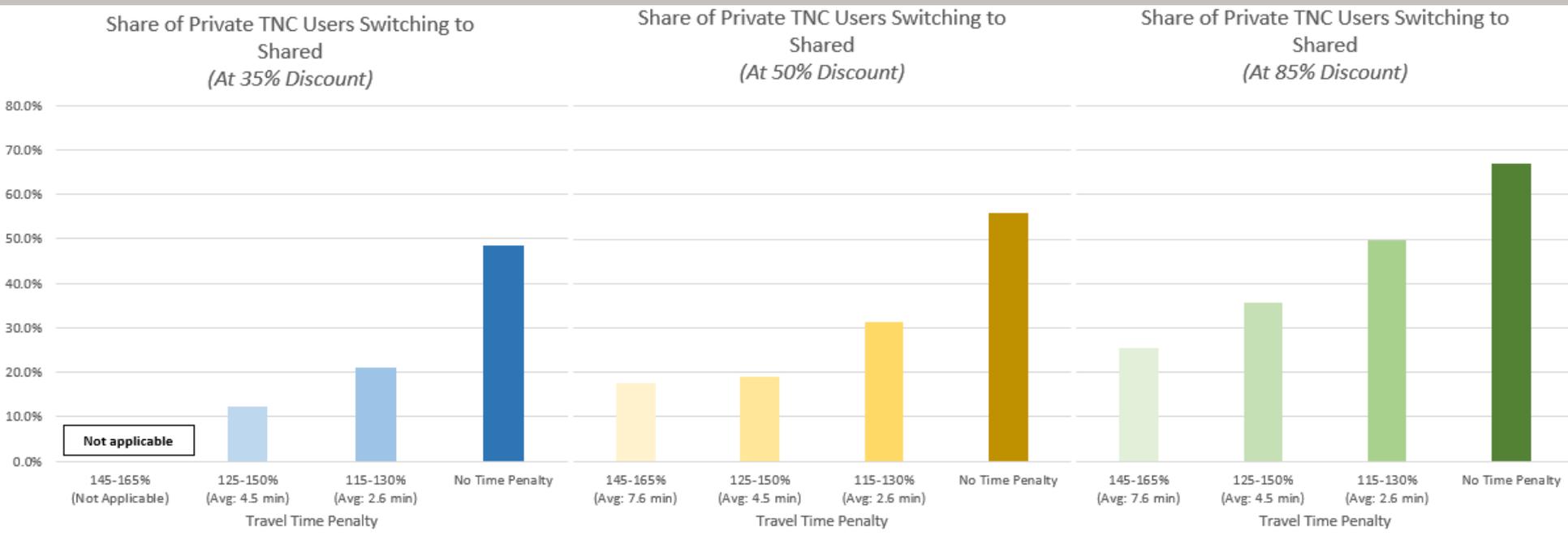
Reason I chose a private ride over a shared ride	% (n=3,142)
There was a chance that it was going to take a lot longer and that uncertainty is too risky	49.5%
The shared option was too much slower than the private option	29.2%
The discount was not big enough	24.6%
I prefer not to share my trip with a stranger	21.7%
I didn't see the shared option in the app	6.5%
I don't understand what the shared option is	0.0%

- Riders appear to place a very high value on their travel time/reliability, indicating an average willingness to pay of \$231 per hour saved (as shown on slide 14).
- 20% of riders never selected a shared option.



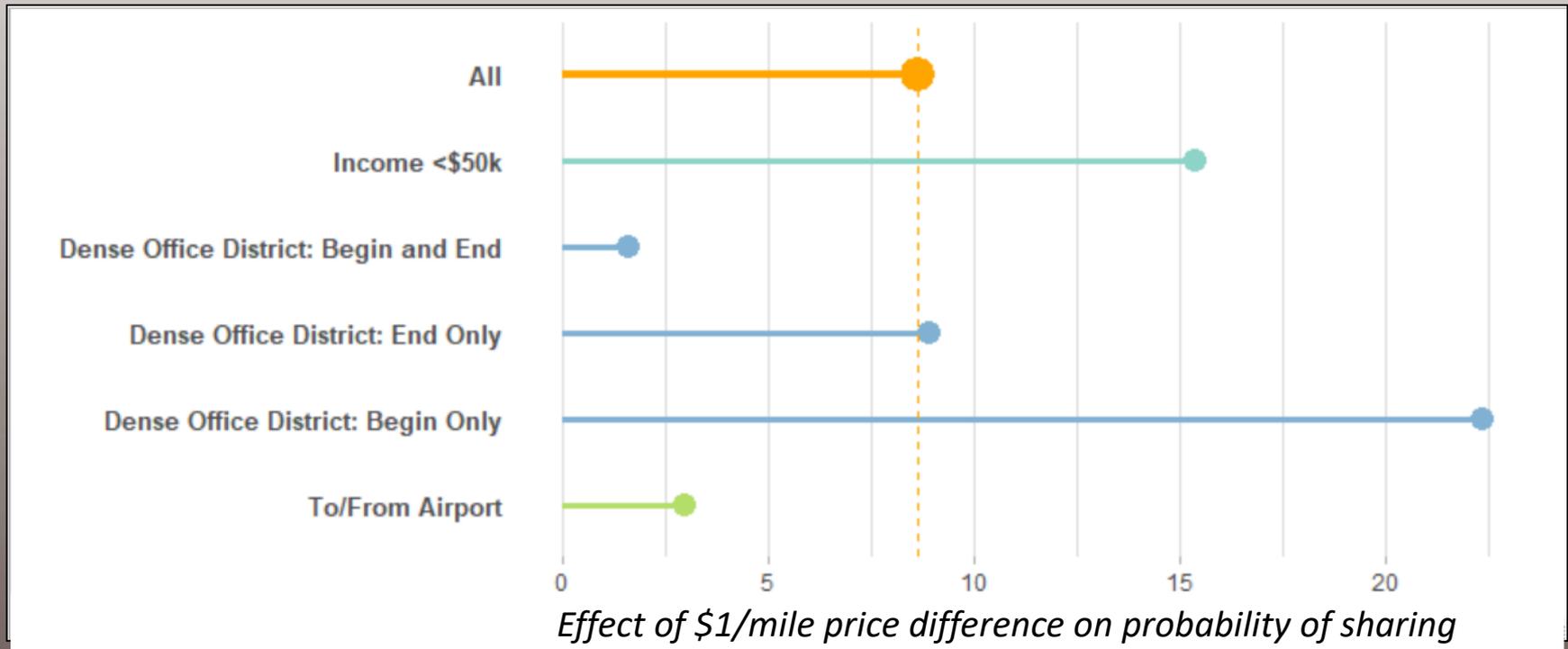
National Results: Price and Time Sensitivity

Share of respondents switching from private to shared at 11 different combinations of price difference (i.e., discount) and travel time penalty



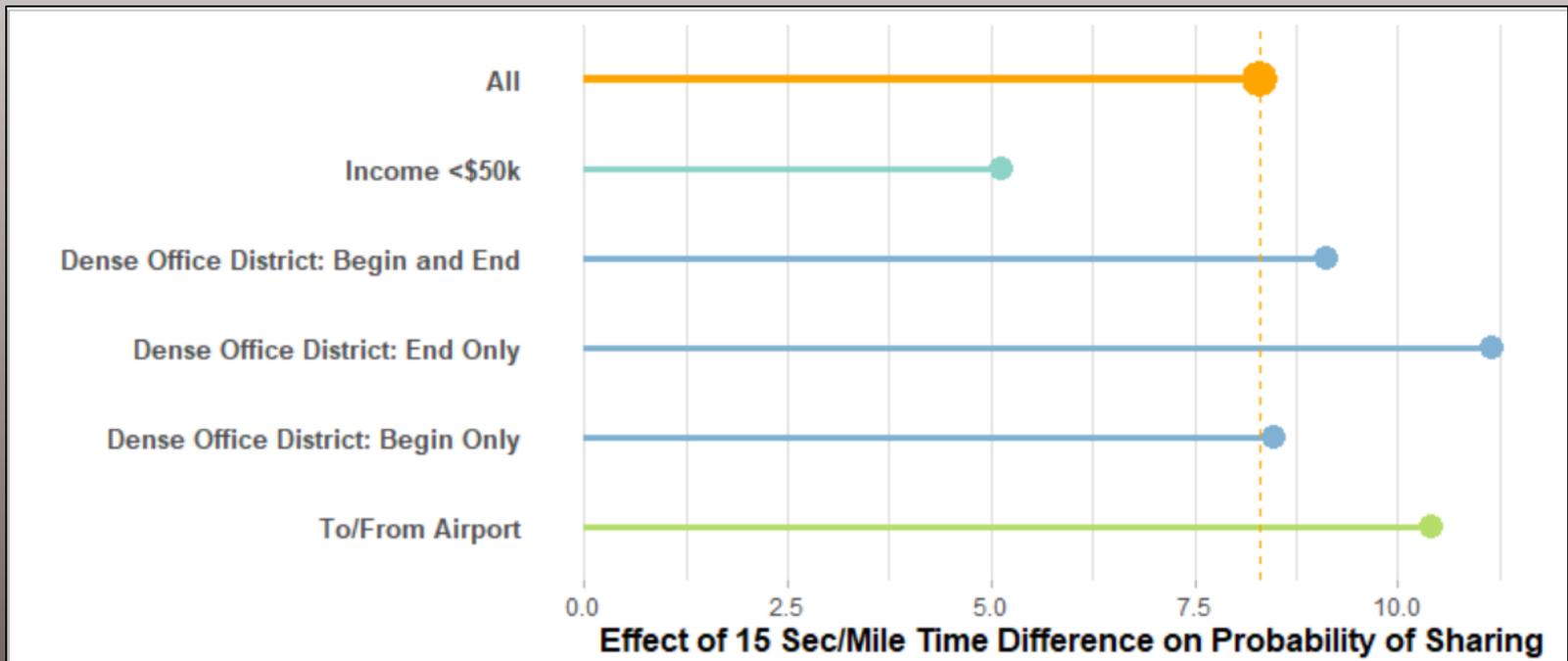
National Results: Price Sensitivity (continued)

For each additional dollar/mile price difference a rider sees between private and shared rides, they are about 8.6 percent more likely to use sharing.



National Results: Time Sensitivity

For each additional 15 seconds/mile relative travel time difference a rider sees between a shared ride and private ride, they are about 8.3 percent more likely to use sharing.



National Results: Price and Time Sensitivity

The **price difference between private and shared rides** that would increase the probability of sharing for **general trips** by 25 percent (i.e., from ~30% of trips to ~37.5%):

- \$0.87 per mile (at average trip length of 6.4 miles and starting price/mile of \$3.30) or

The **time difference between shared ride and private rides** that would increase the probability of sharing for **general trips** by 25 percent (i.e., from ~30% of trips to ~37.5%):

- 14 seconds per mile (at average trip length of 6.4 miles and starting speed of 23.8 mph)

The **implied value of time to increase general trips by 25%** with either a \$0.87 per mile price differential or 14 seconds per mile time differential:

- \$3.86 per minute or \$231.47 per hour

Differences that would increase the probability of sharing for **trips starting in office districts** by 25 percent:

- \$0.33 per mile, or
- 13 seconds per mile



Modeling Tool – Inputs (Sample)

Scenario 1: Increase cost savings for shared TNC trips relative to private TNC trips (\$/mi) - *only affects to TNC mode shares*

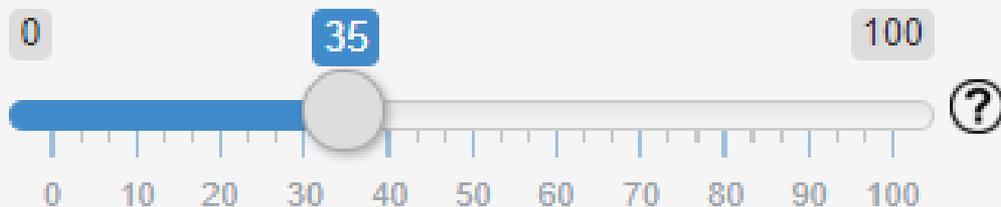


Scenario 2: Reduce travel time penalty for shared TNC trips relative to private TNC trips (mins/trip) - *only affects TNC mode shares*

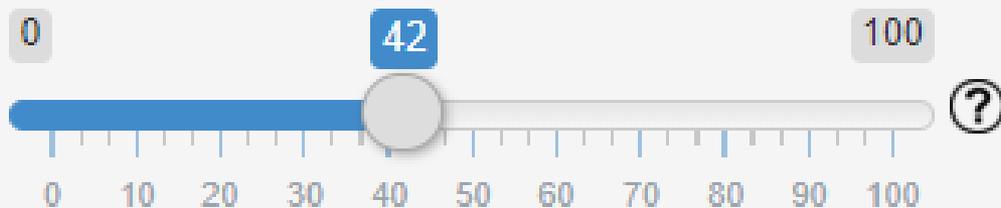


Modeling Tool – Inputs (Sample, continued)

Shared TNC Trip Overlap Rate (%):



TNC Non-passenger Miles (%):



Modeling Tool – Inputs (Sample, continued)

View Geography:

San Francisco Metro ▼ ⓘ

Population Segment

Dense Office District: Begin Only ▼ ⓘ



Modeling Tool – Outputs

(San Francisco-\$1/mile price increase)

Mode	Initial Share	New Share	Initial VMT	New VMT	Change in VMT
Drive Private Car	48.6%	48.6%	1,906,571,673	1,906,571,673	0.0%
Passenger in Private Car	22.0%	22.0%	N/A	N/A	0.0%
Use TNC (private)	1.0%	0.7%	32,919,104	21,393,364	-35.0%
Use TNC (shared)	0.6%	0.9%	13,319,508	21,560,412	61.9%
Use Transit	7.1%	7.1%	N/A	N/A	0.0%
Walk	18.8%	18.8%	N/A	N/A	0.0%
Bike	1.9%	1.9%	N/A	N/A	0.0%
Total	100.0%	100.0%	1,952,810,285	1,949,525,449	-0.2%



Modeling Tool – Outputs

(San Francisco-\$1/mile price increase, continued)

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Passenger in Private Car	22.0%	22.0%	N/A	N/A	0.0%
Use TNC (private)	1.0%	0.7%	22,978,104	11,399,264	-25.0%
Use TNC (shared)	0.0%	0.0%	33,395,088	21,167,412	-61.9%
Use Transit	7.1%	7.1%	N/A	N/A	0.0%
Walk	18.8%	18.8%	N/A	N/A	0.0%
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A \$1/mile relative price increase between private and shared rides for SF trips beginning in the central business district saves ~3.3 million VMT/year



Benefits of VMT Reduction (San Francisco Case)

Road Transport Externality*	Cost/Mile	Benefit
Congestion delay	\$0.053	\$174,573
Accident	\$0.100	\$329,384
Environment/Health	\$0.100	\$362,321
Energy security	\$0.007	\$23,057
Total	\$0.255	\$889,335



Conclusions

- Research used a novel **stated preference study** anchored off real TNC trips to simulate real decisions between taking private and shared TNC trips.
- **Higher rates of sharing** found among younger, lower-income riders, and for social trips and weekend trips.
- Users may be influenced by **time-based ridesharing** incentives or **price-based incentives**, but some users appear unmoved by price.



Conclusions (continued)

- Users taking certain types of trips are more inclined than other users to select a shared option if ***relatively small changes*** in cost and time are made in the direction that favors sharing.
- Modeling tool offers **insight to policymakers and TNCs on impacts to** multimodal transport system, of which TNCs are one component.



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