

Study Motivation

- ❑ Since UPA/CRD are demonstration programs, strong emphasis on evaluation and learning
 - FHWA-sponsored evaluation at all six UPA sites, plus in-depth household surveys in **Seattle** and **Atlanta** to study impacts on traveler behavior
- ❑ Survey addresses the impacts of tolling on:
 - Route and mode choice
 - Trip departure times
 - Origin-destination patterns
 - Overall VMT and daily travel time budgets
 - Carpooling
 - Telecommuting
 - Equity

Outline

- ❑ Survey Methodology Summary
- ❑ Key Findings: Seattle
- ❑ Key Findings: Atlanta
- ❑ Discussion / Future Work

Approach and Methodology

- ❑ Household Panel Study: same households before and after tolling
 - 2-day travel diary plus questions on demographics, typical commute, technology ownership, attitudes and values
- ❑ Sample corridor users
 - Drivers: license plate capture during AM and PM peak, with match to registered address; mail study invitations to households
 - Transit intercept in-person
 - Vanpool members: via email to vanpool participants
- ❑ Invite ALL adult members of household to participate
- ❑ Online survey with option to take by phone
- ❑ Pilot Study
- ❑ Incentives (\$15/\$30 Amazon gift card)
- ❑ Panel maintenance
- ❑ Focus groups in Seattle to get initial impressions of tolling & refine Wave 2 survey
- ❑ Weighting of data to adjust for stratified sampling approach



Survey Invitation

- ❑ Advance notification postcard
- ❑ Introductory letter
- ❑ FAQs

Lake Washington Transportation Study
MEMORY JOGGER

To log your trips, go to
<http://www.rgsurvey.com/seattle/portal>

DAY 1 Name: _____ Travel Date: _____

	When did your trip...		Traveled by	Traveled with	Where did you go?	
	Start?	End?			Description	Address/Intersection
Example	8:05AM	8:35AM	Car	Eloise	Daycare	99 Spring St., Seattle
Example	8:50AM	9:10AM	Walking	n/a	Work	701 5th Ave., Seattle
1st Trip						
2nd Trip						
3rd Trip						
4th Trip						
5th Trip						
6th Trip						
7th Trip						
8th Trip						
9th Trip						
10th Trip						

DAY 2 Name: _____ Travel Date: _____

	When did your trip...		Traveled by	Traveled with	Where did you go?	
	Start?	End?			Description	Address/Intersection
Example	8:15AM	8:50AM	Car, then Bus	Mark & Jim	Work	701 5th Ave., Seattle
Example	10:45AM	10:55AM	Walking	Steve	Coffee	Columbian St. & 3rd, Seattle
1st Trip						
2nd Trip						
3rd Trip						
4th Trip						
5th Trip						
6th Trip						
7th Trip						
8th Trip						
9th Trip						
10th Trip						

This sheet is for your use only. We do not need you to return this form.
 If you have questions, please email seattle@rgsurvey.com



- ❑ Memory Jogger
- ❑ Reminder postcards and emails

Overall Response and Sample Size Summary

	Seattle	Atlanta
Net Survey Invitations	31,873	37,888
Wave 1 Completed Households (Entire Survey Completed by All Adult Household Members)	3356	2412
Wave 1 Response Rate (As Share of Initial Contacts)	10%	6%
Households Retained in Wave 2	2063	1655
Wave 1 to Wave 2 Panel Retention Rate	61%	69%
Overall Response Rate (as Share of Initial Contacts, by Mode)	6%	4%

Sample Demographics

- ❑ Panels were demographically similar to other survey samples of their regions/corridors
- ❑ However, compared to the Census, there were higher levels of education and income; more respondents from middle age groups

Seattle

SR-520 Project Overview



SR-520 Project Overview

- Weekday toll schedule as of spring 2012:

	Toll Tag	Pay by Mail
5-6 AM:	\$1.60	\$3.10
6-7 AM:	\$2.80	\$4.30
7-9 AM:	\$3.50	\$5.00
9-10 AM:	\$2.80	\$4.30
10 AM - 2 PM:	\$2.25	\$3.75
2-3 PM:	\$2.80	\$4.30
3-6 PM:	\$3.50	\$5.00
6-7 PM:	\$2.80	\$4.30
7-9 PM:	\$2.25	\$3.75
9-11 PM:	\$1.60	\$3.10
11 PM – 5 AM:	Free	Free

External Factors

- ❑ Gasoline prices: increased 35% from Wave 1 (\$3.06) to Wave 2 (\$4.13)
- ❑ Transit fares: base Metro bus fare up \$0.25 per ride since Wave 1
- ❑ Employment levels: total nonfarm employees in region about 3% higher in Wave 2

Results: Overall Travel

- ❑ Significant drop in overall corridor travel, especially on SR-520
- ❑ Not offset by any increase in off-corridor travel
- ❑ Diary data consistent with respondents' self-estimates of "typical" weekly travel

Travel Diary Summary, Wave 1 to Wave 2

	Trip Count	Imputed VMT
Overall Corridor	-18%	-23%
<i>SR-520</i>	<i>-43%</i>	<i>-50%</i>
<i>I-90</i>	<i>-13%</i>	<i>+1%</i>
Non-Corridor	-13%	-9%
TOTAL	-14%	-17%

"I do what I can to avoid the premium rate and any travel to Seattle that isn't necessary, i.e. I used to hop over to the U-Village or City People's on a regular basis. Not any more."

Mode Choice

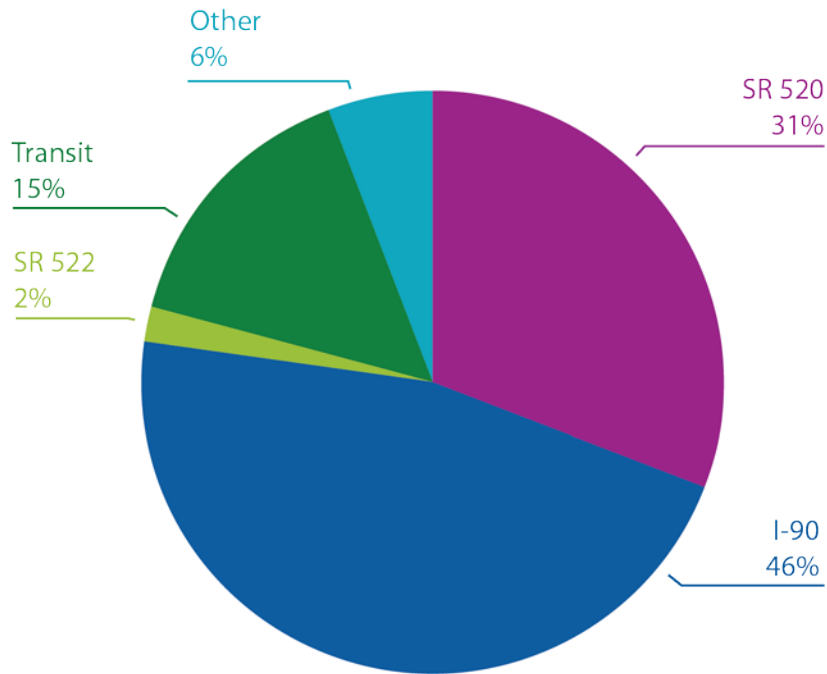
- ❑ Transit mode share on corridor rose from 15% to 18%
- ❑ Share of commuters reporting transit as a “typical” commute mode rose 1.5 percentage points
- ❑ Avoiding tolls was common motivation for switching to transit (45%) but respondents also mentioned reduced stress (44%) and gasoline costs (39%); few cited improved bus service (8%)

“I have also been taking the bus with some frequency. I expected to be inconvenienced by these changes, but surprisingly, I do not feel that way. I enjoy my new travel arrangements.”

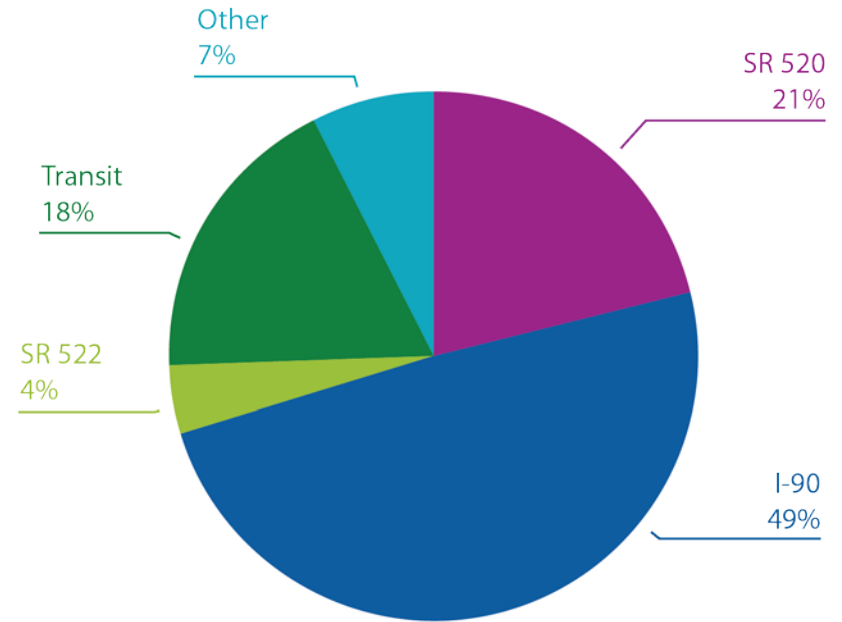
Route Choice

- ❑ SR-520's share of corridor trips fell, while shares for I-90 and SR-522 both increased
- ❑ 86% of those who switched from SR-520 to I-90 or SR-522 cited avoiding the toll as a motivation; no other factor came close

Summary of Lake Wash. Corridor Trips by Route/Mode



Wave 1



Wave 2

Trip Purpose

Biggest Drops in VMT, Wave 1 to Wave 2		Most Stable, Wave 1 to Wave 2	
Shopping	-29%	Social/rec.	+1%
Dining	-29%	Child care	-1%
Pick-up/Drop-off	-27%	Return home	-14%
School	-26%	Go to work	-17%

“We have greatly reduced our trips to the eastside, except for our child, who takes a school bus now.”

Vehicle Occupancy

- ❑ Mean private vehicle occupancies rose slightly on corridor, 1.48 to 1.56
- ❑ On SR-520, rose from 1.42 to 1.61; solo trips fell from 76% to 69%
- ❑ However, no indications of a major shift to carpooling for commuting; held steady at 13%-14%

Telecommuting

- ❑ Two measurements: recorded telecommuting on assigned travel days & self-reported typical telecommuting
- ❑ Both showed no significant change from Wave 1 to Wave 2
- ❑ About 15% of employed respondents telecommuted during at least part of one assigned travel day
- ❑ In follow-up questions, any changes to telecommuting patterns were most frequently attributed to work-related factors, not transportation- or toll-related

“It has motivated us to take transit or telecommute as much as possible, but that's not always do-able.”

Trip Departure Time

- Little net change in the peak vs. off-peak distribution of trips in the corridor
 - On I-90, peak share fell from 61% to 56%
 - On SR-520, peak share rose from 53% to 57%

“Because traffic has increased on the I-90 bridge due to the 520 tolling, I leave 15 minutes earlier from both home and work to try to beat the congestion on Mercer Island.”

“Decreased traffic means I can sleep in later in the morning and get to/from work faster.”

Origin-Destination Patterns

- ❑ Cross-lake travel declined slightly more than overall travel (-18% vs. -14%)
- ❑ Open-ended comments frequently mention staying on own side of Lake Washington
 - Otherwise, there do not appear to be other large shifts in overall O-D patterns
 - We are analyzing in GIS in more detail

Tracking the Choices of SR-520 Users

- ❑ Among those using SR-520 as their primary route in Wave 1:
 - 55% were still using it in Wave 2
 - 24% switched to I-90
 - 7% switched to SR-522
 - 8% switched to transit
 - 4% switched to another route/mode
 - 1% no longer crossed the lake regularly
- ❑ Those who switched to I-90 were more likely to be male, lower-income, with less schedule flexibility

Trip Satisfaction Ratings

- ❑ There was a significant increase in trip satisfaction levels on SR-520
 - For example, for peak-period trips, mean score on satisfaction with travel speed on SR-520 rose from 3.4 to 5.2 (on 7-point scale)
- ❑ Satisfaction with I-90 trips fell slightly, especially among existing I-90 users
- ❑ On transit, satisfaction was mixed: up slightly for travel time, down slightly for seating availability

Equity Issues and Toll Payment

- ❑ Transponder ownership and use of pay-by-plate were both correlated with higher incomes
- ❑ Higher income HHs generally paying more tolls
 - Highest income HHs (>\$200K) recorded about \$3 in tolls paid over 2-day period, vs. about \$1 for HHs under \$50K
 - Avg. toll paid was roughly equal (c. \$3) – difference was in the number of trips
- ❑ Lower-income HHs cut back on travel much more
 - HHs below poverty level: VMT down 48%, cross-lake trips down 38%
 - HHs over 10 times poverty level: VMT down 14%, cross-lake trips down 19%

Recap of Key Survey Findings

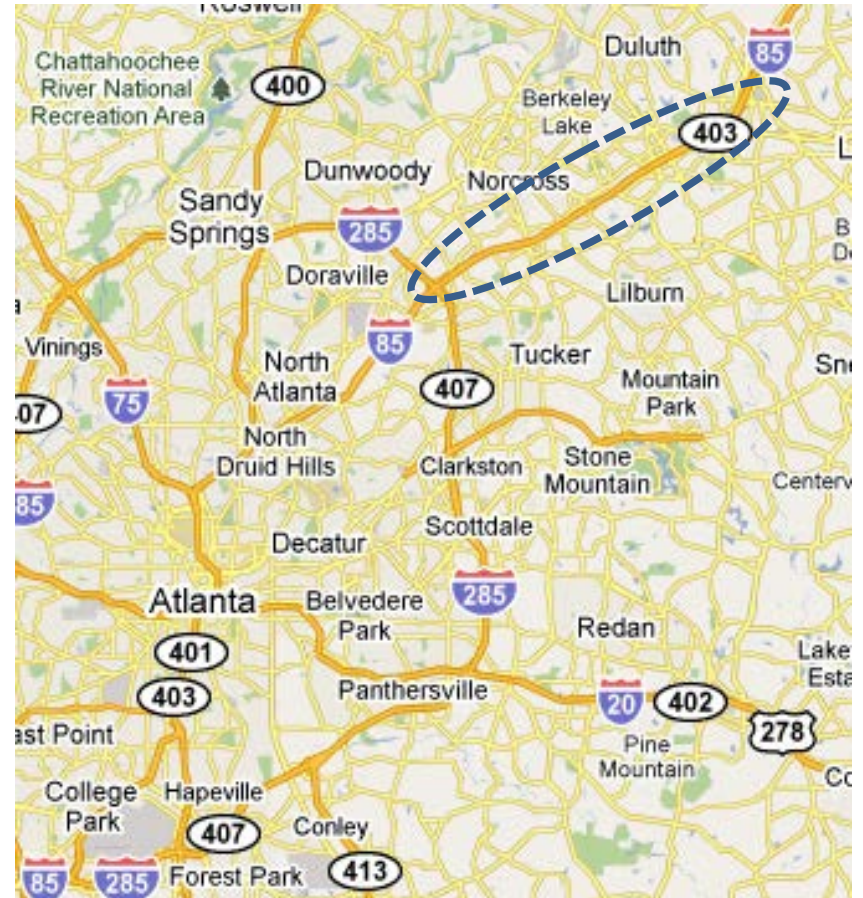
- ❑ Significant decline in overall Lake Washington corridor travel, particularly on SR-520
- ❑ Diversion to toll-free alternative routes & transit
- ❑ Small increases in vehicle occupancy on SR-520
- ❑ Some small variations in trip-making behavior by purpose and destination
- ❑ Little to no change in telecommuting

Recap of Key Survey Findings

- ❑ Demographic differences between those who stayed with SR-520 vs. switched to I-90
- ❑ Significant increase in trip satisfaction levels for trips on SR-520
- ❑ Differences in response to tolling among income groups

Atlanta

- ❑ HOV-2 to HOT-3 conversion on 15-mile stretch of I-85 northeast of Atlanta
- ❑ Variable (dynamic) pricing; toll prices presented to travelers on dynamic messages signs prior to access points for the Express Lanes
- ❑ Electronic collection (Peach Pass) & automated enforcement
- ❑ Enhanced express bus service & new park-and-ride facilities



Overall Results: Mode and Route Choice

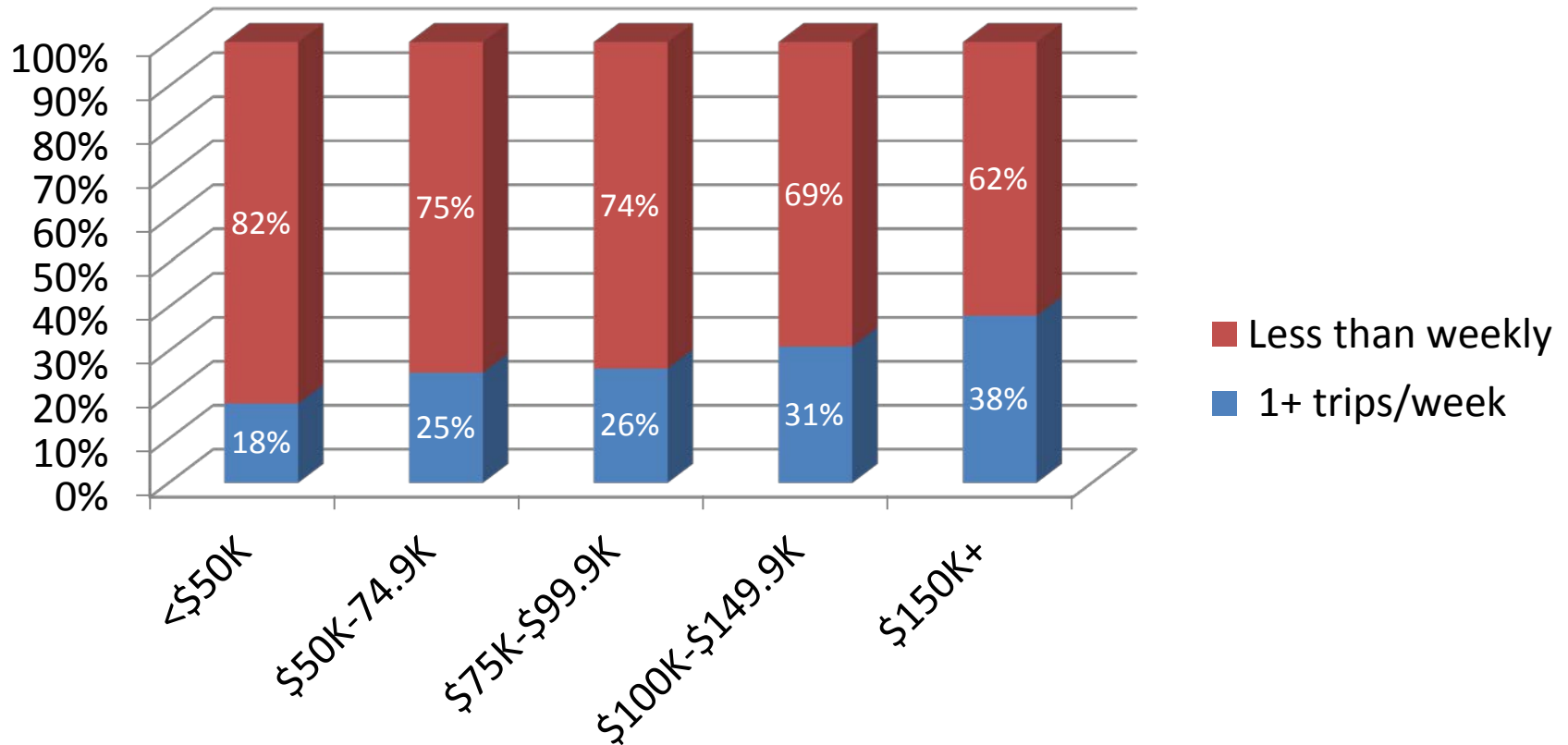
- ❑ The large majority of respondents continue to drive alone in the corridor
 - But there is a slight increase in carpool trips (2+ persons)
 - A slight but non-significant uptick in transit share (3.1% to 3.5 %)
- ❑ Share of corridor trips on I-85 rose a bit compared to nearby arterials
- ❑ Overall, vehicle occupancy on I-85 increased slightly, from 1.13 to 1.17
 - Average occupancy fell dramatically in the HOV/Express Lane, from approx. 2.2 to 1.2
 - Rose from 1.1 to 1.2 in the General Purpose (GP) lanes

Overall Results: Lane Usage

- ❑ Share of I-85 trips in the GP lanes fell from 94% to 85%
 - In other words, Express Lane sees more usage than former HOV lane
- ❑ In Wave 2, usage of Express Lane was primarily by solo drivers paying toll:
 - 82% solo driver paying toll
 - 4% two-person carpools paying toll
 - 9% HOV-3 or more
 - 5% alternative fuel vehicle or motorcycle

Equity: Express Lane Usage by Household Income

Among those making 1+ trips/week on I-85



Recap of Findings

- ❑ I-85's share of corridor travel grew slightly, though overall trips were down in Wave 2
- ❑ Mode choices were largely unchanged:
 - Large majority of respondents continue to drive alone for their I-85 trips;
 - Slight increase in 2+ person trips across the survey waves
 - Use of transit fairly consistent

Recap of Findings (2)

- ❑ Trip diary data confirms that Express lane trips make up a significantly greater share of all reported trips than did HOV trips (15% vs. 7%)
- ❑ Large share (82%) of Express lane trips are solo drivers who pay a toll
- ❑ No decline in overall vehicle occupancy across the survey waves – decline in vehicle occupancy in the Express lanes offset by an increase in vehicle occupancy in the GP lanes
- ❑ Drivers are somewhat more satisfied with their Express Lane trips, post tolling

Planned Future Work

- ❑ GIS-based analysis of changes in origin-destination patterns
- ❑ Archiving of anonymized survey data for use by other researchers

Thank you!

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