



Joseph P. Bort MetroCenter
101 Eighth Street
Oakland, CA 94607-4700
TEL 510.817.5700
TDD/TTY 510.817.5769
FAX 510.817.7848
E-MAIL info@mtc.ca.gov
WEB www.mtc.ca.gov

Memorandum

TO: BATA Oversight Committee

DATE: November 2, 2011

FR: Executive Director

RE: Final Report on Impacts of July 2010 Toll Increase on State-owned Bridges

The attached PowerPoint presentation provides the final results of a year-long independent study to evaluate the impacts of the toll increase on the state-owned bridges that was implemented on July 1, 2010. The toll increase included a new \$2.50 carpool toll on all bridges, a \$1.00 toll increase for 2-axle vehicles on all state-owned bridges except the San Francisco-Oakland Bay Bridge (Bay Bridge), and a \$2.00 peak period toll increase on the Bay Bridge (i.e., congestion pricing).

In July 2010, researchers at the University of California, Berkeley were hired to conduct a year-long comprehensive and independent analysis of the impacts of the toll increase, particularly as it relates to carpool toll lanes and congestion pricing on the Bay Bridge. Their efforts included: reviewing travel data and consultant reports; conducting focus groups, surveys, and interviews; and running complex travel behavior models.

Also attached is an Executive Summary of the final report prepared by UC Berkeley. The research team will present more details of their findings at the November meeting.

A blue ink signature of Steve Heminger, consisting of a stylized 'S' followed by a horizontal line and a flourish.

Steve Heminger

SH:ll

Bay Bridge Toll Evaluation

**Elizabeth Deakin, Karen Trapenberg Frick
Robert Cervero, and Alex Skabardonis**

November 9, 2011

Bay Bridge Toll Structure

	Weekday Peak (5-10AM, 3-7PM)	Weekday Off-Peak	Carpools (5-10AM, 3-7PM)	Weekends
BEFORE 7/1/10	\$4.00	\$4.00	Free	\$4.00
AFTER 7/1/10	\$6.00	\$4.00	\$2.50*	\$5.00

*Payable with FasTrak only; must use designated lanes to obtain \$2.50 discount toll.

Study Research Approach

- **Conducted independent analysis**
- **Mixed methods approach to capture complexity of traveler decisions**
- **Travel data, surveys, focus groups, interviews**
- **Reviewed and evaluated agency data & consultant reports**

Study Challenges

- High day-to-day variability in traffic, congestion
- Traffic also varies seasonally
- Bay Bridge carpooling was declining before the toll changes
- Other factors affect travel choices, traffic levels: gas prices, recession, changes in population, business location & activity, construction impacts, special events, even weather



need to differentiate these factors from toll effect

Key Consideration: Price of trip

- **\$2 peak toll increase is a small portion of the average round trip costs* which can range from \$15 to \$30**
- **\$15 from Oakland, \$25 from Walnut Creek & \$30 from Vallejo**
+ *toll + parking potentially*

* Average costs include fuel, routine maintenance, tires, insurance, license, registration, taxes, depreciation, & finance

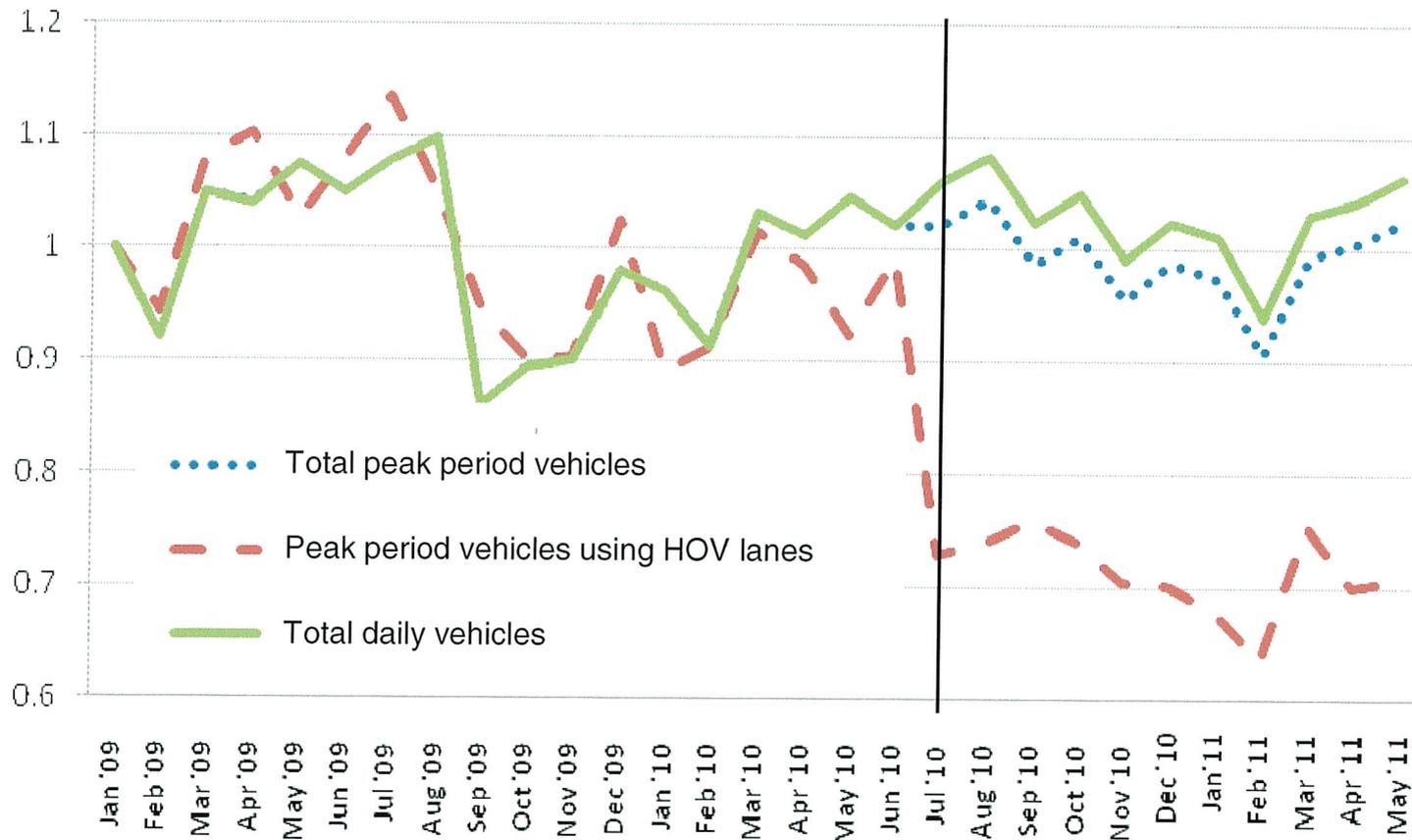
What Were the Changes in Travel?

Bay Bridge Annual Average Daily Traffic (work days)

Lane	Before Toll Increase	After Toll Increase	Vehicle difference
Cash/FasTrak	108,110	111,420	3,310
Carpool Lanes	16,900	12,535	(4,365)
Total	125,010	123,955	(1,055)

Source: BATA, 12-month FY09/10 and FY10/11 toll plaza data

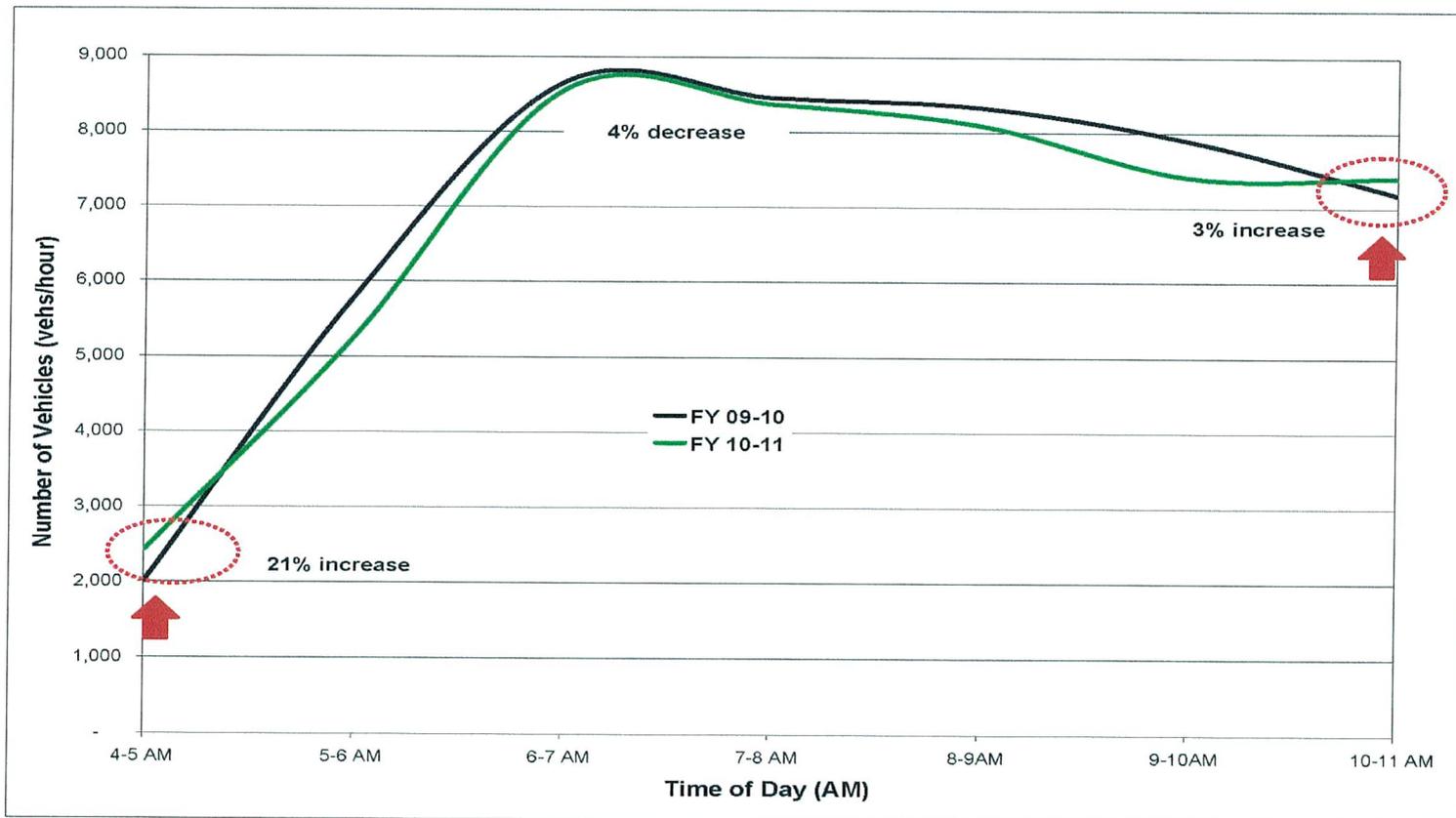
Bay Bridge Traffic Trends: Monthly Volumes As Proportion of January 2009 Volumes



Impact on Drive-Along Travel

- Some shift to off-peak “shoulders”
- Some shift to BART
- Some increase in sharing rides (two persons as well as 3+)
- Some just enjoying faster trip

Bay Bridge Annual Average Traffic (AM Peak)



Source: BATA

Change in Cash Travel Times Feb/Mar 2011 vs. Apr/May 2010

Hour:	Travel Time Change (min)		
	I-80	I-580	I-880
5-6am	no change	no change	no change
6-7am	-4	-4	-6
7-8am	-9	-11	-16
8-9am	-5	-10	-11
9-10am	-6	-11	-11
3-4pm	-2	no change	no change
4-5pm	-2	no change	no change
5-6pm	-4	-2	-2
6-7pm	-5	-5	-6

Negative values indicate reduction (improvement) in travel time.

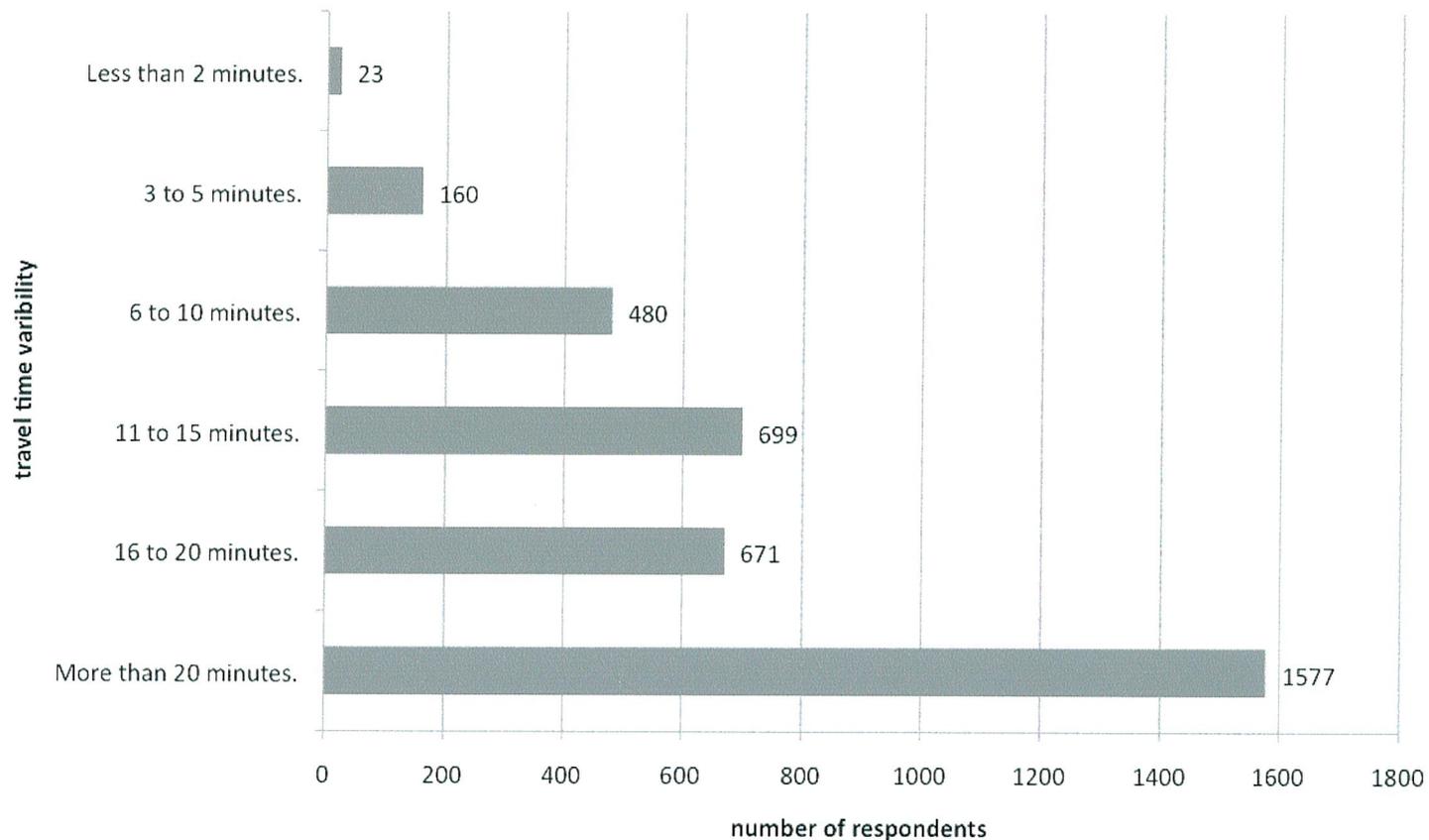
Change in FasTrak Travel Times Feb/Mar 2011 vs. Apr/May 2010

Hour:	Travel Time Change (min)		
	I-80	I-580	I-880
5-6am	-1	no change	no change
6-7am	1	3	no change
7-8am	4	7	-2
8-9am	-1	no change	-6
9-10am	-3	no change	-4
3-4pm	-3	no change	no change
4-5pm	-5	-1	no change
5-6pm	-6	-2	-1
6-7pm	-4	-3	-2

Negative values indicate reduction (improvement) in travel time.

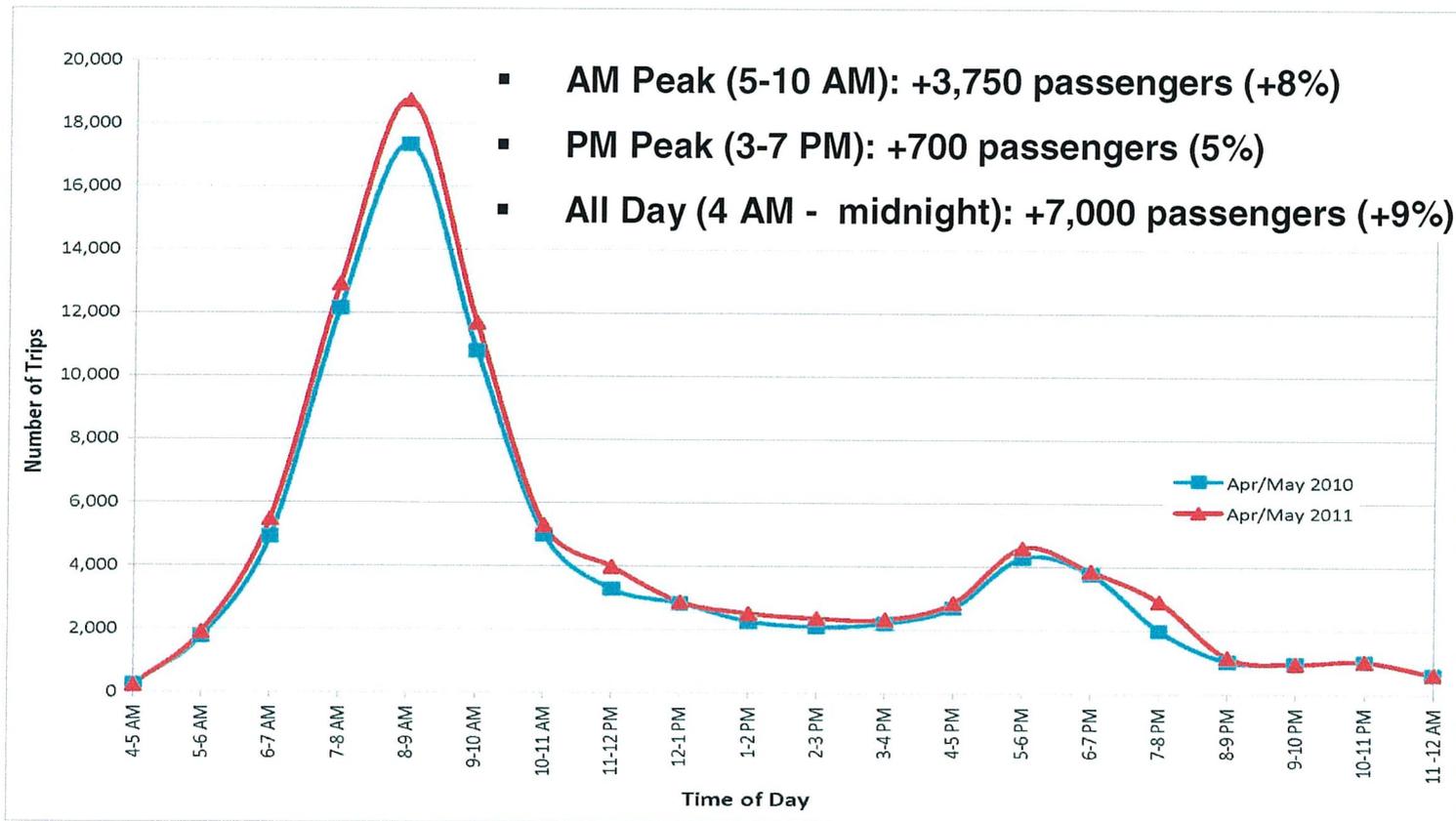
Source: BATA Floating Car Run Data 12

Traveler-Reported Variability of their Daily Door-to-Door Trip



Source: BATA survey of Bay Bridge users, June 2011

BART Weekday Hourly Transbay (westbound direction)



Source: BATA, BART

What Happened to Bay Bridge Carpools?

Carpools and Traffic Volumes

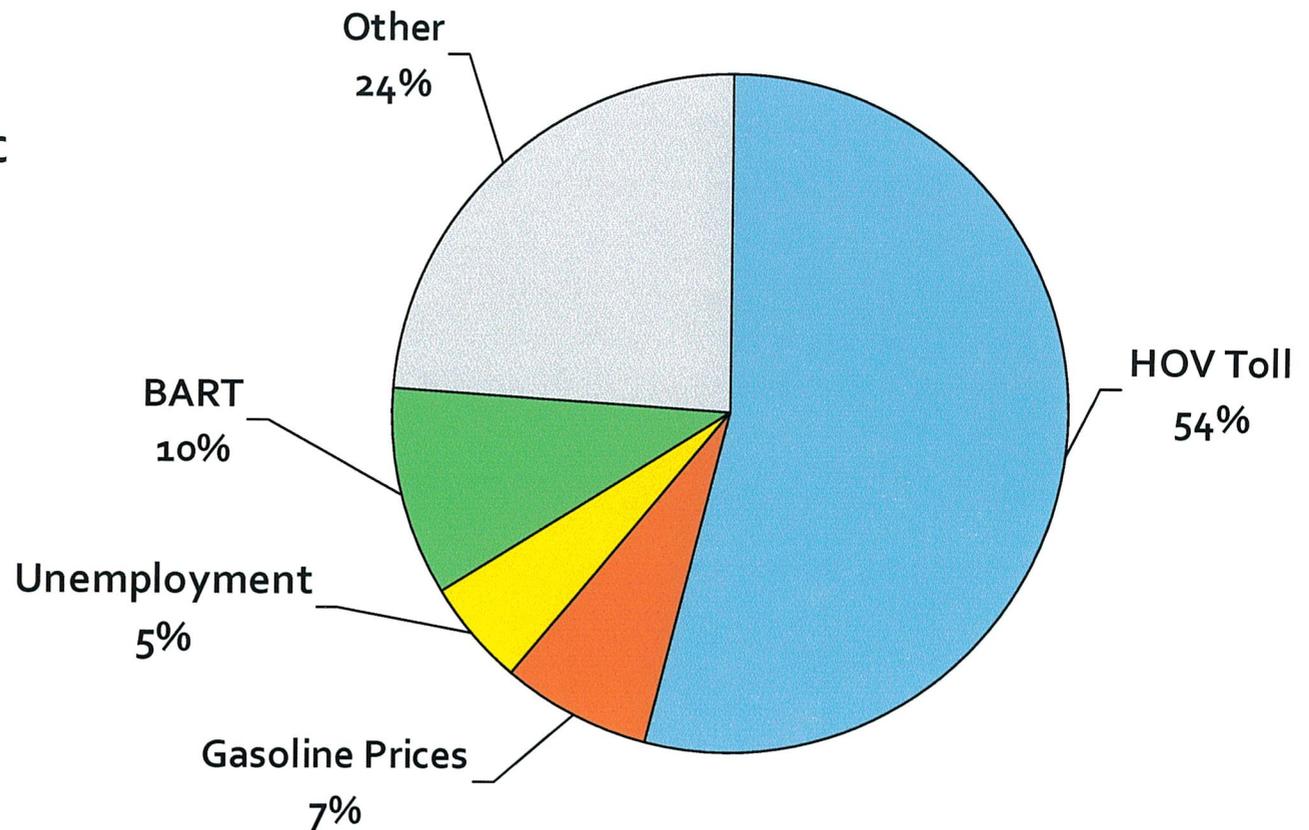
- Carpool counts down 4,300 vehicles
- BUT at 3 people per vehicle = 13,000 people were affected
- If they all became solo drivers, there would be 13,000 more vehicles in the cash/FasTrak lanes
- BUT only 3,300 more vehicles in the cash/FasTrak lanes
- So many carpoolers did not become drive-alone bridge crossers

What Could Carpool Lane Users Have Done?

- some travel by BART or other transit mode
- some are two-person carpools
- some travel off-peak
- some were not carpools to start with (i.e., violators)

Key Factors Influencing Carpool Lane Traffic Volume Decreases

“Other” includes:
changes in economic
conditions, social
relationships
between carpoolers,
changes in travelers’
personal
circumstances and
additional factors



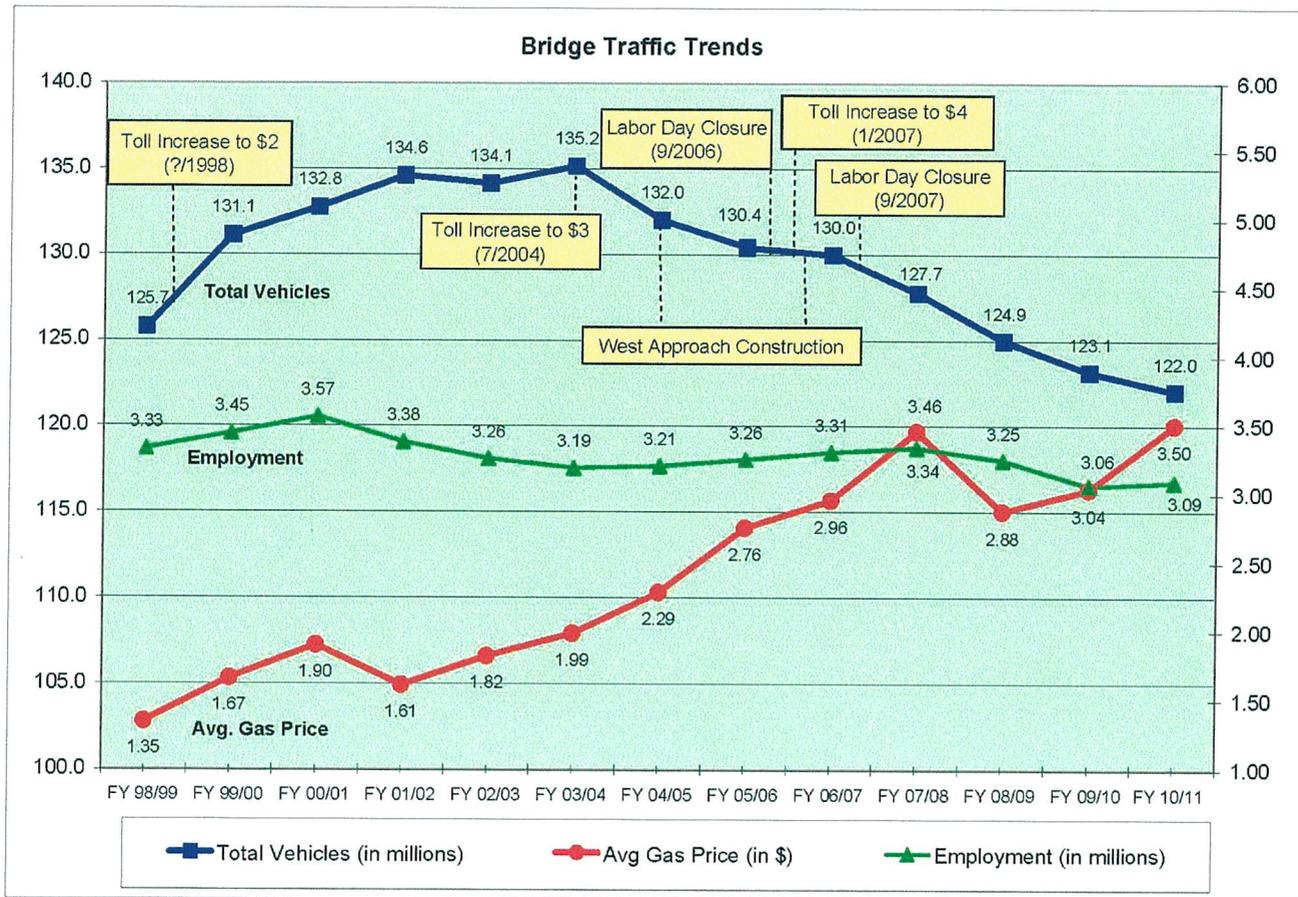
Source: Data collected from BATA, BART and other sources

Toll Sharing by Casual Carpool Passengers

- **Varies by location:**
 - **\$1.25 for Vallejo (2 bridges)**
 - **\$1 at some East Bay sites**
 - **no toll accepted at other locations**

How Did the Economy and Other Factors Play a Role?

Bay Bridge Trends



Source: BATA

Key Factors Contributing to Changes in Total Volumes

- **Much of the traffic volume changes are due to factors unrelated to the toll increase, including:**
 - economic conditions
 - traveler's personal circumstances, such as changes in home and work locations, and other factors
- **Other factors that affected traffic volumes were:**
 - bridge toll increase
 - changes in the gas price
 - the availability of BART

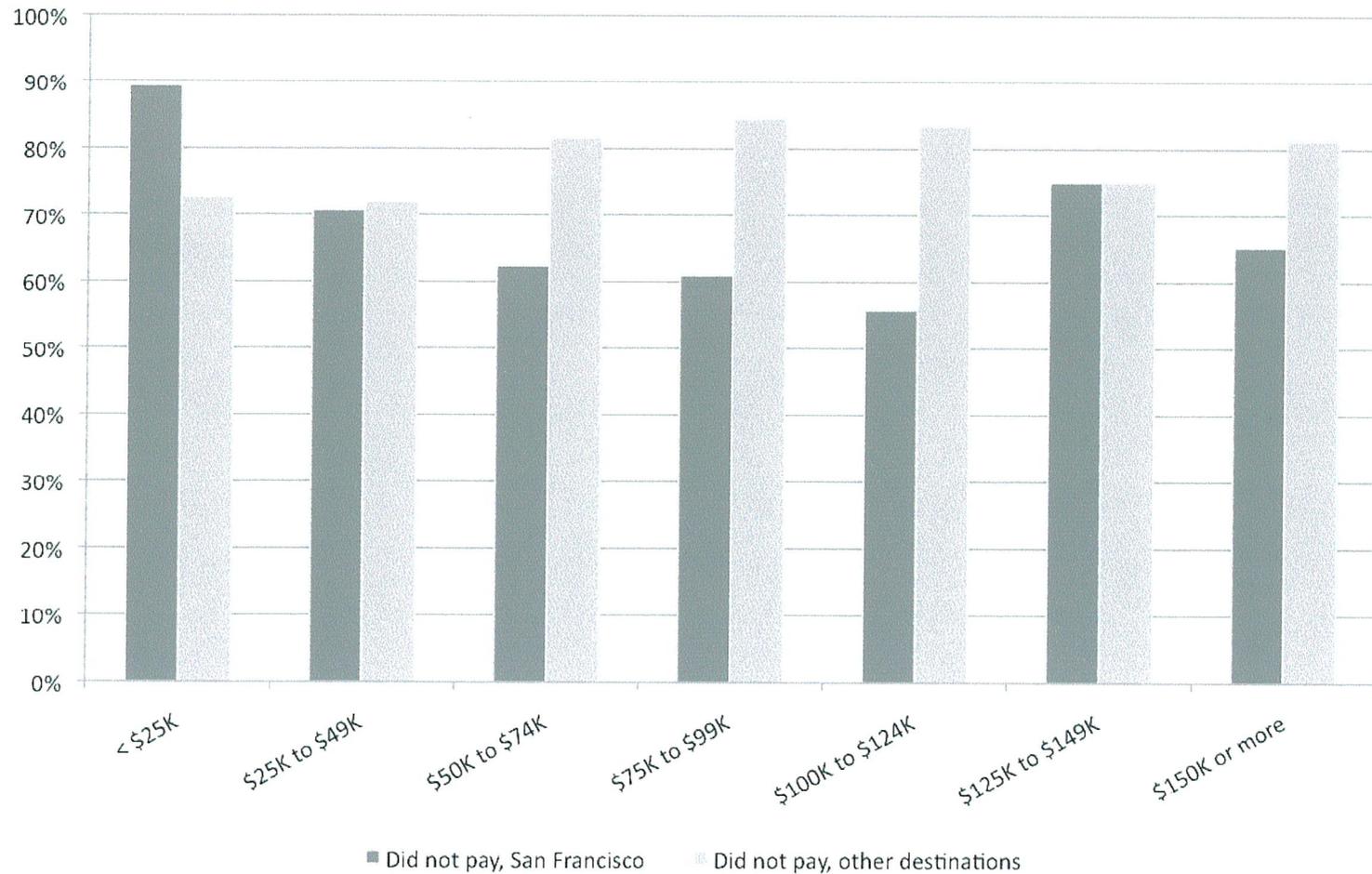
What Role Does the Cost of Parking Play?

Parking is a key factor

- Many drivers have access to free or subsidized parking, which affects travel choices. Even with a toll increase, they still save money by not paying for parking (see next slide).
- These drivers park in on-street spaces they have been able to find, and off-street spaces in employer-provided parking.

Parking is a key factor

Bay Bridge Drivers who did not Pay for Parking at their destination



What are Other Highlights?

New Toll Revenue Estimates vs. Actuals

FY 2010/11 – New Toll Revenues (Millions)

	Estimated New Revenues	Actual New Revenues * (Jul-Jun)	Percent of Total Actual
Reduced Rate (Carpool Lane)	\$ 15	\$ 15.0	100%
Full Fare (Cash and FasTrak)	\$ 114	\$ 117.7	103%
Total	\$ 129	\$ 132.7	102%

* Actual New Revenues are calculated as the increase in revenue generation compared with FY 09-10.

Business Impacts: Minimal

- Impact is small because only some employees, suppliers, customers or clients are affected by tolls.
- Many business travelers and employees could avoid travel in peak periods or use other modes if the toll was a concern.
- Businesses had no plans to change their practices in response to a \$1-\$2 / day toll, especially during difficult economic times.

Business Impacts (cont'd)

- **Businesses that are time-sensitive or employ workers with a high value of time saw the toll increase and congestion pricing as a boon – benefits from faster, more reliable transportation**
- **Businesses that require deliveries or customer arrivals during times of heavy congestion see peak period charges less favorably.**

Summary

- **Peak period pricing led to less congestion at the Bridge approaches & saving time**
- **Net effects on bridge traffic were minimal**
- **Bay Bridge carpool lane volumes dropped 26% & Cash/FasTrak volumes went up by only 3%.**

Summary (cont'd)

- **Some went to transit, others to off-peak; still others to other destinations; some dropped to two-person carpools.**
- **Others have switched to carpooling**
- **Mode changes often due to personal circumstances**

Additional Research Team Members

**James Rubin, Ian Barnes , Karla
Kingsley, Eric Jensen, Javier
Amaro, Cindy Sun, Jennifer Wong,
Melanie Curry, Andreanna
Tzortzis, and Nathan Machida**

Bay Bridge Toll Evaluation: Executive Summary

E. Deakin and K.T. Frick, University of California, Berkeley

On July 1, 2010, the Bay Area Toll Authority (BATA) raised the tolls on the seven state-owned bridges in the San Francisco Bay Area. For six of the bridges, a flat \$5 toll was implemented for passenger vehicles with a 50% discount (\$2.50 toll) for peak-period 3+ person carpools, which had previously crossed the bridges free of charge. On the San Francisco-Oakland Bay Bridge, a more complex toll structure was put into place. The toll was increased to \$6 during weekday peak periods (5-10 a.m. and 3-7 p.m.), and the off-peak weekday toll was left unchanged at \$4. The peak period 3+ person carpool toll was set at \$2.50, the same as on other bridges.

A year-long independent study was carried out at the University of California, Berkeley, evaluating the effects of the new toll structure on the Bay Bridge. The study examined the following questions:

- What effects did the new tolls have on traffic volumes on the Bay Bridge?
- How did traffic conditions change in response to the peak/off-peak tolls?
- How much of the change in Bay Bridge traffic was due to the toll changes, and how much was due to the recession, increased fuel prices, and other external factors?
- How have carpooling and transit ridership been affected?
- How did the traveling public respond to the changes in bridge tolls?
- How did businesses react to the change in Bay Bridge tolling?

This Executive Summary reports the major findings from the UC Berkeley study.

1.0 Effects on Traffic Volumes

For the first full year of the toll increases, total traffic volumes on the Bay Bridge decreased by 1% compared to the previous year (see Table 1). Vehicles in the cash/FasTrak lanes increased by 3% and vehicles in the carpool lanes decreased by 26%. The decrease in carpools affects approximately 13,000 people, assuming an average of three people per vehicle. If they all became solo drivers, there would be 8,700 more vehicles. However, there are only 3,300 more vehicles in the cash/FasTrak lanes. Thus, the majority of carpools did not become drive-alone bridge crossers.

2.0 Changes in Traffic Conditions

Detailed analyses of Bay Bridge traffic data, lane by lane and hour by hour, show that improvements in travel times following the toll increases were relatively large for some times of day and some of the approaches, and less significant for others. Traffic data show that shifts out of the peak into off-peak times of day occurred. Carpool lane usage dropped considerably, but the other lanes continued to function better than before the toll increase, suggesting that the carpoolers did not change to driving alone during the peak commute periods. Findings from

surveys and focus groups suggest that some carpoolers switched to transit, some traveled off peak, and some are in two-person carpools in the cash/FasTrak lanes.

3.0 Sorting Out Toll Effects From Other Factors

Traffic changes can result not only from tolls but also from changes in employment levels, costs of operating a motor vehicle (fuel, parking) and competition from transit, among other factors. Models were developed to sort out these factors. The models indicate that the imposition of the HOV toll was responsible for over half the reduction in peak period usage in the carpool lanes, but other factors such as gas price hikes, unemployment levels, and the availability of competitive transit services also contributed to the carpool decline.

4.0 Effects on Carpools and Transit

Vehicles using the peak period HOV lanes declined significantly after the toll was imposed. However, the carpoolers did not just switch to driving alone. Evidence from a variety of sources indicates that some of the former HOV lane users are now in two-person carpools (but are not picking up a third rider), some are using transit, and some have decided to travel off-peak. Some also are consolidating trips, and some are shopping and dining out closer to home. Some travelers who did not previously carpool have started to do so as well. For those who carpooled less, it was no longer an option because of personal circumstances. The reasons often included moving to another city, new job or change in work hours, work-related travel and more personal plans, new relationships and children in the household, and personal injury. Others noted that their carpool partner was no longer available as one of them had changed jobs. Some noted that the new carpool toll combined with perceived increase wait times at the casual carpool sites negated their perceived benefits of carpooling.

The impact on transit has been minor. BART ridership is up, WestCAT has instituted new transbay services, and AC transit transbay services are reportedly holding steady. Transit ridership also is affected by transit service and price changes, as well as others factors such as unemployment.

5.0 Travelers' Responses to Toll Changes

Surveys and focus groups were used to investigate bridge travelers' responses to the toll changes. A common initial reaction to the toll increase was resigned acceptance; and over time this settled into a broader acceptance of the increase. However, there was relatively low public awareness of the reasons for the toll increases or how these charges relate to transport costs and financing mechanisms. Concerns about whether the funds were being well spent and costs controlled persisted throughout the year (reflecting the broader public debate about government spending).

Many of those who participated in surveys or focus groups reported that they use transit more, telecommute more, and try to combine trips. Toll increases were a factor but gas prices and

concerns about income security in a time when jobs are being lost were even more significant motivations.

Focus groups with carpoolers indicated that the presence of a toll, and not just the dollar amount of it, contributed to the drop in carpoolers. Casual carpoolers were confronted for the first time whether and how to share costs. The social dynamics this set into motion were uncomfortable for many, and some decided not to continue the practice. In addition, however, focus group participants listed a wide variety of reasons for carpooling less, including loss of carpool partners due to cutbacks in the workforce, changes in work hours, a new job location or new residence, and changes in household composition. Some also reported that employer programs providing assistance to carpoolers and others in a number of instances had been cut back or replaced with a simpler pretax treatment of parking and transit expenses.

Table 1: Average Daily Traffic, Work Days (Bay Bridge)

Lane	Before Toll Increase	After Toll Increase	Vehicle Difference	% difference
Cash/FasTrak Lane	108,112	111,419	3,307	+3%
Carpool Lane	16,898	12,534	(4,364)	-26%
Total	125,010	123,953	(1,057)	-1%

Source: BATA, weekday volumes from 7/1/09 to 6/30/10 compared to volumes from 7/1/10 to 6/30/11

6.0 Business Responses to Toll Changes

Interviews with business groups, owners and managers found very little change in practices because of the toll increases. This was partly because the increase was not seen as a major change and partly because only a portion of businesses' employees, customers, clients or suppliers travel to them via a toll bridge. Businesses with highly paid labor forces and those dependent on timely deliveries were broadly supportive of congestion pricing because for them, saving time and expanding the size of the commute shed are important business considerations. Small retailers were thought to be more vulnerable to cost increases affecting early morning or early evening travel across the Bay Bridge and were also thought to be less able to control costs by scheduling deliveries or shipments outside the peak. Freight toll increases had not yet come in to effect, so the full force of these changes could not be observed or studied at this time.