UCI-ITS-WP-95-10

The Century Freeway/Transitway I-105: Nucleation, Land Use Changes And Transportation Behavior

UCI-ITS-WP-95-10

Joseph F. Di Mento
Drusilla R. van Hengel
Sherry Ryan

Department of Urban and Regional Planning and
Institute of Transportation Studies
University of California, Irvine

June 1995

Institute of Transportation Studies
University of California, Irvine
Irvine, CA 92697-3600, U.S.A.
http://www.its.uci.edu

Prepared in cooperation with the California Department of Transportation, Division of New Technology and Research and the Transit-System Research Program, University of California under contract #RTA-65V303.

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.

Title and Subtitle
The Century Freeway/Transitway: Nucleation, Land Use Changes, and Transportation Behavior.

5. Report Date: December 31, 1994

6. Performing Organization Code:

8. Performing Organization Report No.:

7. Author's
DiMento, J.F.; van Hengel, D.R.; and Ryan, S.

9. Performing Organization Name and Address
Institute of Transportation Studies
University of California
Irvine, CA 92717

10. Work Unit No. (TRAIS):

11. Contract or Grant No.: RTA-65V303

13. Type of Report and Period Covered: Final Report 8/9/93-12/31/94

12. Sponsoring Agency Name and Address
California Department of Transportation
Division of New Technology and Research
1227 O Street/ P.O. Box 942873
Sacramento, CA 94273-0001

14. Sponsoring Agency Code:

15. Supplementary Notes:

16. Abstract:

The Glenn M. Anderson Freeway/Transitway project includes six lanes for general traffic, two HOV lanes, and the Green Line, a light rail project with ten transit stations and park and ride lots. The 17.2 mile facility traverses eleven jurisdictions and serves these and other neighboring communities. The study analyzes transportation attitudes and behavior before and after the opening of both the freeway and before the transitway opening. We measure travel behavior impacts of the new transportation system using a panel study. The survey instrument is a mailout/mailback questionnaire including questions regarding attitudes and intended use of the facility as well as a 24 hour travel diary. Also investigated are land use impacts of the facility. We focus both on changes in land use policy and actual land use around transit nodes and local freeway interchanges by measuring zoning changes, reviewing general plans and other documents, and interviewing local planning officials.

17. Key Words:
travel behavior
land use impact
transportation
light rail
highway
community

18. Distribution Statement:

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
unclassified	unclassified		

Form DOT F 1700.7 (2-86)

ACKNOWLEDGMENTS

We wish to thank all those who participated in the surveys and who completed the travel diaries. If we did not have their cooperation, this project would not have been successful. Invaluable too was the assistance of the city planners and managers who gave us their time for interviews.

We thank also Dr. C. Brown, who assisted us in pre-testing the survey instrument in Los Angeles; the staff at the Institute for Transportation Studies at UCI, including Ms. Anne Marie De Feo; Mr. Thomas Golob for his valuable advice in analysis; and Ms. Ziggy Bates, who helped with the production of this report. We appreciate the assistance of Caltrans in the support of this research and the kind help of Mr. Greg Case and his colleagues.

Our undergraduate research assistants were particularly helpful and to them we are very thankful; among them were Joanne Berry, Jennifer Chicconi, Debbie Sue Collins, Peggy Kellogg, Kyle Larson, Tiffany Mueller, James Pugh, Scott Tilley, Kathryn Rushmore, Thomas Wallin, Ky-Yen Wong, Maya Zaitzevsky.

THE CENTURY FREEWAY/TRANSITWAY: NUCLEATION, LAND USE CHANGES AND TRANSPORTATION BEHAVIOR

TABLE OF CONTENTS

Executive Summary

Chapter I. Introduction I-1
A. Early history of the I-105 relevant to this report I-1
B. The Century Lawsuit and its aftermath I-2
C. The Century and Rail Transit I-4
D. Research Objectives I-6

Chapter II. Literature review: Overview of the impact of new transportation facilities on travel behavior II-1
A. A brief history of urban transportation facilities II-1
1. Urban sections of the National Interstate and Defense Highway System II-1
2. Urban light rail facilities II-4
B. Transportation facility impacts on travel behavior II-5
1. Urban sections of the National Interstate and Defense Highway System II-5
2. Urban light rail facilities II-6

Chapter III. Survey Methodology, Study Area, and Study Sample III-1
A. Data Collection III-1
1. The Study Area III-1
2. Sampling III-1
3. The Instrument III-2
a. Wave 1 ..... III-2
b. Wave 2 ..... III-3
4. Data Organization III-4
B. Data Analysis III-4
1. Personal Questionnaire III-4
2. Travel Behavior III-5

Chapter IV. Travel before and after the opening of the Century Freeway IV-1
A. The study area IV-1
B. The sample IV-1
C. Attitudes and Beliefs About Transportation in General IV-6
D. Residents' Intended Use and Perceptions of the Century Freeway/Transitway IV-7
1. General intent to use the Century Freeway/Transitway facility Cross sectional analyses of intent to use by mode at time 1 and time 2 ..... IV-7
2. Intent to use and actual use by mode comparisons of respondents who completed both surveys IV-8
3. Relationship between intention to use and socio-economic indicators of age, income, ethnicity, and perceived proximity to facility. A cross-sectional description of the sample IV-9
E. Attitudes and Beliefs About the Facility IV-18
1. Intended nonusers: What about modes discourages intended use? IV-35
2. Users:What about the modes influences use? IV-39

F. Travel Behavior by Corridor Residents:
Actual travel behavior of respondents on their travel diary day. IV-40
1. Basic travel characteristics at time 1 and time 2. A cross-sectional look at the data IV-40
2. Basic travel characteristics at time 1 and time 2 A longitudinal look at the data IV-44

Chapter V. Literature Review of The Land Use Impacts of Transportation Facilities V-1
A. Land Use Impact of Freeways V-1
1. Introduction V-1
2. First Generation Studies V-3
a. Methods and Study Design V-3
b. Results V-4
3. Second Generation Studies V-5
a. Methods and Study Design V-5
b. Results V-7
4. Third Generation Studies V-8
a. Methods and Study Design V-8
b. Results V-9
5. Conclusions V-9
B. Land Use Impacts of Rail Transit V-10
1. Introduction V-10
2. Methods and Study Design V-10
3. Results V-12
4. Conclusions V-13

Chapter VI. **Methodology for Analysis of Land Use Policy** VI-1
A. Data Collection VI-1
1. General Plans, Zoning Maps and Other Documents VI-1
2. Interviews with Local Officials VI-4
B. Data Analysis VI-5
1. General Plans, Zoning Maps and Other Documents VI-5
a. General Plan Approach VI-5
b. Zoning Map Approach VI-5
2. Interviews with Local Officials VI-8

Chapter VII. Policy impact the I-105 and General Plans and Zoning Ordinances VII-1
A. Introduction VII-1
B. Policy Impacts: The General Plan VII-3
1. General Across Jurisdictions: Broad Overview VII-3
2. By General Plan Category Across Jurisdictions VII-3
a. Land Use VII-3
i. Opportunities Provided by Rail Stations VII-4
ii. Mixed Use Facilities. VII-8
iii. Pedestrian Influence VII-8
iv. Effect on Future Development VII-9
2. Circulation VII-13
C. Policy Impacts: Zoning VII-15

Chapter VIII. Conclusions.....VII-1

References

Appendices

1. Map of Study Area
2. Wave 1 Survey
3. Wave 2 Survey
4. Inventory of On/Off Ramps and Transit Stops
5. List of Interviewees
6. Planner and City Manager Interview Guide
7. Annotated Bibliography: Land Use Impacts of Freeways
8. Economic Conditions in the Corridor
9. Raw Data Summaries/General Plan Analysis

EXECUTIVE SUMMARY

The Glenn M. Anderson Freeway/Transitway ["The Century"] project includes six lanes for general traffic, two HOV lanes, and the Green Line, a light rail project with ten transit stations and park and ride lots scheduled to open in mid 1995. The 17.2 mile facility traverses eleven jurisdictions and serves these and other neighboring communities. Society's investment in the Century has been considerable. In dollar terms the Century has cost over $2.2 billion. To create the system, approximately 6,000 parcels of land were acquired by the Division of Highways and about 21,000 individuals were displaced. Like many transportation systems the benefits associated with the Century were to be significant. This was the conclusion of early analyses and was consistent with the considerable literature on [1] transportation behavior and facility availability and on [2] accessibility and land use intensification around rail stations and interchanges.

In this report we present the results of an almost two year study of the impacts of the Century. Results are based on data which come from surveys and travel diaries at two points in time [Wave 1, before opening of the system; Wave 2, after opening of the mixed flow and car pool lanes] with 450 residents of the corridor, a panel which we plan to survey after the Green Line is opened and again after the total Century transportation system has stabilized. Data also come from general plans and zoning ordinances for which we created a methodology to address intensification effects. Finally we supplement our results with information from interviews of city managers and planners in all of the jurisdictions which are served by the Century.

The hypotheses developed for the purposes of this research stem in part from economic theories of location. Location theory provides a model for understanding the relationship between transportation and land use. Theory predicts that firms will choose locations that minimize their costs (one of which is transportation), and households will choose locations to maximize utility. When a land parcel is located such that its associated transportation costs are lower than all other parcels in the area, firms or households will bid up that parcel's price until it reflects the transportation savings resulting from a more accessible location. It follows that the construction of a major transportation facility should increase the value of nearby parcels since transportation costs associated with these locations will have decreased. Intensification of land use should also follow. Here we examine levels of accessibility before and after the opening of the Century Freeway and we identify land use policy changes and new development and intensification of land uses near the freeway as possible indications of the increased desirability (and value) of these locations.

Our study area included the nine cities through which the I-105 Freeway/ Transitway passes: Downey, El Segundo, Hawthorne, Inglewood, Los Angeles, Lynwood, Norwalk, Paramount and South Gate. The freeway also runs through several parts of unincorporated Los Angeles County. We added three cities that we believe will be impacted by the facility: Bellflower, Compton and Gardena are in close proximity to the freeway/transitway. The study area covers approximately 119 square miles of Los Angeles County, extending approximately 5.25 miles in the north/south direction and 22.75 miles in the east/west direction.

Among the most interesting and important findings are the following:

Transportation Attitudes & Behavior

Actual travel behavior was assessed before and after the opening of the Century Freeway.

Travel Behavior. The great majority of respondents travel alone. They do not walk, use bicycle or transit. About 60% of all trips are non work related. From Wave 1 to Wave 2, the total number of trips increased slightly. The average travel time for *work* trips decreased significantly for Century Freeway users. The other travelers in our sample did not experience a significant change. When a similar comparison is conducted for all freeway users, we find a similar trend. Average travel time to work decreases in Wave 2, but not at a statistically significant level. In addition to decreasing travel time for Century Freeway users, it is possible that the opening of the Century Freeway decreases travel time to work for all freeway users because of the alleviation of traffic on roads Century Freeway users previously used.

An increase in travel time for *"other" trips* was observed for both Century Freeway users and freeway users in general, while non-freeway users exhibited a decrease in average travel time for drive alone "other" trips. None of these changes was statistically significant, however.

Intended and Actual Use of the System. For those respondents taking part in both surveys, there is a drop-off in actual use (mixed flow and carpool) of the facility, when compared to intended use. With respect to the Green Line, even though the facility is not available for use yet, we observe a drop-off in intended use between Wave 1 and Wave 2, although intended use for non work trips remains relatively stable. By Wave 2, 34.9% of those who work indicate that they have changed their route to work because of the freeway opening; about 8% changed their shopping location; and 10% now carpool because of the existence of the Century Freeway. Men and women are equally likely to use the carpool and mixed flow lanes but more men indicate an intention to use the Green Line. The lowest proportion of Green Line users falls in the 30-39 and 60-69 year age groups and among white residents. By location, the area already served by the Blue Line reports the highest intended use of the Green Line. By income, the most likely users fall into the categories of less than $5,000/year and greater than $65,000/year. People 20-29 years of age are most likely to report that they will travel on each of the facility's modes.

Factors Encouraging/Discouraging Use or Intended Use. The reason most often cited for using both the carpool and mixed flow lanes is that it reduces travel time. The main "discouraging" factor across all categories was that the system "won't go where I need it to." In addition there is a substantial concern about crime on the Green Line that might discourage use once the facility opens.

Attitudes and Beliefs About the Facility. Most respondents agree that all three modes of the facility will improve regional and local traffic, with more agreeing that it will influence regional traffic. After the freeway's opening, both users and non users agree with the statement that the facility improves their city's traffic. Non users show a large change in opinion between Wave 1 and Wave 2.

Attitudes and Beliefs About Transportation in General. About one seventh (14.1%) of our respondents indicated that they agreed with the statement "I enjoy using public transit." About half disagreed. However, 72.8% agreed that "Public investment in mass transit is important," and 62.7% agreed that "high density development near transit stops for retail and business centers is a good idea." Regarding the value of land near transit stations, 42.4% had no opinion regarding the statement "Transit stations make nearby land more valuable." 36.7% agreed with that statement and 20.8% disagreed. About 62 % of our sample indicated that they supported the building of the Century Freeway. Six percent were opposed and the remainder had no opinion.

Land Use

General Plans: Across Jurisdictions The Century has had a fairly small impact on policy change in the corridor jurisdictions as reflected in the general plans. When effects *are* discussed, statements made are tentative and careful in many places--at times suggesting that policy makers are responding--in great part--in their plans to market forces rather than actively creating policies for uses around the corridor facilities. Although there is variation within the corridor jurisdictions, in general there is a sense of watchful waiting rather than an active orientation of attempting to direct change around the facilities. The most noted land use element impacts are on *generalpotential* for at least mid-term future development. Jurisdictions which gave considerable attention in their plans to the Century were LA County, Downey, Hawthorne, Lynwood, Norwalk and Paramount. Of the periods reviewed, impact was noted most frequently between 1981 and 1993 [our Time Period 2].

In ten jurisdictions the Century influenced or effected *land use* plan changes. The County of Los Angeles, Paramount and Norwalk dedicated the most attention to the Century. Each of the ten jurisdictions noted impacts in time Period 2, while Paramount was the only city to discuss perceived impact in time Period 1 [1968-1981]. About forty percent [40%] of the jurisdictions addressed the opportunities provided by rail stations and half that percentage saw opportunities for mixed use development associated with the Century facilities.

Some interviewees felt that there might be change in the longer run, that beyond ten years the possibility exists that the economic climate for intensification will be more propitious. Then, too, according to these respondents, there may be a greater appreciation of transit. Once the Green Line is operational, retail users may see there is the potential for market enhancement related to foot and passenger traffic around stations. Possibly there will also be an interest in having housing near rail. On the other hand constraints on future development were also noted: the absence of perceived need for intensification; the existing acceptable residential characteristics of the affected areas transected by the Century; and the general desirability in the Los Angeles area--among citizens if not among professional planners--of suburban standards.

Zoning. Viewed in total, the direction of land use policy change as reflected in the zoning is counter to the direction hypothesized and predicted in much of the literature. The zoning designation changes which occurred in four cities, Paramount, Inglewood, El Segundo and Bellflower are characterized by de-intensification in terms of vehicle-trip generating land uses. Two cities, Lynwood and Hawthorne, showed an intensification of vehicle-trip generating zoning designations. South Gate showed no land use designation changes. Thus for those jurisdictions for which workable data was available the ratio of jurisdictions *intensifying* to *de-intensifying* land use was 1:2.

Chapter I: Introduction

A. Early history of the I-105 relevant to this report

The history of the subject matter of this report is complex and long. In this brief introduction, we touch only on major events which are relevant to our concerns with transportation behavior and land use.[1]

Public hearings on the routing of the Glenn M. Anderson Freeway/Transitway (hereafter the Century Freeway or the I-105) conducted by the California Division of Highways began in 1963. Funds were made available for its implementation after being reallocated through a mechanism of a 1968 Amendment to the Federal Aid Highway Act which provided for this transfer of funds from abandoned projects within the National Interstate and Defense Highway System (Emerson, 1980). Public opposition to the Embarcadero Freeway in San Francisco had led to its abandonment and freed up monies. A then ten lane Century Freeway was thus designated part of the Interstate system in 1968 and it became eligible for 92% Federal funding. The route had already been evaluated according to several criteria which are some of the concerns of the project report: "costs of construction and right of way; the effects on single and multiple family dwelling units, industrial and commercial properties, and community facilities; user benefits; as well as local agency and community input" (State of California, Department of Transportation, Caltrans, 1990).

With the Century Freeway's proposed addition to the Interstate system in 1968, the Federal Highway Administration (FHWA) required the creation of a multi-disciplinary design team. The consultant organizations as well as local agency members, the Federal Highway Administration and the Division of Highways, identified and analyzed various community and environmental impacts and opportunities that the I-105 project would create. These studies became parts of a public report, not ordinarily conducted at the time, assessing economic and fiscal structure, housing displacement, community facilities, traffic

[1] For fuller historical treatment see Emerson, 1980; DiMento et al., 1991.

circulation, neighborhood environmental values and joint use development (State of California, Department of Transportation, 1988). Impacts of interest to the present study were also described in the Draft Environmental Impact Statement. These included connections and related reconstruction of the four north-south freeways which would interchange with the 105; relocation of the Southern Pacific Transportation Company railroad tracks in the central portion of the corridor; and a proposed joint use development project in the City of Lynwood (U.S. Department of Transportation, 1974).

Property acquisition for the Century began in January, 1970. By 1972 this step in freeway development was 70% complete, and 2,840 residences in the freeway corridor had been vacated (Armstrong, 1972; 352 F. Supp. at 139). Forty two percent of the required parcels had been cleared; 14,700 people had been relocated; 1,000 buildings were vacant; and 52 of the 292 businesses had been relocated. It was estimated that eventually 21,000 individuals would be displaced by the freeway (U.S. Department of Transportation, 1974). A significant percentage of them was non-white and an even larger number had relatively low incomes. Approximately 3,900 single family dwellings and 3,000 multiple unit dwellings were required for the freeway right of way. In total, approximately 6,000 parcels of land were eventually acquired by the Division of Highways (Armstrong, 1972).

B. The Century Lawsuit and its aftermath

In early 1972, after all but two freeway agreements had been signed by the local jurisdictions through which the freeway was to run, four couples living in the route of the proposed freeway, together with the NAACP, the Sierra Club, the Environmental Defense Fund, and the Hawthorne Freeway Fighters filed a federal lawsuit seeking an injunction against officials involved in the construction. Plaintiffs contended that the State and Federal highway agencies had not complied with the requirements of the newly enacted federal and state environmental policy acts, the National Environmental Policy Act (NEPA), and the California Environmental Quality Act (CEQA); had not complied with

applicable relocation assistance or public hearing requirements; and had violated the United States Constitution's Fourteenth Amendment protection guarantees by displacing minority members and the poor in the absence of adequate replacement housing. Federal Highway Administrators had previously determined that a formal Environmental Impact Statement (EIS) would not be required for the Century because of the unique urban design approach that had been employed.

A preliminary injunction was issued on July 7, 1972, enjoining defendants from all activities in the furtherance of the Century Freeway except those activities necessary to comply with the injunction's provisions and to protect the public health and safety.[2] The district court ordered preparation and consideration of an environmental impact report and additional public hearings, specific project reassurances with respect to the adequacy of replacement housing, and further housing availability studies.

The Final EIS was submitted in 1977 and approved by the Federal Highway Administration in 1978. At this time, the plaintiffs also indicated their willingness to negotiate a settlement based on certain conditions. In 1979, the federal district judge, Harry Pregerson, approved a consent decree which advanced five purposes: (1) to permit the I-105 freeway to be built according to the specifications provided in the decree; (2) to provide for a bus or rail transitway within the corridor; (3) to preserve the quantity of housing available in the area affected by the project; (4) to ensure that the affected communities benefit from the enhanced employment opportunities generated by the project; and (5) to avoid further litigation [Consent Decree, Keith v. Volpe, 352 F. Supp. 1324 (C.D. Cal. 1980) No. 72-355-HP; See also DiMento and Hestermann, 1993].

In early 1981, federal budgetary developments raised questions about the adequacy of funds to complete the freeway in the manner finally agreed upon at the signing of the consent decree in 1979. A 1982 Congressional Budget Office Report (Congressional Budget Office, 1982) described the financial pressures on the Interstate Program related to

---

[2] Keith v. Volpe, 352 F. Supp. 1324, 4 ERC 1350 (C.D. CAL. 1972). See also 352 F. Supp. 1351, 4 ERC 1562 (C.D. Cal. 1972).

mounting repair needs, escalating completion costs, and declining financial resources. It noted that the dual national and local emphases of the highway program allowed many locally important but nationally non-essential gaps to remain in the system. Over fifteen miles of the I-105 had been designated neither an essential gap by the Department of Transportation, nor a Gap of Defense Importance by the Department of Defense. The Century Freeway's high cost was considered a diversion of funds that might otherwise be devoted to essential repairs. A potential solution was to "shift program emphasis to trim spending on new construction and increase funding for needed repair" (Federal Highway Administration, 1982).

As a result, the Consent Decree was amended in 1981. The roadway was downscaled to six lanes for general traffic, two HOV lanes and a median busway convertible to light rail. The I-105 would include ten transit stations, ten park & ride facilities, and ramp metering. The housing program was also scaled down. The affirmative action program remained intact.

C. The Century and Rail Transit

Left undecided at the time of the Final Consent Decree issuance was a decision on which transit mode would be implemented in the median. The original design of the Century Freeway in the late sixties included preservation of a minimum of forty feet in the median of the freeway right-of-way for public transit (U.S. Department of Transportation, 1974). The initial appearance of this transit feature most likely grew out of concerns about auto congestion and air pollution. The federal government had also recently made funds available for expansion of transit systems, and there was growing interest in implementing a busway system in the Los Angeles region. In the seventies, during the consent decree negotiations, the issue of transit mode in the median began to gain importance as a bargaining tool for the plaintiffs. Between the writing of the draft and final environmental impact statements, the discussion related to transit and mode choice in the median changed

significantly. The 1974 draft EIS reflected a distinct commitment to bus, arguing that the most realistic transit alternative, based on estimated ridership for the corridor, would be a busway.

The 1977 Final EIS indicates that rail was becoming a stronger consideration within the entire region. In discussing the choice of alternatives, an entirely new section was added to address the rail versus bus issue. Approximately three pages of text were added covering the feasibility of bus as compared with rail. Pressure was developing to defend the decision to consider bus as the only transit alternative. The Final Environmental Impact Statement used the same reasoning to explain why only bus would be considered: low estimates of future transit demand, lower capital costs associated with buses, and greater system flexibility and compatibility with the region. A further point was added: the busway was eligible for Interstate funds while a rail line would necessitate other sources of funding. The state did not evaluate the rail alternative in the Final Environmental Impact Statement. However, the consent decree mandated that design should allow for the convertibility to this alternative. Furthermore, although a draft of the 1981 consent decree showed that Caltrans did not support the idea of light rail, the final draft of the 1981 decree established a clear preference for light rail, and omitted any reference to Caltrans' position.[3]

It is difficult to define exactly when the decision to build rail occurred. Apparently, the most significant turning point in deciding the issue was made in the final consent decree in 1981, when the judge approved the requirement that the busway median be built convertible to rail. This action characterized rail as a priority alternative, subject only to the availability of funding. Through the consent decree, local transit agencies were exempted from conducting alternatives analyses beyond those presented in the final EIS. Even though rail had not been considered in the final EIS, Judge Pregerson left open the

---

[3] The draft version of the renegotiated decree in 1981 stated that : "[p]laintiffs do not favor the use of buses as permanent or long-term public transportation in Los Angeles. Plaintiffs would prefer the construction of light rail from the beginning but recognize the limitations on funding. It is the position of Caltrans that current patronage forecasts do not justify the rail alternative at the time of anticipated opening," (Draft of renegotiated Consent Decree, 1981). In the final version of the consent decree, the above language was omitted.

possibility of its construction should funding arrangements be made at a later date. This funding was made possible by the passage in 1980 of Proposition A, allowing for a half cent sales tax increase to be used "to improve and expand countywide public transportation, reduce fares, and construct and operate a rail rapid transit system" (Stanger, 1984), specifically including rail on the I-105 corridor.

Groundbreaking on the Century finally occurred in May of 1982 and the freeway was opened to traffic in October of 1993. The Green Line is scheduled to open in mid 1995.

D. Research Objectives

Transportation projects are often supported and funded in the name of economic development. In President Carter's 1978 National Urban Policy, for example, transportation programs were considered a tool to stimulate urban revitalization. Although the link between economic growth and transportation may seem evident, the existence and nature of this relationship has been difficult to show empirically.

The term "economic development" encompasses a wide range of possible transportation benefits which can be categorized as direct benefits in the form of travel time savings and other cost savings, or indirect benefits in the form of increased value of nearby land, increased employment levels, and reduced pollution. The focus of this research is to identify evidence of either type of benefit; more specifically, we hypothesize that after the opening of the freeway, residents in the area will enjoy higher levels of accessibility and that land uses will intensify near freeway interchanges.

The hypotheses developed for the purposes of this research stem in part from economic theories of location. Location theory provides a model for understanding the relationship between transportation and land use. Theory predicts that firms will choose locations that minimize their costs (one of which is transportation), and households will choose locations to maximize utility. When a land parcel is located such that its associated transportation costs are lower than all other parcels in the area, firms or households will bid

up that parcel's price until it reflects the transportation savings resulting from a more accessible location. It follows that the construction of a major transportation facility should increase the value of nearby parcels since transportation costs associated with these locations will have decreased. Intensification of land use should also follow.

The objective of this research is twofold: first, to examine levels of accessibility before and after the opening of the Century Freeway to present evidence of reduced transportation costs; and second, to identify land use policy changes and new development and intensification of land uses near the freeway as possible indications of the increased desirability (and value) of these locations.

Local travel behavior is assessed before and after the opening of the Century Freeway. We collect data on travel time, trips per day, modal split, and trip destinations to identify changes in accessibility levels and travel trends that may be associated with this new transportation facility. In conjunction with measuring changes in accessibility, we also analyze changes in land use occurring within the Century Freeway corridor. Are land uses intensifying, or, more preliminarily, have jurisdictions planned for intensification of, and have private developers demonstrated an increased interest in, properties with easy access to freeway interchanges? To determine the extent of land use intensification near freeway interchanges and transit stations we analyze General Plans, zoning maps and other relevant documents from periods before and after the construction of the Century Freeway. We inquire whether cities have incorporated the transportation facility in their planning as an opportunity for increased economic activity and land development.[4]

[4] To supplement this land use data we also interview local officials familiar with land development and land use policies in their jurisdictions.

Chapter II. Literature review: Overview of the impact of new transportation facilities on travel behavior

In this chapter, we review the history of the urban interstate freeway and light rail systems and the hypothesized impacts of an improved transportation system on travel. Impacts may result from both the construction and the operation of the facility and its vehicles. They vary in relative permanence, magnitude and importance and can be direct, indirect or induced. Furthermore, they can be physical, perceived, or conceptual effects which alter the lifestyles and makeup of society (Hamilton, 1988). We review both highway and light rail studies; however, the literature on the impact of light rail facilities on travel behavior is not as extensive as highway impact studies, which were heavily funded by the FHWA in the 1970s.

A. A brief history of urban transportation facilities

1. Urban sections of the National Interstate and Defense Highway System

By 1955, 40,000 miles of interstate highway were routed: 5,000 of them were intended to run through urban areas. The mileage of the entire system was to increase over the next few years: in 1968 it was designated a 42,500 mile network with over 8,600 urban miles. In major metropolitan areas maps which depicted the system "generally display[ed] an 'inner belt' encircling all or part of the downtown areas, an 'outer belt' encircling all or part of the entire metropolis, and one or more 'radial' freeways leading outward from the inner belt. In a typical medium size metropolitan area the proposed Interstate [split] in two as it approache[d] the city, one branch going through the city and the other around it, with the two branches then reuniting at a point beyond the city" (Schwartz, 1976). Many smaller cities were connected to the system with a single 'spur.' The transportation purpose of these designated urban portions of the interstate was to provide feeder and distribution routes through urban areas connected by the national system.

In 1956, the Federal Aid Highway Act (70 Stat. 374, codified later as 23 U.S.C. 120 (c) (1970)) provided a taxing mechanism that would finance the construction of the National Interstate and Defense Highway system through the Highway Trust Fund. Designated roads would be built with a 10% contribution from State Highway funds and approximately 90% Federal funding. Completion of the system was hailed as the largest public works program ever, providing much needed jobs as well as a comprehensive network of high speed roadways across the country (Seely, 1987). The system, it was argued, would foster interstate commerce, provide post World War II jobs, and relieve congestion in cities by increasing capacity and providing bypasses around high density areas (Meyer and Gómez-Ibáñez, 1981). Owen (1956) wrote that "urban interstates constitut[ed] a vital improvement in urban transportation entirely necessary if cities are to be successful in adapting to the automotive age."

Because of increased land acquisition costs, as well as preestablished land use patterns, these roadways would prove to be difficult to build. Designation of new roadways through urban areas prompted protests. Protestors associated the Interstate system with increased air pollution, massive displacements, public transit declines, and excessive suburbanization (Schwartz, 1976; Leavitt, 1970; Kelley, 1971). They objected generally to the opportunity costs of replacing marketable land with concrete. Relevant to our investigation, they tended to minimize the potential land use intensification benefits which might result from increased traffic. These accusations were particularly strong in reference to freeways routed in urban and environmentally sensitive areas.

> Significantly, the unfinished portions of the system, and those most likely never to be completed, are in major urban areas where communities do not take kindly to the notion of an interstate highway proceeding through their terrain. Such routing often led to the displacement of residences and businesses, the diminution of property tax rolls and increased air and noise pollution. The greatest disappointment with the interstate highway program, though, was that it did not seem to achieve its major objective of reducing traffic congestion (Meyer and Gómez-Ibáñez, 1981).

The enthusiasm of city officials who welcomed urban freeways as a means to alleviate worsening traffic problems and stimulate the economy was sometimes met by

citizen opposition which raised questions about those supposed benefits. Jones (1989) hypothesized that a change in public attitude toward freeway building in the 1960s and 1970s resulted in part from 1) the increasing scale of the facilities that were being designed by the Division of Highways as it took advantage of the financing available through the Interstate Program; 2) the exhaustion of "easy jobs" which were built in previously established transportation corridors, not in residential neighborhoods; and 3) the increasing severity of air pollution in metropolitan areas.

The public sentiment was reflected in numerous laws and regulations which changed the operating procedures of state highway agencies. Private citizens and the legal community became more vocal and more important to transportation decisions (DiMento et al., 1991). The roles of technical specialists and professionals were altered such that the standard routines of transportation facility construction became things of the past. Views of transportation policymakers were also changing, under the pressure from increasing growth and traffic congestion, coupled with limits on transportation budgets, and increasing opposition to highway construction by environmental coalitions and community groups (Wachs, 1990).

Some of the popular literature on the (urban form and social) effects of urban highways portrayed highway builders as insensitive men who forced homeowners from their land. Roadways were described as symbolic political and racial boundaries which caused the downfall of the city (Leavitt, 1970; Mowbray, 1969). The indictments include the following: the urban interstates have failed to alleviate urban traffic congestion; they have polluted the air; ravaged the urban environment; ruined parks and open spaces; destroyed viable minority low income neighborhoods; and evicted staggering numbers of residents and small businessmen (Mumford, 1956; Kelley, 1971; Leavitt, 1971).

> Given that resident suburbanization was primarily composed of middle- and upper-income whites who required urban highways to connect their residences with their white- and blue-collar jobs concentrated in the central city, it follows that major benefits have gone to them while the negative impacts of highway construction and use have fallen most heavily on lower-income, and often minority, inner-city

neighborhoods, which were politically powerless to prevent such impacts (Hodge, 1986).

These allegations did not go unanswered. The benefits of freeways were addressed by other analysts. Some planners and highway officials argued that freeways were a social good (both regionally and locally): they could rid slums of deteriorating buildings that could be replaced with new structures, through urban renewal, and they would divert local traffic to interstates. In turn, city streets would be made more suitable for neighborhood use. Freeway proponents argued that "a freeway does work to social advantage by satisfying citizen transportation preferences which would otherwise remain unfulfilled or latent" (Schwartz, 1976). Ultimately travel time to work and other destinations would thus drop.

2. Urban light rail facilities

In the 1960s politicians and transportation planners began considering new solutions to the growing transportation problem: urban roadway capacity expansion was not alleviating urban congestion. The major focus of policy efforts at this time shifted away from highway building to the building of a "balanced" transportation system which provided alternative modes of movement for goods and people once they were brought to the city. In 1964, the Urban Mass Transit Act initiated federal expenditures for urban transit systems; the primary goal was to help local transit systems compete with the growing popularity of auto travel. The availability of federal money was limited at first to capital investments, the purchasing of transit properties from private companies, and acquisition of rights-of-ways.

The legislation's emphasis on capital investments had a lasting affect on the growth and development of transit systems in the United States, because it provided cities with the ability and therefore incentive to pursue capital-intensive transportation systems. Since 1974 a federal subsidy program for operating costs of public transit has also been in place.

In response to this newly funded federal program, cities began planning rail transit systems, even though in most cases these cities did not have the population densities and centrally located employment concentrations to support rail service. Meyer and Gomez-Ibanez (1981) cite passenger volumes of 30,000 in the weekday peak period as a minimum for potentially successful rail service. They also remark that there are only a few cities in the U.S. where these conditions exist. The sudden growth of capital intensive transit systems in the U.S. and their questionable success led to criticism of the decision making process which stimulated rail development. Evidence suggested that although local agencies are required to conduct in-depth alternatives analysis and choose the option that provides the lowest cost/benefit ratio, rail systems of questionable merit are being planned and developed in many cities in the United States.

There has been considerable debate in the United States during the past twenty years about the values of light rail versus bus transit. In general, it appears that although bus systems might be more cost effective than rail (Pickrell, 1992; Kain, 1990; Gomez-Ibanez, 1985), rail is more politically attractive. Proponents, not unlike early highway advocates, argue that light rail has the potential to help solve many urban problems: reduce peak hour traffic congestion; reduce time expended on commuter travel; foster central district growth; generate development of subcenters throughout a region; raise land values; accommodate the suburbanization of residence and centralization of employment; and reduce land area devoted to transportation facilities (Webber, 1977; Wachs, 1989).

B. Transportation facility impacts on travel behavior

The debates over the transportation, social and economic costs and benefits of new facilities have been fueled by empirical studies.

1. Urban sections of the National Interstate and Defense Highway System

Until the 1970s the travel behavior impacts of freeways in urban areas were viewed primarily in terms of the quantifiable economic benefits to users, both for the private citizen

and commercial or industrial businesses. The biggest measurable benefit of these limited access roadways was a hypothesized decrease in travel times and costs and therefore improved access to existing jobs and other opportunities. In areas previously unserved by highways, the benefits are clear: these new routes facilitate the movement of goods and services to consumers as well as opening up new land for development, both residential and commercial or industrial.

However, in areas already served by an advanced transportation network, such as exists in Los Angeles, the relationships among highway improvements, level of service, and land use are less consistent (Giuliano, 1989). While construction of the freeway and any new developments provides employment opportunities, travel outcomes in metropolitan areas characterized by a well developed transportation system and decentralized pattern of land use are difficult to predict (Giuliano, 1989), but usually limited.

Critics of the urban interstates conclude that freeways used primarily for intraurban trips generate traffic: any alleviation of local congestion is reestablished on these limited access roadways, causing a deteriorated level of service for through traffic (Downs, 1992; Meyer and Gómez-Ibáñez, 1981). Attempts to accommodate growth simply by increasing system capacity impose greater costs on communities than are warranted by their benefits (Wachs, 1991).

2. Urban light rail facilities

Hypothesized benefits of light rail transit include relief of urban traffic congestion, reduction in the consumption of fossil fuels, provision of transportation service for those too old, too young, or unable to drive cars because of handicaps, reversal of the physical and social decline of the inner cities, and reversal of "urban sprawl" (Wachs, 1989). However, research on the impacts of new transit facilities on travel behavior suggests that the purported advantages of light rail might be overestimated. Ridership projections are

consistently overestimated and the majority of those who do ride used transit before the facility opened (Kain, 1990; Pickrell, 1992). Furthermore, without coordinated policies of urban development the low cost and increased capacity benefits of rail might not be realized (Cervero, 1984; Vuchic, 1991).

Transportation planners, economists and politicians agree that this subsidization of light rail has been accompanied by a decline in productivity and a growth in deficits (Wachs, 1989; Lave, 1981; Lave, 1991; Jones, 1985). Kain (1990) discussed important shortcomings of standard forecasting methods used in alternatives analysis, which stem primarily from the easy manipulation of land use and employment input variables. He pointed out that these variables are subject to great error but are at the same time the major underpinning of accurate ridership forecasts. Gómez-Ibáñez (1985) examined three cities' experiences with light rail in terms of costs, ridership and social benefits. He determined that the proposed advantage of light rail over bus transit is not supported by statistics from the initial years of rail service. He found that per capita transit ridership increased in two of the three cities after rail was implemented; however this was achieved at a high cost ($6-$26 per new transit rider).

In his 1977 evaluation of San Francisco's Bay Area Rapid Transit System (BART), Webber indicated that the service provided transportation primarily for suburban commuters, half of whom were transit users before. Also, because of the increased capacity the system provided on the roads, no relief in auto congestion occurred. Despite higher suburban use, Wachs recommended that transit managers limit service expansions in low density outlying areas because it is in the inner city that transit routes cover the largest share of their costs from the farebox (Wachs, 1989).

The traditional users of transit are women, younger and older travelers, and low income populations (Pisarski, 1992). Therefore transit provides important travel alternatives to patrons who might not be able to operate or afford automobiles. Changes in travel trends in the past ten years, however, indicate that the use of alternatives to the single

occupant automobile is on the decline. Pisarski interpreted this as a "democratization of travel" such that the disparity between young and old, or higher or lower income, with respect to the number of single occupant vehicle trips made, is diminishing (1992).

Chapter III: Survey Methodology, Study Area, and Study Sample

A. Data Collection

1. The Study Area

Our study area included the nine cities through which the I-105 Freeway/ Transitway passes: Downey, El Segundo, Hawthorne, Inglewood, Los Angeles, Lynwood, Norwalk, Paramount and South Gate. The freeway also runs through several parts of unincorporated Los Angeles County. We added three cities that we believe will be impacted by the facility: Bellflower, Compton and Gardena are in close proximity to the freeway/transitway. The study area covers approximately 119 square miles of Los Angeles County, extending approximately 5.25 miles in the north/south direction and 22.75 miles in the east/west direction. (See map attached in Appendix 1).

2. Sampling

For the transit behavior part of our study, the relevant population is the residential population of the corridor whose travel behavior might be affected by the Century facilities. In order to investigate travel behavior of this population we chose to administer a survey which included a travel diary to a scientifically selected sample. To help gain access to households for this task, we enlisted the services of a professional mailing list company. We chose Dunhill International List Company because we found their list compiling methods to be the most rigorous of the companies which serve the Los Angeles County area. The list was generated from a variety of sources including telephone directories, auto registration, voter registration, birth certificates and drivers license records. We obtained a list of 2500 mailing addresses sampled proportionately at random from specified zip code areas of the relevant jurisdictions. From this list we then randomly selected 2000 survey recipients, and kept the remaining 500 addresses to refresh the sample for the second wave mailing, which is a common approach used to counteract panel attrition.

3. The Instrument

One of the goals of our study was to compare travel behavior of corridor residents before and after the facility opened. Another goal was to describe residents' perceptions of the freeway, carpool lanes and light rail line over time. We chose a panel study methodology so that changes in individual travel behavior could be tracked over time, and more effectively associated with the opening of the freeway. By repeatedly surveying the same individual, we aim to identify factors that influence changes in behavior. If no major life changes occur for an individual, and significant travel behavior changes occur between the before and after periods, then it can be assumed that most of this behavioral change results from the opening of the freeway. We surveyed our sample twice. Each survey contained a travel diary and personal questionnaire. We consider this baseline work with which future survey results can be compared.[1]

a. Wave 1

In early September 1993, we prepared a draft survey which we pretested during a one day visit to South Central Los Angeles. We solicited nine individuals with varied educational backgrounds to complete the survey. We provided a five dollar incentive to each participant. With the assistance of a consultant who was a former resident of South Central Los Angeles, we learned that the survey was excessively long and complicated. The pretest illustrated the need for simplification and clarity. Final changes were made based on this knowledge. (No data analyses were performed on this small sample, as it was unclear to what extent the respondents understood the questions.)

Because of the large Hispanic population in parts of the corridor, we translated the survey into Spanish. On September 30, eleven days before the freeway's ribbon-cutting ceremony, we sent the 24 page mail-out/mail-back questionnaire to our sample of residents living within our study area. We sent two surveys to each address, with instructions in both Spanish and English to complete either the Spanish or English version and return it in

[1] We had anticipated surveying our population every six months until six months after the opening of the light rail line.

the postage prepaid envelope provided. A lottery consisting of a two hundred dollar prize was used as an incentive to improve the return rate. The questionnaire included items about the residents' perceptions, expectations, and intentions regarding use of the new facility, and it also included a one-day travel diary.

One week later we sent a follow up postcard to each survey recipient as a reminder to complete and return the completed survey. The response rate was 22.65%, yielding 453 cases. Three respondents removed their identification numbers from their surveys.

b. Wave 2

We prepared a second survey in April 1994, approximately six months after the freeway opened. We updated the first wave questionnaire to improve the data quality. Any questions that were redundant, confusing, or unnecessary were eliminated. Changes in layout and content were made to increase the probability of accurate responses. This survey was sent to the 447 respondents who completed the first survey and still lived within the corridor and a refreshment sample of 53 (drawn randomly) from the 500 names remaining on our original list, bringing our sample to 500. It is our goal to maintain a panel of approximately 450 respondents.

We also translated this survey into Spanish: Wave 1 respondents who completed the Spanish version were sent Spanish copies. Refreshment addressees were sent both English and Spanish versions. We again included a lottery prize as incentive. The surveys are attached as Appendices 2 and 3.

One week later we sent a reminder postcard to all addressees. The response rate following the postcard was 49.2%. Because the remaining sample underrepresented members from many communities, especially Inglewood, Los Angeles, and Compton, the study sample was supplemented in this follow-up of the Wave 2 respondents. One month subsequent to the initial Wave 2 Survey mailout, nonrespondents from Wave 2 were sent a copy of the second survey, and 237 nonrespondents from Wave 1 were sent a first copy of the Wave 2 Survey. Financial considerations determined the size of the supplemental

sample which was drawn as a proportionate sample of the underrepresented areas' populations. In this follow-up, 52 additional surveys were collected: 39 who have completed both Wave 1 and Wave 2 surveys and 13 who have been contacted in both Wave 1 and Wave 2 but responded only in Wave 2.[2] The overall response rate for continuing respondents or residents contacted only in Wave 2 was 57%.

4. Data Organization

As the surveys came back they were dated and collated. The data were entered in SPSS using SPSS Data Entry II. All personal questionnaires were reviewed for accuracy using a post-entry check for invalid ranges. We individually examined travel diary data to assess whether each respondent understood the task.[3] Based on our quality control rules, we accepted most of the diaries.

We further cleaned the data in this manner: all travelers who began their day at home were returned home at the end of the day, and all trip purposes that were listed as "other" but which could be included in one of our closed end categories were transformed.

B. Data Analysis

1. Personal Questionnaire

The respondents' overall perceptions of freeways and transportation in the region are described through basic frequencies and cross-tabulations. As the data in this section are primarily categorical, non-parametric techniques of comparison are used to assess the relationships between socio-economic factors, geographic location, and intended or actual use of the three modes within the facility.

[2] In retrospect this follow-up may have been more cost effective if only a follow-up survey mailout had been conducted. The supplementary refreshment sample drawn mainly from Los Angeles, Inglewood and Compton yielded a 5% response rate.

[3] A respondent demonstrates a lack of comprehension by making either of the following entries in this section of the survey: more than one travel diary day was entered, or the traveler appeared to arrive at a location before he left the previous location. If a respondent did not appear to understand the task, the entire travel diary portion of the survey was excluded from analyses.

2. Travel Behavior

We describe travel behavior at Time I and Time II using basic cross-tabulation and frequency distributions. Travel characteristics assessed are: average number of trips per day and travel time by mode and purpose; and freeway, bus, rail and carpool use measured as a fraction of total number of trips.

For the inferential and longitudinal analyses we analyze the responses of the 256 respondents who provided both questionnaires and travel diaries that could be analyzed in both wave 1 and wave 2. Although a total of 489 respondents returned our survey, 32 completed only wave 2, 149 completed only wave 1 and 52 either did not complete the travel diary, or traveled in excess of 3 standard deviations from the mean total travel time by the sample.

Chapter IV: Travel before and after the opening of the Century Freeway

A. The study area.

The nine cities through which the Century Freeway passes differ markedly from each other. In a separate study (van Hengel, 1994), the average values of some socio-economic indicators for corridor cities were compared with the Los Angeles County values. Using 1990 United States census data we illustrate in Appendix 8 the considerable variation along the route of the freeway/transitway. The charts compare cities with county averages for several economic indicators. There is considerable variation in ethnicity among the cities. Economically, El Segundo stands alone as the city with consistently better than the county average values in unemployment, median income and median home value. Los Angeles and portions of unincorporated Los Angeles County appear to be more reliant on public transportation than the cities on either end of the freeway (El Segundo, Downey and Norwalk).

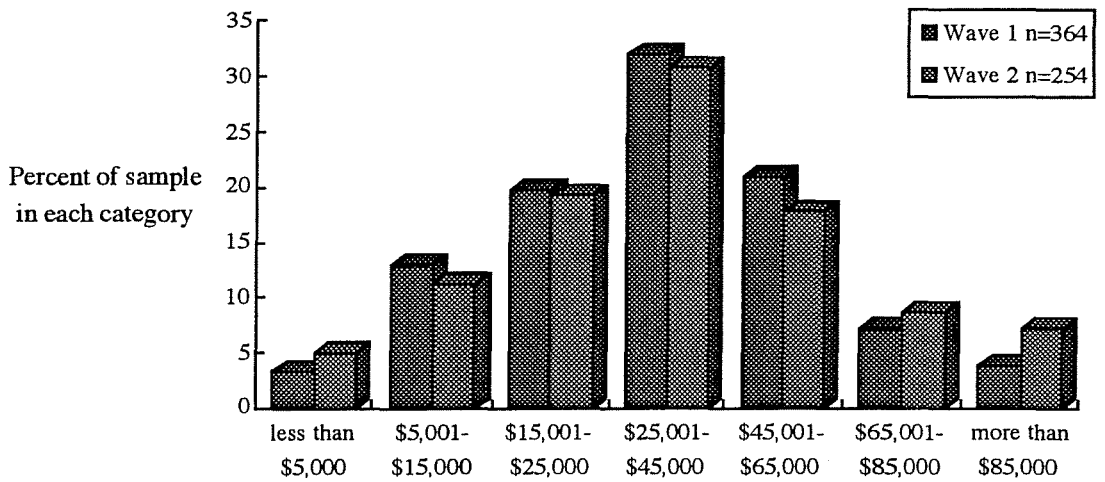
B. The sample

The figures below show the frequencies for several selected socio-demographic and housing variables of the Wave 1 and Wave 2 respondents. The average number of years lived in the present neighborhood was 23.77 in Wave 1 and 24.35 in Wave 2 (standard deviations equal to 13.47 and 13.03 respectively), with a minimum of one year and a maximum of seventy years in the area. The average number of years lived in one's present home was 20.66 and 21.0 (SD = 12.53, SD = 11.81). The average age of our respondents was fifty-four (SD = 15.33; min=20, max=93) in the first wave and 55 in the second. As suspected, based on other research relying on mailout-mailback survey sampling, our sample is slightly older, underrepresents "minority people" and consists of a large portion of retired individuals (Golob, personal communication)[1]. Thirty-six percent of our

[1] A logit analysis was conducted in order to ascertain whether knowledge of differences in age, income, education, residence, neighborhood attachment, car ownership, or intention to use the facility could be

respondents indicated in Wave 2 that they were retired, fifty-four percent were employed and 9.7 percent were unemployed. In Wave 1, 62 percent of our respondents indicated that they were employed; we did not ask respondents to discriminate between being unemployed and being retired. In the charts that follow, where possible, we compare our respondents with the county as a whole.

Figure IV-1: Description of the Sample by Income



helpful in predicting whether a respondent completed both waves of the survey. We found a model that improved significantly the prediction of dropping out and therefore decided to weigh the data by applying a weight computed by 1/predicted probability of response. This value was standardized so that the mean over all cases was set equal to one. While this weight is not applied to the descriptive statistics of the sample, the weight is applied to subsequent inferential statistics.

Figure IV-2: Description of Sample by Ethnicity[2]

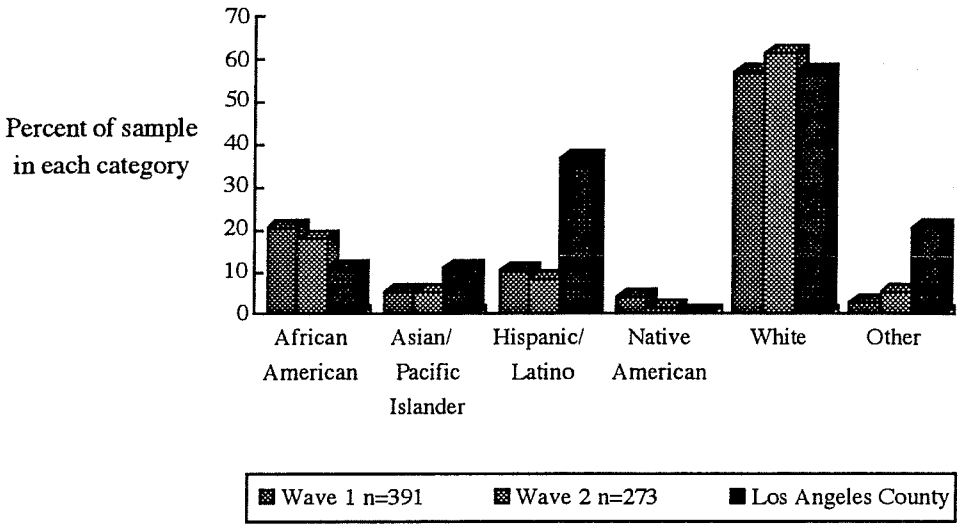
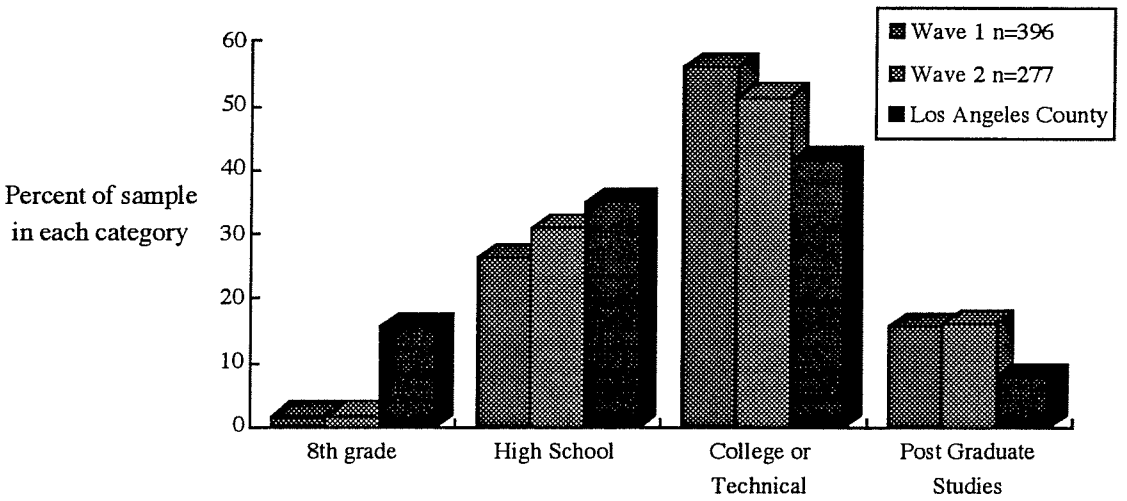
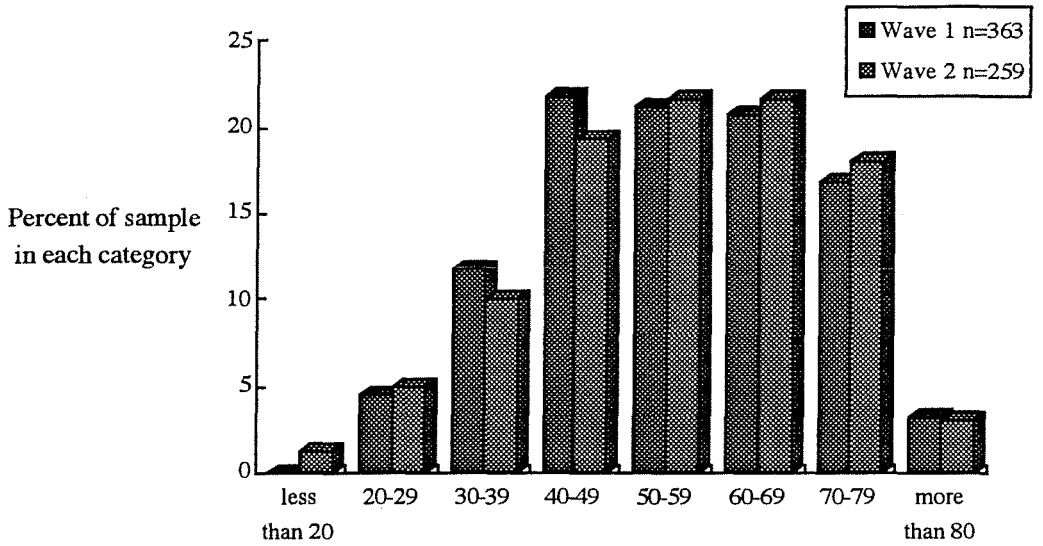


Figure IV-3: Description of Sample by Education



[2] The reader is cautioned to note that the averages across Los Angeles County might be quite different than across the corridor area alone. For example, the black population in the corridor ranges from .9% to 84% between El Segundo and Norwalk, with an average of 31.1% as compared to the county wide average of 11%. Please see Appendix 8 for a more complete picture of the corridor area as compared with the County as a whole.

Figure IV-4: Description of sample by age



We asked respondents questions specifically about their neighborhood. A large proportion of the respondents perceived their residence to be at least fairly close to the freeway, rated their neighborhood to be at least "good," and were at least "strongly attached" to their neighborhood.

Figure IV-5: Description of Sample by Perceived Proximity to Freeway

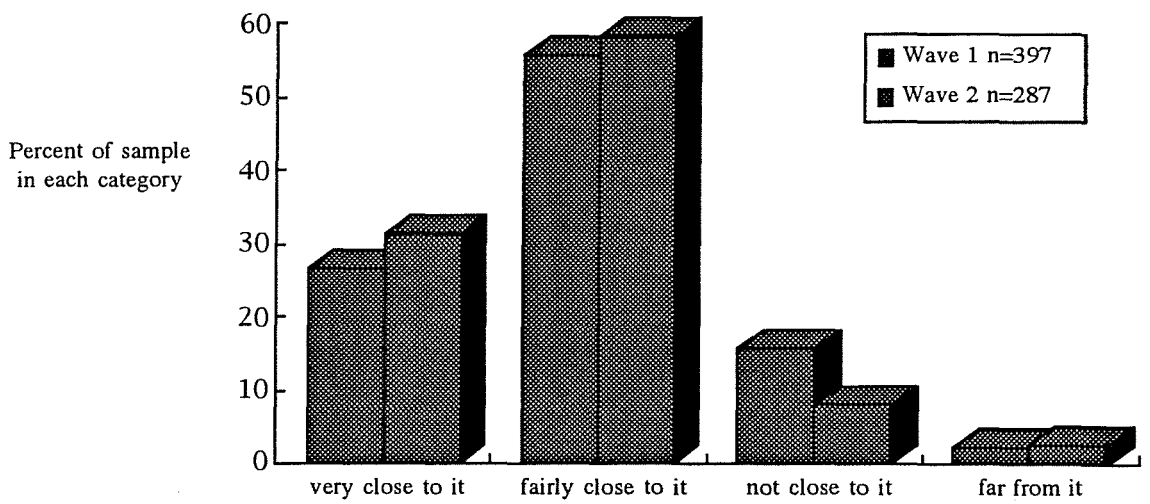
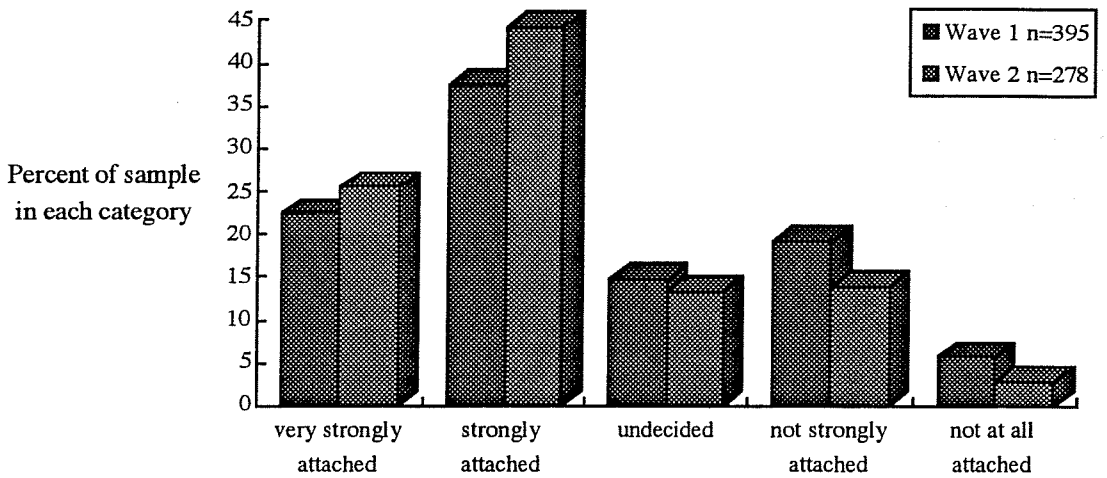


Figure IV-6: Description of Sample by Neighborhood Rating

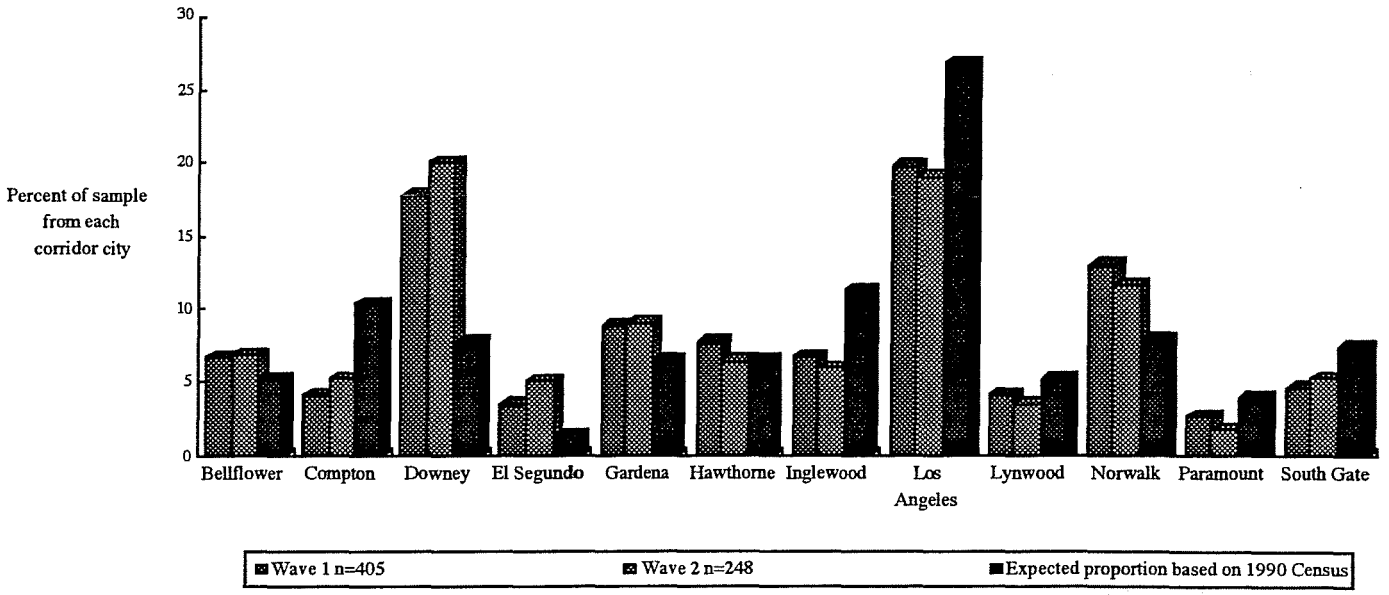
Figure IV-7: Description of the Sample by Personal Attachment



Across both waves approximately 55% of the respondents were male. The modal income in both waves was between $25,001 and $45,000. 95% are car owners; the modal number of vehicles per household is 2. Our sample consists of a large percentage of home owners (85%) in both waves. Under-represented in our sample were residents from Compton, Inglewood, Los Angeles and South Gate[3].

[3] Estimated populations in the corridor cities were computed first by summing the populations of the zip codes sampled and aggregating them by city and then dividing by the population of the sampled area as

Figure IV-8: Estimated and actual proportion of respondents from sampled jurisdictions



C. Attitudes and Beliefs About Transportation in General

In both Wave 1 and Wave 2, in addition to questions about the Century Freeway/Transitway, respondents were asked a series of questions about transportation in general. Below we describe some of the attitudes of the corridor sample.

About sixty-two percent (62.3%) of the sample indicated that they supported the building of the Century Freeway and 6% opposed its construction. The remainder had no opinion. 18.3 % of the sample agreed with the statement "There will be a Green Line Transit station near places where I usually travel to." 24.9% agreed that they would "change the place where [they] usually shop and run errands if [they] could get there using rail." 41.6 % agreed with the statement "There will be Green Line Transit station near my home." 88.7 % indicated that they agreed with the statement "I usually drive places where I shop and run errands." Only 14.1 % indicated that they agreed with the statement "I

---

estimated in the 1990 U.S. Census of Population and Housing. One drawback with this method is that unincorporated areas of Los Angeles County are aggregated into the jurisdiction of Los Angeles which includes Los Angeles city as well.

enjoy using public transit." 51.3 % disagreed. However, 72.8% agreed that "Public investment in mass transit is important," and 62.7% agreed that "high density development near transit stops for retail and business centers is a good idea." Regarding the value of land near transit stations, 42.4% had no opinion regarding the statement "Transit stations make nearby land more valuable." 36.7% agreed with that statement and 20.8% disagreed.

D. Residents' Intended Use and Perceptions of the Century Freeway/Transitway

In Wave 1, two weeks prior to the facility's opening, we asked respondents if they intended to use any feature of the freeway/transitway. We followed up with a general question about use in Wave 2 in which we asked respondents to indicate if they used the freeway or the carpool lanes and whether they intended to use the Green Line for any of a number of trip purposes. Work trips are defined as trips made to get to or from work; and nonwork trips are any shopping, school, recreation, running errands or other trips. We analyze the intended and actual behavior as stated by respondents who returned questionnaires and travel diaries in either wave that were both complete and usable.

1. General intent to use the Century Freeway/Transitway facility: Cross sectional analyses of intent to use by mode at time 1 and time 2

A smaller proportion of respondents uses the facility than expected based on the intentional use of the facility predicted from Wave 1. This is not surprising, as intentional behavior and actual behavior often vary depending on other external constraints (Ajzen and Fishbein, 1980). This finding is consistent across both work and nonwork trips but is more dramatic for nonwork trips. Intended use of the Green Line for nonwork trips remains relatively stable.

Table IV-1: Intended and actual use of facility for work[4]

	Green Line		Mixed flow lanes		Carpool lanes	
	Indicated an intent to use in Wave 1	Indicated an intent to use in Wave 2	Indicated intent to use in Wave 1	Have actually used in Wave 2	Indicated intent to use in Wave 1	Have actually used in Wave 2
number (percent of sample)	41 (10.8%)	24 (9.8%)	112 (29.5%)	58 (22.9%)	65 (17.2%)	19 (13.0%)

Table IV-2: Intended and actual use of facility for nonwork

	Green Line		Mixed flow lanes		Carpool lanes	
	Indicated an intent to use in Wave 1	Indicated an intent to use in Wave 2	Indicated intent to use in Wave 1	Have actually used in Wave 2	Indicated intent to use in Wave 1	Have actually used in Wave 2
number (percent of sample)	140 (36.8%)	87 (34.4%)	302 (79.5%)	187 (73.9%)	228 (60.0%)	123 (48.6%)

2. Intent to use and actual use by mode: comparisons of respondents who completed both surveys.

Here we compare the same respondents over time to determine what fraction of people who indicated an intent to use the facility in Wave 1 actually use the facility in Wave 2 or still intend to use the Green Line when it opens.[5]

[4] We found a difference between general intent to use and intent to use by purpose. Many respondents indicated that they did or did intend to use one or more of the modes but neglected to specify for what types of trips.

[5] The sample being estimated here includes only those respondents who provided usable data as described in Chapter 3.

Table IV-3: Intent and actual use of facility by those respondents who indicated a willingness to use the facility in Wave 1[6]

	Mixed flow lanes		Carpool lanes	
	Work	Nonwork	Work	Nonwork
number (percent of sample actually using mode in Wave 2)	39 (73%)	135 (76.2%)	5 (25.3%)	77 (63.3%)

The table above illustrates that for those respondents taking part in both surveys, there is a drop-off in actual use of the facility. Roughly 75% of the respondents who indicated they would use the mixed flow lanes stated that they are actually using them. Even fewer respondents who stated that they would use the carpool lanes are using them. With respect to the Green Line, 73.8% of the respondents in Wave 2 indicated an intent to use the light rail line for work trips when it opens, and 66.5% still intended to use it for nonwork trips. Even though the facility is not available for use yet, we observe a drop-off in intended use between Wave 1 and Wave 2.

In Wave 2 we asked several questions regarding whether the opening of the freeway caused respondents to make a change either in route, destination or mode choice. 34.9% of those who work indicate that they have changed their route to work because of the freeway opening; 20 (8.2%) of the respondents indicate they have changed their shopping location because of the opening; and 25 or 10.3% indicate that they carpool now because of the Century Freeway.

3. Relationship between intention to use and socio-economic indicators of age, income, ethnicity, and perceived proximity to facility: cross-sectional description of the sample

[6] The number of respondents who both indicated an intention to use the facility for each type of trip and participated in both waves of the surveys is small. This table is for suggestive purposes only and should not be interpreted as representative of the population in the corridor.

Generally, more respondents intend to use the mixed flow lanes of the facility than the carpool or transit modes. Men and women are equally likely to use the carpool and mixed flow lanes but more men indicate an intention to use the Green Line. In Wave 1, greater than 80% of the sample intended to use these lanes while less than 40% intended to use the Green Line. For work trips, 11.2% of the sample intends to use the Green Line, 17.2% intend to use the carpool lanes, and 29.4% intend to use the mixed flow lanes. For nonwork trips the intended use rose to 36.3% for the Green Line; 58.1% for the carpool lanes and 76.7% for the mixed flow lanes.

The lowest proportion of intended Green Line users falls in the 30-39 and 60-69 year age groups while members of the 20-29 year age group are most likely to report that they will travel on each of the facility's three modes. Older age groups indicate less intention to use the carpool and freeway modes than other age groups. See Figures IV-9 to IV-11.

Figure IV-9: Intended use of Green Line by age

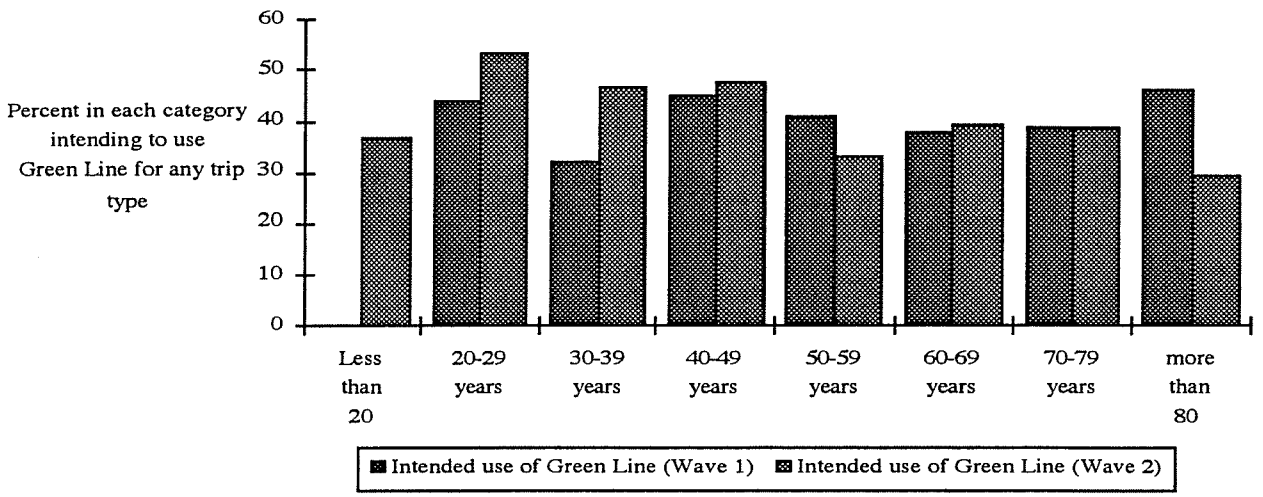


Figure IV-10: Intended and actual use of Carpool Lanes by age

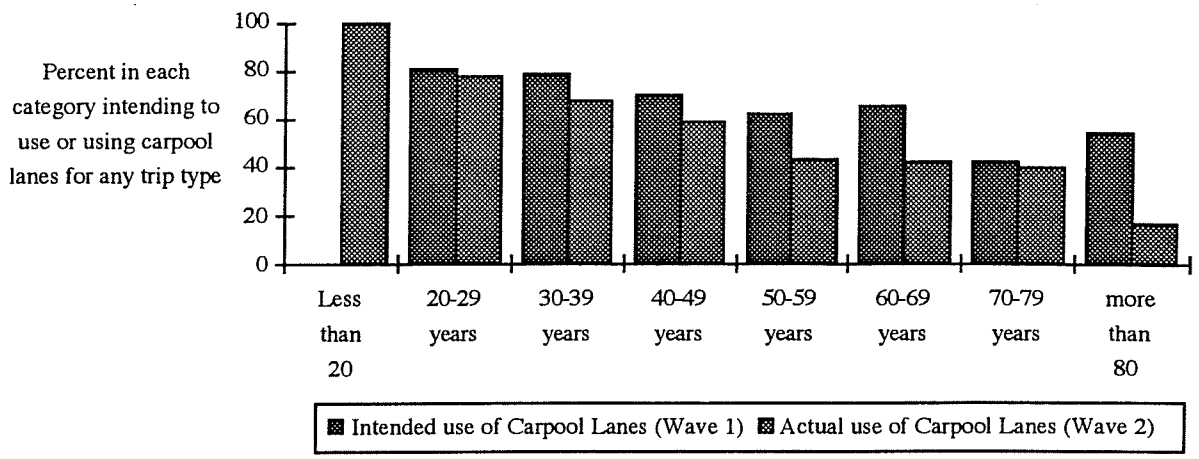
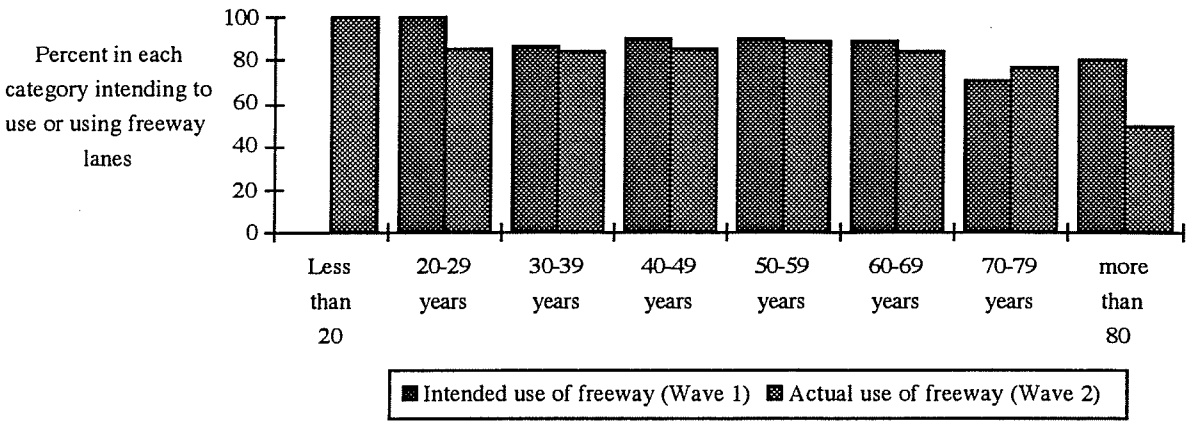


Figure IV-11: Intended and actual use of freeway by age



Between income categories, there is little variability in intended use of the mixed flow lanes. See Figures IV-12 to IV-14. The lowest percentage of intended carpool lane users are those in the $5,001 to $15,000 and more than $85,000 income categories. The group of respondents in the highest income category in Wave 2, however, indicated higher actual use of the carpool lanes than was intended. With the exception of the lowest income

group which has fewer than ten members, the highest percentage of intended Green Line users fall in the $25,001 to $45,000 and $65,001 to $85,000 income categories.

Figure IV-12: Intended use of Green Line by income

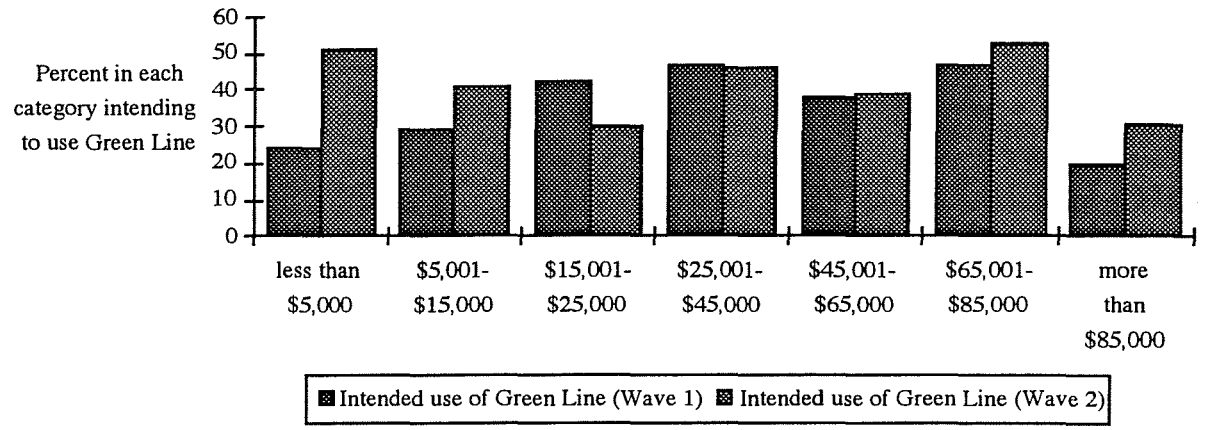


Figure IV-13: Intended and actual use of Carpool Lanes by income

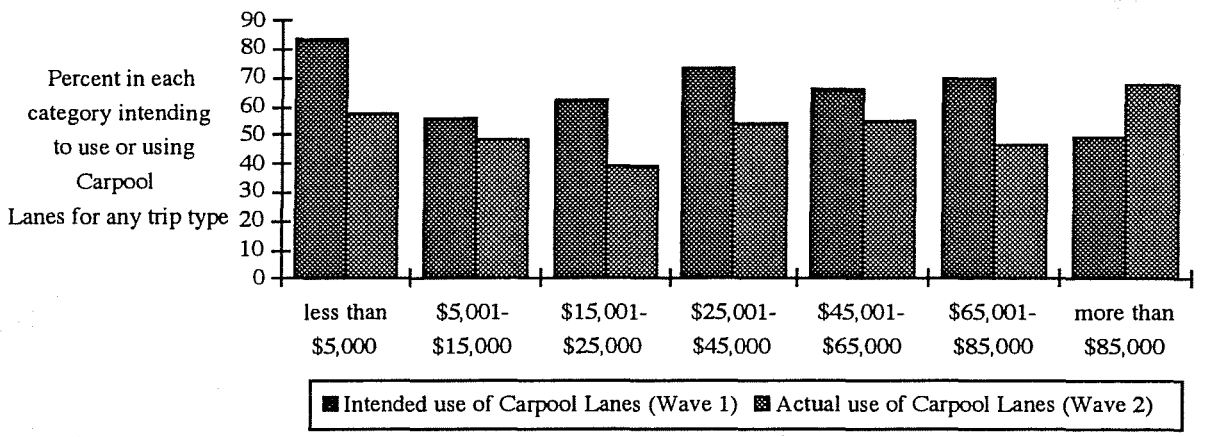
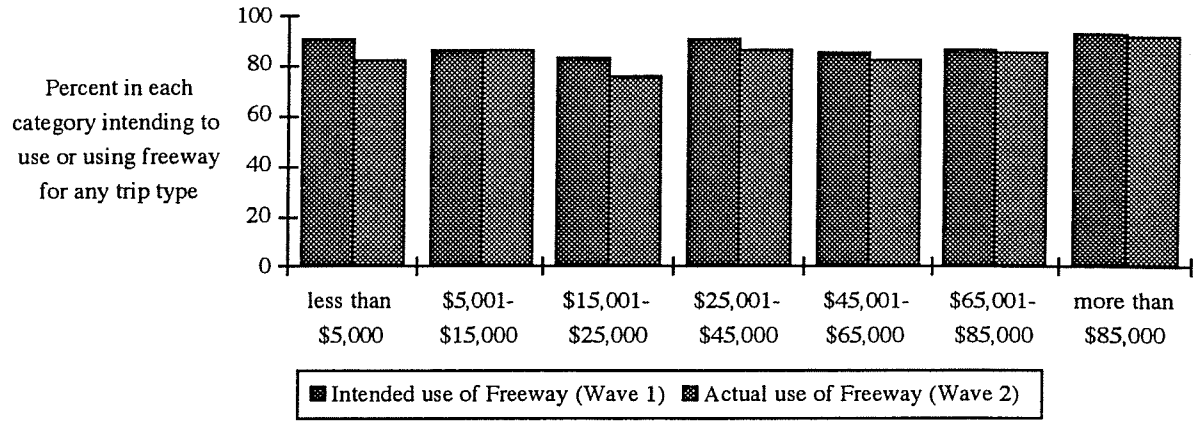
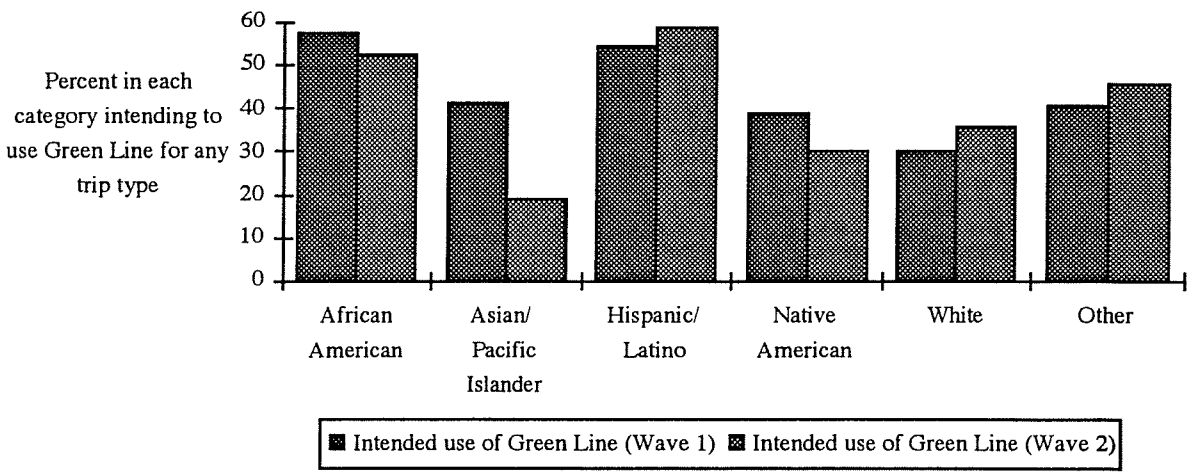


Figure IV-14: Intended and actual use of freeway by income



Segmenting the data by ethnicity, we note that the lowest percentage of intended Green Line users falls in the white and Native American categories and the highest falls in the African American, Hispanic or Latino, and Other categories[7]. See Figures IV-15 to IV-17. There is little variation in intended general freeway and carpool usage among ethnic groups but there is considerable variability in intended Green Line usage.

Figure IV-15: Intended use of Green Line by ethnicity



[7] The Asian/Pacific Islander, Other, and Native American groups are small.

Figure IV-16: Intended and actual use of Carpool Lanes by ethnicity

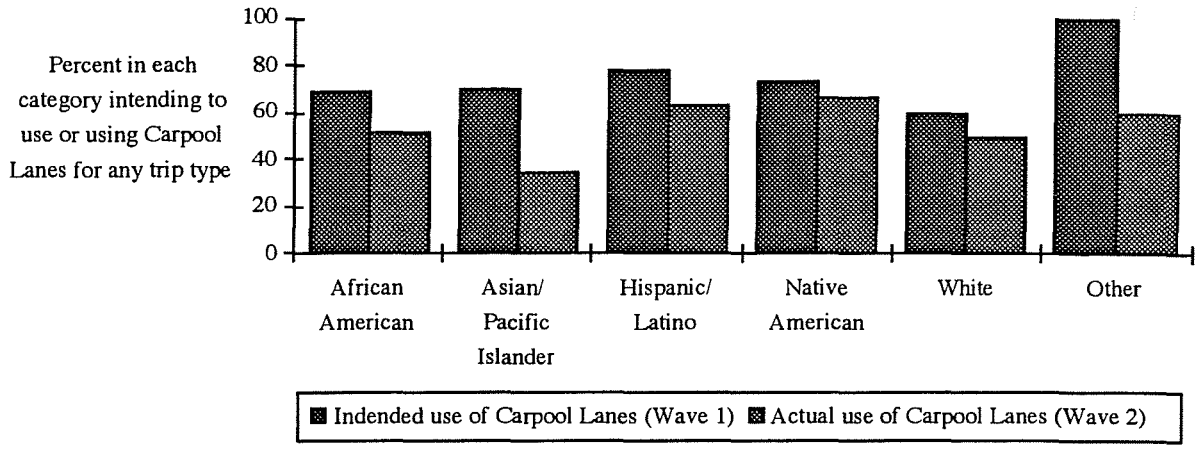
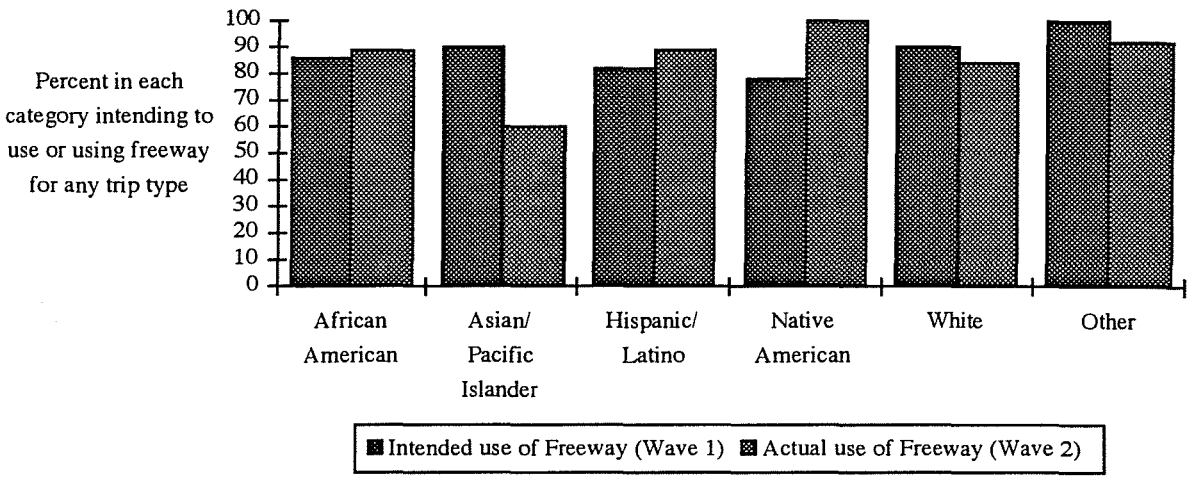


Figure IV-17: Intended and actual use of Freeway by ethnicity



When the data are segmented according to place of residence, we see that those living between the I-110 and the I-605 report the highest intended use of the freeway; however, those living west of the I-405 and between the I-710 and the I-605 are least likely to use the Green Line. See Figures IV-18 to IV-20. Residents between I-110 and I-710, an area which includes Watts, Willowbrook, Compton, and South Gate, report the highest intended use of the Green Line. Much of this area is already served by the Blue Line.

Figure IV-18: Intended and actual use of Green Line by Geographic Location

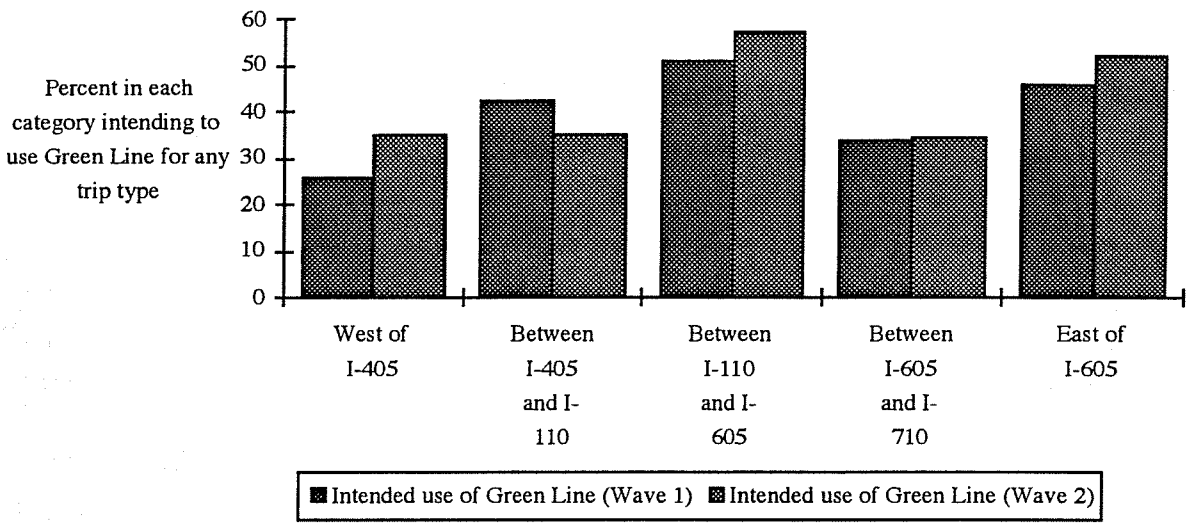


Figure IV-19: Intended and actual use of Carpool Lanes by Geographic Location

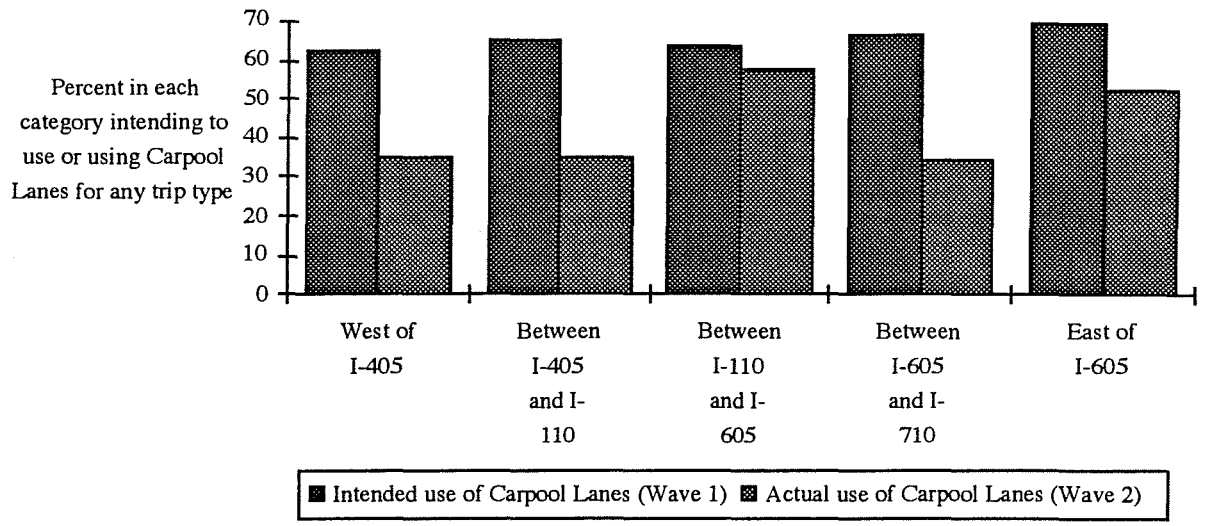
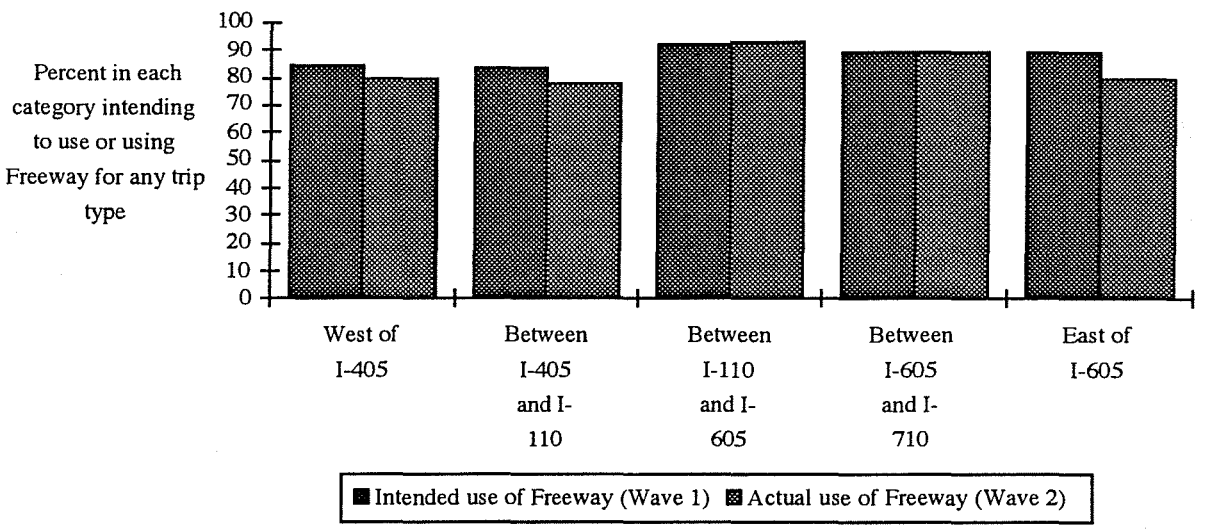


Figure IV-20: Intended and actual use of Freeway by geographic location



As expected, respondents living further from the facility are less likely to indicate that they intend to use the facility. See Figures IV-21 to IV-23.

Figure IV-21: Intent to use Green Line by perceived proximity

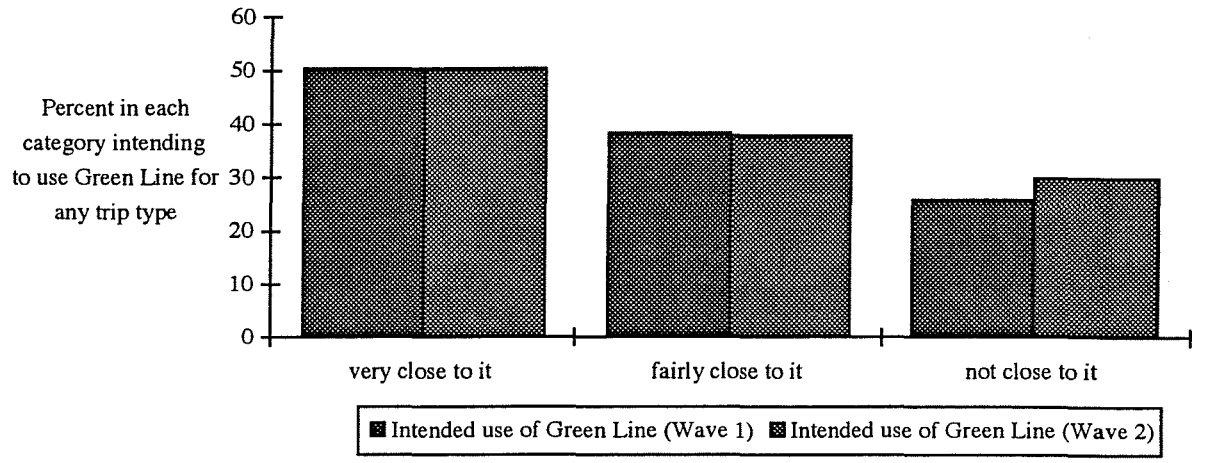


Figure IV-22: Intended and Actual use of Carpool Lanes by perceived proximity

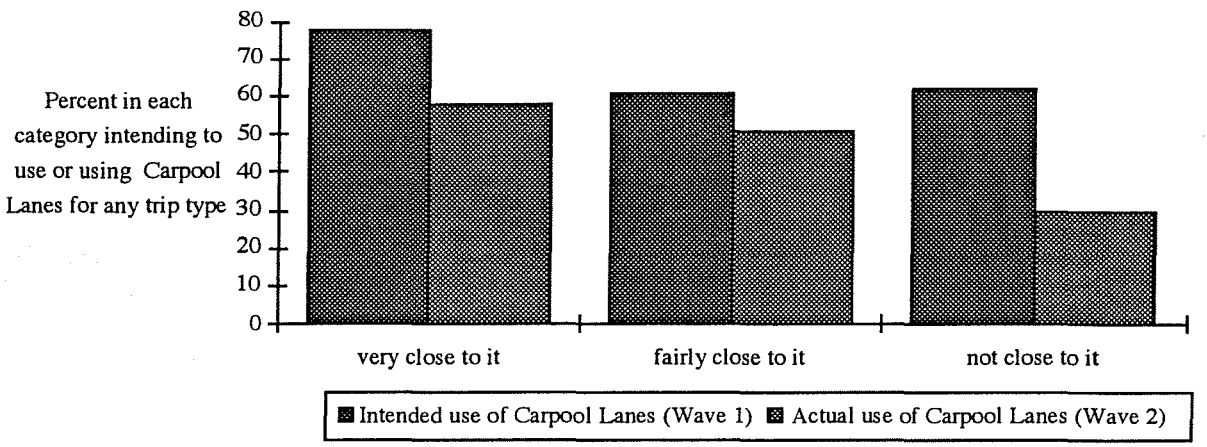
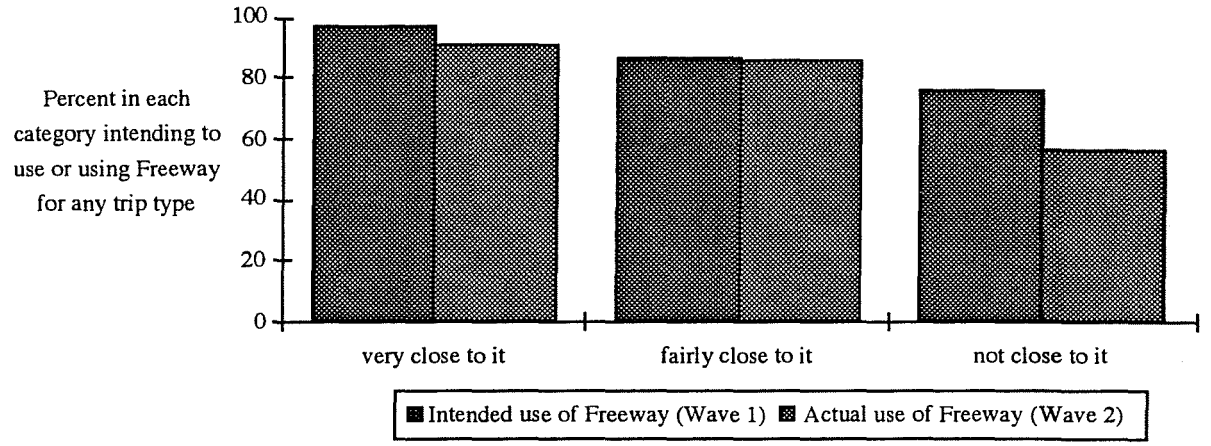


Figure IV-23: Intended and actual use of Freeway by perceived proximity



Although the lowest intended use of the Green Line is among people who do not own a car, we stress that this group represents only 1% of our sample. Similarly, while home-owners indicate a higher intention to use each of the modes than renters, renters constitute a very small fraction of the sample. Neighborhood rating has little effect on intent to use any mode; however those who rate their neighborhoods as good report the lowest intended use of the Green Line and the highest intended use of the mixed flow lanes.

E. Attitudes and Beliefs About the Facility.

In the following section we contrast the beliefs and attitudes of the respondents. The respondents are divided into two groups over two points in time. The first group indicated that they would not use a mode in Wave 1 or did not use a mode in Wave 2.[8] These are the "nonusers." The second group indicated in Wave 1 that they would use a mode or that they have used the mode in Wave 2. These are the "users." This is a cross-sectional analysis of those respondents who, in either wave, indicated that they had an opinion regarding any of the modes on the facility. In all of the comparisons, a chi-squared

[8] In Wave 2, Green Line use is still intended because the facility has yet to open.

analysis revealed that there were significant differences in opinion between the nonusers and the users.

With respect to crime, we see that intended users of the Green Line show more agreement (and less disagreement) with the statement that the Green Line will be free from crime. However, among both groups, there is over 50% disagreement with this statement, indicating that the majority of the respondents believe that the Green Line will not be free from crime.

Figure IV-24: Agreement with statement: The Green Line will be free from crime by intent to use Green Line

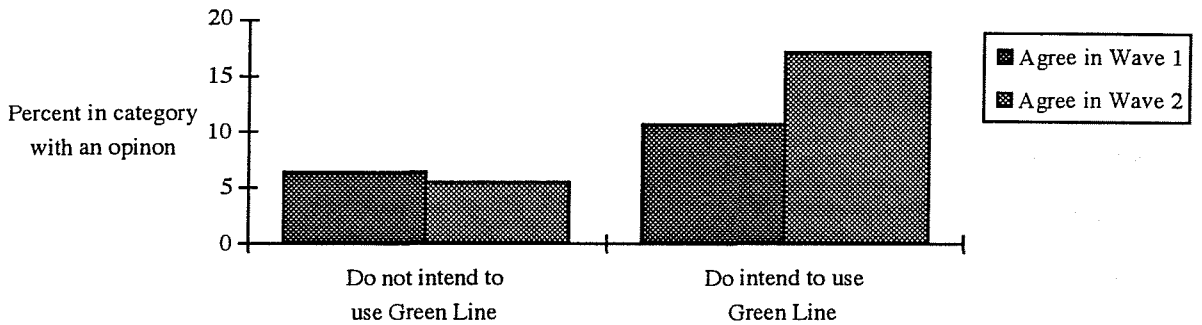
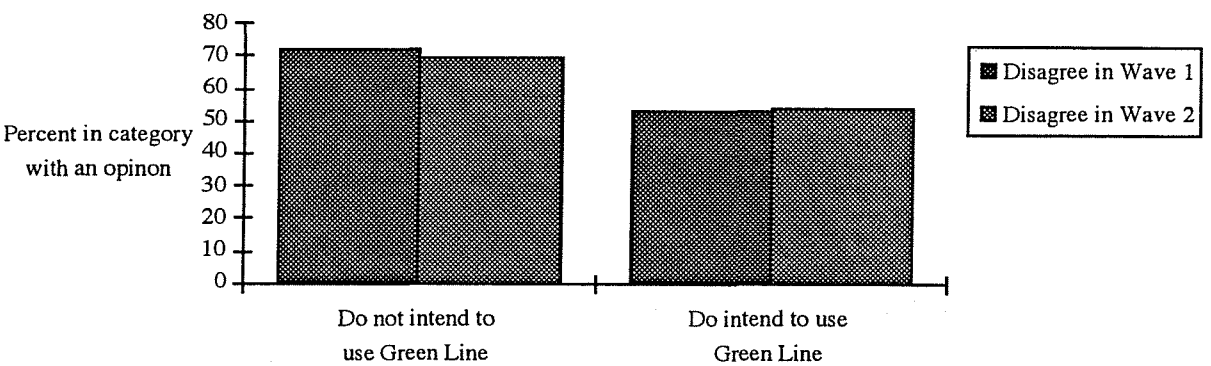


Figure IV-25: Disagreement with statement: The Green Line will be free from crime by intent to use Green Line



Generally, intended and actual users of the facility show more optimism about public safety on the facility. For the mixed flow lanes, however, nonusers indicate more agreement with the statement regarding crime. For both groups, there is more agreement and less disagreement about the facility being free from crime after the facility was opened.[9]

Figure IV-26: Agreement with statement: The mixed flow lanes will be free from crime by intended and actual use of mixed flow lanes

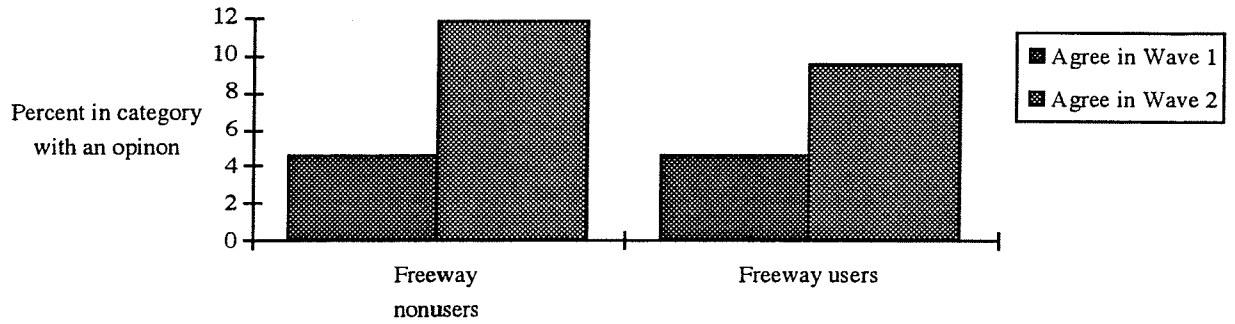
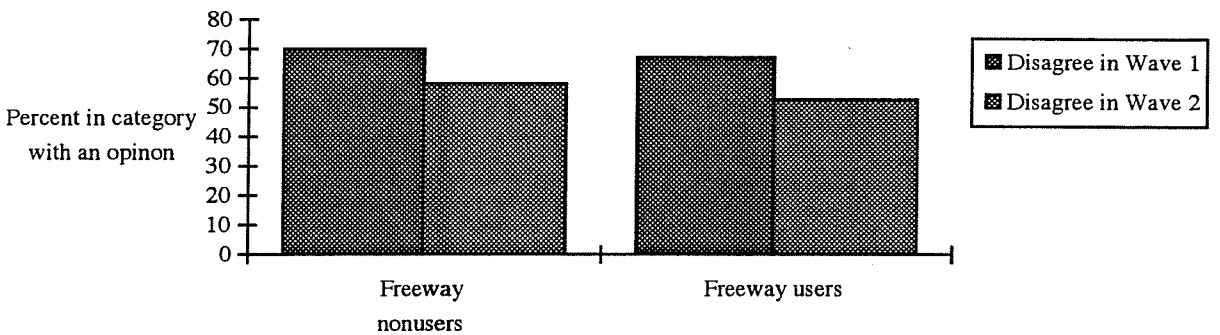


Figure IV-27: Disagreement with statement: The mixed flow lanes will be free from crime by intent to use mixed flow lanes



[9] The graphs which follow contrast the opinions of freeway and carpool users and nonusers. Freeway and carpool users in Wave 1 indicated an intent to use these modes when the facility opened. Nonusers indicated that they did not intend to use the modes. Freeway and carpool nonusers in Wave 2 indicated that since the facility opened they have not used these modes. Similarly, freeway and carpool users in Wave 2 indicated that since the freeway/transitway opened, they have used either mode.

With respect to the facility's influence on air quality, intended Green Line users believe more strongly that the Green Line will improve air quality. This is true in both waves.

Figure IV-28: Agreement with statement: The Green Line will help improve air quality by intent to use Green Line

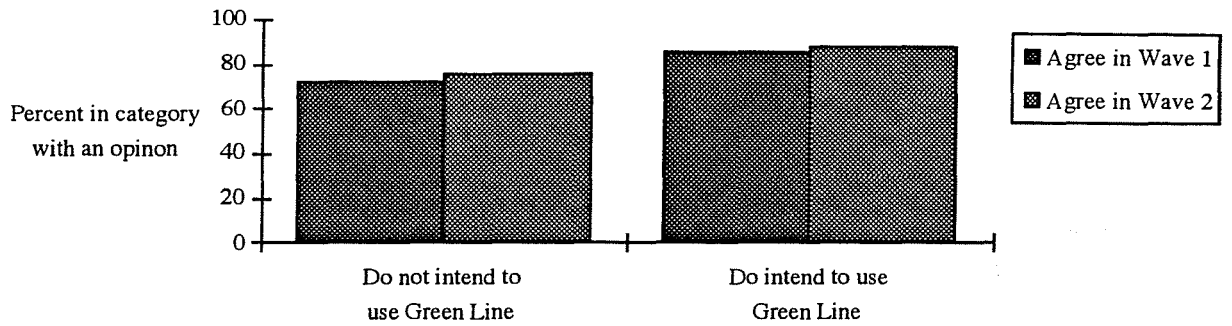
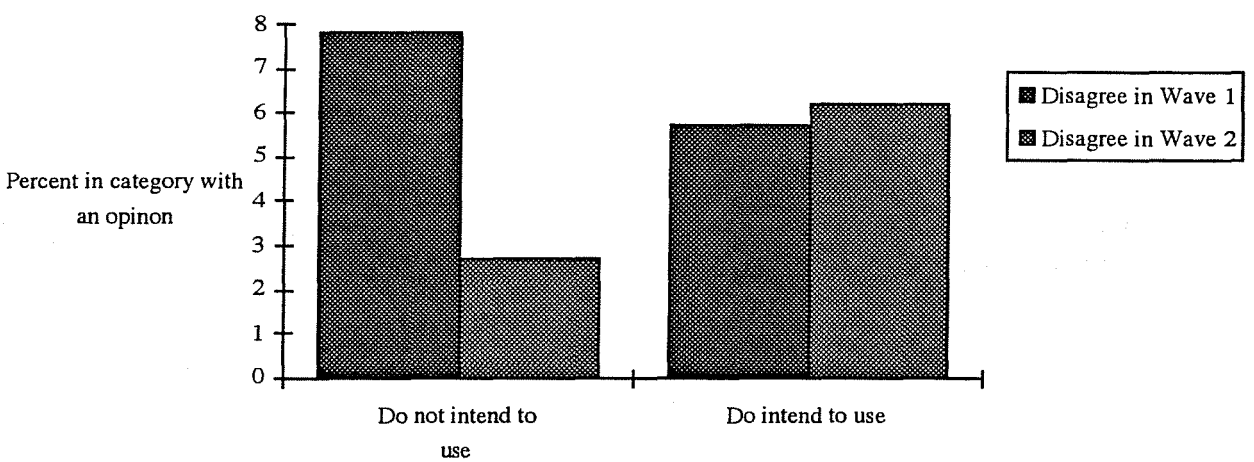


Figure IV-29: Disagreement with statement: The Green Line will help improve air quality by intent to use Green Line



Similarly, carpool and mixed flow lane users both before and after the facility opens, indicate that more of them agree with the statements regarding the improvement of air quality linked to mode. More people indicate that they believe that the carpool lanes will improve air quality than agree that the mixed flow lanes do.

Figure IV-30: Agreement with statement: The carpool lanes will help improve air quality by intended and actual use of carpool lanes

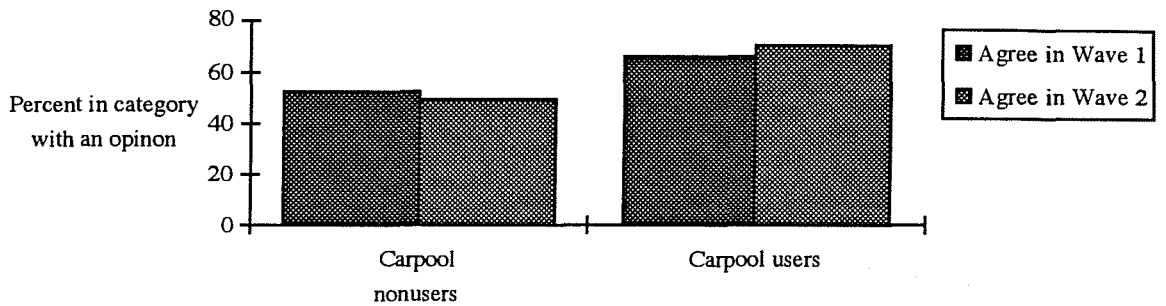


Figure IV-31: Disagreement with statement: The carpool lanes will help improve air quality by intended and actual use of carpool lanes

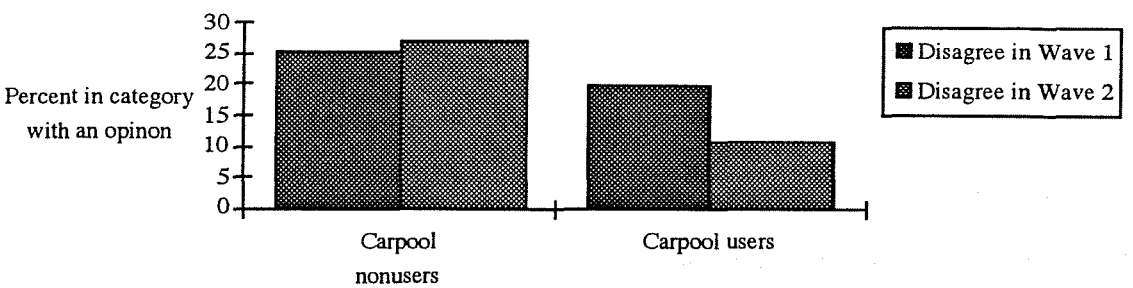


Figure IV-32: Agreement with statement: The mixed flow lanes will help improve air quality by intended and actual use of mixed flow lanes

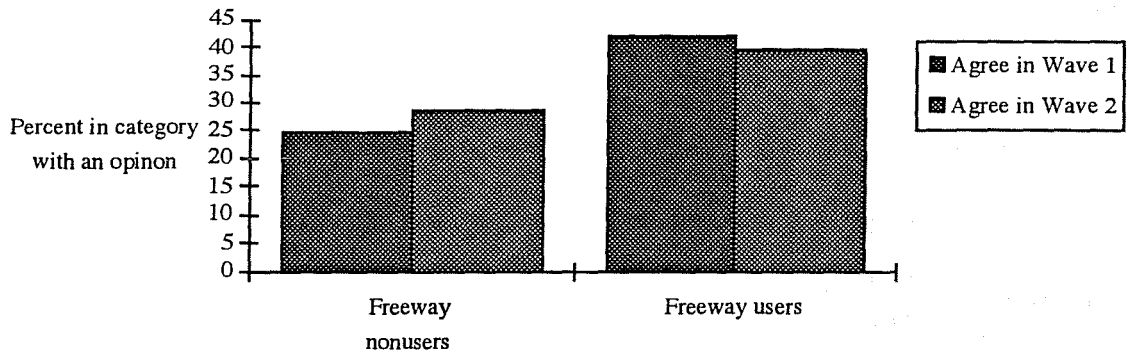
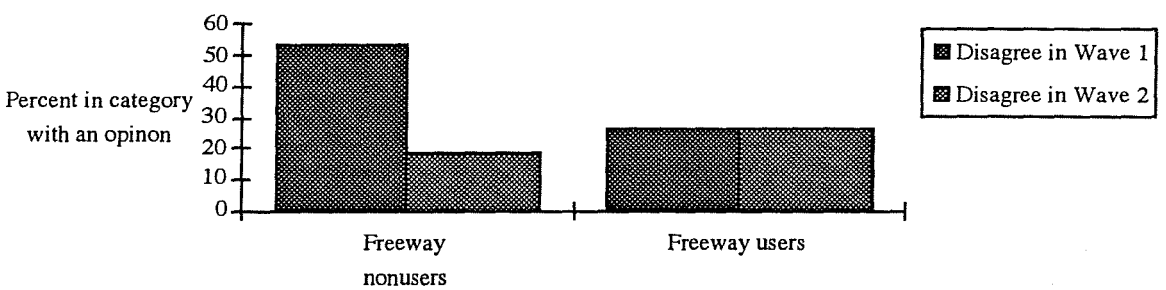


Figure IV-33: Disagreement with statement: The mixed flow lanes will help improve air quality by intended and actual use of mixed flow lanes



The beliefs regarding the facility's influence on both regional and city traffic are noteworthy. See Figures IV-34 to IV-44. Most respondents agree that the all three modes will improve regional and local traffic, with more agreeing that it will influence regional traffic. After the freeway's opening, both users and nonusers agree with the statement that the facility improves their city's traffic. Nonusers show a large change in opinion between Wave 1 and Wave 2.

Figure IV-34: Agreement with statement: The Green Line will help improve traffic in the region by intent to use Green Line

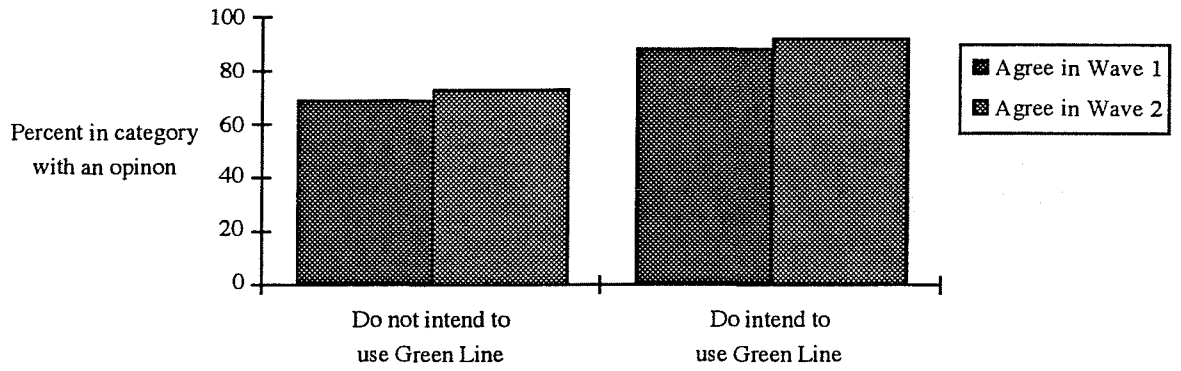


Figure IV-35: Disagreement with statement: The Green Line will help improve traffic in the region by intent to use Green Line

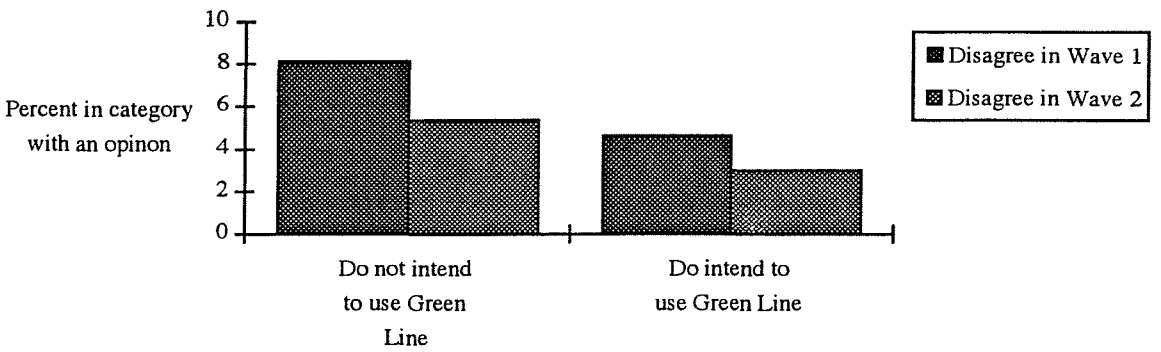


Figure IV-36: Agreement with statement: The carpool lanes will help improve traffic in the region by intended and actual use of carpool lanes

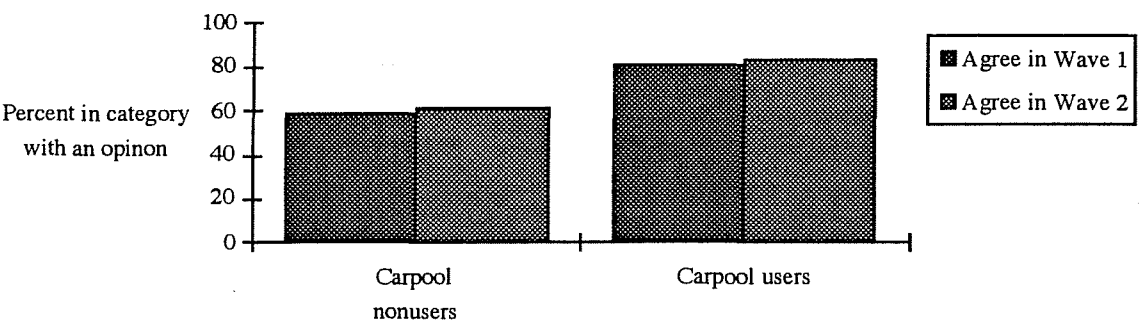


Figure IV-37: Disagreement with statement: The carpool lanes will help improve traffic in the region by intended and actual use of carpool lanes

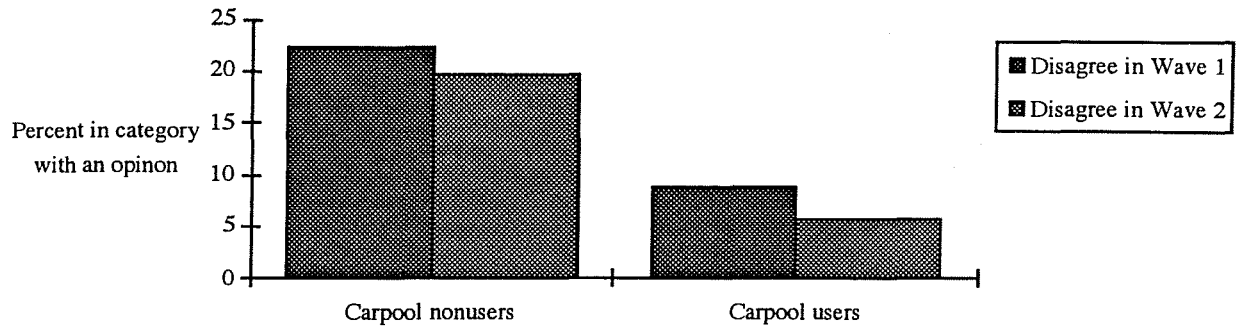


Figure IV-38: Agreement with statement: The mixed flow lanes will help improve traffic in the region by intended and actual use of mixed flow lanes

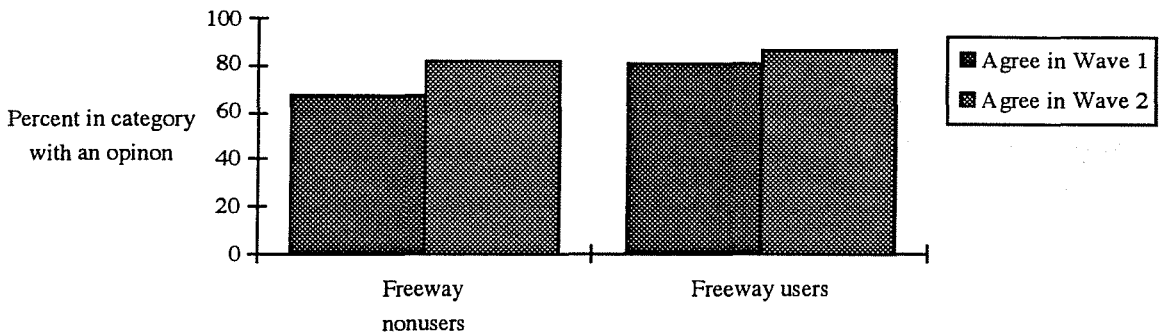


Figure IV-39: Disagreement with statement: The mixed flow lanes will help improve traffic in the region by intended and actual use of mixed flow lanes

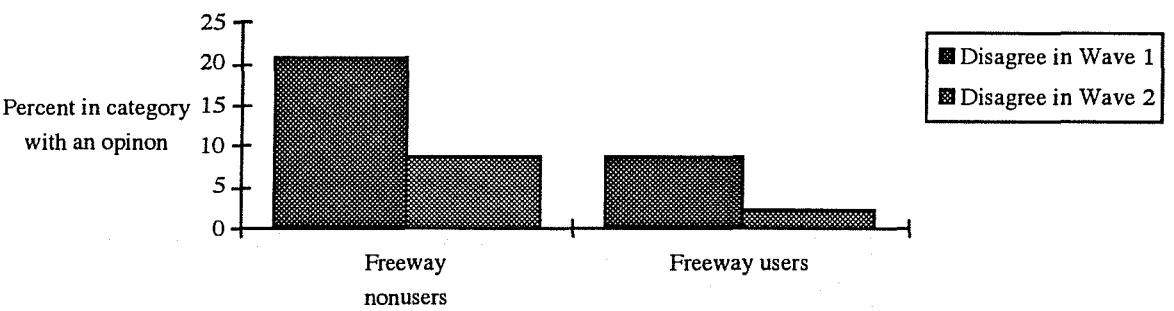


Figure IV-40: Agreement with statement: The Green Line will help improve traffic in the city by intent to use Green Line

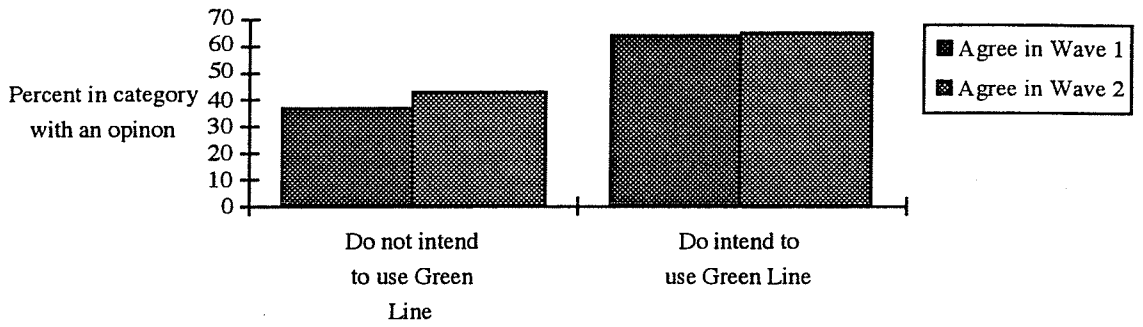


Figure IV-41: Disagreement with statement: The Green Line will help improve traffic in the city by intent to use Green Line

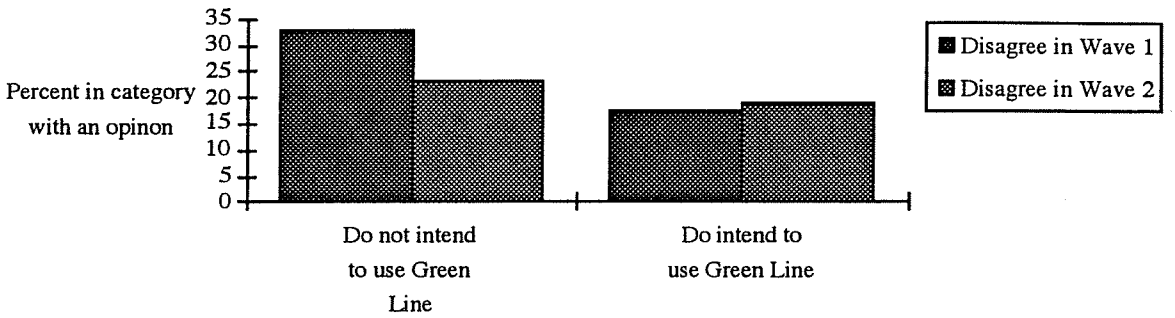


Figure IV-42: Agreement with statement: The Carpool Lanes will help improve traffic in the city by intended or actual use of Carpool Lanes

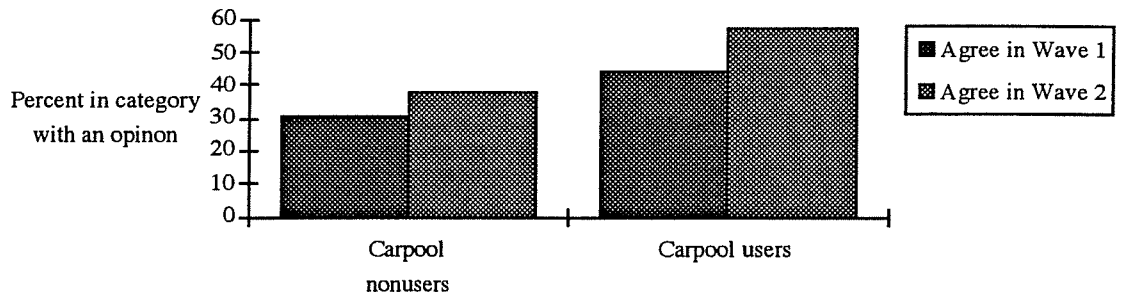


Figure IV-43: Agreement with statement: The Freeway will help improve traffic in the city by intended or actual use of Freeway

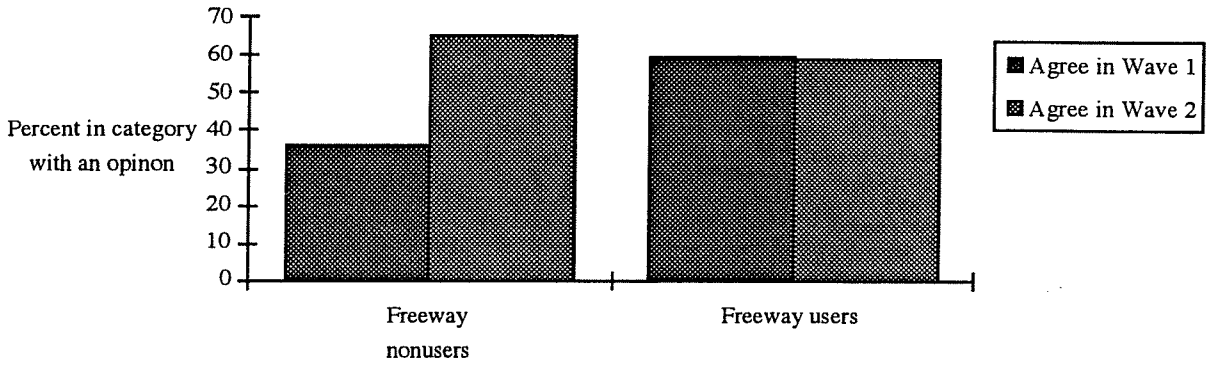
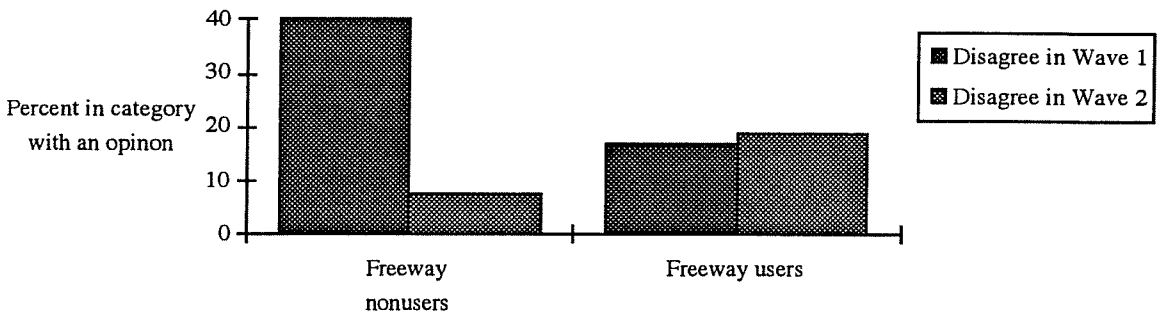


Figure IV-44: Disagreement with statement: The Freeway will help improve traffic in the city by intended or actual use of Freeway



Respondents were asked whether they agreed or disagreed with the statements that the modes would save them money and save them time. Below we show the results for Wave 1 and Wave 2 segmented by intended or actual use of the three modes on the freeway/transitway.

Figure IV-45: Agreement with statement: The Green Line will save me money by intent to use Green Line

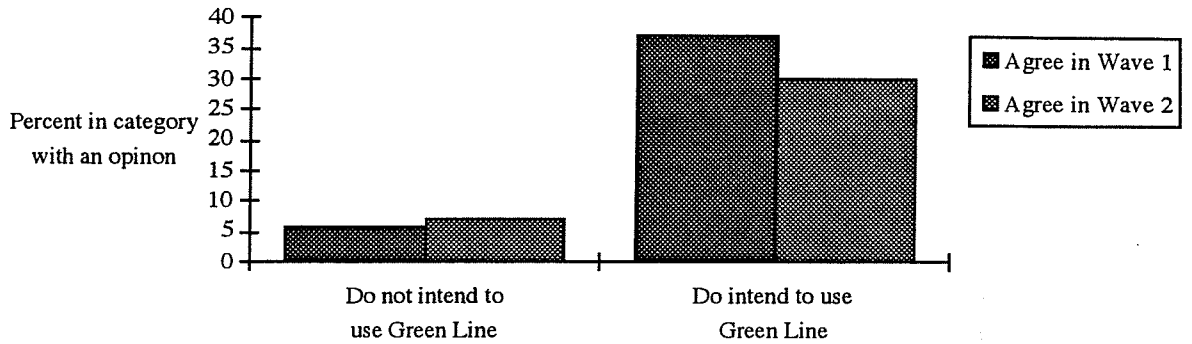


Figure IV-46: Disagreement with statement: The Green Line will save me money by intent to use Green Line

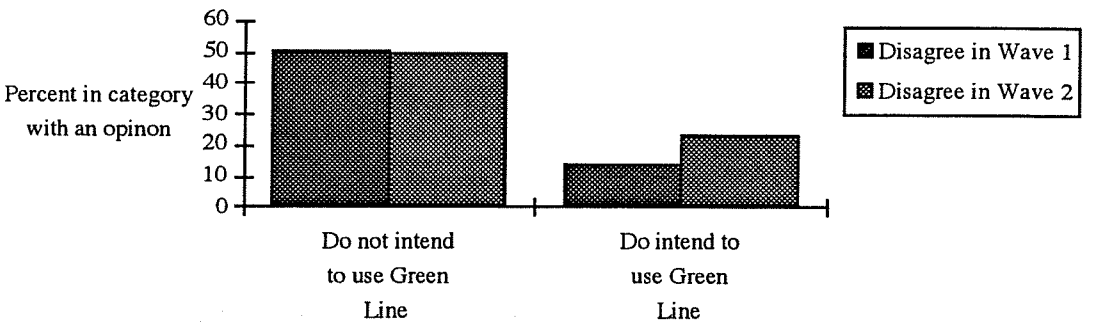


Figure IV-47: Agreement with statement: The carpool lanes will save me money by intended or actual use of carpool lanes

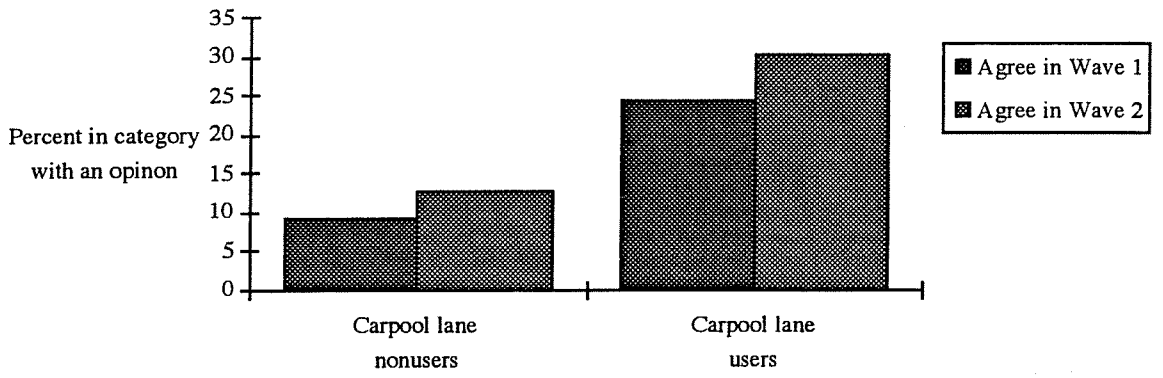


Figure IV-48: Disagreement with statement: The carpool lanes will save me money by intended or actual use of carpool lanes

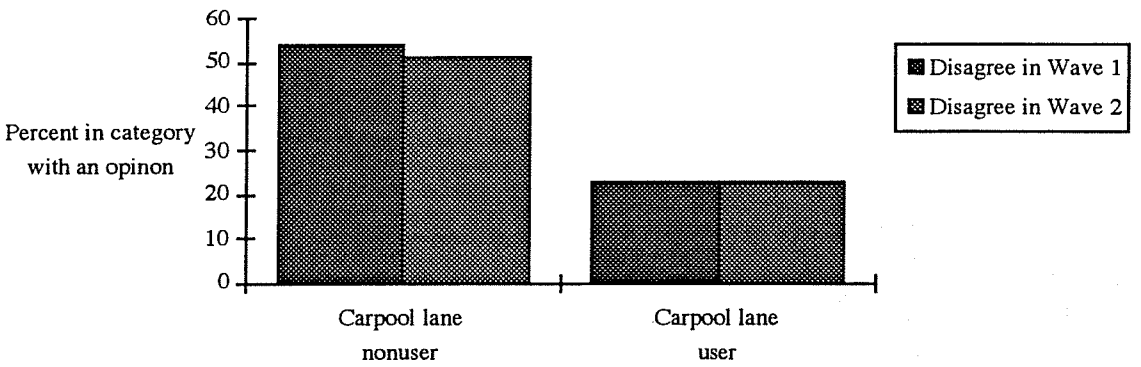


Figure IV-49: Agreement with statement: The mixed flow lanes will save me money by intended or actual use of mixed flow lanes

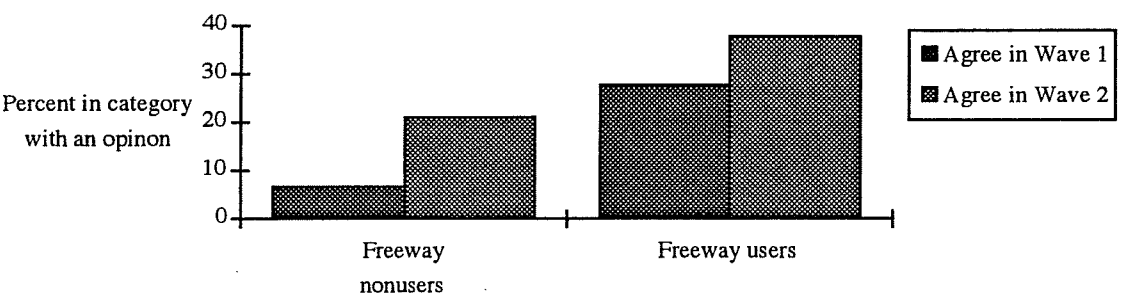
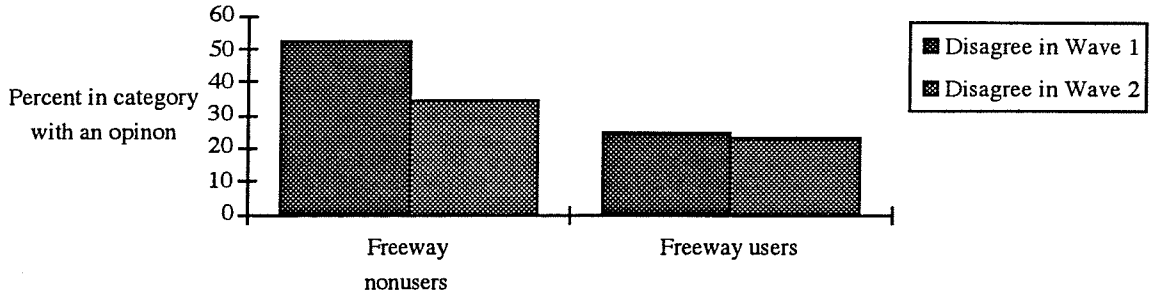


Figure IV-50: Disagreement with statement: The mixed flow lanes will save me money by intended or actual use of mixed flow lanes



There appears to be more agreement with the statements that the modes will save both users and nonusers time. This may be because the use of the facility by other people relieves pre-established routes of congestion. Over time we might expect that the pre-established routes will return to the pre-Century Freeway levels of congestion, because of the latent demand for increased capacity, and agreement with the statement that the facility saves respondents time might decrease.

Figure IV-51: Agreement with statement: The Green Line will save me time by intent to use Green Line

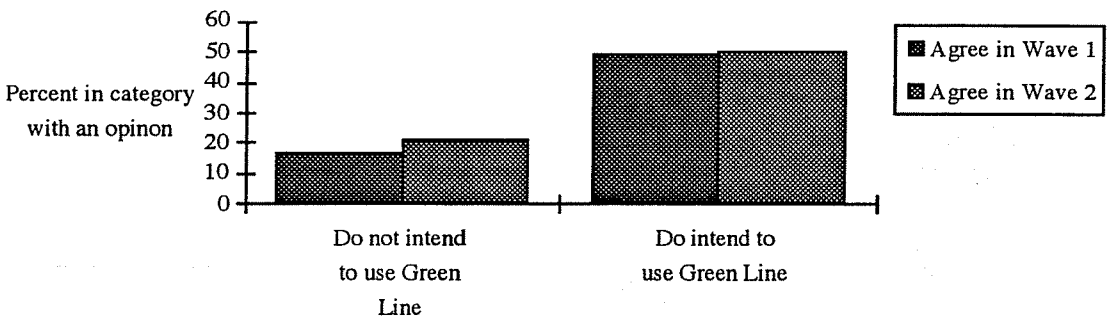


Figure IV-52: Disagreement with statement: The Green Line will save me time by intent to use Green Line

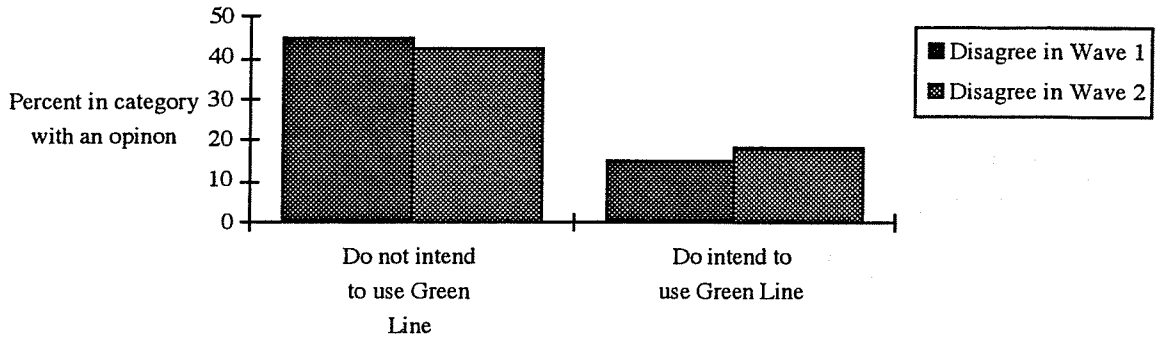


Figure IV-53: Agreement with statement: The carpool lanes will save me time by intended and actual use of carpool lanes

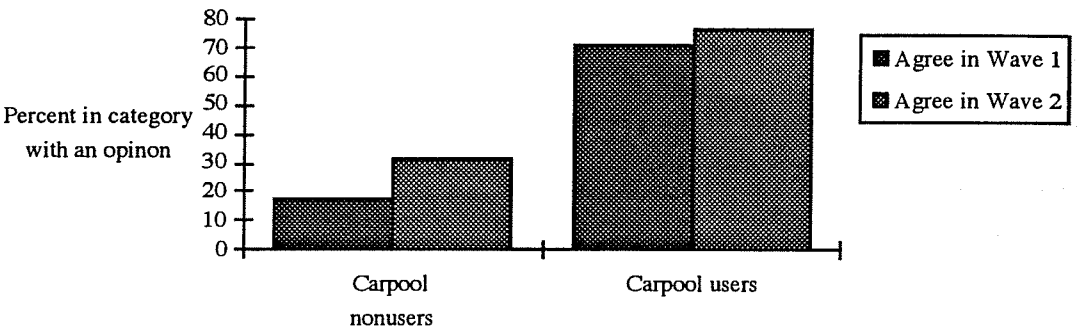


Figure IV-54: Disagreement with statement: The carpool lanes will save me time by intended and actual use of carpool lanes

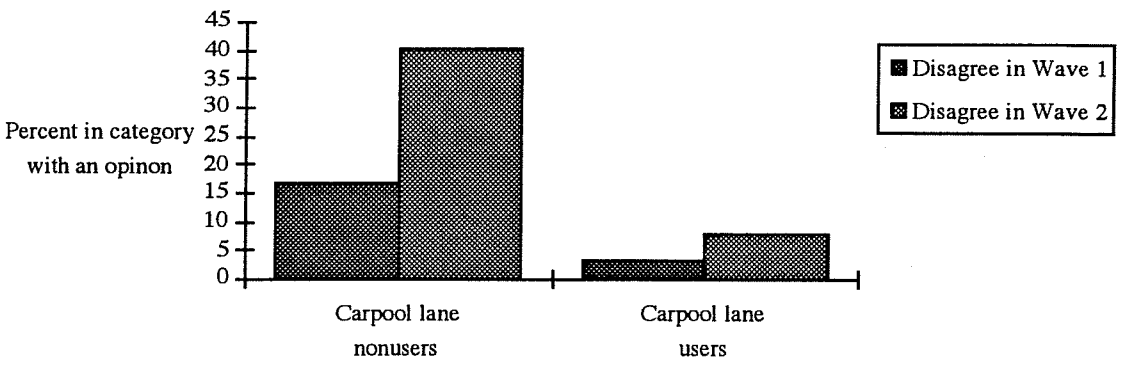


Figure IV-55: Agreement with statement: The mixed flow lanes will save me time by intended and actual use of mixed flow lanes

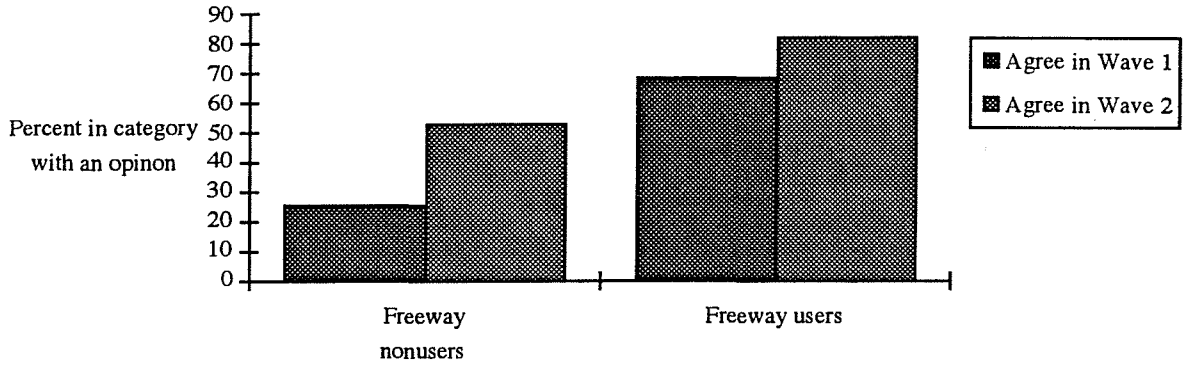
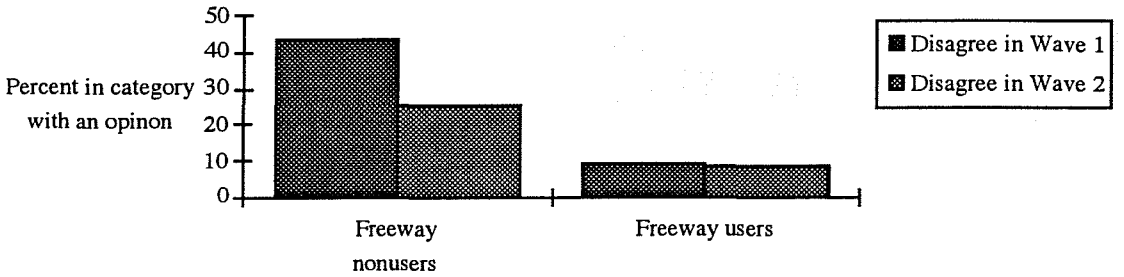


Figure IV-56: Disagreement with statement: The mixed flow lanes will save me time by intended and actual use of mixed flow lanes



We asked respondents to indicate their agreement with the statement that the modes will be convenient to them. Intended users show more agreement that the modes will be convenient.

Figure IV-57: Agreement with statement: The Green Line will be convenient by intent to use Green Line

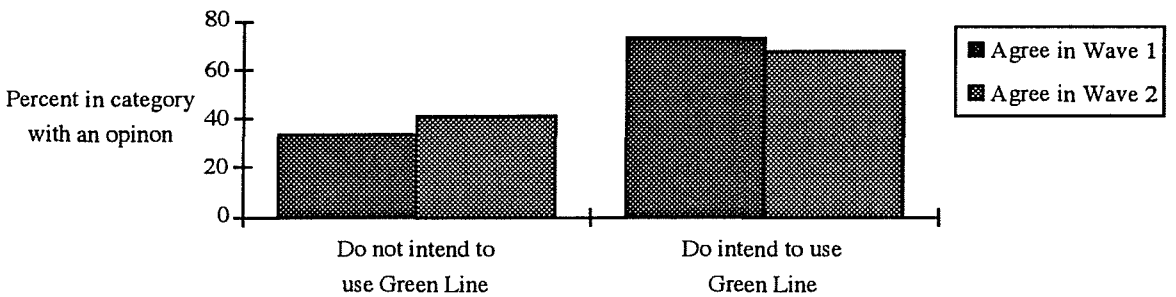


Figure IV-58: Disagreement with statement: The Green Line will be convenient by intent to use Green Line

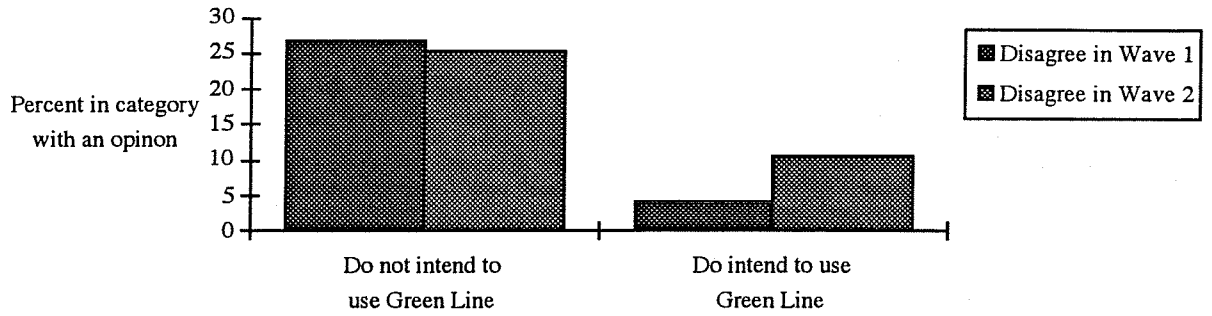


Figure IV-59: Agreement with statement: The carpool lanes will be convenient by intended and actual use of carpool lanes

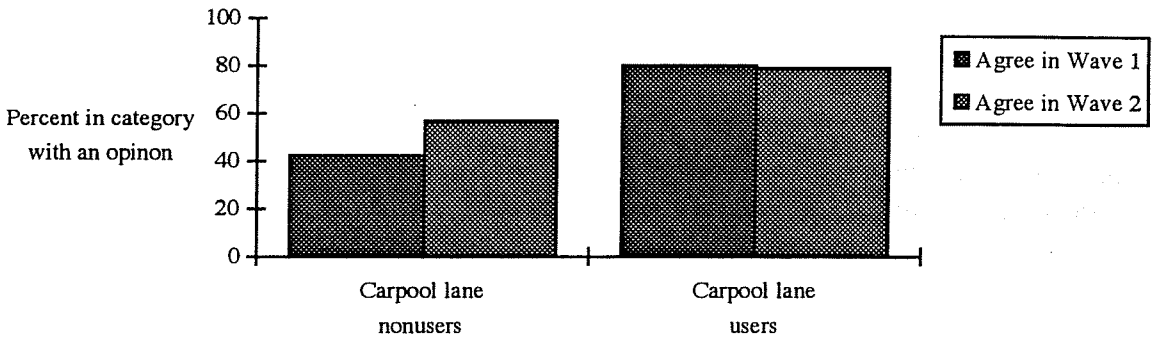


Figure IV-60: Disagreement with statement: The carpool lanes will be convenient by intended and actual use of carpool lanes

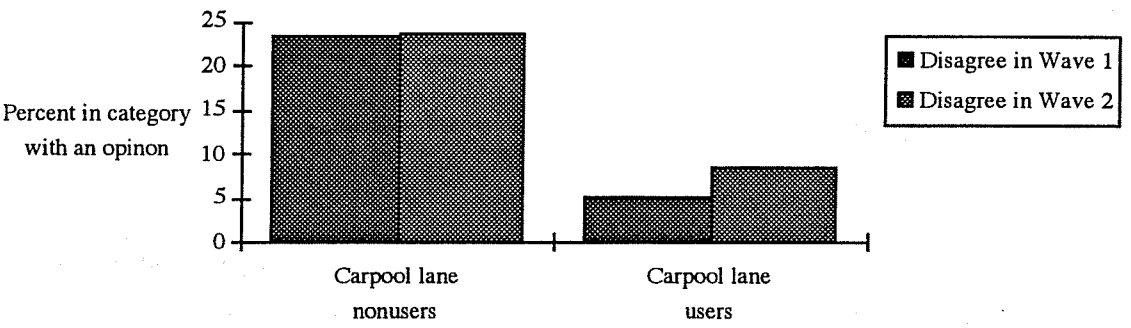


Figure IV-61: Agreement with statement: The mixed flow lanes will be convenient by intended and actual use of mixed flow lanes

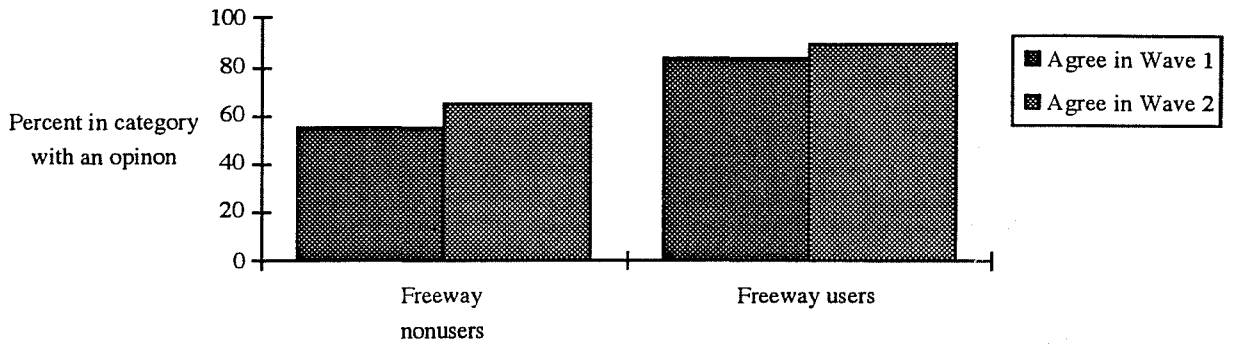
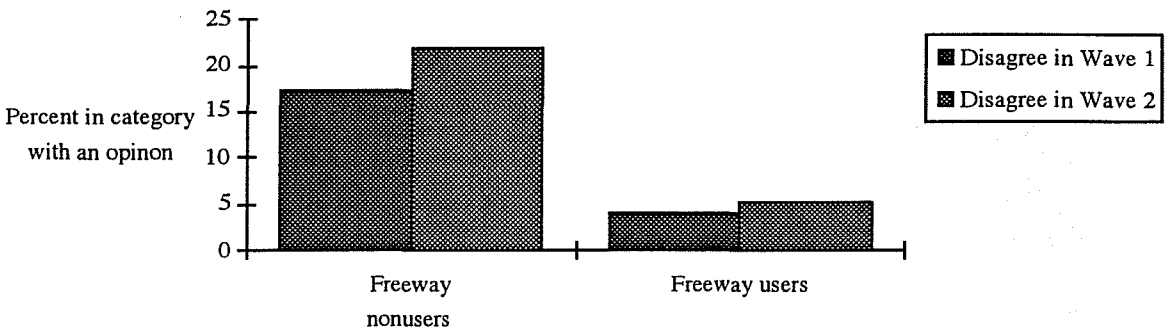


Figure IV-62: Disagreement with statement: The mixed flow lanes will be convenient by intended and actual use of mixed flow lanes

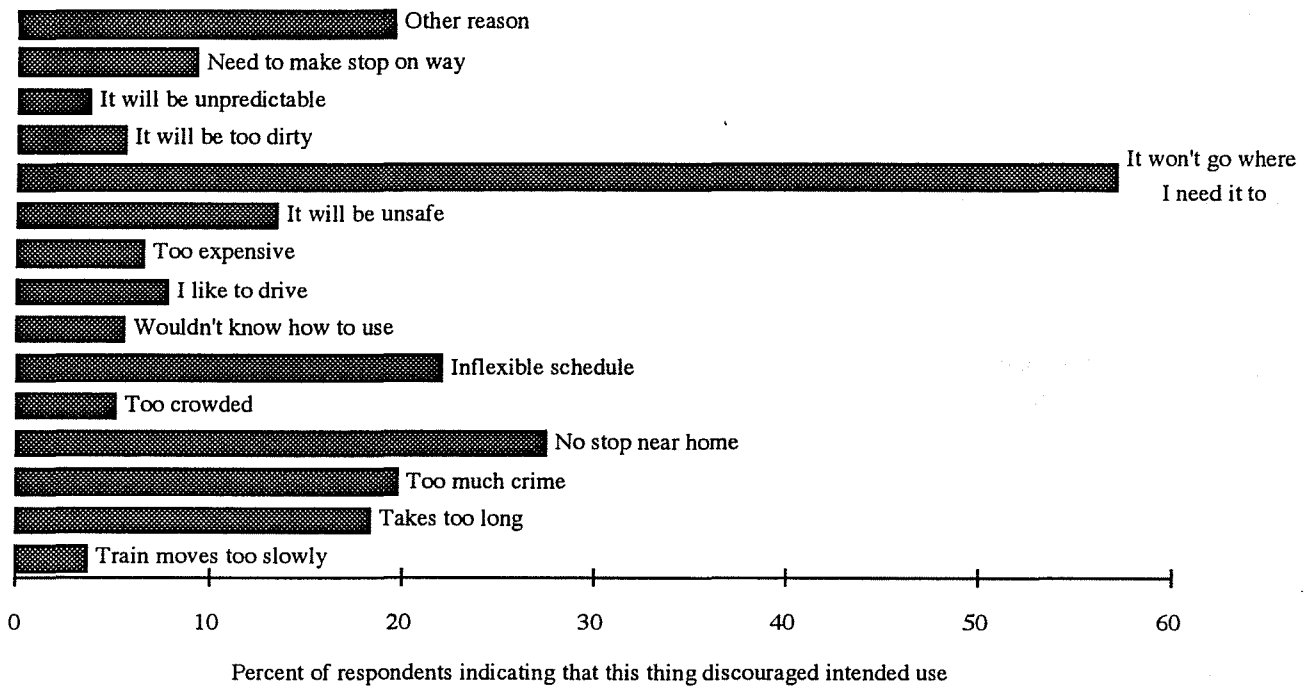


Individual's perceptions of the respective modes might influence their willingness to utilize those modes. We asked respondents to indicate the importance of the above qualities in choosing the way they get around. The majority of respondents strongly agreed with the statements that they would not use transportation that: was dangerous; subject to crime; unpredictable; took more time than usually used; costs more; or does not go where they usually go. The majority of respondents disagreed that air quality impact and perceived influence on regional and local traffic were items that would discourage the use of the modes.

1. Intended nonusers: What characteristics of the modes discourage intended use?

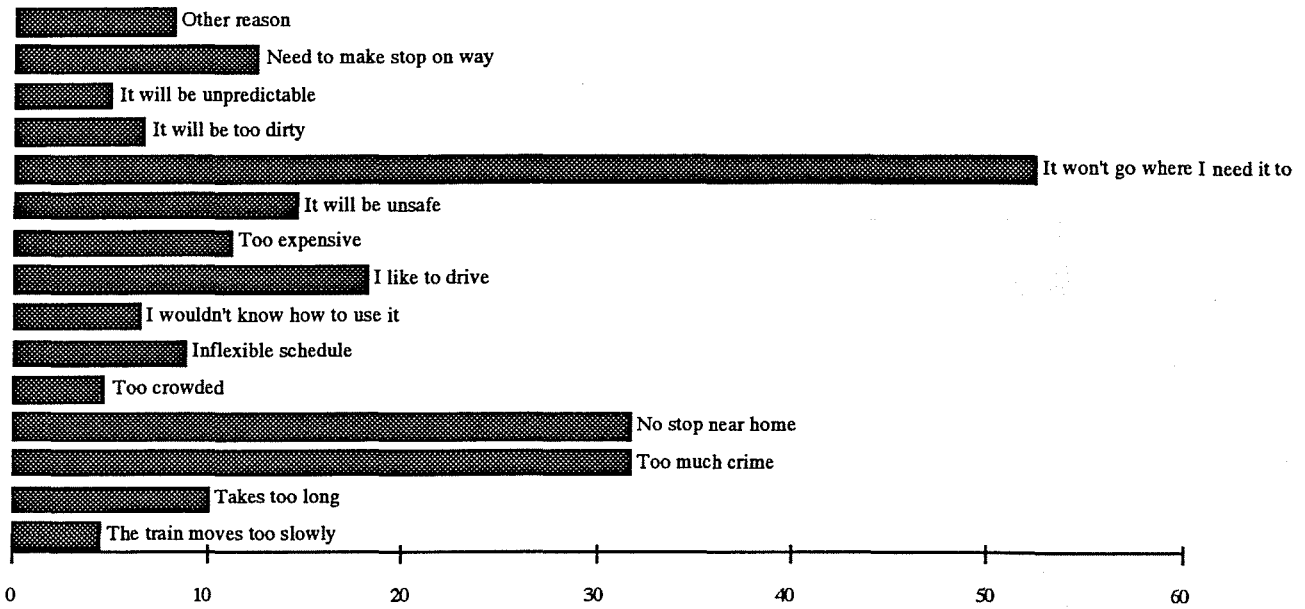
Working respondents who did not intend to use any of the modes were asked, "Which of the following things would discourage you from using" the Green Line, carpool lanes or mixed flow lanes for work and other types of trips? With respect to the Green Line the following reasons were cited most often:[10]

Figure IV-63: Statements cited as discouraging use of Green Line for "work" trips



[10] We report the findings from Wave 2.

Figure IV-64: Statements cited as discouraging use of Green Line for "other" trips



In Wave 2, the following reasons were cited as discouraging use of the freeway and carpool portions of the facility for work and other trip purposes.

Figure IV-65: Statements cited as discouraging use of Century Freeway for "work" trips

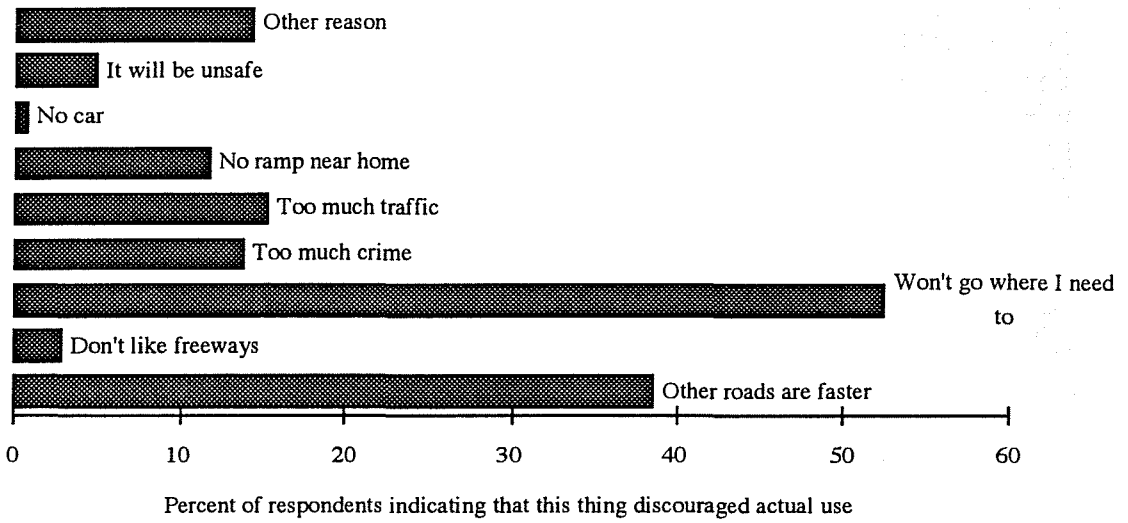


Figure IV-66: Statements cited as discouraging use of Century Freeway for "other" trips

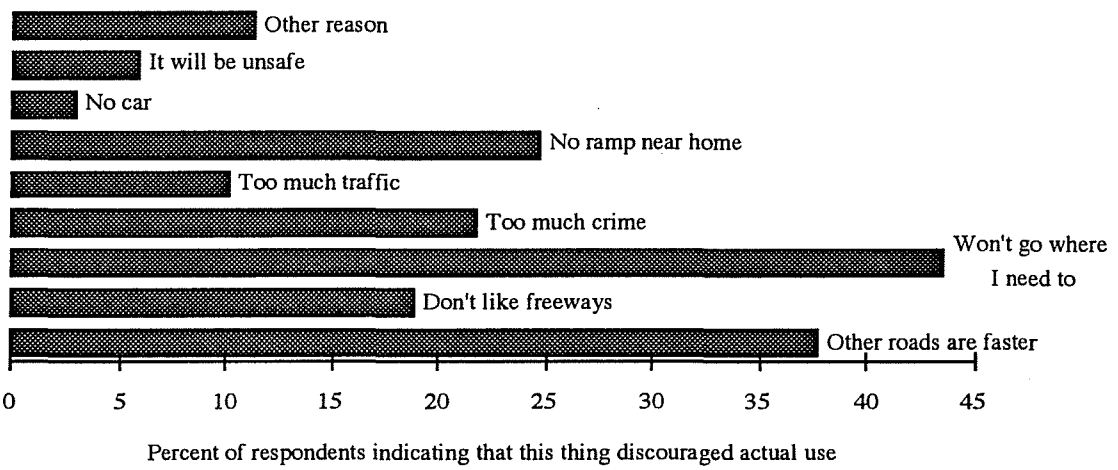


Figure IV-67: Statements cited as discouraging use of carpool lanes for work trips

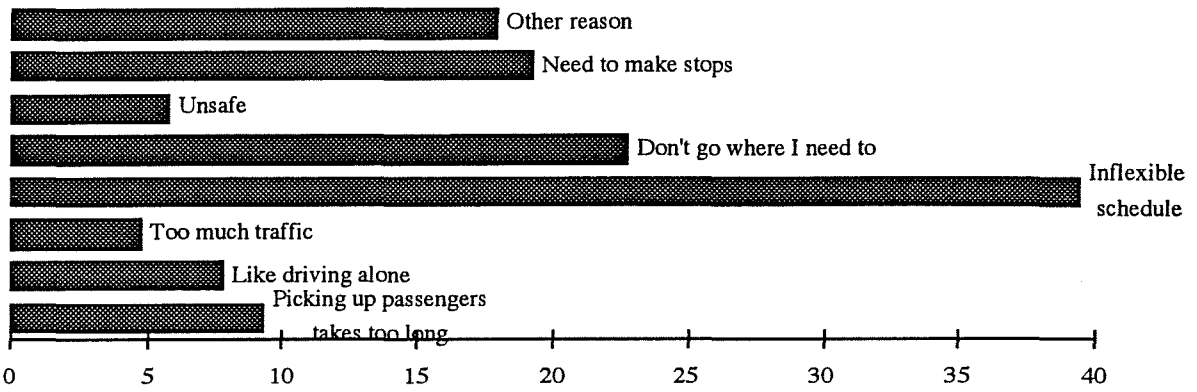
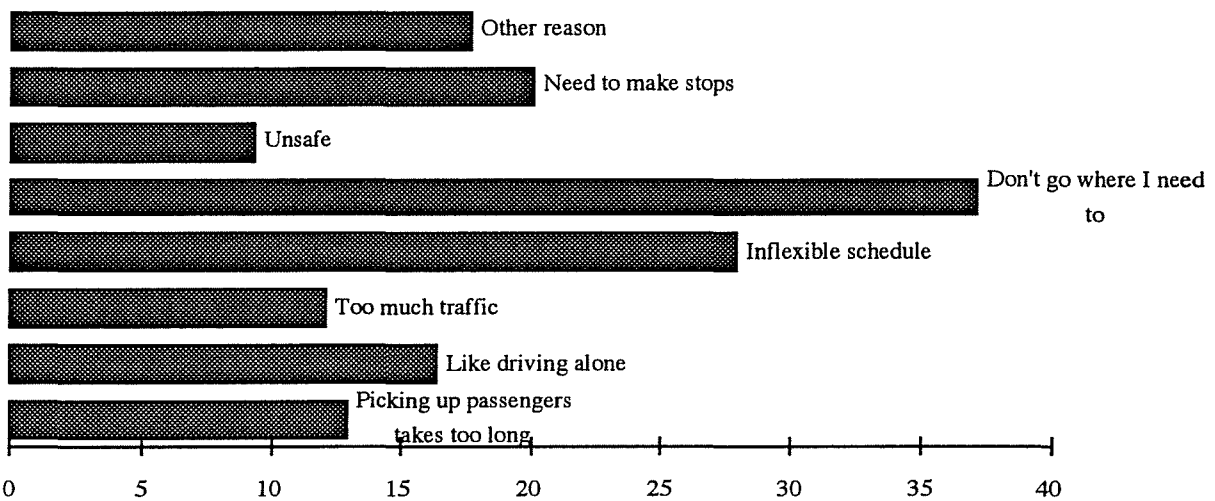


Figure IV-68: Statements cited as discouraging use of carpool lanes for "other" trips



Corridor residents who do not use the facility are concerned that it does not go where they routinely go for work and other trip purposes. Similarly, many express the opinion that there are other ways to get to their destinations faster. Finally, there is a

substantial concern about crime on the Green Line and this might discourage use once the facility opens.

2. Users: What about the modes influences use?

We asked users of the carpool and mixed flow lanes what qualities about the Freeway were important reasons for using it. The reason cited most often for both carpool and mixed flow lane users is that it reduces travel time.

Figure IV-69: Statements users cite as encouraging use of carpool lanes

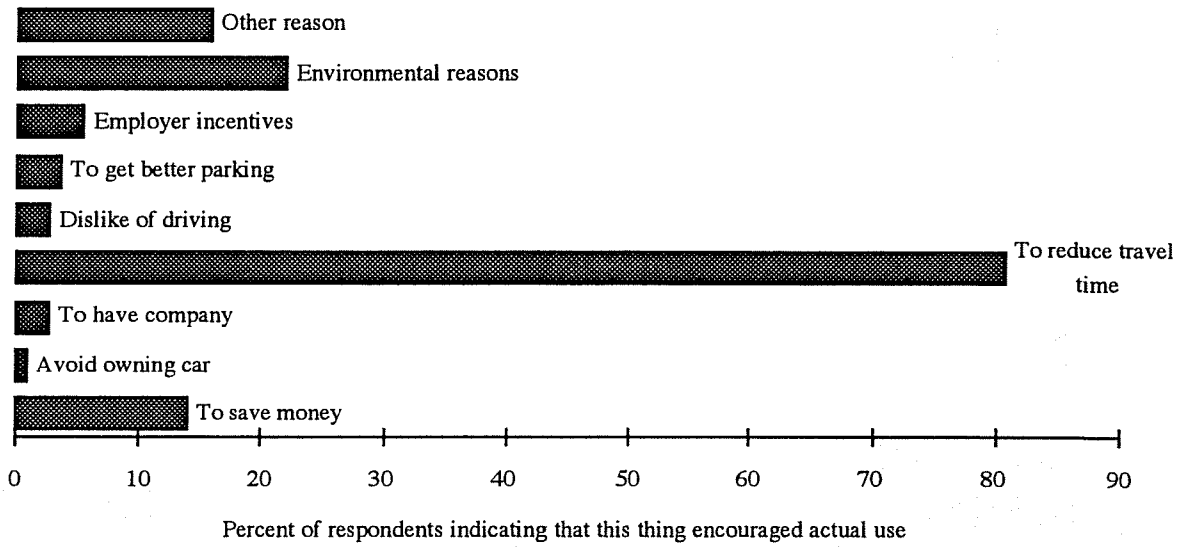
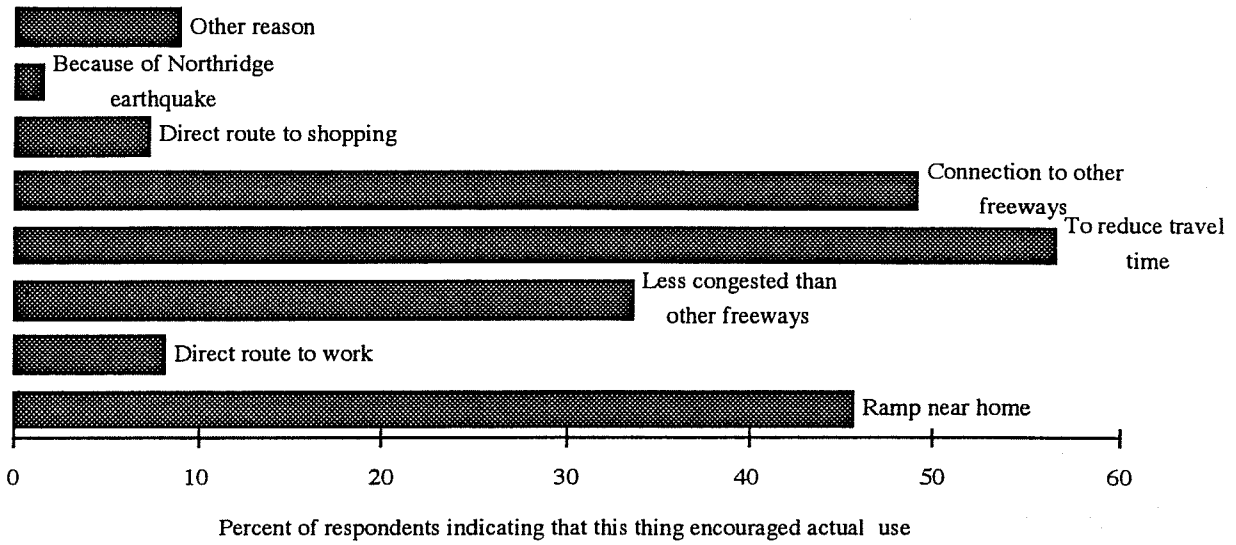


Figure IV-70: Statements users cite as encouraging use of mixed flow lanes



F. Travel Behavior by Corridor Residents: Actual travel behavior of respondents on their travel diary day.

1. Basic travel characteristics at time 1 and time 2. A cross-sectional look at the data

In this section the travel behavior of respondents at time 1 and time 2 is compared using the entire sample of analyzable travel diaries. We include here all people who made at least one trip for any purpose. In total, over all trip purposes and modes, the respondents averaged 3.49 (SD = 2.26) trips per day in Wave 1 and 4.06 (SD = 2.31) in Wave 2. The travel diary asks respondents specific mode and purpose questions for only the first six trips so the following frequency distributions describe only those trips.

In Wave 1, an average of 67% of all person trips were drive alone trips, 29% were drive with others, 3% were by walking or bicycle and 1.2% were by transit. In Wave 2, an average of 68% of all person trips were drive alone trips, 31% were drive with others and 2% were walking or bicycle trips. From the usable travel diaries, no trips were made by transit.

The modal number of trips in both waves was two. The average number of drive alone trips per day in Wave 1 was 2.4 (SD = 1.59); in Wave 2 it was 2.48 (SD=1.65). The average number of trips per day using the drive with others mode was 1.12 (SD = 1.48) in Wave 1 and 1.16 (SD = 1.46) in Wave 2. The vast majority of respondents did not either take public transit or walk or ride a bicycle: the average over all respondents was .03 (SD=.21) for transit in Wave 1 and .11 (SD = .46) and .06 (SD = .41) for walking and riding.

The average number of trips taken for the purpose of errands, recreation, shopping, eating out, or personal business (classified for our purposes as "other," was 1.99 (SD = 1.15) in Wave 1 and 2.12 (SD = 1.15) in Wave 2.[11] The average number of work related trips over the entire sample was 1.6 (SD = 1.06) in Wave 1 and 1.58 (SD = 1.23) in Wave 2. The average number of journey to work trips over the entire sample was 1.25 (SD = .55) and 1.25 (SD = .65) in Waves 1 and 2.

In Wave 1, 60% of all person trips were trips taken for non-work related purposes. 34% were commute to work trips and 6% were otherwise work related. In Wave 2, 64% were non work related trips, 31% were commute to work trips and 4% were non work related.

The mean travel time for "other" trips in Wave 1 was 20.57 (SD = 14.37) minutes while in Wave 2 it was 19.23 (SD = 14.12) minutes. Work related trips averaged 22.39 (SD = 14.66) minutes per trip in Wave 1 and 21.93 (SD = 10.72) in Wave 2. Work trips took an average of 26.06 (SD = 14.9) in Wave 1 and 21.92 (SD = 13.61) in Wave 2.

In Wave 1, carpool trips averaged 22.18 minutes per trip (SD = 18.43) for "other" trips; 26.59 (SD= 16.7) for work; and 24.30 (SD= 18.03) for work related trips. Drive alone trips were shorter in duration, averaging 19.59 minutes per trip (SD= 14.27) for "other" trips; 24.65 (SD=12.87) for work trips; and 21.08 (SD= 14.88) for work-related

[11] Those who take zero trips in any of the three trip purposes are classified as missing for the analysis of trips by purpose. That is, only those respondents who indicate they take at least one trip for either of these trip purposes are included in the average for that purpose.

trips. The carpool trips continued to be, on average, longer in duration than the drive alone trips in Wave 2[12].

Figure IV-71: Mean travel time for "other" trips

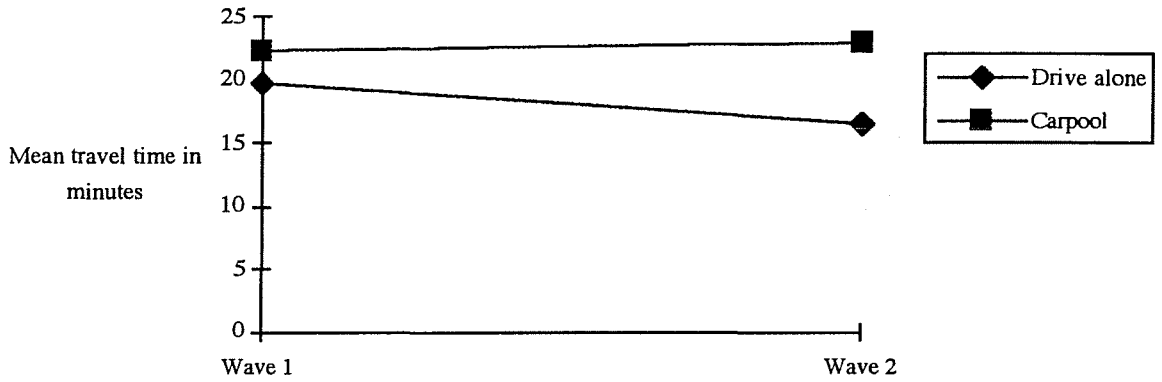
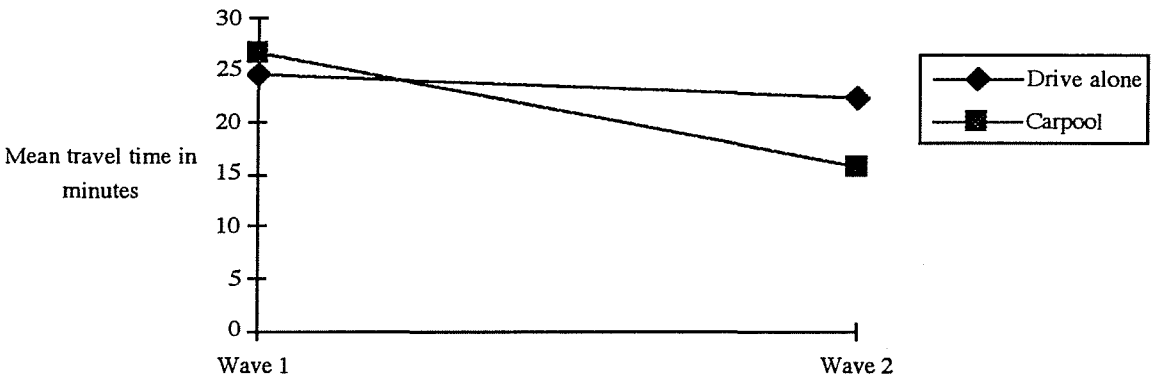
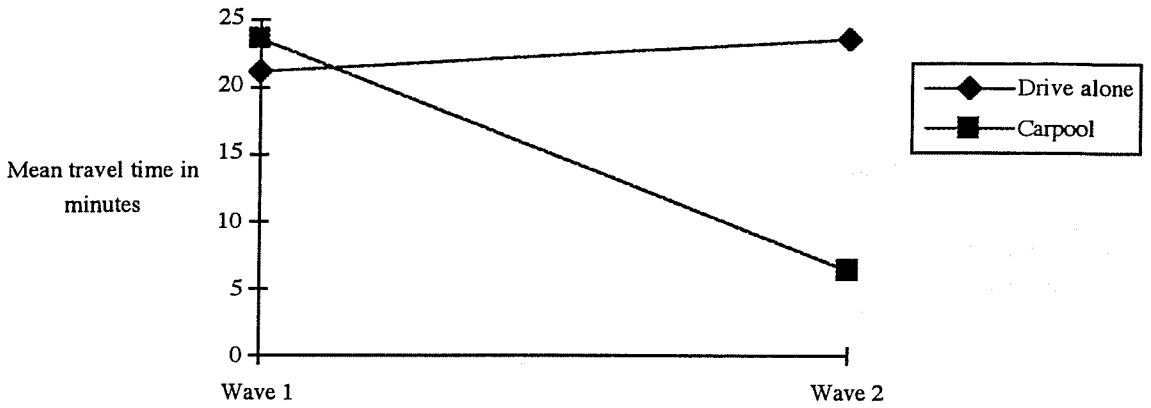


Figure IV-72: Mean travel time for "work" trips



[12] The exception to this is the work related trip purpose. There were only two respondents who drove with others for a "work related" trip in wave 2.

Figure IV-73: Mean travel time for "work-related" trips



2. Basic travel characteristics at time 1 and time 2: A longitudinal look at the data

Table IV-4: Characteristics of travel of sample completing both Wave 1 and Wave 2: Trip purpose = "Other"

Type of trip	n	Wave 1	Wave 2	t/df
Average travel time per trip over all modes	130	20.14 (13.92)	19.35 (13.38)	.25/129
Average travel time per trip: drive alone	82	16.54 (12.25)	16.26 (13.30)	.15/81
Average travel time per trip: drive with others	43	22.02 (14.68)	24.87 (12.25)	-1.06/42
Average travel time per trip: transit	1	75	22	
Average total travel time all modes	130	42.39 (33.9)	40.03 (29.53)	.66/129

Table IV-5: Characteristics of travel of sample completing both Wave 1 and Wave 2: Trip purpose = "Work trip"

Type of trip	n	Wave 1	Wave 2	t/df
Average travel time per trip over all modes	80	23.21 (11.87)	19.99 (13.11)	2.44/79*
Average travel time per trip: drive alone	69	24.17 (12.23)	20.95 (13.94)	2.17/68*
Average travel time per trip: drive with others	2	10.97	9.97	
Average travel time per trip: transit	--			
Average travel time per trip: walk or ride bicycle	1	35	18	--
Average total travel time all modes	80	27.22 (16.46)	26.59 (24.63)	.24/79

* = $p<.05$ significance

Table IV-6: Characteristics of travel of sample completing both Wave 1 and Wave 2: Trip purpose = "Work related"

Type of trip	n	Wave 1	Wave 2	t/df
Average travel time per trip over all modes	6	21.82 (10.66)	28.08 (10.99)	-2.45/5
Average travel time per trip: drive alone	5	16.90 (6.77)	25.50 (10.331)	-3.24/4*
Average travel time per trip: drive with others	--			
Average travel time per trip: transit	--			
Average travel time per trip: walk or ride bicycle	--			
Average total travel time all modes	6	58.66 (32.21)	44.40 (22.82)	.91/5

* = p<.05 significance

Although there appear to be differences in travel time, particularly average travel time over all trip modes, the reader is cautioned that this alone does not indicate that the opening of the freeway itself has contributed to these differences. 21.6% of the travelers (87) used the Century Freeway on their travel day in Wave 2 and 73 of the participants in both waves used the Freeway. In the following table we describe the changes in travel for respondents who used the Century on their travel day in Wave 2 and who were also participants in Wave 1.

Table IV-7: Travel characteristics of Century Freeway users

	n	Wave 1	Wave 2	t/df
Average travel time per trip for all "other" trips	49	21.49 (13.94)	22.03 (14.92)	-.2/48
Average travel time per trip for drive alone "other" trips	28	14.37 (9.1)	17.19 (13.2)	-.97/27
Average travel time per trip for carpool "other" trips	16	26.37 (17.35)	25.98 (10.76)	.09/15
Average travel time per trip for "work" trips	20	30.87 (11.16)	27.29 (11.14)	2.06/19 *
Average travel time per trip for drive alone "work" trips	18	31.99 (11.29)	27.36 (11.75)	2.66/17*
Average travel time per trip for carpool "work" trips	--	--	--	--
Average travel time per trip for "work related" trips	3	26.91 (12.66)	32.66 (13.19)	-1.01/2
Average travel time per trip for drive alone "work related" trips	2	19.58 --	28.55 --	--
Average travel time per trip for carpool "work related" trips	--	--	--	--

Travel time expressed in minutes. ( ) indicates standard deviation of the mean.

* $p < .05$ significance

The travel changes of those respondents who did not use the Century Freeway on their travel day are described below.

Table IV-8: Travel characteristics of Century Freeway non-users

	n	Wave 1	Wave 2	t/df
Average travel time per trip for all "other" trips	81	19.32 (13.93)	17.71 (12.15)	.83/80
Average travel time per trip for drive alone "other" trips	54	17.67 (13.56)	15.78 (13.42)	.83/53
Average travel time per trip for carpool "other" trips	27	19.41 (12.43)	24.19 (13.21)	-1.38/26
Average travel time per trip for "work" trips	60	20.69 (11.06)	17.6 (12.9)	1.86/59
Average travel time per trip for drive alone "work" trips	51	21.47 (11.45)	18.73 (14.05)	1.43/50
Average travel time per trip for carpool "work" trips	--	--	--	--
Average travel time per trip for "work related" trips	3	16.78 (7/14)	23.55 (8.4)	-6.61/2*
Average travel time per trip for drive alone "work related" trips	3	15.19 (8.2)	23.55 (8.4)	-8.63/2
Average travel time per trip for carpool "work related" trips	--	--	--	--

Travel time expressed in minutes. ( ) indicates standard deviation of the mean.
* $p < .05$ significance

The average travel time for work trips decreased significantly for Century Freeway users. The other travelers in our sample did not experience a significant change. When a similar comparison is conducted for all freeway users, we find a similar trend. Average travel time to work decreases in Wave 2, but not at a statistically significant level. In addition to decreasing travel time for Century Freeway users, it is possible that the opening of the Century Freeway decreases travel time to work for all freeway users because of the alleviation of traffic on roads Century Freeway users previously used.

The increase in travel time for "other" trips was also observed for both Century Freeway users and freeway users in general, while non-freeway users exhibited a decrease in average travel time for drive alone "other" trips. None of these changes was statistically significant, however.

Chapter V: Literature Review of The Land Use Impacts of Transportation Facilities

A. Land Use Impact of Freeways

1. Introduction

Over forty studies of the land use impacts of highways have been conducted over the past three decades, and several literature reviews were done in the seventies and eighties (Giuliano, 1989; Dyett 1981; Gamble and Davinroy, 1978). A review of the literature is presented here: our particular additional emphasis is on study design. We do so because design differences make it difficult to find consensus about how to interpret this body of empirical work. In fact it is possible for researchers to find previous studies that will support almost any proposed hypothesis. Here we sort the various study designs used over the years, and attempt to identify relationships between the direction and strength of the results obtained by researchers and the particular study design employed.

Although most analysts are in agreement regarding the general land use-transportation model described by location theories, two divergent opinions about the magnitude of this relationship in the urban environment have developed. On one hand, some researchers believe that transportation corridors, especially transit corridors, will lead to significant intensification of land uses; on the other hand, some researchers believe that accessibility levels in most metropolitan regions are so high, almost no amount of transportation investment could affect accessibility enough to influence land use changes. Another goal of this review, therefore, is to analyze past work in light of this current disagreement.

Researchers who believe that new transportation investments can have little influence on land use in the current urban environment have interpreted this body of literature to support their understanding of the transportation-land use relationship. For example, they have claimed that studies from the fifties and sixties generally show significant land use impacts from highway construction because, as their reasoning

follows, the marginal increase in accessibility and consequent decrease in travel cost created were dramatic enough to cause shifts in land development patterns. Likewise, it has been claimed that more recent studies show relatively few significant land use impacts from transportation investment because of the fact that metropolitan transportation systems have become very dense and travel costs uniformly low. In other words, in the current urban environment, it is difficult to change marginal accessibility levels and travel costs enough so that land use patterns shift to take advantage of increased transportation benefits. This interpretation of the land use-transportation literature is not entirely supported by the review conducted here. The idea that transportation effects on land use patterns are concentrated during a period of history when stark changes in technology and transportation supply occurred does not appear to be an accurate depiction of the land-use transportation research.

Because this literature is so extensive, and because different methods and study designs have been used, many interpretations of this work are possible. By closely re-examining these studies, possibly overlooked trends can be identified and a better understanding of the land use-transportation relationship will evolve. The first step in this examination is to review the methodologies employed by various researchers; the second step is to review the results obtained. To complete the examination, the direction and magnitude of the results will be compared across methodologies to determine if any systematic influence is presented by various aspects of the study design.

The two predominate methods used to examine the land use impacts of highways over the past several decades are experimental-control analysis and multivariate regression analysis. Although the methods used can be divided into two general categories, a review of the literature shows that almost no two studies have similar study designs. This complicates the reviewer's attempt to generalize about the overall body of results obtained from these studies. The study design factors considered here include the time period in relation to the freeway construction and opening, the duration of the study, the definition of impact and control areas, the type of land use impact to be evaluated, and the independent

variables to be included in regression analysis. The varied nature of these study designs reflects the fact that transportation researchers come from many different disciplines, and also reflects the complexity and broad nature of the research issue at hand.

Roughly thirty-five highway studies were reviewed for the purposes of this report. Three basic generations of land use impact studies were found: the first generation studies span the fifties and sixties and employ primarily an experimental-control methodology; the second generation studies are from the seventies and use mainly regression analysis; the third generation studies are from the eighties and also use regression analysis but focus primarily on changes in aggregate measures of economic and demographic growth and distribution. In the following sections, each generation of study is reviewed in terms of methods, study design, and results.

2. First Generation Studies

a. Methods and Study Design

The first generation studies generally analyze data associated with a test site and a control site for some designated before and after periods (See Table V-1 in Appendix 7). This approach entails collecting land use data sets associated with two different geographic areas, a test area and a control area. Theoretically, the test area and the control area are identical except for the presence of the freeway within the test area. Comparisons of these data are then made to determine whether significant differences exist between the two sets of data. Differences found in the data trends are attributed to the freeway, since all other variables have theoretically been held constant. Within this general type of methodological approach, several study designs have been used. The geographical definition of "impact" area or test site ranged from the area within nine hundred feet (0.17 miles) of either side of the freeway in question (Crosby et al, 1978), to an area within two miles of the freeway (Ererly, 1966). The definition of control site ranged from an area within 0.5-1.0 miles of the freeway (Adkins, 1959), to a non-descript area characterized as "the rest of the town"

(Ererly, 1966). The time variable of the studies varies widely also. Some researchers used the date of initial freeway planning to distinguish between the before and after periods, while others used the beginning of construction, and yet other researchers used the opening date. The duration of data collected ranges from before and after periods of three years in Adkin's study, to a before period of seven years and an after period of twelve years in Crosby's study.

The predominate measure of land use is land value or real estate value. This is the most consistent aspect of the land use impact studies. Five of the six first generation studies use some measure of value to represent land use. Although this provides some consistency across studies, the exact source of value data varies widely. Value data were collected from sources such as real estate sales records and county property assessors. Some researchers attempted to address the difference between land value and value of improvements to the land, while others did not. Adkins (1959) for example used real estate sales data, but attempted to remove the effect of improvements to the land by subtracting the appraised tax value of the improvements, multiplied by a construction cost factor, from the real estate sales figure. Most researchers used a cross-section of real estate sales values or assessed property values from a before and after period.

b. Results

Three of the six test-control studies reviewed show a positive relationship between freeway construction and the land use variable in question (Adkins, 1959; Bone, 1959; and Crosby et. al., 1978). The studies show land value increases in the test sites ranging from 180% in Bone's study to 483% in Adkins' study, while control site values changed between -64% in Adkins' study and 85% in Bone's study. Three of the six test-control studies show a weak relationship between freeway construction and land use variables (Ererly, 1966; Golden, 1968), and in some cases no relationship (Burton, 1965).

Some general patterns relating study design and results become apparent in reviewing the test-control studies. Of those studies showing a positive relationship between freeways and land use change, the study areas appear to be smaller, in particular the impact or test area, and the data set collected are more extensive, particularly in the after period. For example, studies with a positive relation between freeways and land use change defined impact areas all falling within 0.5 miles of the freeway; and all of the studies that did not find a relationship used impact areas including land up to 1.5-2.0 miles from the freeway. In terms of the timing of the data, studies finding a positive relationship all had "after" data at least ten years from the established critical point, either the planning or opening of the freeway. The studies that did not find a relationship between land use change and freeways all had "after" data that did not extend beyond four years from the critical point, either planning or opening of the facility.

3. Second Generation Studies

a. Methods and Study Design

Two general types of models were developed in the regression analysis studies: one to estimate the effect of freeways on land values, the other to estimate the effect of freeways on the amount and type of development occurring in a community. Five of the eight second generation studies focused primarily on the effect of freeways on property value (Wheeler, 1956; Pendleton, 1963; Cribbins et.al., 1965; Gamble et.al., 1974; and Langley, 1976), and although each of these studies developed models to predict land value, the orientation and design of the individual studies varied greatly (See Table V-2 in Appendix 7). In terms of their spatial organization, three of the five property value studies used regression analysis in a test-control context (Wheeler, 1956; Gamble et. al., 1974; and Langley, 1976), where test areas ranged from a 1000 foot band along the freeway in Gamble's study to an entire 128 acre community in Wheeler's study. The same scale of difference between studies exists in their definition of control areas. Two of the five

property value studies did not use a test-control design to identify the effect of a freeway's presence on a community (Pendleton, 1963; Cribbins et. al., 1965); rather a distance variable, such as distance of property to freeway right of way, or distance of property to nearest freeway access, was included in the regression equation.

In terms of the temporal organization of the property value studies, data sets also varied greatly. Three of the studies used a before-after comparison: before periods ranged from three years in Gamble's study to ten years in Cribbin's study, and after periods ranged from three years in Gamble's study to eleven years in Langley's study. One study used cross-sectional data collected after the opening of a freeway to predict the significance of the freeway in relation to other variables that may affect real estate value (Pendleton, 1963). Many different types of variables were included in these five studies; however in general researchers include some measure of accessibility to a freeway in terms of distance or travel times, characteristics of the property that affect its value such as lot size, square footage, or building type, and other variables that reflect specific interests of the researcher such as perceived noise and pollution levels. Only two of the property value studies attempted to control for the macro effects of the economy on real estate values: Wheeler did so by including an independent variable which reflected economic activity levels in the nearest metropolitan area, and Langley used an index calculated from sale-resale values of the same property at two time periods. These methods minimize the variation in real estate markets linked to fluctuations in the economy.

Three of eight regression studies focused on developing models to predict the amount and type of land use changes occurring after freeway construction (Corsi, 1974; Epps, 1974; Khasnabis and Babcock, 1976). Two of these studies analyzed land around freeway interchanges within a 1.5 radius, and one study looked at a half mile band on either side of the freeway. Two of the studies used a before-after comparison, while the other study looked at land development data only after freeway opening. These studies use data sets spanning a relatively longer period than many of the other studies reviewed,

twelve years in Khasnabis' study to twenty years in Corsi's study. Independent variables used in these models were similar to those used in the property value studies, including measures of distance to the freeway, availability of land, measures of traffic conditions, characteristics of nearest and largest CBD, and availability of municipal services.

b. Results

In general, the regression studies that modeled land values found a positive effect associated with the freeway variables in question. Three of the five regression studies showed a positive effect of freeways on land value (Wheeler, 1956; Pendleton, 1965; and Gamble et al, 1974), while Langley (1976) showed that the value of abutting properties is adversely affected in comparison with properties 200 to 4000 feet from the freeway, and Cribbins et al (1965) showed inconclusive or no effects of freeways on property values.

Again, the size and location of the study area in relation to the freeway in question appears to influence the nature of the results obtained by a researcher. Langley, for example, divided his study area into three sections, abutting, impact (200-400 feet), and non-impact (400-4000 feet). The other regression studies did not directly evaluate the effect of freeways on abutting properties; rather they included abutting properties within a larger test area. (Perhaps if Langley had not separately analyzed abutting properties, but included them in a larger test area, the negative freeway effects associated with abutting parcels may have been absorbed by the value changes occurring farther away.)

The empirical results of the analyses were reported in a variety of ways according to study design. Wheeler (1965) found an increase in test area property values ranging from 70%-154% more than in the control area. Pendleton (1963) found that a one minute decrease in driving time to the CBD adds $63.68 to the price of a house, and that a price increase of $444 could be attributed to a house located at three miles from the CBD rather than four miles, or a $206 increase in real estate value if located at seven miles from the CBD rather than eight miles (log of distance showed a stronger relation to housing price

than linear distance). Gamble et al (1974) showed that increased accessibility (accessibility indexes calculated during 1960 and 1968 by Washington Metropolitan COG) accounted for an increase of $2950/property in the entire North Springfield area.

Two of the three regression studies that modeled freeways' effects on the type and amount of development occurring found a positive relation. Corsi (1974) found that interchange development is best explained by proximity of the interchange to large and small urban centers, the growth rate of the nearest large and small urban centers, the availability of public facilities, and the volume of traffic on the freeway and intersecting roads (R-squared = 0.92). He also developed models to explain individual types of land use development occurring at interchanges, such as residential, commercial, and industrial. Epps (1974) also developed models for total development occurring at interchanges and for three specific types of land uses: services stations, motels, and restaurants. Total interchange development was best explained by ADT on the freeway, interchange type, population of nearest major urban center, and ADT on the intersecting highway. These variables only explained forty percent of the variation in interchange development, however, and were determined not to be particularly useful or applicable to other cities' planning efforts.

4. Third Generation Studies

a. Methods and Study Design

Three recent studies developed models to determine the influence of freeways on aggregate measures of population and employment levels, and also on the distribution of population and employment within a metropolitan area (See Table V-3 in Appendix 7). These studies used data sets extending over relatively long time periods, ten to eighteen years. The definition of study areas is not as crucial for the purposes of this approach since the focus is on entire regions, rather than only on the immediate areas around a single freeway. The models developed ranged from two variable time-series analysis in the case

of Stephanedes study to the analysis of over thirty different demographic and economic variables, such as in the Payne-Maxie study.

b. Results

The models developed to explain fluctuations in aggregate economic and demographic variables in relation to highway construction were perhaps the best designed studies in terms of time span and sophistication of statistical analysis. These studies consistently found a weak relationship or no relationship between highways and economic development. Two of the studies (Payne-Maxie, 1980; Stephanedes and Eagle, 1987) did find however that highways attract population and economic development from within a region although they rarely stimulate new growth.

5. Conclusions

The current transportation-land use literature characterizes the transportation/land use relationship as becoming weaker and weaker in the context of current urban development patterns. This conclusion has been supported by an interpretation of the literature based on older studies finding a relationship and more recent studies not finding a relationship. However, after closely reviewing the study designs employed over the past four decades, it is evident that the difference in the results between the older studies and the recent studies is more likely a function of study design and not of the changes occurring in the transportation-land use relationship. Older studies generally found positive relationships and recent very well constructed studies generally found weak relationships; however the different generations of studies evaluated different variables. In older studies, researchers focused on areas immediately surrounding new freeways; in recent studies, entire regions have been considered. The difference in results may be more a function of the fact that older studies tended to look at the effect of freeways on individual parcels, and recent studies tend to look at the effect of freeway construction on a metropolitan region. It

is important for researchers interpreting this literature and attempting to understand the land use-transportation relationship, to distinguish between the micro and macro effects of transportation investment[1] .

B. Land Use Impacts of Rail Transit

1. Introduction

There have been two waves of rail construction in the U.S. in recent decades: in the sixties and seventies, several cities began constructing heavy rail systems including San Francisco, Atlanta, and Washington D.C.; in the late seventies and eighties, some cities began constructing light rail systems including San Diego, Portland, and Buffalo. Several thorough empirical studies of the land use impacts of heavy rail were conducted. Few researchers to date have attempted to analyze the impacts of light rail systems. The following sections present the methods, study designs and results found from a review of literature published on the land use impacts of rail.

2. Methods and Study Design

The approaches used in the study of rail transit effects on land use have been varied, including regression and trend analysis, test-controls, and descriptive analysis based on surveying and interviewing (See Table V-4 in Appendix 7).

Dyett's study of the BART system addressed many aspects of the land use-transportation relationship. Station area land uses were examined using aerial photos, assessor's maps, and planning information, to conduct descriptive analyses of land use changes occurring from 1965 to 1977 (BART opened in 1972). Two study areas were delineated, a circle centered on the station with a 1500ft radius, and a larger 4000ft by 4000ft area centered on the stations. The effect of BART on property prices and rents was

[1]Various other methods have been used to determine the land use impacts of freeways, including use of aerial photographs to measure the change in development occurring before and after freeway construction, simulation studies, expert panel studies, and historical studies.

also studied using regression analysis and a before-after comparison. The before period lasted two years and the after period was five years. Trends in aggregate measures of population, housing, and employment were analyzed using the entire BART service area as a test area and the surrounding counties as control areas. BART's effects on speculation were analyzed to determine if public or private parties anticipated development in the rail corridors.

Gannon and Dear conducted a survey of private businesses and land developers to determine the significance of light rail in their decisions to develop and occupy office space near the rail line or stations. Qualitative data from the survey was reported, with the authors citing a lack of available data sources to conduct statistical analysis.

Boyce conducted a study of the Philadelphia Lindenwold High Speed rail line which opened in 1968. The primary purpose of this study was to evaluate and measure the indirect benefits resulting from transit development. In this case, the particular focus was on property value increases. A second focus of the study was on the effect of the rail line on local land development policies.

Lernman uses econometric analysis to determine the effect of Washington's Metro Rail on property values. Separate models are developed for different land uses, such as single family, multi-family and retail. A thorough search of the literature is presented.

Cervero (1984, 1993) has contributed significantly to the recent empirical work on land use impacts of light rail. His studies focus specifically on the effects of the new generation of light rail systems which have opened or are being considered in twenty-five cities across the U.S. and Canada. In one study, he conducted a survey of local land use and planning officials in twelve North American cities, and also compiled the land use characteristics of these cities from planning documents, to assess how public policy, the introduction of a new rail system, and current urban form, shape the potential effect of light rail on future land use patterns. No statistical analysis was performed; rather trends were presented. One of his most recent studies, and certainly the most recent study of this type,

revisits the large body of highway studies which focused on the effect of transportation investment on the real estate rental rates of parcels near the corridor. Cervero and Landis (1993) use a test-control method with data spaning an eleven year period, from 1978 to 1989. Two sets of sites were analyzed, one pair in Washington D.C., the other in Atlanta. The study focuses on the after period, rather than a before-after comparison, as both rail systems analyzed opened in the 1970's. The variables analyzed were average office rents, net absorbtion rates, annual office space additions, average building size, and percent of new regional office space. T-tests were used to evaluate whether significant differences existed between sites with rail, or test sites, and sites without rail, the control sites.

3. Results

A general review of the rail study results shows that rail has impacted land use patterns, although this influence is inconsistent and smaller than initially anticipated. Gannon and Dear found that the Philadelhia-Lindwold line was a significant factor in the locational decisions of office builders and renters, although very little actual construction had occurred at the time of the study. The Philadelhia-Lindwold line began operation in 1969; the survey was conducted in the early 1970's, thus the scope of the results is limited. The BART system did influence land use and land development in the Bay area somewhat, although at the time of the study, which was only three to five years after operation began, the effects appeared quite small relative to expectations. Forty percent of the new development occurring between 1965 and 1977 within the station areas was single family residential; twenty-three percent, office or commercial; and twenty percent multifamily residential. Falcke's study of the effect of BART on residential and commercial property prices and rents shows that some benefit may be gained from proximity to the rail system, but it is not consistent. In the before period (1962-1965), BART had a positive impact on residential property prices, and almost no impact during the construction period (1967-1971) or the after period (1972-1977); for office development, BART had no impact in the

before period or construction period, and a positive impact in the after period. Population and employment growth inside the three county BART service area was slower than in the surrounding counties. However, of the growth that did occur in the BART service area, fifty-one percent of employment growth occurred in the vicinities of rail stations and fourteen percent of housing growth occurred in the vicinity of rail stations.

In a 1993 empirical study of the effect of rail on land use Cervero found that commercial centers with rail access did not show any consistent real estate advantage over centers with no rail access. In the Washington D.C. test-control case, the no rail center generally out-performed the rail center. In the Atlanta case, two of the five variables analyzed showed a significant difference between the rail and no rail centers, with rail centers performing better than no rail centers.

4. Conclusions

Very little recent empirical work has been conducted on the land use effects of the new generation light rail systems. In fact, few published studies were found from the period between the late seventies and early ninties.

Chapter VI: Methodology for Analysis of Land Use Policy

The primary goal of this portion of our research is to determine whether cities have implemented or intend to implement land use policy changes in response to the freeway/transitway, and whether there have been actual land use changes near the freeway/transitway.

A. Data Collection

1. General Plans, Zoning Maps and Other Documents

We made preliminary visits to the corridor study area cities in December 1993, and January 1994. We visited Bellflower, Compton, Downey, El Segundo, Gardena, Hawthorne, Inglewood, Los Angeles, Lynwood, Norwalk, Paramount, South Gate, and the County of Los Angeles. The purpose of these field visits was to become familiar with the appropriate agencies in the jurisdictions and to collect maps, general plans, and other documents that span the course of the history of the freeway.

We analyzed the general plan because in California it is atop the hierarchy of land use policy documents; because it is the "constitution for all future land use decisions," and because zoning and other land use regulations must be consistent with it (DiMento, 1980). We use the zoning map as a policy variable itself and as one proxy for actual land use, because in most cases, the zoning map most closely reflects current land use.[1]

Our strategy on these initial visits was to collect the following:

a) Zoning maps dating from the period before serious consideration of the Century.

---

[1] Zoning maps may not always reflect actual use of the land. Many of the planners with whom we spoke made this point. Usually there is a time lag associated with zoning changes and land transfer. Also changes of actual use may not be recorded on the land use maps when those changes are effected by another level or branch of government, such as when Caltrans creates a right-of-way through a city-zoned area. Aerial photographs could provide a picture of the actual land uses in the area; however, the photograph collection available is not complete, nor does it reflect the points of time we wish to analyze. Windshield or door to door surveys are among other methods beyond the resources of this project.

b) Zoning maps from the late 1960s and 1970's when cities had some reason to believe the freeway would be constructed

c) Current zoning maps, from a period in which serious implementation and then construction was ongoing

d) Land Use Elements from prior General Plans (this includes land use map)

e) Circulation Elements from prior General Plans

f) Land Use Elements from current General Plans (this includes land use map)

g) Circulation Elements from current General Plans

Time periods are defined in Table VI-1

Table VI-1: Time Periods Used for Data Analysis

TIME PERIOD	DATE	DESCRIPTION
TIME 0	Pre-1968	Period before serious consideration of the Century Freeway/Transitway.
TIME 1	1968-1981	Period when local and other officials had some reason to believe that the Century would be built. Important events include: 1) 1972: Freeway agreements approved and/but lawsuit filed, 2) May 1976: Corridor cities approve eight lane freeway/transitway project, 3) October 1978: FHWA approves final EIS, and 4) October 1979: Consent Decree
TIME 2	1981-1993	Period in which serious implementation and then construction was ongoing. Important events include: 1) April 1982: All conceptual freeway agreements signed, 2) May 1982: Groundbreaking, and 3) September 1987: On time/on target half way into construction.
TIME 3	1993-1994	Period in which the freeway was operational but the Green Line had not yet been completed.
TIME 4	1995-	Period in which the complete Century project is in operation: freeway and light rail.

The zoning maps and general plans which were collected are listed by city as shown in Table VI-2 and Table VI-3.[2]

Table VI-2: Zoning Map Data Collection

City	Time 0	Time 1	Time 2	Time 3
1. Bellflower		1977 Land Use	1984	
2. Compton		1968		
3. Downey	1951 Land Use		1992	
4. El Segundo			1993	1994
5. Gardena			1992	
6. Hawthorne		1981	1990 Land Use	
7. Inglewood	1967		1990	
8. Los Angeles (city)				
9. Los Angeles (county)				
10. Lynwood				
11. Norwalk			1991	
12. Paramount	1964	1976	1988	
13. South Gate	1961	1990 Land Use		

[2] We also visited each city's Chamber of Commerce to collect promotional and informational literature distributed to potential developers. For the most part, this information consisted of demographic profiles drawn from United States census materials. We do not use this information in our report.

Table VI-3: General Plan Data Collection[3]

City	Time 0	Time 1	Time 2	Time 3
1. Bellflower		1977	1993	
2. Compton	1964		1991	
3. Downey	1963 (notes)		1992	
4. El Segundo			1983, 1989, 1992	
5. Gardena		1974		
6. Hawthorne		1970	1990	
7. Inglewood	1966 (notes)		1986, 1992	
8. Los Angeles (city)			1991	
9. Los Angeles (cnty)		1980		
10. Lynwood	1962 (notes)		1989	
11. Norwalk	1961		1993	
12. Paramount		1973 (notes)	1985 (notes)	
13. South Gate				

2. Interviews with Local Officials

We interviewed city managers and community development directors or their designees in each of the corridor cities. [Please see Appendix 5, "List of Interviewees".] The average length of an interview was 72 minutes. The goal was to determine to what extent each city uses available land use policy and regulatory tools in response to changes in transportation "opportunities". These tools can include but are not limited to General

[3] Our results reflect our ability to obtain General Plan documents. This table presents the results of those efforts. Compare with the reported status by jurisdiction in the 1995 California Planner's Book of Lists Governor's Office of Planning and Research, January, 1995, published after completion of our analysis; it gives the following dates for land use and circulation elements: Bellflower 1994/1994; Compton 1991/1991; Downey 1992/1992; El Segundo 1992/1993; Gardena 1975/1975; Hawthorne 1994/1989; Los Angeles 1986/1986; Lynwood 1990/1993; Norwalk 1992/1992; Paramount 1989/1989; South Gate 1986/1986. Its results are based on a survey and cities and counties have no legal obligation to submit copies of plans themselves to the state.

Plan Amendments, Zoning Ordinance changes, designation of nearby areas as redevelopment areas, and tax incentives to interested developers. [Please see Appendix 6, the Interview Guide.] The interviews supplement information found in general plans and ordinances. General plans are sometimes out of date. They take a considerable amount of time to create and amend and, despite legal obligations in California that they be made current and followed, non compliance within this state law is not uncommon. Also interviews provide information even in complying jurisdictions-- on leading ideas about policy changes and projects which have not reached fruition.

B. Data Analysis

1. General Plans, Zoning Maps and Other Documents

a. General Plan Approach

We analyzed the land use and circulation elements of current and previous general plans to ascertain the impact of the freeway/transitway. We reviewed each general plan for goals, objectives, policies and implementation programs including those which have been suggested in the literature as promoting transit based development. Each section that refers to the freeway/transitway by name was highlighted and categorized according to one of the following descriptive terms: land use, circulation, transportation behavior, housing, and economic development. We report results by jurisdiction, in aggregated form, and by period as defined in Table VI-1.

b. Zoning Map Approach

The purpose of the zoning map analysis is to identify the types and amount of zoning changes that have occurred in the zoning analysis study area, defined as 1.0 mile on either side of the freeway. Two zoning maps ("current" and "previous") from each corridor city were compared parcel by parcel within the zoning analysis study area. Parcels that changed zoning designation from the "previous" to "current" were numbered in pencil

on one of the maps (the easiest map to measure was chosen). Each parcel was then measured with a ruler, accurate to the 1/32 of an inch. For example in the City of Paramount, approximately twenty-six parcels were identified in the 1988 zoning map which had changed zoning designation since the 1964 zoning map. Each of these parcels was numbered on the 1988 map and measured. Most parcels are rectangular, or can be divided into rectangles and right triangles. The dimensions of the parcels were measured in 32nd's of an inch and then converted into feet. Square footage is calculated by multiplying the length times the width of a rectangular parcel, and 1/2 the length times the width for triangular parcels or triangular portions of parcels.

For each parcel, the following information was recorded: the number assigned to each parcel which has changed use between time periods, the type of zoning change that has occurred, the dimensions of the parcel in inches (measured with ruler) and feet (calculated using inches measurement and the scale provided on the map), and the square footage. After all zoning designation changes were recorded, parcels which underwent identical zoning designation changes were summed. The total square footage of each type of zoning change was then divided by 43,560 square feet/acre to obtain a measure of acreage. The total acreage of each type of zoning designation change is recorded in a table. (See Chapter VII, Table VII-3 through Table VII-12). The percentage of each type of zoning change as compared with the total amount of zoning change in each city's study area was calculated and recorded in the table. An overall summary direction (intensification or deintensification) was then assigned.

Many possible definitions of the term "intensification" exist. For the purposes of this report, standard traffic engineering estimations of trip generation rates are used. Land uses with higher trip generation rates are considered more intense than land uses with lower trip generation rates. The primary advantage in using trip generation to determine intensity is that it provides a common unit of measurement for all land uses: trips generated per acre of land use. Another possible measure of intensity is density of land development per acre

of land; however the major shortcoming with this approach is that the density of residential land uses is measured differently than all other land uses. Residential uses are usually measured in dwelling units per square foot of land, while other uses are generally defined by square footage of building per square footage of land.

The ITE Trip Generation Manual reports trip rates by specific land use types, while in this project, we measure changes in *zoning designations* rather than changes in actual land uses. Therefore, in order to use the information provided in the ITE Manual, we average trip rates for all types of land uses that could possibly fall within the definition of the zoning designation in question. Zoning designations from the corridors' zoning maps are shown in the first column of Table VI-4, while the specific land uses reported in the ITE Manual are shown in the second column of Table VI-4. The trip generation rates are reported in column three of Table VI-4. In cases where there is more than one land use category for the zoning designation averages of trip rates were used. For example, the ITE Manual reports trip rates for four different office land uses (Corporate, Single Tenant Office Building, Office Park, and Business Park) that possibly fall within the definition of the office zoning designation. Ranking zoning designations by trip generation rates requires considerable generalizing; we determined this to be necessary given the available data.

A change in zoning is classified as an intensification if the "post-freeway" zoning designation has a higher trip rate than the "pre-freeway" zoning designation. Zoning designation changes that involve a public facility zone were not classified as either an intensification or a de-intensification because it was impossible to arrive at a trip rate for this zoning designation. The public facility zone can include many different types of land uses with trip rates that vary greatly. Changes involving public facility zones were therefore classified in the "don't know" category. In cases where the estimated trip rates of two zoning designations in question were very close, this type of change was also classified in the "don't know" category.

The mixed use zoning designation was determined to be the most intense land use in terms of trip generation because the land uses allowed in the mixed use designation are more dense than the corresponding single use designations allowed in the rest of the cities (only El Segundo and Hawthorne have mixed use designations). There was no single trip rate used in either city associated with the mixed use zoning designation; rather trip rates were determined on a project by project basis and fluctuate according to the specific land uses being developed.

For R2, R3 and R4, the ITE Manual does not report trips per acre; rather number of trips per dwelling unit is reported. The measure of dwelling units per acre was obtained as follows: multiplying 43,560 square feet per acre by the definitions of R2, R3 and R4 (which are given in dwelling units per square feet). Multiplying dwelling units per acre and trips per dwelling unit gives trips per acre. We consider the trip rates for R2, R3, and R4.

In our results in Chapter VII the figures in italics are those we calculated. Figures in regular print were obtained directly from zoning codes, or the ITE Manual.

2. Interviews with Local Officials

We transcribed the interviews and analyzed them for content according to the hypothesized land use changes which are the subject of this part of our research. We focused not only on changes already made but also on possible future policy and on-the-ground changes and attempts to attract potential developers in each city. The interviews also assist in analysis of the relationship between the Century and land use change: changes may not be linked (in the opinion of interviewees) to the Century project; rather they may be better explained by other factors including policy changes, demographic shifts, and economic trends.

Table VI-4: Determining Trip Generation from ITE Trip Generation Manual, 5th Edition.

Zoning Designations as Reported by Cities	**ITE Trip Generation Manual Land Use Categories**	**Trip Rates** (averaged from trip rates reported in column 2.)
R1: Low Residential	Single Family Detached	31.37 trips/acre 9.87 trips/d.u.[4]
R2: Medium Residential	Low Rise Apartment (1-2 floors)	6.88 trips/d.u.
R3, R4: High Residential	High Rise Apartment (10+) : 4.59 trips/d.u. Condos : 5.76 trips/d.u. High Rise Condos (3+) : 4.24 trips/d.u.	4.86 trips/d.u.
Planned Unit	Planned Unit	46.78 trips/acre 7.44 trips/d.u.
C1, C2, C3, CS, CG, CM: Commercial/ Retail/Office	Retail Center : 359 trips/acre Discount Center : 456.4 trips/acre Corporate : 68.04 trips/acre Single Tenant Office : 60.17 trips/acre Office Park : 195.11 trips/acre Business Park : 159.75 trips/acre	216.4 trips/acre
M1: Light Manufacturing	Light Industry : 51.80 trips/acre	51.8 trips/acre
M2: Heavy Manufacturing	Heavy Industry : 6.75 trips/acre Industrial Park : 62.9 trips/acre Manufacturing : 38.88 trips/acre	36.2 trips/acre
CO: Corporate	Corporate	68.04 trips/acre
F-MU, MU: Mixed Use		
PF: Public Facility	Elementary School : 10.72 trips/1000sf GFA[5] High School : 10.90 trips/1000sf GFA University/College : 9.13 trips/1000sf GFA Church : 9.32 trips/1000sf GFA Library : 45.5 trips/1000sf GFA Hospital : 16.78 trips/1000sf GFA Post Office : 87.12 trips/1000sf GFA	17.06 trips/1000sf GFA (excluding post office)

[4] dwelling units

[5] gross floor area

Chapter VII: Policy Impact: The I-105 And General Plans And Zoning Ordinances

A. Introduction

In chapters II and V we summarize major research findings on the impacts of transportation facilities on land use and other dimensions of community life. A small part of that literature focuses on policy changes which precede and are intended to guide actual changes in land use. Before actual changes on the ground, or in some cases concomitant with their initiation, major highway programs and other proposed transportation facilities can have an impact on the policies promoted by local government. These may be reflected in general plans and zoning ordinances. They also may be reflected in other more specific types of land use regulations such as parking ordinances if, within the jurisdiction, these are understood as distinct from the zoning ordinance and found in other sections of the municipal code.

An important case: California, General plan and land use controls

The legal significance of some policy documents is considerable in California and--as an indicator of the impact of transportation facilities--therefor potentially different from that impact in other states.

In California since implementation of the first major consistency law, A.B. 1301 in 1973, zoning must be consistent with the general plan. Along with that landmark statute many judicial opinions reinforce the notion that the general plan is the guide for all future development, that it is the highest policy document in the hierarchy of land use controls, and that no development may occur that is inconsistent with the general plan.[1] For this report we simply state this requirement as a preface to the conclusion that *if major highway and other transportation facility developments are to influence development patterns, those changes legally must be provided for in the general plans of local governments*

[1] Generally, see J. DiMento, The Consistency Doctrine and the Limits of Planning (1980)

affected.[2] We also add the caveat before presenting our results that the legal significance and function of the general plan changed during the history of the Century's consideration and development. Specifically, the consistency requirement was not in force during Time Period 0 and parts of Time Period 1. [A.B. 1301 became law during Time Period 1.[3]]

In this chapter our results are found in two parts: first policy changes attributable to the Century which are found in plans are summarized; then the impacts as reflected in zoning are presented.[4] As these sections elaborate, impact [as reflected in goals, objectives, policies and implementation programs] on plans was modest. So too was the impact as reflected in zoning ordinance changes where the direction of change[5] was counter to that hypothesized by many land use specialists: a greater number of jurisdictions (for which we have usable data) *de-intensified* rather than intensified zoning along the corridor in the period of our study.

---

[2] As a matter of practice there may be some special situations which are particularly relevant to this study. We are informed that when Caltrans takes property for highway purposes, the affected jurisdiction does not change its zoning. Thus maps may reflect zone designations which are inconsistent with actual use. However, our understanding is that once taken land is returned to the jurisdiction, it would need to be planned and zoned consistently. The hypothesis we are investigating is that acreage returned near transit stations and interchanges would be intensified. Put more concretely: Area A may be residentially zoned prior to a Caltrans take. Once the land becomes that of the State through an eminent domain action, the zoning need not be changed. Sometime thereafter there will be a highway using some or all of this land; again, no zone changes are actually made nor required. Thereafter when excess land is returned to the jurisdiction, presumably before development would go forward that is not the same as the original entitlement [in our hypothetical for residential use], plan and zone changes would need to be undertaken.

[3] As laid out and justified in Chapter VI, the periods are: 0=pre 1968; 1= 1968-1981; 2=1981-1993; 3=1993-1994; 4=1995-.

[4] In Chapter VI we describe the method used for data collection for this aspect of the study; there, also, gaps in our data base are described.

In this chapter we also report a few plan impacts that go beyond the proposed research and are outside of the literature search summarized above. While not linked to the central issue of the land use transportation connection, the results may be of interest to transportation specialists in Caltrans and elsewhere. Throughout we supplement our policy document analysis with interview results.

[5] Here we mean change from earlier to later Period (which we hypothesize is attributable at least in part to the Century). We say "in part" because the correlation between evolution of the Century and land use policy changes may reflect a spurious relationship--with the influence on policy outcome actually resulting from other variables.

B. Policy Impacts: The General Plan[6]

1. General Across Jurisdictions: Broad Overview

Our most general conclusion is that the Century has had a fairly small impact on policy change in the corridor jurisdictions as reflected in the general plans. When effects *are* discussed, statements made are tentative and careful in many places--at times suggesting that policy makers are responding--in great part--in their plans to market forces rather than actively creating policies for uses around the corridor facilities. Although there is variation within the corridor jurisdictions, in general there is a sense of watchful waiting rather than an active orientation of attempting to direct change around the facilities. The most noted land use element impacts are on *general potential* for at least mid-term future development. Jurisdictions which gave considerable attention in their plans to the Century were LA County, Downey, Hawthorne, Lynwood, Norwalk and Paramount. Of the periods reviewed, impact was noted most frequently in Period 2.[7]

2. By General Plan Category Across Jurisdictions

a. Land Use

In ten jurisdictions the Century influenced or effected land use plan changes.[8] The county of Los Angeles, Paramount and Norwalk dedicated the most attention to the Century. Each of the ten jurisdictions noted impacts in time Period 2, while Paramount was the only city to discuss perceived impact in time Period 1.

We present our qualitative results by the type of land use category noted in the plans. There are seven: opportunities linked to the Green Line, effect on future development, pedestrian effects, mixed-use facilities, separation/stratification, open space/

---

[6] Where relevant in this section we also report changes described in other plans of the jurisdiction, such as specific plans or community plans--all of which in California must be consistent with the general plan.
[7] Often the "impact" was a statement of some change to be considered or made in the future, perhaps in some later Period.
[8] The City of Los Angeles, Southgate and Gardena [1974 plan] did not discuss Century Freeway impacts on land use. On Los Angeles see the comment in the text on the City's plans.

parks, and noise. We begin with a cluster of categories related to possible development opportunities or policies around the light rail and interchanges.[9]

i. Opportunities Provided by Rail Stations. Four jurisdictions discussed impacts of the rail and station development.[10] Each saw transit as a development opportunity.[11]

The County's policy document gives an example of the perceived impact:

> *The Century Freeway light rail transit station to be constructed at Vermont Avenue is expected to provide a unique opportunity for commercial development in West Athens/Westmont. To take advantage of this opportunity, the plan recommends that zoning in the station area be tailored to accommodate the development of clustered, pedestrian shopping malls designed for shopper convenience and safety.*

Interviews in the County added some detail on the nature of the policies sought:

> "...when we formulated the plan we made sure that we included things like to intensify land use around transit centers....It was a general policy that we said we were going to try to implement....at that time there was discussion about how to link the redevelopment area which had already been designated in the Willowbrook Community along Wilmington ...{and} we thought it was a whole idea of accessibility...shopping center as well as...transit."

County respondents noted that the policy changes were at least in part changes in design standards.[12] And they noted that, with very few exceptions, effects have been at

---

[9] We present our results in a qualitative/narrative manner. In Appendix 9 we present tables for each sub category of policy.

[10] Note also that in May, 1989, before its land use element was adopted El Segundo undertook a study entitled, "Analysis of Demand for Revenue Generating Land Use Supported by Light Rail Stations in the City of El Segundo." In the process of revising the General Plan, a process that took eight years, the pending completion of the Century was a major consideration.

[11] The Green Line's impacts were noted in other elements of some of the plans. The City of Inglewood (Period 2) concluded that the Green Line would "accommodate employees working in Inglewood and help meet trip reduction requirements for *intensifying development*" [emphasis added]. El Segundo's Circulation Plan (Period 2) anticipated the "corridor's ability to accommodate public transportation in the form of exclusive bus transit lanes or rail rapid transit." Bellflower in its Circulation Element noted that the "net effect of the diversion of traffic might be that *additional development potential* or improved traffic operations will be created along these roadways" [emphasis added].

[12] Interview 6 @ p. 3

the level of policy as opposed to what they view as the implementing steps of zone changes.[13]

Interviews with *City* of Los Angeles planners identified anticipation of change but not great confidence that it would take place in the short run. At the time of our interviews the general plan framework relating to land use and transportation was under revision.

[After our data collection the City released its "framework plan" which dedicates considerable and central attention to the land-use transportation connection.[14] Therein the framework for several relevant policies is articulated including for land use, housing, urban design, ridership, parking and circulation, equity, economic development, and community facilities elements.

> *The Policy provides general objectives and principles. During the implementation process, application of the Policy to individual properties and areas, including current and future Specific Plan areas, will allow for the achievement of these objectives and principles in the most appropriate manner for such properties and areas. The Policy should not be rigidly applied but must allow for flexibility in achieving its goals for guiding future development around transit station areas." (@ p. 3)....Among the objectives of the Land Use-Transportation Policy are to: •Focus future growth of the City around transit stations. •Increase land use intensity in transit station areas, where appropriate. •Create a pedestrian oriented environment in context of an enhanced urban environment. •Accommodate mixed commercial/residential use development. •Provide for places of employment. •Provide a wide variety of housing for a substantial portion of the projected citywide population. •Reduce reliance on the automobile. •Protect and preserve existing single family neighborhoods.*

---

[13] The exceptions include Westmont where the zoning was in fact changed--in conjunction with the adoption of a plan--from residential to commercial at a transit site [116th and Vermont]: "We're hoping this year to be formulating a transit district." Interview 6 @ p. 4

[14] See City of Los Angeles/Planning Department, Land Use/Transportation Policy for the City of Los Angeles & the Los Angeles County Metropolitan Transportation Authority *(Adopted by City Council, November 2, 1993, Council File No. 93-0478).*

The document proceeds to provide specific direction [in each of the areas enumerated above]: "the development guidelines for neighborhoods within a 1/2-mile distance of transit stations. These neighborhoods are defined by a Primary Influence Area of 1/4-mile radius from the transit station, and a Secondary Influence Area that serves as an area of transition and extends to a 1/2 -mile radius from the transit station." (@ p. 6) The document also provides "a set of six Transit Station Area Prototypes...devised to set the framework for the more detailed planning of transit station areas, each keyed conceptually to what might be accomplished when applied to a particular area served by subway, light rail or bus or a combination of all three. The six Prototypes establish a hierarchy of density ranging from a very dense urban area to a less dense, more suburban area." In Figure VII-I we present the Station Area Prototype for "Major Urban Center."]

Part of the intention of the framework plan is to set a policy for future entitlements, including potential changes in plan designations and zoning.[15]

[15] MTA funding was to be used for a pilot program to rezone properties within the station areas.

INSERT HERE Station Area Prototype for "Major Urban Center" from City of Los Angeles/Planning Department, Land Use/Transportation Policy for the City of Los Angeles & the Los Angeles County Metropolitan Transportation Authority

STATION AREA PROTOTYPE
MAJOR URBAN CENTER

1/4 Mile Radius	Residential	Commercial	Mixed Commercial Residential	Other Uses
Minimum Desirable Density[1]	80 du/acre		80 du/acre	
Maximum Permitted Density[2]	100 du/acre		100 du/acre	
Discretionary Density[3]	100 du plus		100 du plus	
Minimum Desirable FAR[1]		6:1	6:1	6:1
Maximum Permitted FAR[2]		13:1	13:1	13:1
Discretionary FAR[3]		13 plus	13 plus	13 plus
Minimum Parking[4]	phased	phased	shared	phased
Maximum Parking[4]	phased	phased	shared	phased
Minimum Sidewalk Width	20 feet; 20 feet plus in immediate transit station area			

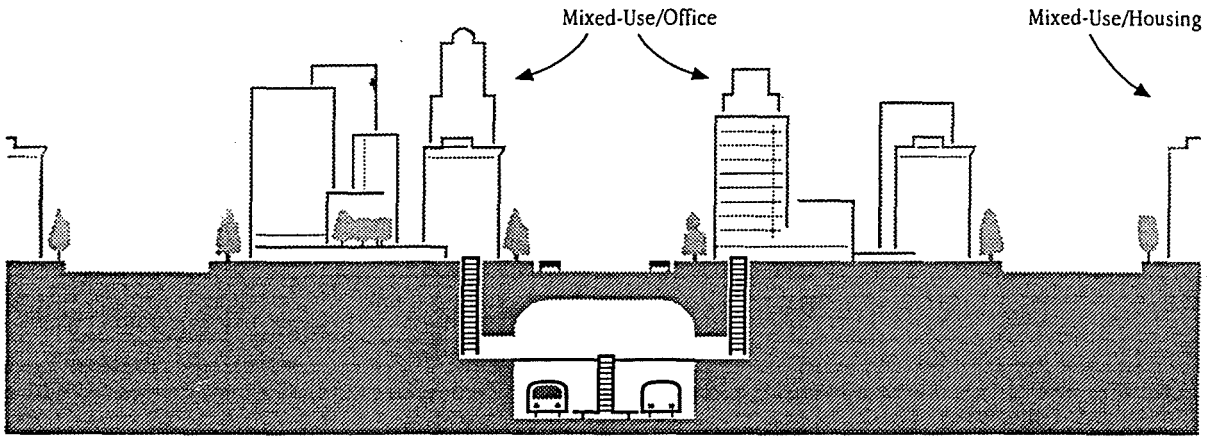
NOTES:

1 To qualify for Additional Incentives, projects must meet this threshold

2 Permitted as of right.

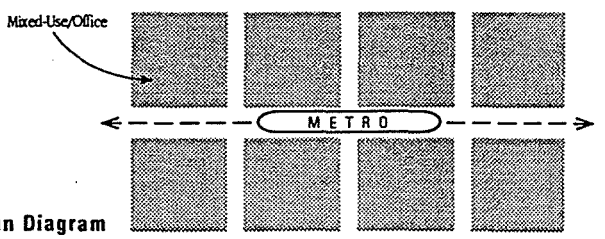
3 Determined by discretionary review, in consideration of local neighborhood circumstances, as well as public benefits provided by developer, such as dedication of green open space, childcare facilities. Also in consideration of amount of affordable housing provided.

4 Parking subject to a phased reduction from the citywide standards as the transportation system is constructed and opens for operation.



Section Diagram

Station Area Prototype matrix applies to the Primary Influence Area (1/4 mile). A Secondary Influence Area is an area of transition (1/2 mile). The 1/4 mile radius may be adjusted according to land uses, topography, etc. Minimum sidewalk width anticipates pedestrian crowding due to bus/rail queuing, and retail activity.



Plan Diagram

City interviewees felt that there might be change in the longer run, that beyond ten years the possibility exists that the economic climate for intensification will be more propitious. Then, too, according to the respondents, there may be a greater appreciation of transit. Once the Green Line is operational, retail users may see there is the potential for market enhancement related to foot and passenger traffic around stations. Possibly there will also be an interest in having housing near rail.

ii. Mixed Use Facilities. Two jurisdictions specifically discussed the potential for mixed use facilities in relation to the Century Freeway and the rail stations. LA County's policy document gives an example of the perceived impact:

> *...encourage the development of mixed-use facilities, particularly near the light rail station.*

In the *interviews* county respondents noted that a promoted concept was to mix senior citizen housing with mixed uses near transit stations. "That was located within 500 feet of the light rail stations, realizing that mixes well with shopping and transportation facilities. So the zoning was changed to increase the density and, in fact, encourage senior citizen housing in that particular block."[16]

iii. Pedestrian Influence. Two other jurisdictions noted possible land use changes to facilitate the perceived increase in pedestrian traffic and to provide a support network with the Green Line.

Downey's policy document gives an example of the perceived impact:

> *Consider the installation of sidewalks to and from the new Green Line station on Lakewood Boulevard, to Imperial Highway and Rosecrans, which are served by scheduled bus lines.*

[16] Interview 6 @ p. 6.

Here again there were reservations, a kind of reality test in some jurisdictions: As one respondent in Gardena noted:

> "...it is something that is very gray--pedestrian oriented development. What is it? It's really more the reverse--not development that...discourages pedestrians--is really what pedestrian friendly is. So we work very closely with the developers and applicants to make sure that to the extent possible they have incorporated all transit and pedestrian-friendly layouts and amenities. But that's about it in terms of mandates. We don't mandate that development be that way, mainly because we don't know that we are the experts at it anyway."

In addition, in our interview Paramount officials recognized municipal activities which could enhance the effects of the Green Line:

> "We spearheaded an effort with Bellflower and Downey to fund an additional $150,000 to the Green Line to improve the aesthetics of the station."

Although the city recognized the limitations on its ability to influence development in this sphere, it also recognized its potential:

> "You can't control what happens on private property as much. We can through our code enforcement officer who is very active, but it takes a long period of time to enact those changes--set back changes or zoning or color design... But you can immediately impact the public perception, And you can do that on the sidewalks, the set-backs, street furniture. You have to put in street medians anyhow...so we've had a real aggressive landscaping campaign."

iv. Effect on Future Development . Six jurisdictions reported opportunities for future development of areas associated with implementation of the Century project. In Period 1 Paramount's policy was one of high hopes for development of a community scale shopping center. The pivotal function of the freeway was noted there:

> *....the potential service population for a community shopping center in Paramount, located north of the*

proposed Century Freeway between Paramount and Downey...This center is dependent on freeway access for competitive advantage, and other locations in Paramount would not provide adequate market to support such a center.

Hawthorne's policy document also gives an example of the perceived impact:

Areas adjacent to the Century Freeway (I-105) and San Diego Freeway and San Diego Freeway (I-5)/Rosecrans Avenue offer significant development for land uses requiring accessibility and visibility. Such uses include major retail goods and services involving comparison purchasing decisions.

Interviews reinforced this orientation:

"In 1989 we amended our general plan. The document took on a new designation for land use which was commercial mixed use. And that designation occurs along freeway corridors. And the intent of that was the mixed use designation for residential and commercial...that it would foster vertical zoning rather than horizontal zoning and that you would have commercial and residential uses occupying the same space. And taking the intensity up to a point where the people could utilize the light rail or transportation systems. That was a major change in the thinking at that time."

But the constraints on development were noted. An aborted project was described in Hawthorne. The project would have included condominiums built over retail, office buildings and all-suite hotels:

"Probably somewhere around 300 to 500 million dollars worth of development. Commitments were made, eminent domain started to move forward. And as it went forward, the economics of the project began to deteriorate, so the bank stopped funding up capital.

Q. So how far did the project go?

> A. To litigation...developer against the city, the city against the developer, the bank against developer, city/developer against the bank...all trying to sort who is at fault...

Officials in other cities also recognized constraints. A respondent in Gardena concluded:

> "I just don't see that there's a natural need for it, in terms of land use at this point--partially because of the economy, but partially because it runs through mainly residential areas that are pretty much built out. So you are really talking about major efforts that will involve relocating again. They relocated all those people to put the freeway there and now there's very little opportunity for meaningful development in there unless they do some more moving."[17]

And elsewhere in the same interview: "housing in the northern areas is quite sound and it is very low density [with some...along the major street, multi residential]. But they are pretty sound up there and I would say there would be tremendous opposition to intensify."

Perhaps most telling are observations of planners in Los Angeles County: We present the summary at length because it so succinctly summarizes the relevant situation:

> "So the developers are not beating down our door, unfortunately, to build in this area. Most of the building that has gone on out there has been through public agencies--heavily subsidized or through the public agency itself...I just did some assessed valuations of a quarter-mile radius and did an analysis of how many permits had been pulled in the last five years, just within a quarter mile radius of the Blue Line Stations. And nothing's happening...We wanted to get a sense of how much development is occurring along the Blue Line...in anticipation of congestion management...The one area we didn't have to worry about was the Blue Line because nothing was happening. The assessed evaluation for the permits, even, that came in was just so low it's silly...I drove around the Green Line Station and the Blue Line Station just in the last couple of months and just physically--you can see that not much--no new development is occurring.

---

[17] The respondent said elsewhere: "although most planners are very supportive of mixed use, the decision makers are not. Because the constituents that elect them are very very wary of mixed use development. They say, 'Fine, have high density around the transit, but don't put that near me'....it is still a very...low density mentality in Southern California. The people that are here have it and I don't think they are going to change. They don't want to be San Francisco. They want to be L.A., whatever that is."

> Q. One of the things I'm concerned about is that people look at our study and say, 'That's interesting, but it is so much driven by the economic downturn.' And you can't generalize past the economic downturn or to other areas. Do you have any comments on that?
>
> A. I would say the economic downturn started in '90--we're talking the last 3 or 4 years. You could go back in that community 15 to 20 years and the numbers would stay the same. If you looked at permit activity, if you looked at assessed evaluation of the property. You just are not going to find--at least, I've been dealing with that area [Green Line and Blue Line] since the late '70s and I would say not much has changed."[18]

Spatial influences of the Century were also noted elsewhere in the plans. Two jurisdictions expressed concern over the possible *separation and stratification* of the jurisdiction caused by the Century Freeway/ Transitway. Both jurisdictions' policy documents give an example of the perceived impact:

> *Insure the balanced development of land uses north and south of the Century Freeway to reduce the risk of stratified City image and to mitigate the potential negative impacts of the freeway--Lynwood*
> *The Century Freeway will intersect the area just below the college. It will form a physical barrier which can diminish the sense of community cohesion and reduce pedestrian activity.--LA County*

As well two jurisdictions addressed the possibility of acquiring excess land for *open space or parks* from Caltrans when the Century Freeway is completed. The plans were based on the belief that small pockets of condemned land not used for the facility could be made available to the jurisdictions.[19]

---

[18]Six jurisdictions addressed the economic development influence of the Century. Five of these six mentioned the growth of business resulting from the Century. See appendix under economic development policy influences. Interviewees in Inglewood described the potential negative effect on development of the depressing of the freeway: If you "can see as you are approaching [a development] you say 'Oh, we have to get off.' You can't do that here. By the time you realize there is a K-Mart, you have already passed it."

[19]Both jurisdictions' policy documents give an example of the perceived impact. We cite the Lynwood case:

2. Circulation

In eleven jurisdictions the Century was linked to circulation element changes [traffic congestion improvement, traffic congestion generated by the Century, travel patterns, accessibility, access to LAX, public transportation, buffering and future effects].[20] Downey, El Segundo, Inglewood, Norwalk and Paramount dedicated the most consideration to the Century in their circulation elements. Every jurisdiction reporting effects presented some positive impact on circulation resulting from the operation of the Century including in cases with specific reference to the Green line as a means of transport. The main effects were to be on traffic congestion and access to Los Angeles International Airport [LAX]. Five noted that the Century would also increase traffic levels in other parts of their communities, particularly in the north-south arterials. The influences were not appreciably different by time period. As with most of the other general plan elements, Lynwood's policy documents reflected the least positive assessment of the influence of the Century.

> *Century Freeway Construction and Housing Demolitions- Some of the land cleared for the Century Freeway may become excess available for new development. As construction nears completion, the city will gain a more definite picture of what, if any, land will be left available. Any such areas, because of their proximity to the freeway and possibly unusual configurations, will probably not be appropriate for residential development. However, creative, practical, and desirable solutions can result in usable public space, pocket parks, or other beneficial opportunities. At the same time, the freeway can create opportunities for new commercial and light industrial uses.*

For the sake of completeness in summarizing perceived impacts of the Century we include the *Noise and Land use* category although it does not fall within our analysis of hypothesized impacts. One city, Inglewood, addressed the possible effects of noise pollution created by the Century Freeway in the General Plan section on land use. In time Period 2 the city adopted a policy of a zone change from residential to industrial/commercial because of this predicted impact:

> *As the construction of the Century Freeway along the City's northern boundary progresses, the highly noise impacted area between Century and 104th which is west of Crenshaw should be recycled from its present residential uses to more appropriate industrial/commercial offices uses.*

Other cities concerned with noise impacts were Lynwood, Norwalk and Paramount--each in Period 2.

[20] LA City and South Gate did not discuss Century Freeway impacts on circulation in the materials made available to us.

The type of impact on traffic patterns is illustrated in the details provided by El Segundo and Bellflower: El Segundo noted that the on-ramp locations would create an imbalance of traffic on local streets and recommended that those streets be converted to one-way couplets. Bellflower was concerned that the absence of an on-ramp near its historical district would diminish the perceived value of the area. Five cities discussed issues of accessibility, although each differed in terms of what should become more accessible. Inglewood provides an example:

> *A network of freeways (the San Diego, Santa Monica, Harbor, and in 1993, the Century) provides easy access between Inglewood and all major commercial/office centers in the greater LA area.*

On a specific question of accessibility seven cities projected favorable effects from increased access to the Los Angeles Airport.[21] And six cities discussed *public transportation* and gave recommendations concerning the effect of the freeway and the Green Line on modes of transportation throughout the city. El Segundo, in particular, discussed this area focusing on bike and pedestrian lanes to the Green Line stations and an alteration in truck routes.

Norwalk provides a lesson on opportunities:

> *The I-105/I-605 Node is proposed to be used for a large "Park-N-Ride" facility. Although sound walls are being constructed to buffer impacts to the residences, the parking facility and traffic may adversely impact existing neighborhoods. As planned, the facility does not utilize the property to its fullest potential. Its unique location is ideally suited for a mixed-use development which can benefit from both convenient public transportation and freeway access.* Period 2 (p.4.15).

---

[21]Inglewood provides an example:

> *The Century Freeway will be constructed, further enhancing the City's location vis-a-vis the airport as it related to industrial and commercial office development.*

And elsewhere in the sections on recommendations:

> *As modes of transportation shift and new market demands emerge, development will benefit from proximity to public transportation centers. These centers create ideal opportunities for mixed-use development composed of transit oriented uses, support retail and perhaps residential. Development of this property has the potential of revitalizing adjacent areas. Existing residences can be linked with a mixed-use center to create a distinctive urban village. This center can also provide parking and other amenities for commuters using the new Green Line Station.* Period 2 (p. 4.16).[22]

El Segundo exhorts:

> *To ensure that the Metro Green Line is integrated into the City's circulation system, and City activities in general, consideration of the rail line should be incorporated into all aspects of City planning activities and the development review process.*[23]

C. Policy Impacts: Zoning

We next present policy impacts as reflected in zoning intensification and deintensification. Legally this could be seen as a trivial exercise in California because

---

[22] The preliminary nature of some of the planning associated with the Century Freeway, even in Period 3, is suggested by the Implementation Program in the 1993 Norwalk General Plan: "Begin discussions with State officials and the MTA regarding the parking lot site and how the City, the MTA, and the State may work together toward the reuse of the site; Form an advisory committee composed of City staff and interested parties to assist in the development of alternative land uses; Change zoning to conform with Public Facilities land use designation of the General Plan; Conduct a planning and urban design study to examine alternative site developments. (P. 4. 16-4.17)

[23] For sake of completeness: four cities discussed issues of buffering and noise abatement policies, Although this category is not considered part of circulation, the noise abatement policies were located in the same sections of the plans as many of the references to circulation.

Lynwood is particularly interested in the issue and provides an example:

> *Century Freeway construction is disrupting the internal physical and circulation continuity of Lynwood. The creation of a new major freeway through a well-established, densely built community can result in land use incompatibilities or residences too close to the freeway to avoid its accompanying noise, odors, and air pollution.*

Finally three cities notes that *future surveys and reports* were to be done in order to evaluate the impact of the Century freeway on circulation.

zoning must be consistent with the general plan. But no guarantee exists in practice of compliance with the consistency requirement. Furthermore, the general plan influences we have described are quite general and some may be implemented with different zoning designations. Moreover, the level of detail reflected in zoning is greater than that of the general plan giving another picture of the influence of the Century facilities on land use policy.

Viewed in total, the direction of land use policy change as reflected in the zoning is counter to the direction hypothesized and predicted in much of the literature. However, we present these results with caution: we were unable to obtain necessary data for some of the affected cities. Furthermore, as we point out in the Tables which follow, some of our conclusions about overall direction of change are sensitive to classifications of acreage which could not be determined in this study. Finally, our results reflect decisions regarding definitions of intensification as outlined in Chapter VI.

The zoning designation changes which occurred in four cities, Paramount, Inglewood, El Segundo and Bellflower are characterized by de-intensification in terms of vehicle-trip generating land uses. Two cities, Lynwood and Hawthorne, showed an intensification of vehicle-trip generating zoning designations. Paramount pursued a high density residential development policy until its citizens somewhat reversed direction through a ballot box measure. South Gate showed no land use designation changes. Table VII-1 displays our overall results. Components of this summary follow in Table VII-2 - VII-12.

Table VII-1: Intensification Summary

Zoning Changes Within One Mile of Century Freeway/Transitway					
City	**Acres Intensified**	**Acres De-Intensified**	**Can Not determine**	**Estimated Acreage of City within Study Area**	**Overall Direction**
Bellflower	7.37	12.58	0.80	1177	D
El Segundo	162.77	348.76	294.91	2303	D[24]
Hawthorne	88.28	3.21	72.87	1812	I
Inglewood	7.38	51.44	0	1110	D
Lynwood	7.92	1.99	6.11	2777	I[25]
Paramount	6.58	56.05	24.81	1446	D
South Gate	0	0	0	380	---
TOTAL	**280.30**	**474.03**	**399.50**	**11,005**	

TABLE VII-2: City of Bellflower: Zoning Changes Within One Mile of the Century Freeway/Transitway. (Time 1=1977 [L.U. Map], Time 2=1984)

ZONING CHANGES	ACREAGE OF CHANGE	% OF TOTAL CHANGE	
R1 to R2	0.80	2.49	dk
R1 to R3	2.66	8.27	i
R1 to CG/CGPD	1.8	5.60	i
R1 to CN	1.37	4.26	i
R1 to M1	0.44	1.37	d
R1 to A1	8.63	26.83	d
C/R/P to R1	0.45	1.4	d
C/R/P to R3/R3PD	3.06	9.51	d
OS to R3	1.54	4.79	i
TOTAL CHANGE	20.75	100.02%	

SUMMARY: 7.37 acres intensified (35.51%)
12.58 acres de-intensified (60.62%)
0.80 acres don't know (3.85%)

[24]If 63% or more of the acres of zoning changes in the category "cannot determine" for El Segundo were changed to the "intensification" classification, then the overall direction of change for El Segundo would be considered intensification.

[25]If 97% or more of the acres of zoning changes in the category "cannot determine" for Lynwood were changed to the "de-intensification" classification, then the overall direction of change for Lynwood would be considered de-intensification.

TABLE VII-3: Definition of Zoning Designations and Corresponding Trip Rates for City of Bellflower

	Zone	Definition[26]	Estimated Trip Rate
T1	R1: Low Density Residential	1 d.u./5000sf~= *8.71 d.u./acre*	9.87 trips/d.u. *85.97 trips/acre*[27]
	C/R/P: Commercial/ Retail/Professional		*264 trips/acre*
T2	R1: Single Family Residential	1 d.u./5000sf~= *8.71 d.u./acre*	9.87 trips/d.u. *85.97 trips/acre*
	R2: Two Family Residential	1 d.u./3350sf~= *13 d.u./acre*	6.88 trips/d.u. *89.44 trips/acre*
	R3/R3PD: Multi-Family/M.F. Planned Develop.	1 d.u./1980sf~= *22 d.u./acre*	4.86 trips/d.u. *106.92trips/acre*
	CN: Neighborhood Business	35' max height 15000sf min lot	*264 trips/acre*
	CG/ CGPD: General Commercial/ G.C. Planned Develop.	1 parking/300sf retail 1 parking/200sf office 15,000sf min lot	*264 trips/acre*
	M1: Light Industry	12 stories or 150' max height	51.80 trips/acre

[26] The zoning definitions were obtained during a phone conversation with Mr. Bing Hyun, a city planner, on 1/23/95.

[27] The ITE Trip Generation Manual reports 31.37 trips/acre for single family residential land uses. For this analysis, however, trips/acre for residential land uses is calculated using trips/dwelling unit (from the ITE Trip Generation Manual) and dwelling units/acre (obtained for each residential land use from the City of Bellflower).

TABLE VII-4: City of El Segundo: Zoning Changes Within One Mile of the Century Freeway/Transitway. (Time 2=1993, Time 3=1994)

ZONING CHANGES	ACREAGE OF CHANGE	% OF TOTAL CHANGE
C2 to R3	2.55	0.32 d
C3 to CO	106.2	13.17 d
CM to M1	206.06	25.55 d
CM to CRS	1.05	0.13 dk
CM to CO	33.95	4.21 d
CM to MU	141.17	17.51 dk
CM to PF	104.50	12.96 dk
M1 to MU	54.84	6.80 i
M1 to CO	2.98	0.37 i
M2 to MU	66.45	8.24 i
M2 to CO	38.5	4.77 i
M2 to PF	42.95	5.33 dk
PF to R1	0.39	0.05 dk
PF to PRD	4.85	0.60 dk
TOTAL CHANGE	806.44	100.01%

SUMMARY: 162.77 acres intensified (20.18%)
348.76 acres de-intensified (43.24%)
294.91 acres don't know (36.56%)

Table VII-5: Definition of Zoning Designations and CorrespondingTrip Rates for City of El Segundo.

	Zone	Definition[28]	Trip Rate
T2	C2: General Commercial	FAR 1.5 min lot 5000 sf	*264 trips/acre*
	C3: Special Comm District	FAR 2.0 min lot 10,000sf	*264 trips/acre*
	CM: Comm-Manuf	FAR 1.0 min lot 10,000sf	*264 trips/acre*
	M1: Light Manufacturing[29]	FAR 0.6 min lot 10,000sf	51.80 trips/acre
	M2: Heavy Manuf	FAR 1.0 min lot 20,000sf	*36.2 trips/acre*
	PF: Public Facility	height dependent on abutting properties	*17.1 trips/1000sf GFA*[30]
T3	R1: Residential	1 d.u./5000sf~= *8.71 d.u./acre*	9.87 trips/d.u. *85.97 trips/acre*[31]
	R3: Multi-Family Residential	1 d.u./1613-2420sf~= *18-27 d.u./acre*	4.86 trips/d.u. *87.48-131.22 trips/acre*
	PRD: Planned Residential Devel	1 d.u./2420-3000sf~= *14.5-18 d.u./acre*	7.44 trips/d.u. *108.2-133.9 trips/acre*
	CRS: Downtown Commercial	FAR 1.0 min lot 5000sf	*264 trips/acre*
	CO: Corporate Office	FAR 0.8 min lot 10,000sf	68.04 trips/acre
	M1: Light Manufacturing	FAR 0.6 min lot 10,000sf	51.80 trips/acre
	MU: Urban Mixed Use	FAR 1.3 min lot 10,000sf (no residential)	*264 trips/acre*
	PF: Public Facility	height dependent on abutting properties	17.1 trips/1000sf GFA

[28] Two zoning codes were used, the Subdivision and Zoning Code (1993) and a prior code.

[29] No definition was found in the previous code. The zoning definition from the current code was used.

[30] Gross Floor Area

[31] The ITE Trip Generation Manual reports 31.37 trips/acre for single family residential land uses. For this analysis, however, trips/acre for residential land uses is calculated using trips/dwelling unit (from the ITE Trip Generation Manual) and dwelling units/acre (obtained for each residential land use from the City of El Segundo).

TABLE VII-6: City of Hawthorne: Zoning Changes Within One Mile of the Century Freeway.
(Time 1=1981, Time 2=1990 [LU MAP])

ZONING CHANGES	ACREAGE OF CHANGE	% OF TOTAL CHANGE
R1 to C1	1.05	0.64 i
R2 to C1	2.14	1.30 i
R1 to PF	13.54	8.24 dk
R2 to F-MU	9.25	5.63 i
R2 to PF	5.14	3.13 dk
R1 to OS	1.82	1.11 d
R3 to C1	16.29	9.91 i
R3 to OS	0.40	0.24 d
R3 to PF	3.63	2.21 dk
R3 to F-MU	33.39	20.32 i
R4 to C1	2.06	1.25 i
R4 to F-MU	6.71	4.08 i
CM to F-MU	28.41	17.29 dk
C2 to R3	0.76	0.46 d
C2 to R4	0.23	0.14 d
C2 to PF	7.32	4.45 dk
C2 to F-MU	14.83	9.02 dk
M1 to R3	0.33	0.20 i
M1 to C1	13.50	8.21 i
M1 to F-MU	3.56	2.17 i
TOTAL CHANGE	164.36	100.00%

SUMMARY: 88.28 acres intensified (53.71%)
3.21 acres de-intensified (1.95%)
72.87 acres don't know (44.33%)

Table VII-7: Definition of Zoning Designations and Corresponding Trip Rates for City of Hawthorne

	Zone	Definition[32]	Trip Rate
T1	R1: Low Density Residential	1 d.u./5000sf~= *8.71 d.u./acre*	9.87 trips/d.u. *85.97 trips/acre*[33]
	R2: Medium Density Residential	1 d.u./3500sf~= *12.45 d.u./acre*	6.88 trips/d.u. *85.63 trips/acre*
	R3: Medium Density Residential	1 d.u./2500sf~= *17.42 d.u./acre*	4.86 trips/d.u. *84.66 trips/acre*
	R4: High Density Residential	1 d.u./2500sf~= *17.42 d.u./acre*	4.86 trips/d.u. *84.66 trips/acre*
	CM: Comm-Manuf	FAR 3.0	*264 trips/acre*
	C2: General Commercial	FAR 4.0	*264 trips/acre*
	M1: Limited Industrial	FAR 2.0	51.80 trips/acre
T2	R3: High Density Residential	1 d.u./2500sf~= *17.42 d.u./acre*	4.86 trips/d.u. *84.66 trips/acre*
	R4: Maximum Density Residential	1 d.u./2500sf~= *17.42 d.u./acre*	4.86 trips/d.u. *84.66 trips/acre*
	C1: General Commercial	FAR[34] 3.5	*264 trips/acre*
	F-MU: Freeway Comm/Mixed Use	commercial: FAR 3.5 residential: 1 du/2500sf	*264 trips/acre*
	PF: Public Facility	no definition	17 trips/1000sf GFA[35]

[32] Zoning definitions were obtained from the City of Hawthorne Zoning Ordinances (revised 1994). The same definitions were used for both Time 1 and Time 2.

[33] The ITE Trip Generation Manual reports 31.37 trips/acre for single family residential land uses. For this analysis, however, trips/acre for residential land uses is calculated using trips/dwelling unit (from the ITE Trip Generation Manual) and dwelling units/acre (obtained for each residential land use from the City of Hawthorne).

[34] Floor Area Ratio

[35] Gross Floor Area

TABLE VII-8: City of Inglewood: Zoning Changes Within One Mile of the Century Freeway/Transitway. (Time 0=1967, Time 2=1990)

ZONING CHANGES	ACREAGE OF CHANGE	% OF TOTAL CHANGE
R2 to CS	1.30	2.21 i
R1 to MIL	3.70	6.29 d
R3 to MIL	21.79 (+54.18 @1.25 miles)	37.01 d
C2 to R1	0.5	0.85 d
C2 to MIL	25.18	42.77 d
C2 to OS	0.27	0.46 d
M1 to C2A	1.97	3.35 i
P1 to CS	0.54	0.92 i
P1 to MIL	3.57	6.06 i
TOTAL CHANGE	58.82	99.92% (round off error)

SUMMARY: 7.38 acres intensified (12.55%)
51.44 acres de-intensified (87.45%)

Table VII-9: Definition of Zoning Designations and Corresponding Trip Rates for City of Inglewood

	Zone	Definition[36]	Estimated Trip Rate
T0	R1: One Family Residential	1 d.u./6000sf ~= *7.26 d.u./acre*	9.87 trips/d.u. *71.66 trips/acre*[37]
	R2: Limited Multi Family	1 d.u./2500sf ~= *17.42 d.u./acre*	6.88 trips/d.u. *119.85 trips/acre*
	R3: Multi Family	1 d.u./1100-1400sf~= *31.1-39.6 d.u./acre*	4.86 trips/d.u. *151.2-192.5 trips/acre*
	C2: General Commercial	6 stories or 75' max height	*264 trips/acre*
	M1: Light Manuf	6 stories or 75' max height	51.80 trips/acre
	P1: Parking		
T2	R1: One Family	1 d.u./6000sf~= *7.26 d.u./acre*	9.87 trips/d.u. *71.66 trips/acre*
	CS: Commercial Service	6 stories or 75' max height	*264 trips/acre*
	C2A: Airport Commercial	6 stories or 75' max height	*264 trips/acre*
	M1L: Limited Manufacturing	200' max height min lot 15K-60K sf	51.80 trips/acre

[36] The 1994 Zoning Code was used to define zones in both time periods.

[37] The ITE Trip Generation Manual reports 31.37 trips/acre for single family residential land uses. For this analysis, however, trips/acre for residential land uses is calculated using trips/dwelling unit (from the ITE Trip Generation Manual) and dwelling units/acre (obtained for each residential land use from the City of Inglewood).

Table VII-10: City of Lynwood: Zoning Changes Within One Mile of the Century Freeway/Transitway. (Time 2=1984, Time 3=1994)

ZONING CHANGES	ACREAGE OF CHANGE	% OF TOTAL CHANGE
R1 to R3	2.84	17.95 i
R2 to R3	2.40	15.17 dk
R3 to R2	2.02	12.77 dk
R3 to CB1	1.69	10.68 i
R3 to C2	0.23	1.45 i
CB1 to R3	0.99	6.26 d
C2 to R3	0.32	2.02 d
CF to P1	0.48	3.03 d
CF to R2	1.69	10.68 dk
M1 to R1	3.16	19.97 i
TOTAL CHANGE	15.82	99.98% (round off error)

SUMMARY: 7.92 acres intensified (50.06%)
1.99 acres de-intensified (12.57%)
6.11 acres don't know (38.62%)

Table VII-11: Definition of Zoning Designations and Corresponding Trip Rates for City of Lynwood

	Zone	Definition[38]	Estimated Trip Rate
T2	R1: Single Family Residential	7 d.u./ acre	9.87 trips/d.u. *69.09 trips/acre*[39]
	R2: Two Family Residential	14 d.u./acre	6.88 trips/d.u. *96.32 trips/acre*
	R3: Multi Family Residential	18 d.u./acre	4.86 trips/d.u. *87.48 trips/acre*
	CB1: Controlled Business	75' max height	*264 trips/acre*
	C2: Light Commercial	75' max height	*264 trips/acre*
	CF: Community Facility		
	M1: Manufacturing	75' max height	51.80 trips/acre
T3	R1: Single Family Residential	7 d.u./ acre	9.87 trips/d.u. *69.09 trips/acre*
	R2: Two Family Residential	14 d.u./acre	6.88 trips/d.u. *96.32 trips/acre*
	R3: Multi Family Residential	18 d.u./acre	4.86 trips/d.u. *87.48 trips/acre*
	CB1: Controlled Business	75' max height	*264 trips/acre*
	C2: Light Commercial	75' max height	*264 trips/acre*
	P1: Parking		

[38] The zoning definitions were obtained during a phone conversation with Mr. Omorouyi, a Lynwood city planner, on 1/30/95. Mr. Omorouyi also explained how the City of Lynwood views the trip generating characteristics of specific zoning designations. This information was used in determining whether a zoning designation change should be considered as intensification or de-intensification.

[39] The ITE Trip Generation Manual reports 31.37 trips/acre for single family residential land uses. For this analysis, however, trips/acre for residential land uses is calculated using trips/dwelling unit (from the ITE Trip Generation Manual) and dwelling units/acre (obtained for each residential land use from the City of Lynwood).

TABLE VII-12: City of Paramount: Zoning Changes Within One Mile of the Century Freeway/Transitway. (Time 0=1964, Time 2=1988)

ZONING CHANGES	ACREAGE OF CHANGE	% OF TOTAL CHANGE
R1 to CM	1.33	1.52 i
R3 to HDR	2.69	3.08 i
R3 to PD-PS	4.17	4.77 dk
R4 to RM	21.62	24.73 d
CM to MDR	2.65	3.03 d
CM to HDR	12.39	14.17 d
CM to PD-PS	1.79	2.05 dk
CM to M1	19.39	22.18 d
M1 to MDR	1.60	1.83 i
M1 to C3	0.09	0.10 i
M1 to PD-PS	13.76	15.74 dk
M2 to PD-PS	5.09	5.82 dk
Vacant to PD-PS	0.87	0.99 i
TOTAL CHANGE	87.44	100.01% (round off error)

SUMMARY: 6.58 acres intensified (7.52%)
56.05 acres de-intensified (64.10%)
24.81 acres don't know (28.37%).

Paramount: Intensification in a Specific Case and a Policy Shift. Through the interviews we identified several residential projects linked to the Century. Paramount noted five, four of which were "higher density." There the city provided developers with incentives to build higher quality higher density housing. The program was aggressive:

> "So we looked at the multifamily areas and what we did is to provide developers the incentive to come in and do the high quality complexes that we were looking at. We provided density bonuses or zoning incentives. And we've allowed, in these areas along the Century Freeway, to be built up to somewhere in the neighborhood of 60 units per acre for multifamily--whether it's apartments or whether it's condomin- iums or townhomes. So we bought these things, rezoned them, and gave them these specific plan elements so that we could sell them to developers to be built at these densities."

However, in Paramount in 1989, voters passed an initiative limiting densities of residential developments throughout the city. Other than as provided by state inclusionary

mandates and for senior citizen complexes, the maximum density in Paramount is now 22 units per acre. Paramount's very aggressive development policies have, at least partially, confronted an attitude which prevails in many of the corridor cities: "Single families are very blessed in this community. Single families can go anywhere--any single family tract is just blessed." (Interview)

Table VII-13:Definition of Zoning Designations and Corresponding Trip Rates for City of Paramount

	Zone	Definition[40]	Trip Rate
T0	R1: One-family Residential	1 d.u./5000sf *8.71 d.u./acre*	9.87 trips/d.u. *85.99 d.u./acre*[41]
	R3: Limited Multi Residential	45 d.u./acre	4.86 trips/d.u. *218.70 trips/acre*
	R4: Unlimited Multi Residential	70 d.u./acre	4.86 trips/d.u. *340.2 trips/acre*
	CM: Comm-Manuf	FAR[42] 2.0	*264 trips/acre*
	M1: Light Manuf	FAR 4.0	51.80 trips/acre
	M2: Heavy Manuf	FAR 4.0	36.2 trips/acre
T2	RM: Residential Multiple	22 d.u./acre	4.86 trips/d.u. *106.92 trips/acre*
	MDR: Medium Density Residential	45 d.u./acre	4.86 trips/d.u. *218.7 trips/acre*
	HDR: High Density Residential	70 d.u./acre	4.86 trips/d.u. *340.2 trips/acre*
	PD-PS: Planned Develop with Performance Standards	(development specific)	
	CM: Comm-Manuf	FAR 2.0	*264 trips/acre*
	C3: General Commercial	FAR 2.0	*264 trips/acre*
	M1: Light Manuf	FAR 4.0	51.80 trips/acre

[40] The zoning definitions were obtained during a phone conversation with Mark Galvin, a city planner, on 1/31/95.

[41] The ITE Trip Generation Manual reports 31.37 trips/acre for single family residential land uses. For this analysis, however, trips/acre for residential land uses is calculated using trips/dwelling unit (from the ITE Trip Generation Manual) and dwelling units/acre (obtained for each residential land use from the City of Paramount).

[42] Floor Area Ratio

City of South Gate (Time 1 = 1961 Time 2 = 1990 [Land Use])

Only a small portion of the City of South Gate is within one mile of the Century Freeway/Transitway. This small portion of South Gate had no major zoning changes that could be identified in the comparison of the 1961 zoning map and the 1990 Land Use Policy Map. Changes may have occurred that could not be detected given the lack of detail on the land use policy map.[43] In other parts of the city outside of the one mile study boundary, zoning changes did occur, especially along several arterials leading to the Century Freeway/Transitway. These arterials include Long Beach Boulevard, South Street, Atlantic Avenue, and Garfield Avenue. Parcels along each of these arterials changed zoning designation to a new mixed use designation.

[43]Our interview confirmed this finding. Interviewees described a missed opportunity for development and intensification potential in the failure to locate an "off ramp/on ramp...at the Alameda Corridor." Lynwood, Compton, and South Gate had agreed that this would be a beneficial project.

Chapter VIII: Conclusions[1]

Fundamentally, what is added to our knowledge of the relationship between new transportation systems and land use change and transportation behavior based on this study of the Century Freeway/Transitway [I-105]? We present several conclusions in this section: they cumulate to an overall judgment that the system has had modest effects on both outcomes of interest, some of which impacts are economically quite significant. Further, we conclude that to move beyond these modest impacts would require substantial additional public sector involvement.

In Context: a case study at an early point in time.

Our study is based on a rich set of data collected from two surveys and travel diaries in a panel study, interviews with the leading planning officials in the affected corridor, and analysis of all available general plan and zoning documentation of jurisdictions affected by the Century Freeway/Transitway. Yet in presenting our results and reaching some general conclusions we must offer also some caveats.

1. The panel underrepresented certain potential user groups including people who might be most assisted by the new transit alternative.

2. Attitudes and behaviors were investigated just before and only a short time after the opening of two elements of the Century system and before the opening of the Green Line. Some may view this as too early to tap actual changes which the Century will ultimately foster. [One 1993 General Plan, for example, reported "beginning discussions with State officials and the MTA regarding ...how...[they] may work together toward reuse of the site; forming an advisory committee...to assist in the development of alternative land uses" (emphasis added)]. We need to also keep in mind that the transit element was an add-on to the Century system so the time lag phenomenon may be

[1] In this section we do not repeat results quantitatively but give only overall qualitative results to elaborate the general conclusions of the study.

particularly relevant in the present case. Others may view the time frame as biasing in another understanding: the area the system traverses may still be recovering from severe counter-development impacts of the extremely long planning period and of a massively intrusive condemnation program. The latter removed thousands of structures and families from an already urban areas. [As put by one responding jurisdiction: "The Century.....will form a physical barrier which can diminish the sense of community and reduce pedestrian activity."] Results then may not generalize to the mid range future when a.] potential users are more familiar with the Century system and b.] local governments and developers have been convinced that this is a fully operating transportation system in a now potentially stable, centrally located part of one of the world's largest economic regions.

3. The influence of "missing data" must be remembered: General plan and zoning documentation was not accessible for all of the jurisdictions (and there are reasonable alternative means of analyzing and interpreting the intensification data which we did collect).

Other results and conclusions must await the opening of one of the three major elements of the system which has been postponed until mid 1995: the Green Line. Proponents of light rail continue to contend that its benefits are significant and that the introduction of rail systems can assist in solving a variety of urban problems. We have some data on intended use of the Green Line but actual use figures await further study and the routinization and stabilization of the operation of the system.

Nonetheless, based on multiple sources of information, we can conclude that the system has modestly but significantly affected transportation behavior and that it has had localized modest impacts on land use change. Our results are consistent with those of the leading recent generation of transportation scholars who have investigated areas already served by an advanced transportation network.

IA. TO THIS POINT THE CENTURY SYSTEM HAS FOSTERED A MODEST CHANGE IN TRANSPORTATION BEHAVIOR BUT ONE WITH SUBSTANTIAL

ECONOMIC IMPLICATIONS.

With mixed use and car pool lanes operational, the system is associated with a statistically significant travel time decrease for work trips for Century Freeway users. Economists and other analysts [cognizant of the results of earlier studies about the relationships among driving times to work, real estate values and work force productivity and efficiency] may well conclude that improvements in travel time multiplied over the huge Los Angeles population which regularly commutes to work have major economic implications. We leave to them the quantification that may be useful in further public policy analysis.

The opening of the Century Freeway may have decreased travel time to work for all freeway users because of the alleviation of traffic on those roads Century Freeway users previously used. Some commuters have changed their route to work; some have changed their shopping location; and some now carpool because of the existence of the Freeway. Future analysis may benefit from socio economic characterization of those who derive the most value from the system.

IB. ALTHOUGH IN GENERAL THE RESPONDING PUBLIC SUPPORTS INVESTMENT IN PUBLIC TRANSPORTATION, ONLY SMALL PERCENTAGES OF PEOPLE USE AND ENJOY USING PUBLIC TRANSIT AND A RELATIVELY SMALL PERCENTAGE INTENDS TO USE THE NEW TRANSIT SYSTEM WHEN IT IS OPERATIONAL.

That conclusion does not mean that people are not favorable to transportation system development: A substantial majority of respondents was supportive of building of the Century Freeway and very few people now living in the corridor were opposed. Furthermore, most respondents agreed that all three modes of the Century Freeway/Transitway system will improve regional and local traffic [with more agreeing that it will influence regional traffic]. And considerable majorities thought that public investment in mass transit is important and agree that high density development near transit

stops for retail and business centers is a good idea. Perhaps people recognize a potential public good for others and are even willing to support its development but are themselves satisfied with the "typical" Southern California development and their own commuting patterns. To be sure, there is evidence that those patterns are not as aversive as the popular non Californian perception would have: Southern Californians experience generally stable commuting times of about 26 minutes.

IC. SEVERAL FACTORS ARE ASSOCIATED WITH MODEST EXPECTATIONS FOR USE OF THE SYSTEM.

Among the most important were a.] that the system will not serve the areas where potential users need to go and b.] a non trivial concern about crime on the system. Age and ethnicity are also factors associated with future use of the transit system as are income and proximity to other parts of the Los Angles rail system. Presumably, also, the needs of many potential users of the Century system elements are met by alternatives which are generally satisfactory.

What policies and programs would promote even greater changes in transportation behavior and specifically greater use of each element of the system?

Potential users seek in any transportation system: one that is not dangerous; that is not subject to crime; that is predictable; that does not add either to their time or cost of travel; and that is directed to places which the traveler wishes to go. Some of these variables are now beyond public policy influence for the Century system; others [e.g., safety and cost] are subject to intervention although perhaps with considerable costs and further subsidies. Certainly also government can attempt to influence land use patterns so that people will intend to go places at the nodes of the system. That leads to our next conclusion.

II. GOVERNMENT PROMOTION [THROUGH POLICY CHANGES] OF INTENSIFICATION OF LAND USE AROUND SYSTEM NODES HAS BEEN MODEST. THIS PATTERN REFLECTS RELATIVELY LITTLE INTEREST AMONG

CORRIDOR RESIDENTS IN THE INTENSIFICATION OF LAND USES NEAR INTERCHANGES AND TRANSIT STOPS.

Few jurisdictions have incorporated the Century transportation facility in their planning as a major opportunity for increased economic activity and land development. Fewer still have gone a further step in changing zoning to promote more intensive land uses around the system's nodes. This limited response may be a function in part of the pre-existing developed patterns of the affected jurisdictions. This explanation is consistent with a literature that concludes that accessibility levels in most metropolitan areas are so high that no amount of transportation investment could affect them enough to influence land use changes. In other words in the current urban environment it is difficult to change marginal accessibility levels and travel costs enough so that land use patterns shift to take advantage of increased transportation benefits.

However, that factor cannot explain fully the response in our case: major swatches of land were cleared for and around the corridor and made potentially available for alternative uses.

What policies and programs would promote in the mid term mixed use development which does not counter the residential interests of the affected communities?

Perhaps greater coordination among the policies of MTA, Caltrans and local governments can lead to further shifts in development incentives which meet the needs of the local jurisdictions, both of maintaining residential values and of regional and statewide transportation improvements.

Local conditions necessary but not necessarily sufficient include: economic upturn regionally; and a commitment by local government through policies in addition to those normally associated with zoning changes: reduced parking requirements; public contributions of capital or land; tax increment financing; and design standards which are friendly to the Los Angeles pedestrian.

Nonetheless, expectations should remain modest, not wholly because of the

economic conditions in the region and its immense size/impact area [even our small study area, a minuscule percentage of the Southern California market covers almost 120 square miles] but also because of a more positive factor: the standards of the suburb are known and generally satisfying. ["Single families can go anywhere (in this community)--any single family tract is just blessed."]

Also, the social and economic conditions of the corridor may not be conducive to intensification. Relative to other zip code areas the areas bordering the Century Freeway have larger percentages of people living below the poverty level, more male unemployment, more men not in the labor force, more high school dropouts, more families with a female head of household, more households receiving welfare, and less valuable homes. These conditions may make the stimulation of new development opportunities even more challenging. This speculation is consistent with findings of prior research that "depending on the quality of the area, freeways can either help mitigate or cause blight...in certain areas, not promote economic development." Where the results are opposite and more positive "comprehensive planning incorporating freeway development is a strategy that allows for the preservation of the social structure", stimulates urban renewal, attracts industry and recreational facilities.

References

Adkins, W. (1959) Land value impacts of Expressways in Dallas, Houston and San Antonio, Texas. *Highway Research Board Bulletin* **277**. Washington, D.C. pp.51-65.

Ajzen, I. and Fishbein, M. (1980) *Understanding Attitudes and Predicting Social Behavior.* Prentice-Hall, Inc., New Jersey.

Alcaly, R. (1976) Transportation and urban land values: a review of the theoretical literature. *Land Economics* **52**(1), 42-53.

Alexis, M. and Ditomaso, N. (Spring, 1983) Transportation, race and employment: In pursuit of the elusive triad. *Journal of Urban Affairs* **5**(2), 81-94.

Alihan, M. A. (1938) *Social Ecology: A Critical Analysis.* Columbia University Press, New York.

Allen, J. P. and Turner, E. (April 1993) Ethnic distribution patterns in Los Angeles, 1980 and 1990. Presented to the Association of American Geographers, April 1993, Atlanta.

Anderson, F.R., and Daniels, R.H. Problems of Transition: Projects and Programs in Progress When NEPA was Enacted. *NEPA in the Courts.* Environmental Law Institute. 142-178.

Anderson, F.R.; Mandelker, D.R.; and Tarlock, A.D. (1984) *Environmental Protection: Law and Policy.* Little, Brown and Company, Boston.

Appleyard, Donald (1979) Evaluating the social and environmental impacts of transport investments. Behavioural Travel Modelling, David A. Hensher and Peter Stopher (Eds.), (England: Croom Helm Ltd.) 797-814.

Armstrong, K. (1972) Litigating the Freeway Revolt: Keith v. Volpe. *Ecology Law Quarterly* **2**, 761-799.

Ashley, R., Berard, W. (1965) Interchange development along 180 miles of I-94. *Highway Research Record* **96**, 46-58.

Atkins, S.T. (1990) Personal security as a transport issue: a state of the art review. *Transport Reviews* **10**, 111-125.

Babcock, W., and Khasnabis, S. (1973) A study of land development and traffic generation on controlled-access highways in North Carolina. *Highway Research Record* **467**, 34-37.

Baerwald, T. (1982) Land use change in suburban clusters and corridors.*Transportation Research Record*, **861**, 7-12.

Baumbach, R.O., and Borah, W.E. (1981) *The Second Battle of New Orleans: A History of the Vieux Carre Riverfront Expressway Controversy.* University of Alabama Press, University, Alabama.

Benson, D. E., and Mahoney, M.J. Jr. (1972) Data requirements in transportation planning for urban disadvantaged. *Highway Research Record* **403**, 35-48.

Bone, A., and Wohl, W. (1959) Massachuchetts Route 128 impact study. Bulletin 227, Highway Research Board, Washington, D.C. pp.21-49.

Boston Redevelopment Agency (1972) *Statement on BTPR Southwest Corridor Report.*

_____ (1974) *Boston's Transportation Program.*

Burgess, E. W. (1925) The growth of the city: An introduction to a research project, Chapter II in *The City* (Edited by E. W. Burgess, R. D. McKenzie, and R. E. Park), University of Chicago Press, Chicago.

Burkhardt, J.E. (1971) Impact of highways on urban neighborhoods: A model of social change. *Highway Research Record* **356**, 85-94.

Burton, R., and Knapp, F. (1965) Socio-economic change in vicinity of Capital Beltway in Virginia. *Highway Research Record*, **75**, 32-47.

Cervero, R. (1984) Light rail transit and urban development. *J. of the American Planning Association* **50**(2), 133-147.

_____ (1986) Intrametropolitan trends in sunbelt and western cities: transportation implications. *Transportation Research Record* **1067**, 20-27.

_____ (Spring, 1984) Light rail transit and urban development. *Journal of the American Planning Association* **50**, 133-147.

Cline, M. G. (1963) Urban freeways and social structure- some problems and proposals. *Highway Research Record* **2**, 12-20.

Comptroller General of the United States (1978) *Costs and Problems of Completing the Interstate System.*

Congressional Budget Office (1982) *The Interstate Highway System: Issues and Options.*

Connally, J., and Meiburg, C. (1968) The Washington Capital Beltway and its impact on industrial and multi-family expansion in Virginia. *Highway Research Record* **217**, 9-27.

Corsi, T. (1974) A multivariate analysis of land use change: Ohio turnpike interchanges. *Land Economics* **50**(3), 232-241.

Cosby, P., and Buffington, J. (1978) Land use impact of widening East 29th Street in a developed residential area in Byran, Texas. Research Report 225-5. Texas Transportation Institute, Texas A&M University. State Department of Highways and Public Transportation, Austin, Texas.

Cribbins, D., Hill, W., and Seagraves, H. (1975) Economic impact of selected sections of interstate routes on land value and use. *Highway Research Record* **75**, 1-31.

Czamanski, S. (1966) Effects of public investment on urban land values. *AIP Journal* **32**, (4), 204-217.

Dansereau, H. K. (1965) Five years of highway research: A sociological perspective. *Highway Research Record* **75**, 76-82.

Dansereau, H. K., Frey, J. C., and Pashek, R. D. (July, 1963) Highway Development: Community attitudes and organization. *Highway Research Record* **16**, 44-59.

de Boer, E. (1986) Transport Sociology. *Transport Sociology*, Pergamon Press, Oxford, Great Britain.

DiMento, J. Baker, J., Detlefsen, R., van Hengel, D., Hestermann, D., and Nordenstam, B.J. (1991) *Court Intervention, the Consent Decree, and the Century Freeway.* Public Policy Research Organization, UC Irvine.

DiMento, J. F. Nordenstam, B., Hestermann, D., and van Hengel, D. (1992) *Regional Projects/Local Concerns: Urban Freeways, Citizen Participation and Community.* Public Policy Research Organization, UC Irvine.

Downs, A. (1992) *Stuck in Traffic.* The Brookings Institution, Washington, D.C.

Durkheim, E. (1893) *The Division of Labor in Society.* As translated by G. Simpson in 1933, Free Press, New York.

Dyett, M. (1977) BART impact program: station area land use. Series Title: Metropolitan Transportation Commission. U.S. Department of Transportation: Springfield, Virginia.

_____ (1981) The land use and urban development impacts of beltways: an annotated bibliography. Public Administration Series: Bibliography Number P-809. Vance Bibliographies. Monticello, Illinois.

Dyett, M., et al (1978) BART impact program: land use and urban development impacts of BART. Final Report; Number DOT-B1P-FR-14-5-78. Series Title: Metropolitan Transportation Commission. U.S. Department of Transportation: Springfield, Virginia.

Ellis, R.H. (1968) Toward measurement of the community consequences of urban freeways. *Highway Research Record* **229**.

Emerson, N. (1980) The Century Freeway Corridor Project: The Interstate System in Transition. Paper presented at the 59th Annual Meeting of the Transportation Research Board.

Epps, J. (1974) Interchange development patterns on interchange highways in South Carolina. *Transportation Research Record* **508**, 23-36.

Eriksen, E.G. (1950) The Superhighway and City Planning: Some Ecological Considerations with Reference to Los Angeles. *Social Forces* **28**, 429-434.

Eyerly, R. (1966) Land use and land value in four interchange communities. Institute for Research on Land and Water Resources, Research Report Number 7. Pennsylvania State University.

Fajans, M., et al. (1978) BART impact program: study of development patterns. Series Title: Metropolitan Transportation Commission. U.S. Department of Transportation: Springfield, Virginia.

Falcke, C. (1978) BART impact program: BART's effects on property prices and rents. Series Title: Metropolitan Transportation Commission. U.S. Department of Transportation: Springfield, Virginia.

_____ (1978) BART impact program: study of property acquisition and occupancy, BART's effect on speculation. Series Title: Metropolitan Transportation Commission. U.S. Department of Transportation: Springfield, Virginia.

Falcocchio, J.C., Pignataro, L.J., and Cantilli, E.J. (1972) Modal choices and travel attributes of inner city poor. *Highway Research Record* **403**, 6-17.

Fellman, G. (1969) Neighborhood protest of an urban highway. *Journal of the American Planning Association* **35**, 118-122.

Fellman, G., Brandt, B., Rosenblatt, R. (September, 1970) Dagger in the Heart of Town Mass. Planners and Cambridge Workers. *Trans-Action* **7**, 38-47.

Flannelly, Kevin J., McLeod, Malcolm S. Jr. (1989) A multivariate analysis of socioeconomic and attitudinal factors predicting commuters' mode of travel. *Bulletin of the Psychonomic Society* **27**, 64-66.

Frankland, B. (1965) Land-use control at freeway interchanges in California. *Traffic Quarterly* **19** (4), 541-555.

Gamble, H., Raphael, D., Sauerlender, O. (1966) Direct and indirect economic impacts of highway interchange development. *Highway Research Record* **149**, 42-55.

Gamble, H., Sauerlender, O. (1974) Adverse and beneficial effects of highways on residential property values. *Transportation Research Record* **508**, 37-48.

Gamble, H.B., Davinroy, T.B. (1978) *Beneficial effects associated with freeway construction: Environmental, social and economic.* National Cooperative Highway Research Program Report 193, Transportation Research Board, National Research Council, Washington, D.C.

Gannon, C., Dear, M. (1975) Rapid transit and office development. *Traffic Quarterly* **29**, (2), 223-242.

Gans, Herbert J. (1990) Deconstructing the underclass: The term's dangers as a planning concept. *Journal of the American Planning Association* **56**(3), 271-277.

General Accounting Office (1988) *Highway Contracting: Assessing Fraud and Abuse in FHWA's Disadvantaged Business Enterprise System.*

Giuliano, G. (1986) Land use impacts of transportation investments: highway and transit. *The Geography of Urban Transportation*, Chapter 11. Hanson, S. (ed.). Guilford Press: New York, N.Y.

_____ (1989) New directions for understanding transportation and land use. *Environment and Planning A* **21**, 145-159.

_____ (October, 1989) *Literature synthesis: Transportation and urban form.* Federal Highway Administration, U.S. Department of Transportation Contract DTFH61-89-P-00531.

Golden, J. (1968) Land values in Chicago: before and after expressway construction. Chicago Transportation Area Study.

Golob, T. F. and Nicolaidis, G.C. (August, 1976) Comparison of segmentation for modelling consumers' preferences for transportation modes. Research Publication GMR-2209, General Motors Research Laboratories, Warren, MI.

Gómez-Ibáñez, J.A. and Roberts (1985) The Westside Highway Proposal (Abridged) Kennedy School of Government, Cambridge, MA.

Gordon, P., Kumar, A. and Richardson, H. W. (June, 1989) The spatial mismatch hypothesis: Some new evidence. *Urban Studies* **26**, 315-326.

Gordon, P., Richardson, H.W., and Jun, M. (Autumn, 1991) The commuting paradox: Evidence from the Top Twenty. *Journal of the American Planning Association* **57**(4), 416-420.

Gordon, P., Richardson, H.W., Wong, H.L. (1986) The distribution of population and employment in a polycentric city: the case of Los Angeles. *Environment and Planning A* **18**, 161-173.

Grossman, D.A., Levin, M.R. (1963) Area development and highway transportation. *Highway Research Record* **16**, 24-31.

Gruen Associates (1970) *Interstate (Century) 105 Freeway Design Team Concepts.*

Hamilton, H.R. (1988) Identification and ranking of environmental impacts associated with the United States Interstate Highway system. *Transportation Research Record* **1166**, 1-8.

Hensher, D.A. and McLeod, P.B. (1977) Towards an integrated approach to the identification and evaluation of the transport determinants of travel choices. *Transportation Research* **11**, 77-93.

Hensher, D.A., McLeod, P.B. and Stanley, J.K. (1975b) Usefulness of attitudinal measures in investigating the choice of travel mode. *International Journal of Transportation Economics II* **2**(1), 51-75.

Herr, P.B. (1962) The timing of highway impact. *Traffic Quarterly*, 279-288.

Hestermann, D., DiMento, J. F., van Hengel, D., and Nordenstam, B.J. (1993) Impacts of a Consent Decree on The Last Urban Freeway : Interstate 105 in Los Angeles County. *Transportation Research-A* **27A**(4), 299-313.

Hill, S. (1968) Century Freeway (Watts) Joint Development and Multiple Use of Transportation Rights-of-Way, *Special Report 104*, Highway Research Board, Washington, D.C.

_____ (June, 1967) The Effect of Freeways on Neighborhoods. Right of Way Research and Development, Division of Highways, Department of Public Works, Transportation Agency, State of California.

Hodge, D. (1981) Modeling the geographic component of mass transit subsidies. *Environment and Planning A* **13**, 581-599.

_____ (1986) Social impacts of urban transportation decisions: Equity Issues. Chapter 13 in *The Geography of Transportation*, (Edited by Susan Hanson), Guilford Press, New York.

Horowitz, A. D. (January, 1978) *A cognitive dissonance approach to attitudinal modeling in travel behavior research.* General Motors Research Laboratories, Warren, MI.

Horowitz, A., ed. (1984) Land-use impacts of highway projects. Proceedings of the Wisconsin Symposium on Land-Use Impacts of Highway Projects. Wisconsin Department of Transportation. Milwaukee, Wisconsin.

Hughes, M. A. (1990) Formation of the impacted ghetto: Evidence from large metropolitan areas, 1970-1980. *Urban Geography* **11**(3), 265-284.

Hughes, M. A., Madden, J. F. (1991) Residential segregation and the economic status of Black Workers: New evidence from an old debate. *Journal of Urban Economics* **29**, 28-49.

Humphrey, C. R., Krout, J. A. (October, 1975) Traffic and the suburban highway neighbor. *Traffic Quarterly* **29**(4), 593-613.

Jones, D. W. (1985) *Urban Transit Policy: An Economic and Political History.* Prentice-Hall, Inc., Englewood Cliffs, N.J.

Jones, D. W. *(1989) California's Freeway Era in Historical Perspective.* Caltrans/ITS Berkeley.

Jones, D.W., and Kinaga, P.A. (1977) *Caltrans 1977: The Road to Transition is Paved with Uncertainty.* Caltrans/ITS Berkeley.

Jones, P. M. (1992) Some recent methodological developments in our understanding of travel behaviour. *IATSS Research* **16**(2), 18-29.

Jones, P.H. (1990) *Changing Transportation and Environmental Regulations and their Efects on the Planning Process.* Unpublished Honor's Thesis, University of California, Irvine.

Kain, J. F. (May 1968) Residential segregation, Negro unemployment, and metropolitan decentralization. *Quarterly Journal of Economics* **82**(2), 175-197.

_____ (Spring, 1990) Deception in Dallas, Strategic misrepresentation in rail transit promotion and evaluation. *Journal of the American Planning Association* **56**(2), 184-196.

Kasarda, J. D. (1990) Structural factors affecting the location and timing of urban underclass growth. *Urban Geography* **11**(3), 234-264.

_____ (January 1989) Urban industrial transition and the underclass. *Annals of the American Academy of Political and Social Science* **501**, 26-47.

Kelley, B. (1971) *The Pavers and the Paved.* Donald W. Brown, Inc., New York.

Kemp, B. (1965) Social impact of a highway on an urban community. *Highway Research Record* **75**, 92-102.

Khasnabis, S. (1976) Impact of a beltway on a medium-sized urban area in North Carolina: a case study. *Transportation Research Record*, **583**, 71-77.

_____ (1977) Analysis of freeway impact in five urban areas in North Carolina. *Transportation Research Record* **638**, 26-32.

Kiley, E. (1965) Highway as a factor in industrial location. *Highway Research Record*, **75**, 48-61.

Kitamura, R. (1990) Panel analysis in transportation planning: An overview. *Transportation Research A* **24A**(6), 401-415.

Knight, R.,Trygg, L. (1977) Evidence of land use impacts of rapid transit systems. *Transportation* **6**, 231-247.

Knox, P. L. (1994) *Urbanization: An Introduction to Urban Geography.* Prentice Hall, Englewood Cliffs, N.J.

Langley, C. (1976) Adverse impacts of the Washington Beltway on residential property values. *Land Economics* **52**, (1), 54-65.

_____ (1976) Time-series effects of a limited-access highwy on residential property values.*Transportation Research Record* **583**, 36-43.

Lave, C. A. (1991) Measuring the decline in transit productivity in the U.S. *Transportation Planning and Technology* **15**, 115-124.

_____ (Spring, 1981) Dealing with the transit deficit. *Journal of Contemporary Studies* **4**(2), 53-60.

Leavitt, H. (1970) *Superhighway-Superhoax.* Doubleday & Company, Inc., Garden City, N.Y.

Lee, D., Yujnovsky, O. (1971) Transportation and land use: research design for the analysis of BART impacts. Working Paper No. 148/BART 2. Institute of Urban and Regional Development. University of California, Berkeley. Berkeley, California.

Levin, D. R. (1965) Informal notes on sociological effects of highways. *Highway Research Record* **75**.

Levitan, D. (1976) Massachusetts Route 128: a nonemulative enigma. *Transportation Research Record* **583**, 45-54.

Lowe, I. (November, 1992) *Social and environmental impacts of road transport.* 16th Conference Proceedings- Part I Australian Road Research Board Limited.

Marcuse, P. (1989) 'Dual city': a muddy metaphor for a quartered city. *International Journal of Urban and Regional Research* **13**(4), 697-708.

McGough, B. (1968) Methodology for highway impact studies. *The Appraisal Journal* **36**, (1), 65-72.

McKenzie, R.D. (1925) The ecological approach to the study of the human community. Chapter III, in *The City* (Edited by E. W. Burgess, R. D. McKenzie, and R. E. Park) University of Chicago Press, Chicago.

McLean, E.L., and Adkins, W.G. (1971) Freeway effects on residential mobility in metropolitan neighborhoods. *Highway Research Record* **356**.

Meyer, J.R. and Gómez-Ibáñez, J.A. (1981) *Autos Transit and Cities A Twentieth Century Fund Report.* Harvard University Press, Cambridge, Massachusetts.

Mierzejewski, E.A. and Ball, W.L. (1990) New findings on factors related to transit use. *ITE Journal*, 34-39.

Mohring, H. (1961) Land values and the measurement of highway benefits. *Journal of Political Economy* **79**, 236-249.

Moon, H. (1987) Interstate highway interchanges as instigators of nonmetropolitan development.*Transportation Research Record* **1125**, 8-14.

Mowbray, A.Q. (1969) *Road to Ruin.* J. B. Lippincott Company, Philadelphia and New York.

Mulligan, P., Horowitz, A. (1986) Expert panel method of forecasting land use impacts of highway projects. *Transportation Research Record* **1079**, 9-15.

Mullins, J. A. III, Washington, E. J. and Stokes, R. (1989) Land use impacts of the Houston transitway system, *Transportation Research Record* **1237**.

Mumford, L. (1956) *The Highway and the City.* Harcourt, Brace & World, New York.

Myers, D. (1992) *Analysis with Local Census Data Portraits of Change*. Academic Press, Inc., San Diego, CA.

Nevey, A. J., Koppelman, F. S., and Stopher, P. R. (August, 1978) *Perceptions of comfort, convenience and reliability for the work trip*. Planning Research Unit, New York State Department of Transportation.

Orski, C.K. (1990) Can management of transportation demand help solve our growing traffic congestion and air pollution problems? *Transportation Quarterly* **44**(4), 438-498.

Owen, W. (1966) *The Metropolitan Transportation Problem*. The Brookings Institution, Washington, D.C.

Park, R. E. (1915) The ecological approach to the study of human community. Reprinted from the *American Journal of Sociology* **20**(1), in *The City* (Edited by E. W. Burgess, R. D. McKenzie, and R. E.), University of Chicago Press, Chicago.

Payne-Maxie Consultants, Blayney-Dyett Urban and Regional Planners (1980) The land use and urban development impacts of beltways. Final Report, DOT-OS-90079, U.S. Department of Housing and Urban Development.

Pendleton, W. (1961) Land use at freeway interchanges. *Traffic Quarterly* **15**(4), 535-546.

_____ (1963) Relation of highway accesssibilty to urban real estate values. *Highway Research Record* **16**, 14-23.

_____ (1965) An empirical study of changes in land use at freeway interchanges. *Traffic Quarterly* **19**(1), 89-100.

Pickrell, D. H. (Spring 1992) A desire named streetcar; Fantasy and fact in rail transit and planning. *Journal of the American Planning Association* **58**(2), 158-176.

Pisarski, A.E. (1992) *Travel Behavior Issues in the 90's*. Based on data from the 1990 National Personal Transportation Survey for the Office of Highway Management. HPM-40, U.S.D.O.T.

Politano, A. (1980) Urban blight and highways in central cities: Theoretical and practical perspectives. *Transportation Research Board* **747**, 63-66.

Politano, A., and Mills, F. (1980) Reducing urban blight: A reconnaissance of current highway experiences. *Transportation Research Record* **747**, 49-54.

Pucher, J. (Autumn, 1988) Urban travel behavior as the outcome of public policy: the example of modal-split in Western Europe and North America. *Journal of the American Planning Association* **54**, 509-520.

Pucher, J., Hendrickson, C. and McNeil, S. (July, 1981) Socioeconomic characteristics of transit riders: Some recent evidence. *Traffic Quarterly* **35**(3), 461-483.

Recker, W.W. and Stevens, R.F. (1977) An attitudinal travel demand model for non-work trips of homogeneously constrained segments of a population. *Transportation Research* **11**, 167-176.

Ricketts, E. R. and Sawhill, I. V. (1988) Defining and measuring the underclass. *Journal of Policy Analysis and Management* **7**(2), 316-325.

Rose, M. H. and Seely, B. E. (1990) Getting the Interstate System Built: Road Engineers and the Implementation of Public Policy, 1955-1985. *Journal of Policy History* **2**(1), 23-55.

Rosener, J. B. (1975) *The Caltrans Public Participation Project: An Evaluation and Recommendations.* Graduate School of Management, UC-Irvine.

Rossmy, M.J. and Brown, S.A. (1989) Congestion Management in New York City: Managing why people drive. *Transportation Research Record 1237, 10-17.*

Sawhill, R.B. (1966) Freeways and residential neighborhoods. *Highway Research Record* **149**, 57.

Schwartz, G.T.(1976) Urban Freeways and the Interstate System. *Southern California Law Review* **49**, 406-513.

Seely, B.E. (1987) *Building the American Highway System: Engineers as Policy Makers.* Temple University Press, Philadelphia.

State of California, Department of Transportation (1989) *The State Highway Program.*

_____ (1990a) *History of the Glenn M. Anderson (Century) Freeway/Transitway.*

_____ (1990b) *History of the I-105 Glenn Anderson (Century) Freeway-Transitway.*

State of California, Department of Transportation, Office of Management Analysis (1984) *Report on the Roles and Responsibilities for the Project Delivery of the Century Freeway Housing Program.*

State of California, Division of Highways (1966) *California's Freeway Planning Team.*

_____ (1967) *How Los Angeles was Unified by Freeways.*

_____ (1969) *Highways, Housing, and People.*

State of California, Division of Highways, District 7 (1966) *The Freeway Evolution--1965.* Annual Report of the California Division of Highways, District 7.

Stephanedes, Y., Eagle, D. (1987) Highway impacts on regional employment. *Journal of Advanced Transportation* **21**, 67-79.

Systems Design Concepts, Inc. (1970) *Study Design for a Balanced Transportation Development Program for the Boston Metropolitan Region.*

Taebel, D. A. and Cornehls, J. V. (1975) Ideological and policy perspectives of urban transportation. In *Transport Sociology: Social Aspects of Transport Planning*, (Edited by Enne de Boer), Pergamon Press, Oxford, 199-209.

Talbot, A.R. (1983) *Settling Things: Six Case Studies in Environmental Mediation.* The Conservation Foundation and the Ford Foundation, Washington, D.C.

Taylor, B. D. (1993) Why California stopped building freeways. *Access* **3.**

Taylor, B. D., and Ong, P. M. (1993) *Racial and ethnic variations in employment access: An examination of residential location and commuting in metropolitan areas.* University of California Transportation Center Working Paper No. 175.

Theil, F. (1965) Highway interchange area development. *Highway Research Record* **86,** 24-47.

_____ (1965) Seminar on sociological effects of highway transportation: Introductory remarks. *Highway Research Record* **75**, 75-76.

Tischer, M.L., and Phillips, R.V. (1979) The relationship between transportation perceptions and behavior over time. *Transportation* **8**,(1), 21-36.

Trombley, W. and Hebert, P. (December 27, 1987) First of a series of articles on the Century Freeway Project in the *Los Angeles Times.*

U.S. Department of Transportation, Federal Highway Administration (1972a) *Guide for Highway Impact Studies.* Washington, D.C.

_____ (1972b) *Economic and Social Effects of Highways Summary and Analysis.*

_____ (1978) *Final Environmental Impact Statement for the Proposed Routes 1 & I-105 (El Segundo-Norwalk) Freeway-Transitway.*

Ulberg, C. (1984) Perceptions of travel modes and measured travel behavior: Initial findings from the Puget Sound Transportation Panel.

van Hengel, D. (1994) Near its Path: Population and Housing Characteristics of the Century Freeway Corridor, An unpublished paper submitted in partial satisfaction of the Breadth Requirement in Social Ecology.

van Kempen, E. T. (1994) The dual city and the poor: Social polarisation, social segregations and life chances. *Urban Studies* **31**(7), 995-1015.

Vuchic, Vukan R. (September/October 1991) Recognizing the value of rail transit. *TR News* **156**, 13-19.

Wachs, M. (June, 1989) U.S. transit subsidy policy: In need of reform. *Science* **244**, 1545-1549.

_____ (May 1993) *Learning from Los Angeles: Transport, urban form, and air quality.* The Seventh Smeed Memorial lecture, presented at University College London (May 17, 1993).

_____ (May, 1991) Policy implications of recent behavioral research in Transportation Demand Management. *Journal of Planning Literature* 5(4).

Webber, M. M. (1977) The BART experience- what have we learned? *The Public Interest*, 79-106.

Wendt, P. (1957) Theory of urban land values. *Land Economics* 23(3), 228-240.

_____ (1960) Influences of transportation changes on urban land uses and values. *Highway Reseach Board Bulletin* **268.**

Wheeler, B. (1956) The effect of freeway access upon suburban real property values: a case study of the Seattle, Washington area. *Allocation of Road and Street Costs:Part V.* Washington State Council for Highway Research.

Wilson, W.J. (1987) *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*, The University of Chicago Press, Chicago.

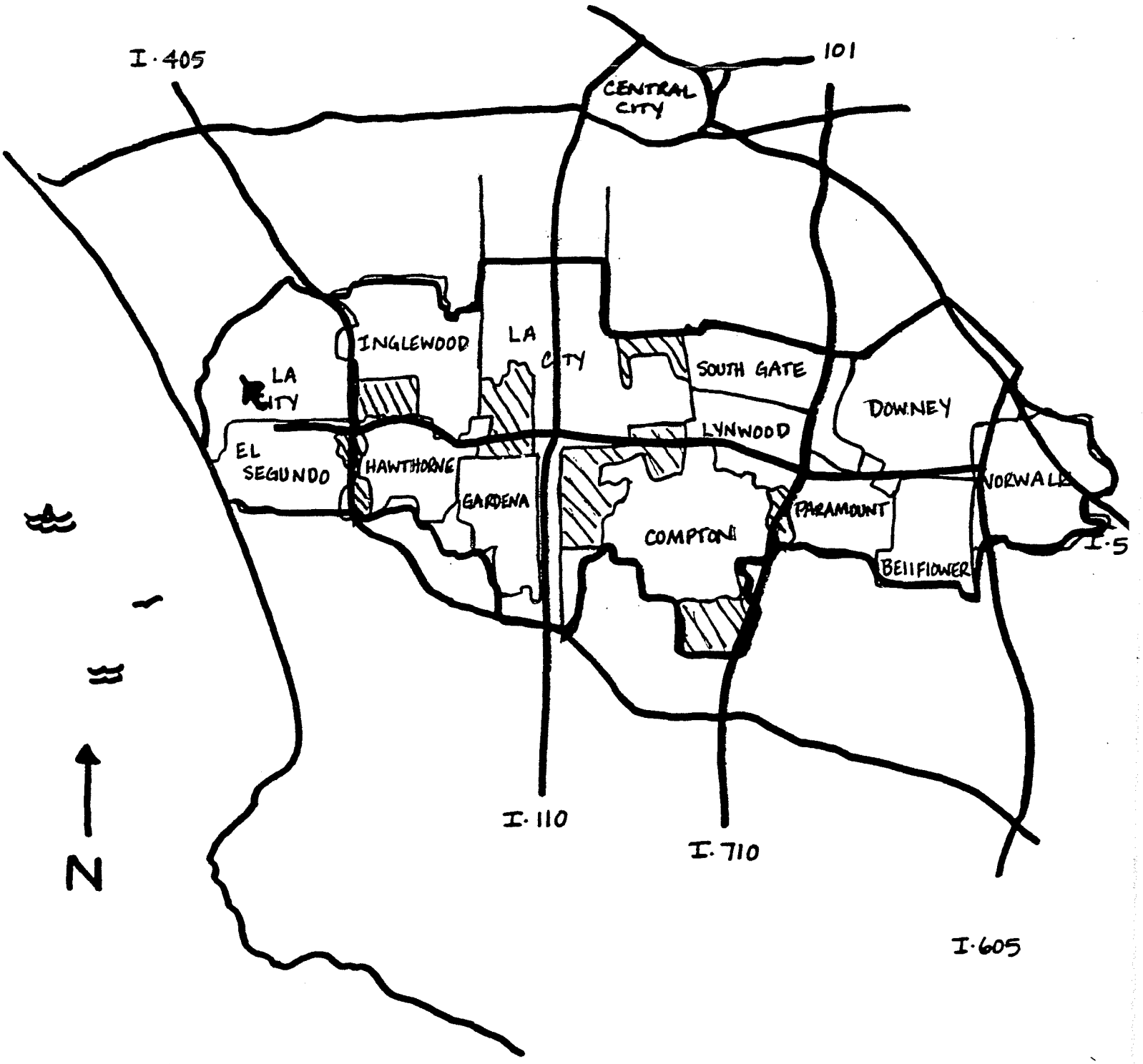
_____ (1991) Studying inner-city social dislocations: the challenge of public agenda research. *American Sociological Review* **56**, 1-14.

Wingo, L. Jr. (1964) *Transportation and Urban Land*, Resources for the Future, Inc., Baltimore, MD.

_____ (July, 1938) Urbanism as a way of life. *The American Journal of Sociology* **XLIV**.

Zamichow, N. (October 15, 1993) Century Freeway opening is a road rally. *Los Angeles Times.*

Appendix 1: Map of Study Area


I·405
101
CENTRAL CITY
INGLEWOOD
LA CITY
LA CITY
SOUTH GATE
DOWNEY
LYNWOOD
EL SEGUNDO
HAWTHORNE
GARDENA
COMPTON
PARAMOUNT
NORWALK
BELLFLOWER
I·5
I·110
I·710
I·605
N

= L.A. COUNTY

Appendix 2: Wave 1 Survey

UNIVERSITY OF CALIFORNIA, IRVINE

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO SANTA BARBARA • SANTA CRUZ

SCHOOL OF SOCIAL ECOLOGY IRVINE, CALIFORNIA 92717-5150

30 September, 1993

Dear Sir or Madam:

The Institute of Transportation Studies at the University of California, Irvine asks for your participation in a public opinion study of the Century Freeway scheduled to open soon. The survey should take only a short time to fill out and can be returned in the enclosed postage paid envelope. Please complete either the English or Spanish copy.

Part I of the survey is a questionnaire which we would like you to complete at your convenience. Part II is a Travel Diary in which you are to record any traveling you do during a day that is convenient for you. We ask that you return both sections before October 11th.

We are interested in your opinions about several parts of the roadway including the Green Line, a train which will run in the middle of the Freeway, and the carpool lanes.

Our research will help in understanding what people think about the freeway and how they plan to travel after the freeway and transitway are completed. All responses to the questions are confidential. We would appreciate receiving responses to all questions; however you do not have to answer any questions you do not like.

Thank you for your willingness to take part in this study. The success of it depends entirely upon the cooperation of people like you. As a small expression of our appreciation, everyone who returns both sections of the survey completed will be entered in a drawing for a cash award of $200.

Sincerely,

Joseph DiMento
Professor
Transportation and Land Use Project

PART I

PLEASE COMPLETE AND RETURN BY MONDAY OCTOBER 11TH!

THIS IS YOUR PERSONAL QUESTIONNAIRE

Thank you for participating in this important study for residents of Los Angeles County. Please fill out each section as COMPLETELY AS POSSIBLE! You'll only need a pencil or pen and a few minutes of quiet time.

THIS IS WHAT'S INSIDE:

In this booklet you will find questions about the Century Freeway and the Green Line which are being constructed near your home. We are interested in your opinions. Please remember as you answer these questions that there are no incorrect answers.

The Century Freeway is a six lane highway running from Los Angeles International Airport to Norwalk. It has six lanes for mixed flow traffic, one lane each direction for carpool, and a train line. Any reference to The Green Line means we are referring to the train in the middle of the Freeway.

1b. Below are several statements about the Century Freeway Carpool Lanes. Please tell us how much you agree or disagree with each of these statements. (Please circle one number for each statement)

	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
1. The carpool lanes will help improve air quality.	1	2	3	4	5
2. The carpool lanes will improve traffic in the region.	1	2	3	4	5
3. The carpool lanes will improve traffic in my city.	1	2	3	4	5
4. The carpool lanes will save me money.	1	2	3	4	5
5. The carpool lanes will save me time.	1	2	3	4	5
6. The carpool lanes will be convenient.	1	2	3	4	5
7. The carpool lanes will be free from accidents.	1	2	3	4	5

Do you intend to use the **carpool lanes**? ❑ yes ❑ no

If yes, what types of trips do you intend to use it for (Check as many as you wish):

- ❑ work
- ❑ school
- ❑ shopping or meal
- ❑ other (including recreation, social or personal)

2. Please tell us how important it is to you that the way you travel possesses each of the following qualities by circling the number that best represents your feelings about that statement:

	not important	important	very important
1. It should be free from crime.	1	2	3
2. It should help improve air quality.	1	2	3
3. It should be predictable.	1	2	3
4. It should be a place where I can be alone.	1	2	3
5. It should be convenient.	1	2	3
6. It should get me where I want to go, when I want to get there.	1	2	3
7. It should be inexpensive.	1	2	3
8. It should be free from accidents.	1	2	3
9. It should improve traffic in my city.	1	2	3
10. It should be fast.	1	2	3
11. It should be clean.	1	2	3

The following series of questions ask whether you plan to use the Green Line, the carpool lanes and the regular lanes of the Century Freeway to go to places other than work:

3d. Please tell us what things would **discourage you from riding the Green Line to other places**, such as for shopping, recreation or social engagements: (Please check no more than three)

- ❑ The train moves too slowly
- ❑ It will take too long to get where I need to go
- ❑ There will be too much crime
- ❑ There won't be a stop near my home
- ❑ It will be too crowded
- ❑ My schedule is not flexible enough
- ❑ I wouldn't know how to use it
- ❑ I like to drive
- ❑ It will be too expensive
- ❑ It will be unsafe
- ❑ It won't go where I need it to
- ❑ It will be too dirty
- ❑ It will be unpredictable
- ❑ I need to make a stop on the way
- ❑ Other (Please specify) _____

3e. Please tell us what things would **discourage you from using the Century Freeway to go to other places**, such as for shopping, recreation or social engagements: (Please check no more than three)

- ❑ Other roads will get me there faster
- ❑ I don't like to drive on freeways
- ❑ It won't go where I need it to go
- ❑ There will be too much crime on or near the freeway
- ❑ There will be too much traffic
- ❑ There won't be a ramp near my home
- ❑ I don't have a car
- ❑ Driving on it will be unsafe
- ❑ Other (Please specify) _____

3f. Please tell us what things would **discourage you from using the carpool lanes on the Century Freeway to go to other places**, such as for shopping, recreation or social engagements: (Please check no more than three)

- ❑ Picking up other passengers will take too long
- ❑ I like to drive alone
- ❑ There will be too much traffic in the carpool lanes
- ❑ My schedule is not flexible enough to carpool
- ❑ The carpool lanes won't go where I need them to go
- ❑ The carpool lanes will be unsafe
- ❑ I need to make personal stops on the way
- ❑ Other (Please specify)_____

5. **Listed below are statements that people sometimes make about the environment in Southern California. Please tell us how much you agree or disagree with each of these statements. (Please circle one number for each statement)**

	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
1. I would drive less if I knew it would help improve the environment.	1	2	3	4	5
2. I would drive less if I knew it would help improve traffic.	1	2	3	4	5
3. In Southern California, air pollution is primarily caused by automobiles.	1	2	3	4	5
4. I would drive less if I knew everyone would.	1	2	3	4	5
5. I would drive less if I would save time.	1	2	3	4	5
6. I often worry about crime.	1	2	3	4	5
7. If everyone drove less, air quality would improve.	1	2	3	4	5
8. I would drive less if I would save money.	1	2	3	4	5
9. Air pollution is a threat to my health today.	1	2	3	4	5
10. Air pollution is a threat to my health in my old age.	1	2	3	4	5
11. There are many issues in Southern California that are more important than environmental quality.	1	2	3	4	5
12. I feel safe in my neighborhood.	1	2	3	4	5
13. I often worry about air pollution.	1	2	3	4	5
14. I often worry about having enough money.	1	2	3	4	5
15. There is a lot of violence in my city.	1	2	3	4	5

A. Now we have a few questions about where you live:

1. How many years have you lived in your present home? _____

2. How long have you lived in your present neighborhood? _____

3. How many years have you lived near the Century Freeway? _____

B. When you think of your personal attachment to your neighborhood, are you? (Please check one)

- ❑ very strongly attached
- ❑ strongly attached
- ❑ undecided
- ❑ not strongly attached
- ❑ not at all attached

C. In general how would you rate your neighborhood as a place to live? (Please check one)

- ❑ excellent
- ❑ good
- ❑ fair
- ❑ poor

D. Do you own or rent your home? (Please check one)

❑ own ❑ rent

E. How close do you live to the Century Freeway? (Please check one)

- ❑ very close to it
- ❑ fairly close to it
- ❑ not close to it
- ❑ far from it

F. What is the highest level of school you have completed? (Circle number of years)

1 2 3 4 5 6 7 8	9 10 11 12	13 14 15 16	17 18 19 20 or more
Grade School	High School	College/Technical	Post-Grad.

PART II

THIS IS YOUR PERSONAL
ONE-DAY
TRAVEL DIARY

In the next section of the survey, we are asking you to record each trip you make on one day.

By telling us where you go and how you travel, we will learn about the transportation needs of the people in your area.

THIS IS HOW YOU DO IT:

FIRST, choose one day during the week that you think will be convenient for you to record your travel. You can choose any day of the week as long as it is BEFORE MONDAY, OCT 11TH, 1993.

THEN, begin the travel diary with your first trip after 4 a.m. on the day you've chosen. Anytime you drive, take the bus or train, ride a bike or walk to get from one place to another, you've made a trip. Driving to work, walking to the movies, picking someone up, or going to the bank are all examples of trips.

IT'S EASY! WE ONLY NEED TO KNOW FOUR THINGS:

- Where did you go during the day?
- What was the general reason for going there?
- How long did it take you to get there?
- How did you travel on your way there?

FIRST TRIP

1. **Where did you go on your first trip?**(Please fill in the address or nearest cross-streets)

_____
(Place Name)

_____
(Address or Nearest Intersection)

_____
(City) (Zip, if known)

2. **What was the purpose of this trip?**

- ❑ Work
- ❑ School
- ❑ Shopping
- ❑ Eating Out
- ❑ Return Home
- ❑ Work-Related
- ❑ Pick Up or Drop Off Someone
- ❑ Recreation
- ❑ Banking/Personal Business
- ❑ Other
  (Please specify)_____

3. **How long did it take to get there?**

I left at____:____ ❑ am ❑ pm I got there at____:____ ❑ am ❑ pm

4. **How did you get there?**

- ❑ Drive alone
- ❑ Passenger in Car/Truck
- ❑ Train
- ❑ Bicycle
- ❑ Driver with Passengers
- ❑ Bus
- ❑ Walk

5. **If you were a driver or a passenger, which freeways did you use?** (please list)

____ ____ ____ ____ ____ ❑ none

6. **If you were a driver or passenger, did you use any carpool lanes?**

❑ Yes ❑ No

7. **If you used the bus, which routes did you use?** (please list)

____ ____ ____ ____ ____

8. **If you used the train, which lines did you use?**

❑ Red Line ❑ Blue Line ❑ Amtrak ❑ Commuter Train

9. **Was this the last thing you did today?**

❑ Yes (Finished! Go to last page.) ❑ No (Go to next page to tell us where you went after this.)

THIRD TRIP

1. Then, where did you go next? (Please fill in the address or nearest cross-streets)

_____
(Place Name)

_____
(Address or Nearest Intersection)

_____
(City) (Zip, if known)

2. What was the purpose of this trip?

- ❑ Work
- ❑ School
- ❑ Shopping
- ❑ Eating Out
- ❑ Return Home
- ❑ Work-Related
- ❑ Pick Up or Drop Off Someone
- ❑ Recreation
- ❑ Banking/Personal Business
- ❑ Other (Please specify)_____

3. How long did it take to get there?

I left at____:____ ❑ am ❑ pm

I got there at____:____ ❑ am ❑ pm

4. How did you get there?

- ❑ Drive alone
- ❑ Passenger in Car/Truck
- ❑ Train
- ❑ Bicycle
- ❑ Driver with Passengers
- ❑ Bus
- ❑ Walk

5. If you were a driver or a passenger, which freeways did you use? (please list)

____ ____ ____ ____ ____ ❑ none

6. If you were a driver or passenger, did you use any carpool lanes?

❑ Yes ❑ No

7. If you used the bus, which routes did you use? (please list)

____ ____ ____ ____ ____

8. If you used the train, which lines did you use?

❑ Red Line ❑ Blue Line ❑ Amtrak ❑ Commuter Train

9. Was this the last thing you did today?

❑ Yes (Finished! Go to last page.) ❑ No (Go to next page to tell us where you went after this.)

FIFTH TRIP

1. **Then, where did you go next?** (Please fill in the address or nearest cross-streets)

_____
(Place Name)

_____
(Address or Nearest Intersection)

_____
(City) (Zip, if known)

2. **What was the purpose of this trip?**

- ❑ Work
- ❑ School
- ❑ Shopping
- ❑ Eating Out
- ❑ Return Home
- ❑ Work-Related
- ❑ Pick Up or Drop Off Someone
- ❑ Recreation
- ❑ Banking/Personal Business
- ❑ Other (Please specify)_____

3. **How long did it take to get there?**

I left at____:____ ❑ am ❑ pm I got there at____:____ ❑ am ❑ pm

4. **How did you get there?**

- ❑ Drive alone
- ❑ Passenger in Car/Truck
- ❑ Train
- ❑ Bicycle
- ❑ Driver with Passengers
- ❑ Bus
- ❑ Walk

5. **If you were a driver or a passenger, which freeways did you use?** (please list)

____ ____ ____ ____ ____ ❑ none

6. **If you were a driver or passenger, did you use any carpool lanes?**

❑ Yes ❑ No

7. **If you used the bus, which routes did you use?** (please list)

____ ____ ____ ____ ____

8. **If you used the train, which lines did you use?**

❑ Red Line ❑ Blue Line ❑ Amtrak ❑ Commuter Train

9. **Was this the last thing you did today?**

❑ Yes (Finished! Go to last page.) ❑ No (Go to next page to tell us where you went after this.)

Two last questions...

If you made more than six trips, how many more?_____

Is the name and address on the mailing label correct?

❑ Yes ❑ No (If not, what is your current address?)

_____
(name)

_____
(street)

_____
(city) (zip code)

You are finished with the questionnaire!

By returning a completed questionnaire, you are automatically entered in a special drawing for $200. GOOD LUCK!

Thank you very much for your participation in this survey. You have been included as a member of an important transportation study in the Century Freeway area, and we hope to contact you again in the future. Please indicate if you prefer that we do not contact you again.

Please return this survey in the postage paid envelope provided in this package. **No stamp is required.** If you have any questions or comments, feel free to contact the Transportation and Land Use Project by calling collect.

University of California
Institute of Transportation Studies
Irvine, CA 92717-3600-12

(714) 856-5102

THANK YOU FOR YOUR COOPERATION.

UNIVERSITY OF CALIFORNIA, IRVINE

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO SANTA BARBARA • SANTA CRUZ

INSTITUTE OF TRANSPORTATION STUDIES

IRVINE, CALIFORNIA 92717
(714) 856-5989
FAX (714) 856-8385

30 septiembre 1993

Estimado Señor o Señora:

El Instituto de Estudios de Transportación de la Universidad de California, Irvine le pide su participación en un estudio de opinión público concerniente a la Autopista Century. Estamos haciendo esta encuesta a los ciudadanos que viven cerca de la Autopista Century. La encuesta debe requerir un período corto de tiempo para llenarla y se puede devolver en el sobre de regresso que ha sido pagado he incluido.

La primera parte de nuestra encuesta es un cuestionario el cual nos gustaría que lo llenará usted a su conveniencia. La segunda parte es un diario de viaje en cual debe de apuntar cualquier viaje que haga usted durante un día. Pedimos que usted regrese las dos secciones antes del 11 de octubre.

Estamos interesados en sus opiniones acerca de las differentes partes de la carretera incluyendo la Línea Verde ("the Green Line"), un tren que correrá por el medio de la autopista, y los carriles para vehículos de transporte colectivo ("carpool lanes"). Este estudio nos ayudará a comprender lo que el público en general piensa a cerca de la autopista y como piensan viajar después de que la autopista y el tren sean terminados.

Todas las repuestas son confidenciales. Le agradeceríamos de recibir las contestaciones a todas las preguntas; sin embargo, no tiene usted que responder a las preguntas que no le agraden.

Gracias por su participación en esta encuesta. El éxito enteramente depende de la cooperación de la gente como usted. Como expresión de nuestra apreciación, cada individuo que regrese el cuestionario completo entrará en un sorteo de $200.

Atentamente:

Joseph F. DiMento
Professor
Proyecto de Transportación

PARTE I

POR FAVOR COMPLETE Y DEVUELVA ESTA ENCUESTA ANTES DEL LUNES, 11 DE OCTOBRE

ESTA ES SU ENCUESTA PERSONAL

Gracias por participar en este importante estudio para los residentes de Los Angeles. Por favor de llenar cada sección completemente como sea possible! Lo único que necesita usted es un lápiz y pluma y unos minutos de su tiempo libre.

ESTO ES LO QUE SE ENCUENTRA ADENTRO:

En este libro usted encontrará las prequntas sobre la Autopista Century y la Línea Verde que están construyendo cerca de su casa. Estamos interesados en sus opiniones. Al contestar estas preguntas por favor de recuerde que no hay respuestas incorrectas.

La Autopista Century (Century Freeway) es una carretera de seis carriles que va desde el Aeropuerto Internacional de Los Angeles hasta Norwalk. Tiene seis carriles para el tráfico que fluye mezclado, un carril en cada dirección para vehículos de transporte colectivo, y una línea de ferrocarril. Cualquier indicación que hagamos a la línea verde (Green Line) quiere decir que nos referimos al tren en el centro de la autopista.

1b. Abajo usted encontrará varias declaraciones acerca de Los Carriles para Vehículos de Transporte Colectivo (Carpool Lanes) en la Autopista Century. Por favor díganos hasta que punto está de acuerdo o desacuerdo con cada una de estas declaraciones. (Por favor circule un número para cada declaración.)

	fuertemente en desacuerdo	en desacuerdo	ni acuerdo ni desacuerdo	de acuerdo	fuertemente de acuerdo
1. Los Carriles para vehículos de transporte colectivo (Carpool Lanes) ayudarán a mejorar la calidad del aire.	1	2	3	4	5
2. Los Carriles para vehículos de transporte colectivo (Carpool Lanes) mejorarán el tráfico en la región.	1	2	3	4	5
3. Los Carriles para vehículos de transporte colectivo (Carpool Lanes) mejorarán el tráfico en mi ciudad.	1	2	3	4	5
4. Los Carriles para vehículos de transporte colectivo (Carpool Lanes) me ahorrarán dinero.	1	2	3	4	5
5. Los Carriles para vehículos de transporte colectivo (Carpool Lanes) me ahorrarán tiempo.	1	2	3	4	5
6. Los Carriles para vehículos de transporte colectivo (Carpool Lanes) serán prácticos.	1	2	3	4	5
7. Los Carriles para vehículos de transporte colectivo (Carpool Lanes) serán libres de accidentes.	1	2	3	4	5

Piensa utilizar **Los Carriles para vehículos de transporte colectivo (Carpool Lanes)**? ❑ sí ❑ no

Si su repuesta es sí, en que rutas piensa usarlos? (Marque todas que quiera)

- ❑ trabajo
- ❑ escuela
- ❑ hacer compras o salir a comer
- ❑ otras (incluyendo recreación, social o personal)

2. Por favor, díganos cuán importante es para usted que la vía de transportación que usted utiliza contenga cada una de las siguientes calidades. Circule el número que mejor represente sus sentimientos acerca de esta declaración.

	no importante	importante	muy importante
1. Mi vía de transportación debería de ser libre de crimen.	1	2	3
2. Mi vía de transportación debería de ayudar a mejorar a la calidad del aire.	1	2	3
3. Mi vía de transportación debería de ser prognosticable.	1	2	3
4. Mi vía de transportación debería de ser un lugar donde yo pueda estar solo(a).	1	2	3
5. Mi vía de transportación debería de ser práctica.	1	2	3
6. Mi vía de transportación debería de llevarme a donde quiero ir cuando yo quiero llegar allí.	1	2	3
7. Mi vía de transportación debería de ser económica.	1	2	3
8. Mi vía de transportación debería de ser libre de accidentes.	1	2	3
9. Mi vía de transportación debería de mejorar el tráfico en mi ciudad.	1	2	3
10. Mi vía de transportación debería de ser rapida.	1	2	3
11. Mi vía de transportación debería de ser limpia.	1	2	3

Estamos interesados en saber si usted piensa utilizar La Línea Verde, los Carriles para Vehículos de Transporte Colectivo (Carpool Lanes) y los carriles regulares de La Autopista Century para ir a otros lugares además de trabajo.

3d. Primero, díganos cuáles cosas le impedirían utilizar los servicios de La Línea Verde para ir a otros lugares además de trabajo. (Por favor no marque más que tres)

- ❑ El Tren se mueve demasiado lento
- ❑ Tomará demasiado tiempo para ir a donde necesito ir
- ❑ No sabría cómo utilizarla
- ❑ No será seguro
- ❑ Habrá demasiado crimen
- ❑ No habrá una parada cerca de mi casa
- ❑ Será demasiado congestionado
- ❑ Mi horario no es bastante flexible
- ❑ Me gusta manejar
- ❑ Será demasiado costoso
- ❑ No irá a los lugares donde necesito ir
- ❑ Será demasiado sucio
- ❑ No será prognosticable
- ❑ Tengo que hacer cosa personales en el camino
- ❑ Otras (Por favor especifique)

_____

3e. Por favor, díganos cuáles cosas le impedirían utilizar la Autopista Century para ir a otros lugares además de trabajo. (Por favor no marque más que tres)

- ❑ Otros caminos me llevarán más rápido
- ❑ Habrá demasiado tráfico
- ❑ No me gusta manejar en las autopistas
- ❑ No irá a los lugares donde necesito ir
- ❑ Habrá demasiado crimen cerca de o en la autopista
- ❑ No habrá una entrada cerca de mi casa
- ❑ No tengo carro
- ❑ Manejar en la autopista no será seguro
- ❑ Otras (Por favor especifique)

_____

3f. Por favor, díganos cuáles cosas le impedirían utilizar los Carriles para Vehículos de Transporte Colectivo (Carpool Lanes) en la Autopista Century para ir a otros lugares además de trabajo. (Por favor no marque más que tres)

- ❑ Recoger otros pasajeros tomará demasiado tiempo
- ❑ Mi horario no es bastante flexible
- ❑ Los carriles para vehículos de transporte colectivo no serán seguros.
- ❑ Habrá demasiado congestión en los carriles para vehículos de transporte colectivo
- ❑ Los carriles para vehículos de transporte colectivo no irán a los lugares donde necesito ir
- ❑ Tengo que hacer cosas personales en el camino
- ❑ Me gusta manejar solo(a)
- ❑ Otras (Por favor especifique)

_____

5. Abajo encontrará algunas declaraciones sobre el ambiente ecológio de California del sur. Por favor díganos hasta que punto usted está de acuerdo o desacuerdo con cada una de las declaraciones.

	fuertemente en desacuerdo	en desacuerdo	ni acuerdo ni desacuerdo	de acuerdo	fuertemente de acuerdo
1. Manejaría menos si yo supiera que esto ayudaría a mejorar el ambiente ecológio.	1	2	3	4	5
2. Manejaría menos si yo supiera que ayudaría a mejorar el tráfico	1	2	3	4	5
3. En California del sur, el aire contaminado es cuasado primariamente por las emisiones de carros..	1	2	3	4	5
4. Manejaría menos si supiera que toda la gente lo hiciera.	1	2	3	4	5
5. Manejaría menos si ahorrará tiempo.	1	2	3	4	5
6. Frecuentemento me preocupo por el crimen.	1	2	3	4	5
7. Si todo el mundo manejará menos, la calidad del aire mejoraría.	1	2	3	4	5
8. Manejaría menos si ahorrará dinero.	1	2	3	4	5
9. La contaminación del aire es una amenaza para mi salud hoy en día.	1	2	3	4	5
10. La contaminación del aire será una amenaza para mi salud cuando sea mayor.	1	2	3	4	5
11. Hay otros asuntos mucho más importantes en California del sur que la calidad del ambiente.	1	2	3	4	5
12. Me siento seguro en mi vecindad.	1	2	3	4	5
13. Frecuentemente me preocupo por la calidad del aire.	1	2	3	4	5
14. Frecuentemente me preocupo por no tener bastante dinero.	1	2	3	4	5
15. Hay mucha violencia en mi ciudad.	1	2	3	4	5

A. Ahora tenemos algunas preguntas acera de donde vive.

1. Cuántos años hace que usted vive en su casa?_____
2. Cuántos años hace que usted vive en su vecindad actual?_____
3. Cuantos años hace que usted vive cerca de la autopista Century?_____

B. Cuando piensa acerca de su afecto personal hacia su vecindad, cómo se siente? (Marque uno)

- ❑ muy fuertemente apegado
- ❑ fuertemente apegado
- ❑ indeciso
- ❑ no muy apegado
- ❑ no apegado

C. En general, cómo evaluaría su vecindad como un lugar para vivir? (Por favor marque uno)

- ❑ excelente
- ❑ bueno
- ❑ propicio
- ❑ malo

D. Es usted el dueño de la casa o vive en arriendo? (Por favor marque uno)

- ❑ propia
- ❑ arriendo

E. Cuán cerca vive usted de la Autopista Century? (Por favor marque uno)

- ❑ muy cerca
- ❑ mas o menos cerca
- ❑ no cerca
- ❑ lejos

F. Cuál es el nivel más alto de estudios que usted ha completado? (Coloque un círculo en el número de años)

1 2 3 4 5 6 7 8	9 10 11 12	13 14 15 16	17 18 19 20 o más
Primaria	Secundaria	Universidad/Tecnico	Post-Grad.

PARTE II

ESTE ES SU DIARIO PERSONAL DE VIAJES DURANTE UN DIA

En la próxima sección de la encuesta, le pedimos que anote cada viaje que usted hace durante un día.

En decirnos a donde va y como viaje, comprenderemos las necesidades de la transportación que tiene la gente de Los Angeles.

ESTO ES COMO USTED LO HACE:

PRIMERO, escoja un día durante la semana que usted piense que sea conveniente para anotar sus viajes. Usted puede escojer cualquier día de la semana con tal de que sea antes del lunes, 11 de octubre de 1993.

Y LUEGO, empiece su diario con su primer viaje después de las cuatro de la mañana en el día que usted ha escogido. En cualquier momento que usted maneje, tome el bus o el tren, monte bicicleta o camine de un lugar a otro, usted ha hecho un viaje. Otros ejemplos de viajes son: manejar al trabajo, caminar al cine, recoger a alguien, o ir al banco.

ES FACIL! SOLAMENTE NECESITAMOS SABER CUATRO COSAS:

- A dónde fue durante el día?
- Cuál fue su propósito general para viajar allí?
- Cuánto tiempo duró usted para llegar allí?
- Cómo viaja usted para llegar allí?

PRIMER VIAJE

1. **A dónde fue usted en el primer viaje?** (Por favor de coloque la dirección o intersección más cerana)

_____
(Nombre de Lugar)

_____
(Dirección o Intersección más cerana)

_____
(Ciudad) (Código, si lo sabe)

2. **Con que propósito hacía usted este viaje?**

- ❑ Trabajo
- ❑ Escuela
- ❑ Compras
- ❑ Comer Afuera
- ❑ Regresar a casa
- ❑ Relacionado al trabajo
- ❑ Recoger o dejar a alguien
- ❑ Recreación
- ❑ Banco/Asuntos Personales
- ❑ Otro (Por favor especifique)

_____

3. **Cuánto tiempo duró para lleger allí?**

salí a las____:____ ❑ am ❑ pm Llegue a las____:____ ❑ am ❑ pm

4. **Cómo llegó allí?**

- ❑ Condujo solo(a)
- ❑ Pasejero en carro/camión
- ❑ Tren
- ❑ Bicicleta
- ❑ Conductor con pasajeros
- ❑ Bus
- ❑ Caminando

5. **Si usted fue conductor o pasejero, cuáles autopistas utilizó?** (Por favor haga una lista)

___ ___ ___ ___ ___ ❑ ninguno

6. **Si usted fue conductor o pasejero, utilizó los carriles para vehículos de transportes colectivo?**

❑ Sí ❑ No

7. **Si usted utilizó el bus, cuáles rutas tomó?** (Por favor haga una lista)

___ ___ ___ ___ ___

8. **Si usted utilizó el tren, cuáles líneas tomó?**

❑ La Línea Roja ❑ La Línea Azul ❑ Amtrak ❑ Metro Link

9. **Fue esta la última cosa que usted hizo hoy?**

❑ Sí (Terminado! Vaya a la última página.) ❑ No (Vaya a la siguiente página para decirnos a dónde fue después.)

TERCER VIAJE

1. **Entonces, a dónde fue después?** (Por favor de coloque la dirección o intersección más cerana)

_____
(Nombre de Lugar)

_____
(Dirección o Intersección más cerana)

_____
(Ciudad) (Código, si lo sabe)

2. **Con que propósito hacía usted este viaje?**
   - ❑ Trabajo
   - ❑ Escuela
   - ❑ Compras
   - ❑ Comer Afuera
   - ❑ Regresar a casa
   - ❑ Relacionado al trabajo
   - ❑ Recoger o dejar a alguien
   - ❑ Recreación
   - ❑ Banco/Asuntos Personales
   - ❑ Otro (Por favor especifique)

     _____

3. **Cuánto tiempo duró para lleger allí?**

salí a las____:____ ❑ am ❑ pm Llegue a las____:____ ❑ am ❑ pm

4. **Cómo llegó allí?**
   - ❑ Condujo solo(a)
   - ❑ Pasejero en carro/camión
   - ❑ Tren
   - ❑ Bicicleta
   - ❑ Conductor con pasajeros
   - ❑ Bus
   - ❑ Caminando

5. **Si usted fue conductor o pasejero, cuáles autopistas utilizó?** (Por favor haga una lista)

___ ___ ___ ___ ___ ❑ ninguno

6. **Si usted fue conductor o pasejero, utilizó los carriles para vehículos de transportes colectivo?**
   ❑ Sí ❑ No

7. **Si usted utilizó el bus, cuáles rutas tomó?** (Por favor haga una lista)

___ ___ ___ ___ ___

8. **Si usted utilizó el tren, cuáles líneas tomó?**
   ❑ La Línea Roja ❑ La Línea Azul ❑ Amtrak ❑ Metro Link

9. **Fue esta la última cosa que usted hizo hoy?**
   - ❑ Sí (Terminado! Vaya a la última página.)
   - ❑ No (Vaya a la siguiente página para decirnos a dónde fue después.)

QUINTO VIAJE

1. **Entonces, a dónde fue después?** (Por favor de coloque la dirección o intersección más cerana)

_____
(Nombre de Lugar)

_____
(Dirección o Intersección más cerana)

_____
(Ciudad) (Código, si lo sabe)

2. **Con que propósito hacía usted este viaje?**
   - ❑ Trabajo
   - ❑ Escuela
   - ❑ Compras
   - ❑ Comer Afuera
   - ❑ Regresar a casa
   - ❑ Relacionado al trabajo
   - ❑ Recoger o dejar a alguien
   - ❑ Recreación
   - ❑ Banco/Asuntos Personales
   - ❑ Otro (Por favor especifique)

     _____

3. **Cuánto tiempo duró para lleger allí?**

   salí a las____:____ ❑ am ❑ pm Llegue a las____:____ ❑ am ❑ pm

4. **Cómo llegó allí?**
   - ❑ Condujo solo(a)
   - ❑ Pasejero en carro/camión
   - ❑ Tren
   - ❑ Bicicleta
   - ❑ Conductor con pasajeros
   - ❑ Bus
   - ❑ Caminando

5. **Si usted fue conductor o pasejero, cuáles autopistas utilizó?** (Por favor haga una lista)

   ___ ___ ___ ___ ___ ❑ ninguno

6. **Si usted fue conductor o pasejero, utilizó los carriles para vehículos de transportes colectivo?**
   ❑ Sí ❑ No

7. **Si usted utilizó el bus, cuáles rutas tomó?** (Por favor haga una lista)

   ___ ___ ___ ___ ___

8. **Si usted utilizó el tren, cuáles líneas tomó?**
   ❑ La Línea Roja ❑ La Línea Azul ❑ Amtrak ❑ Metro Link

9. **Fue esta la última cosa que usted hizo hoy?**
   ❑ Sí (Terminado! Vaya a la última página.) ❑ No (Vaya a la siguiente página para decirnos a dónde fue después.)

Solamente dos preguntas más...

Si usted hizo más de seis viajes, cuántos más?_____

Están correctos el nombre y la dirección en el sobre?
❑ Sí ❑ No (Sino, cuál es su dirección actual?)

_____
(nombre)

_____
(calle)

_____
(ciudad) (código de área)

Usted ha termindo con la cuestionario!

Por haber regresado un cuestionario completo, usted está automaticamente incluido en un sorteo de $200. Muy Buena Suerte!

Muchas Gracias por su participación en esta encuesta. Usted ha sido incluido en una encuesta muy importante de la Autopista Century, y esperamos ponernos otra vez en contacto con usted. Por favor díganos si usted prefiere que no nos pongamos en contacto con usted en el futuro.

Por favor regrese su encuesta en el sobre con el sello de correo ya pagado que se encuentra incluido en este package. **No es necesario poner sello** Si usted tiene preguntas o comentarios, por favor sientase libre de comunicarse por teléfono con El Proyecto de Transportación.

University of California
Institute of Transportation Studies
Irvine, CA 92717-3600-12

(714) 856-5102

GRACIAS POR SU COOPERACION

1b. Below are several statements about the Century Freeway Carpool Lanes, in which only vehicles with two or more people can travel. Please tell us how much you agree or disagree with each of these statements. (Please circle one number for each statement)

	strongly disagree	disagree	neither agree nor disagree	agree	strongly agree
1. The carpool lanes help improve air quality.	1	2	3	4	5
2. The carpool lanes improve traffic in the region.	1	2	3	4	5
3. The carpool lanes improve traffic in my city.	1	2	3	4	5
4. The carpool lanes save me money.	1	2	3	4	5
5. The carpool lanes save me time.	1	2	3	4	5
6. The carpool lanes are convenient.	1	2	3	4	5
7. The carpool lanes are free from accidents.	1	2	3	4	5

2. Please put a check mark in one of the spaces in each box below to indicate how important each of the following qualities is in choosing the way you get around.

For example, if you strongly agreed with the statement, "I will not use transportation that harms air quality," you would check a space on the left side of the box:

strongly agree	✓ 1	2	3	4	5	strongly disagree

"I will not use transportation that _____."

a. harms air quality	strongly agree	1	2	3	4	5	strongly disagree
b. increases traffic in the region	strongly agree	1	2	3	4	5	strongly disagree
c. increases traffic in my city	strongly agree	1	2	3	4	5	strongly disagree
d. is dangerous	strongly agree	1	2	3	4	5	strongly disagree
e. is subject to crime	strongly agree	1	2	3	4	5	strongly disagree
f. is unpredictable	strongly agree	1	2	3	4	5	strongly disagree
g. takes more time than the one I usually use	strongly agree	1	2	3	4	5	strongly disagree
h. costs me more money than the one I usually use	strongly agree	1	2	3	4	5	strongly disagree
i. does not go where I usually go	strongly agree	1	2	3	4	5	strongly disagree

We're interested in whether you now use the carpool lanes on the Century Freeway.

4a. First, please tell us if you have used the carpool lanes on the Century Freeway?

❑ Yes (CONTINUE IN BOX BELOW) ❑ No → (GO TO QUESTION 4f)

4b. How many days in the last week did you use the carpool lanes on the Century Freeway?

_____ Days

4c. What types of trips do you usually use the carpool lanes on the Century Freeway for? (Check as many as you wish)

- ❑ Work
- ❑ School
- ❑ Shopping or errands
- ❑ Other (recreation, social, or eating out)

4d. People have many reasons why they use carpool lanes. Please mark the most important reasons why you use the carpool lanes on the Century Freeway. (Please mark two only)

- ❑ To save money
- ❑ To avoid owning a car or needing an additional car
- ❑ To have company for the work trip
- ❑ To reduce my travel time
- ❑ Because I dislike driving
- ❑ To get a better parking space at work
- ❑ My employer encourages me to carpool
- ❑ For environmental reasons
- ❑ Other_____

4e. What don't you like about the carpool lanes on the Century Freeway?

_____

(GO ON TO NEXT PAGE)

4f. Please tell us why you do not use the carpool lanes on the Century Freeway to go to work: (Please check only three)

- ❑ Picking up other passengers takes too long
- ❑ I like to drive alone
- ❑ There is too much traffic in the carpool lanes
- ❑ My schedule is not flexible enough to carpool
- ❑ The carpool lanes don't go where I need them to go
- ❑ The carpool lanes are unsafe
- ❑ I need to make personal stops on the way or once at work
- ❑ I am currently unemployed
- ❑ Other (Please specify) _____

_____

4g. Please tell us why you do not use the carpool lanes on the Century Freeway to go other places such as for shopping, recreation, or social engagements: (Please check only three)

- ❑ Picking up other passengers takes too long
- ❑ I like to drive alone
- ❑ There is too much traffic in them
- ❑ My schedule is not flexible enough to carpool
- ❑ The carpool lanes don't go where I need them to go
- ❑ The carpool lanes are unsafe
- ❑ I need to make personal stops on the way
- ❑ Other (Please specify) _____

_____

6. Now we have some general questions about transportation. Please circle the response that most accurately reflects your feelings about the following statements.

	strongly disagree	disagree	neutral	agree	strongly agree
There will be a Green Line Transit station near places where I usually travel to.	1	2	3	4	5
There will be a Green Line Transit station near my home.	1	2	3	4	5
I usually drive to places where I shop and run errands.	1	2	3	4	5
There is a bus or train stop located near my home.	1	2	3	4	5
I enjoy using public transit.	1	2	3	4	5
Public investment in mass transit is important.	1	2	3	4	5
I would use transit if there were a stop near my home.	1	2	3	4	5
I would change the place where I usually shop and run errands if I could get there using rail.	1	2	3	4	5
High density development near transit stops for retail and business centers is a good idea.	1	2	3	4	5
Transit stations make nearby land more valuable.	1	2	3	4	5

14. When you think of your personal attachment to your neighborhood, are you? (Please check one)

- ❑ very strongly attached
- ❑ strongly attached
- ❑ undecided
- ❑ not strongly attached
- ❑ not at all attached

15. In general how would you rate your neighborhood as a place to live? (Please check one)

- ❑ excellent
- ❑ good
- ❑ fair
- ❑ poor

16. Do you own or rent your home? (Please check one)

❑ own ❑ rent

17. How close do you live to the Century Freeway? (Please check one)

- ❑ very close to it
- ❑ fairly close to it
- ❑ not close to it
- ❑ far from it

18. What is the highest level of school you have completed? (Circle number of years)

1 2 3 4 5 6 7 8	9 10 11 12	13 14 15 16	17 18 19 20 or more
Grade School	High School	College/Technical	Post-Grad.

19. Are you currently employed? ❑ yes ❑ no ❑ retired

If yes, what is the address or nearest cross streets of the place you most often go to work?

_____
(address or cross-streets)

_____

_____
(city) (zip code, if known)

22. Please indicate which group most closely describes you (Please check one):

- ❑ African American
- ❑ Asian/Pacific Islander
- ❑ Hispanic/Latino
- ❑ Native American
- ❑ White
- ❑ Other_____

23. How would you describe yourself? (Please check one)

- ❑ liberal
- ❑ moderate
- ❑ conservative

24. What is your personal income? (Please check one)

- ❑ less than $5,000
- ❑ $5,001-$15,000
- ❑ $15,001-$25,000
- ❑ $25,001-$45,000
- ❑ $45,001-$65,000
- ❑ $65,001-$85,000
- ❑ more than $85,000

25. Do you own a car?

If yes,
What is the make and year of the car you usually drive? _____

19___

If no,
Do you usually have a car available to you? ❑ yes ❑ no

26. In total, how many vehicles are there in your household?

_____ vehicles

You're now done with this part of the study. Thanks so much! Now it's time to turn to your Personal One-Day Travel Diary. Please pick a day that's convenient for you to fill it out, either today or another day before May 5th. Once you have completed both portions of the survey, return this booklet to the address on the last page and you will be eligible for the $200 drawing. ☞ ☞ ☞ ☞

TRAVEL DIARY

CHOOSE Your Travel Diary Day
Please Circle One Day

Mon. Tues. Wed. Thurs. Fri. Sat. Sun.

Even if you travel the same way every day, we would like you to PICK ONE SINGLE DAY and concentrate on recording the movements you make on THAT day.

NOW, LET'S GET STARTED!

REMEMBER- A TRIP OCCURS EVERY TIME YOU LEAVE ONE LOCATION TO GO TO ANOTHER LOCATION.

First, we need to know where you were at the BEGINNING of your travel diary day (4 a.m.). For example, if you were at home sleeping at 4 a.m. on the day you choose to record your trips, mark the box next to "home" below.

1. Where did your first trip begin on your travel diary day?

   ☐ Home ☐ Work

   ☐ Other Location (Please Fill in Address)

   _____
   (Place Name)

   _____
   (Address or Nearest Cross-streets)

   _____
   (City) (Zip, if known)

SECOND TRIP

1. Then, where did you go next? (Please fill in the address or nearest cross-streets)

_____
(Place Name)

_____
(Address or Nearest Cross-streets)

_____
(City) (Zip, if known)

2. What was the purpose of this trip? (Please check only one)

- ☐ Work
- ☐ School
- ☐ Shopping
- ☐ Eating Out
- ☐ Return Home
- ☐ Medical appointment
- ☐ Work-Related
- ☐ Pick Up or Drop Off Someone
- ☐ Recreation
- ☐ Banking/Personal Business
- ☐ Other (Please specify)_____

3. How long did it take to get there?

I left at _____:_____ ☐ am ☐ pm I got there at _____:_____ ☐ am ☐ pm

4. How did you get there?

- ☐ Drive alone
- ☐ Passenger in Car/Truck
- ☐ Train
- ☐ Bicycle
- ☐ Driver with Passengers
- ☐ Bus
- ☐ Walk

5. If you were a driver or a passenger, which freeways did you use? (please list)

_____ _____ _____ _____ _____ ☐ none

6. If you were a driver or passenger, were you in a carpool?

☐ Yes ☐ No

7. If you used the bus, which routes did you use? (please list)

_____ _____ _____ _____ _____

8. If you used the train, which lines did you use?

☐ Red Line ☐ Blue Line ☐ Amtrak ☐ Commuter Train

9. Was this the last thing you did today?

☐ Yes (Finished! Go to last page.) ☐ No (Go to next page to tell us where you went after this.)

FOURTH TRIP

1. Then, where did you go next? (Please fill in the address or nearest cross-streets)

_____
(Place Name)

_____
(Address or Nearest Cross-streets)

_____
(City) (Zip, if known)

2. What was the purpose of this trip? (Please check only one)

- ❒ Work
- ❒ School
- ❒ Shopping
- ❒ Eating Out
- ❒ Return Home
- ❒ Medical appointment
- ❒ Work-Related
- ❒ Pick Up or Drop Off Someone
- ❒ Recreation
- ❒ Banking/Personal Business
- ❒ Other (Please specify)_____

3. How long did it take to get there?

I left at _____:_____ ❒ am ❒ pm I got there at _____:_____ ❒ am ❒ pm

4. How did you get there?

- ❒ Drive alone
- ❒ Passenger in Car/Truck
- ❒ Train
- ❒ Bicycle
- ❒ Driver with Passengers
- ❒ Bus
- ❒ Walk

5. If you were a driver or a passenger, which freeways did you use? (please list)

_____ _____ _____ _____ _____ ❒ none

6. If you were a driver or passenger, were you in a carpool?

❒ Yes ❒ No

7. If you used the bus, which routes did you use? (please list)

_____ _____ _____ _____ _____

8. If you used the train, which lines did you use?

❒ Red Line ❒ Blue Line ❒ Amtrak ❒ Commuter Train

9. Was this the last thing you did today?

❒ Yes (Finished! Go to last page.) ❒ No (Go to next page to tell us where you went after this.)

SIXTH TRIP

1. Then, where did you go next? (Please fill in the address or nearest cross-streets)

_____
(Place Name)

_____
(Address or Nearest Cross-streets)

_____
(City) (Zip, if known)

2. What was the purpose of this trip? (Please check only one)

- ❒ Work
- ❒ School
- ❒ Shopping
- ❒ Eating Out
- ❒ Return Home
- ❒ Medical appointment
- ❒ Work-Related
- ❒ Pick Up or Drop Off Someone
- ❒ Recreation
- ❒ Banking/Personal Business
- ❒ Other (Please specify)_____

3. How long did it take to get there?

I left at _____:_____ ❒ am ❒ pm I got there at _____:_____ ❒ am ❒ pm

4. How did you get there?

- ❒ Drive alone
- ❒ Passenger in Car/Truck
- ❒ Train
- ❒ Bicycle
- ❒ Driver with Passengers
- ❒ Bus
- ❒ Walk

5. If you were a driver or a passenger, which freeways did you use? (please list)

_____ _____ _____ _____ _____ ❒ none

6. If you were a driver or passenger, were you in a carpool?

❒ Yes ❒ No

7. If you used the bus, which routes did you use? (please list)

_____ _____ _____ _____ _____

8. If you used the train, which lines did you use?

❒ Red Line ❒ Blue Line ❒ Amtrak ❒ Commuter Train

9. Was this the last thing you did today?

❒ Yes (Finished! Go to next page.) ❒ No (Go to next page to tell us how many more trips you made.)

Appendix 4: Inventory of Interchanges and Transit Stops

This inventory was used to identify corridors and nodes along which intensification was hypothesized

ON/OFF RAMPS	JURISDICTIONS IN ANALYSIS AREA	
(From West to East)		
Terminus on Imperial Hwy	El Segundo	
El Sepulveda Blvd	El Segundo	
	City of Los Angeles	
Nash	El Segundo	
Douglas	El Segundo	
I-405 & I-105		
Hawthorne Bvld	Hawthorne	
	LA County	
	Inglewood	
Prairie Av	Inglewood	
	LA County	
	Hawthorne	
120th Street	Hawthorne	
	Inglewood	
	LA County	
Crenshaw Blvd	Inglewood	
	Hawthorne	
	Gardena	
Vermont Av	LA County	
	LA City	
	Gardena	
I-110 & I-105		
Central Av	LA City	
	LA County	
	Compton	
Wilmington Av	LA County	
	Compton	
	LA City	

ON/OFF RAMPS	JURISDICTIONS IN ANALYSIS AREA	
(From West to East)		
Imperial Hwy	LA City	
	LA County	
	Lynwood	
Long Bch Blvd	Lynwood	
	South Gate	
I-710 & I-105		
Garfield Av	Paramount	
	South Gate	
	Downey	
Paramount Blvd	Paramount	
	South Gate	
	Downey	
Lakewood Blvd	Paramount	
	Bellflower	
	Downey	
Bellflower Blvd	Downey	
	Bellflower	
I-605 & I-105		
Studebaker Rd	Norwalk	
Firestone	Norwalk	
	Downey	
Imperial Hwy	Norwalk	
	Downey	

TRANSIT STATIONS	JURISDICTIONS	
(From West to East)		
Aviation	El Segundo	
	Los Angeles	
	LA County	
Hawthorne	LA County	
	Hawthorne	
Crenshaw	Hawthorne	
	Inglewood	
Vermont	LA County	
	LA City	
I-105 & I-110	LA City	
Avalon	LA City	
	LA County	
Wilmington	LA City	
	LA County	
Long Beach Blvd	Lynwood	
Lakewood Blvd	Downey	
	Bellflower	
	Paramount	
I-105 & I-605	Norwalk	
	Bellflower	
	Downey	

Appendix 5: List of Interviewees

city and street address	*contact*	*position*	*Interviewee*
Bellflower 16600 Civic Center Dr. Bellflower, CA 90706 (310) 804-1424	Linda C. Lowry	City Manager	Linda Lowry -City Manager
Compton 205 S. Willowbrook Ave. Compton, CA 90220 (310) 605-5585	Howard Caldwell	City Manager	Jerry Gadt -Planning Manager
Downey 11111 Brookshire Blvd. Downey, CA 90241 (310) 869-7331	Gerald Caton	City Manager	Mark Sellheim -Principal Planner
El Segundo 350 Main St. El Segundo, CA 90245 (310) 322-4670	James Morrison	City Manager	Hyrum Fedje -Planning Director Lori Jester
Gardena 1700 W. 162 nd St. Gardena, CA 90247 (310) 217-9503	Kenneth Landau	City Manager	Kathy Ikari -Community Development Director Whitman Ballenger, Transportation Director
Hawthorne 4455 West 126th St. Hawthorne, CA 90250 (310) 970-7910	Jim Mitsch	City Manager	Michael Goodson, AICP, Director of Planning
Inglewood 1 Manchester Blvd. Inglewood, CA 90301 (310) 412-5230	Paul Eckles	City Manager	Tony de Bellis
Los Angeles 221 S. Figueroa St. Suite 410 Citywide Planning Division Los Angeles, CA 90012 (213)485-8009	Sara Rodgers Michael Davis	Sr. City Planner City Planner	David Weintraub -Assoc. City Planner Michael Davies -City Planner Sara Rodgers -Sr. City Planner Alan Bell- City Planner
Los Angeles County 500 W. Temple St., Room 1390 Los Angeles, CA 90012 (213) 974-6401	Jim Hartl	Dir.- Dept. of Regional Planning	Sorin H. Alexanian-Supervising Regional Planner Rose Hamilton, AICP, Supervising Regional Planner II
Lynwood 11330 Bullis Rd. Lynwood, CA 90262 (310) 603-0220	Faustin Gonzales	City Manager	Faustin Gonzales, City Manager

city and street address	*contact*	*position*	*Interviewee*
Norwalk 12700 Norwalk Blvd. Norwalk, CA 90650 (310) 929-2677	Richard Powers	City Manager	Jill Anderson -Sr. Management Assistant
Paramount 16400 Colorado Ave. Paramount, CA 90723 (310) 220-2000	William Holt	City Manager	Patrick West -City Planning Director Linda Benedetti-Leal, Director of Community Development John Carver, Senior Planner
Southgate 8650 California Ave. Southgate, CA 90280 (213) 563-9500	Todd Argow	City Manager	Todd Argow -City Manager Andrew Pasmant, Director

Appendix 6: Planner and City Manager Interview Guide

file=TLU

LOCAL OFFICIAL TRANSPORTATION AND LAND USE INTERVIEW GUIDE
VERSION OF MAY 10, 1994

Interviewee Name:

Interviewee Title:

Jurisdiction and Address:

Interviewer: Sherry Dru Joe RAs:_____

Date of Interview:

Time Begun: Time Ended: Duration: Recorded? y n
****

Introduction (Make the following points):

We're interested in the relationship between the Century Freeway/Transitway and land use in your jurisdiction.

People have spoken of both the opportunities and the negative impacts associated with the transportation corridor.

We want to learn how your city is reacting. We have a series of questions which address both actual and planned changes.

As we mentioned in our letter our focus is on changes in land use plans, zoning and other ordinances, regulations and policies which are related to the new freeway and the soon to be completed Green Line.

Our project is being carried out at the Institute of Transportation Studies at UCI and is funded by Caltrans.

Before we begin, do you have any questions?

It helps us to focus on our conversation if we can record our interview. Is that alright with you?

1. Let's first concentrate on land use policy changes that have been made in relation to the Century Freeway and Green Line.

   As you know, initial planning of the Century Freeway/Transitway began several decades ago. Over the past several decades, and more specifically in recent years, has your City initiated specific land use policies in anticipation of this new transportation facility?

   For example, has your city implemented or considered implementing changes in the general plan or zoning ordinances to allow for increased densities near the Century?

   Or more specifically, has your city made policy changes such as providing density bonuses near interchanges and transit stops, or marketing excess land parcels and air rights near the transportation facility?

2. Can you give us additional detail about these policies? What does each policy entail?

Policies	Details

3. Which governmental department/s were responsible for the inception of these land use policies, and what was the primary motivation for implementing these policies?

4. Now let's concentrate, in a general way, on changes which **have already been made** at transportation nodes along the Century. By node, we mean interchanges, on and off ramps, transit stops, _____ created as part of the Century project ..... We have identified [SPECIFY HERE PRE INTERVIEW] Later we'll inquire about development elsewhere in the city.

a. Can you please give us additional detail about these? What does each change entail? We're interested in as much detail as you can including with specific information about densities, intensities of use, etc.

Changes already made:	Details

b. Are there other projects/changes which have been started?

c. Which of these were primarily public sector driven? [List or circle on list above]

d. Which were primarily initiatives of the private sector? [Underline or circle on list above]

PROBE IF RESPONSE IS UNCLEAR OR IF ADDITIONAL DETAIL WOULD BE VALUABLE

e. Have there been any "false starts", i.e., development initiatives around the nodes which needed to be abandoned or postponed for any reason?

5. Now I would like to focus on <u>each</u> of the individual projects you have <u>mentioned</u>:

[Begin with housing project]

a. **If housing**, why did the city choose to foster/promote housing in the area?

i. Would housing have occurred without the Century housing program, that is, would there have been a market response without the specific Consent Order-directed projects we have seen? Put another way, would housing have returned to the Corridor without the I-105 program?

b. **If no housing**: Do you have any idea why housing was not chosen as a land use to promote at these nodes?

c. Others: why did the city choose to foster/promote these other policies?
[ ]

First Project

Second Project

6. Now could you tell us about **plans** for future developments?

a. What is the schedule for completing these projects? Do you think that it is a realistic schedule?

Project	Schedule/Realistic?	y	n

7. Now could you tell us about **inquiries or ideas** which may **not have evolved yet** to the status of projects or plans [such as preliminary conversations with developers, ideas of commissions of the city....]

a. Have any coalitions of developers [or other non governmental entities] come together with development at the "nodes" in mind?

8. Has the City addressed this topic [land use changes related to the Freeway/Transitway] explicitly in any special forums or as a special item in a regularly scheduled meeting [such as of the Council or one of the Commissions]?

9. What kinds of contributions is the city being asked to make to each of the development initiatives [direct financial contributions, subsidies,indirect financial including tax relief, changes in regulations or policies, land or other direct contributions]?

Project	Requested of City

10. [FOR RESPONDENTS WHO HAVE DESCRIBED LAND USE CHANGES] Have you identified any "fallout" from the first land use changes you have described [negative or positive]? For example, is there a kind of chain reaction of other development opportunities? Or have you not seen this phenomenon? Or is there any community opposition after the citizens have heard about or seen the results of the changes?

11. Now we'd like to focusing **in general on development plans of the city, not around what we have called the nodes but nonetheless projects related to the Century project:**

a. Would you please list projects you view as related to the CF with as much detail as you can including with specific information about densities, intensities of use, etc.

i. Which of these are primarily public sector driven?

ii. Which are primarily initiatives of the private sector?

b. Have there been any "false starts", i.e., development initiatives which needed to be abandoned or postponed for any reason?

12. Now I would like to focus on each of the specific projects you have mentioned:

a. **If housing**, why did the city choose to foster/promote housing in the area?

i. Would housing have occurred without the Century housing program, that is, would there have been a market response without the specific Consent Order-directed projects we have seen? Put another way, would housing have returned to the Corridor without the I-105 program?

b. **If no housing**: Do you have any idea why housing was not chosen as a land use to promote in the Corridor? [PROBE]

c. Others: why did the city choose to foster/promote these other projects?
[ ]

First Project

Second Project

13. What kinds of contributions is the city being asked to make to each of the development initiatives? [again, direct financial contributions, subsidies, indirect financial including tax relief, changes in regulations or policies, land or other direct contributions].

Project	Requested of City

14. Now could you tell us about **plans** for future developments [anywhere in the city, related to the Century]?

15. Now could you tell us about **inquiries or ideas** which may not have evolved yet to the status of plans [such as preliminary conversations with developers, ideas of commissions of the city....] .

16. Now a general question about reaction to development activity linked to the Centers: Is there formal (articulated) **opposition** to the higher density plans? We're very interested in the kinds and the intensity of that opposition, so please give us as much detail as possible.

17. Now can we turn attention to your personal views: what types of development would you propose for the "areas of potential nucleation" or nodes? I.e., what kinds of development based on the new corridor would you like to see promoted?

a. Do you feel that the private sector is bringing forward proposals that are in the public interest?

b. In your view, what would be necessary (what types of policies would need to be adopted) to promote your desired land use changes in response to the Century opportunity? [PROBE TO UNDERSTAND OBSTACLES]

c. In your view, what would be necessary (what types of policies would need to be adopted) to promote use of transit (**Green line**)? Has the city adopted any policies aimed at promoting or facilitating use?

PROBE WITH SOME EXAMPLES IF NO RESPONSE [discounted parking, new stations, special safety precautions, encouraging housing near stations].

18. We would like to focus a bit on the parking ordinances in your city. Does your municipal code specifically address parking at the transit nodes?

a. What are new sites expected to provide in terms of parking?

[PROBE different from elsewhere in city]

b. How else is parking being affected by changes associated with the Century?

i. At the nodes

ii. Elsewhere

19. Do you have any new or contemplated policies regarding the promotion of pedestrian oriented development?

20. Now can we focus a bit on the relationship between **your development plans** related to the Century and **those of neighboring jurisdictions.** Could you please tell us about both the opportunities and the conflicts (the fiscalization of land use effects, for example) which derive from the Century projects?

21. We have summaries of your General Plan, your zoning ordinance, and [list other documents which we have] _____.

Are we missing any materials which you consider important to our study?

22. If you were undertaking this study, which questions would you be asking? of whom?

23. Another way of addressing our questions is through land value changes. We know that we could work through the assessor to track changes in land values in designated areas of your city. Are there other sources of information which might be available to us?

THIS IS THE END OF OUR INTERVIEW. THANK YOU VERY MUCH FOR YOUR ASSISTANCE. MAY WE ASK THAT YOU LET US KNOW IF NEW POLICIES WHICH RELATE TO THIS STUDY ARE ADOPTED?

Appendix 7: Annotated Bibliography: Land Use Impacts of Freeways

Annotated Bibliography: Land Use Impacts of Freeways
Table V-1: First Generation Studies

DATE	AUTHOR	STUDY	METHODOLOGY	RESULTS
1956	Wheeler, B.	"The Effect of Freeway Access Upon Suburban Real Property Values"	Analysis of before and after real estate sales prices to determine effect of bridge opening on residential property values. Test and control sites used. Multiple regression used to model determinants of property value. Value changes compared with changes in travel times to downtown Seattle.	Author finds that improved access, defined as travel time savings to CBD of between 5 to 25 minutes, accounts for increases in residential real estate prices of 70% to 154%.
1959	Adkins, W.	"Land Value Impacts of Expressways in Dallas, Houston and San Antonio, Texas"	Compares real estate sale values before and after operation of expressways in three cities using experimental and control sites. In two cities, parcels were grouped according to distance from facility, and in one city parcels were grouped by zoning designation.	The values of abutting parcels increased more than parcels not adjacent to freeway. Differentials in values between experimental and control sites for abutting property ranged from 483-271%, and for non abutting properties, -64-110%.
1959	Bone, A.	"Massachuchetts Route 128 Impact Study"	Investigation of industrial and residential land use changes. Surveys of 96 industrial businesses newly located within one mile of Route 128. Experimental and control site comparisons were made to measure effect of the freeway on residential land use. Land use data included assessed valuations, building permits, housing densities, and sales records.	Industries cited need for regional access as one of primary reasons for relocating to Route 128 corridor. Assessed values of residential properties adjacent to freeway increased 180% while control site increased 85%. Housing density increased 75% in adjacent site and 40% in control site. Residential sales prices increased more rapidly in the adjacent band in one case and showed no variation from the control site in another case.

Table V-1: First Generation Studies
(Continued)

DATE	AUTHOR	STUDY	METHODOLOGY	RESULTS
1965	Burton, R. and Knapp, F.	"Socio-economic Change in Vicinity of Capital Beltway in Virginia"	Before-after study to assess trends in land and real estate property values, land uses, traffic patterns, travel habits, and business activity. Changes in these variables occurring near beltway are compared with control areas away from beltway.	Authors conclude beltway has caused land values of nearby parcels to increase faster than parcels with less beltway access. Conclusions are not well supported by the data. There is no easily identified relationship between land value trends in study sites of differing distances to the beltway. There is also no justification for attributing the differences in rates of change of land values to distance from the beltway.
1966	Eyerly, R.	"Land Use and Land Value in Four Interchange Communities: An Interim Report on the New York Study"	Evaluates rate of change in the formation of new properties from existing properties, real estate value, and land uses over a five year period.	New properties formed at a rate of 2.4%/year in the interchange areas. Real estate and land values did not increase conclusively faster in interchange areas as compared with control areas.
1968	Golden, J.	"Land Values in Chicago: Before & After Expressway Construction"	Analysis of trends in land values using a test and control site comparison for segments on each link in the Chicago freeway system. T-tests were used to determine if after-period mean land values were significantly different from before-period means.	Although author claims results support hypothesis of increased land values due to freeway accessibility, a review of the actual numbers presented does not necessarily lead to this conclusion. For residential and commercial land uses, 3 of eleven control sites increased in value more than test sites. For industrial uses, 5 of eleven control sites increased in value more than test site. Analysis of t-tests show that 6 of eleven control sites did not show definitive tapering of land values with increasing distance from freeway.

Table V-1: First Generation Studies
(Continued)

DATE	AUTHOR	STUDY	METHODOLOGY	RESULTS
1978	Cosby, P. and Buffington, J.	"Land Use Impact of Widening East 29th Street in a Developed Residential Area in Byran, Texas"	Land use data collected from land use maps from before (1958, 1965) and after (1970, 1977) highway improvements. Total acres in land use types were calculated for abutting and non abutting land uses. Types and rates of land uses were compared from before and after improvements. Conducted interviews to determine reasons for land use changes.	In the before period, 2% increase in residential uses on abutting property, and on non abutting, a 3% increase in residential and 36% decrease in commercial uses. In the after period, 6% increase in residential development and 718% increase in commercial development on abutting properties, and on non abutting, 6% increase in residential and 167% increase in commercial.

Table V-2: Second Generation Studies

DATE	AUTHOR	STUDY	METHODOLOGY	RESULTS
1963	Pendleton, W.	"Relation of Highway Accessibility to Urban Real Estate Values"	Regression analysis is used to determine significance of accessibility factors in land values, and thereby quantify value of transportation improvements.	Accessibility variable accounted for a 10% price variation in houses located at the extremes (in relation to CBD). Cost per trip was estimated at $0.0126/minute.
1965	Cribbins, P., Hill, W., and Seagraves, H.	"Economic Impact of Selected Sections of Interstate Routes on Land Value and Use"	Uses multiple regression techniques to test hypothesis that land values decrease with increasing distance from the highway in after-period, and in the before-period, land values follow no particular pattern in relation to the highway location. Property sales price is used as dependent variable. Independent variables are size of parcel, year of sale, vacancy, urban-rural, subdivision, roadside, alternate roadway, distance to CBD, distance to ROW, distance to access.	Highway facility studied has had no measurable effect on property values. One of first studies to attempt to include as many variables as possible that may have significant effect on property prices. In comparison with all other variables in the regression equation, the variables accounting for access to highway showed no consistent pattern of increased significance during the after-periods.
1974	Corsi, T.	"A Multivariate Analysis of Land Use Change: Ohio Turnpike Interchanges"	Aerial photographs used to measure land uses at three time periods over a total period of eighteen years. Five hypotheses relating to the determinants of interchange development were tested using regression analysis.	Total acreage of urban development in an interchange community is explained by: 1)traffic on intersecting road, 2) existence of sewer and water facilities, 3)population growth in nearest large urban area, 4) distance to nearest large and small urban area, and 5) county population density. (R squared=0.92)

Table V-2: Second Generation Studies (continued)

DATE	AUTHOR	STUDY	METHODOLOGY	RESULTS
1974	Gamble, H. and Sauerlender, O.	"Adverse and Beneficial Effects of Highways on Residential Property Values"	Study using multivariate regression analysis to determine relationship between regional accessibility measures (Washington COG accessibility indexes), levels of highway-generated disturbances (noise pollution levels, NPL), distance from highway, and residential property values (records of real estate transactions).	Noise was found to be greatest annoyance to residents, and was significant in explaining variation in property values with an average loss of $2050 for abutting properties. Gains in value were found to be about $2955/property up to a 1/4 mile from freeway. Net effect of freeway in study area was an increase in property value. Total losses due to disturbance were $302,475, while total gains due to increased accessibility were $5,005,770.
1974	Epps, J.	"Interchange Development Patterns on Interstate Highways in South Carolina"	Data obtained by site investigation at 131 interchanges were used to examine the relationship between the amount of development (service stations, motel, restaurant, highway-oriented) occurring and several characteristics of the interchanges (ADT on intersecting highway, ADT on the Interstate, distance to and population of nearest communities within 10 miles, distance to nearest major urban center, distance to nearest adjacent interchange). Models developed to estimate amount of development that will occur.	Regression equations did not provide good estimations of interchange development (R^2's between 0.4 and 0.18). Author suggests using linear approximations of relationships between amount of development and interchange characteristics for prediction of development. Actual relationships between selected variables and amount of development and their linear approximations are graphed for this study's data set.

Table V-2: Second Generation Studies
(continued)

DATE	AUTHOR	STUDY	METHODOLOGY	RESULTS
1976	Khasnabis, S., Babcock, W.	"Impact of a Beltway on a Medium-Sized Urban Area in North Carolina: a Case Study"	Study examines land use changes at freeway interchanges in N.C. using land use data from aerial photographs taken in 1960, 1964, and 1970. Multiple regression analysis used to model land development at interchanges. Independent variables include distance of development from nearest interchange, and other demographic, socio-economic and physical factors possibly related to land development.	Distance from interchange explained significant portion of residential development (t=3.48). A composite variable measuring availability of land and distance from interchange explained a significant portion of industrial development (t=12.38) and commercial development (t=5.0). Author concludes beltway was a factor in stimulating urban development, but also states that development was also already in progress before planning and construction of beltway.
1976	Langley, C.	"Adverse Impacts of the Washington Beltway on Residential Property Values"	County property records used to develop property price indexes based on sale and resale pairs for abutting, impact, and nonimpact zones in a residential area bisected by the I-495. Regression analysis used to test hypothesis that property values close to freeway were adversely affected in terms of lower property values during the first eleven years of operation (1962-1972).	Properties located in proximity to freeway increased in value at a slower rate than those located farther away. Abutting properties sold for an average of $1650 less than non abutting after 1970. Pre-1970 data did not reveal a significantly adverse effect of freeway on nearby properties.

TABLE V-3: Third Generation Studies

DATE	AUTHOR	STUDY	METHODOLOGY	RESULTS
1980	Payne-Maxie Consultants and Blayney-Dyett	"The Land Use and Development Impacts of Beltways: Case Studies	Comprehensive study of the land use impacts of beltways in eight U.S. cities. Histories of the cities and regions are provided, as well as detailed discussions of the economy, local and regional planning structures, and transportation system. Conclusions are drawn about the effect of the beltway on development decisions.	Beltways in five out of eight cities did not have a distinct effect on the locational trends of new development.
1980	Payne-Maxie Consultants and Blayney-Dyett	"The Land Use and Development Impacts of Beltways: Final Report."	Pesentation of results from the case studies and from statistical analysis. Regression analysis used to determine beltway influence on population, employment, trade, residential movement, work location, and vehicle miles travelled. Data collected from beltway and nonbeltway cities in the U.S.	Many of the null hypotheses could be rejected (meaning the beltway did exert some influence on the dependent variables being tested), however the degree of influence was small and inconsistent. Multicollinearity of independent variables was a problem in many of the models. Unclear how researchers controled for the effects of the macro-economy.
1987	Stephanedes, Y. and Eagle, D.	"Highway Impacts on Regional Employment"	Time-series analysis used to differentiate effects of highways on economic development from effects of economic development on highways. Employment levels are used as indicator of economic development.	Results indicate that causality from highway expenditure to employment is weak; however, in counties that are already growing economic centers, highway expenditures lead to a sustained increase in employment above the normal growth trends. Authors suggest that any economic gains from highways are distributional rather than absolute. In other words, economic gains by one sector or county will usually correspond to a loss in another sector or county.

Table V-4. Empirical Studies of the Land Use Impacts of Light Rail

DATE	AUTHOR	STUDY	METHODOLOGY	RESULTS
1972	Boyce, D. et. al.	"Impact of Rapid Transit on Suburban Residential Property Values and Land Development"	Multiple regression analysis of the effect of a new transit line on suburban property values. Independent variables include site characteristics, neighborhood characteristics, regional variables, historical or external variables, and transit related variables. Residential sales prices collected from 1965 to 1970, with the transit line opening in 1969. Case study analysis of the effect of the transit line on land development policies.	A positive impact of the transit line on property values is found. Considerable apartment development occurred in one of the two communities close to the transit line. Although it was not determined how important the transit line was in influencing apartment construction, it was determined that the apartments bring more revenue to the localities than expenditures required to service the developement and new population growth.
1975	Gannon, C. and Dear, M.	"Rapid Transit and Office Development"	Survey of the users and suppliers of office space in the Philadephia region to determine effect of new rail line on locational decisions. Statistical analysis was not possible given the available data.	Survey suggests rail line was significant factor in decisions of users and suppliers of office space, although relatively little office construction had occurred during the study period.
1977	Lerman, S., Damm, D., Lerner Lam, E., and Young, J.	"The Effect of the Washington Metro on Urban Property Values"	Multiple regression analysis of the effects of the Metro on urban property values. Real estate data collected from 1969 to 1976. Independent variables used in the analysis fall into three categories: characteristics of the parcel, description of the Metro's relation to individual parcels, and neighborhood characteristics.	Distance to a Metro station is found to be a determinant of parcel value. Parcel characteristics and neighborhood characteristics together have a far greater influence on parcel value than transit-related variables.

Table V-4. Empirical Studies of the Land Use Impacts of Light Rail (continued)

DATE	AUTHOR	STUDY	METHODOLOGY	RESULTS
1977	Knight, R. and Trygg, L.	"Evidence of Land Use Impacts of Rapid Transit Systems"	Review of published empirical studies of the land use impacts of rapid transit.	Authors conclude that rapid transit can have an impact on location and intensification of development, but only if several supporting factors are present. These factors include local government land use policies, regional development trends and forces, availablity of developable land, and physical characteristics of the area.
1977	Dyett, M.	"BART Impact Program: Station Area Land Use"	Used existing aerial and ground level photos, assessors' land use information, and planning documents to determine number of structures built within a 4000 ft by 4000ft area around 22 BART stations. The study areas was also divided into a smaller area encircling each station with a 1500ft radius. Data represents changes occurring from 1965 to 1977.	During the thirteen year period, 1791 new structures were built. Sixty-one percent occurred within 1500ft of the station. Forty percent of the new building was single family residential, 23% was office or commercial, and 20% was multifamily residential.
1978	Falcke, C.	"BART Impact Program: BART's Effects on Property Prices and Rents"	Before/after study of changes in residential and commercial property prices and rents. Multiple regression analysis used. Explanatory variables included proximity of property to station, characteristics of station site, and characteristcs of the property.	Results show that BART had a positive impact on residential property prices in the before period (1962-1965), and almost no impact in the construction period (1967-1971) or the after period (1972-1977). In terms of office rents, BART had a positive impact in the after period.

Table V-4. Empirical Studies of the Land Use Impacts of Light Rail (continued)

DATE	AUTHOR	STUDY	METHODOLOGY	RESULTS
1978	Fajans, M. et. al.	"BART Impact Program: Study of Development Patterns"	Population, housing, employment, and land use data for 1970 and 1975 used to analyze relationship between development patterns and BART accessibility improvements.	Population and employment growth inside the three county BART service area is slower than in the other counties of this region. Within its four corridors, BART has affected both residential and employment location decisions: 51% of the employment increase in the greater BART service area occurred in zones surrounding stations. Fourteen percent of housing growth in the greater BART service area occurred around stations. Employment growth around station areas has been greater in the older central cities than in suburban centers.
1978	Falcke, C.	"BART Impact Program: Study of Property Acquisition and Occupancy, BART's Effect on Speculation"	Analysis of speculative property acquisitions in the BART station areas, and the extent of BART's influence on conversion and intensification of land use. Authors used interviews with key informants and statistical analysis of land variables indicative of speculation, such as property turnover, changes in owner occupancy, zoning variance requests, and land use conversion.	Speculative activity was found in the vicinity of all stations except in downtown San Francisco and Alameda County. Activity has tended to be more intensive nearer stations, and the greatest amount occurred in downtown Oakland. Most speculation occurred in the construction stage of BART when expectations about its benefits were highest.
1979	Dyett, M. et. al.	"BART Impact Program: Land Use and Urban Development Impacts of BART: Final Report"	Final report that includes chapters on construction impacts, accessibility and mobility impacts, locational impacts, development impacts, market effects, and regional effects. Work is also available in separate reports, as reviewed in this bibliography.	Overall, BART has influenced land use and urban development in the Bay Area, although at the time of study, which was only 3-5 years after BART began operation, the effects appeared quite small relative to expectations.

Table V-4. Empirical Studies of the Land Use Impacts of Light Rail (continued)

DATE	AUTHOR	STUDY	METHODOLOGY	RESULTS
1984	Cervero, R.	"Light Rail Transit and Urban Development"	Survey of local officials responsible for planning and managing LRT systems in twelve North American cities. Survey focused on urban development potential of light rail and specific land use planning activities taking place in conjunction with LRT systems.	Eight of twelve cities have used or are considering implementing land use strategies to stimulate private development around LRT stations. Reduced parking requirements was most frequently cited. Four cities were using public capital improvements and public lease or sale of land. Less popular strategies were air rights development, tax increment financing, zoning revisions, provision of pedestrian amenities, creation of transit districts, or granting density bonuses.
1993	Cervero, R. and Landis, J.	"Assessing the Impacts of Urban Rail Transit on Local Real Estate Markets Using Quasi-Experimental Comparisons"	Experimental-control method used to examine the influence of rail transit on commercial office development. Performance variables included average office rents, net absorption rates, annual office space additions, average building size, and percent of new regional office space. T-statistics were used to evaluate significance of difference between experimental and control sites over a period from 1978 to 1989.	Commercial centers with rail access did not show any consistent real estate advantage over centers with no rail access. In Washington D.C., the significant variables showed that the no-rail center generally out-performed the centers with rail. In Atlanta, only two variables had significant differences, and these results showed that centers with rail performed better than centers without rail.

Appendix 8: Economic Conditions in the Corridor

Appendix 8

Descriptive analyses were conducted to test for differences between zip codes in the corridor study area that are and are not segmented by the freeway. For no groups were differences found to be statistically significant, however, F tests revealed significant differences of variance between the groups, violating the assumption of equal variance across groups, necessitating the use of the separate variance t-test.[1]

First we present tables describing some population, household, and labor force characteristics of the corridor as enumerated in the 1990 U.S. Census of population and housing.

Population characteristics

	Percent white ethnicity	Percent living below poverty level	Male Unemployment
Zip codes bordering Century Freeway	33.09% (25.3)	20.63% (10.94)	10.85% (4.65)
Zip codes not bordering Century Freeway	35.04% (28.79)	16.99% (11.97)	10.07% (5)
Corridor Mean	34.205%	18.55%	10.4%
County Mean	58.05%	15.1%	7.4%

	Percent men not in labor force	Percent high school dropouts	Percent female head of household	Percent of households receiving welfare
Zip codes bordering Century Freeway	26.82% (8.22)	19.80% (7.71)	21.49% (9.56)	17.11% (10.72)
Zip codes not bordering Century Freeway	25.48% (6.66)	17.5% (7.74)	19.51% (7.86)	14.14% (10.08)
Corridor Mean	26.06%	18.49%	20.36%	15.41%
County Mean	22.8%	17.3%	12.8%	9.85%

[1] It is difficult to reveal significant differences between groups in a small sample such as this because the denominator of the t-statistic will be quite large.

Household Characteristics

	Median Household Income in 1990 Dollars	Median Home Value in 1990 Dollars
Zip codes bordering Century Freeway	28590 (8502)	165775 (69980)
Zip codes not bordering Century Freeway	40767 (34550)	175825 (70498)
Corridor Mean	35548	171517
County Median	34965	223800

Labor force characteristics

	Percent white collar workers[2]	Percent blue collar workers	Percent service workers
Zip codes bordering Century Freeway	48% (13.38)	21.09% (9.73)	30.91% (7.64)
Zip codes not bordering Century Freeway	52.81% (13.65)	20.18% (9.4)	27% (4.92)
Corridor Mean	50.75%	20.57%	28.68%
County Mean	59.9%	24.55%	15.55

	Percent Drive Alone	Percent Using Transit	Mean Travel Time in minutes
Zip codes bordering Century Freeway	66.93% (7.39)	7.22% (3.86)	26.56 (2.79)
Zip codes not bordering Century Freeway	71.99% (8.85)	5.41% (4.28)	25.34 (2.79)
Corridor Mean	69.82%	6.18%	25.86
County Mean	70.1%	6.5%	26.5

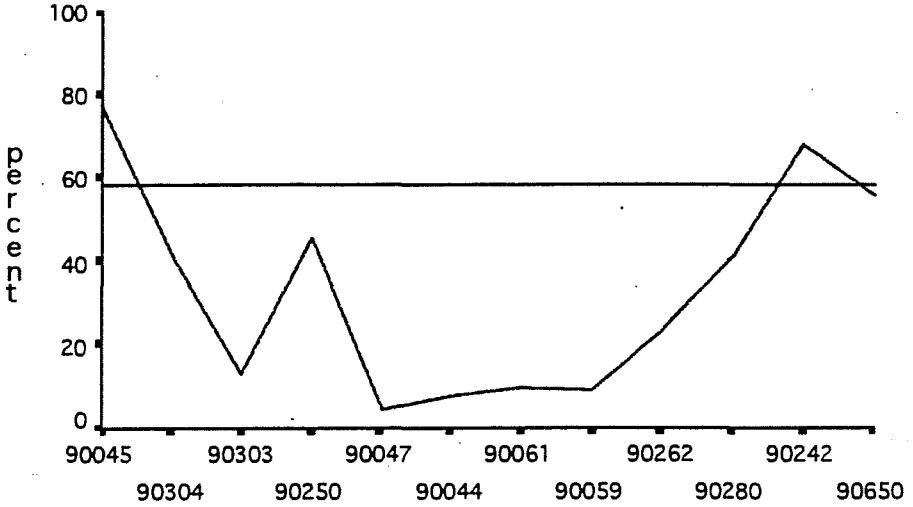
The following graphs plot, by zip code from west to east along the x axis, the average values of some socio-economic indicators for zip codes that the freeway segments. Corridor zip codes are compared with Los Angeles County values.

---

[2] Three categories of workers were classified based on data provided on labor force characteristics. White collar = , (executive/administrative/manager + professional/specialty + technicians/related support + sales + administrative support/clerical); service = , (private household worker + protective service + service occupation + farming, forestry, fishing); Blue collar = , (precision workers/ production/ craft/ repair + machine operators/assemblers/inspectors + transportation and material moving + handlers/equipment cleaners/helpers/laborers)

Profile of zip codes segmented by freeway

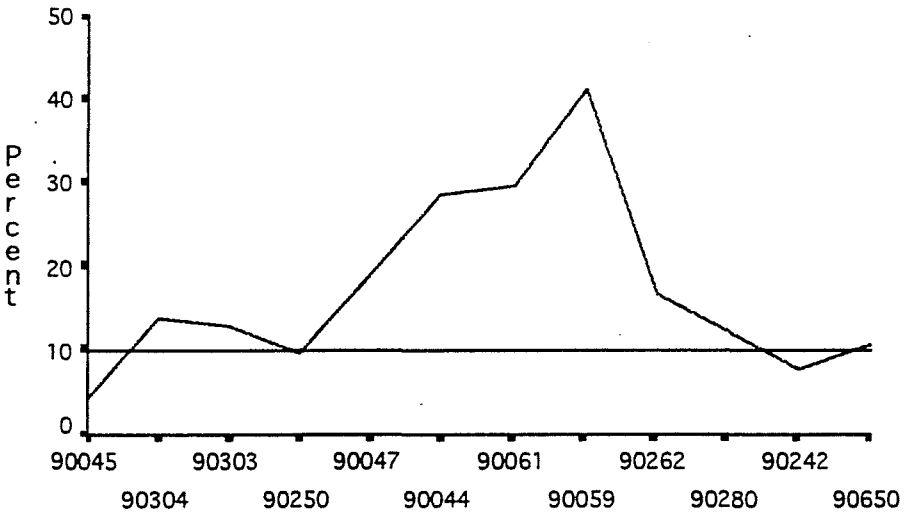
Percent of individuals with white ethnicity



1. Data values plotted by zip code from west to east on x axis
2. Horizontal line represents county average

Profile of zip codes segmented by freeway

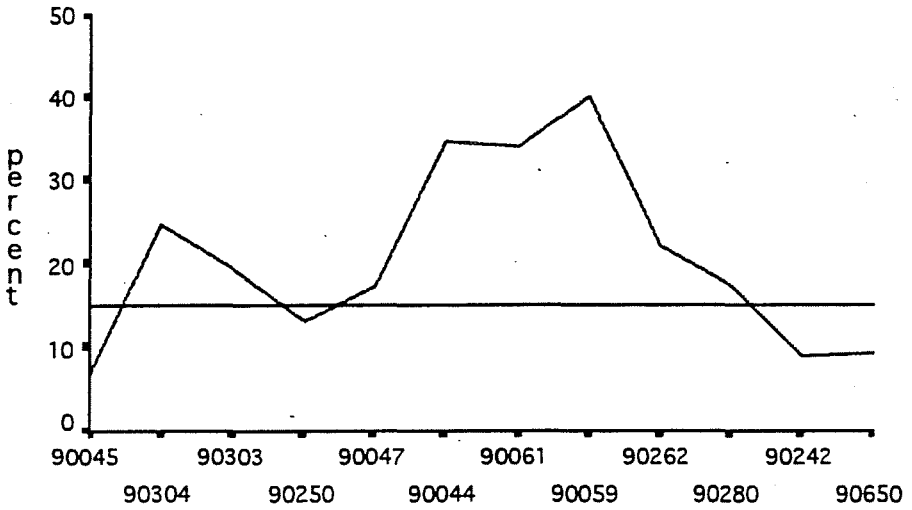
Percent households receiving public assistance



1. Data values plotted by zip code from west to east on x axis
2. Horizontal line represents county average

Profile of zip codes segmented by freeway

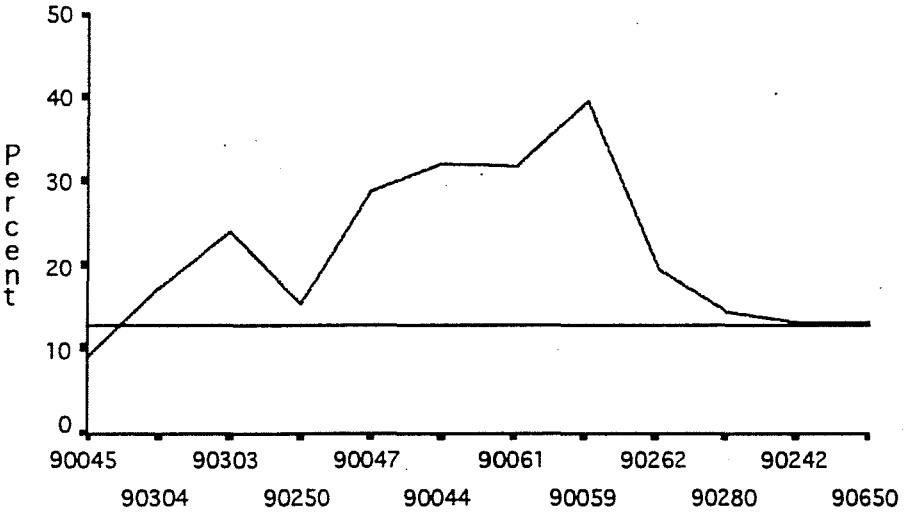
Percent of individuals living below poverty level



1. Data values plotted by zip code from west to east on x axis
2. Horizontal line represents county average

Profile of zip codes segmented by freeway

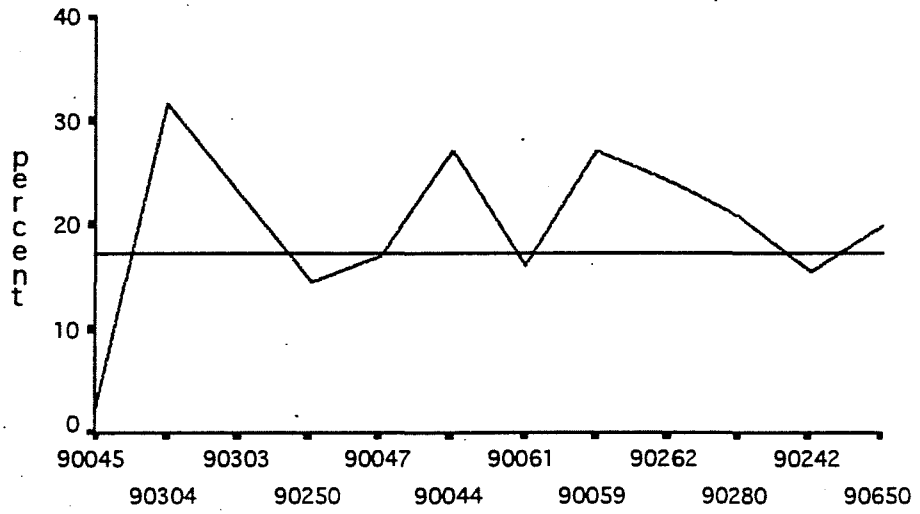
Percent female head of household



1. Data values plotted by zip code from west to east on x axis
2. Horizontal line represents county average

Profile of zip codes segmented by freeway

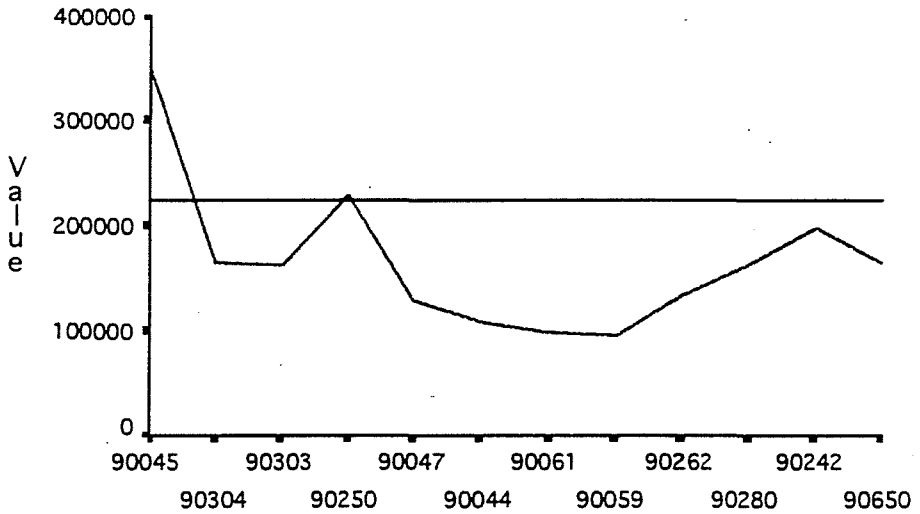
Percent high school dropouts



1. Data values plotted by zip code from west to east on x axis
2. Horizontal line represents county average

Profile of zip codes segmented by freeway

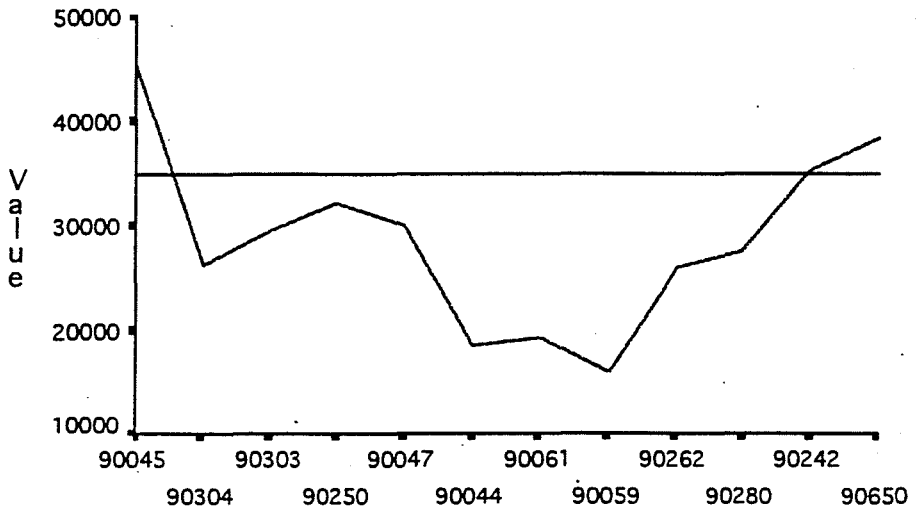
Median house value (1990 dollars)



1. Data values plotted by zip code from west to east on x axis
2. Horizontal line represents county median

Profile of zip codes segmented by freeway

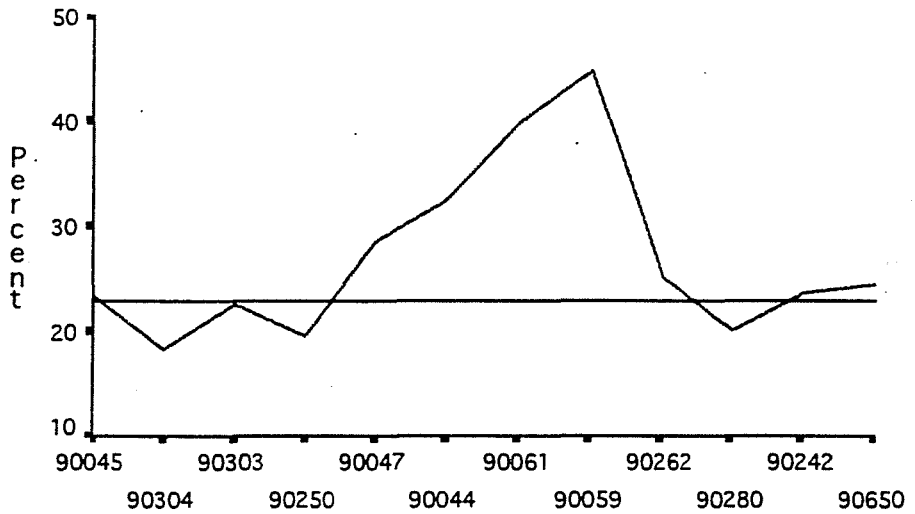
Median household Income (1990 dollars)



1. Data values plotted by zip code from west to east on x axis
2. Horizontal line represents county median

Profile of zip codes segmented by freeway:

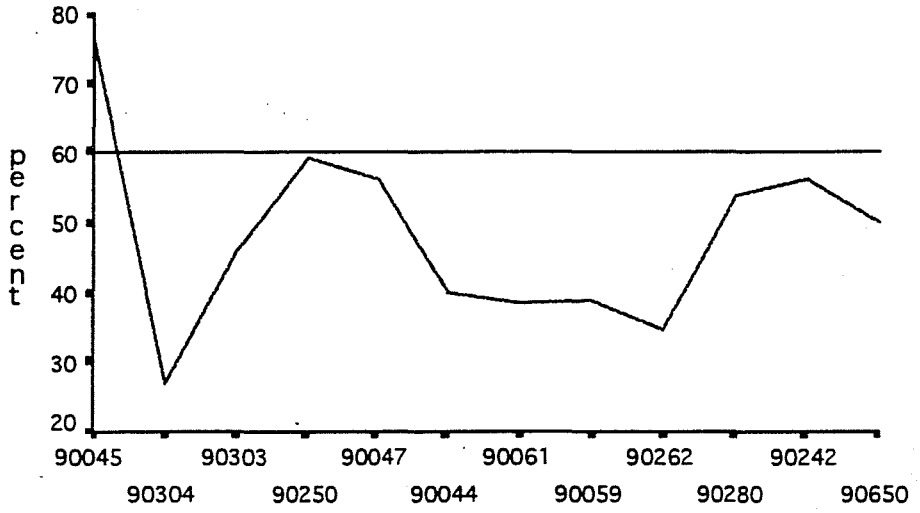
Percent men not in labor force



1. Data values plotted by zip code from west to east on x axis
2. Horizontal line represents county average

Profile of zip codes segmented by freeway

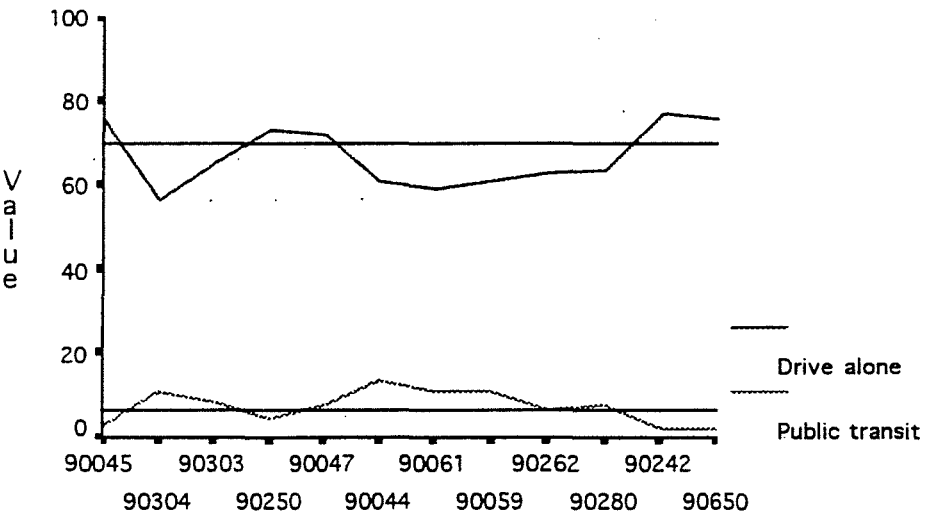
Percent white collar workers



1. Data values plotted by zip code from west to east on x axis.
2. Horizontal line represents county average

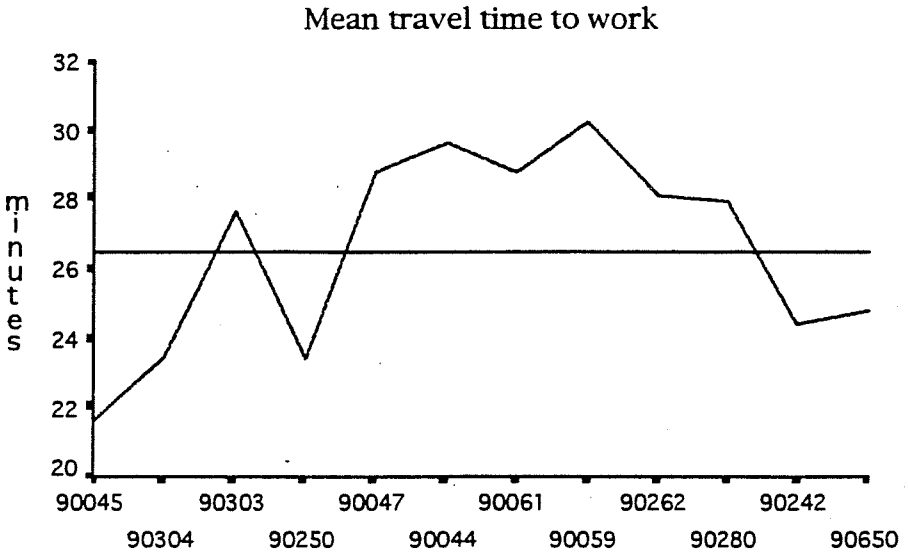
Profile of zip codes segmented by freeway

Percent of workers driving alone and using public transit



1. Data values plotted by zip code from west to east on x axis
2. Horizontal lines represent county average

Profile of zip codes segmented by freeway



1. Data values plotted by zip code from west to east on x axis
2. Horizontal line represents county average

Appendix 9: Raw Data Summaries/General Plan Analysis

Appendix 9: Raw Data summaries/General Plan Analysis

LAND USE
a. Rail

Jurisdiction	Predicted Impact and Time Period
Hawthorne	Expand redevelopment area including a retail center to take advantage of the increased pedestrian activity-Period 2
Norwalk	Will stimulate demand for office/retail space-Period 3[1]
Downey	Increase economic potential-Period 2
LA County	Take advantage of increased pedestrian activities, Period 2.

---

b. Mixed Use Facilities

Jurisdiction	Predicted Impact and Time Period
Norwalk	Mixed-use project including commercial and residential, Period 3
La County	Development of mixed use facilities, Period 2.

---

c. Pedestrian Influence

Jurisdiction	Predicted Impact and Time Period
Downey	Install sidewalks to link bus lines with rail stations-Period 2
El Segundo	Develop bike paths and bike storage areas-Period 2

---

d. Effect on Future Development

Jurisdiction	Predicted Impact and Time Period
LA County	Development of commercial and office facilities-Period 2
Hawthorne	Freeway related commercial uses-Period 2
Bellflower	High potential for commercial use-Period 2
Lynwood	Commercial and light industrial uses-Period 2
Norwalk	Additional demand for office and retail space-Period 2
Paramount	Development of major community scale shopping center north of Century Freeway-Period 1

---

[1] In its economic development concept, the City wrote that "City Centre has the potential to become a strong subregional retail/commercial office core. The convergence of commuter rail lines at the proposed Transportation Center, improvements to the I-5 Freeway and completion of the I-105 Freeway will stimulate additional demand for quality and easily accessible office space. While demand for local-serving retail space in Norwalk has generally been met, the potential for a strong subregional-serving retail core does exist. Economic projections indicate a supportable demand for new department stores in the future. (p. 3,4).

e. Separation/Stratification

Jurisdiction	Predicted Impact and Time Period
Lynwood	Insure balanced development north/South-Period 2
LA County	Form physical barrier-Period 2

f. Open space/parks

Jurisdiction	Predicted Impact
Lynwood	Usable public space/pocket parks
LA County	Land for park/open space

CIRCULATION ELEMENT

a. Traffic Congestion Improvements

Jurisdiction	Predicted Impact and Time Period
Hawthorne	East-west surface streets improvement-Period 2
Bellflower	East-West and North-South improvements-Period 1
Downey	Minor improvements-Period 2
El Segundo	Provide needed roadway capacity-Period 2
Gardena	East-west arterials improvements-Period 1
Inglewood	East-west and Imperial Highway traffic improvements
Lynwood	East-west improvements-Period 2
Paramount	East-west improvements-Periods 1 and 2

b. Traffic Congestion Generated by Century

Jurisdiction	Predicted Impact and Time Period
Downey	Local streets would see increased traffic-Period 2
Gardena	North-south arterials increase in traffic-Period 1
Inglewood	Increase along entrances and exits of freeway-Period 2
Lynwood	North-south must be used for access to freeway-Period 2
Paramount	North-south arterials increased traffic-Periods 1 and 2.

c. Travel Patterns

Jurisdiction	Predicted Impact and Time Period
El Segundo	Freeway traffic will use local streets as shortcut-Period 2
Bellflower	Altered flow might improve operations-Period 2
Hawthorne	Green Line will alter--increasing adequate transit, Period 2
Lynwood	Traffic movement affected-Period 2
Paramount	Improve circulation on local arterials and increase loads on some residential streets, Period 2

d. Accessibility Issues

Jurisdiction	Predicted Impact and Time Period
Compton	Access to business centers improved-Period 1
Bellflower	General and regional access enhanced-Period 2
Inglewood	Major commercial/office and regional-Period 2
Norwalk	Line to rest of Southern California Region-Period 2
Paramount	Commercial access-Period 1

e. Los Angeles Airport

Jurisdiction	Predicted Impact and Time Period
Downey	Green Line access-Period 2
Compton	Period 2
El Segundo	Period 2
Hawthorne	Period 2
Inglewood	Period 2
LA County	Period 2
Norwalk	Period 2

f. Public Transportation

Jurisdiction	Predicted Impact and Time Period
Downey	Expand intracommunity transit for schools and employers for Green Line-Period 2
El Segundo	Bike and pedestrian lanes, truck routes- Period 2
Hawthorne	Green Line reduces cost and allows easy access to a key light rail public transport system
Inglewood	SCRTD bus lines need to be coordinated to serve Green Line-Period 2
Norwalk	Can benefit from convenient public transit-Period 2

g. Buffering

Jurisdiction	Predicted Impact and Time Period
Downey	Buffering is a concern- Period 2
Lynwood	Predict residences too close to freeway- Period 2
Norwalk	Adverse impact on neighborhoods from parking and traffic and sound walls-Period 2
Paramount	Buffering is a concern Period 2

h. Future Reports

Jurisdiction	Predicted Impact and Time Period
Downey	Period 2
El Segundo	Period 2
Paramount	Period 2

ECONOMIC DEVELOPMENT POLICY INFLUENCE

Jurisdiction	Predicted Impact
LA County	Opportunity for economic development; access to LAX and other major destinations; transit station can create pedestrian environment which enhances retail development
LA City	Higher density commercial and industrial development can be aided by transit stations; improved residential access to new job opportunities
Hawthorne	Prediction of additional demand for quality and easily accessible office space
Bellflower	High potential for commercial uses which will be developed with completion of Century: Redevelopment Agency is developing revitalization plan
Compton rail,	Attract new business by emphasizing accessibility via passenger freeways and arterial highways [2].
Lynwood	Begin to experience business creation; increased exposure; access for existing businesses and greater residential mobility; increased property taxes noted [3].

[2] From Land Use Element.

[3] Comprehensive Housing Affordability strategy