

# 2003

## GOLD LINE CORRIDOR BEFORE/AFTER STUDY COMBINED REPORT



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**Metro**

**LOS ANGELES COUNTY  
METROPOLITAN TRANSPORTATION AUTHORITY**

**GOLD LINE CORRIDOR BEFORE/AFTER STUDY**

**FEBRURARY 2004**

**Prepared by:**

**Strategic Consulting & Research**

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## EXECUTIVE SUMMARY

The Los Angeles County Metropolitan Transportation Authority (Metro) commissioned a study to assess the impact of the Metro Gold Line and related adjustments to Metro Bus service. To achieve this, Metro designed a two-phase research program; the first phase surveyed Metro Bus users in the Gold Line corridor prior to the Gold Line opening and the second phase assessed the impact of the Gold Line and the related service changes after it opened.

### *Overview*

The first phase survey (prior to the service changes) was conducted aboard 28 Metro Bus lines between May 7<sup>th</sup>, 2003 and June 3<sup>rd</sup>, 2003. The second phase survey (after the service changes) was conducted aboard 27 Metro Bus lines and the Metro Gold Line between September 16, 2003 and October 10, 2003.

A total of 4,177 surveys were collected in the first phase and 4,340 surveys were collected in the second phase. Both sample sizes provide an accuracy of  $\pm 1.5\%$  at a 95% confidence level.

### *Study Findings*

- The addition of the Metro Gold Line and Metro Bus service changes have increased the number of passengers using the system, while reducing the number of trips made by car. Fourteen percent of the corridor patrons report that they now use the Gold Line instead of using a car.
- Service changes have impacted 44 percent of riders in the study corridor. The largest percentage report changing the buses they use to make the trip (17 percent). Twenty-eight percent are now using the Metro Gold Line instead of their car, or combining the Gold Line with other forms of public transit (both mentioned by 14 percent of all corridor riders). Seven percent switched from using buses to using the Gold Line.
- Two-thirds of Metro Gold Line patrons (67 percent) used a car to make their trip before the Gold Line opened.
- Over half of the patrons in the corridor (55 percent) are unaware that the Metro Bus routes and schedules have been changed to coordinate with the Metro Gold Line.
- Among those who were aware of Metro Bus and Metro Gold Line service coordination, a majority within all demographic segments agree that Metro Gold Line-related bus service changes have improved transit service in their area.

- Although the findings are not sufficiently large to be statistically significant, average trip length is longer at 7.4 miles versus 7.3 miles before, and the average travel time is shorter at 32.2 minutes versus 32.6 before.
- The average speed of trips in the corridor has improved slightly from 13.5 MPH to 13.9 MPH. Metro Gold Line riders are traveling significantly faster than their corridor counterparts at 18.4 MPH.
- The average number of transit vehicles per linked trip has declined from 1.42 to 1.37.
- Nearly two-thirds of survey participants (64 percent) say the service changes have improved transit service in their area.
- Forty-five percent of Metro patrons who were previously using the bus were impacted by the Metro Bus service changes. When further probed to determine the impact of the service changes, the largest percentage of respondents (43 percent) say that the service changes have resulted in shorter travel times. Thirty-eight percent say the service changes have resulted in longer travel times.
- In terms of the number of transfers, 26 percent say they now make more transfers as a result of the Metro Bus service changes while 24 percent say they now make fewer transfers. By inference, the increased time involved with transferring tends to be offset by the Metro Gold Line's higher speed.
- Within the corridor the percentage of patrons with incomes of \$35,000 or over has increased from 13 percent before the Metro Gold Line opening to 20 percent after the opening. Since the median income has not gone up, it is clearly a case of new services recruiting patrons from the upper end of the income scale.

## **CHAPTER 1: BACKGROUND**

The Los Angeles County Metropolitan Transportation Authority (Metro) launched the Metro Gold Line on July 26<sup>th</sup>, 2003. The Gold Line is a light rail system, connecting Pasadena, South Pasadena, Highland Park, Cypress Park, Chinatown and Downtown Los Angeles. Metro commissioned a study to assess the impact of the Gold Line and related adjustments to bus service. To achieve this, Metro designed a two-phase before/after research study; the first phase surveyed Metro bus riders in the Gold Line corridor prior to the Gold Line opening, and the second phase surveyed bus and rail riders in the corridor.

Objectives of the Before/After Metro Gold Line research study include:

- Exploring the impact of the Gold Line on travel mode
- Establishing rider perceptions of the effect the Metro Gold Line and related Metro Bus service changes have had on travel
- Determining if the addition of the Gold Line has positively or negatively impacted commute time, distance and number of transfers
- Determining the number of patrons new to transit as a result of the Gold Line and related bus service changes
- Comparing patron demographics before and after service changes

## CHAPTER 2: IMPACT OF METRO GOLD LINE ON TRIP MAKING

### 2.1 - Impact of Metro Gold Line on Travel Mode

Metro Bus service was programmatically changed to coordinate with Metro Gold Line service. The program included: routing bus lines within one block of the Gold Line to meet trains, elimination of redundant express lines, and initiation of bus shuttle service between Gold Line stations. Additionally, for every hour of bus service that was eliminated, an hour of bus service was added elsewhere. One of the primary goals for Phase II was to explore the impact these changes had on travel mode. At 44 percent, more than four out of ten corridor travelers say they were impacted by the opening of the Gold Line.

**Figure 2.1 – Has the Way You Make This Trip Changed Since the Metro Gold Line Opened? (4,076 Responses)**



Source: Metro Gold Line After Survey (Weighted)

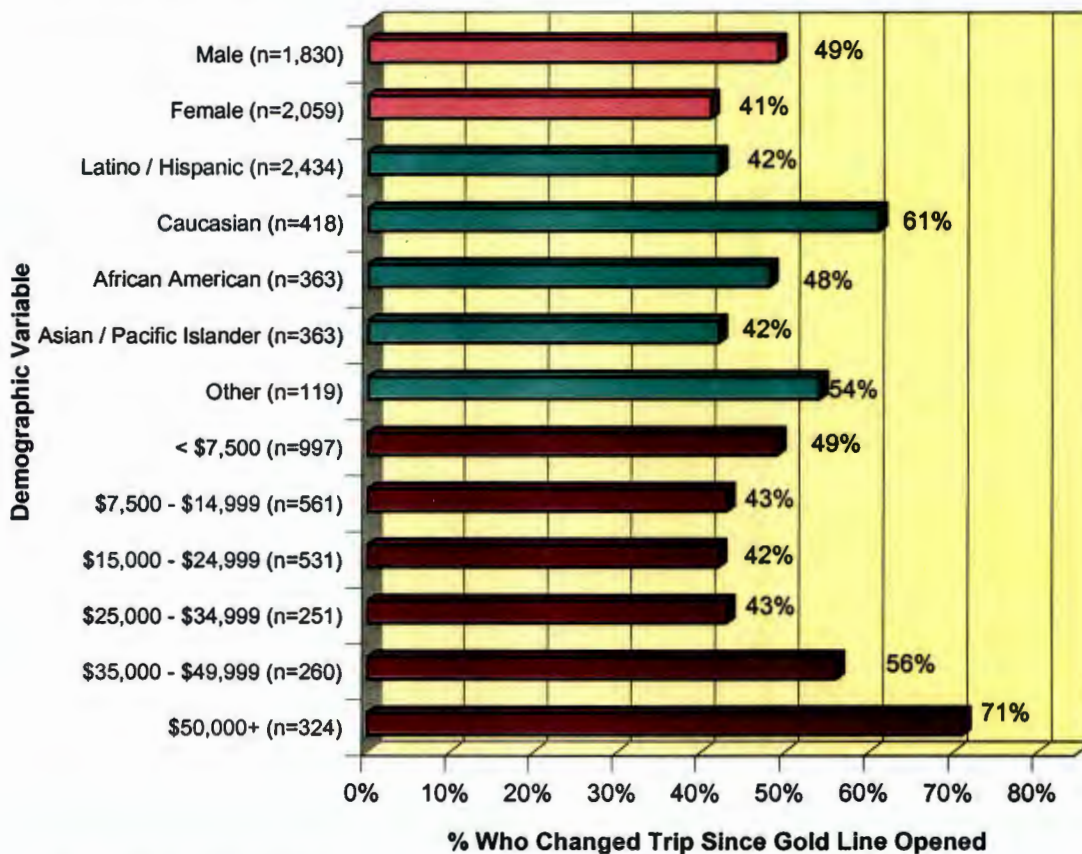


## 2.2 - Impact of Metro Gold Line by Demographic Characteristic

Among the demographic groups, those who earn more than \$50,000 annually are the most likely to have changed their trip since the Metro Gold Line opened (71 percent). Additionally, men are significantly more likely to have changed the way they travel than women.

Among ethnicities Caucasians are the most likely to have changed their travel behavior since the Metro Gold Line opened, at 61 percent.

**Figure 2.2 – Has the Way You Make This Trip Changed Since the Metro Gold Line Opened? (By Demographic Classification)**

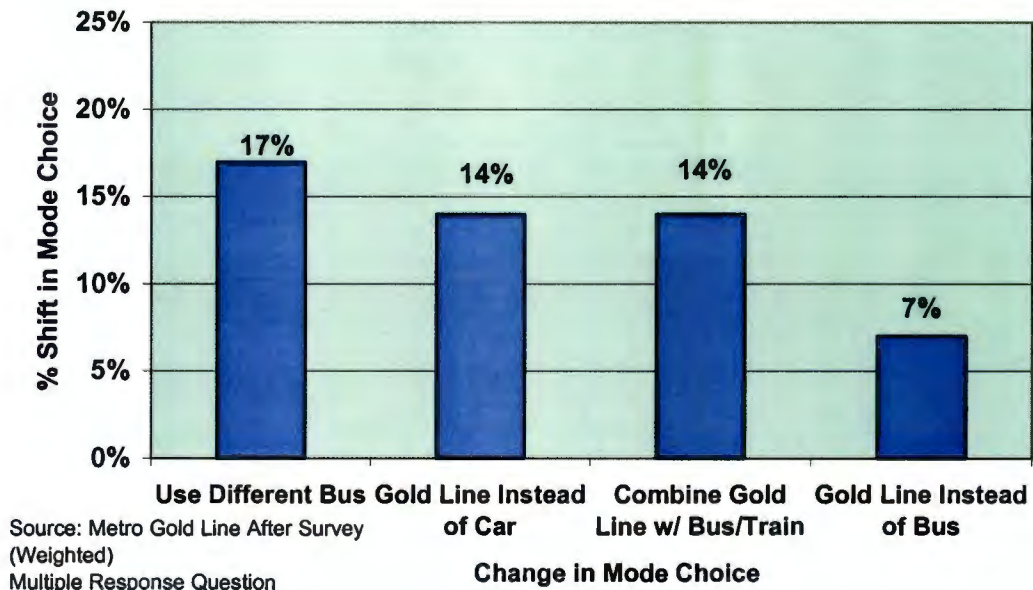


Source: Metro Gold Line After Survey (Weighted)

### 2.3 - Changes in Mode Choice After the Opening of the Metro Gold Line

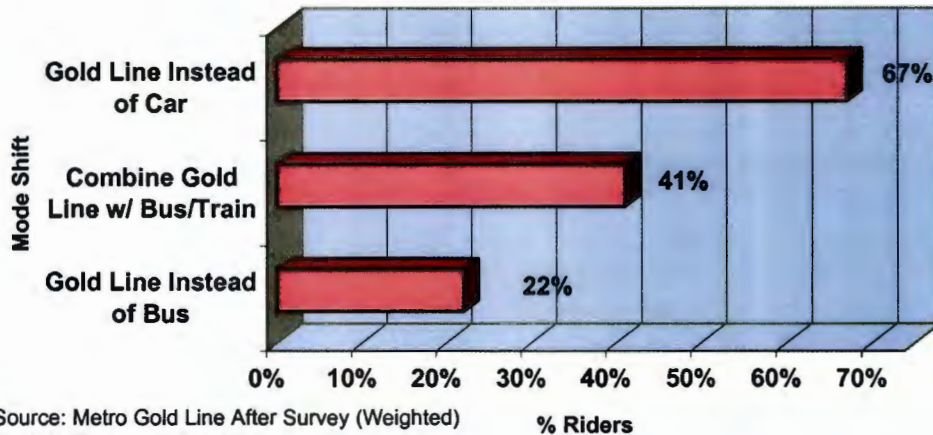
Fourteen percent of all riders in the corridor indicate that they were using a car prior to the opening of the Metro Gold Line. Another 14 percent (n=592) combine the Gold Line with other modes of public transit. Seventeen percent use different buses than they were using prior to the opening of the Gold Line, and seven percent have replaced bus service with the Gold Line service. This adds up to more than the 44% reported above because more than 1 choice could have been selected.

**Figure 2.3 – Shift in Mode Choice (4,076 Responses)**



Sixty-seven percent of Metro Gold Line riders previously used a car for the same trip they currently make on the Gold Line.

**Figure 2.4 – Shift in Mode Choice Among Metro Gold Line Riders (433 Responses)**



As seen in Figure 2.4, 41 percent of Metro Gold Line riders combine the Gold Line with other public transit modes, and 22 percent use the Gold Line instead of buses.

Among those who changed their travel behavior ( $n = 1,698$ ), men are almost one and a half times more likely than women to have switched from using their car to using the Metro Gold Line (41 percent versus 28 percent). Women are one and a quarter times more likely than men to simply change the buses they use to make the trip. Although it cannot be ascertained from the present study, this may be due to differential gender access to autos in one-car households.

**Figure 2.5 – Shift in Mode Choice by Gender (1,698 Responses)**

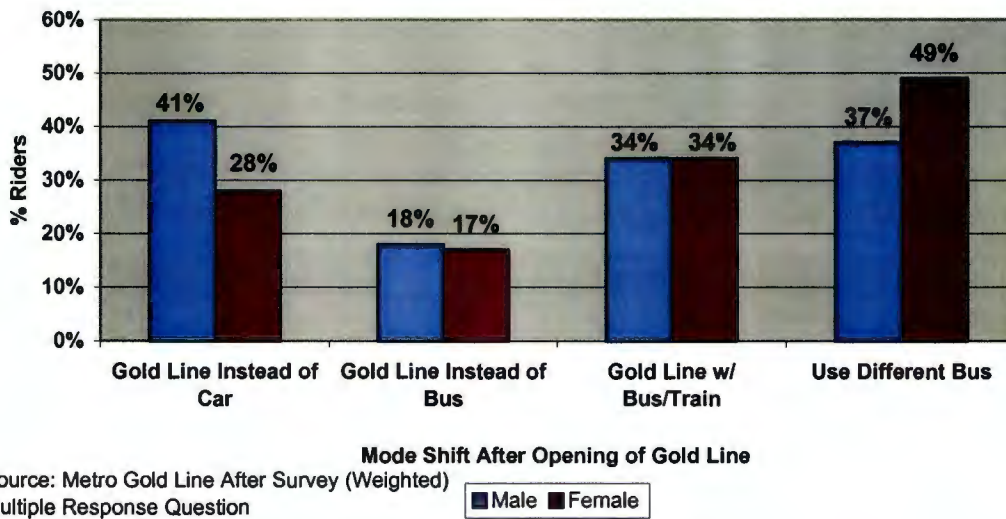
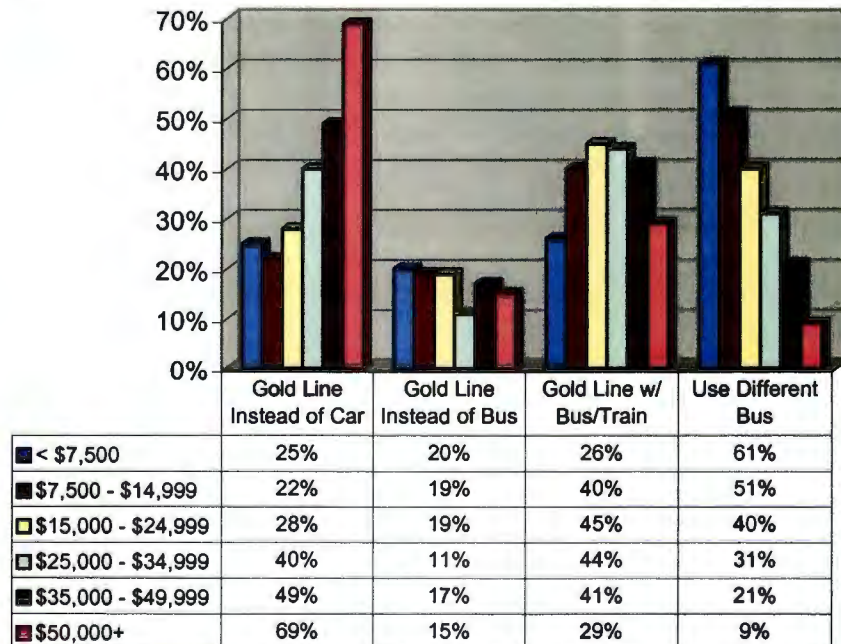


Figure 2.6 shows that those earning more than \$50,000 annually are the most likely to have switched from using their car to using the Metro Gold Line and those earning between \$7,500 and \$15,000 are the least likely to make that mode shift. On the other hand, those earning more than \$50,000 are the least likely to have simply switched the buses they use, while those earning less than \$7,500 annually are the most likely to have simply switched the buses they are using.

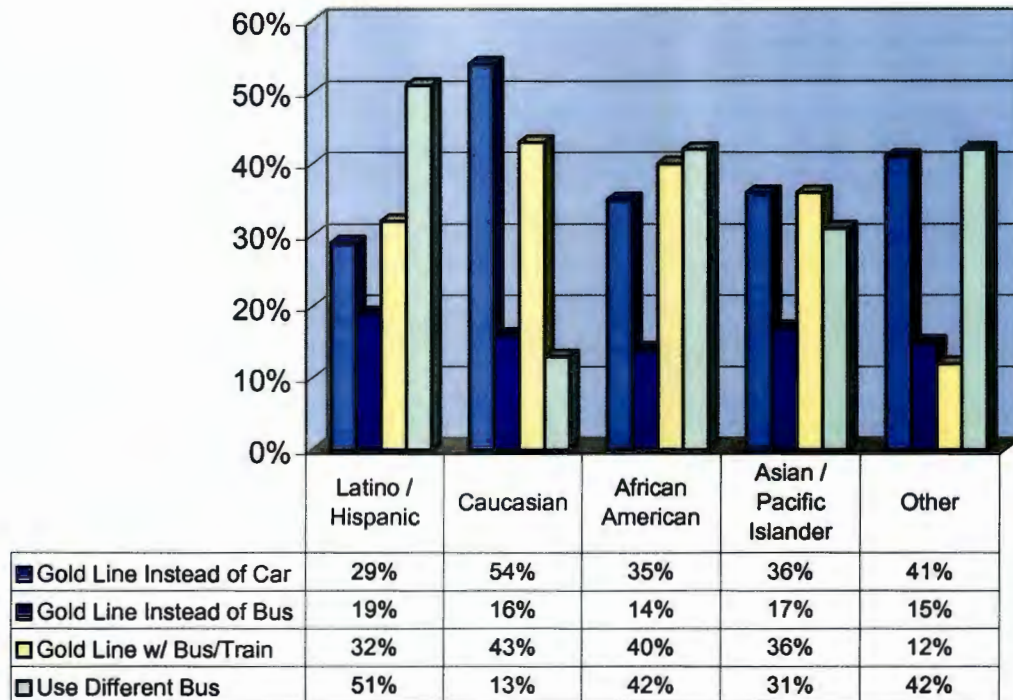
**Figure 2.6 – Shift in Mode Choice by Income (1,698 Responses)**



Source: Metro Gold Line After Survey (Weighted)  
Multiple Response Question

Figure 2.7 delineates mode shift by ethnicity. Caucasians are the most likely to have switched from cars to the Metro Gold Line.

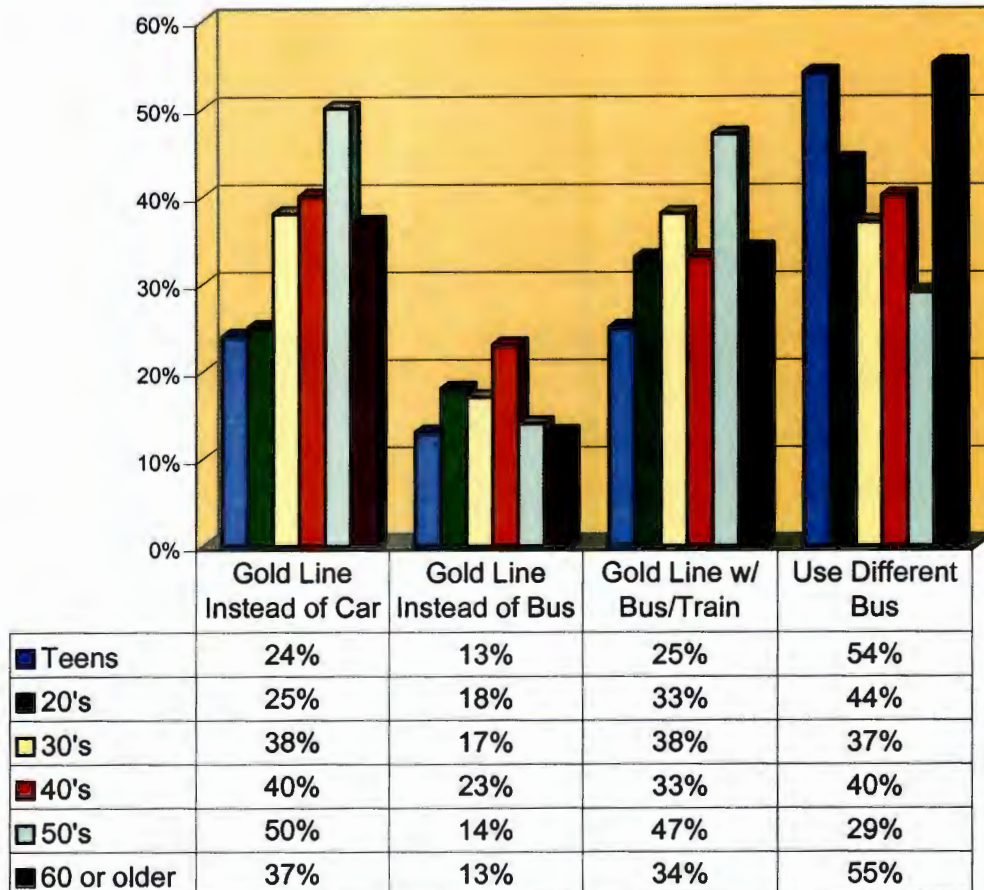
**Figure 2.7 – Shift in Mode Choice by Ethnicity (1,709 Responses)**



Source: Metro Gold Line After Survey (Weighted)  
Multiple Response Question

Figure 2.8 shows that the proportion of those switching from using their car to using the Metro Gold Line increases until riders reach 60 years old at which point it drops from a peak of 50 percent (those in their 50's) to 37 percent.

**Figure 2.8 – Shift in Mode Choice by Age (1,698 Responses)**



Source: Metro Gold Line After Survey (Weighted)  
Multiple Response Question

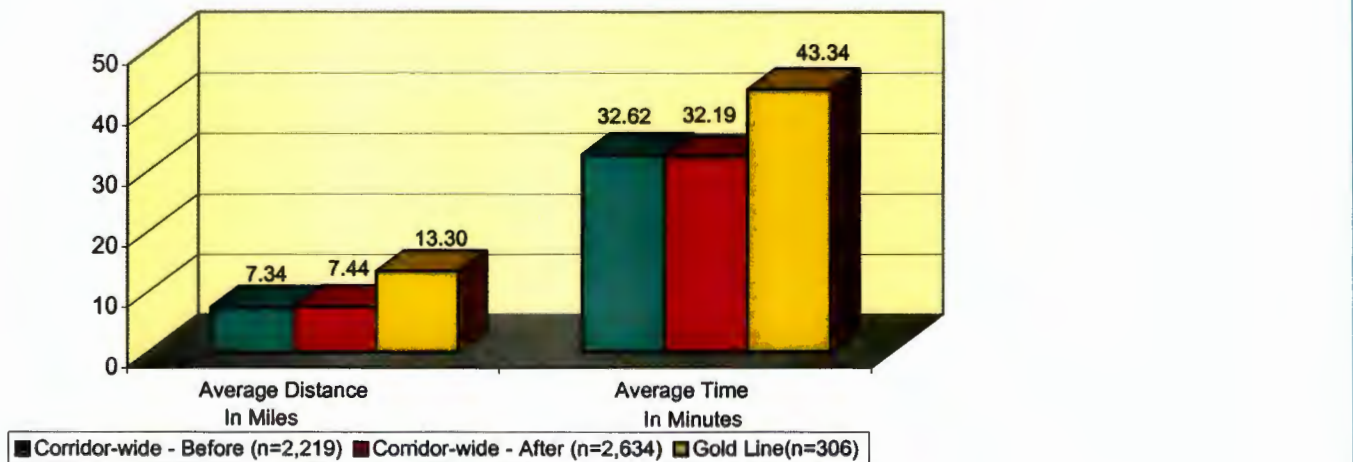
## 2.4 – Number of Patrons New to Transit

The addition of the Metro Gold Line and Metro Bus-service related changes have increased the number of transit users in the corridor. Fourteen percent say that they have switched to the Gold Line. This translates to 18,268 trips corridor-wide. This number is larger than the average daily ridership on the Gold Line. This is consistent with other Metro studies that show more people say they use transit than actually use it everyday. Two-thirds of riders surveyed on the Gold Line, itself, say they now use the rail line instead of making the trip by car.

## 2.5 – Impact of Service Changes on Travel Time and Distance

Travel distance was calculated based on the origin/destination information provided by survey participants.<sup>1</sup> Although the differences are not statistically significant, travel distance is longer in the corridor, while travel time in minutes has decreased. Prior to service changes the average travel distance was 7.3 miles, subsequent to the changes the average distance increased slightly to 7.4 miles. Further, those traveling on the Metro Gold Line have a much longer average travel distance of 13.3 miles.

**Figure 2.9 – Average Time and Distance (Linked Trips)**



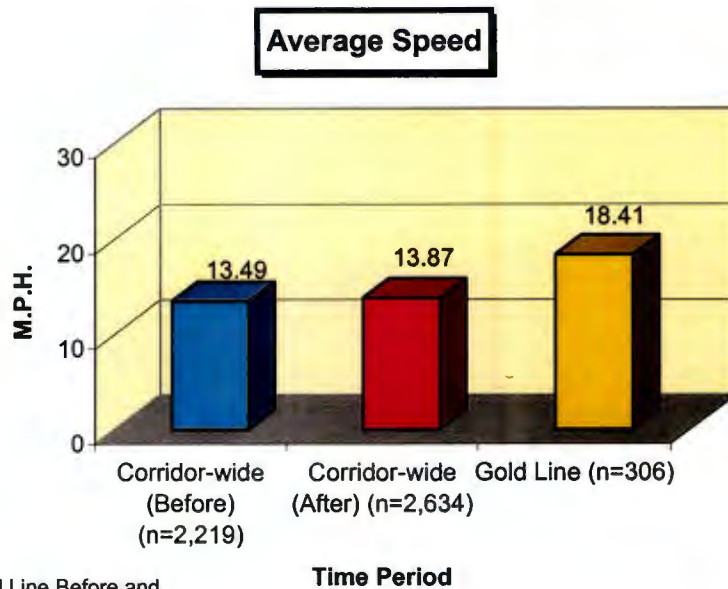
Source: Metro Gold Line Before and After Survey (Weighted)

To further understand the impact of these changes, average speed was calculated. Figure 2.10 shows that patrons in the corridor are now traveling 13.9 MPH on average, which is

<sup>1</sup> Distance, time and number of transfers are calculated for the entire linked trip, not just the link upon which the survey was collected. The estimates of time, distance and number of transfers are based on Metro's customer information database. These estimates by algorithm are certainly more reliable than self-reports, and probably more accurate. Distance traveled is calculated by adding the East-West distance traveled plus the North-South distance traveled. This is more accurate than basing distance on straight-line calculations, which would significantly understate the true distance traveled.

marginally faster than the 13.5 MPH traveled prior to the service changes. Metro Gold Line patrons, however, are traveling significantly faster than the corridor as a whole, at 18.4 MPH.

**Figure 2.10 – Average Speed (Linked Trips)**



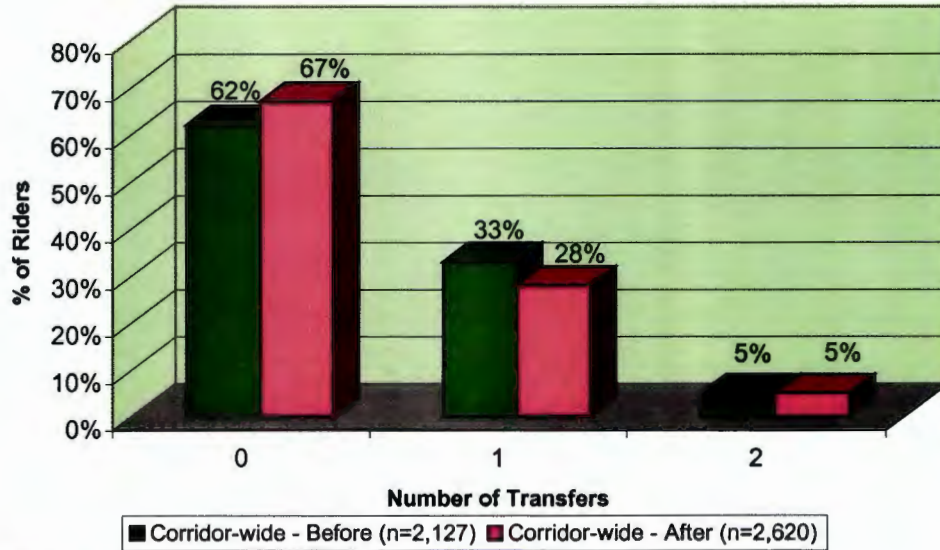
Source: Metro Gold Line Before and After Survey (Weighted)

## 2.6 – Impact of Service Changes on Transfer Rate

The estimated proportion of passengers making a transfer during their trip decreased from 38 percent to 33 percent. Most of this decline came from the proportion of passengers making exactly one transfer, since the proportion of riders in both phases making two or more transfers remained the same.



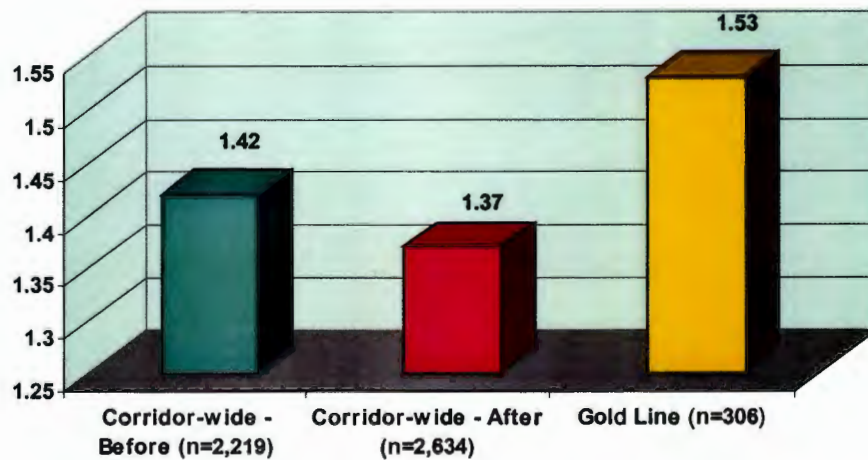
**Figure 2.11 – Number of Transfers Before and After Service Changes (Linked Trips)**



Source: Gold Line After Survey (Weighted)

Corridor-wide, the average number of transit vehicles per linked trip has declined from 1.42 before service changes to 1.37 post service changes.

**Figure 2.12 – Average Number of Transit Vehicles Per Linked Trip Before and After Service Changes**

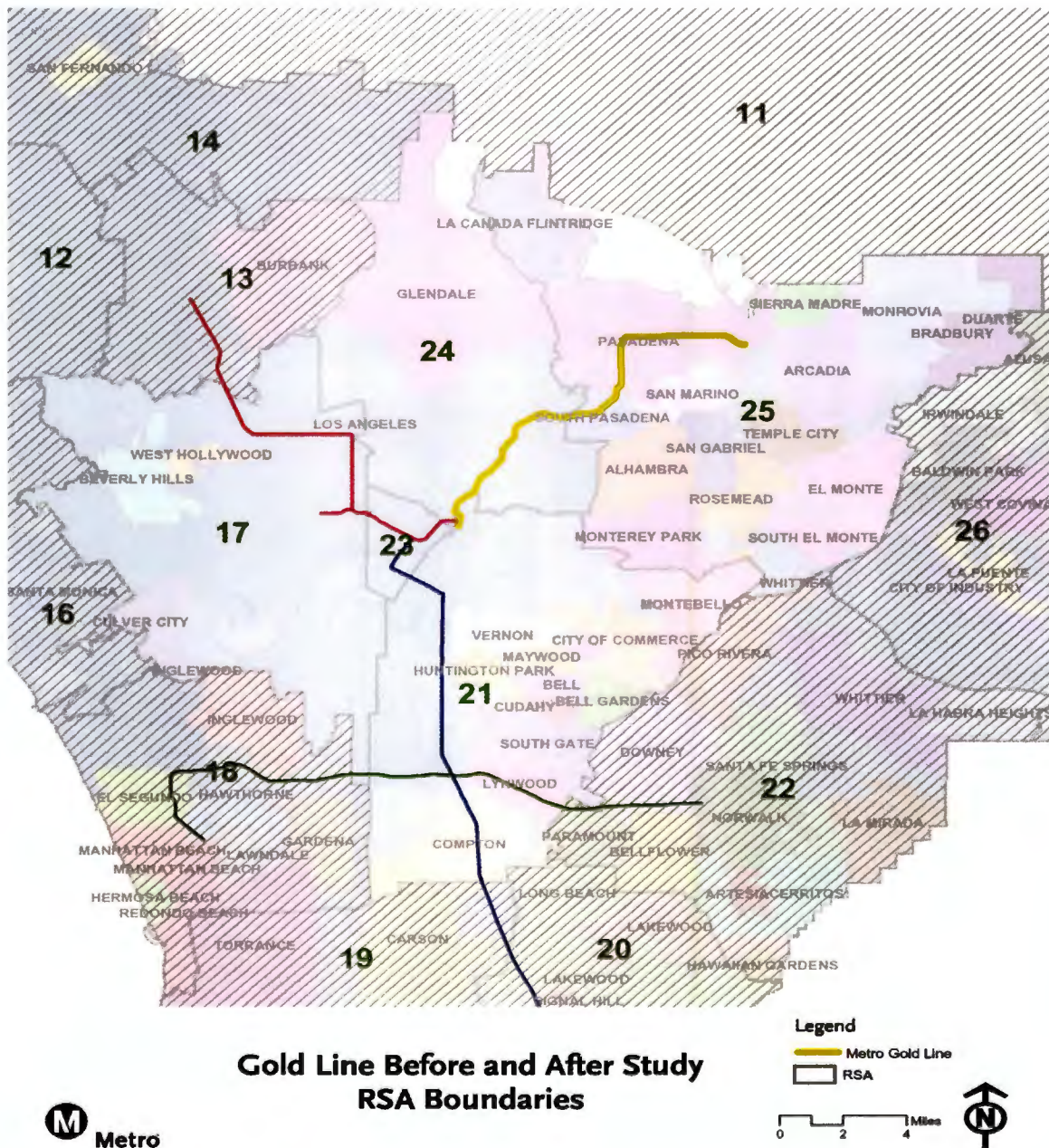


Source: Metro Gold Line Before and After Survey (Weighted)

## 2.7 – Impact of Service Changes on Origins and Destinations

Since the opening of the Metro Gold Line and related service changes, the general pattern of travel has not significantly changed. Additionally, about 95 percent of the travel in both periods continues to be entirely within the region defined by five RSAs (17, 21, 23, 24 and 25). While downtown's share is disproportionately large, it is not dominant; and more than three-quarters of the Metro Gold Line travel continues to originate and end outside that RSA.

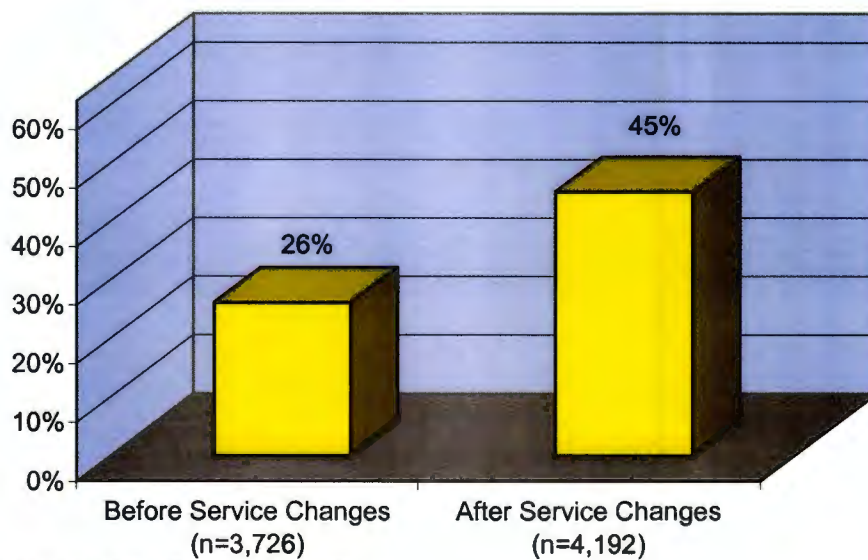
**Figure 2.13 – Map of RSA Boundaries**



### CHAPTER 3: AWARENESS OF SERVICE CHANGES BEFORE AND AFTER THE OPENING OF THE METRO GOLD LINE

Prior to the service changes, riders were asked, “Did you know that the bus service changes will be coordinated with Gold Line service?” Twenty-six percent of corridor patrons say they were aware that bus service changes would be coordinated with Metro Gold Line service. Subsequent to the service changes, awareness that Metro Bus routes and schedules were modified to coordinate with Gold Line operations increased to 45 percent, still less than a majority.

**Figure 3.1 – Awareness of Service Changes**



Source: Metro Gold Line Before and After Survey (Weighted)

Data from the first wave indicates that distributing brochures was the most effective tool for raising awareness.

## CHAPTER 4: IMPACT OF METRO GOLD LINE-RELATED BUS SERVICE ON AREA TRANSIT SERVICE

### 4.1 – Impact of Metro Gold Line-related Bus Service Changes

A significant majority of survey participants (64 percent) say that Metro Gold Line-related bus service changes have improved transit service in their area.

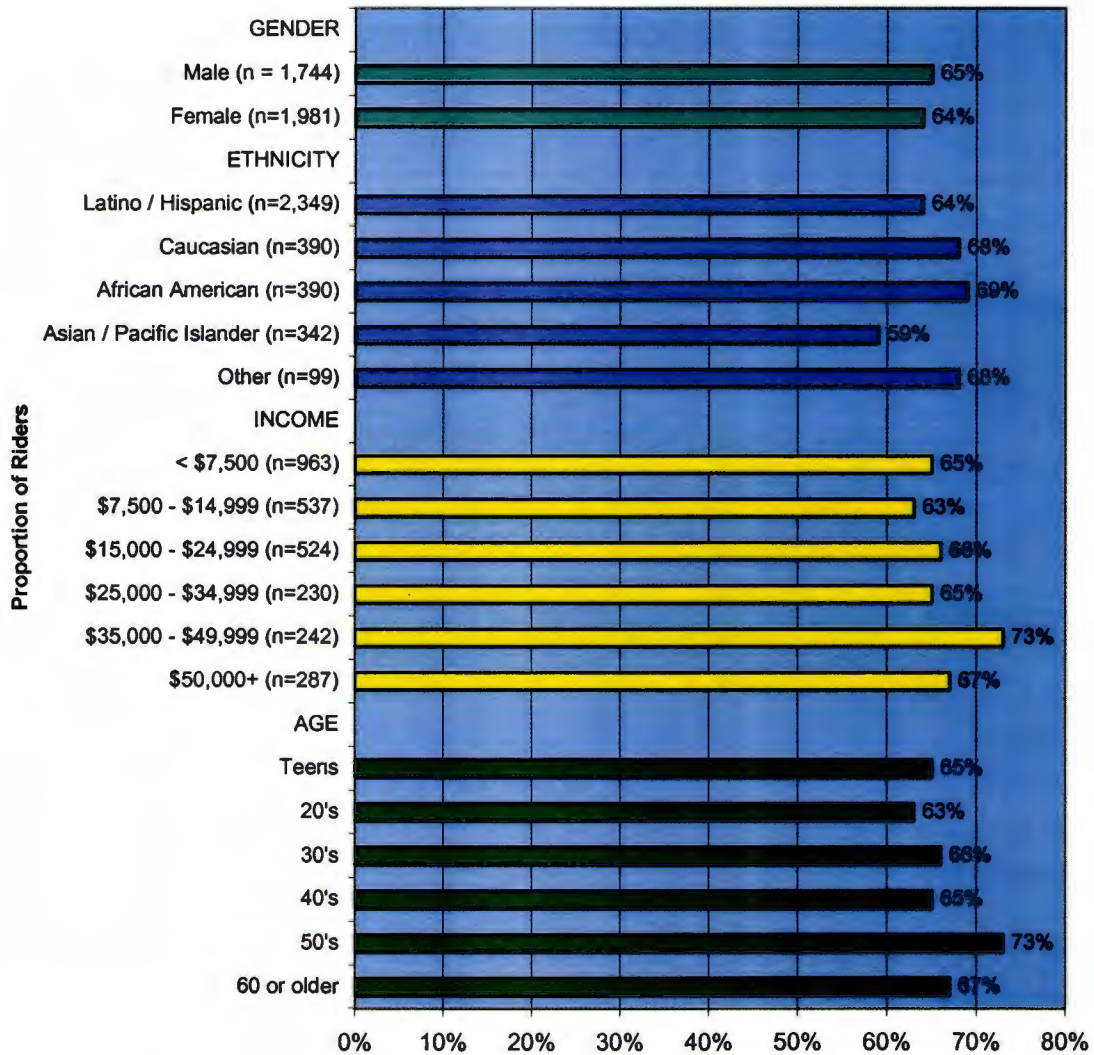
**Figure 4.1 – Do you think the Metro Gold Line-related Metro Bus Service Changes Improved Transit Service in Your Area? (3,895 Responses)**



Source: Metro Gold Line After Survey  
(Weighted)

Figure 4.2 shows the percentage of patrons by demographic variable who say that Metro Gold Line-related bus service changes improved transit in their area. A majority of all demographic segments agree that Gold Line-related bus service changes have positively impacted transit service in their area. Seven out of ten participants (73 percent) earning between \$35,000 and \$50,000 said this, making them the most satisfied subgroup among all demographic categories.

**Figure 4.2 – Positive Impact of Metro Gold Line-related Bus Service Changes by Demographic Category**



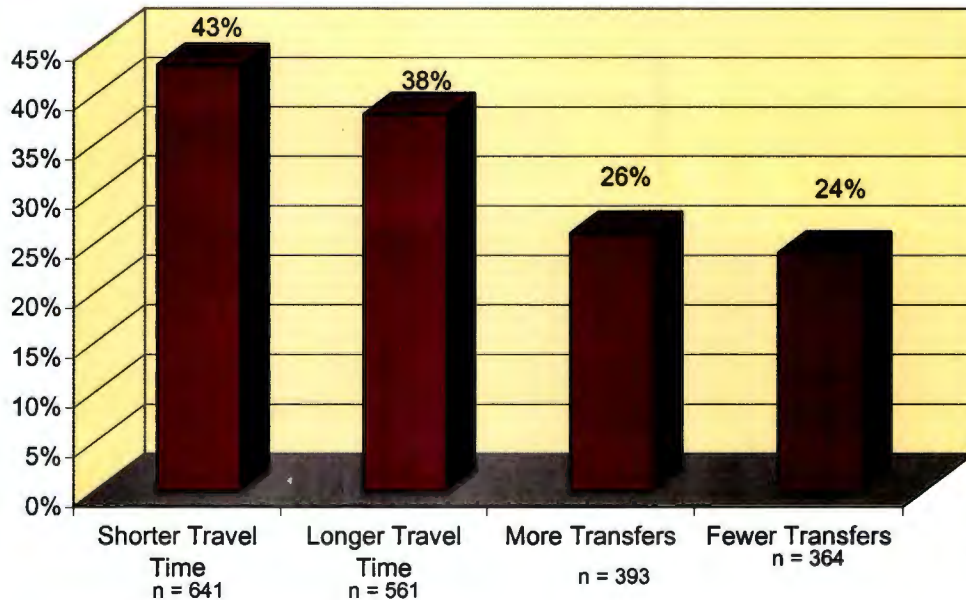
Source: Metro Gold Line After Survey (Weighted)

## 4.2 - Impact of Metro Gold Line-related Bus Service on a Particular Trip

When riders were asked if changes in bus service affected the particular trip on which they were surveyed, 45 percent said yes.

Those who were both impacted by changes and had also used Metro Bus prior to the opening of the Metro Gold Line (n = 1,487) were further probed. The largest proportion (43 percent) indicated that the change in bus service has resulted in shorter travel times. Thirty eight percent say that the change in bus service has made their travel time longer. Thirty eight percent say that the change in bus service has made their travel time longer. Thirty eight percent say that the change in bus service has made their travel time longer.

**Figure 4.3 – Shift in Mode Choice as a Result of Metro Gold Line-related Service Changes for a Particular Trip**



Source: Metro Gold Line After Survey (Weighted)  
Multiple Response Question

## CHAPTER 5: DEMOGRAPHICS

Table 5.1 describes the demographic characteristics of the corridor before and after the Metro Gold Line opening. The last column describes the same characteristics of the Gold Line alone.

**Table 5.1: Demographic Profile for Project Area**

| Description    |                        | % of Riders in Metro Gold Line Corridor (Before) | % of Riders in Metro Gold Line Corridor (After) | Metro Gold Line Patrons |
|----------------|------------------------|--|---|-------------------------|
| Gender         | Male                   | 45%  | 47%   | 64%                     |
|                | Female                 | 55%  | 53%   | 36%                     |
| Income         | Less than \$7,500      | 39%  | 34%   | 8%                      |
|                | \$7,500 - \$14,999     | 19%  | 19%   | 6%                      |
|                | \$15,000 - \$24,999    | 20%  | 18%   | 10%                     |
|                | \$25,000 - \$34,999    | 9%   | 9%  | 10%                     |
|                | \$35,000 - \$49,999    | 7%   | 9%  | 19%                     |
|                | \$50,000 or more       | 6%   | 11%   | 47%                     |
|                | Median Income          | \$11,250   | \$11,250  | \$42,500                |
| Race/Ethnicity | Latino/Hispanic        | 67%  | 65%   | 30%                     |
|                | Black/African-American | 9%   | 11%   | 15%                     |
|                | White/Caucasian        | 9%   | 11%   | 39%                     |
|                | Asian/Pacific Islander | 10%  | 10%   | 11%                     |
|                | Other                  | 3%   | 3%  | 4%                      |
| Age            | Teens                  | 11%  | 13%   | 2%                      |
|                | 20's                   | 25%  | 25%   | 17%                     |
|                | 30's                   | 21%  | 21%   | 29%                     |
|                | 40's                   | 19%  | 18%   | 24%                     |
|                | 50's                   | 15%  | 14%   | 23%                     |
|                | 60 or older            | 10%  | 9%  | 5%                      |
|                | Median Age             | 38   | 35  | 41                      |

Source: Metro Gold Line Before and After Survey (Weighted)

Table 5.1 shows that the Metro Gold Line rider:

- Is more likely to be a male at (64%) versus the corridor as a whole (47%).
- Has a higher median income of \$42,500 versus \$11,250 for the corridor.
- Is more likely to be Caucasian (39%) than Hispanic (30%), and is three times more likely to be Caucasian when compared to the rest of the project area.
- Has a median age of 41, older than the corridor median age of 35.

Experience from past Metro Rail openings indicate that the most dramatic differences between rail and bus demographics will attenuate during the first year of operations, although significant differences will remain.

The table also shows that the opening of the Metro Gold Line has had minor impacts on the demographics of transit users in the corridor, but Income is an exception. The percentage of patrons with incomes of \$35,000 or over has increased from 13 percent before the Gold Line opening to 20 percent after the opening. Since the median income has not gone up, it is clearly a case of new services recruiting patrons from the upper end of the income scale (put technically, the skew rather than the central tendency of the income distribution has changed).



## **APPENDIX 1: SURVEY INSTRUMENTS**



# Los Angeles County Metropolitan Transportation Authority



Twelve MTA monthly passes will be awarded

## WHERE ARE YOU COMING FROM?

1. Where did you first get on a bus for this trip?  
(If you transferred, your first stop on your first bus)

\_\_\_\_\_ & \_\_\_\_\_  
(Street bus traveled on) (Nearest cross street)

1a. City: \_\_\_\_\_

2. Bus Line # \_\_\_\_\_

2a. If not MTA, Bus Agency \_\_\_\_\_

## WHERE ARE YOU GOING?

3. Where is the stop you will get off your last bus for this trip? (If you will transfer, your last stop on your last bus)

\_\_\_\_\_ & \_\_\_\_\_  
(Street bus traveled on) (Nearest cross street)

3a. City: \_\_\_\_\_

4. Bus Line # \_\_\_\_\_

4a. If not MTA, Bus Agency \_\_\_\_\_

## GOLD LINE SERVICE PLAN

5. Did you know that the Gold Line is a new light rail trolley service?  1 Yes  2 No

6. Did you know that the Gold Line is opening this summer?  1 Yes  2 No

7. Did you know that bus service changes will be coordinated with Gold Line service?  1 Yes  2 No

7a. If yes, how did you first find out: (check one)

- 1 From a brochure  3 Word-of-mouth/friend  5 TV  7 Radio  8 Newspaper  9 Other
- 2 Community Meetings  4 Internet  6 Banners \_\_\_\_\_

8. Do you think bus lines within a block of a Gold Line station should be routed to meet trains?  1 Yes  2 No

9. Do you think that express lines that go where the Gold Line will go should be eliminated?  1 Yes  2 No

10. Do you think that new bus shuttle service between Gold Line stations is a good idea?  1 Yes  2 No

11. Do you like the idea of maintaining bus service levels (for every eliminated hour of service an hour is added elsewhere?)  1 Yes  2 No

12. From the above, do you agree with the plan overall?  1 Yes  2 No

## TELL US ABOUT YOURSELF

13. Gender:  1 Male  2 Female

14. Year of birth: 19 \_\_\_\_\_

15. Ethnicity:  
 1 Latino/Hispanic  4 Asian/Pacific Islander  
 2 Black/African American  5 Native American/Aleutian  
 3 White/Caucasian  6 Other

16. Household Income:  
 1 Under \$7,500  3 \$15,000-24,999  5 \$35,000-49,999  
 2 \$7,500-14,999  4 \$25,000-34,999  6 \$50,000 or more

Contact information needed to participate in monthly pass drawing (optional).  
All information will be kept confidential.

Name: \_\_\_\_\_

Telephone: (\_\_\_\_) \_\_\_\_\_

No purchase necessary. To be eligible entries must be received by a surveyor on-board the bus, or by mail received no later than June 14th, 2003. Winners will be chosen by a random drawing. Entries valid only on official survey form. Survey team members and their families, and MTA employees and their families are not eligible to enter. Prizes are non-transferable and cannot be substituted for cash. All Federal, State, and local regulations apply. In case of minors, prizes must be accepted by parent or legal guardian. Prize winners must meet all eligibility requirements.

# Metropolitan Transportation Authority



Return your completed survey for a chance to win a one-month Metro Pass.

## WHERE ARE YOU COMING FROM?

1. Where did you first get on a bus or train for this trip? (If you transferred, your first stop on your first bus or train)

\_\_\_\_\_ & \_\_\_\_\_  
(Street bus traveled on) (Nearest cross street)

1a. City: \_\_\_\_\_

2. Bus Line # or Rail Line Name/Color \_\_\_\_\_

2a. If not MTA, Bus/Rail Agency \_\_\_\_\_

## WHERE ARE YOU GOING?

3. Where is the stop you will get off your last bus or train for this trip? (If you will transfer, your last stop on your last bus or train)

\_\_\_\_\_ & \_\_\_\_\_  
(Street bus traveled on) (Nearest cross street)

3a. City: \_\_\_\_\_

4. Bus Line # or Rail Line Name/Color \_\_\_\_\_

4a. If not MTA, Bus/Rail Agency \_\_\_\_\_

## GOLD LINE SERVICE PLAN

5. Has the way you make this trip changed since the Gold Line opened?  1 Yes  2 No  
If YES, how (Check all that apply)

- 1 I use the Gold Line instead of a car to make this trip  
 2 I use the Gold Line instead of buses to make this trip  
 3 I combine the Gold Line with buses or other trains to make this trip  
 4 I use different buses to make this trip

6. Did you know that bus routes and schedules were changed to coordinate with Gold Line operations?  1 Yes  2 No

7. Do you think the Gold Line-related bus service changes improve transit service in your area?  1 Yes  2 No

8. Have changes in bus service since the Gold Line opening affected this trip?  1 Yes  2 No  
If YES, (check all that apply):

- 1 Total travel time for this trip is longer  4 I make fewer transfers  
 2 Total travel time for this trip is shorter  5 I did not use bus service before the Gold Line opening  
 3 I make more transfers

## TELL US ABOUT YOURSELF

9. Gender:

- 1 Male  2 Female

10. Year of birth: 19 \_\_\_\_\_

11. Ethnicity:

- 1 Latino/Hispanic  4 Asian/Pacific Islander  
 2 Black/African American  5 Native American/Aleutian  
 3 White/Caucasian  6 Other

12. Household Income:

- 1 Under \$7,500  3 \$15,000-24,999  5 \$35,000-49,999  
 2 \$7,500-14,999  4 \$25,000-34,999  6 \$50,000 or more

Contact information needed to participate in monthly pass drawing (optional).  
All information will be kept confidential.

Name: \_\_\_\_\_

Telephone: (\_\_\_\_\_) \_\_\_\_\_

No purchase necessary. To be eligible entries must be received by a surveyor on-board the bus, or by mail received no later than October 24th, 2003. Winners will be chosen by a random drawing. Entries valid only on official survey form. Survey team members and their families, and MTA employees and their families are not eligible to enter. Prizes are non-transferable and cannot be substituted for cash. All Federal, State, and local regulations apply. In case of minors, prizes must be accepted by parent or legal guardian. Prize winners must meet all eligibility requirements.

## APPENDIX 2: SURVEY METHODS AND STATISCAL ACCURARACY LEVELS BY LINE

### *Sampling Frame*

Twenty-eight Metro bus lines in the Gold Line corridor were sampled before the Gold Line opened. A total of 4,177 surveys were collected during the initial wave of data collection, achieving an accuracy rate of 1.5% overall.

The sampling frame after the Gold Line opened was changed to reflect the service changes. Twenty-seven Metro bus lines in the corridor and the Gold Line were sampled. A total of 4,340 surveys were collected after the Gold Line opened, also achieving an accuracy level of 1.5%.

The sampling technique was the same for both waves of the research, with bus trips sampled in clusters by bus run using a random selection process. This method ensured the most representative yet cost-effective sample.

A few bus lines extended well beyond the corridor. Only line segments within the corridor were sampled on those lines. In those instances, contiguous bus trips on that segment were surveyed with the first segment of the daily assignment randomly selected from a list of trips.

### *Data Weighting*

Twenty-four hour passenger counts provided by MTA and line-level survey counts were used to weight the dataset. An example of the weighting methodology used for the first dataset is detailed in Table 1.1 below.

The first dividend in the formula represents the proportion of the line's patrons that were surveyed. The second dividend represents the proportion of corridor patrons that were surveyed. By multiplying the two proportions, one ultimately obtains a weighted sample that is equal in size to the un-weighted sample.

**Table 1.1 – Data Weighting for the After Dataset**

| Weight Factor for Line 58                    |                               |   |                         |        |
|--|-------------------------------|---|-------------------------|--------|
| Total Number of Weekday Boardings on Line 58 | Number of Surveys for Line 58 | Total Weekday Boardings for Sampled Lines | Total surveys collected | Weight |
| (496   | ÷ 107)                        | * (4,340                                  | ÷ 130,486)              | .1543  |

### *Survey Administration*

Data collection prior to the opening of the Gold Line was conducted between May 7<sup>th</sup>, 2003 and June 3<sup>rd</sup>, 2003 between 5:00 AM and 8:00 PM. Data collection after the Gold

Line opened was from September 16, 2003 to October 10, 2003 between 5:00 AM to 8:00 PM.

In order to maximize survey response rates and minimize non-response bias, additional efforts were taken during the survey effort:

- Business reply envelopes were made available to passengers near terminal points and upon request to avoid short-trip bias.
- When possible, survey attendants offered assistance to passengers who requested it.
- All interview teams had a bi-lingual English/Spanish speaker

## APPENDIX 2: STATISTICAL ACCURACY BY LINE AFTER SERVICE CHANGES

| Line         | Starting Survey Boundry | Ending Survey Boundry         | APC Count      | Survey Count | Accuracy     |
|--------------|-------------------------|-------------------------------|----------------|--------------|--------------|
| 28/83        | Olympic & Figueroa      | Eagle Rock & York             | 16,579         | 125          | 8.7%         |
| 58           | Patsurastran Plaza      | Patsurastran Plaza            | 496            | 107          | 8.4%         |
| 76           | Olive & Washington      | Valley & Fremont              | 4,580          | 147          | 8.0%         |
| 81/381       | Figueroa & Vernon       | Figueroa & York               | 14,308         | 202          | 6.8%         |
| 84           | Olympic & Figueroa      | Colorado & Eabledale          | 4,703          | 245          | 6.1%         |
| 85           | Olympic & Figueroa      | Verdugo & Towne               | 3,693          | 190          | 6.9%         |
| 90/91        | Main & 11th             | Glendale & Broadway           | 3,323          | 146          | 7.9%         |
| 92           | Terminal 28             | Brand & Broadway              | 4,733          | 184          | 7.1%         |
| 94/394       | Terminal 28             | San Fernando & Los Feliz      | 5,675          | 223          | 6.4%         |
| 176          | El Monte Station        | Cypress & Verdugo             | 6,034          | 131          | 8.5%         |
| 177          | Rosemead & Foothill     | JPL                           | 321            | 105          | 7.9%         |
| 180/181/380  | Brand & Broadway        | Altadena & Lake               | 8,702          | 114          | 9.1%         |
| 251          | Pacific & Florence      | Soto & 1st                    | 14,536         | 136          | 8.4%         |
| 252          | Soto & Whittier         | Huntington & Monterey         | 2,204          | 149          | 7.8%         |
| 255          | Herber & Whittier       | Pasadena & French             | 2,194          | 123          | 8.6%         |
| 256          | Huntington & Monterey   | Mendocino & Lake              | 861            | 209          | 5.9%         |
| 260          | Atlantic & Garvey       | Fair Oaks & Mendocino         | 5,890          | 135          | 8.3%         |
| 264          | Altadena & Lake         | Santa Anita Fashion Park      | 327            | 140          | 6.3%         |
| 266          | Lakewood & Telegraph    | Sierra Madre Villa & Foothill | 3,096          | 197          | 6.8%         |
| 267          | El Monte Station        | Altadena & Lake               | 2,050          | 149          | 7.7%         |
| 268          | Washington & Fair Oaks  | Baldwin & Las Tunas           | 1,479          | 107          | 9.1%         |
| 485          | Terminal 28             | Fontenet & Lake               | 3,581          | 159          | 7.6%         |
| 487          | Wilshire & Figueroa     | Sierra Madre & Baldwin        | 1,462          | 178          | 6.9%         |
| 489          | Wilshire & Westlake     | Valley & Del Mar              | 202            | 124          | 5.5%         |
| 491          | Wilshire & Figueroa     | Sierra Madre & Baldwin        | 1,614          | 172          | 7.1%         |
| 686          | Raymond & Glenarm       | New York & Allen              | 975            | 109          | 8.9%         |
| 687          | Garfield & Atlantic     | Altadena & Lake               | 1,694          | 150          | 7.6%         |
| Gold Line    | Union Station           | Sierra Madre Villa Station    | 15,174         | 184          | 7.2%         |
| <b>TOTAL</b> |                         |                               | <b>130,486</b> | <b>4,340</b> | <b>1.49%</b> |

## APPENDIX 3: MTA Gold Line Time Distance and Transfers (Linked Trips)

| LINE         | PHASE I      |              |              |             | PHASE II     |              |              |             | CHANGE IN UNITS |             |             |              | PERCENT CHANGE |             |             |               |
|--------------|--------------|--------------|--------------|-------------|--------------|--------------|--------------|-------------|-----------------|-------------|-------------|--------------|----------------|-------------|-------------|---------------|
|              | TIME         | DIST         | SPEED        | TRANS       | TIME         | DIST         | SPEED        | TRANS       | TIME            | DIST        | SPEED       | TRANS        | TIME           | DIST        | SPEED       | TRANS         |
| 28/83        | 28.07        | 5.580        | 11.93        | 0.32        | 26.98        | 5.298        | 11.78        | 0.26        | -1.09           | -0.28       | -0.15       | -0.06        | -3.9%          | -5.1%       | -1.3%       | -18.8%        |
| 58           | 23.14        | 4.652        | 12.06        | 0.25        | 24.44        | 5.479        | 13.45        | 0.42        | 1.30            | 0.83        | 1.39        | 0.17         | 5.6%           | 17.8%       | 11.5%       | 68.0%         |
| 76           | 39.71        | 9.591        | 14.49        | 0.45        | 37.89        | 9.709        | 15.37        | 0.40        | -1.82           | 0.12        | 0.88        | -0.05        | -4.6%          | 1.2%        | 6.1%        | -11.1%        |
| 81/381       | 30.60        | 7.554        | 14.81        | 0.33        | 31.70        | 7.310        | 13.84        | 0.35        | 1.10            | -0.24       | -0.97       | 0.02         | 3.6%           | -3.2%       | -6.5%       | 6.1%          |
| 84           | 25.64        | 5.213        | 12.20        | 0.24        | 29.25        | 5.871        | 12.04        | 0.38        | 3.61            | 0.66        | -0.16       | 0.14         | 14.1%          | 12.6%       | -1.3%       | 58.3%         |
| 85           | 33.14        | 6.148        | 11.13        | 0.37        | 37.47        | 8.105        | 12.98        | 0.39        | 4.33            | 1.96        | 1.85        | 0.02         | 13.1%          | 31.8%       | 16.6%       | 5.4%          |
| 90/91        | 43.20        | 9.645        | 13.40        | 0.41        | 46.55        | 9.769        | 12.59        | 0.38        | 3.35            | 0.12        | -0.81       | -0.03        | 7.8%           | 1.3%        | -6.0%       | -7.3%         |
| 92/93        | 30.52        | 6.376        | 12.53        | 0.25        | 33.61        | 7.238        | 12.92        | 0.39        | 3.09            | 0.86        | 0.39        | 0.14         | 10.1%          | 13.5%       | 3.1%        | 56.0%         |
| 94/394       | 43.04        | 10.197       | 14.22        | 0.43        | 34.16        | 8.641        | 15.18        | 0.27        | -8.88           | -1.56       | 0.96        | -0.16        | -20.6%         | -15.3%      | 6.8%        | -37.2%        |
| 176          | 46.94        | 9.682        | 12.38        | 0.94        | 33.23        | 6.413        | 11.58        | 0.46        | -13.71          | -3.27       | -0.80       | -0.48        | -29.2%         | -33.8%      | -6.5%       | -51.1%        |
| 177          | 37.47        | 7.611        | 12.19        | 0.48        | 39.49        | 8.076        | 12.27        | 0.51        | 2.02            | 0.47        | 0.08        | 0.03         | 5.4%           | 6.1%        | 0.7%        | 6.3%          |
| 180/380      | 32.08        | 7.114        | 13.31        | 0.48        | 28.91        | 6.568        | 13.63        | 0.28        | -3.17           | -0.55       | 0.32        | -0.20        | -9.9%          | -7.7%       | 2.4%        | -41.7%        |
| 255          | 23.72        | 4.721        | 11.94        | 0.43        | 17.61        | 2.962        | 10.09        | 0.25        | -6.11           | -1.76       | -1.85       | -0.18        | -25.8%         | -37.3%      | -15.5%      | -41.9%        |
| 256          | 28.17        | 5.376        | 11.45        | 0.40        | 35.21        | 5.896        | 10.05        | 0.27        | 7.04            | 0.52        | -1.40       | -0.13        | 25.0%          | 9.7%        | -12.2%      | -32.5%        |
| 260          | 35.77        | 6.967        | 11.69        | 0.69        | 28.85        | 5.905        | 12.28        | 0.34        | -6.92           | -1.06       | 0.59        | -0.35        | -19.3%         | -15.2%      | 5.0%        | -50.7%        |
| 264          | 27.67        | 4.655        | 10.09        | 0.80        | 30.17        | 6.158        | 12.25        | 0.50        | 2.50            | 1.50        | 2.16        | -0.30        | 9.0%           | 32.3%       | 21.4%       | -37.5%        |
| 266          | 31.26        | 9.580        | 18.39        | 0.37        | 30.69        | 7.417        | 14.50        | 0.45        | -0.57           | -2.16       | -3.89       | 0.08         | -1.8%          | -22.6%      | -21.2%      | 21.6%         |
| 267          | 35.55        | 7.917        | 13.36        | 0.47        | 35.83        | 7.935        | 13.29        | 0.34        | 0.28            | 0.02        | -0.07       | -0.13        | 0.8%           | 0.2%        | -0.5%       | -27.7%        |
| 268          | 27.52        | 5.859        | 12.77        | 0.36        | 29.40        | 6.493        | 13.25        | 0.43        | 1.88            | 0.63        | 0.48        | 0.07         | 6.8%           | 10.8%       | 3.8%        | 19.4%         |
| 487          | 43.43        | 11.471       | 15.85        | 0.64        | 31.58        | 8.900        | 16.91        | 0.32        | -11.85          | -2.57       | 1.06        | -0.32        | -27.3%         | -22.4%      | 6.7%        | -50.0%        |
| 489          | 43.64        | 13.881       | 19.08        | 0.42        | 40.10        | 12.828       | 19.19        | 0.37        | -3.54           | -1.05       | 0.11        | -0.05        | -8.1%          | -7.6%       | 0.6%        | -11.9%        |
| 491          | 35.90        | 11.457       | 19.15        | 0.48        | 40.24        | 11.342       | 16.91        | 0.55        | 4.34            | -0.11       | -2.24       | 0.07         | 12.1%          | -1.0%       | -11.7%      | 14.6%         |
| 251          | N/A          | N/A          | N/A          | N/A         | 28.32        | 5.328        | 11.29        | 0.37        | N/A             | N/A         | N/A         | N/A          | N/A            | N/A         | N/A         | N/A           |
| 252          | N/A          | N/A          | N/A          | N/A         | 20.98        | 5.226        | 14.94        | 0.39        | N/A             | N/A         | N/A         | N/A          | N/A            | N/A         | N/A         | N/A           |
| 686          | N/A          | N/A          | N/A          | N/A         | 28.49        | 6.064        | 12.77        | 0.47        | N/A             | N/A         | N/A         | N/A          | N/A            | N/A         | N/A         | N/A           |
| 687          | N/A          | N/A          | N/A          | N/A         | 18.69        | 3.757        | 12.06        | 0.29        | N/A             | N/A         | N/A         | N/A          | N/A            | N/A         | N/A         | N/A           |
| 485          | N/A          | N/A          | N/A          | N/A         | 30.94        | 7.192        | 13.95        | 0.40        | N/A             | N/A         | N/A         | N/A          | N/A            | N/A         | N/A         | N/A           |
| Gold Line    | N/A          | N/A          | N/A          | N/A         | 43.34        | 13.298       | 18.41        | 0.53        | N/A             | N/A         | N/A         | N/A          | N/A            | N/A         | N/A         | N/A           |
| <b>TOTAL</b> | <b>32.62</b> | <b>7.335</b> | <b>13.49</b> | <b>0.42</b> | <b>32.19</b> | <b>7.443</b> | <b>13.87</b> | <b>0.37</b> | <b>-0.43</b>    | <b>0.11</b> | <b>0.38</b> | <b>-0.05</b> | <b>-1.3%</b>   | <b>1.5%</b> | <b>2.8%</b> | <b>-11.9%</b> |

## APPENDIX 4: CHANGES IN ORIGIN/DESTINATION BY RSA BEFORE/AFTER

### RSA DISTRIBUTION BEFORE SERVICE CHANGES (N = 2,009)

| ORIGIN RSA |      | DESTINATION RSA |       |       |       |      |      |      |
|------------|------|-----------------|-------|-------|-------|------|------|------|
|            |      | 17              | 21    | 23    | 24    | 25   | EAST | WEST |
| 17         | 0.0% | 0.0%            | 3.3%  | 4.5%  | 1.2%  | 0.0% | 0.0% |      |
| 21         | 0.0% | 8.5%            | 0.5%  | 2.2%  | 1.2%  | 0.0% | 0.3% |      |
| 23         | 1.5% | 0.2%            | 2.9%  | 6.5%  | 2.8%  | 0.0% | 0.4% |      |
| 24         | 1.9% | 1.7%            | 10.1% | 16.8% | 3.6%  | 0.5% | 0.6% |      |
| 25         | 1.2% | 1.0%            | 3.4%  | 2.6%  | 16.1% | 0.6% | 0.2% |      |
| EAST*      | 0.0% | 0.0%            | 0.0%  | 0.0%  | 0.9%  | 0.0% | 0.0% |      |
| WEST*      | 0.0% | 0.0%            | 0.5%  | 0.4%  | 0.0%  | 0.8% | 0.0% |      |

\* "East" and "West" represent, respectively, the RSAs east and west of the 5 contiguous RSAs listed in this table.

### RSA DISTRIBUTION AFTER SERVICE CHANGES (N = 2,505)

| ORIGIN RSA |      | DESTINATION RSA |      |       |       |      |      |      |
|------------|------|-----------------|------|-------|-------|------|------|------|
|            |      | 17              | 21   | 23    | 24    | 25   | EAST | WEST |
| 17         | 0.9% | 0.4%            | 1.4% | 1.7%  | 0.9%  | 0.0% | 0.0% |      |
| 21         | 0.7% | 13.6%           | 1.0% | 2.2%  | 1.2%  | 0.0% | 0.0% |      |
| 23         | 1.3% | 0.1%            | 1.0% | 4.2%  | 1.3%  | 0.5% | 0.0% |      |
| 24         | 3.1% | 2.2%            | 7.8% | 12.9% | 4.1%  | 0.4% | 0.0% |      |
| 25         | 2.4% | 5.9%            | 4.1% | 3.1%  | 17.9% | 0.1% | 0.6% |      |
| EAST       | 0.0% | 0.0%            | 0.0% | 0.0%  | 1.5%  | 0.0% | 0.4% |      |
| WEST       | 0.0% | 0.0%            | 0.3% | 0.4%  | 0.0%  | 0.0% | 0.0% |      |

### RSA DISTRIBUTION - % CHANGE

| ORIGIN RSA |      | DESTINATION RSA |      |      |      |      |       |      |
|------------|------|-----------------|------|------|------|------|-------|------|
|            |      | 17              | 21   | 23   | 24   | 25   | EAST  | WEST |
| 17         | NA   | NA              | -57% | -62% | -29% | NA   | NA    |      |
| 21         | NA   | 60%             | 90%  | -2%  | -7%  | NA   | -100% |      |
| 23         | -17% | -52%            | -65% | -35% | -53% | NA   | -100% |      |
| 24         | 58%  | 28%             | -23% | -23% | 15%  | -27% | -100% |      |
| 25         | 96%  | 489%            | 21%  | 17%  | 11%  | -81% | 201%  |      |
| EAST       | NA   | NA              | NA   | NA   | 56%  | NA   | NA    |      |
| WEST       | NA   | NA              | -44% | -2%  | NA   | -95% | NA    |      |



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