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TRANSIT OPTIONS FOR NON-CBD ACTIVITY CENTERS Executive Summary

Los Angeles is the prototypical polycentric and dispersed metropolitan region It has more activity centers than other large U S metropolitan areas, but this 'Los Angelization' is being replicated across the nation Largely because of the availability of local public funding (Proposition A) over several years, Los Angeles probably has a wider array of local transit and para transit services than other metropolitan areas The coexistence of many political and fiscal jurisdictions raises important issues from service provision in response to local needs to region-wide coordination Activity centers are much broader than employment centers because many types of activity (e g retail and entertainment) generate more trips (up to 33 times more) than their employment would suggest Total trips generated per gross acre in 1980 were computed for the 1285Analysis Zones (AZs) in the Los Angeles five-county area, and these were ranked The 59 highest-ranked AZs accounting for 17 5 percent of the region's employment locations were mapped and 19 major centers (including an enlarged CBD) were identified Fourteen of these were in Los Angeles County, and four (Santa Ana, Riverside, San Bernardino and Ontario) were in the peripheral counties The Los Angeles core area remains dominant, accounting for 46 percent of the centers' employment (but only 8 percent of the region's employment), more than four times larger than the second center (Westwood-Beverly Hills-Century City) in terms of jobs and 3 5 times larger in terms of trips generated The 19 centers show some degree of specialization in their economic structures; for example, the Los Angeles core specializes in finance and public administration, the Westwood and Hollywood centers in entertainment, Huntington Park in manufacturing and wholesaling, and so on However, an analysis of Los Angeles County's 369 largest firms, facilities and sites (including shopping centers, hotels, industrial parks and office buildings as well as companies) showed that many of the facilities (the exceptions were banks, office buildings and property management companies) were predominantly located outside the centers (on average 9 2 kilometers from the nearest center) These results suggest that the Los Angeles region is as much dispersed as polycentric, a fact that severely restricts the market for conventional transit services The matrix for traffic flows (total trips, journeys-to-work -- JTW and transit JTWs) was constructed for the 46 Regional Statistical Areas (RSAs) used by the Southern California Association of Governments (SCAG) and for the 19 identified activity centers However, the data for the centers were separated from the RSA in which they were located so that 19 of the RSAs are, in effect, 'donuts' This procedure generates a 65 X 65 traffic flow matrix Of the 4 7-

million roundtrip commutes in the region, only 250,000 (5-3 percent) are by transit, and of the latter more than 77,000 (31 percent) are to the Los Angeles core area (the enlarged downtown center) The other 18 centers receive less than 37,000 workers by transit, less than 15 percent of the region's transit commuters

The analysis of traffic flows revealed several generalizations:
i) Many trips to and from the centers, roughly about one-half, are either internal to the center or with the surrounding hinterland('donut') This even applies in the Los Angeles core area
ii) Inter-center traffic flows, including those with the Los Angeles core, are very small In fact, the centers have much more interaction with dispersed locations (non-centers) outside their own 'donut' than with other centers The four peripherally located centers outside Los Angeles County have even less interaction with other centers
iii) The vast majority of trips in the region (including JTWs) is between dispersed origins and destinations, bypassing the centers (including the Los Angeles core) This confirms the above finding from the analysis of facility locations that Los Angeles is a dispersed rather than a polycentric metropolis
iv) Transit JTWs are on a very small scale in the region as a whole Very few transit commuter's work in the non-CBD activity centers, and only the Los Angeles core is a prominent transit destination The regional transportation system in the Los Angeles region relies heavily on the automobile Vehicle occupancy is low; there is not much ridesharing in spite of Computer Commuter, some successful commercial commuter vanpools, and the growth in airport van service Congestion has been increasing because vehicle miles traveled have been increasing much faster than freeway mileage (which has remained more or less unchanged for many years) Nevertheless, total trip times remain tolerable and most drivers choose the freeway even though there is a highly developed surface street system The dispersed settlement and workplace pattern has not provided a favorable environment for the growth of transit The regional transit agency, the Southern California Rapid Transit District (SCRTD), the largest all-bus system nationwide, has been plagued with many problems: a widening cost-revenue gap and increasing reliance on subsidies (more than three-fifths of its budget); service cutbacks; and actual, (freeway commuter expresses) or threatened (the San Gabriel Valley routes) takeovers of some of its routes Its future role may be increasingly focused on the provision of service in the Los Angeles core area and along the major boulevards However, the relative decline in the role of SCRTD, now about 80percent of total transit operating expenditures in the region compared with 90 percent in 1980, has been accompanied by an expansion in a wide array of local transit services (for the general public and for specialized groups, on

fixed routes and for demand-responsive travel, subsidized and for-profit) This expansion has been facilitated by Proposition A which made sales tax revenues in Los Angeles County available for transit services after 1980 The funding has assisted service provision, capital projects and user subsidies By 1988, 86cities and the unincorporated Los Angeles County area are providing more than 250 different types of service Although many of these are special-purpose (e g for the elderly and the handicapped), there are many general-public services such as shopping center shuttles and the Rose Bowl shuttle (for UCLA football games) Unfortunately, there are insufficient data to develop

performance measures for these local transit services to compare them with conventional transit However, the numbers served by most services are very small, the subsidy levels are high, and it is unlikely that these services divert much travel to transit and relieve traffic congestion This study has focused on the local transit services in place rather than on what might develop, on the assumption that the level of public funding has been high enough to stimulate a local response to potential transit service markets The conclusions and policy implications that may be drawn from this study are:1 Based on Los Angeles' experience, the scope for conventional transit services in non-CBD activity centers is very limited These centers generate minimal traffic flows with each other and with the downtown core However, their growth has weakened radial corridors to downtown Their major traffic flows are with their own hinterlands and with very dispersed locations, but the traffic densities are very low Flows are from many origins to many destinations (no hope for conventional transit) rather than from many origins to few destinations (possibly, some potential for transit) or from few origins to few destinations (real prospects for transit, were it not for the fact that this pattern is not found anywhere among U S metropolitan areas) The only viable complement to the automobile in these centers is an expansion in locally-provided, low-capacity Para transit services Such an expansion will require more subsidies and further policy innovations 2 Despite regulations favoring transit monopolies and hefty subsidies to SCRTD and for Metro-Rail, a shift to small-scale suppliers throughout the region is underway Public policy is ambivalent, however, providing public funding for conventional mass transit and for Para transit services simultaneously A serious risk is that over time Metro-Rail will drain away an increasingly large share of available public subsidies 3 A sensible transportation policy package for the region might include: a continued, traditional bus services catering for line-haul demands in the Los Angeles core and along major streets in low-income neighborhoods; b more deregulation to permit private (non-subsidized) operators to seek out viable Para transit market niches in the region (e g allowing the airport shuttle companies to take on non-airport routes); c promoting more transit operation to replace SCRTD in individual, low-density neighborhoods, with subsidies awarded on a competitive bid basis; d deregulation of entry and rate-setting for taxis to permit an expansion of the fleet to a level appropriate for the region's population; e continuing the policy of promoting 'local return' projects to provide specialized Para transit services for the elderly, the hand-capped, and other groups in need; f the rail transit projects are a diversion from the real transportation problems of the dispersed metropolis 4 The failure to introduce restraints on the automobile (whether in the from of workplace parking limitations or, more sensibly,

road congestion pricing) inhibits the development of alternatives, or more precisely complements, to the automobile However, with respect to commuting, automobile restraints are less likely to result in significantly more transit use than to lead to more ridesharing in the short run and to locational readjustments by firms in the longer run

The remaining issue is to the degree to which the results for Los Angeles can be applied to other large U S metropolitan areas Non-CBD activity centers have emerged, or are emerging, in other metropolitan areas so that the polycentric/dispersed spatial patterns becoming universal in cities above a threshold size Of course, the number of centers is often much smaller than in Los Angeles, and this could make a difference For instance, it might be argued that with fewer centers inter-center flows might be somewhat denser than when diluted over many centers However, any minor effect of this kind will be more than outweighed by other considerations First, smaller number of centers implies more diversified rather than specialized centers, implying more intricate than inter-center flows Second, non-CBD activities are unlikely to generate heavyinter-center flows unless they have substantial residential pop-ulations, but high land values in these centers squeeze out all but amodest amount of residential land uses Third, electronic communications are being increasingly substituted for business-related person-flows that might otherwise dominate inter-center flows (e g in developing country metropolises) Fourth, the growth of activity centers in itself weakens the downtown radial corridor links that formerly accounted for much of the conventional transit in place In other metropolitan areas, hinterland and dispersed flows probably dominate the traffic flows into and out of the activity centers as much as in Los Angeles Hence, the policy implications are, subject to local differences and idiosyncrasies, more or less the same

I Introduction, overview, and approach Purpose of the study Modern American cities have been dispersing for some time People and jobs, as well as other activities, have been moving away from the CBD, sometimes forming rival clusters, diminishing the importance of the traditional downtown In the greater Los Angeles metropolitan area ,for example, the CBD accounted for only 3 percent of total jobs in1980; the average for the ten largest U S urbanized areas was only7 4% (Appendix E Table F 1) The land and travel market interactions which generate such spatial arrangements are not yet well understood Transit services for such environments are the topic of this research Los Angeles as a case study This case study presumes the Los Angeles area is a prototype of the large, modern, U S metropolis Pisa ski's recent study (1987) as well as our own research (Gordon, Kumar, Richardson; 1988) call attention to the fact that the dispersion of jobs and residences is a widespread phenomenon that results in commuting economies as well as shrinking markets for conventional transit Los Angeles has long been recognized as the city where these trends were first noted Itsdevelopment is probably an important leading indicator of U S urban development trends Other metropolitan areas in the U S are exhibiting the samesubcentering trends first observed in Los Angeles For example, 14centers have been identified in the Washington D C area, 7 inBaltimore and 8 in Atlanta; similar patterns can be observed in everysizeable metropolitan area in the country Moreover, because LosAngeles has more centers than anywhere else (this study identifies 19,but a finer grain of spatial detail would generate more), it is notdifficult to find examples of representative types of center similarto those found elsewhere The Los Angeles case is also particularlyrelevant to an appraisal of the transit services outside core areasbecause the availability of local public funding (Proposition A funds)over several years has encouraged development of a wider array oftransit and paratransit services than in other metropolitan areas Furthermore, the budgetary and service delivery problems of the masstransit agency, the Southern California Rapid Transit District(SCRTD), are typical of those experienced by similar agencies in othermetropolitan areas, and the success of the airport shuttle services(especially Super Shuttle) mirrors exactly what has happened in othercities where similar services have been introduced Even if LosAngeles is a little different in terms of its spatial structure, itstransportation problems and their soloutions are very similar to thosein other metropolitan areas The research stepo discussed below are:1) identify non-CBD activity centers and other study areas;2) understand the relationships between dispersed activity centers and the rest of the greater metropolitan area;3) examine the provision and performance of conventional and para- transit services for the various sub-centers;

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4) suggest appropriate transit service and policy innovations
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II Activity centers and regional traffic flows Local geography and the activity centers The first task in this research was to define and identify local activity centers The main information source for our determination of activity centers was the data on journey-to-work and related characteristics from the 1980 decennial census The origin-destination matrix for journey-to-work is obtained from the UTPP file for the Los Angeles five-county area * The data includes O-D matrices for all work trips as well as for commuting via three separate modes: solo auto driver, share-ride, and transit As the census data do not include any information on non-work trips, an O-D matrix for non-work trips was constructed using parameters from the 1976 Urban and Rural, Survey, consisting of 7619 home interviews conducted by the Southern California Association of Governments (SCAG)and the Los Angeles Regional Transportation Study (LARTS) The survey updated a 1967 data base All of the data are compiled at the Analysis Zone (AZ) level; there are 1285 AZs in the Los Angeles five-county area Other information was obtained from local planning agencies and transit operators These sources are identified throughout the text In addition, we conducted a survey of Para transit operators in Los Angeles county In spite of the growing importance of major centers of activity located outside of traditional CBDs, the available literature offers little on how to identify sub-centers (see, for example, Hartwick and Hartwick, 1974; Kim, 1979; Odland, 1978; Ogawa and Fujita, 1980;Wieand, 1984; and McDonald, 1987) Simply defined, an activity centers the location of economic activity exercising significant impact onthe metropolitan region The variables identified by McDonald todefine sub-centers include: gross/net employment density; gross/netpopulation density; and employment-population ratio Yet, centersthus identified do not necessarily exhibit any functional linkageswith the metropolitan area and also the method does not distinguishamong the characteristics due to different employment types and mixes McDonald's indices are more likely to define employment centers thanactivity centers, a flaw because many types of centers (e g thoseincorporating recreational facilities, a suburban shopping mail or auniversity) generate many more trips than implied by their levels ofemployment A more appropriate procedure would identify theinteraction potential in terms of traffic flows for each area and toclassify places above some threshold of traffic as sub-centers Thecomputation of interaction potential requires establishing tripgeneration rates by employment types Trip generation rates peremployee are available from the Institute of Traffic Engineers (ITE,1983) manual, and are shown in Table 1I 1 The UTPP employment datawere aggregated to a level that allowed utilization of available ITEtrip-generation rates ----------* Los Angeles County, along with the four counties that surround it(Orange,

Riverside, San Bernardino, Ventura) makes up the study areafor this research The five-county area is congruent with the CensusBureau's Los Angeles CMSA

As expected, the nature of each job influences trip generation rates For example, according to the ITE source, an employee in the retailsector generates fifteen times as many trips as one in themanufacturing sector Using the ITE rates, total trips generated per zone per day werecomputed Total trips generated by all workers were divided by zonalacreage The 1285 AZs were then ranked by total trips generated pergross acre The distribution of trips-generated-per-acre wasstandardized The analysis zones were then classified by standardizedtrip generation densities (Table II 2) The fiftynine AZs in the groupwith more than 0 8 SDs (trips generated per acre) above the meanaccounted for 17 5 % of the area's job locations These AZs weremapped and nineteen geographic clusters were observed (Table II-3) Whereas the Census Bureau's CBD accounted for 3% of the urbanizedarea's jobs in 1980, our much larger 'core' center accounted for justover 8% of the fivecounty area's employment The other centers weremuch smaller: Westwood-Century City-Beverly Hills accounts for lessthan 2% of the area's employment, Hollywood has 1%, and the othersixteen centers are below 1% It should be pointed out that the 82 5%of area employment not accounted for by our nineteen centers is notspread uniformly; the non-center agglomerations are spread out anddifficult to characterize More centers could have been identified,but a natural break in the data point to 19 centers (see geographicalunits in Appendix C) as being dominant (in an earlier study based onthe more limited concept of employment densities only 7 centers stoodout, while there was a much larger number (57) of population peaks(Gordon, Richardson and Wong; 1986); again, the distinction betweenpopulation/employment clusters and activity center is critical) Agglomeration economies have a far greater spatial range than has beenrecognized in much of the literature The sectoral distributions (Table II 4) of employment highlight thecore-area's importance in the finance, insurance, and real estate aswell as public administration sectors Hollywood and Westwood-CenturyCity-Beverly Hills are, of course, more influential in theentertainment sector Looking at sectoral totals, retail andmanufacturing are, as expected, significantly more dispersed (not incenters) than is overall employment The nineteen centers along with SCAG's forty-six Regional StatisticalAreas (RSAs) gave us sixty-five areas to work with To make the dataon RSAs and centers mutually exclusive, data for the centers wereremoved from the RSAs, truncating many of them and reducing some to'donut'-shaped areas We will not know until 1990 census results are available the extent towhich sub-centering in the region has evolved How many new nodes(using our approach to the

definition of centers) emerged? How manyof the nineteen identified places no longer qualify as centers? Towhat extent have the nineteen centers grown beyond their 1980boundaries? What proportion of total employment are accounted for bythe 1980 vs the 1990 centers? The answers to questions such as thesewill command the attention of anyone interested in policentric urbandevelopment and its implications Our approach to an examination ofcenter development since 1980 relied on the Los Angeles BusinessJournal's 1988 Book of Lists That compilation reports 1987 rankingsfor sixty-six types of firms and facilities, reporting the 'top-10'for some, all the way to 'top-100' for others Unfortunately, many ofthe lists referred only to Los Angeles

county We recorded the addresses of the following: 1 top-100 publiccompanies; 2 top-100 private companies; 3 top-22 banks (this listcontained 25 entries but 22 were in L A County); 4 top-25 hotels; 5 top-25 shopping centers; 6 top-24 office buildings; 7 top-25 officespaces; 8 top-25 property management companies; 9 top-23 office-and-industrial parks This information was processed via a geographicinformation system to match the addresses to our centers We wereinterested in the extent to which the 369 major sites and headquarterswere associated with the major 1980 centers Table II 5 shows thedistribution of all nine lists between eight L A county centers aswell as eighteen non-center study areas in the county More than two-thirds of the functions were located outside the centers Banks,office buildings, and property management companies were the onlythree clustered activities, predominantly in the Los Angeles cor earea with a minor cluster in the Westwood-Century City-Beverly Hillscenter

Traffic and the activity centersThe Los Angeles urbanized area is the most dispersed of the large U S metropolises * In 1980, approximately 9 5 million people and 4 4million job locations were spread over almost 2,000 square miles Thearea is served by about 720 miles of limited access freeways Therewere about 1 7 vehicles per household and an average vehicle occupancyfor the worktrip of 1 1 (the nation's high AVO for the large urbanizedareas was Washington DC's 1 2) As many as 88 percent of worktripswere via private vehicles (5-8 percent by transit and 6 percent by'other') with 83 4 percent of the private vehicle users driving alone Worktrip travel times were among the best of the U S top-10 urbanizedareas (Appendix E; Table E 2) because many industries had chosen tofollow the work force to the suburbs This settlement pattern, inturn, has diminished transit markets and also restricted opportunitiesfor carpooling The key information required for an assessment of potential demand fortransit and paratransit services in or near activity centers is anestimate of traffic flows throughout the metropolitan region UTPPdata on worktrips and on worktrips via transit were combined with thestudy's estimates of non-work trips to measure all trips on an origin-destination basis over the regional system Trips for each of thecenters were disaggregated into: internal trips within each center;trips to other parts of the RSA where the center was located (the'donut'); trips to and from the Los Angeles core; trips to and fromthe other eighteen centers (disaggregated into centers in its owngeographical cluster -Westside, Eastside, Northside or Southside - -and the remaining centers; and trips to and from non-centers Tosimplify the presentation, these trips are given in percentage termsbut all the raw numbers -- critical for the measurement of thresholdlevels of demand for particular types of transit service -are given inAppendix A These trips are summarized in 15 tables (Table II 6 1 toTable II 6-7-3), One of these tables (Table II 6 2) shows the trafficflows in and out of the Los Angels core area These tables contain substantial detail on the pattern of trafficflows in 1980 for all trips, for journeys-to-work, and for journeys-to-work by transit in the Los Angeles metropolitan region Many ofthese details are interesting in themselves, but from the perspectiveof the goals of this study a few key findings stand out: i) Considering the nineteen activity centers as a whole (i e including the Los Angeles core area), almost one-third of all types oftrip (total, journey-to-work, or journey-to-work via transit) were tointernal destinations within each center (Table II 6 1) Moreover,53 - 57 percent of trips originating within each center did not leavethe RSA in which the center is located (Table II 6 1) Although a muchsmaller proportion of arrivals at each center originated within thecenter (7 5 percent of journeys to work, 12 4 percent of journeys towork by transit, and 13 8 percent of all trips), this was compensatedfor by higher proportions of all trips from with the 'donuts' so that43----------*

The background data in this paragraph refer to the 'urbanizedarea', a Census Bureau definition that excludes the sparsely settledparts of the five-county area

percent (journeys to work) to 50 percent (all trips) of centerarrivals started in their home RSAs (Table II 6 1 1) These facts showthat a very high proportion of all trips (50 +/- 7 percent) areinternal to the centers and their surrounding 'donuts' ii) In the absence of data on traffic flows, a primitive ex antehypothesis might be that there would be strong traffic linkages amongthe activity centers, and that they might provide a foundation for aninter-center transit service system The data in Table II 6 1 showthat this idea is totally false Only a very small proportion oftrips (ranging from 3 percent for total trip arrivals to 16 percentfor transit journey-to-work departures, but only 6 5 percent of thetransit journey-to-work arrivals) are inter-center trips Moreover,the traffic linkages between the centers and the Los Angeles core arealso weak; only 7 5 percent of journeys-to-work leaving the centers,and 10 percent of transit journeys-to-work, are destined for thebroadly defined core, 2 7 times larger than downtown in terms ofemployment Naturally, the share of trips originating in the core anddestined for the centers is miniscule (12 5 percent) Combined withthe results described in (i) above, these findings confirm theargument that center-hinterland (in our terminology, 'donut') flowsare much more important than inter-center flows for all types of trip(total, journeys-to-work and journeys-to-work by transit) Moreover,center-hinterland flows are much more dispersed than the trafficcorridors that link centers However, as the journey-to-work matrixin Appendix A shows, all the intercenter traffic densities are verysmall, typically only a few hundred round-trips to work per day iii) A sizeable proportion of all trips, both leaving and arrivingat centers, were with non-centers, and hence were highly dispersed(Table II 6 1) iv) The vast majority of trips (with the exception of transitjourney-towork trips arriving at centers, where the majority wasmodest, only 54 percent) neither left-nor arrived at centers but tookplace between dispersed locations (the last column of Table II 6 1) Less than one in twenty journeys-to-work left any of the 19 centers,and only one in six arrived at any of the centers v) Table II 6 2 shows the traffic flows in and out of the LosAngeles core Again, a high proportion of trips (both arrivals anddepartures) are internal to the core and its surrounding 'donut', andonly very small proportions of trips (4-5 percent of arrivals and 10-15 percent of departures) were associated with other centers However, the Los Angeles core accounts for a large proportion of allthe 19 centers' trips, particularly for transit journeys-to-work (morethan three-fifths of departures, and more than two-thirds ofarrivals) Moreover, more than 30 percent of all the region's transitjourneys-to-work pour into the Los Angeles core This confirms thatthe bulk of conventional transit worktrips in the Los Angelesmetropolitan region is associated with serving the downtown area andits immediate surroundings vi) Table II 6 3 presents the data for the four clusters ofactivity centers, i e totalling 14 centers and

excluding the fourperipherally located centers (San Bernardino, Ontario, Santa Ana, andRiverside) The peripheral centers have even higher proportions oftheir traffic flows either within themselves or their 'donuts'(Appendix A), and negligible interactions with other centers Thedata for the clusters of centers reinforce the conclusions

revealed above: more internal and hinterland flows than inter-centerflows and a high degree of interactions (especially for centerarrivals) with dispersed (i e non-center) locations The otherobvious point from the data in Table II 6 3 is that trips eitherarriving or departing from the cluster centers account for very modestshares of the region's trips once the Los Angeles core is excluded(only 1 out of 5 trips leave the centers, and only 1 out of 10 arrivethere) Most of the trips in the region take place between non-centerlocations, reinforcing the conclusion that the Los Angeles region isessentially a dispersed, even more than a policentric, metropolis vii) Tables II 6 4 1 - II 6 3 present more detailed information onthe traffic flows into and out of each activity center by cluster (14centers in four clusters) Only two of the centers (both in theWestside cluster: Westwood and Hollywood) account for more than 3percent of the region's trip origins and only two centers (Westwoodand Huntington Park in the Eastside cluster) account for more than 1 5percent of the region's trip destinations Most of the centers arenot closely linked with other member centers of their cluster; excep-tions are the Santa Monica and Mid-Wilshire centers, both on theWestside Several centers (Glendale, Burbank, USC Medical Center,Long Beach and San Pedro) have stronger links with centers outsidetheir own cluster But for all centers, inter-center linkages remainweak The aggregate trip pattern is repeated in the individual cases:most trips are internal, with the immediate hinterland or with non-centers There are some differences (Santa Monica and Long Beach aredominated by very local flows, while Huntington Park, East Hollywood,UCLA and USC Medical Center have very high shares of dispersed flows,for example), but the picture remains the same viii) The journey-to-work data on individual centers (TablesII 6 4 2, Table II 6 5 2, Table II 6 6 2, Table II 6 7 2) give similarresults to the data on total trips The only differences of note arethat these trips in the Westside cluster are destined for othercenters in the cluster to a greater degree than elsewhere and thatmost of the Westside and Eastside cluster centers have relatively highshares of workers commuting to the Los Angeles core ix) The journey-to-work transit data for the cluster centers areshown in Tables II 6 4 3, II 6 5 3, II 6 6 3 and II 6 7 3 They do notindicate much promise for commuting by transit to and from thecenters First, the numbers of journey-to-work trips by transit arevery small: only 14,705 departures from the 14 centers and 35,626arrivals Second, the Los Angeles core is the major transitdestination for many centers (the exceptions are Long Beach, SanPedro, Westwood, Santa Monica, and the Northside centers where most ofthe transit journeys-to-work are to 'donut' destinations) Third, thedominant transit journey-to-work arrivals in many centers are fromtheir 'donuts' (the exceptions are San Pedro, USC Medical Center,Burbank, and several of the Westside centers

which draw transitcommuters from non-center locations) This analysis may now be summarized:1 Many center trips, roughly about one-half, are either internal to the center or with the immediately surrounding hinterland ('donut') This generalization even applies to the Los Angeles core area 2 Inter-center traffic flows, including those with the Los Angeles core, are

relatively small 3 In fact, the centers have much more interaction with dispersed locations (in non-centers) outside their own 'donut' than with other centers 4 The peripheral centers outside Los Angeles County have negligible interac-tion with the other centers of the region 5 The vast majority of trips in the region (including JTWs) is between dispersed origins and destinations, bypassing the centers (including the Los Angeles core) Los Angeles is better described as a dispersed than a policentric metropolis 6 JTWs by transit are small, and only the Los Angeles core area features as a major transit destination (31 percent of all JTWs by transit end up in the Los Angeles core); less than 15 percent of the region's transit commuters work in the other 18 centers These results demonstrate that the scope for conventional transitservices in non-CBD activity centers is very limited if assessed onLos Angeles' experience The centers generate minimal traffic witheach other and with the Los Angeles core area Traffic flows withtheir own hinterlands and with dispersed (non-center) locations aremuch more important, but the traffic densities are too low The onlyviable complement for the automobile in the absence of major changesin the regulatory environment is the expansion of locally-providedlowcapacity paratransit services Such an expansion will require moresubsidies and further policy innovations

TABLE II 1 ITE MANUAL TRIP GENERATION RATES UTILIZED 24-Hour Trip Generation SectorRates Per Employee Manufacturing 2 01 Wholesale 8 21 Entertainment 22 80 FIRE 2 45 Public Adm 12 00 Service 6 09 Retail 33 20 Transport 16 82_____source: ITE Handbook

TABLE II 2 THE SPATIAL DISTRIBUTION OF EMPLOYMENT: DESTINATION DENSITIESLOS ANGELES FIVE-COUNTY AREA, 1980 Type # of # of % of% of Jobs/ of Zone Zones Workers Workers Area* SqMi 1 density of destinations below mean 856 2,142,274 45 6% 91 7%533 2 density of destinations 1;2 S D s above mean 14** 275,413 5 9%0 1% 57944 TOTALS 1147 4,699,578 100 0% 100 0%_____* 4,392 square miles of the five-county area's analysis zones arepresumed to be 'urbanized', for our purposes; these are zones with 50or more jobs ** The 59 analysis zones with highest employment densities cluster toform 19 'centers' sources: Computed from 1980 UTPP data and 1983 ITE trip-generationrates

TABLE II 3 THE SPATIAL DISTRIBUTION OF EMPLOYMENT: MAJOR ACTIVITY CENTERSLOS ANGELES FIVE-COUNTY AREA, 1980Est 24- # of Jobs/ Hr TripCenter WorkersAcresAcre Generat (000s) 1 L A Core 373,2836,73755 44,350 2 Westwood/ 89,4472,95630 31,245 Bev Hills/Cent City 3 Hollywood 44,8021,90223 6 784 4 Santa Monica 37,2551,67222 3 563 5 Pasadena 35,9111,41925 3 445 6 Huntington Park 30,429 55654 7 223 7 UCLA 30,029 60749 5 374 8 Glendale 25,6491,00625 5 340 9 Mid-Wilshire 20,772 96421 5 306 10 San Pedro 20,4131,04319 6 271 11 Santa Ana 18,055 94619 1 246 12 Long Beach 17,326 73123 7 270 13 USC Medical/ 16,316 43737 3 140 L A County General 14 Riverside 14,166 66121 4 177 15 Burbank 12,703 70718 0 206 16 East Hollywood 12,383 41829 6 155 17 East Los Angeles 10,471 59317 7 182 18 San Bernardino 7,324 32022 9 147 19 Ontario 4,974 30516 3 84 TOTAL 821,708* 23,980_____* 17 5% of the five-county area's total

TABLE II 4THE SPATIAL DISTRIBUTION OF EMPLOYMENT: INDUSTRIAL SECTORS BY MAJOR ACTIVITY CENTERS, L A FIVE-COUNTY AREA, 1980 (Activity Centers 1 - 19) Industrial SectorMfg Trans Whlsl Retail FIRE Serv Entert Pub Ad TOTAL 1 6 38% 11 98% 9 66% 5 41% 15 35% 8 05% 2 04% 19 70% 8 22% 2 0 47 1 09 1 21 1 79 3 93 3 34 2 66 1 09 1 96 3 0 57 1 64 0 55 1 02 0 76 0 99 3 21 0 76 1 00 4 0 36 1 20 0 35 0 89 0 94 1 29 0 24 0 68 0 81 5 0 24 0 87 0 26 0 67 1 68 1 16 0 11 0 74 0 73 6 1 61 1 03 2 16 0 20 0 05 0 07 0 02 0 15 0 68 7 0 05 0 09 0 10 0 52 0 37 1 87 0 30 0 29 0 67 8 0 84 0 74 0 83 0 53 0 27 0 37 0 33 0 31 0 56 9 0 10 0 56 0 17 0 48 1 43 0 63 0 29 0 34 0 4710 0 39 0 48 0 24 0 37 0 40 0 54 0 36 1 10 0 4511 0 0 0 34 0 09 0 34 0 93 0 47 0 04 2 23 0 4012 0 16 0 85 0 16 0 38 0 53 0 36 0 12 1 50 0 3813 0 04 0 07 0 05 0 11 0 09 0 99 0 08 0 72 0 3414 0 11 0 19 0 08 0 23 0 45 0 46 0 04 1 61 0 3115 0 09 0 52 0 10 0 16 0 25 0 30 1 58 0 04 0 2816 0 02 0 06 0 03 0 22 0 14 0 77 0 09 0 15 0 2717 0 34 0 24 0 39 0 36 0 06 0 09 0 03 0 06 0 2218 0 05 0 22 0 01 0 27 0 48 0 09 0 06 0 59 0 1619 0 04 0 19 0 01 0 13 0 19 0 11 0 02 0 42 0 11TOT 11 92% 22 36% 16-54% 14 08% 28 32% 19 69% 22 91% 32 47% 18 03%_____sources: Computed from 1980 UTPP data; centers defined as above

TABLE II 5SPATIAL DISTRIBUTION OF 369 TOP COMPANIES IN LOS ANGELES COUNTY, 1987 Type of Firm* 1 2 3 4 5 6 7 8 9 TotalSTUDY AREASCentersL A Core 10% 7% 45% 24% 0% 63% 32% 44% 0% 19%Santa Monica 1 2 5 0 0 0 0 4 0 1Westwood/CC/BH 16 2 14 8 4 21 4 12 0 9Mid-Wilshire 1 2 0 0 0 4 0 0 0 1Long Beach 0 0 0 4 4 0 4 0 0 1East L A 0 1 0 0 0 0 0 0 0 0Huntington Pk 0 1 0 0 0 0 0 0 0 1Glendale 0 0 0 0 0 0 0 0 4 1Total w/o LA Core 18 8 18 12 8 25 8 16 413Total Centers 28 15 64 36 8 88 40 60 431Non-CentersAgoura 1 1 0 0 0 0 0 0 0 1Santa Clarita1 0 0 0 0 0 0 0 4 1Lancaster 0 1 0 0 0 0 0 0 0 0S W San Fern 11 9 9 4 16 0 4 4 9 8Burbank** 3 5 0 8 0 4 4 0 0 3N E San Fern 0 2 0 0 0 0 0 0 0 1Santa Monica** 10 5 0 0 0 4 0 4 0 5West Central** 13 8 5 0 12 0 4 8 0 8South Bay 8 2 5 44 8 4 32 0 4 9Palos Verdes** 4 6 0 0 8 0 8 4 35 6Long Beach** 2 3 5 4 4 0 4 4 0 3East Central** 5 17 0 0 4 0 0 12 17 8Norwalk/Whittier 1 10 5 0 20 0 0 0 17 6L A CBD** 0 0 0 0 0 0 0 4 0 0Glendale** 5 2 5 4 4 0 4 0 0 3W San Gabr ** 8 8 0 0 4 0 0 0 0 5E San Gabr 0 6 0 0 12 0 0 0 9 3Pomona 0 0 5 0 0 0 0 0 0 0Total Non-Centers 72 85 36 64 92 13 60 40 9669_____*1 Public Company 2 Private Company3 Bank 4 Hotel 5 Shopping Center6 Office Building 7 Office Space8 Property Mgmn't 9 Office & Ind'l Park** Truncated SCAG 'Regional Statistical Area'

TABLE II 6 1 SUMMARY TRAFFIC FLOWS FOR ALL NINETEEN ACTIVITY CENTERS Destinations: Centers Non- Share Self 'Donut' LA Core Cluster Other Centers of AreaLEAVINGCENTERS:ALL TRIPS 32 4% 24 4% 1 7% 5 8% 3 9% 31 8% 37 6%JTW TRIPS 30 3 22 97 59 03 4 26 9 4 3TRANSIT JTW 31 7 25 4 10 2 12 23 8 16 8 16 2 Origins: Centers Non- Share Self 'Donut' LA Core Cluster Other Centers of AreaARRIVINGAT CENTERS:ALL TRIPS 13 8 36 31 81 91 2 45 0 15 6JTW TRIPS 7 5 35 81 22 80 9 51 8 17 5TRANSIT JTW 12 4 45 92 65 60 9 32 6 45 6

TABLE II 6 2 TRAFFIC FLOWS IN AND OUT OF THE L A CORE
Destinations: Centers Non- Share of: Self 'Donut' Cluster Other
Centers Centers AreaLEAVINGL A CORE:ALL TRIPS 31 2% 28 6%
6 0% 3 8% 30 3% 42 4% 15 9%JTW TRIPS 39 4 22 79 13 8 25 0
38 1 1 6TRANSIT JTW 44 7 26 2 10 24 3 14 6 62 5 10 1
Origins: Centers Non- Share of: Self 'Donut' Cluster Other Centers
Centers AreaARRIVING ATL A CORE:ALL TRIPS 32 7 30 93 21 1
32 1 17 3 2 7JTW TRIPS 8 2 38 13 10 9 50 0 45 4 7
9TRANSIT JTW 14 6 49 44 31 1 30 6 67 6 30 8

TABLE II 6 3 SUMMARY TRAFFIC FLOWS FOR THE FOUR 'CLUSTERS' OF ACTIVITY CENTERS Destinations: Centers Non- Share Self 'Donut' LA Core Cluster Other Centers of AreaLEAVINGCENTERS:ALL TRIPS 34 4% 18 9% 3 3% 6 0% 4 2% 33 2% 20 0%JTW TRIPS 25 1 21 6 12 89 43 4 27 7 2 5TRANSIT JTW 9 9 23 3 27 9 16 o3 1 19 9 5 9 Origins: Centers Non- Share Self 'Donut' LA Core Cluster Other Centers of AreaARRIVINGAT CENTERS:ALL TRIPS 11 6 29 02 62 01 4 53 4 10 5JTW TRIPS 7 4 31 22 52 81 0 55 2 8 6TRANSIT JTW 4 1 37 1 10 26 61 4 40 6 14 3

TABLE II 6 4 1 DISTRIBUTION OF TRAFFIC FLOWS BY CLUSTERS OF ACTIVITY CENTERS (all trips; 1980 estimates) Westside Cluster Destinations: Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaOriginCenter:S Monica 40 5% 22 5% 2 2%9 4% 2 1% 23 4% 5 8% 2 2%Hollywood 39 6 10 3 3 711 1 6 4 28 8 8 4 3 2E Hwd 39 5 10 1 5 5 7 2 5 7 32 1 2 3 0 9UCLA 35 0 12 5 2 4 6 6 3 3 40 2 3 1 1 2Westwood 33 4 20 4 4 4 6 2 3 2 32 5 11 1 4 2Mid-Wilsh 36 7 13 6 5 110 2 3 3 31 2 3 3 1 2TOTALCLUSTER 37 0 16 2 3 8 8 5 4 0 30 6 34 0 12 8 Origins:Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaDestinationCenter:S Monica 20 0% 28 3% 2 8%3 0% 0 4% 45 4% 5 0% 0 8%Hollywood 27 4 12 8 3 6 4 3 1 6 50 3 5 2 0 8E Hwd 12 5 13 6 5 0 3 3 1 4 64 4 3 1 0 5UCLA 13 4 21 5 4 6 4 5 1 2 54 8 3 4 0 5Westwood 15 1 42 1 2 8 2 3 0 5 37 2 10 5 1 6Mid-Wilsh 14 0 20 2 4 5 9 6 0 7 51 0 3 7 0 6TOTALCLUSTER 17 4 27 1 3 5 4 0 0 9 47 1 30 9 4 8Note: Estimate of total daily trips leaving this cluster is 599,469;estimate of total daily trips arriving at this cluster is1,277,359

TABLE II 6 4 2 DISTRIBUTION OF TRAFFIC FLOWS BY CLUSTERS OF ACTIVITY CENTERS (journey-to-work; 1980 UTPP data) Westside Cluster Destinations: Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaOriginCenter:S Monica 29 1% 20 3% 9 3% 14 2% 1 8% 25 4% 7 4% 0 3%Hollywood 18 9 18 9 16 612 9 3 2 29 5 11 0 0 5E Hwd 11 4 15 2 22 310 8 5 4 34 8 2 9 0 1UCLA 47 2 6 9 7 412 2 1 4 24 8 2 9 0 1Westwood 34 9 18 3 12 8 8 8 2 3 22 9 13 0 0 6Mid-Wilsh 11 5 19 5 18 521 6 1 6 27 2 3 9 0 2TOTALCLUSTER 26 5 17 9 14 012 5 2 5 26 5 41 1 1 8 Origins:Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaDestinationCenter:S Monica 11 8% 41 7% 1 9%2 5% 0 0% 42 1% 4 5% 0 8%Hollywood 9 4 22 0 2 7 3 8 1 2 60 9 5 4 1 0E Hwd 5 5 23 0 4 5 3 2 0 9 63 0 1 5 0 3UCLA 9 1 21 2 2 0 6 8 0 4 60 5 3 7 0 6Westwood 10 3 27 9 3 4 5 0 0 5 53 0 10 9 1 9Mid-Wilsh 4 4 26 3 4 7 4 4 0 7 60 0 2 5 0 4TOTALCLUSTER9 4 27 7 3 0 4 4 0 6 54 8 28 6 5 0Note: Estimate of daily JTW trips leaving this cluster is 83,502;estimate of daily JTW trips arriving at this cluster is 234,466

TABLE II 6 4 3 DISTRIBUTION OF TRAFFIC FLOWS BY CLUSTERS OF ACTIVITY CENTERS (journey-to-work transit; 1980 UTPP data)Westside Cluster Destinations: Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaOriginCenter:S Monica 14 5% 27 4% 17 2% 24 6% 1 3% 15 0% 5 3% 0 8%Hollywood 7 2 20 2 31 318 8 4 0 18 5 12 9 2 1E Hwd 0 0 15 0 45 011 6 3 2 25 3 3 1 0 5UCLA 10 0 4 4 18 934 8 4 1 27 8 0 7 0 1Westwood 20 3 21 3 19 818 7 2 9 17 0 3 4 0 5Mid-Wilsh 8 0 15 0 38 529 3 1 4 7 9 2 6 0 4TOTALCLUSTER9 5 20 2 29 120 4 3 0 17 7 27 9 4 5 Origins:Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaDestinationCenter:S Monica 8 7% 43 8% 8 4%7 3% 0 0% 31 7% 3 1% 1 4%Hollywood 10 7 33 5 11 4 3 6 1 8 39 0 3 1 1 4E Hwd 0 0 37 0 12 7 5 5 0 0 44 8 1 1 0 5UCLA 0 6 21 4 6 612 6 0 4 58 4 3 7 1 7Westwood 3 5 37 8 13 814 6 0 3 30 1 6 9 3 2Mid-Wilsh 3 3 30 0 13 7 6 9 0 4 45 7 2 2 1 0TOTALCLUSTER4 7 34 2 11 210 1 0 5 39 4 20 1 9 2Note: Estimate of daily JTW transit trips leaving this cluster is11,279; estimate of daily JTW transit trips arriving at this clusteris 22,909

TABLE II 6 5 1 DISTRIBUTION OF TRAFFIC FLOWS BY CLUSTERS OF ACTIVITY CENTERS TOTAL TRIPS LEAVING ACTIVITY CENTERS (all trips; 1980 estimates) Eastside Cluster Destinations: Shares:Centers Non- Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaOriginCenter:USC Med 24 7% 8 8% 3 6%1 2% 7 2% 54 5% 1 7% 0 6%East LA 37 2 15 9 3 6 4 0 3 5 35 7 1 4 0 5Hunt Pk 1 4 30 3 1 4 0 4 0 8 65 7 1 8 0 7TOTALCLUSTER 19 8 18 7 2 8 1 7 3 8 53 1 4 8 1 8 Origins:Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaDestinationCenter:USC Med 6 5% 18 1% 5 6%0 5% 3 6% 65 7% 2 7% 0 4%East LA6 7 15 8 2 6 0 1 2 1 72 6 3 3 0 5Hunt Pk 0 1 0 1 1 2 0 2 0 8 97 6 9 7 1 5TOTALCLUSTER2 7 6 6 2 3 0 2 1 5 86 6 15 4 2 4Note: Estimate of total daily trips leaving this cluster is 85,080;estimate of total daily trips arriving at this cluster is 635,065

TABLE II 6 5 2 DISTRIBUTION OF TRAFFIC FLOWS BY CLUSTERS OF ACTIVITY CENTERS (journey-to-work; 1980 UTPP data) Eastside Cluster Destinations: Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaOriginCenter:USC Med 19 7% 16 4% 14 5%3 2% 7 8% 38 3% 0 9% 0 0%East LA 11 1 23 1 17 7 3 5 2 4 42 2 1 0 0 0Hunt Pk 68 4 18 4 0 0 0 0 0 0 13 2 0 0 0 0TOTALCLUSTER 16 2 20 0 15 9 3 3 4 8 40 0 1 9 OA Origins:Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaDestinationCenter:USC Med 2 1% 13 3% 3 1%0 1% 3 1% 78 3% 2 0% 0 4%East LA2 2 28 6 4 2 0 3 2 2 62 6 1 3 0 2Hunt Pk 0 2 30 7 1 4 0 3 0 8 66 7 3 7 0 6TOTALCLUSTER1 1 25 4 2 4 0 2 1 7 69 2 7 0 1 2Note: Estimate of daily JTW transit trips leaving this cluster is3,862; estimate of daily JTW trips arriving at this cluster is 57,142

TABLE II 6 5 3 DISTRIBUTION OF TRAFFIC FLOWS BY CLUSTERS OF ACTIVITY CENTERS(journey-to-work transit trips; 1980 UTPP data) Eastside Cluster Destinations: Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaOriginCenter:USC Med 0 0% 4 0% 48 7%0 0% 6 6% 40 7% 0 6% 0 1%East LA6 6 17 1 30 8 0 0 3 6 42 0 0 8 0 1Hunt Pk 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0TOTALCLUSTER3 8 11 5 38 4 0 0 4 9 41 4 1 3 0 2 Origins:Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaDestinationCenter:USC Med 0 0% 17 0% 8 9%0 0% 5 9% 68 2% 1 5% 0 7%East LA1 8 52 3 16 4 1 7 1 9 26 0 1 0 0 5Hunt Pk 0 0 53 5 11 5 0 0 1 3 33 7 1 2 0 6TOTALCLUSTER0 5 38 9 11 8 0 4 3 3 45 3 3 8 1 7Note: Estimate of daily JTW transit trips leaving this cluster is531; estimate of daily JTW transit trips arriving at this cluster is4,211

TABLE II 6 6 1 DISTRIBUTION OF TRAFFIC FLOWS BY CLUSTERS OF ACTIVITY CENTERS (total trips; 1980 estimates) Northside Cluster Destinations: Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaOriginCenter:Glendale 37 3% 17 7% 3 6%1 6% 7 5% 32 6% 3 7% 1 4%Pasadena 33 7 31 8 1 8 1 2 3 5 28 0 4 4 1 6Burbank 24 2 23 1 2 0 1 8 11 5 37 4 1 5 0 6TOTALCLUSTER 33 6 25 0 2 4 1 5 6 3 31 3 9 6 3 6 Origins:Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaDestinationCenter:Glendale 14 6% 24 6% 3 4%0 6% 2 4% 54 3% 4 0% 0 6%Pasadena 16 8 30 8 1 6 0 5 1 6 48 7 3 7 0 6Burbank4 1 69 7 1 0 0 6 5 8 18 9 3 8 0 6TOTALCLUSTER 11 9 41 4 2 0 0 5 3 3 40 9 11 6 1 8Note: Estimate of total daily trips leaving this center is 168,979;estimate of total daily trips arriving at this cluster is 478,261

TABLE II 6 6 2 DISTRIBUTION OF TRAFFIC FLOWS BY CLUSTERS OF ACTIVITY CENTERS (journey-to-work; 1980 UTPP data) Northside Cluster Destinations: Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaOriginCenter:Glendale 23 0% 23 4% 9 5%3 2% 6 7% 34 1% 4 4% 0 2%Pasadena 31 2 32 0 11 2 0 8 4 1 20 7 5 1 0 2Burbank 15 8 29 1 10 7 3 9 11 7 28 8 2 0 0 1TOTALCLUSTER 25 5 28 2 10 4 2 3 6 4 27 2 11 4 0 5 Origins:Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaDestinationCenter:Glendale 8 0% 34 9% 1 8%0 8% 1 3% 53 3% 3 1% 0 6%Pasadena 9 0 57 8 0 3 0 5 0 7 31 7 4 4 DABurbank4 9 31 0OA 1 2 3 0 59 5 1 6 0 3TOTALCLUSTER7 9 45 3OA 0 7 1 3 43 9 9 1 1 6Note: Estimate of daily JTW trips leaving this cluster is 23,191;estimate of daily JTW trips arriving at this cluster is 74,288

TABLE II 6 6 3 DISTRIBUTION OF TRAFFIC FLOWS BY CLUSTERS OF ACTIVITY CENTERS(journey-to-work transit trips; 1980 UTPP data) Northside Cluster Destinations: Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaOriginCenter:Glendale 16 5% 16 9% 29 8%0 0% 4 3% 32 5% 1 8% 0 3%Pasadena 17 4 31 9 32 1 0 0 1 7 16 9 2 3 0 4Burbank7 7 20 1 10 7 8 3 23 7 30 2 0 4 0 2TOTALCLUSTER 16 1 24 8 29 1 0 8 4 8 24 4 4 6 0 7 Origins:Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaDestinationCenter:Glendale 8 3% 30 4% 14 8%0 9% 2 8% 42 7% 1 3% 0 6%Pasadena 8 2 73 1 0 0 0 0 0 0 18 8 1 8 0 8Burbank4 6 28 0 5 3 0 0 16 7 45 4 0 2 0 1TOTALCLUSTER7 9 52 9 6 2 0 4 2 4 30 2 3 3 1 5Note: Estimate of daily JTW transit trips leaving this cluster is1,846; estimate of daily JTW transit trips arriving at this cluster is3,746

TABLE II 6 7 1 DISTRIBUTION OF TRAFFIC FLOWS BY CLUSTERS OF ACTIVITY CENTERS (total trips; 1980 estimates) Southside Cluster Destinations: Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaOriginCenter:Long Bch 33 5% 34 7% 0 4%1 4% 1 6% 28 3% 2 3% 0 9%San Pedro 29 8 19 3 2 9 1 6 3 3 43 1 2 5 0 9TOTALCLUSTER 31 6 26 8 1 7 1 5 2 5 35 9 4 8 1 8 Origins:Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaDestinationCenters:Long Bch 7 0% 56 6% 0 5%0 4% 0 4% 35 1% 4 8% 0 8%San Pedro 6 8 56 1 1 1 0 3 0 9 34 7 4 6 0 7TOTALCLUSTER6 9 56 4 0 8 0 3 0 6 34 9 9 4 1 5Note: Estimate of total daily trips leaving this cluster is 84,694;estimate of total daily trips arriving at this cluster is 387,371

TABLE II 6 7 2 DISTRIBUTION OF TRAFFIC FLOWS BY CLUSTERS OF ACTIVITY CENTERS (journey-to-work trips; 1980 UTPP data) Southside Cluster Destinations: Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaOriginCenter:Long Bch 13 9% 41 2% 2 4%1 4% 1 5% 39 6% 1 9% o 1%San Pedro 12 5 42 4 7 9 1 4 3 1 32 6 0 5 0 1TOTALCLUSTER 13 2 41 8 5 3 1 5 2 3 36 0 4 0 0 2 Origins: Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaDestinationCenters:Long Bch 3 2% 54 1% 0 1%0 4% 0 2% 42 1% 2 1% 0 4%San Pedro 2 6 06 8 4 3 0 3 3 4 72 6 2 5 0 4TOTALCLUSTER2 9 33 9 2 4 0 3 2 0 58 6 4 6 0 8Note: Estimate of daily JTW trips leaving this cluster is 8,200;estimate of daily JTW trips arriving at this cluster is 37,615

TABLE II 6 7 3 DISTRIBUTION OF TRAFFIC FLOWS BY CLUSTERS OF ACTIVITY CENTERS(journey-to-work transit trips; 1980 UTPP data) Southside Cluster Destinations: Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaOriginCenter:Long Bch 5 9% 58 6% 5 8%1 3% 0 0% 28 4% 2 0% 0 3%San Pedro 5 0 65 9 9 1 8 2 0 0 11 8 0 5 0 1TOTALCLUSTER5 7 60 2 6 5 2 8 0 0 24 9 2 6 0 4 Origins:Shares:Centers Non-Self 'Donut' LA Core Cluster Other Cntrs Cntrs AreaDestinationCenters:Long Bch 2 5% 80 1% 0 0%0 9% 0 0 16 6% 1 7% 0 8%San Pedro 0 4 6 2 12 4 0 4 5 3 75 3 2 4 1 1TOTALCLUSTER1 3 36 9 7 3 0 6 3 1 50 9 4 2 1 9Note:Estimate of daily JTW transit trips leaving this cluster is 1,049;estimate of daily JTW transit trips arriving at this cluster is 4,760

III State of the area's transit providersIntroduction Over the past decade, public transit in Los Angeles has undergonemany changes, both in the service delivery system (who provides whatservice and who allocates the funds) and in the transit financingsystem In order to understand the current status of transit andtransit policy in Los Angeles County, it is necessary to provide somebackground on its evolution The changes that have taken place havebeen directed at the following three objectives: 1) Increase thequantity and variety of transit services in the County, 2) Develop alocal funding base for both capital and operating support, and 3)Implement a longrange plan for a regional rail transit system Thesechanges are particularly interesting because they illustrate afundamental conflict in policy orientation On the one hand, policyobjectives reflect an emphasis on serving local markets and providinga dispersed set of small, individual services On the other hand,there is also an emphasis on developing a traditional, core-orientedmass transit system History Transit in Los Angeles County has been dominated by the SouthernCalifornia Rapid Transit District (SCRTD) since its formation in 1965 State legislation authorized formation of the District, and it wasgranted sole operating rights throughout the County SCRTD was alsodesignated the regional transit carrier, and thus had operatingauthority for all connecting services in the adjacent counties ofOrange, Riverside, and San Bernardino The only exemptions to SCRTD'soperating rights were the service areas of the County's 12 pre-existing municipal operators (e g Santa Monica, Long Beach,Montebello) These municipal operators retained their operatingrights within their own jurisdictions, but were effectively preventedfrom expanding into any new areas SCRTD was by far the largesttransit operator in the County since its inception, and has operated85 to 90 percent of all the County's transit ever since The California State Transportation Development Act of 1972authorized the first local source of transit support The TDAauthorized an additional 1/4 cent sales tax on gasoline to beearmarked for public transit in California's urbanized counties TDAfunds were collected by the state and redistributed back to localjurisdictions This revenue source, together with the rapid expansionof the Federal transit subsidy program, provided the revenue base forthe revitalization and expansion of public transit in the county Although there was no competition in state or federal operatingsubsidy allocation, (the split of TDA funds among the 13 transitoperators in Los Angeles County was determined in the legislation)there were conflicts over transit service policy among local decision-makers These conflicts led to the formation of the Los AngelesCounty Transportation Commission (LACTC) in 1977 The Commission iscomposed of elected officials from the cities and County of LosAngeles Duties of LACTC included approval of all short-and long-range transit plans The purpose of

establishing LACTC was to protectlocal transit interests and to temper the influence of SCRTD However, LACTC's influence was limited by the lack of anydiscretionary power over funding decisions

The situation changed drastically with the passage of Proposition A in1980 Proposition A authorized an added 1/2 cent sales tax,countywide, to be earmarked for public transit It allowed for atemporary (3 year) roll-back in SCRTD fares to 50 cents, capitalfunding for a 150-mile regional rail network, and operating fundingfor both new and existing transit operations General provisions ofProposition A were as follows: --25% to the 'Local Return Program' --35% to a reserve fund for rail construction --40% to discretionary uses determined by LACTC The Local Return Program returns 25 percent of all revenues collectedback to the local jurisdictions These monies may be spent on anytransit-related use, subject to LACTC approval The discretionaryfund is currently split 95/5, with 95 percent used for operatingsubsidies to SCRTD and the municipal carriers and 5 percent used byLACTC as 'incentive funding' for favored projects The consequences of Proposition A are significant The sales tax hasgenerated a large and growing amount of local funding In 1982 itgenerated $208 million; the total in 1987 was $336 million LACTCbecame the most powerful transportation agency in the County as aresult of controlling this major revenue source Also, the localreturn program promoted the rapid development and expansion of localtransit services SCRTDThough more than one public transit agency operates in the five-countystudy area, the following section concentrates on services provided bythe Southern California Rapid Transit District (SCRTD), which is themajor local transit property This district encompasses mainly thearea of Los Angeles county, though a few other small municipal buscompanies also operate in the county and despite the fact that a fewof the SCRTD routes run into neighboring counties (Table III 1) SCRTD is the local legally designated 'regional carrier' Its servicearea is approximately 2,000 square miles, including approximatelyeighty cities it operates about 2,000 buses and recent dailyridership has been as high as 1 46 million (Table III 2 and FigureIII 1) The agency has an operating budget of $507,022,000 for fiscal1989, of which $314,330,000 (62%) is covered by subsidies fromfederal, state, and local government sources Subsidies have doubledsince 1980 (Table III 3 and Figure Ill 2) SCRTD has been experiencing problems Its costs and deficits havebeen rising faster than passengers or fare-box revenues (Table III 4and Figure III 3) Allegations of inefficiencies, mismanagement, andcorruption have surfaced regularly in the Los Angeles newspapers Service cutbacks have taken several forms Some of SCRTD's freewayexpress services have been taken over by the City of Los Angeles,using its share of the Proposition A (dedicated sales tax) revenuesand contracting to private operators With this approach, costs havebeen cut and overall ridership has increased by 54 percent in ninemonths

48

35

because a more reliable schedule of departures has been followed(Table III 5) The buses are grafitti-free and patrons have beenspared the SCRTD's recent fare increases Included in LACTC's duties is the provision of cost-effectiveservices LACTC has used this provision to justify the replacement ofSCRTD service with that of lower-cost private contract providers Most recently, the Commission has proposed the identification ofTransportation zones -- areas that because of low demand or distancefrom the core are difficult and/or costly to serve by SCRTD Thefirst transportation zone was established in the San Gabriel Valleyarea, located in the northeast quadrant of the County Transitservices within the zone are evaluated and redesigned as necessary,and put out to bid SCRTD has the option of bidding on the service,but their high unit costs prevent them from being competitive It isestimated that $4 6 million would be diverted from SCRTD's subsidiesto support this new service Proponents suggest that costs would bereduced and service expanded The district (and its major employees'union) has brought suit and the formation of the Zone is now stalled Informal discussions and studies of similar 'zones' in other parts ofLos Angeles county have recently surfaced These, of course, awaitresolution of SCRTD's lawsuit Yet, all of these changes simplyrepresent a slow coming to terms with reality There is no economicreason for the existence of a major carrier the size of SCRTD Thescale economies are just not there In fact, the District's problemsare evidence of severe scale diseconomies The comparative success ofsmaller and more specialized transit providers is to be expected Data from the SCRTD's 1986-87 ridership survey were available at thecensus tract level It was, therefore, possible to study transitservice to the nineteen major activity centers (Table III 6) Somewhatsimilar data were provided by two of the comparatively larger localmunicipal bus companies (the Santa Monica Municipal Bus Lines and theLong Beach Public Transit Company) This information was added wherethe two lines served activity centers Approximately 34% of SCRTD's boardings and alightings take place inthe nineteen centers Yet, almost three-quarters of these are in theL A Core The absence of significant transit service in the othercenters, in spite of our finding that much traffic to the centers isfrom the surrounding 'donut', may be surprising Conventionaltransit, it appears, is best suited to the area surrounding the CBDand little else Trip purpose data are not available for each of the activity centers SCRTD's tracking studies found that 52% of its boardings areworktrips; 64% of bus riders surveyed in downtown Los Angeles weretravelling to or from work *While SCRTD and the municipal transit operators have maintained arelatively constant level of operation, local transit services havegreatly expanded as a---------- *1981 Ridership Tracking

Study: Mode Choice by Trip Type, by RonaldA Johnson (1983), SCRTD Market Research

result of Proposition A (Appendix E) In 1980, 24 cities had localtransit services of some sort, including the cities with municipalfixed-route services By 1988, 64 of the 86 cities in the County wereproviding one or more type of local services FY 1988 local servicesrelated expenditures amounted to approximately $46 2 million, notcounting funds given to other existing carriers for added localservice The most recent estimate is that 253 different localservices are currently in operation within the cities and countyunincorporated area In fact, there has been so much proliferation oflocal services that LACTC is using its incentive fund to promote theformation of 'subregional systems ' The subregional systems cross atleast one municipal boundary and are jointly provided by two or moremunicipalities As of FY 1987-88, 12 subregional systems had beenformed The purpose of establishing subregional systems is to providecoordinated service, to minimize overlapping services, and to designservice-areas around patterns of travel demand The local return program has provided local governments with asignificant revenue source for transit-related projects Funds may beused for transit service development, or program administration Funds can also be exchanged between jurisdictions, and can be accruedfor up to three years All expenditures are subject to LACTCapproval To date, LACTC has exercised little actual control on theseprojects Local return expenditures have increased dramatically overthe past five years In earlier years, fund allocations greatlyexceeded actual expenditures This trend has now been reversed, andexpenses for the past two years have been greater than the annual fundallocation of approximately $85 million (Figure III 4) Figure III 5 shows how expenditures have increased between 1985 and1988, and how expenditures were distributed between categories Service expenses include local transit operations as well as subsidiescontributed to other carriers (e g free RTD bus passes) Serviceexpenses were $32 4 million in 1985 (63% of total) and $51 5 million(48% of total) in 1988 Capital expenses include vehicle and otherequipment acquisition, new facilities, and in a few cases capitalreserves for local rail transit projects Metro-rail expenses arelocal match contributions to the metro-rail project from the City ofLos Angeles Program expenditures more than doubled between the twocomparison years, from $51 4 million in 1985 to $107 4 million in1988 Local return transit servicesOne of the major impacts of Proposition A is the proliferation oflocal transit services These services are generally limited to theindividual cities (in the case of Los Angeles to individual districtswithin the City) Table III 7 shows how these services have expandedin the past three years Services are categorized by type 'Generalpublic' includes fixed-route, demand-responsive, commuter or otherservice available to the general public

'Elderly and handicapped'includes all services limited to this user group 'Recreational orspecial events' includes all transportation services linked withspecific programs Subsidies to 'others' includes all forms of user-side subsidies as well as contributions to existing transit operatorsfor specific services Table III 7 also gives the number of cities providing at least oneservice of the given type A total of 72 of the 86 cities and LosAngeles County provided at least one type of service in 1985, and 75cities were providing at least one

type in 1988 Table III 7 indicates that the number of citiesproviding general public service has remained constant, while otherservice categories have increased significantly, both in number anddollar terms Expenditures on elderly and handicapped services haveincreased by a factor of 4; expenditures on various subsidy programshave increased by a factor of 375 The numbers also suggest thatnearly half of the cities provide more than one type of service Local transit surveyBecause services operated under the local return program are notsubject to any reporting requirements, there is little informationavailable on the operating characteristics or performance of thesesystems A survey was conducted as part of this research in an effortto obtain basic data on these systems Surveys were mailed to each ofthe cities requesting information on type of services provided,service use, and length of service operation The survey responserate was 71 percent after two follow-up letters and several follow-uptelephone calls; a total of 60 valid surveys were received Of these,57 cities were providing 136 different local services Basic characteristics of the local services are given in Table III 8 Services are categorized into 5 service types: general public fixed-route, general public demand-responsive, elderly and handicappeddemand-responsive, recreational, and user subsidy The user subsidyservices are various types of bus pass or taxi pass programs, and notseparate operating services The majority of these are free passprograms for SCRTD bus service Table III 8 gives both the number ofservices in each category, and the number identified as having beenimplemented as a result of the availability of Proposition A funds The average length of time the service has been in operation reflectsthe fact that many of these services have been in operation forseveral years prior to the measure Table III 8 also shows thatservice is provided 12 to 13 hours per weekday, with some servicesoperating 24 hours per day Most services also operate on weekends The survey also asked about the types of trips served by the transitservice Table III 9 shows trip purpose as a percent of totalresponses in each service category Recreational services are notincluded because they are single purpose services Since multipleresponses were allowed, the percentages reflect the relative share ofeach trip type by or purpose it should be noted that the data arebased on the responses of city staff who filled out the questionnaire,and not necessarily on user surveys Impact of Proposition A on Transit ServicesAs stated previously, Proposition A provides a substantial revenueflow for public transit in Los Angeles County It has generated thedevelopment of many new local services, has provided LACTC with fundsto operate services directly (through the County allocation), allowedfor service expansion without taking funds from existing operators,notably SCRTD, provided a large and

growing capital reserve fund, andhas provided LACTC with sufficient power to mandate the development ofmore cost-effective services The previous section has shown how Proposition A has generated a verylarge increase in the number of local services operating within theCounty The most

recent (1988) estimate is 250 separate local services currently inoperation This does not include the 12 subregional operationsmentioned earlier There is no information on the effectiveness ofthese services, and thus whether they are increasing transit use orserving previously unmet travel demands remains to be determined Discussions with LACTC staff revealed some concern regarding the lackof information on service performance and the coordination problemsgenerated by these services The subregional services are LACTC'sattempt to consolidate some of these services and develop serviceareas that more closely match travel patterns The local return allocation to Los Angeles County is directly underthe control of LACTC The agency has used these funds to providelocal bus services, both fixed-route and demand responsive, on acontract basis using private sector providers LACTC has long been aproponent of contracted services, and has been able to demonstratetheir cost-effectiveness Service contracting is now the norm ratherthan the exception among local services All of the subregionalsystems are contract operations According to LACTC staff, the vastmajority of the local return systems are also contract operations The result of these changes is an increase in the total amount oftransit service provided, while SCRTD service has remained relativelystable A rough estimate of the magnitude of this change can be madefrom transit operating expenditures In 1980, total transit operatingexpenditures amounted to about $317 million, and SCRTD accounted foralmost 90 percent of the total In 1988, total transit expenditureswere approximately $621 million, with SCRTD accounting for a littlemore than 80 percent of the total In terms of transit service, then,the trend has been toward individualized local services largelyprovided through private contractors and away from continued growth ofSCRTD services It would, therefore, appear that the serviceexpansion generated by Proposition A reflects the decentralizedpattern of travel flows identified in this research Local return program in the activity centersAlthough the absence of operational data makes it impossible toexamine local transit usage patterns in cities with subcenters, somecomparisons of local return fund expenditures can be made It may berecalled that 14 of the activity centers identified in this researchare in Los Angeles County All or part of 6 of the 14 L A Countysubcenters (as well as the Los Angeles core) are located in the Cityof Los Angeles The relative shares of Proposition A FY 1988expenditures for the City of Los Angeles, other cities withsubcenters, and the remainder of cities (including Los Angeles County)are shown in Figure III 6 Los Angeles City has the largest share, 43percent Both, Los Angeles and the other cities with subcenters haveexpense shares slightly greater than population shares, indicatingthat the subcenter cities generate more

sales tax than other cities The other subcenter cities account for about 12 percent of the Countypopulation, and Los Angeles accounts for about 38 percent of theCounty population Table III 10 shows Proposition A expenditures per capita for the threesectors (Los Angeles City, other subcenter cities, and all other localjurisdictions) both for total expenditures and service expenditures These were calculated for FY 1988, using 1987 updated populationestimates Per capita expenditures

are quite compatible for other subcenter cities and non-subcentercities The rates are quite different for Los Angeles Total percapita expenses are about 50 percent greater than in the other twosectors, while service expenditures are substantially lower Thesedifferences reflect Los Angeles' contribution of $23 9 million ofthese funds to Metro-Rail construction It is interesting to notethat the smaller investment in service subsidies could reflect thegreater usage of transit in the core and adjacent areas (more usemeans more fare revenue and less subsidy, all other things equal),rather than a lesser commitment to current transit needs within thecity The available data suggest that both transit use and local transitfunding support are similar between subcenters and non-subcenters This is in contrast to the Los Angeles core, which accounts for adisproportionately large share of transit use and transit expenses The core area is of course the focus of the Metro-Rail system, andthus will continue to receive the greatest share of transit-relatedcapital funding This review of transit services in Los Angeles points to severalconclusions:1 The bus monopoly is gradually being broken up, bringing lower costs, better service, and higher ridership levels 2 Metro-Rail, the proposed light-rail lines and conventional bus services are irrelevant to meeting the travel demands connected with non-CBD activity centers because there is negligible corridor traffic (existing or potential) between the centers, and the dispersed traffic flows must rely either on the automobile or on low-capacity modes 3 Public, subsidized and private for-profit paratransit services can co-exist side-by-side There may be some scope for expanding these services, but policy changes would be needed: more deregulation, more competitive bidding to minimize subsidies, and more innovative types of service In addition, Metro-Rail is likely to drain available transit subsidies away from bus and paratransit, especially when it goes into operation and begins to build up operating losses Thus, an increasingly smaller segment of the transit market will absorb an increasingly larger share of the transit funds available 4 Although this type of service is the only alternative to the automobile given the dispersed trip patterns around activity centers, the markets that have developed hitherto are very small, and are likely to remain small in the absence of tough restraints on automobile use Even so, the evidence from the myriad small- scale transit services in place is that they have had a negligible impact in terms of increasing transit ridership in spite of a heavy expenditure on subsidies 5 Privately provided but publicly subsidized paratransit services for the specialized in-need groups are effective, but should be subjected to stronger performance evaluation and efficiency criteria

TABLE III 1 SCRTD SERVICE DATA BY COUNTY, 1986-87 County Boardings Alightings Los Angeles1380993 1380681 (L A City 1016116 1008467) Orange 2856 3032 Riverside660649 San Bernardino 902 1028 Ventura 56 77 System Total 1385467 1385467source: SCRTD on-board ridership survey, 1986-87

TABLE I I 1 2 SCRTD BASIC STATISTICS, 1980 - 86 Year* Passengers(m) Vehicle-Service Hrs Peak-Vehicles 1979-80 352 7 6200 1914 1980-81 389 2 6865 1948 1981-82 354 6 6733 1898 1982-83 415 9 6762 1869 1983-84 465 6 7063 1992 1985-86 450 4 7066 1945* Data for FY 1984-85 unavailable Source: Transportation Development Act, Annual Reports, StateComptroller's Office

TABLE III 3 SCRTD SUBSIDIES, 1980 - 86 (millions of current of which Year* Local Prop-A TDA** State Federal TOTAL 1979-8083 1 082 0 0 276 8 160 1 1980-81 107 6 0 106 120 058 3 185 9 1981-8298 7 092 526 364 7 164 7 1982-83 207 9 124 682 014 249 7 271 9 1983-84 221 6 140 180 217 250 9 289 2 1985-86 224 585 5 188 0 7 451 4 283 3* Data for FY 1984-85 unavailable ** Transportation Development Act, local assistance Source: Transportation Development Act, Annual Reports StateComptroller's Office

TABLE III 4SCRTD COSTS AND REVENUES, 1988 - 86(millions of current $) OperatingOperatingof which Year* Cost Revenue Passqr Revenue Deficit 1979-80281 6 108 5 102 4 178 1 1980-81351 1 151 6 141 8 199 5 1981-82398 1 185 5 164 7 212 6 1982-83427 6 123 6 107 6 304 0 1983-84463 4 138 8 119 8 324 6 1985-86535 6 216 1 199 0 319 5* Data for FY 1984-85 unavailableSource: Transportation Development Act, Annual Reports StateComptroller's Office

TABLE II 1 5 RIDERSHIP ON COMMUTER BUS LINES TAKEN OVER FROM SCRTD AND CONTRACTED TO PRIVATE OPERATORS BY L A CITY October 1987 - June 1988 Month Ridership* October 198732,207 November 1987 37,917 December 1987 38,757 January 198842,593 February 1988 44,803 March, 1988 51,707 April, 1988 47,167 May, 1988 48,203 June, 1988 49,588_____* Includes data for eleven commuter bus lines taken over from SCRTDand the new Encino line, added at the beginning on 1988 Source: Department of Transportation, City of Los Angeles

TABLE III 6 CONVENTIONAL TRANSIT SERVICE BY MAJOR ACTIVITY CENTER, 1986-87(SCRTD data; SMMBL and LBPTC service added where indicated)Center Boardings Alightings B/ETTG* A/ETTG (and %'s of RTD L A County totals) 4 Santa Monica 6511(O 50) 6457(0 47) 0 0166 0 0326 SMMBL 13465 12891 0 0239 0 0229 Total 19976 19348 0 0355 0 0555 3 Hollywood 30762(2 23) 28458(2 06) 0 0135 0 0886 16 E Hollywood 21710(1 57) 13726(1 00) 0 1480 0 0886 7 UCLA 3076(0 22) 3667(0 27) 0 0082 0 098 SMMBL 5861 4462 0 0157 0 0119 Total 8937 8129 0 0239 0 0217 2 Westwood/BH/CC16783(l 22) 16769(1 21) 0 0135 0 0135 9 Mid-wilshire 11147(0 81) 10594(0 77) 0 0364 0 0345 1 LA Core 345674(25 03) 344812(24 97) 0 0795 0 0793 SMMBL 441468 0 0001 0 0001 Total 346115 345280 0 0796 0 0794 12 Long Beach 5482(0 40) 6627(0 48) 0 0203 0 0245 LBPTC 13056 13034 0 0484 0 0483 Total 18538 19661 0 0687 0 0728 13 USC Medical 4309(0 31) 3804(0 28) 0 0308 0 0272 17 East LA 3184(0 23) 3227(0 23) 0 0175 0 0177 6 Huntington Pk 2840(0 21) 2864(0 21) 0 0127 0 0128 8 Glendale 6834(0 49) 6051(0 44) 0 0201 0 0178 5 Pasadena12613(0 91) 10600(0 77) 0 0283 0 0238 18 San Bernardino 132(0 01)159(0 01) 0 0009 0 0011 15 Burbank 643(0 05)699(0 05) 0 0031 0 0034 10 San Pedro1079(0 08) 1617(0 12) 0 0040 0 0060 19 Ontario 76(0 00) 99(0 00) 0 0009 0 0012 11 Santa Ana 3563(-)4687(-) 14 Riverside 418(0 04)376(0 03) 0 0024 0 0021 ETTG: estimated (24-hour) total trips generated (table 11 1)

TABLE III 7 LOCAL RETURN SERVICE EXPENDITURE BY TYPE
1984-85 vs 1987-1988 1984-1985 1987-1988Service Type#Cities
Expenses #CitiesExpenses General Public 46 $25 6 46 $23 3 E & H
385 4 52 20 8 Rec/Special 321 2 51 2 3 Subsidy 10 1 41 5 2
TOTAL $33 3$51 6

TABLE III 8 CHARACTERISTICS OF LOCAL SERVICES GP-FR GP-DRT E & HRECSUB Number 17 22 46 31 15 Number due to Prop A 11 16 30 27 15 Time in operation mean (yrs) 11 95 77 54 52 8 Median (yrs) 3 24 75 54 02 5 Range (yrs)12-55* 2-16 5 1-16 5 3-261-7 Service hrs/weekday Mean 13 3 13 3 12 4N/AN/A Range 4-24 4-24 6-24N/AN/A Service hrs/week Mean78 75 76N/AN/A

TABLE III 9 TRIP PURPOSE BY PARATRANSIT SERVICE TYPE
PURPOSEGP-FR GP-DRT E & HSUB Medical/dental
15%60%95%45% Shopping 77 80 88 64 Social/recreational 69 50 44
36 Work54 55 23 36 School 69 70 26 55 Other 23 75 28 9
49

TABLE III 10PROPOSITION A EXPENDITURES PER CAPITA, FY 1988 Service Expenditure Total Expenditure per Capita per Capita Los Angeles $5 03$15 39 Other Subcenters 6 98 10 49 Others 6 3710o 82 50

Figure III 1Click HERE for graphic 51

Figure III 2Click HERE for graphic 52

Figure III 3Click HERE for graphic 53

Figure III 4Click HERE for graphic 54

Figure III 5Click HERE for graphic 55

Figure III 6Click HERE for graphic 56

IV Public transportation in sub-centers: two case studiesThis chapter presents results of two case studies conducted in orderto survey the array of transportation services provided in subcenters Our analysis has shown that conventional mass transit plays a minorrole in subcenter travel patterns, and suggests that more localized,flexible transit options may be more appropriate In order toevaluate the further viability of alternative forms of publictransportation, we have conducted two studies The first is acomprehensive survey of transportation services being provided in twoof our identified subcenters; the cities of Glendale and Pasadena The second is a survey of local subsidized transit services within LosAngeles county The local transit survey was discussed in chapterIII Purpose of the case studiesThe purpose of the case studies is to determine the types of transitservices that have emerged in subcenters and that can provide guidancefor future subcenter--based transportation planning Los angelescounty provides a particularly rich resource for such a study not onlybecause of the rapid growth and development of subcenters, but alsobecause of the availability of local transit subsidy funding Localfunding has encouraged the development of innovative transitalternatives In addition, the economic vitality of the area hascreated market opportunities for private, unsubsidized transportationservices as well The case studies provide information on all formsof 'for-hire' transportation services Thass transportation' isdefined in the broadest terms so as to encompass both subsidized andfor-profit activities By examining the entire spectrum of publictransportation services, we can gain a better understanding of thetransportation market in urban subcenters The case studies thusencompass regular transit services, locally funded paratransit servi-ces, services provided by PLIC-licensed carriers, and ridesharingservices The case study citiesPasadena and Glendale are similar in many respects They are amongthe region's oldest cities: Pasadena was incorporated in 1886;Glendale was incorporated in 1906 Pasadena emerged as an earlyaffluent suburb of Los Angeles, and by 1920 had a population of over45,000 Only 7 miles from downtown Los Angeles, the Arroyo SecoParkway (built initially as a bicycle path), provides easy access tothe city Glendale remained a small city until postwar years, wheneconomic and population growth promoted rapid suburban residentialgrowth throughout the region Table IV 1 gives selected populationcharacteristics for the two cities They are of comparable size Pasadena is slightly less affluent, with a lower median income andmore households below the poverty level Pasadena is also moreethnically mixed, with a relatively high proportion of non-whitepopulation Economic characteristics are somewhat different (seeTable IV 2) Glendale has more employment than Pasadena, but also hasmore resident workers Thus the ratio of

jobs to resident workers ishigher for Pasadena Given the large number of jobs available inPasadena, we find that a smaller proportion of residents work outsidethe city Both cities have substantial retail sales activity, withtotal annual sales close to $1 billion Both cities have experiencedsteady growth in recent years, and both have undergone substantialredevelopment Glendale used redevelopment funds to help finance theGlendale Galleria, now the city's major retail center Pasadena

has redeveloped major portions of the central city Commercial/officedevelopment is occurring in both cities, and both are alsoexperiencing growing traffic problems as a result of this growth DataCase study data were gathered from a variety of sources Informalinterviews were conducted with city staff members to identify servicesoperating within the area Information on locally funded services wasprovided by LACTC as well as the cities and services provided Ridesharing information was gathered from local TSM consultants Dataon private, for-hire services were obtained via telephone interviewswith carriers licensed by the California Public Utilities Commission Public transportation: GlendaleThe city of Glendale provides to its citizens, through contracts withprivate transportation providers, the following services:A fixed-route shopping shuttle that brings shoppers from residentialareas to the downtown commercial district Known as the 'BeeLineShuttle', this service provides rides to about 95,000 passengers peryear, operating two mini-buses on weekdays between 9am and 6pm andfour mini-buses between 1lam and 11pm The shuttle is operated by aprivate contractor using city-owned vehicles purchased with Prop Afunding The fare is quite nominal at $0 25 per ride Bulk sales areencouraged; 200 or more tickets are sold at $0 10 each These salesare to local retailers who are encouraged to give them away tocustomers The purpose of the services is to reduce downtown traffic,particularly around mid-day The shuttle has been operating for aboutthree years, A senior citizen/handicappped dial-a-ride service, which carriesapproximately 36,000 passengers per year The service is operated byPacific Busing, Inc , a local provider specializing in dial-a-rideservices The service charges no fare; rather, a $0 75 donation isrequested Participants in the local senior citizens nutritionalmeals program are charged a donation of $0 10 The diala-ride servicehas also been operating for about three years A senior citizen recreational transit service, a cooperative programwith the city's Parks and Recreation Department Using the BeeLineShuttle vehicles, the service provides transportation for 10-12 tripsper year to various destinations With fares depending on thedestination An SCRTD bus subsidy program This is another senior program Itallows senior citizens to purchase RTD monthly passes offeringunlimited ridership for $4 00 Regular purchase price of these passesis $7 00 All of these services are subsidized with Prop A funding The FY 87-88 budget allocation for these programs is presented below:Shopping shuttle $287,000Elderly and handicapped DAR 459,000

Recreational transit 5,000RTD bus pass subsidy162,000TOTAL $913,000In addition to these local services, Glendale is served by 9 SCRTDbuslines that provide transit connections to adjacent areas Glendale's daily boardings on these lines are about 17,500, or 5 25million annual passengers Public transportation: PasadenaThe City of Pasadena provides the following services:Senior citizen/handicapped dial-a-ride This service is provided by 2private contractors Chair-There North, Inc , is the primarycontractor; it provides the dispatching service, and operates up to 6dedicated vans Babien Transportation Company provides additionalshared-ride taxi service on an as-needed basis at a flat rate of $4 50per trip A recent performance audit estimates that the van serviceaverage total cost is $7 05 per trip The service is heavilysubsidized; price per rider is $ 50 It operates 7 days per week, from7am to 9pm on weekdays and 9am to 5pm on weekends Ridership isestimated at 250-300 trips per weekday and 100 trips per weekend day Annual ridership for FY 87-88 is estimated to be 76,237 The DARservice has been in operation since 1985 Recreational transportation for the elderly, handicapped, youth andeconomically disadvantaged This service is provided on a contractbasis and administered by the Community and Recreation ServiceDepartment Free transportation is provided for recreational fieldtrips sponsored by the department This program has been operatingfor about 3 years A homeless, ticket/token program provides RTD bus tickets and tokensto homeless people actively seeking employment, making medicalappointments, etc This service provides about 10,000 trips/year Union Station/The Depot, a homeless assistance program in Pasadena,manages this program Rose Bowl Shuttle provides shuttle service between the Rose Bowl and adowntown Pasadena parking lot for UCLA football games The shuttlehas been operated by the SCRTD; however, the city is considering usinglower cost private charter operators in the future Other Prop A funded activitiesPasadena transportation demand management program This is the only Prop A funded program of its type in Los Angelescounty The program began in 1983 in an attempt to manage trafficimpacts of the city's rapidly growing employment base It hasresulted in the passage of a 'trip reduction ordinance' in 1986 thatprovides for reduced parking requirements for new developments inexchange for the development and implementation of TDM programs Although the ordinance allows parking requirements to be reduced by up

to 19 percent, discussions with city staff revealed that it has notyet been used The goal of the City's TDM program is a 10 percent reduction in peak-period vehicles in the central Business District in 3 years comparedto traffic that would exist without the program A TDM program forcity employees, including personalized matching service, possibleparking fees, and city-sponsored onsite child care (currently understudy), is the core of the program Formation of transportationmanagement associations among the downtown area employers, as well asefforts to implement the trip reduction ordinances are also part ofthe program Light-rail transit and local trolley service Pasadena is reserving20 percent of its Prop A funding for capital projects Two projectsare currently being planned The first is a light-rail transit linethat would extend a planned regional line into central Pasadena Thesecond is a local trolley shuttle service for the city's majorshopping and commercial areas A transportation center proposal isalso being considered as part of the city's overall transit plan All of the above programs are funded by Prop A The total FY 87-88Pasadena budget was $1,632,000, and it was allocated as follows: Transit operations:Elderly and handicapped DAR $699,000Recreational transit 25,000Bus token program 18,000TSM-ridesharing 147,000 Subtotal 889,000 Capital expenditures:Bus facilities 542,000Planning:LRT study 150,000Needs assessment 51,000 TOTAL $1,632,000It may be noted that this is a budget for committed funds, and doesnot necessarily reflect total Prop A funds received Since theinception of Prop A,

Pasadena has received about $7 3 million, of which $3 8 million isbeing held in reserve Other public transportationIn addition to these Prop A-funded services, the Pasadena SchoolDistrict also subsidizes SCRTD services for students About 3,000students in the incorporated area use the SCRTD, for which the schooldistrict pays $12 per month per student Subsidies for students inthe adjacent unincorporated areas are split between the schooldistrict ($4) and the county ($8) Pasadena is also served by 10SCRTD routes that link Pasadena and the adjacent areas Ridership in1986 is estimated at 23,000 daily boardings, or about 6 9 millionannual passengers Private transportationA variety of for-profit services are provided in Glendale andPasadena Due to data limitations, it is not possible to provide anyestimates of the quantity or usage of these services in the twocities The services are as follows:Taxi service is provided by two major taxi companies (Yellow cab,Checker cab), as well as a number of small independent operators Limousine service Four limousine services are headquartered in thetwo cities These provide airport service, special event service, andcorporate transportation services Airport/hotel shuttles Shuttle service is provided by the majorSouthern California carriers (Super Shuttle, Lux Livery Service, Inc ,Airport Service, Inc) as well as several locally based operators thatprovide connections to Burbank and LAX Special services including transportation for the physicallyhandicapped, and ambulance services are provided by local operators Some of these also provide the contracted local public dial-a-rideservice Charter service is provided by small local operators as well as majorcarriers These include weekend tours, weekday tours, churchactivities, etc Commuter services There are no privately sponsored commuter transitservices operating at this time However, such services are beingconsidered by the City of Pasadena as part of the TDM program Ridesharing programs for the two citiesIn addition to the City of Pasadena's program, Glendale and Pasadenaare served by Commuter Computer, a private, non-profit corporationthat provides ridesharing assistance throughout the greater LosAngeles metropolitan area As of 1987, Commuter Computer served 62clients in the Pasadena/Glendale areas, each employing 100 or morepeople Commuter Computer's main task is providing computerizedmatching for prospective carpoolers and vanpoolers They also providemarketing services, assist with development of employer transportationprograms, and with formation of third party vanpools CommuterComputer

conducts surveys of client employees, and thus can provide informationon journey to work travel Table III 3 gives modal split datacollected by Commuter Computer The first column applies to workerswho live in Glendale/Pasadena; the second column applies to those whowork in Glendale/Pasadena Note that the survey data is collectedfrom client companies, and is not representative of the generalpopulation of the two cities It is also worth noting that the modalsplit data is quite consistent with the regional average, and suggeststhat subcenter commuters in contrast to CBD commuters, do not usetransit or carpool in larger numbers than non-subcenter commuters Asurvey of 4 major Commuter Computer clients in Glendale/Pasadenaprovides additional information on these commuters Table IV 4 givesjourney to work data for each of the 4 firms, and for the averageamong all Commuter Computer firms in the Los Angeles metropolitanarea Again, work trip travel characteristics are quite similar tothe regional average, with the exception of paid parking None of thePasadena/Glendale firms charge employees for parking, compared to theregional average proportion of 39% However, the regional average isprobably skewed by the large number of downtown Los Angeles firms inthe data sample Table IVA also shows that car availability for thework trip is almost universal; thus some of the use of alternate modesis choice-based The case study surveys show that a variety of transportation servicesare available in Glendale and Pasadena The availability of localtransit subsidies has enabled both cities to expand local services,experiment with various service options, and invest in transit-relatedcapital improvements These funds have been used to enhance mobility,rather than solve traffic problems The resulting service expansionhas focused on the disadvantaged: primarily the elderly andhandicapped and secondarily the poor Although neither city regularlycollects ridership data, city representatives claim that ridership onthe E&H services has grown consistently Despite the expansion ofthese services, however, actual usage is quite small For example,the Pasadena E&H service carries 250-300 daily passengers, compared tothe 23,000 daily boardings on the SCRTD Efforts to develop service options to reduce perceived trafficproblems have been less successful Pasadena operated a 'shoppersshuttle' in the downtown area to reduce mid-day congestion, butabandoned it because of its failure to attract riders The Glendaleshuttle is apparently more successful, (although estimated ridershipis a modest 350-400 trips per day) in part because the area is not aswell served by regular route public transit However, local trafficproblems have not been affected Neither city has developed transitservice aimed at area commuters, nor are any of the transit passsubsidy programs available to commuters Both cities have experienced increasing traffic problems due to rapidgrowth of

commercial activities Their response has been planning fortraditional (railbased) mass transit for the long term The Pasadena ridesharing program is already well underway; Glendale is still developing a program As discussed above, the Pasadena program isaimed at decreasing the proportion of drive-a]one commuters (e g thetrip generation rate of commercial and industrial activities) Sofar, the program has focused on providing incentives such as personalized carpool matching, and on-site childcare services, rather than on imposing constraints on auto use either directly (via parking restrictions or parking fees) or indirectly (via developers fees orland use constraints) to

accomplish trip reduction goals Because both cities are fully developed, rights-of-way for major road widenings are not available Moreover, road improvements are not viewed as appropriate long-term solutions Rather, both cities reactively studying rail transit options in the belief that rail transit will succeed where bus transit has so far failed, namely in attracting area commuters out of their cars Both cities are evaluating options for connections with the planned Los Angeles regional rail transit system, as well as for local circulation systems The cities anticipate that local Prop A funds will be available to subsidize the operating costs of these new systems The limited data available in these case studies also indicate that commuter travel behavior is quite typical of the region as a whole Commute patterns in these two sub centers do not have any of the characteristics of the CBD commute Work trips are not unusually long in travel time or distance; transit use and carpooling are not unusually high These characteristics, together with the actual experiences of these two cities, provide additional evidence that transportation problems in the sub centers require innovative solutions

TABLE IV 1 1980 POPULATION CHARACTERISTICS OF THE CASE STUDY CITIES Glendale Pasadena Total Population 139,060 118,550 Number of Households59,339 47,056 Number of Housing Units 61,653 49,497 Percent Owner Occupied 43% 46% Percent Vacant 3 7% 5 4% Median Family Income $21,778 $20,848 Percent Households Below Poverty Level 8 0% 10 7% Ethnic Distribution White 88% 64% Black HERE for graphic 71

TABLE A 1 Contd Click HERE for graphic 72

TABLE A 2Click HERE for graphic 73

TABLE A 2 Contd Click HERE for graphic 74

TABLE A 3Click HERE for graphic 75

TABLE A 3 Contd Click HERE for graphic 76

TABLE A 4Click HERE for graphic 77

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TABLE A 6Click HERE for graphic 81

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APPENDIX BClick HERE for graphic 83

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APPENDIX C TABLE C 1ACTIVITY CENTERS AND THEIR CORRESPONDING GEOGRAPHIC UNITSId# Area Name RSA AZ1 AZ2 Census Tract (as used by SCAG) 51 Santa Monica 16 16011 320 701501* 701502* 701601* Center 16 16013 322 7O16O2* 701701* 7O1802* 16 16014 323 7019 52 Hollywood 17 17013 350 1902 190301 190302 Center 17 17014 351 1906* 1907 1908* 17 17015 352 1909 191901 17 17016 353 17 17017 354 53 East Hollywood 17 17019 356 191201 191202 1913* Center 1953* 54 UCLA17 17022 359 265301 265302 Center 55 Westwood/ 17 17026 363 2149* 2657 2671 Beverly Hills/ 17 17027 364 7004* 7005* 7008* Century City 17 17040 376 700902 7010 17 17043 378 56 Midwilshire 17 17031 368 2145 2151 2163* Center 17 17048 383 57 L A Core 17 17035 373 1977 204502* 2061 17 17058 393 2062 2063 2064 17 17059 394 2071 2072 2073 17 17070 405 2074 2075 2076 21 21001 553 2077 2078 2079 21 21007 558 2088 2089 2091 21 21009 559 2092 2093 2094 21 21011 560 2095 2096 2097 21 21019-20 568 2111* 2112* 2113 21 21021-22 569 2114 2118 2119 21 21008 572 2121 2122 2123 23 23002 701 2124 2125 2132* 23 23003 702 2133* 2134 2241 23 23004 703 2245 2246* 2261* 23 23005 704 2262* 2263* 2311* 23 23009 707 23 23010 708 23 23011 709 23 23012 710

23 23016 713 23 23018 714 23 23020 715 23 23021 716 23 23022 717 23 23023 718 23 23025 720 23 23026 721 23 23027 722 24 24034 751 58 Long Beach20 20035 548 5759 5760 5761 Center 5762 59 USC Med Center 21 21004 555 2031 2033 60 East L A 21 21026 573 2051* 61 Huntington Park 21 21041 588 5325* 533101* 5332* 62 Glendale 24 24009 727 3016 3023 3024 24 24013 731 63 Pasadena 25 25016 781 4619 4622 4635 Center 25 25019 785 4636 64 San Bernardino 29963 57 Center 65 Burbank Center 13 13029 274 3116* 66 San Pedro 19 19035 510 2962* 2965* 2966* Center (2969)* 67 Ontario Center 28 28026 921 14* 68 Santa Ana 42 42028 1181 74401* 69 Riverside Center46 1242 303*Total59 AZs 103 Census Tracts_____* = Newly Added Census Tracts 88

APPENDIX DClick HERE for graphic 89

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APPENDIX E TABLE E 1 THE LIMITED ROLE OF CBDs IN THE TEN LARGEST U S URBANIZED AREAS (1980) total core-city all CBDarea jobs CBD jobs* jobs* (000's) (000's) (000's) (1) (2) (3) (2)/(1) (3)/(1) (2)/(3)N Y 6,627 5 537 7 664 9 0 081 0 100 0 809L A 4,366 3 129 8 183 6 0 030 0 042 0 707 Chicago 2,989 9 279 1 289 6 0 093 0 097 0 963 Phila 1,689 4 172 6 206 4 0 102 0 122 0 837S F 1,536 9 168 0 225 4 0 109 0 147 0 745 Detroit 1,498 876 783 8 0 051 0 056 0 915D C 1,415 6 124 5 124 5 0 088 ------ Boston 1,270 785 8 106 6 0 068 0 084 0 805 Dallas 1,228 878 3 102 2 0 064 0 083 0 767 Houston 1,200 0 102 9 109 1 0 086 0 091 0 944 TOTAL 23,838 8 1,755 5 2,096 1 0 074 0 088 0 838* Central Business District jobs held by residents of all SMSAs of the corresponding SCSA; for Dallas and Washington, D C : all CBD job sheld by SMSA res- idents Sources: computed from U S Census of Population (1980) Journey to Work: Met- ropolitan Commuting Flows, Table 3; and U S Department of Transportation (1985) Demographic Change and Recent Work trip Travel Trends, Volume I Final Report Table C2

TABLE E 2WORKTRIP TRAVEL TIME DISTRIBUTIONS TEN LARGEST U S URBANIZED AREAS (1980)one-way trip (minutes) less 45 and apprx mean than 10 10-19 20-29 30-44 more md mean 45+N Y 10 0% 23 7% 16 2% 20 3% 29 8% 30 0 32 3 62 6L A 11 5% 31 0% 22 1% 21 6% 13 7% 23 4 24 1 57 0Chicago 11 2% 24 7% 18 4% 23 3% 22 5% 27 7 28 3 58 0Phila 12 3% 27 5% 20 0% 21 9% 18 3% 25 1 26 0 57 2S F 11 0% 30 1% 20 7% 21 8% 16 4% 24 3 25 2 56 5Detroit 11 7% 30 2% 25 1% 22 5% 10 4% 23 3 22 9 54 4D C 8 4% 22 9% 21 6% 26 7% 20 3% 28 7 28 1 55 5Boston 14 7% 30 9% 19 9% 21 1% 13 4% 22 0 23 1 55 2Dallas 11 9% 31 3% 24 9% 22 3% 9 7% 22 7 22 4 55 3Houston 10 3% 26 0% 21 0% 25 6% 17 2% 26 5 26 2 55 9Source: computed from U S Department of Transportation (1985)Transportation Planning Data for Urbanized Areas Based on the 1980Census Chapters 1 and 2

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