FCMA Public Transportation Strategic Service Evaluation Project

Public Transportation System Assessment - Draft

(Includes summary of Public Outreach and Transit System Network Plans)

Task Nos. 1.4, 1.5, 2.1

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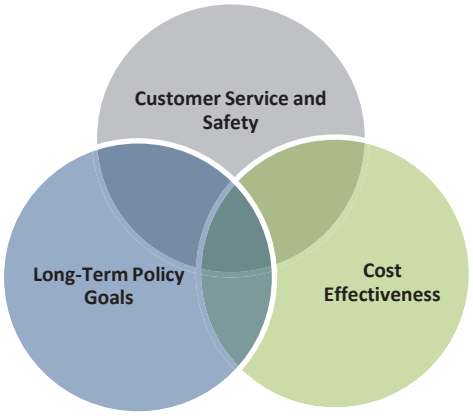
1.0 INTRODUCTION

The purpose of the Public Transportation System Assessment is to evaluate current policies, existing public transit service, and transit and auto travel patterns to develop a set of recommended policy and transit service changes to better meet the mobility needs of the Fresno-Clovis Metropolitan Area (FCMA). The goal of the study is to define changes that can make transit a more viable alternative to the auto by reducing transit travel times, improving linkages to major trip generators and improving the overall productivity, cost effectiveness, and sustainability of transit.

The Study Area for this evaluation is defined as the City of Fresno and City of Clovis city boundaries. Fresno Area Express (FAX) operates a modified grid system with intersecting east-west and north-south routes. The system serves the FCMA including the City of Fresno as well as portions of unincorporated Fresno County and it supplements the City of Clovis system. The City of Clovis is served by both FAX and Stageline Transit. The City of Fresno and the City of Clovis are also served by two demand-responsive transit programs (HandyRide and Round-Up) which are not included in this system assessment.

This System Assessment is focused around three main transit considerations:

- **Long-term policy goals** – review of current federal, state and local policies that influence transit service
- **Cost-effectiveness** – evaluation of current transit system performance, including revenue hour/vehicle hour, max load factors and boardings per hour
- **Customer service and safety** – review of existing travel patterns on both transit and auto modes and public opinion about the current transit system.



This report takes into consideration the survey data and analysis, stakeholder input and policy review, and develops three proposed service concepts (network alternatives within existing resources) to meet the future needs of the FCMA. These concepts will be vetted and placed into one recommendation, to be defined in a subsequent project task.

2.0 POLICY REVIEW

To assess how the current policies influence the transit system, a comprehensive review of existing transit policies was conducted. (This review is discussed briefly here; please see the *Final Policy Review* document, dated August 2013, for details, Appendix A) Some of these policies directly dictate transit service, such as hours of operation, while others have an indirect influence on transit service, such as development policies. The purpose of the policy review is to determine whether there are any conflicts in current policies or whether any policies unintentionally result in less productive transit service in the FCMA.

This policy review includes both adopted policies as well as policies from recent studies, which have not necessarily been formally adopted. The following transit service categories were considered for each policy document reviewed:

- **Coverage** – Where is service provided? Is service location determined by geography, population density or another metric? Where is service being expanded or reduced?
- **Frequency** – What are headway requirements? What are the criteria for determining headways along different routes?
- **Stop Spacing/Location** – What is the minimum and maximum distance between transit stops? How is spacing determined?
- **Shelter/Amenities** – What are the transit station amenities required?
- **Span of Service** – What are the required hours of operation? What are service requirements on weekends and holidays?
- **On-Time Performance** – Are there requirements for on-time performance of the transit network?
- **Route Deviations** – How are route deviations identified and corrected?
- **Load Standards** – What are maximum loads for transit vehicles?
- **Customer Complaints/Customer Service** – How are customer complaints addressed? What customer service policies are in place?
- **Accidents/Security** – What polices are in place to provide a safe and secure transit system?
- **Number of Transfers** – Are there policies limiting the number of transfers necessary?
- **Productivity** – How is service productivity measured and what are the productivity requirements? Metrics could include passengers per hour and cost per passenger.

For each of these topic areas, the following sections outline the potential policy change recommendations, if any, that might improve the efficiency of the system and could be integrated into the network alternatives to be analyzed in Task 2. These policy recommendations are intended to serve as a framework for the implementation of the recommended service changes.

2.1 Coverage

The 2014-2018 Short Range Transit Plan (SRTP) includes a policy requiring 90 percent of the service area population to reside within one-half mile of a bus route. In addition, the City of Fresno General Plan includes a policy that the major street network should be planned and developed to facilitate efficient direct transit routing that provides one-half mile coverage throughout the metropolitan area. These policies may require providing large amounts of predictably unproductive service.

In contrast, the Fresno County Public Transportation Infrastructure Study (PTIS) recommends that FAX adopt a transit service expansion policy that stipulates FAX transit service will not be expanded to, or subsidized in, new areas that do not have minimum transit-supportive densities (8 dwelling units/acre for local bus service and 12-18 dwelling units/acre for BRT/LRT). This proposed policy could allow service to be better targeted to areas with high transit ridership rather than spreading it across a large geographic area. The policy would limit transit service to only those areas with minimum transit supportive densities may provide a more efficient system that in turn would attract more new riders.

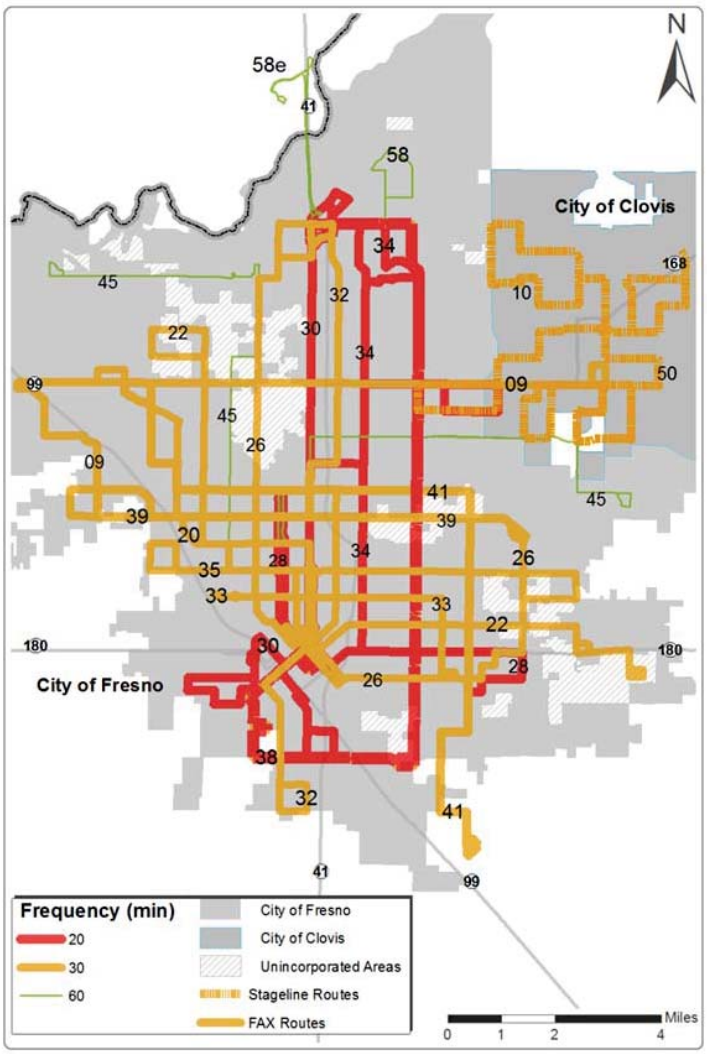
The current policy relates to coverage over frequency, causing the system to serve areas may not have the supportive population and employment to support ridership necessary for productive service. The Measure C Extension Expenditure Plan could be revisited to improve the productivity of the system.

2.2 Frequency

The 2014-2018 SRTP includes a policy stating that FAX scheduled service should provide for maximum headways of 60 minutes on every route. The Measure "C" Extension Expenditure Plan includes a proposed policy to improve headways to every 15 minutes on the busiest bus routes. This policy could attract new riders because the service will be more reliable, more useful and more conducive to easy connections. The current policy to provide 60 minute headways on every route should be reconsidered to determine which routes would be better served by improved frequency and which routes may not need any service. In addition to improving frequency on popular routes, FAX might consider providing less frequent service on commuter routes during off-peak periods and more frequent service during peak periods to provide more efficient service during times of high demand. Figure 2-1 illustrates the frequency of current service.

Observation: Improving headways would make service more useful and could attract new riders**.**

Figure 2-1: Frequency of Current Service



2.3 Stop Spacing

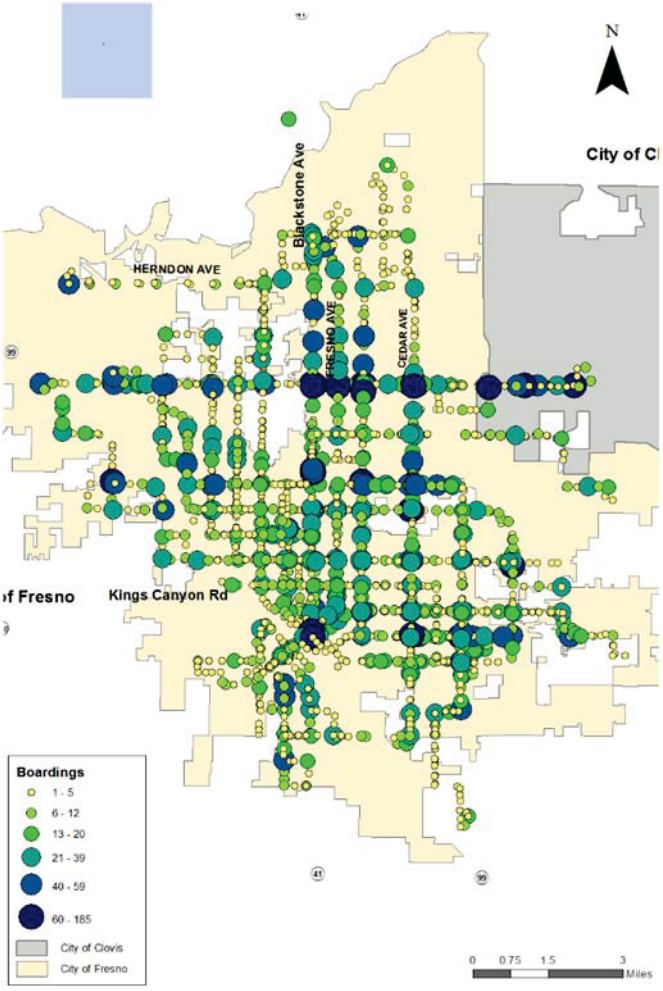
The Transit Facilities and Development Standards include the following policies:

- Maintain minimum spacing of every one-half mile
- Maintain optimum spacing of every two-tenths mile
- Maintain specialized spacing of every block in Central Business Districts

These policies may be hindering the development of an efficient transit network. The two-tenths of a mile policy does not sync with the approximately ½ mile grid predominate in the region. Developing alternative spacing configurations may better serve a grid pattern, improve travel time, reduce costs and improve reliability. Requiring a stop every block in the CBDs may be slowing down service unnecessarily. A system that allows for a bus stop patterns that align with the existing grid and service demand might better serve the various transportation needs of FCMA residents.

Figure 2-2 shows the distribution of boardings across the FAX and Stageline systems.

Figure 2-2: Systemwide Boardings on FAX and Stageline Routes



Observation: Stop spacing policies may be out of sync with a logical stop pattern and with the ridership demand.

2.4 Span of Service

The 2014-2018 SRTP identifies the hours of service on FAX and Clovis Transit as the following:

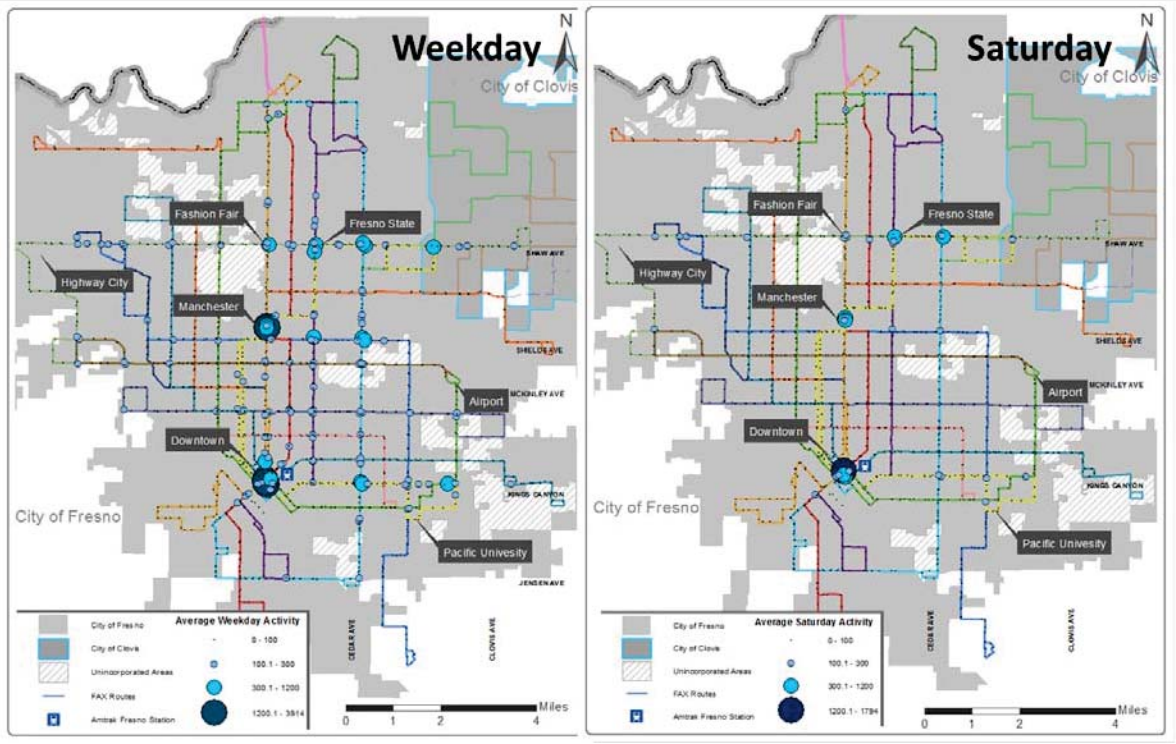
- Regular FAX service stops at 10:00 p.m. on weekdays and 7:00 p.m. on weekends.
- Clovis Transit fixed-route service (Stageline) should operate weekdays (Monday-Friday) from 6:15 a.m. to 6:15 p.m. and Saturday from 7:30 to 3:30 p.m.

The current hours of service may not serve the needs of off-peak passengers, such as night shift workers and students. Based on the results of the survey and feedback from the community, there may be

sufficient demand to expand the span of service hours. Figure 2-3 shows ridership on weekdays versus Saturdays.

Expanding service hours is often a cost-effective approach to increasing ridership because it makes the service more reliable and travelers can use transit for both origin and return trips.

Figure 2-3: Ridership, Weekday vs. Saturday



Observation: Extending the span of service hours could better serve the need of passengers who make trips outside the peak hours.

2.5 On-Time Performance

The 2014-2018 SRTP includes a policy stating that FAX should operate its fixed-route buses so that on-time performance is achieved 90 percent of the time. This on-time performance standard could be expanded to include guidance for early arrival /departure (i.e. no more than one minute early). For clarification, the policies could also include a discussion of the role of traffic congestion in on-time performance.

In addition, bus stop spacing or locations of stops, traffic signal adjustments, bus pullouts, length of route (and/or interline), and the directness of the route to decrease turns can all contribute to on-time performance.

Observation: Guidance on early arrival/departure (i.e. no more than one minute early) would help to facilitate system reliability from the user perspective.

2.6 Route Deviations

FAX and Clovis Transit currently do not have any policies in place that address route deviations, nor is a policy necessarily required. However, moving forward through the network planning process, routes that divert off a major arterial to serve a transit center or other destination should be evaluated to consider the trade-offs on effects to ridership, access for specific populations, and safety. As part of this Service Evaluation, all of these factors will be considered.

Observation: A policy guiding route deviations could help decision makers evaluate the system efficiency trade-offs for route deviation requests.

2.7 Load Standards

The 2014-2018 SRTP includes a policy identifying the maximum seat to passenger load ratio of 1:1.1, or 110 percent of vehicle capacity. This existing load standard policy could be forcing more service than is necessary. A higher load may be acceptable for several trips during peak periods.

Observation: Higher loads than are permitted by the SRTP policy may be acceptable.

2.8 Customer Complaints

The 2014-2018 SRTP includes a policy requiring that all compliments, complaints, and inquiries from the public are tracked, evaluated, and receive follow up. In order to improve efficiency, customer complaints could be categorized to identify those that need immediate attention and those that can be reviewed on an annual or semi-annual basis

Observation: Categorize policies to areas that can be implemented with safety, and those affecting service. Service complaints can be weighed based on their impact on total system efficiency vs coverage.

2.9 Accidents / Security

The 2014-2018 SRTP includes policies requiring that regular maintenance be performed at prescheduled cycles to ensure optimal performance, efficiency, safety, and reliability of assigned equipment and that the FAX security plan provide a highly visible security presence for transit customers and employees.

Observation: Bus stop safety could be enhanced with improvements to the stop areas. Policies could be developed that set clearer standards for the safety of passengers at bus stops. This includes an evaluation of lighting, crossings, and sidewalk conditions within an immediate area.

2.10 Number of Transfers

The Measure "C" Extension Expenditure Plan includes a plan to install and integrate a regional Automated Fare Collection System (AFC) to enhance transit coordination and seamless passenger travel between transit systems. However, there are no current policies dictating the acceptable number of transfers. A policy statement could be developed to help align service changes to match a desired

threshold of transfers, however, given the service grid pattern, this may not be desirable. The multiple origins and destinations available through an efficient grid network would be better governed by policies to increase frequency, so that passengers connecting between routes experience less delay when transferring

Observation: Policies guiding customer information, and seamless transfers would be better suited to enhancing the customer transfer experience.

3.0 TRAVEL PATTERNS AND MARKETS

The purpose of the travel pattern and market analysis is to identify any potential new transit markets by comparing current travel patterns across all modes with transit travel patterns. If there are areas where a large number of overall trips are originating or are destined, but there is low transit ridership, these areas may be primed for potential transit service expansion (see Appendix B for additional details).

3.1 Top Seven Travel Origins/Destinations

The first step in the travel pattern analysis was to identify the origin/destination "hot spots" in the FCMA. The hot spots are defined as geographic areas where there is a high concentration of travel activity and include residential areas, commercial areas, universities, and transportation hubs.

In order to identify the hot spots, two complementary analyses were conducted: a Transit Suitability Index (TSI) study and a trip activity study based on anonymized cell phone location data (AirSage). The TSI combines population and employment density, auto ownership, and household income to identify hotspots where there is a potentially high demand for transit. The Air Sage analysis uses anonymized cell phone data to track travel patterns for all travel modes. The sampling rate of these data was approximately 9.6%, indicating the data would be reasonably representative of the population.

Whereas the TSI captures socioeconomic factors drawn from Census data, the AirSage analysis is based on mode-neutral trip activity. The two studies complement each other, as TSI is oriented toward trip origins and AirSage more toward trip destinations. Figure 3-1 shows TSI hotspots, and Figure 3-2 shows AirSage hotspots.

Figure 3-1: TSI Analysis and Hotspots

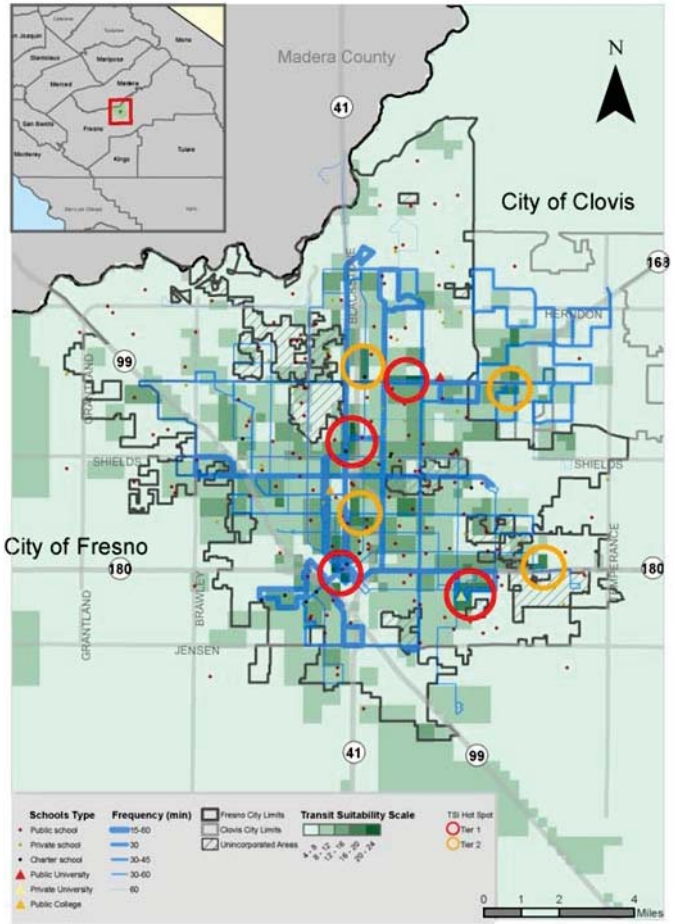
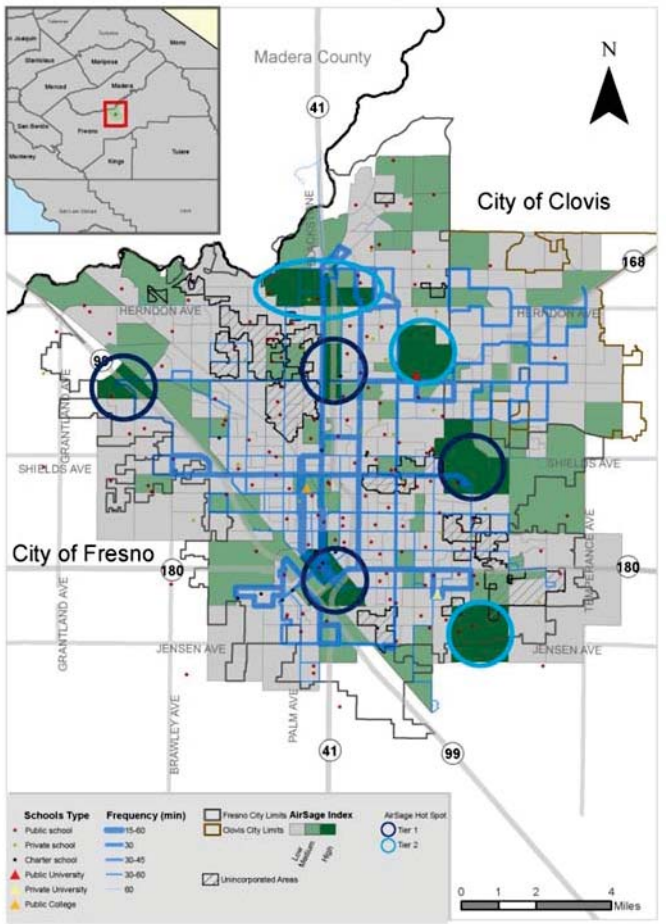


Figure 3-2: AirSage Analysis and Hotspots



Combining the results of these two analyses, seven hot-spots traffic analysis zones (TAZs) were identified within the FCMA, where either a high number or trips currently originate or end or there is the potential for high transit ridership based on density and socioeconomic factors. The combined seven hot-spots are identified in Figure 3-3 and are listed below:

1. Downtown Fresno
2. Fresno Pacific University
3. Manchester Transit Center
4. California State University, Fresno (Fresno State)
5. Highway City residential area
6. Fashion Fair Shopping Center
7. Fresno Yosemite Airport

The hot spots were reviewed by the TAC, which concurred that these locations best represent centers of travel activity for the FCMA. These hot spots serve as the baseline for the origin-destination travel market analysis.

DEFINING POTENTIAL MARKETS

For each of the seven hotspot destinations identified, maps were developed comparing the origins from the AirSage data and the On-Board Survey. The black and gray circles in the figures in Sections 3.2-3.4 are part of a stepwise process to identify key Transportation Analysis Zone (TAZ) origins. The black circles identify TAZs that meet a criterion in the comparison, and are carried over to the next step of the stepwise process. The gray circles identify TAZs that fail to meet the criterion and are not carried over to the next step. The stepwise process consists of four steps described below:

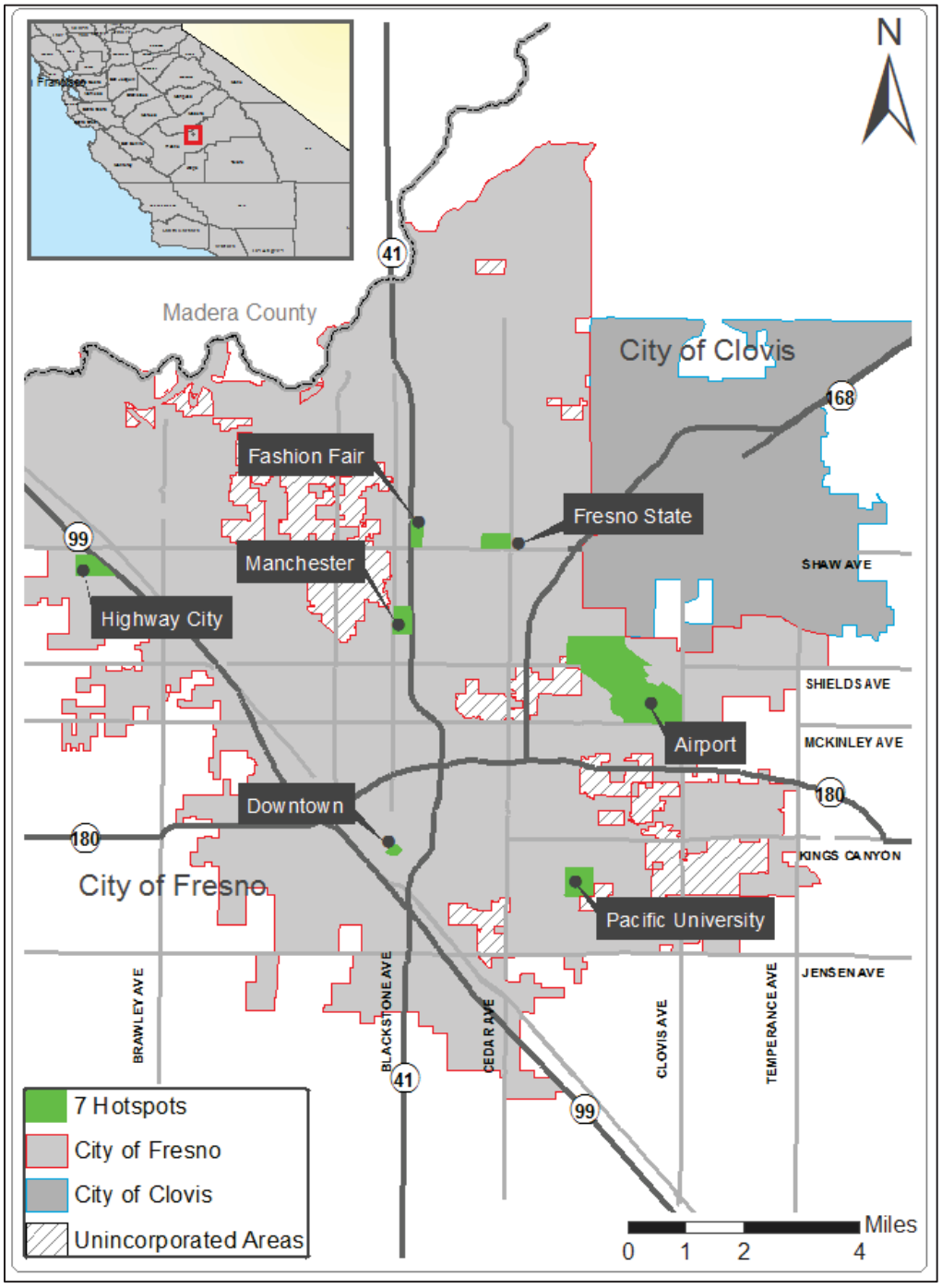
1) The initial step (Figures 3-4 – 3-10, labeled as "AirSage") identifies five TAZs with the highest number of origins to a specific activity hotspot, based on AirSage data. These five selected TAZs are marked with a black circle and carried over to the on-board survey figure.

2) Step two identifies those selected TAZs with low total transit trips to the specific activity hotspot in the on-board survey data figure. These selected TAZs with low total transit trips are marked with black circles and are carried to the transit travel times analysis (Figures 3-4 – 3-10, labeled as "On-Board Survey (Transit Trips only)"). Selected TAZs with a significant amount of existing transit trips are marked with gray circles and are not carried over because transit already captures trips in this market.

3) Step three selects the TAZs with transit travel times greater than 30 minutes to a specific activity hotspot. Selected TAZs with transit travel times greater than 30 minutes are marked with black circles and are carried over to the no-vehicle household trips analysis (Figures 3-11-3-17). Selected TAZs with transit travel times less than 30 minutes are marked as gray circles and are not carried over because transit already serves these potential trips.

4) Step four narrows the selection of TAZs to only include those with medium to high proportions of no-vehicle household trips to the specific activity hotspot. Selected TAZs with medium to high proportions of no-vehicle household trips, relative to the other TAZs, are marked with blacks circle (Figures 3-18 – 3-24). These selected TAZs indicate specific locations where transit improvements could yield additional transit ridership. Selected TAZs with low proportions of no-vehicle household trips are marked with gray circles.

Figure 3-3: Seven Origin-Destination Hot-Spots



3.2 Origin-Destination Patterns

In October 2013, an on-board survey was conducted on FAX and Clovis Stageline buses (Appendix D). The survey included questions regarding the origin and destinations of riders, information which is used to determine the travel patterns of transit riders. This information was compared to areas with high total trips. Areas with high total trips, but low transit ridership were identified as a potential transit market. Further analysis of travel time are described in section 3.3, and markets based on auto ownership are described in Section 3.4.

In Figure 3-4 through Figure 3-10, the black circles in the AirSage maps indicate the five TAZs with the highest number of origins to a specific activity hotspot, based on AirSage data. The black circles in the survey data figures indicate those TAZs in the AirSage data where origins are highest that also have low total transit trips to a specific destination. The gray circles indicate those TAZs in the AirSage data where origins are highest but with low total transit trips to specific hotspots.

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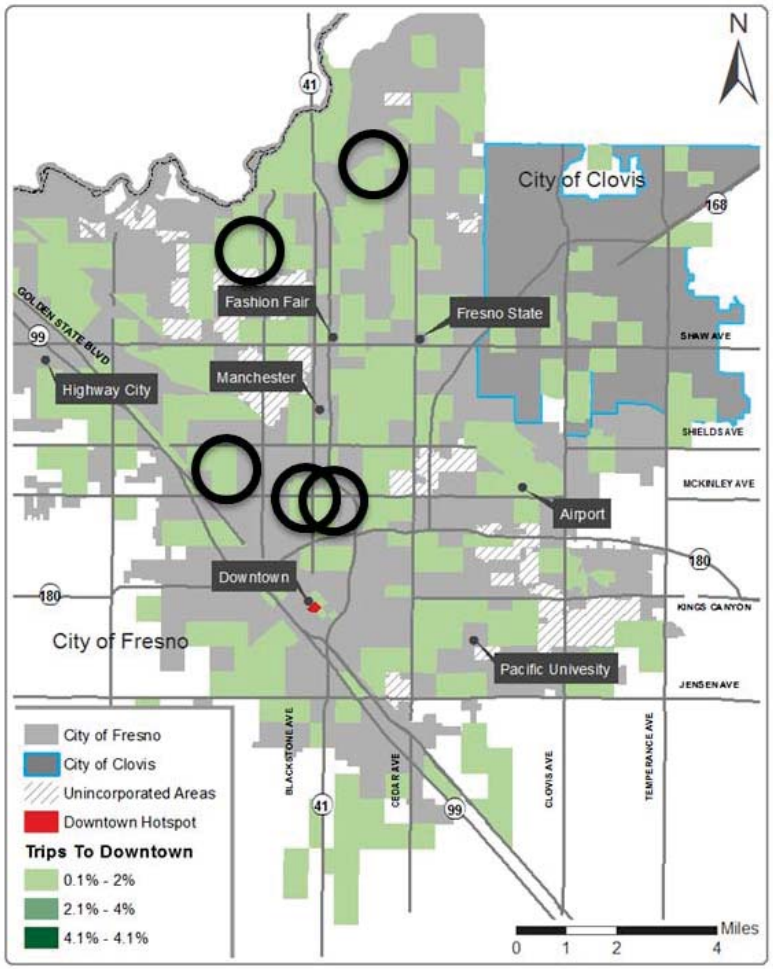
Figure 3-4: Downtown Fresno O-D Analysis

AirSage



On-Board Survey (Transit Trips Only)

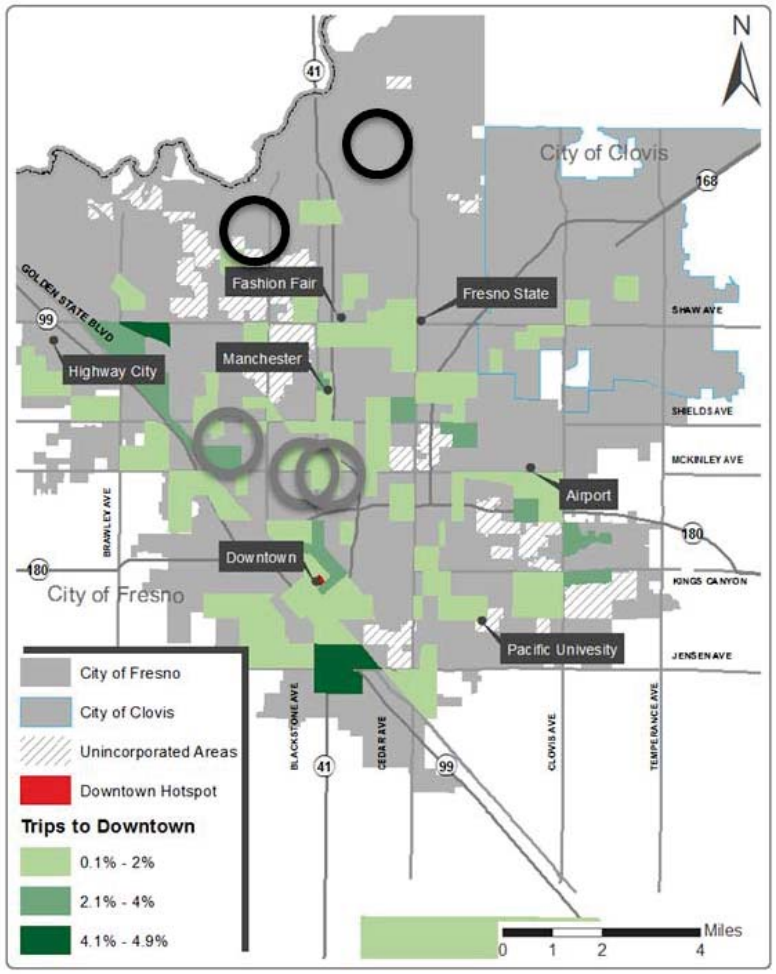
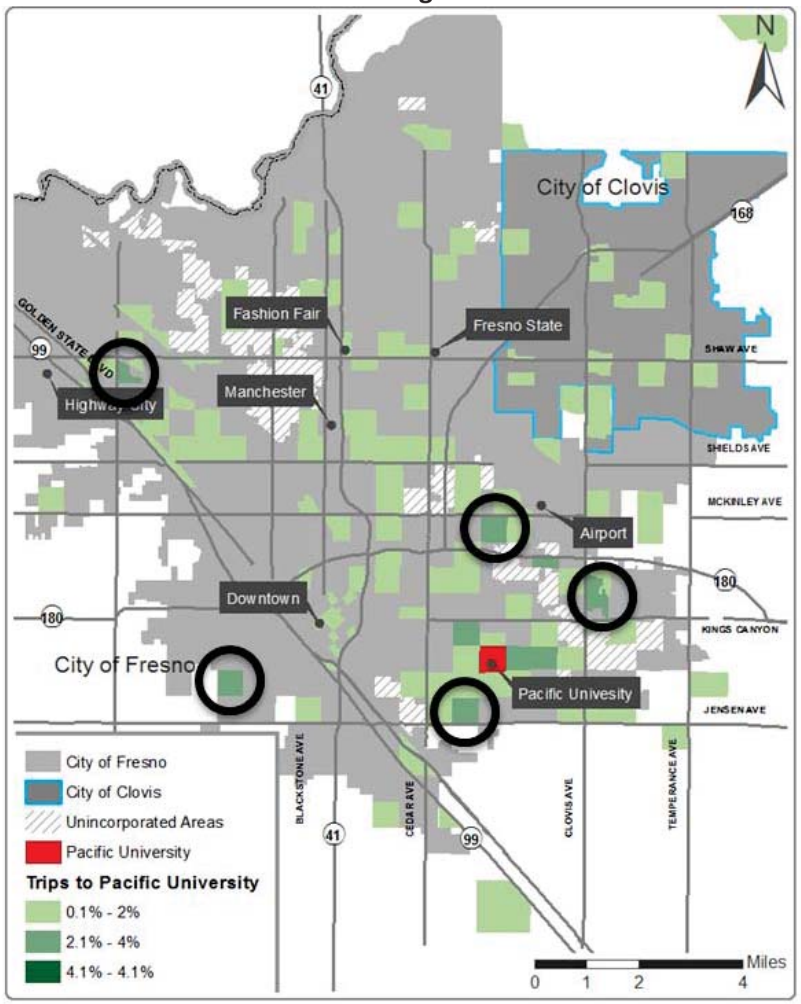


Figure 3-5: Fresno Pacific University O-D Analysis

AirSage



On-Board Survey (Transit Trips Only)

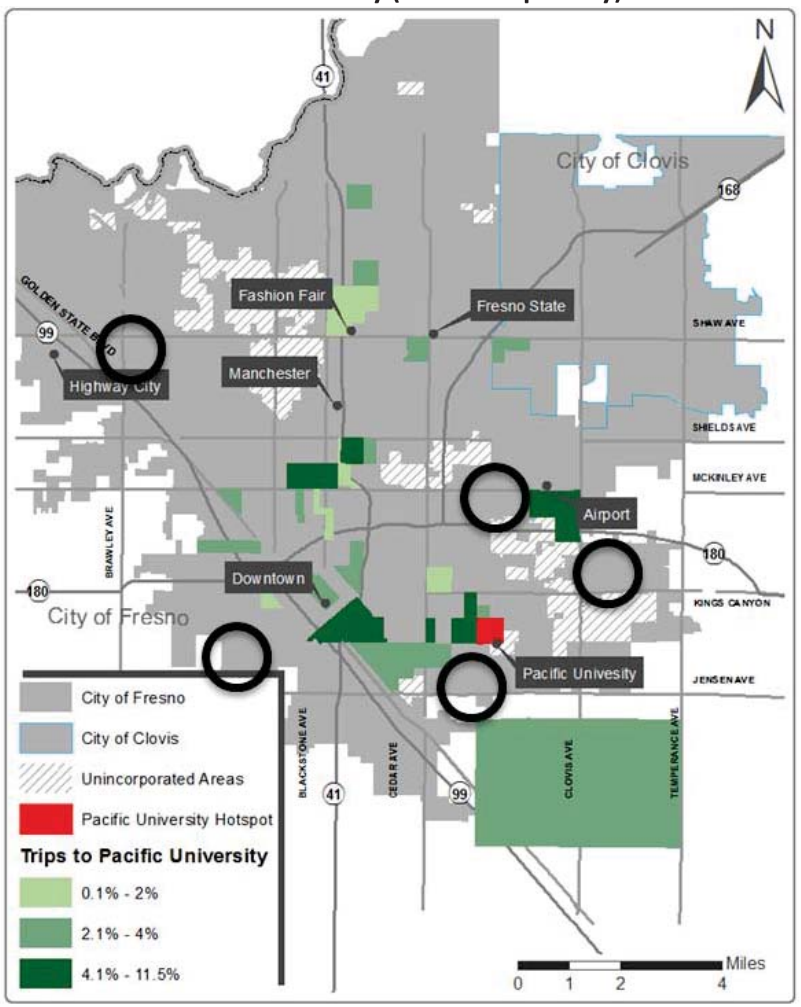
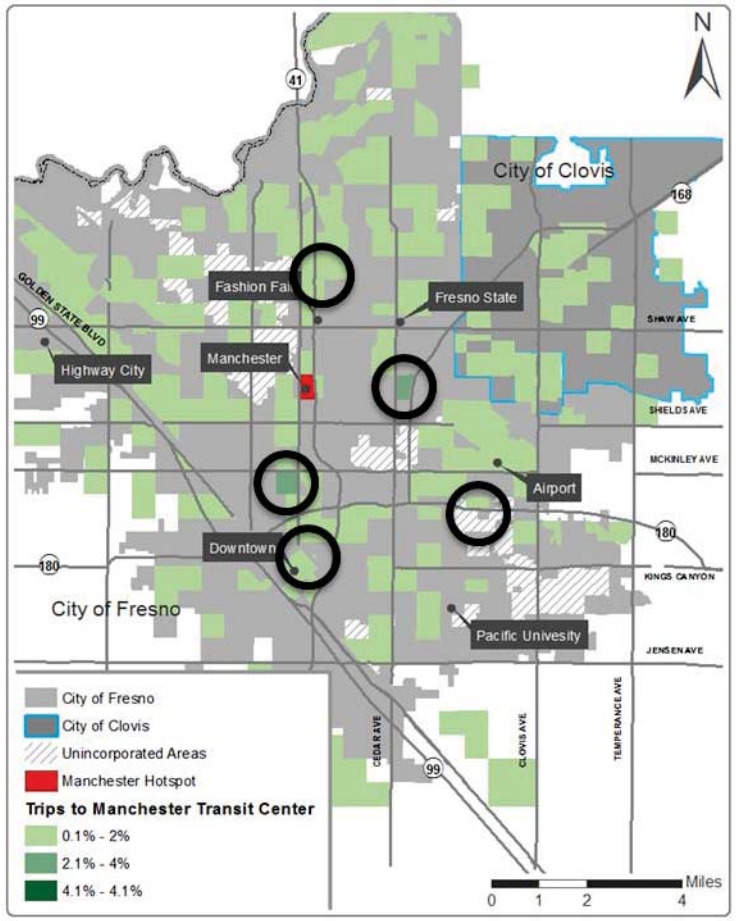


Figure 3-6: Manchester Transit Center O-D Analysis

AirSage



On-Board Survey (Transit Trips Only)

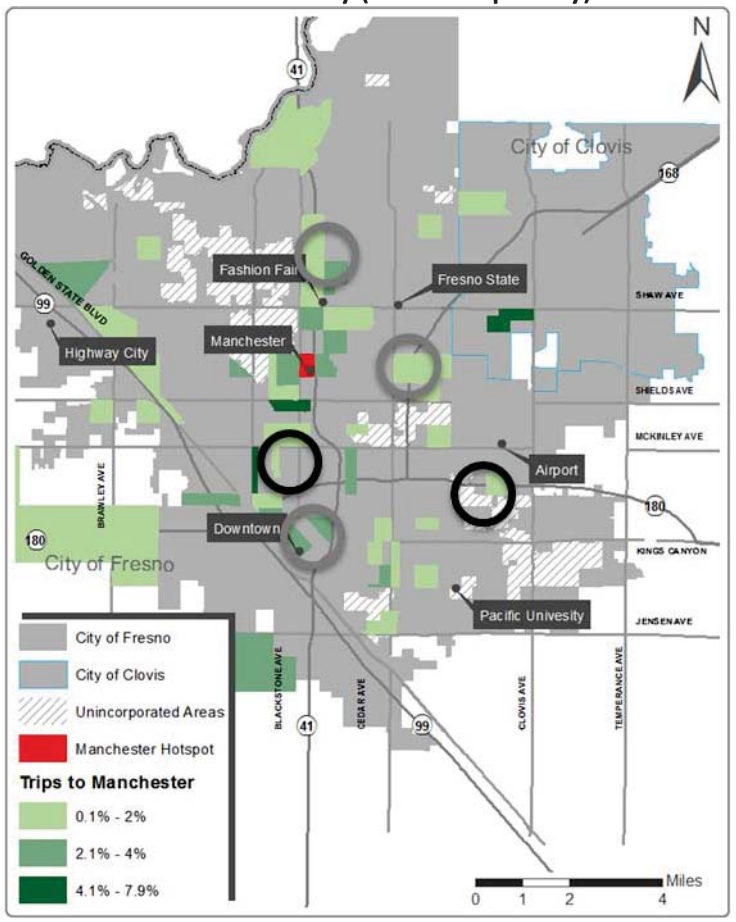
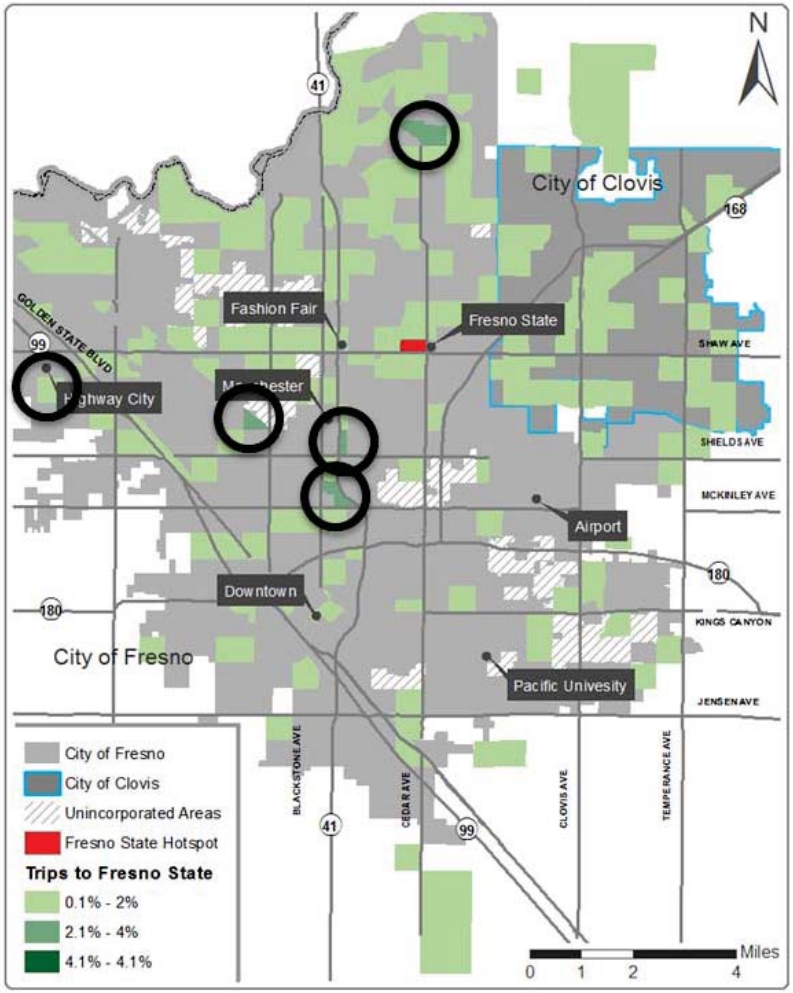


Figure 3-7: Fresno State O-D Analysis

Airsage Analysis



O-D Survey Analysis (Transit Trips Only)

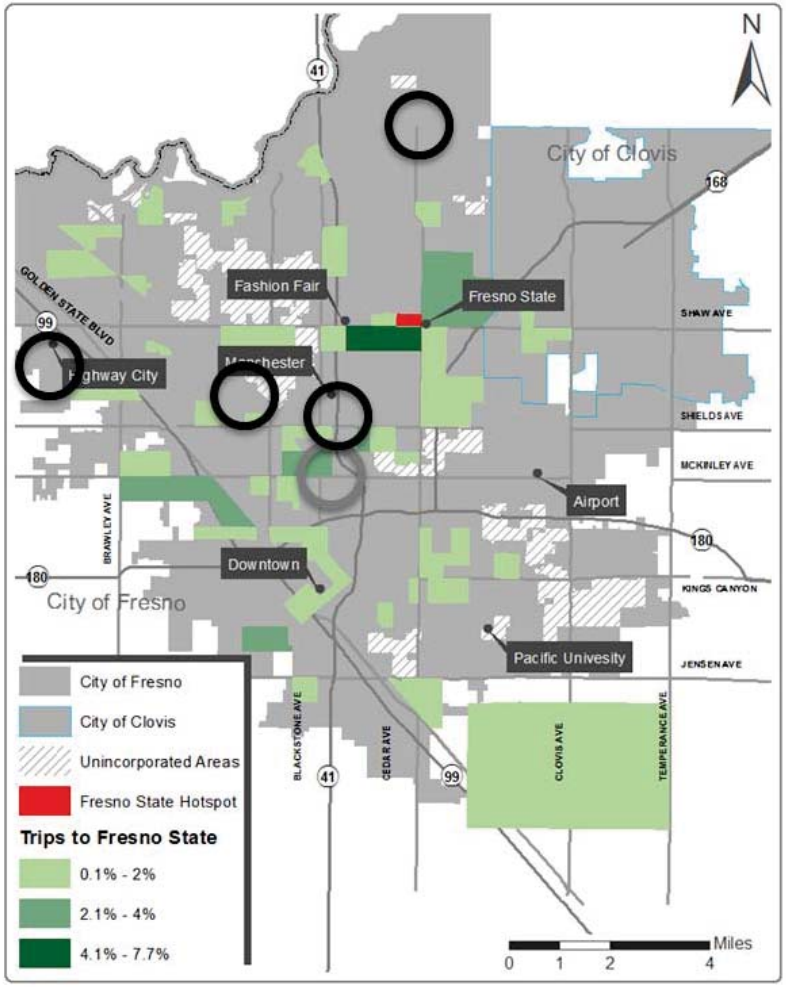
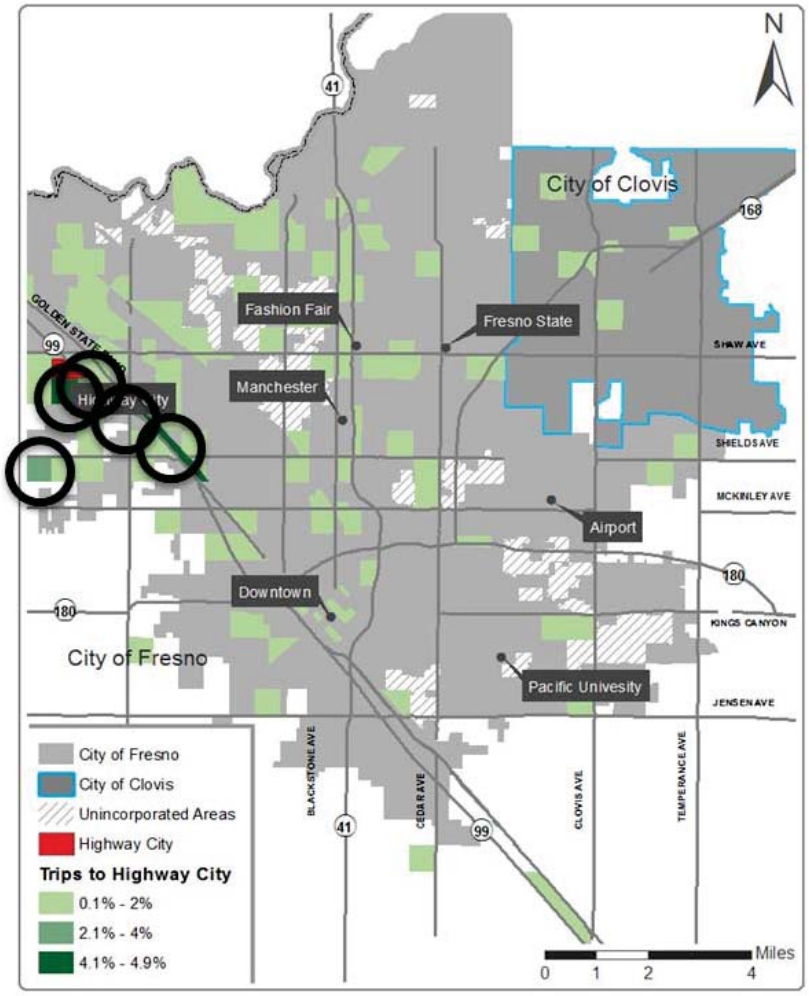


Figure 3-8: Highway City O-D Analysis

AirSage



On-Board Survey (Transit Trips Only)

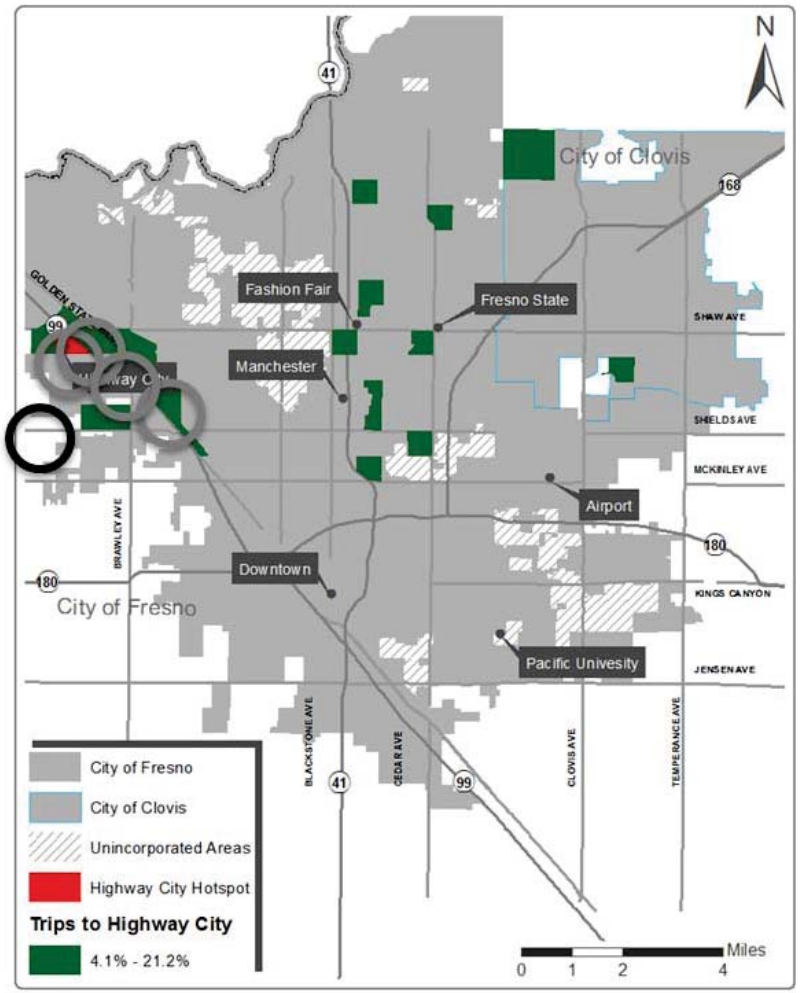
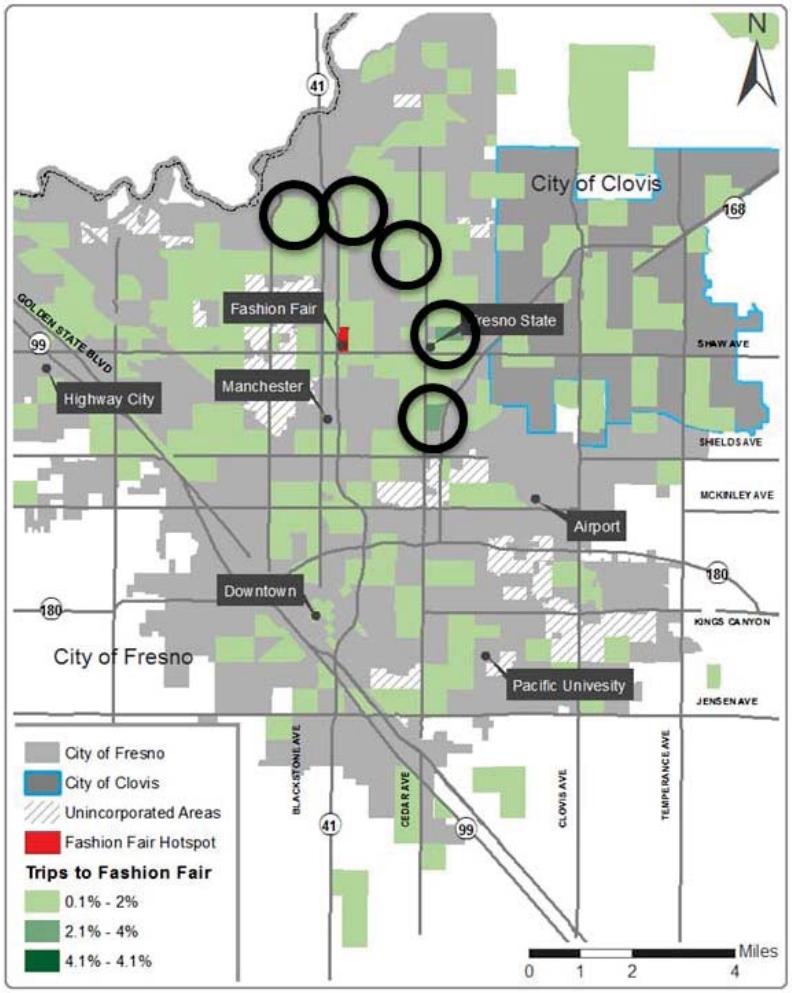


Figure 3-9: Fashion Fair Mall O-D Analysis

AirSage



On-Board Survey (Transit Trips Only)

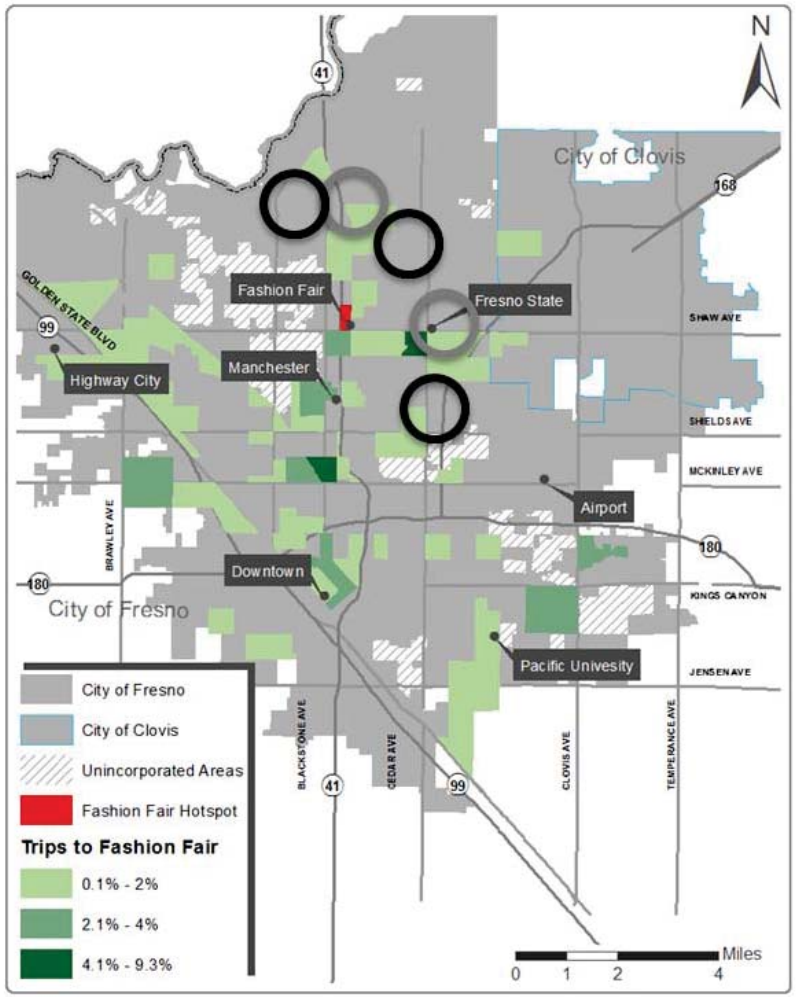
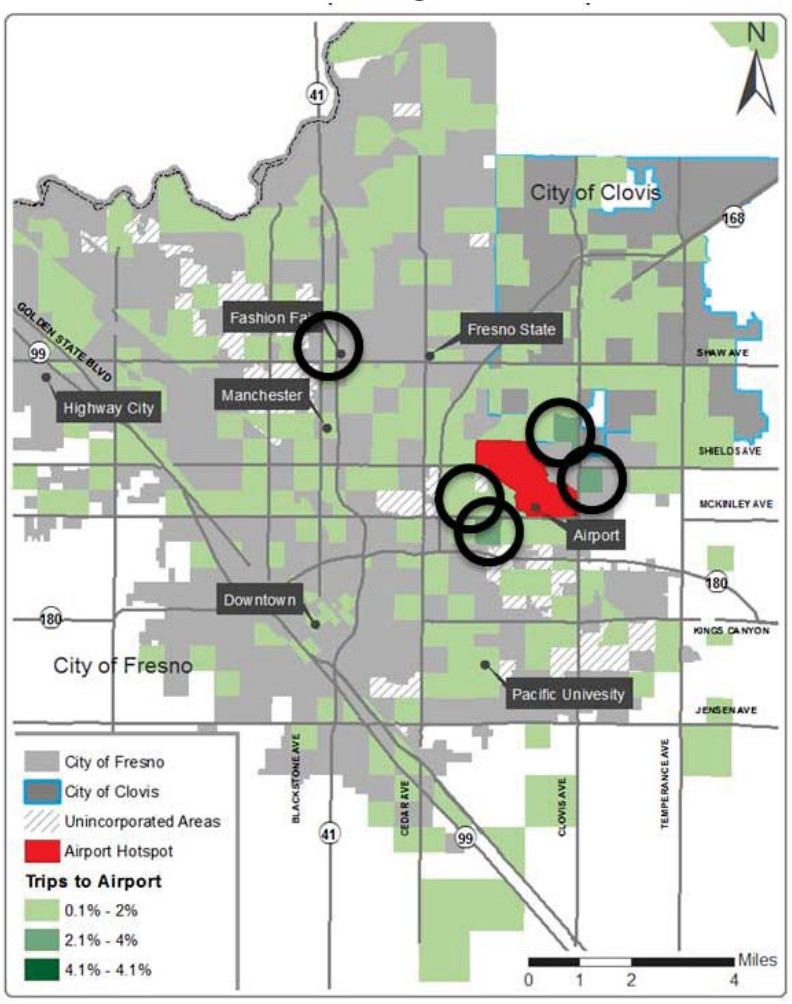
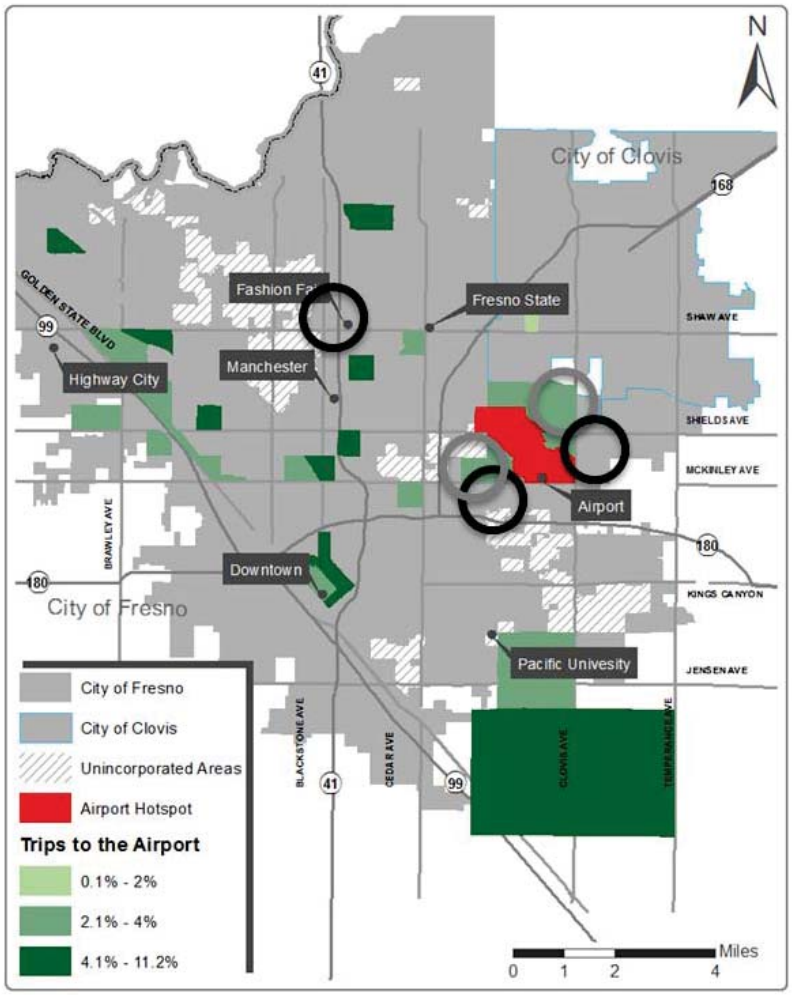


Figure 3-10: Fresno Yosemite Airport O-D Analysis

AirSage



On-Board Survey (Transit Trips Only)



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Figures 3-4 – 3-10 illustrate where travelers are originating if they are mode-neutral (AirSage) and if they are traveling by transit (on-board survey). As expected, the AirSage origins were much more dispersed than the on-board survey origins.

1. **Downtown Fresno** (Figure 3-4) – Mode-neutral trips destined for downtown Fresno were widely distributed across the FCMA, while the transit trips were concentrated mainly in other nearby downtown TAZs and along the Highway 99 corridor, including the Highway City residential area. In addition, a large number of transit trips originated in the Fresno State area. Based on the results of the AirSage analysis, many trips originate in the northern part of the city, but few of these are made by transit, suggesting there could be a market for transit service expansion.

2. **Fresno Pacific University** (Figure 3-5) – In both the mode-neutral analysis and the transit trip analysis, many trips destined for Fresno Pacific University originate nearby. With the mode neutral analysis, the trips were slightly more distributed with a concentration between Highway 180 and Shields Avenue and Highway 41 and Clovis Avenue. There is also a concentration of trips originating near Highway City.

3. **Manchester Transit Center** (Figure 3-6) – In the mode-neutral analysis, trips destined for the **Manchester** Transit Center are much more widely distributed than transit trips. Both mode-neutral trips and transit trips to Manchester Transit Center cluster along the Highway 99 corridor and the Highway 41 corridor, with a few additional clusters in downtown Fresno and Clovis.

4. **California State University, Fresno** (Fresno State) (Figure 3-7) – In the transit trip analysis, most trips originate in relatively close proximity to Fresno State, whereas trips in the mode-neutral analysis are more widely distributed across the FCMA. In comparison to transit trips, a large portion of the mode-neutral trips originate in the northern portions of the city – along Cedar Avenue and Blackstone Avenue. There are also more mode-neutral trips originating in the Clovis area.

5. **Highway City residential area** (Figure 3-8) – Most transit trips destined for Highway City also originate in that vicinity. Likewise, many of the mode-neutral trips destined for Highway City also originate along the Highway 99 corridor. However, a cluster of trips originate in the north-central part of Fresno, near the Shaw Avenue/Blackstone Avenue intersection.

6. **Fashion Fair Shopping Center** (Figure 3-9) – Many of the transit trips destined for the Fashion Fair area originate along Blackstone Avenue or Shaw Avenue. A good number also originate in the downtown Fresno area and by the Clovis Avenue/Kings Canyon intersection. The mode-neutral trips are much more widely dispersed, including the Highway City area, north-central Fresno, central Fresno and Clovis.

7. **Fresno Yosemite Airport** (Figure 3-10) – Most of the transit trips destined for the Airport originate either directly south or directly west of the Airport. In contrast, the mode-neutral trips are spread throughout the FCMA with a large concentration of trips originating nearby the Airport and along Blackstone Avenue.

Based on these results, some key origin-destination pairs to explore introducing or expanding transit service include:

- Downtown Fresno – Northern Fresno
- Fresno Pacific University north via Cedar Avenue
- Fresno State north via Cedar Avenue/Blackstone Avenue
- Highway City east via Shaw Avenue
- Shaw City north along Blackstone Avenue or east-west along Shaw Avenue

In general, many trips seem to originate in the north-central area of Fresno that are not being made on transit, which suggests there could be a potential market there that is underserved.

3.3 Travel Times

Travel times affect the desirability of transit. Reducing transit travel time to major destinations can improve ridership. Figure 3-11 through Figure 3-17 show the existing travel time to each of the previously identified hotspots.

The circles in these maps are origins that have been carried forward from the previous analyses (AirSage and on-board survey) and are "key" TAZs, where transit service improvements could yield additional ridership in section 3.4. The black circles are origins with transit travel times greater than 30 minutes to a specific hotspot. These areas will be carried forward into the subsequent "No-vehicle Ownership" analysis. The gray circles are origins that are located in areas with lower travel times to a specific hotspot (less than 30 minutes), which are less likely to yield significant benefits from transit improvements. Gray circles are not carried forward.

Figure 3-11: Transit Travel Times to Downtown

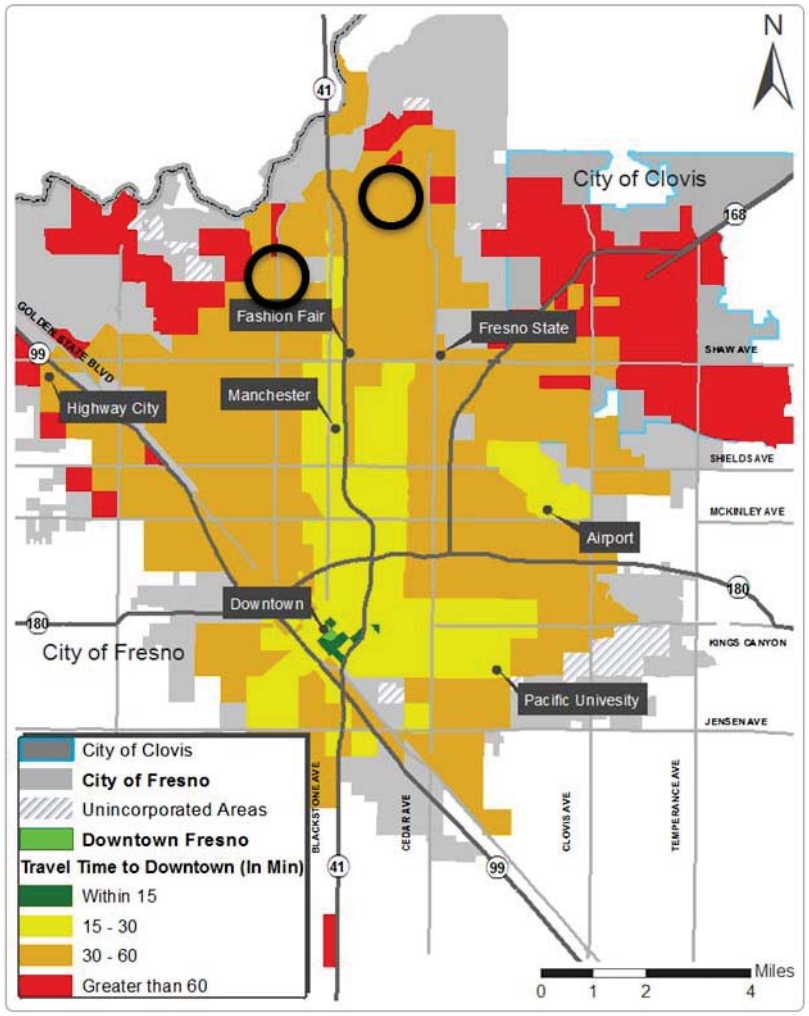

Figure 3-12: Transit Travel Times to Fresno Pacific

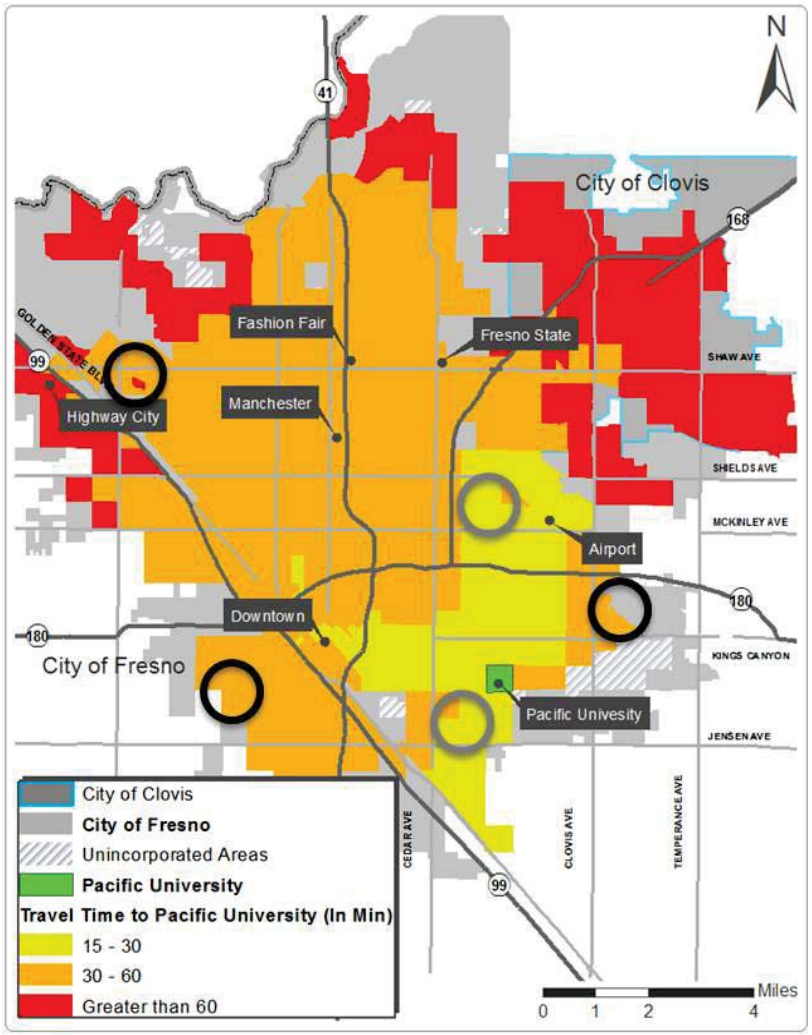

Figure 3-13: Transit Travel Times to Manchester Transit Center

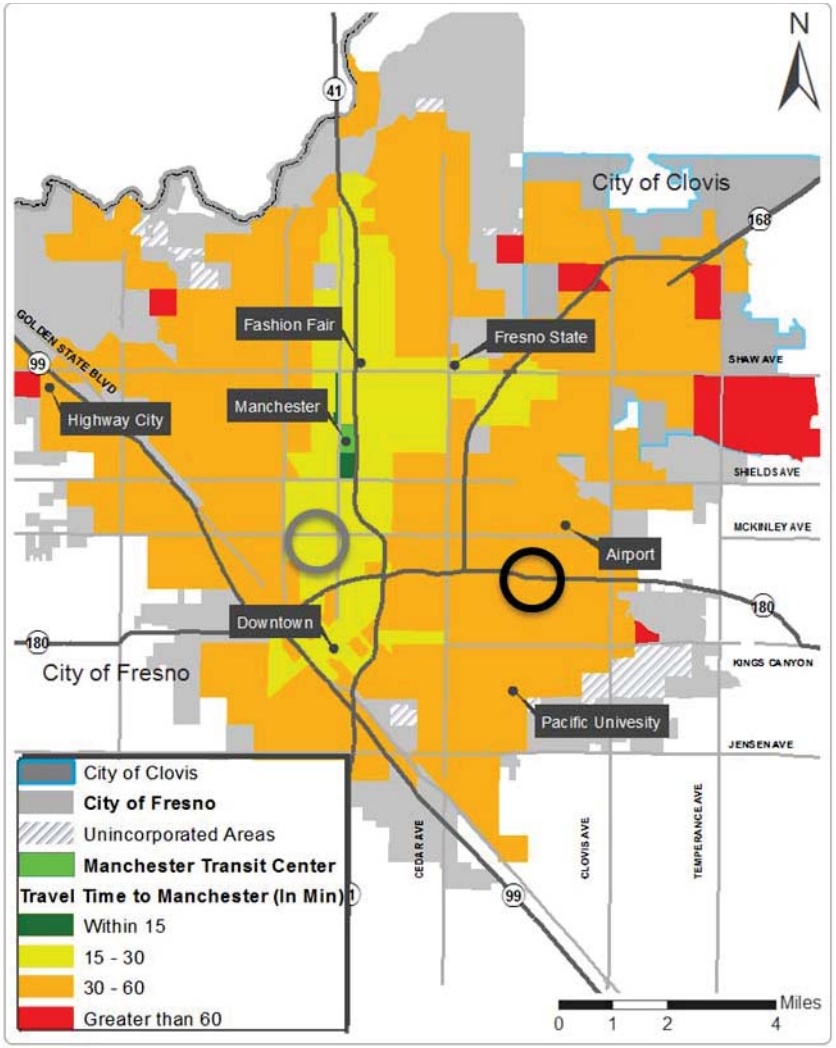

Figure 3-14: Transit Travel Times to Fresno State

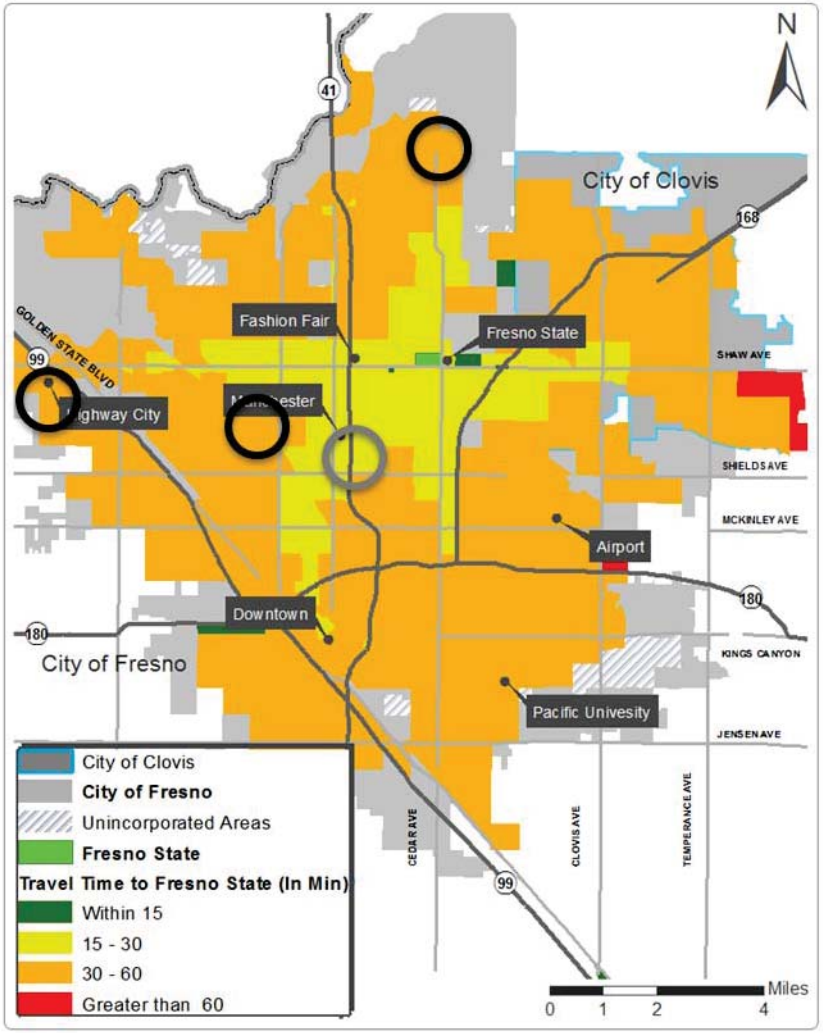

Figure 3-15: Transit Travel Times to Fashion Fair Mall

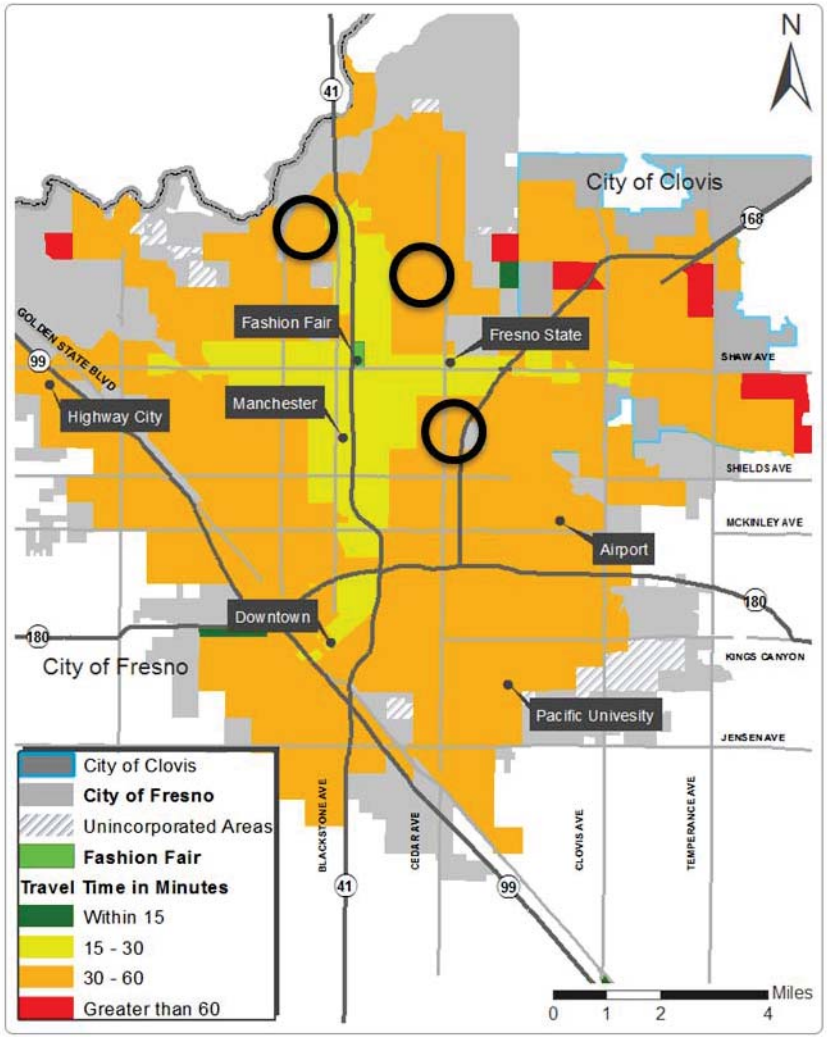

Figure 3-16: Transit Travel Times to Highway City

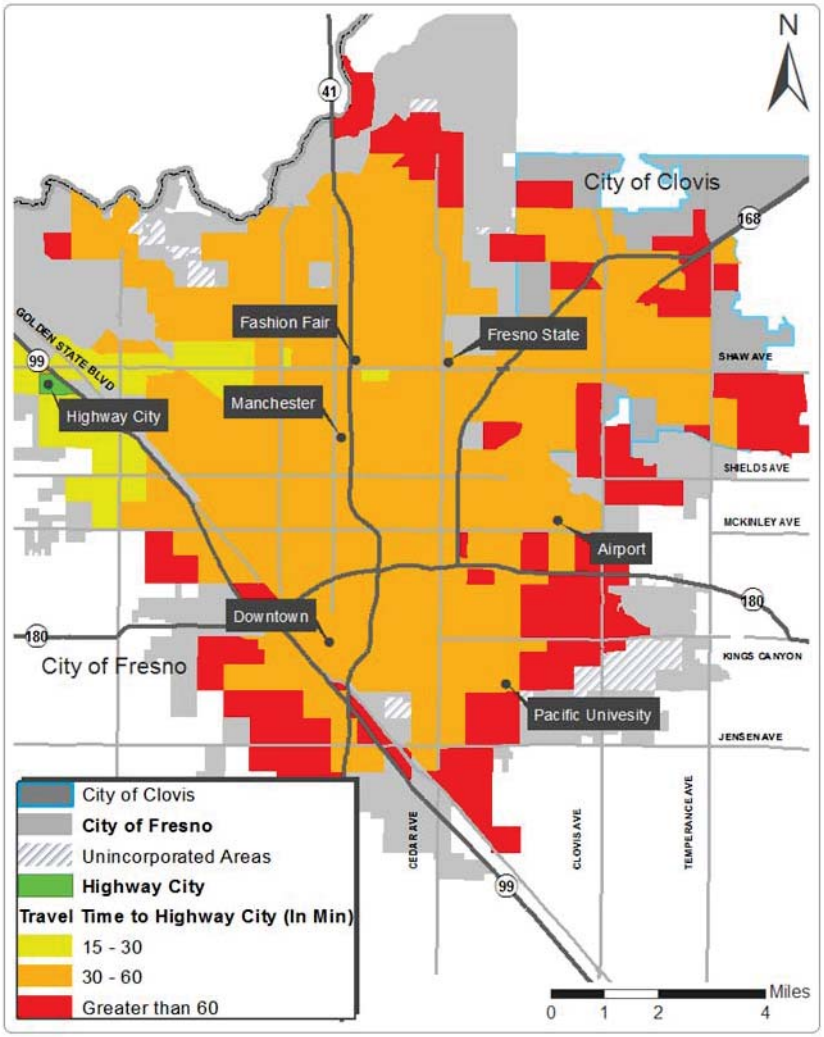

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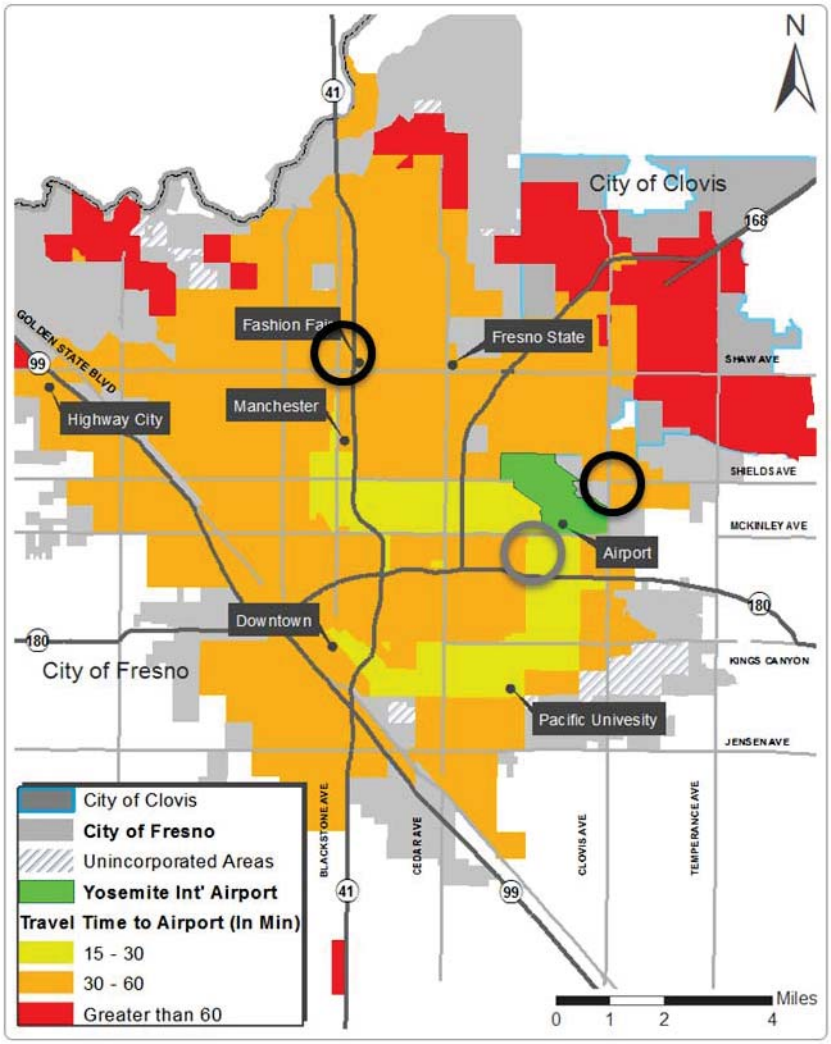
Figure 3-17: Transit Travel Times to Fresno-Yosemite Airport



1. **Downtown Fresno** (Figure 3-11) – The two TAZs carried forward into this analysis (shown in the black circles), one located northwest of Fashion Fair Mall and the other in north-central Fresno, have transit travel times in excess of 30 minutes. This further indicates a need for improved transit service from these areas to Downtown Fresno. These areas are carried forward into the next stage of analysis.

2. **Fresno Pacific (**Figure 3-12**) –** Three of the five areas carried forward into this analysis experience transit travel times greater than 30 minutes (shown as black circles on the map). These are located in southeastern Fresno just south of Highway 180, southwest of Downtown Fresno and near Shaw Ave. and Golden State Blvd. These areas are carried forward into the next stage of analysis.

3. **Manchester Transit Center** (Figure 3-13) – One of the two origins carried into this analysis experiences travel times in excess of 30 minutes to Manchester Transit Center. It is located just southwest of Fresno-Yosemite Airport. This origin is carried forward into the next stage of analysis.

4. **Fresno State** (Figure 3-14) – Three high-origin areas to Fresno State experience transit travel times in excess of 30 minutes. These are located in north central Fresno, just west of Manchester Transit Center and in Highway City. These are carried forward into the next stage of analysis.

5. **Fashion Fair Mall** (Figure 3-15) – All three high-origin areas to Fashion Fair Mall experience travel times in excess of 30 minutes. Two are located in north central Fresno, near Blackstone Ave. and Herndon and on Shaw Ave. northwest of Fresno State. The third origin with high transit travel times to Fashion Fair Mall is located near Shields Ave. and Highway 168. These are carried forward into the next stage of analysis.

6. **Highway City** (Figure 3-16) – No high-origin areas to Highway City were carried forward into this analysis.

7. **Fresno-Yosemite Airport** (Figure 3-17) – Two high-origin areas to Fresno-Yosemite Airport experience transit travel times in excess of 30 minutes. These are located at Fashion Fair Mall and northwest of the airport near the intersection of Shields and Clovis Avenues. These are carried forward into the next stage of analysis.

3.4 Trips from No-Vehicle Households

The origin-destination data from the AirSage analysis was refined with the on-board survey data and the transit travel time analysis. The high-origin areas that were carried forward after these analyses were analyzed further with respect to the number of trips made by members of no-vehicle households (a data point from the AirSage data). These trips are of particular interest because they further refine the identification of areas with transit ridership potential to high activity destinations (or hotspots). All trips (transit and non-transit) made by members of no-vehicle households to each of the hotspots were screened into three categories: low, medium, and high, reflecting the number of no-vehicle household trips to that destination, relative to the total number of transit trips to the same destination.

Figure 3-11 through Figure 3-17 show these data on a map. The circles are part of a stepwise process to identify TAZs that: 1) have many origins in the AirSage data, 2) have many origins in the survey data, 3) are outside the 15-30 minute travel time boundary, and 4) have many no-vehicle households. Black circles in these “no-vehicle household” maps are origins that have been carried forward from the previous stages of analysis. These “key” TAZs indicate, with a higher level of certainty, that transit improvements to these specific areas could yield transit ridership. The gray circles are origins that have met all of the criteria from the previous analyses but are located in areas with higher levels of vehicle ownership. However, despite not meeting this final criterion, these areas may still benefit from transit improvements to specific hotspots.

Figure 3-18: No-Vehicle Household Trips to Downtown

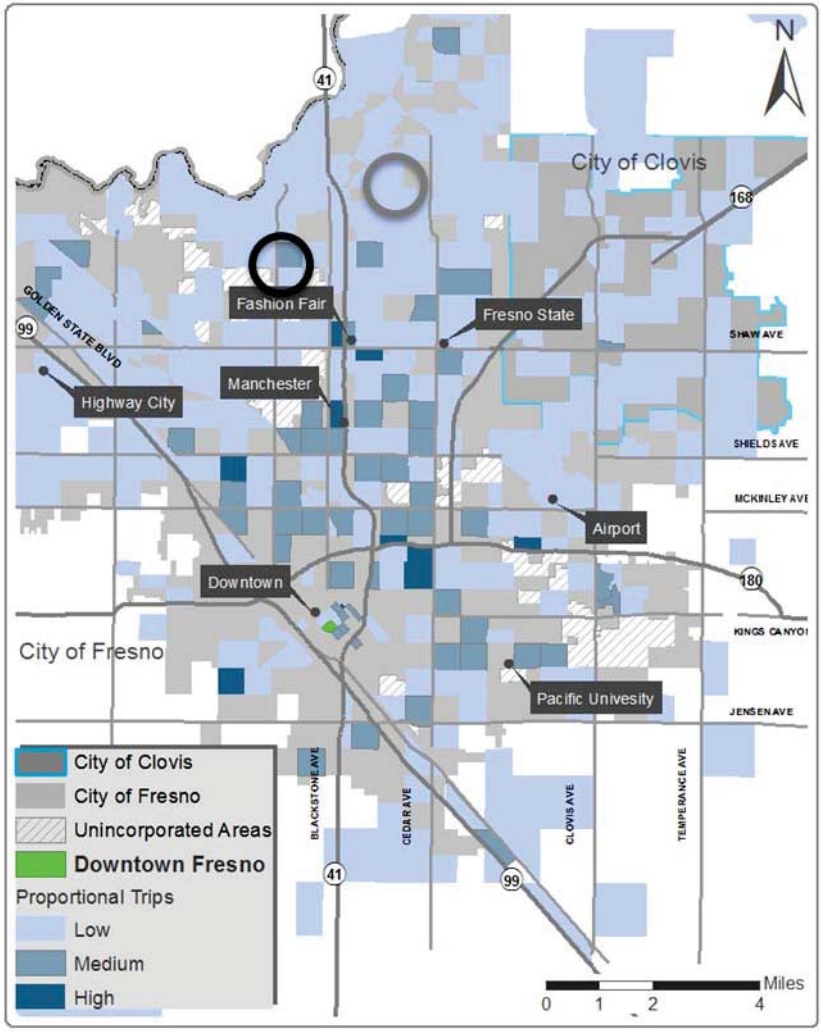


Figure 3-19: No-Vehicle Household Trips to Fresno Pacific

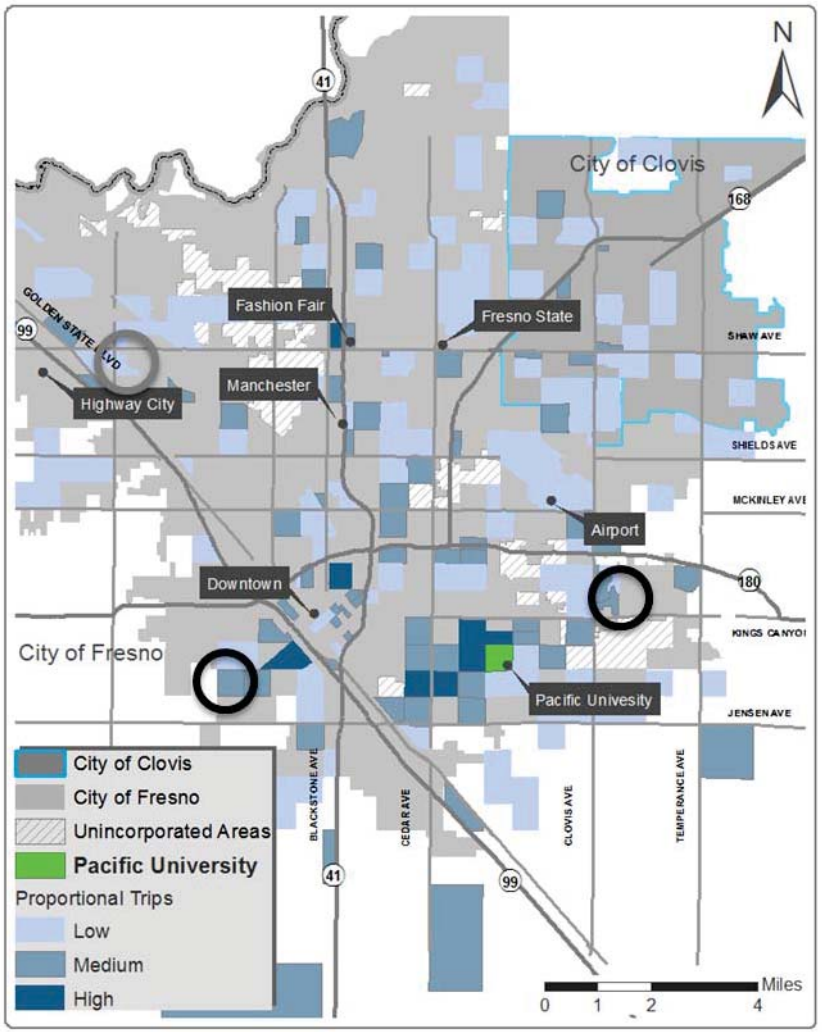


Figure 3-20: No-Vehicle Household Trips to Manchester Transit Center

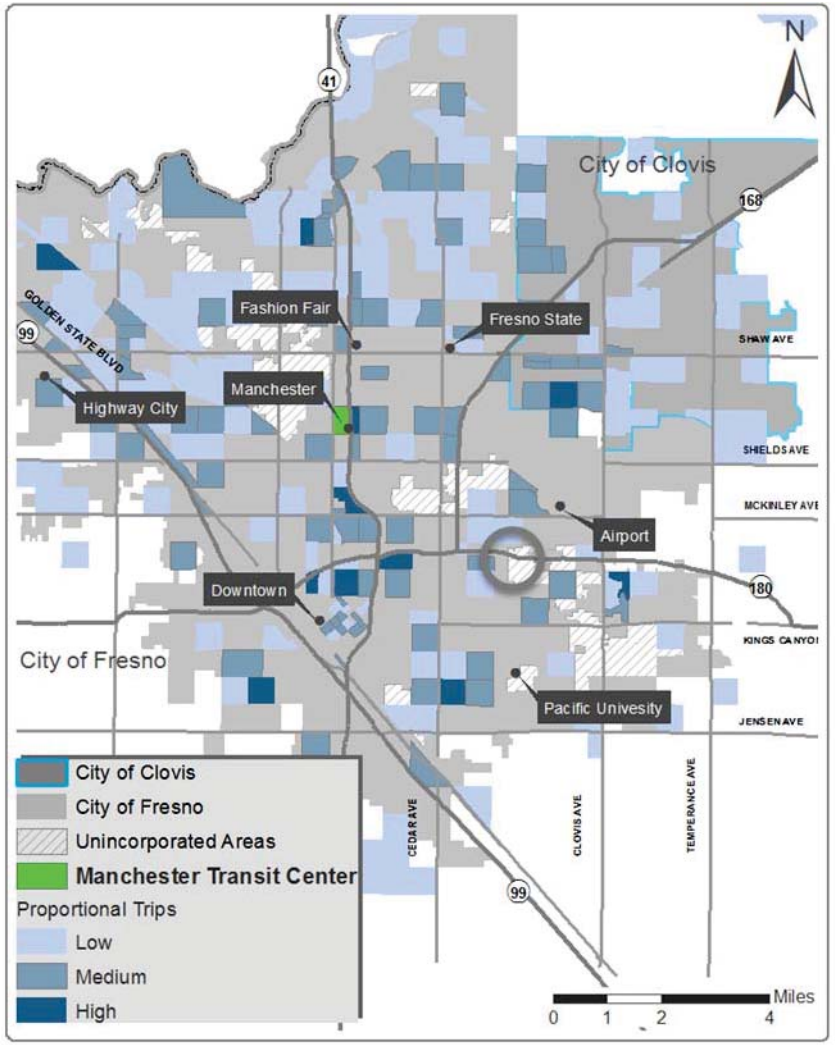


Figure 3-21: No-Vehicle Household Trips to Fresno State

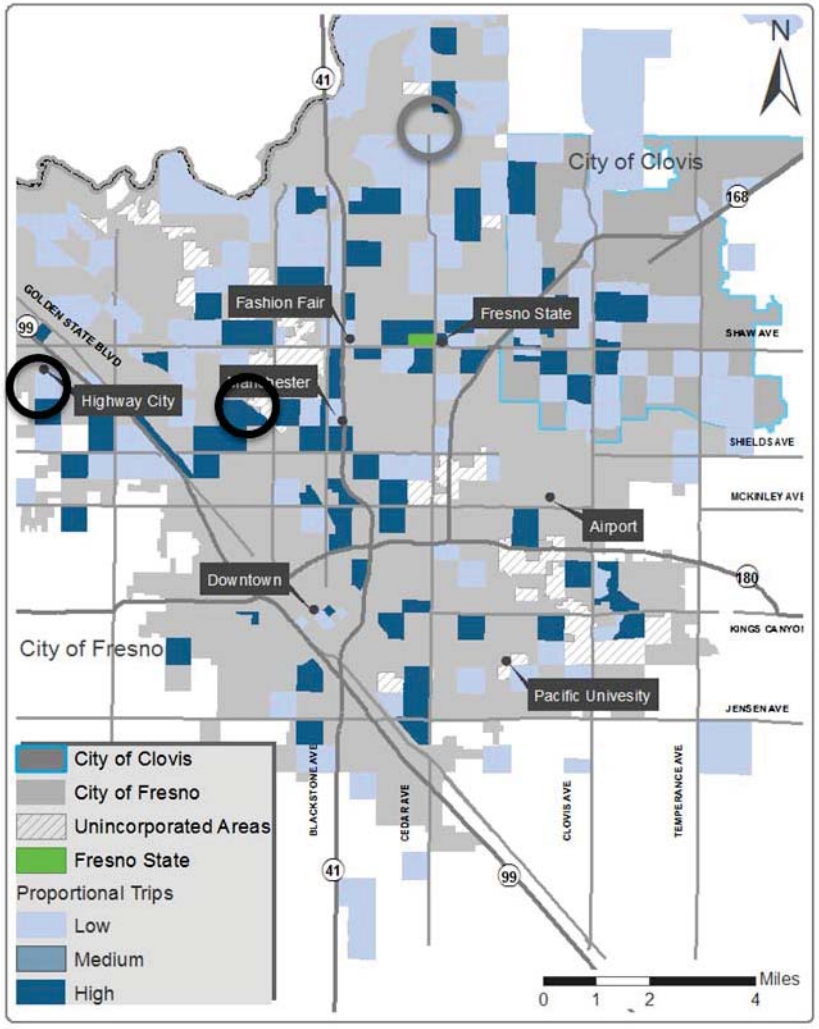


Figure 3-22: No-Vehicle Household Trips to Highway City

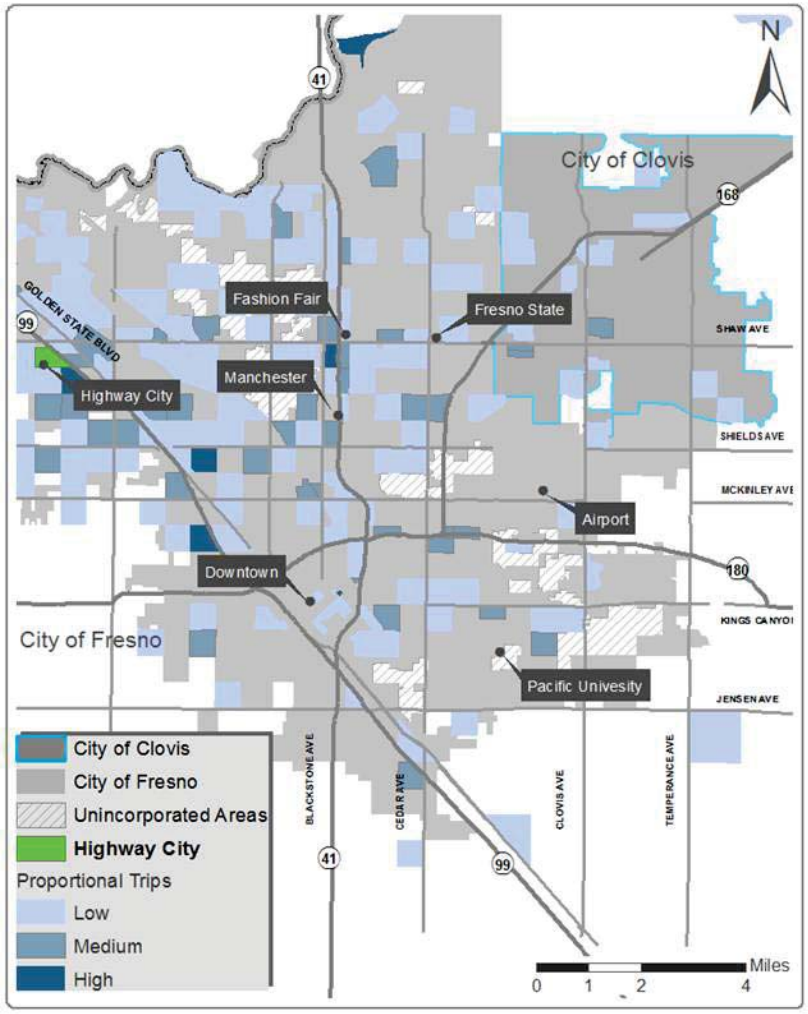


Figure 3-23: No-Vehicle Trips to Fashion Fair Mall

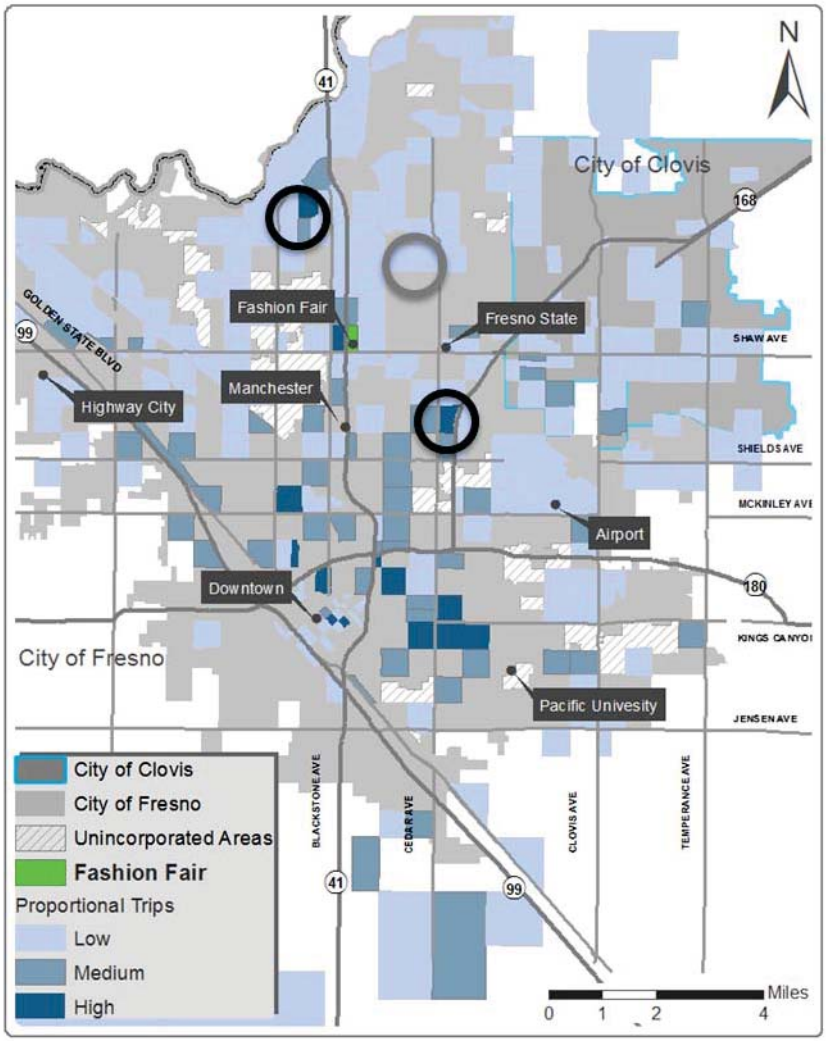


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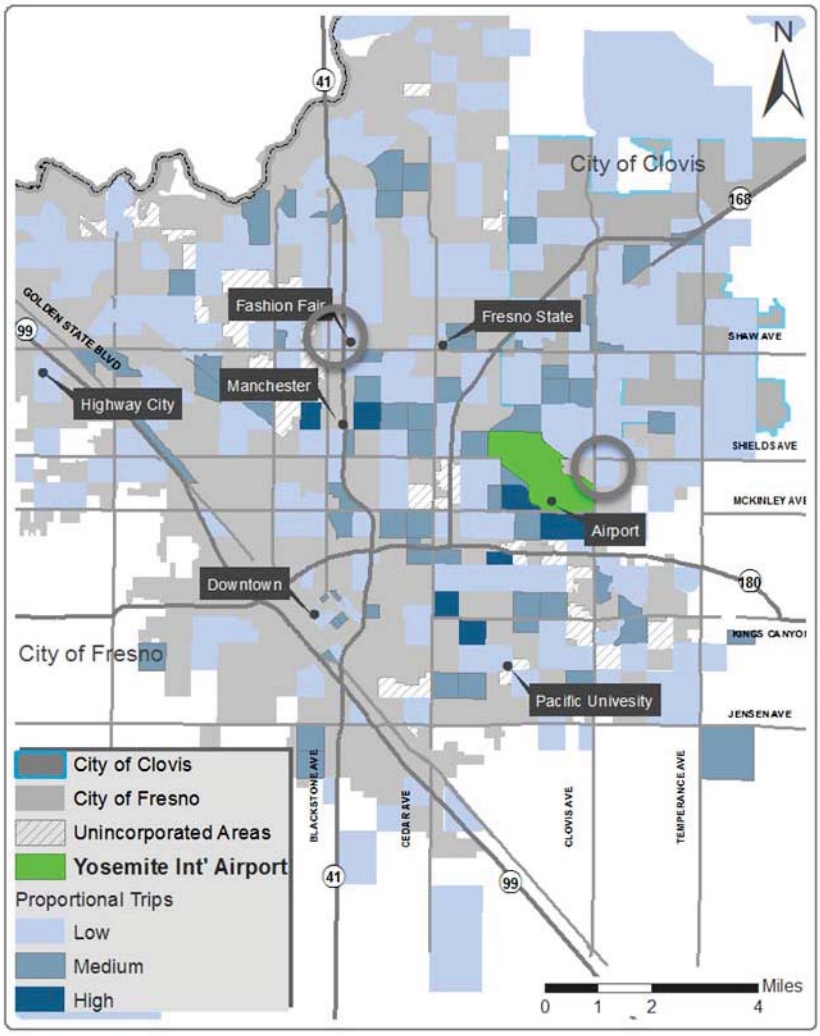
Figure 3-24: No-Vehicle Trips to the Airport



1. **Downtown Fresno** (Figure 3-18) – No-vehicle household trips to downtown have several "high" origin TAZs scattered over the study area. A TAZ northwest of Fashion Fair is a key origin, representing a TAZ that has a relatively high number of originating trips from no-vehicle households ("medium"), in addition to having a high number of origins in both the AirSage and survey data, and a transit travel time in excess of 30 minutes.

2. **Fresno Pacific University** (Figure 3-19) – Many no-vehicle trips to Fresno Pacific originate close to campus. Two TAZs are significant (and circled in black): one southwest of Downtown Fresno and another south-southeast of the airport represent a relatively high number of originating trips from no-vehicle households ("medium"), in addition to having a high number of origins in both the AirSage and survey data, and a transit travel time in excess of 30 minutes.

3. **Manchester Transit Center** (Figure 3-20) – No-vehicle household trips to Manchester Transit Center originate from all over the city. No TAZ meets all of the stepwise criteria, but the gray circle represents the TAZ that comes closest. This TAZ, southwest of the airport, has many origins in both the AirSage and

survey data, and has transit travel times exceeding 30 minutes, but does not have a high number of trips originating from no-vehicle households.

4. **California State University, Fresno** (Figure 3-21) – There are a very large number of TAZs that have a high number of trips to Fresno State that originate from no-vehicle households. Fresno State is clearly an important destination for no-vehicle households. Two TAZs are significant from the stepwise process: one in Highway City, and the other west of Manchester Transit Center. These show TAZs with a high number of trips originating from no-vehicle households, a high number of total origins, and a transit travel time over 30 minutes.

5. **Highway City residential area** (Figure 3-22) – Relatively few trips to Highway City are made from TAZs with medium or high proportions of no-vehicle households. Highway City does not appear to be a major destination for these households. No TAZs with high origins to Highway City were carried into this analysis.

6. **Fashion Fair Mall** (Figure 3-23) – Most no-vehicle household trips to Fashion Fair Mall are made from TAZs clustered between downtown and Pacific University. Two TAZs are significant in the stepwise process (circled in black): one north of Fashion Fair, and the other south of Fresno State. These two TAZs have a high proportion of no-vehicle household trips originating there, in addition to having a high number of total origins, and a transit travel time over 30 minutes.

7. **Fresno Yosemite Airport** (Figure 3-24) – TAZs with a high proportion of trips to the airport originating from no-vehicle households are grouped next to the airport, close to Manchester Transit Center, and close to Pacific University. There are no TAZs that are significant in terms of meeting all the stepwise criteria, but the two that come closest (circled in gray) are near Fashion Fair and just east of the airport.

4.0 EXISTING SERVICE ASSESSMENT

The purpose of this section is to determine the current performance of the entire system and each individual route based on both quantitative analysis of performance metrics as well as qualitative responses collected from key stakeholders and the public (see Appendix C for details).

4.1 Performance Evaluation

The *Performance Evaluation Memorandum* (September 2013) provides an assessment of the performance of transit routes in the cities of Fresno and Clovis. The primary objective of this memo is to evaluate transit routes based on well-established measures of transit service efficiency. This analysis helps identify routes that perform below average in terms of their productive hours of operation (revenue hours) as well as identifies the most and least efficient portions of individual routes (in terms of balancing bus capacity with passenger loads).

4.1.1 Revenue/Vehicle Hour

The revenue/vehicle hours ratio measures the percentage of time that a transit vehicle serves passengers (and collects revenue). A higher ratio is indicative of a route with more efficiently deployed service as the bus spends more time serving passengers and less time deadheading, at layovers, or driving to and from its bus storage/maintenance facility. A lower ratio suggests routes that could benefit from scheduling or operational changes to reduce deadheading and non-revenue operation.

Table 4-1 summarizes the most and least efficient routes in terms of revenue/vehicle hour ratio. Routes 32, 30, and 26 have the three highest revenue/vehicle hour ratios, respectively, and exceed the systemwide average ratio of 89.5 percent. Conversely, Routes 35, 9, and 33 are the least efficient routes in terms of their revenue/vehicle ratios, performing below the systemwide average ratio. Fifty-seven percent of FAX routes perform below the system average on weekdays. The most and least efficient routes are the same for weekends within the FAX system.

Table 4-2 summarizes the operating efficiency of Stageline routes as measured by revenue/vehicle ratios. Routes 10 and 50 perform above the system average. However, determining the efficiency of these routes is difficult because the system average is based on a limited amount of routes, two of which primarily operate only for a few hours per day. This skews the average to a much lower number of hours. Efficiency of the Stageline network may be more effectively determined by comparing these data with their performance in a load factor analysis.

Table 4-1: Most and Least Efficient FAX Routes by Revenue/Vehicle Hour (Weekday)

	Route	Revenue/Vehicle Hours Ratio	Revenue/Vehicle Hour +/- Average
Most Efficient	Route 32	94.8%	5.4%
	Route 30	93.4%	3.9%
	Route 26	92.9%	3.4%
Systemwide Average		**89.5**	
Least Efficient	Route 35	86.8%	-2.7%
	Route 9	86.5%	-3.0%
	Route 33	82.1%	-7.4%

Table 4-2: Most and Least Efficient Stageline Routes Weekday

	Route	Revenue/Vehicle Hours Ratio	Revenue/Vehicle Hour +/- Average
Most Efficient	Route 10	12.2%	5.25
	Route 50	11.8%	4.85
Systemwide Average		**6.95**	
Least Efficient	Route 70	1.8%	-5.15
	Route 80	2.0%	-4.95

4.1.2 Passenger Loads

Table 4-3 ranks the maximum load factor compared to systemwide average (130%). Routes 38, 26, 41 have the highest average max load factors, ranging from 159 percent to 223 percent. These routes, on average, are more highly patronized than all other routes in the system, which is one indicator of service efficiency. Routes 35, 33, and 58 are the least efficient routes in the system in terms of max load factors, ranging from 11 to 38 percent. This indicates that these routes are not well-utilized, since even the runs with highest loads fare well below the systemwide average. Six of the fourteen FAX routes operate below the systemwide average, which are the potential candidates for service adjustments. These six routes are 45, 32, 22, 35, 33 and 58.

Table 4-3: Maximum Load Factor by Time of Day and Route Weekdays

Route	Time	Direction	Peak Load Location	Average Max Load	Max Load Factor
Route 38	6:35 AM	North	B Shelter	87	223%
	2:46 PM	South	Blackstone – El Paso	67	172%
	2:26 PM	South	Blackstone – El Paso	67	172%
Route 26	1:35 PM	South	Nees – Blackstone	73	187%
	5:50 AM	North	Shields - Brawley	70	179%
	6:20 AM	North	Shields - Brawley	58	149%
Route 41	2:35 PM	North	Grand - Harding	72	185%
	2:05 PM	North	Grand - Harding	64	164%
	7:05 AM	South	Marks - Shaw	62	159%
Route 34	6:40 AM	North	Jensen – Cherry	67	172%
	2:27 PM	South	First - Nees	63	162%
	2:47 PM	South	First - Nees	62	159%
Route 9	6:40 AM	South	Brawley - Shields	65	167%
	3:10 PM	North	Shaw/Cole	60	154%
	2:08 PM	South	Brawley - Shields	59	151%
Route 30	3:04 PM	North	SE Crystal - Kearney	59	151%
	11:52 AM	South	SW Blackstone - Nees	58	149%
	12:24 PM	North	SE Crystal - Kearney	56	144%
Route 28	6:05 AM	South	NW Shaw - Cedar	58	149%
	12:32 PM	South	Willow – Shaw	56	144%
	8:30 AM	North	Kings Canyon - Winery	53	136%
Route 20	7:40 AM	South	Brawley - Walmart	54	138%
	2:55 PM	North	L Shelter	53	136%
	7:10 AM	South	Brawley - Walmart	52	133%
Average Max Load and Average Max Load Factor (all routes)				**50**	**130%**

Route	Time	Direction	Peak Load Location	Average Max Load	Max Load Factor
Route 45	2:40 PM	North	Herndon - Milburn	58	149%
	1:40 PM	North	Herndon - Milburn	47	121%
	6:40 AM	North	Herndon - Milburn	40	103%
Route 32	1:58 PM	South	El Paso EB	48	123%
	2:24 PM	North	North - Elm	47	121%
	11:54 AM	North	North - Elm	46	118%
Route 22	3:05 PM	South	West - Bullard	55	151%
	8:05 AM	South	West - Bullard	42	108%
	10:35 AM	South	West - Bullard	40	103%
Route 35	3:00 PM	North	Belmont - Clovis	38	97%
	12:45 PM	South	NE Marks - Olive	35	90%
	4:30 PM	North	Belmont - Clovis	32	82%
Route 33	8:30 AM	North	Maple - Butler	30	77%
	7:30 AM	North	Maple – Butler	21	54%
	12:30 PM	South	Belmont – Delano	19	49%
Route 58	8:02 AM	North	Champlain – Perrin	22	56%
	7:32 AM	South	Maulpin - Peck	11	28%
	6:32 AM	South	Maulpin - Peck	11	28%

4.1.3 Boardings

Table 4-4 summarizes the average boardings per hour for weekdays across the FAX system. The systemwide average for weekday boardings is roughly 44 boardings per hour. Routes 28, 41, and 9 have the highest number of boardings per hour. Routes 33, 45 and 58 have the lowest number of boardings per hour.

Based on the on-board survey results, FAX routes 28, 26/39, 38 and 30 have the highest rider volume in the FCMA.

Figure 4-1 through Figure 4-3 illustrate the locations of boardings and alightings on the FAX and Clovis Stageline systems for weekdays, Saturdays Sundays, respectively. The areas with the greatest activity are Downtown Fresno and Manchester Transit Center, a major transfer point. Other areas with a high

number of boardings and alightings are key transfer points between routes, such as Shaw/1st (34/28), Shaw/Cedar (38/10), and Cedar/Ventura (38/28).

The weekend boardings are lower than weekday boardings with Sunday having the lowest number of boardings. On the weekends, Downtown Fresno remains the center of activity for transit boardings and alightings.

Table 4-4: FAX Routes Average Boardings per Hour Weekday

FAX Route	Average Boardings Per Hour
28	53.3
41	49.9
9	48.9
26	47.1
32	45.8
30	45.6
38	44.5
Systemwide Avg.	**43.8**
20	43.8
34	42.3
35	42.3
22	41.6
33	33.3
45	31.5
58	14.6

Figure 4-1: Average Weekday Boardings and Alightings Combined

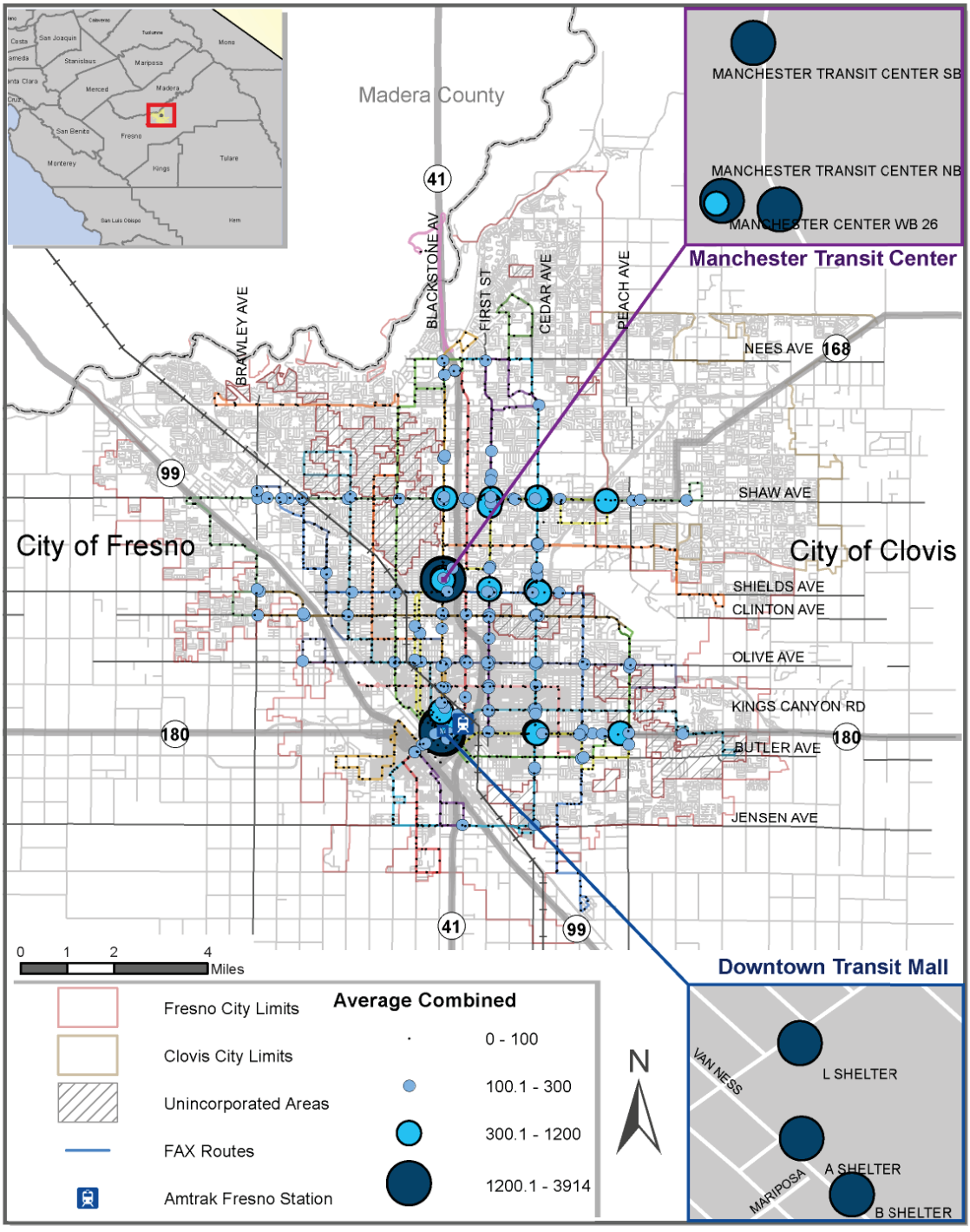


Figure 4-2: Average Saturday Boardings and Alightings

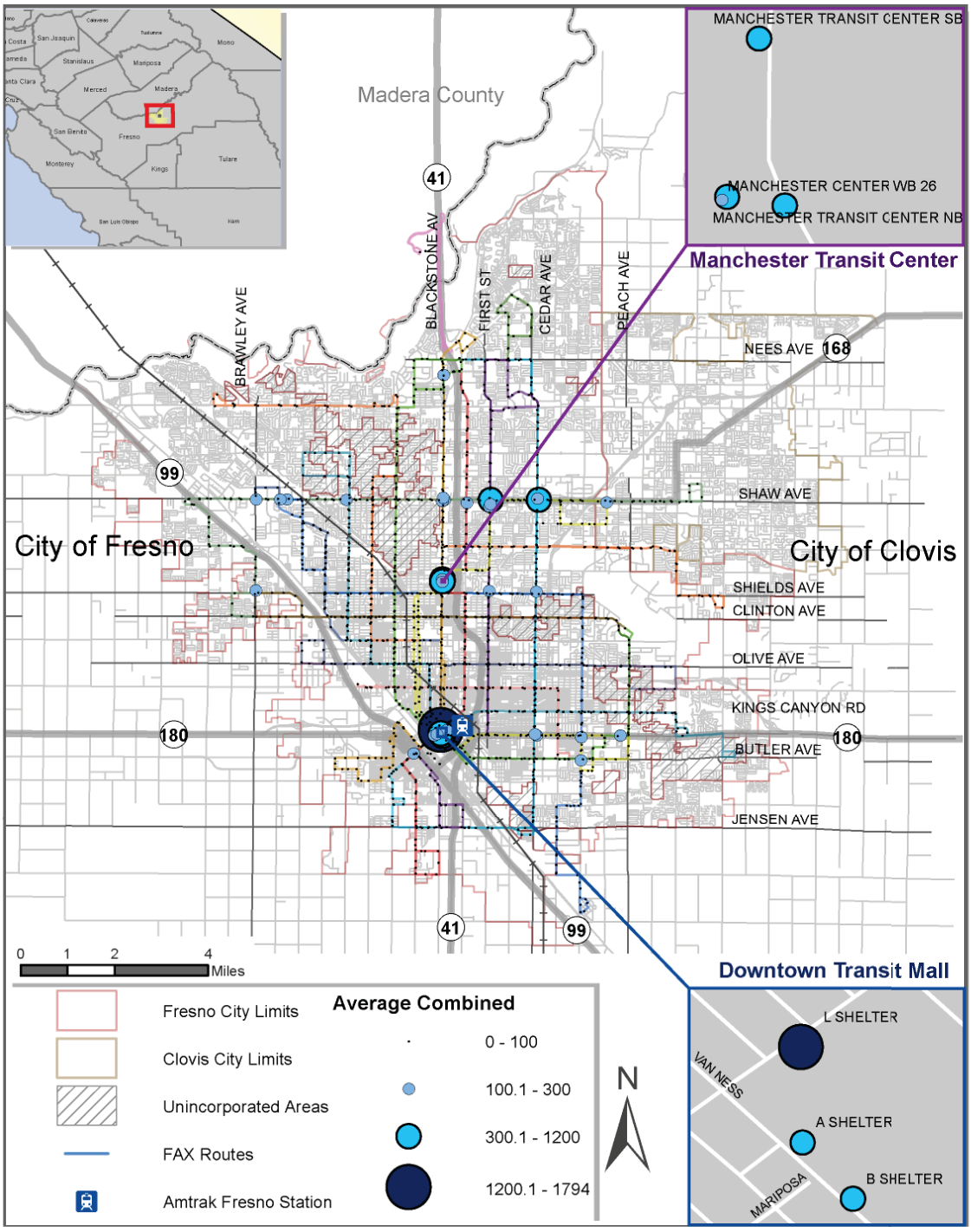
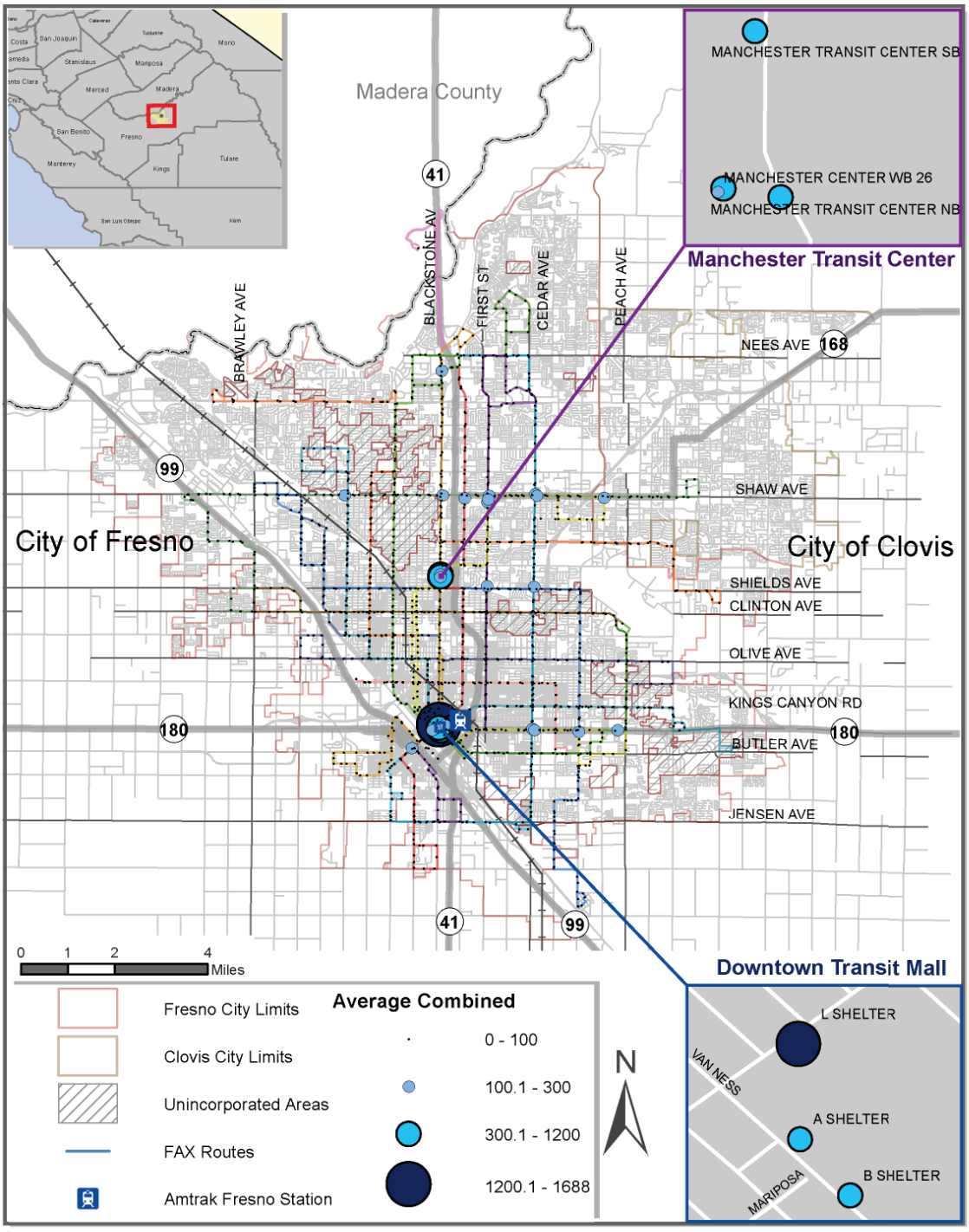


Figure 4-3: Average Sunday Boardings and Alightings



4.1.4 Summary of Performance Metrics

Table 4-5 summarizes the most efficient and least efficient FAX routes based on the preceding analysis.

The most efficient/highest use routes include:

- Route 26 – N. Palm/Peach Avenue (Downtown Fresno to Fresno Yosemite Airport via Fresno Pacific University)
- Route 41 – N. Marks Ave/Shields Ave/Chestnut (Highway City to Malaga via Manchester Transit Center, Duncan Polytechnic High School)

The least efficient/lowest use routes include:

- Route 35 – Olive Crosstown (east-west via Olive)
- Route 33 – Belmont Crosstown (Roeding Park to County Fair Grounds)
- Route 58 – NE Regular Service (River Park to Clovis West High School)

In general, the most efficient/highest use routes serve multiple major destinations in line with the hot spots identified in the AirSage and TSI analysis. The least efficient/lowest use routes do not serve these areas, which explains their lower performance. In developing the network alternatives, there will be a focus on the restructuring of the least efficient/lowest use routes to better serve the FCMA.

Table 4-5: Summary of Performance Metrics

Metric	Most Efficient/Highest Use	Least Efficient/Lowest Use
Revenue/Vehicle Hours	Route 32 Route 30 Route 26	Route 35 Route 9 Route 33
Max Load Factors	Route 38 Route 26 Route 41	Route 35 Route 33 Route 58
Boardings per Hour	Route 28 Route 70 Route 41	Route 58 Route 50 Route 48

4.2 Stakeholder and Public Opinion

In Fall 2013, a series of interviews were conducted with a variety of stakeholders in the FCMA community, including Fresno and Clovis city councilmembers and representatives from schools, universities and social services. In addition, a customer satisfaction survey was conducted as part of the origin-destination survey (Appendix D). The feedback received has been categorized into the three

transit considerations: long-term policy goals, cost-effectiveness, and customer service and safety (Figure 4-11).

In the long-term, many stakeholders felt that the FCMA region could be more efficiently served by transit if the development patterns changed. Policy suggestions included increasing density in downtown Fresno by encouraging infill development as well as reducing sprawl by assessing developers a fee for providing city services in new outlying areas.

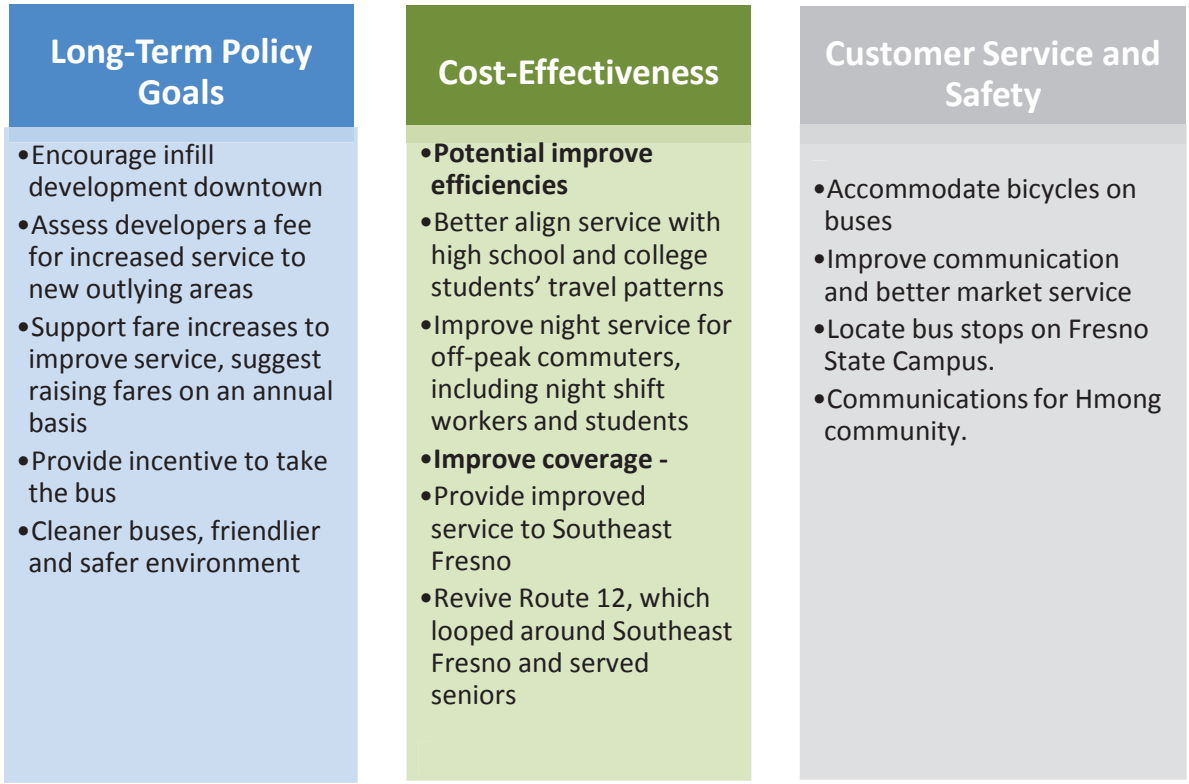
The financial stability of FAX and Clovis Stageline was another common topic of concern, especially among those in political office. There was support for increasing fares to improve service and to introduce annual fare increases to keep pace with inflation.

One common theme raised was improving service for off-peak commuters, including night shift works and students. Over one-quarter of those who responded to the on-board survey were students and 23 percent of trip purposes were home-school, suggesting that students comprise a considerable portion of the FCMA transit market. In addition to adjusting the schedules to better serve off-peak riders, some suggested also considering route realignments to better align service with students' travel patterns.

In addition to students, there was concern that seniors are being adequately served by FAX and Clovis Stageline, although only five percent of the survey respondents were 65 and over.

Improving service to the Fresno State Campus was a top priority for many of those interviewed, who felt that the current service is focused on the perimeter of the campus and does not serve the central core. Locating the bus stops on the perimeter forces students to walk farther, adding to their travel time and potentially making those who have to walk across a dark campus at night feel unsafe.

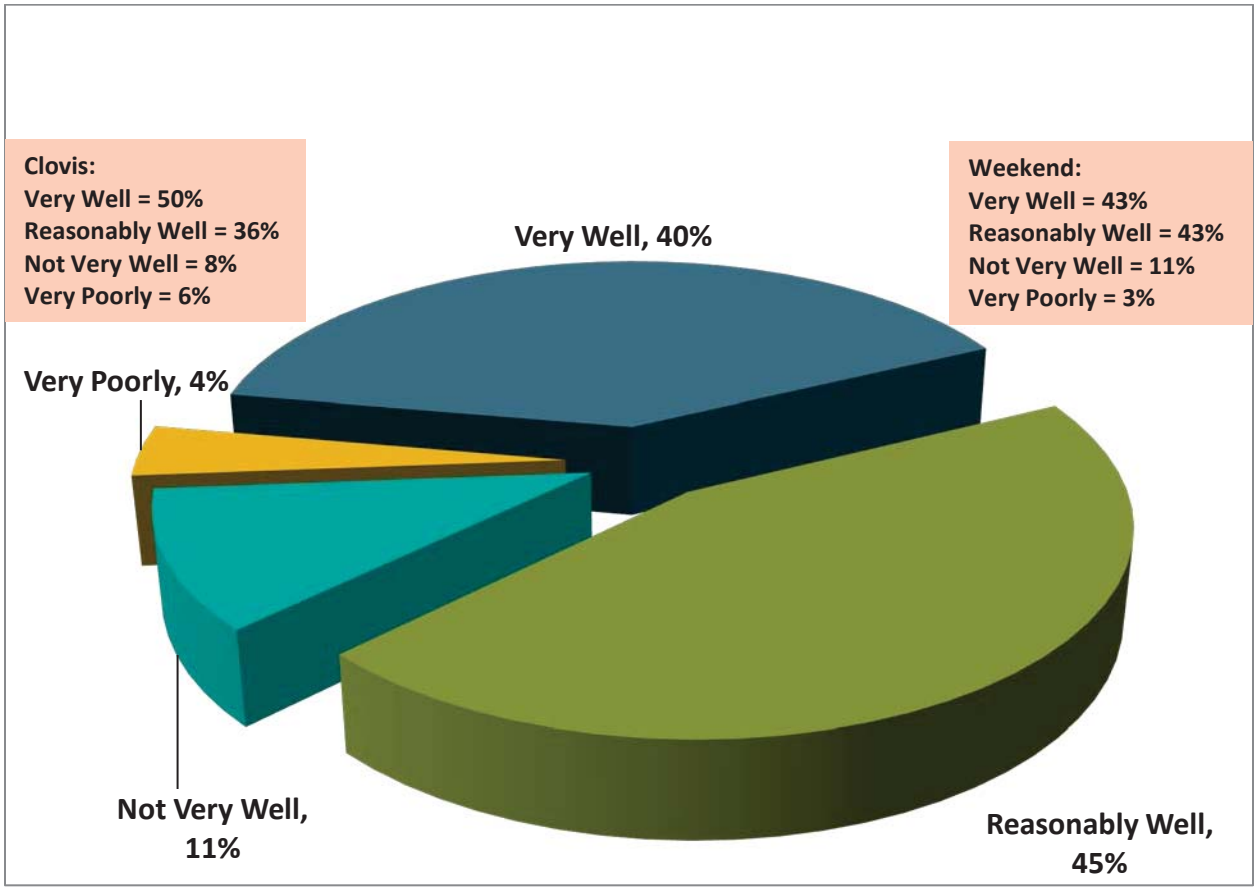
Figure 4-4: Summary of Stakeholder Feedback



The transit riders surveyed were overwhelmingly dependent on transit to make their trip with only 12 percent of respondents having access to a car. Over half of respondents had an annual income below $10,000 and eighty percent had an annual income below $20,000, supporting the transit-dependency of the transit riders in the FCMA. Nearly two-thirds of riders have ridden FAX or Clovis buses for 3 or more years. More than one-half (56 percent) ride the bus 5 or more days per week.

Based on the on-board survey results, 85 percent of respondents felt that FAX and Clovis Stageline met their transportation needs very well or reasonably well (Figure 4-12). Eighty-percent of those surveyed were satisfied with the trip time on transit. However, those who do not transfer buses at all are somewhat more satisfied with trip time than those who do transfer, but satisfaction does not decrease as the number of transfers increases above one transfer. Over two-thirds of all riders transfer buses on their trip, with the average transferring rider making 1.37 transfers.

Figure 4-5: How well are Transportation Needs Met by FAX and Clovis Stageline?



5.0 NETWORK ALTERNATIVES

The following section assembles the stakeholder interviews, analysis of ridership patterns and bus route usage, and assessment of potential new markets for service. There are competing elements between improving productivity (i.e., ridership) and coverage. These competing elements have been developed in extreme examples of network alternatives to demonstrate the potential trade-offs and help clarify policies for decision-makers to consider and to guide the future of FCMA transit services.

Key findings include:

- All major transit markets are served today based on the extensive analysis in the preceding chapters. The primary opportunities for capturing transit ridership are served by the existing routes; however, *there are lots of routes, but not a network.* The prevailing frequency of the network is every 30 minutes, which is insufficient for the easy connections that make it possible to get from anywhere to anywhere in the network. While a few connections are timed, there are many cases where a customer may wait 25 minutes for the bus and then 25 minutes to transfer to another bus. A few key routes run every 20 minutes.

- In a city where many people are employed in service industries – such as retail and medical – that generate intense evening shifts, the system shuts down too early to be relevant to people who must work these shifts. Similar limitations apply on weekends. These span limits are a major issue, limiting access, and encouraging automobile use.
- Many issues of pedestrian circulation and safety exist around stop locations, outside the control or responsibility of FAX or Stageline. Yet, this is an important determinant of outcomes.
- The network naturally converges at two points where off-street transit facilities are needed: Fresno State and the River Park area. River Park is a matter of particular urgency, as the routes in that area cannot be organized for easy connections without a facility to support operations.
- The downtown transit center imposes serious capacity limitations that create inefficiencies on operations. Most comparable cities have a considerably more functional facility at the heart of their network.

The necessary policy and network changes to achieve each of these system concepts are described in the following pages. Each alternative considers existing resources redeployed to demonstrate alternative network structures.

- **Existing Network Scenario:** Adapt policies to improve elements such as customer information and bus stop patterns. The basic route structure and service levels remain as they are today. Figure 5-1 illustrates the existing system and headways.
- **Ridership Scenario:** A Ridership (or Productivity) Scenario cuts unproductive service and concentrates those resources where they would gain the most ridership, as additional frequency and span along the corridors where transit potential demand is highest. This scenario does not expand the area of the network; in fact, the area contracts as unproductive areas are removed. Figure 5-2 shows the system in a "ridership" system. Note that in the "ridership" scenario, some low-productivity service is deleted, but headways are improved on the busiest corridors, with 15-minute service reducing waiting times. Service on some routes is also extended to midnight.
- **Coverage Scenario:** The Coverage Scenario responds to service requests from stakeholders – mostly for service around the edges of the service area. This scenario deploys more service to cover these areas. To pay for this, transit agencies cut frequencies on highly productive services. Because these are areas of low ridership potential (compared to the highly productive existing system) the effect is that overall productivity goes down. Figure 5-3 shows the system in a "coverage" scenario.

Maximizing *productivity* involves thinking like a business and choosing which markets to enter. Routes operated on straight lines along dense and walkable corridors are most conducive to high-ridership and efficient transit operations, i.e., a high number of passengers per unit of service cost.

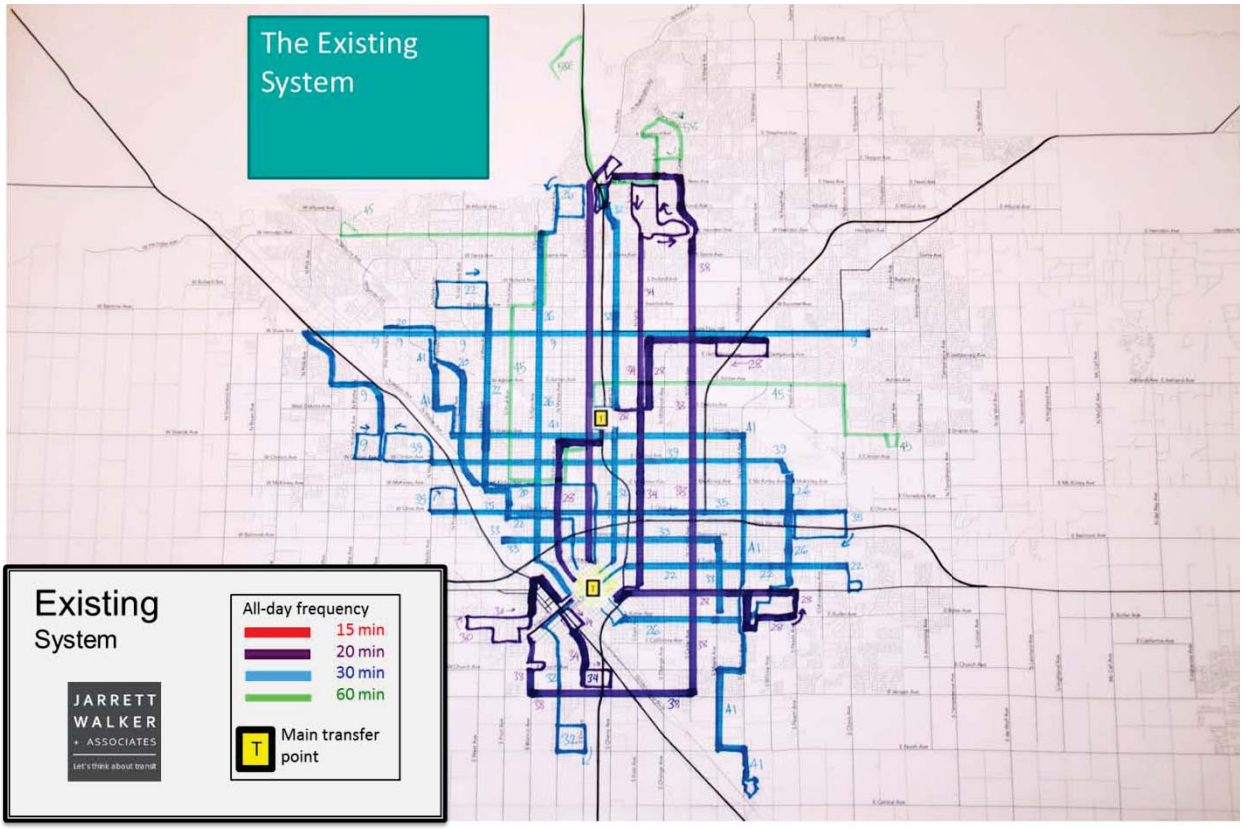
Maximizing *coverage* involves thinking like a government service, and trying to "spread service out" to provide a wider service area even though that means providing service in some areas that are expensive to serve and generate low ridership (e.g., suburban, low-density development).

Agency decision-makers must weigh the goals, which lead in opposite directions, and decide what percentage of the operating budget should be allocated to the ridership goal and what percentage to the coverage goal.

5.1 Existing Service Scenario

A small number of improvements are recommended regardless of the scenario, and would be included in the Existing Service Alternative, as well as the Ridership and Coverage Alternatives. These improvements are described below.

Figure 5-1: Existing System



- Capital improvements that would improve the efficiency and utility of the connections on which the network relies, notably expanded capacity at the downtown transit center and a transit

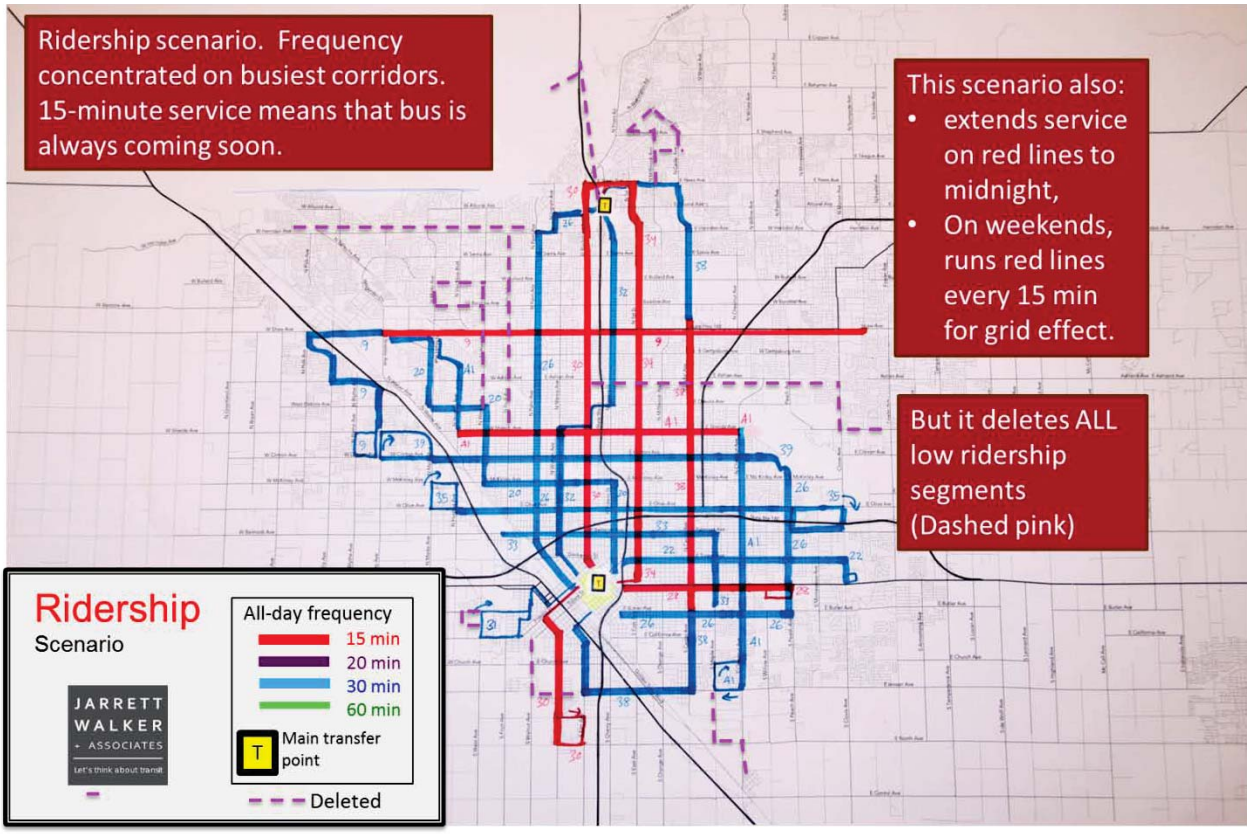
center in the River Park area. Almost as important (for both ridership and efficiency of operations) is an off-street facility at Fresno State, although the university must lead on that issue. *What little "waste" there is in the current operations is the result of inadequate facilities.*

- Weekend service should be standardized to *clock headways*, so that connections occur on a consistent pattern. This means changing 45-minute and 50-minute headways to 60 minutes, if 30 minutes cannot be afforded. The memorability of repeating clockface headways tends to be of greater value to ridership than the minor increase in service quantity that these irregular headways represent.
- The presentation of the network – in maps and information materials -- should highlight frequency and the timing of connections. Uncertainty about connections and frequency are the primary barriers to understanding and having confidence in the FAX system.
- Some minor improvements in ridership could arise from reducing to hourly service on low-ridership half-hourly segments, and redeploying this service in more productive ways. For example:
    - Route 41 south of Church Street could be replaced by an hourly route between Malaga and downtown, similar to Route 61 sketched in the Coverage scenario. This could be a possible no-cost response to the "restore Route 12" request. Malaga is a low-ridership area but would need to be queried about whether it values access to downtown more or less than to the Chestnut corridor.
    - Some streamlining in SW Fresno is suggested by the low ridership along the SW segment of Route 38, which follows Jensen and Walnut through this area. It may be appropriate to bring Route 38 into downtown on a higher ridership path, such as that of Route 34. It may even make sense to bring Route 38 into downtown on MLK/Pottle and extend Route 34 via Elm to replace the high ridership Ivy Center loop.
    - Extend Route 34 on North First to the River Park transfer area, so that it makes a connection with Routes 58 and 58E, as well as with the other north-south services that are useful for local distribution in the northern area. To do this, look for alternatives to the Millbrook / Spruce / Herndon loop. This is a lower ridership area of Route 38, therefore Route 38 could be split with half of its service going to the River Park area via Cedar & Nees and the other half via Cedar (as described northward), L/Spruce, L/Millbrook, R/Herndon, R/Fresno to River Park.

5.2 Ridership (Productivity) Scenario

The Ridership Scenario aims to serve as many people as possible given its resources. This is not merely a fiduciary goal. It also corresponds to reaching as many residents as possible with service that is actually providing access to jobs and other opportunity. Maximum ridership also tends to correspond to maximum sustainability outcomes such as vehicle trip reduction.

Figure 5-2: Ridership Scenario



Productivity at FAX is already high for a city the size of Fresno. Still, a somewhat more productive system would be possible if ridership was the overriding goal. Productivity can be increased by:

- Deleting the least productive services and
- Adding service that, based on the agency's own experience, is likely to be highly productive.

Predictably high-productivity service takes the following forms:

- The service is frequent, usually every 15 minutes or better, which allows for easy connections and thus multiple connections and options for travel, AND
- The service fits together into a network. This is primarily achieved by frequency – see above – but also by *clock headways* and, where possible, *timed connections.*
- The service runs an adequate service span – including evening and weekends – that it's useful for the 18/7 travel that most customers require. It is a common fallacy that easy savings can be achieved by cutting service at unproductive *times of day.* In fact, for a largely all-day demand pattern such as FAX experiences, ridership at different times of day and day of week are highly interdependent. Because most transit customers need to use the service twice per day, they cannot choose transit unless both times of day are served. That is why cuts to evening service

routinely cause losses of ridership at other times of day. Likewise, a family cannot choose to sell a car and rely on transit if they must commute five days a week including weekends, unless service works as well on weekends as during the week.

- The network and schedules are as simple as possible.
- The service features discussed above focus on areas of high transit demand, signaled mainly by:
    - Density – How much activity is around each transit stop? This must be understood in aggregate over an entire proposed transit route, and for a band of 1/4 mile on either side. The density of a single parcel is of no relevance.
    - Walkability – How easy is it to walk to a transit stop and cross the street to get there?
    - Straightness – How straight is the transit path? Can a logical transit route link many destinations along what is perceived as a straight line, or are many deviations required?
    - Income - All other things being equal, income is also a factor. However, the built-form issues above are more influential than demographics in determining ridership.

This kind of high-productivity service can generate *voluntary transit-dependence*, in which people choose to own fewer cars – thus advancing their own economic circumstances – by relying on transit for a range of purposes. FAX service is mostly inadequate to trigger these outcomes.

Specifics: Service Deleted

The first step to achieve maximum productivity with fixed resources is to delete unproductive services so that resources are available to invest in more productive ones. The focus here is on *unproductive geographic areas,* NOT unproductive times of day or day of week.

NOTE: In this no-resource-growth scenario services were deleted that would not be deleted if more resources were available. For example, Route 45 was deleted, serving portions of West Herndon, Fruit, and East Ashlan. This route carries over 30 boardings per hour, *which would be above average in San Jose or Sacramento, for instance.* In the context of FAX's system average of 47 boardings/hour, however, it is *relatively* low and it contains long segments with very little ridership. For that reason, a scenario attempting to push Fresno's productivity higher must delete Route 45.

Also deleted were a range of unproductive *segments* of productive routes, as identified by stop-level ridership.

The deleted segments below all have very low ridership (identified by stop-level data) and their deletion would therefore have a net positive impact on productivity. In the list below, the number in parenthesis is the route number currently serving this segment:

- Shuttle to Childrens Hospital (58H)
- Shuttle to neighborhoods north of Nees (58)
- Herndon west of Palm (45)
- Ashlan east of Cedar and social service destinations around Clovis & Shields.
- All service along Fruit Ave. (45)
- Service along West Ave north of Dakota (22) including the current 22 loop via Barstow, Marks, Bullard, West.
- Malaga and Maple south of Church (41)
- South Walnut between Fresno and Jensen (38)

- Kearney Blvd and Eden St west of Teilman (30)

For Route 28, delete the direct links from Fresno State to Manchester Transit Center and downtown. Unlike the other deletions listed above, this deletion does not eliminate service but does require a transfer where none was required before. However, the main additions to the network, outlined below, are designed to make transferring easier, especially the transfers required to access Fresno State.

Service Added: Core High Frequency Grid

The key idea of the service additions is the high-frequency grid. Where east-west and north-south routes both run every 15 minutes or better, it becomes easy to transfer wherever they cross for anywhere-to-anywhere access.

No FAX services run at this threshold frequency today. The most frequent segment s in the FAX system, currently 20-minutes, are Blackstone, First, Cedar, and Ventura. Apart from Ventura, these routes run parallel to each other and thus do not provide opportunities for grid connections.

The proposed network introduces 15-minute frequencies, but given extremely limited resources, these must be implemented strategically. In fact, almost *all of the remaining services in the productivity scenario would support 15-minute service with little loss of productivity.* In short, the grid network shows the path toward future investments that would attract vastly more ridership at the high levels of cost-effectiveness that are already being achieved.

The key frequency changes are as follows:

- Apart from the services deleted due to low ridership, all remaining services run at least every 30 minutes all day.
- 15-minute all-day service is introduced on:
    - Blackstone between downtown and Nees
    - First between downtown and Nees, ending in the River Park area.
    - Cedar between Butler and Shaw (Fresno State)
    - Shaw between Brawley and Willow (Fresno State)
    - Shields between Hughes and Chestnut
    - Ventura between downtown and Peach
    - South Pottle/MLK/Fig from downtown to North St.

Service Added: Evening and Weekend improvements

To improve the ability of customers to rely on transit throughout the day and week, judicious changes to evening and weekend service are made:

- On the 15-minute corridors listed above, 30-minute service extends to 11:30 PM (contingent on review of paratransit costs).
- On weekends, all routes now running at 45-60 minute frequencies are standardized at 60 minutes so that connection patterns are consistent.

- All routes running every 15 minutes weekdays standardized to every 30 minutes weekends.

The next priority would be the extension of minimal Saturday and Sunday service to 11:30 PM.

Stop Respacing

The other key productivity-enhancing step taken in the Productivity Scenario is systemwide stop respacing, especially in more suburban areas relatively few safe places exist to cross the fast arterials on which transit operates.

Like most transit agencies, FAX stops anywhere from 1/10 to 1/4 mile.

While everyone will defend the stop closest to their home, Fresno's stop-level ridership clearly shows that ridership is highly concentrated at the intersections of the 1/2-mile grid, and secondarily at 1/4 mile points. It is relatively rare to see multiple consecutive stops all with high ridership. It is quite common to see high-ridership stops and low-ridership stops closely interspersed. In suburban areas especially, this partly reflects the difficulties of pedestrian access to stops on fast arterials. Some stops in these environments are accessible to very few people. More commonly, stops on opposite sides of the street will occur where it is impossible to cross the street safely. Since most transit riders cannot use the system unless it can be used in both directions, these stops border on symbolic; they are not actually useful for anyone's two way trip.

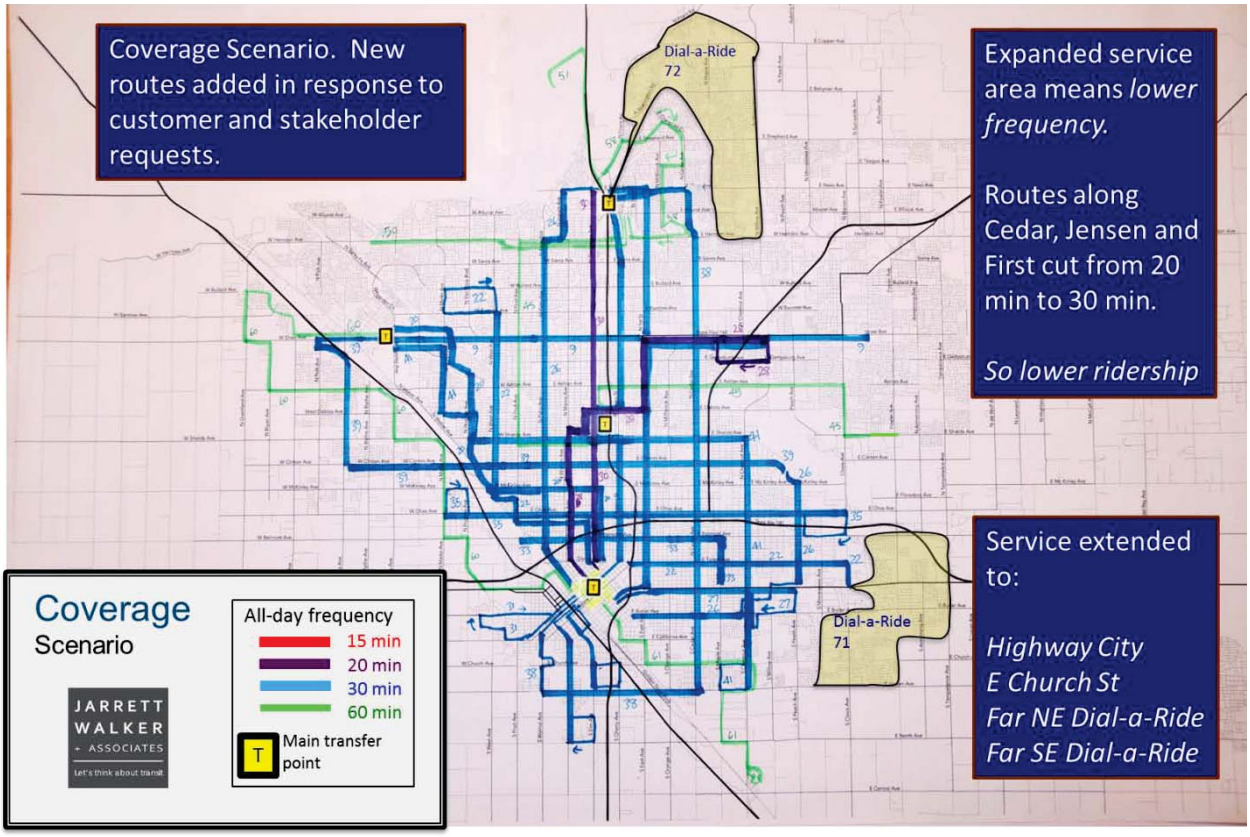
In the Ridership Scenario, a rigorous stop spacing standard is imposed - one that generally asks *a few people* to walk *further* to *faster service* with *better amenities*. The policy would be:

- Standard stop spacing is 1/4 mile. Stops are always at the 1/2-mile grid intersections, with one stop between these intersections located at the safest location for crossing the street that is roughly midway between the other two stops.
- A key goal of this standard is not just increased operating speed and reliability, but to stop only where it is reasonably safe to cross the street.
- Exceptions are made when:
    - Serving a site with high senior or disabled needs.
    - Operating through a commercial district where the pedestrian is a dominant presence.
    - On streets where more frequent stop spacing is both safe (due to abundant safe places to cross) and will not impact speed because the bus does not stop at most stops. This is an interim consideration requiring continuous review as ridership rises and more stops are served.

5.3 Coverage Scenario (No New Resources)

This scenario's goal is to respond to public demands for new coverage without increasing the total operating resources.

Figure 5-3: Coverage Scenario



Areas requesting service at the edges of the developed area do not have the same potential to generate productivity comparable to the high-demand parts of Fresno on which the Productivity Scenario focuses. This assessment arises from reviewing the data in the previous sections, including Fresno's own ridership data.

For example, there are many areas comparable to West Herndon or to the neighborhoods north of Nees that could argue for new service. However, existing services in these areas perform poorly, and more importantly, the existing land use pattern – especially the relatively poor walkability – is a known indicator of low ridership for purely geometric reasons: without a regular local street grid, fewer people can walk easily to a bus stop, so transit has a smaller market.

Similar observations apply to the idea of expanding coverage in Highway City, or around Malaga or east of Clovis Avenue. All of these areas are growing but (a) the aggregate density is low partly because the areas are only partly built, (b) the walkability is much less favorable to transit than in the core areas and (c) in some cases, notably Highway City, awkward circuitous routings are needed to cover the area effectively.

For these reasons, and given the high productivity of the existing system and the features of the areas requesting new coverage, *all coverage expansions should be presumed to be productivity reductions.*

Increased Role of Transit Centers

An important consequence of the Coverage Scenario is that transit centers – locations where many buses can meet for timed connections – become more critical to the functioning of the network. Timed transfer is more important as frequencies get worse, and low frequencies are a basic feature of a scenario that tries to cover more area without more resources.

The existing facilities at Manchester and downtown are heavily used, but a critical one must also be added in the River Park area where many major north-south routes reach their northern endpoint. This transit center would be very useful under the Ridership scenario (and the existing system) but it becomes critical in the Coverage scenario because several feeder routes logically focus there.

Another site that becomes more important is adjacent to the Wal Mart near Shaw & Brawley. This site requires four routes to terminate in order to organize connections optimally. This can be accommodated with a modest on-street facility at the current layover site of Route 20.

Specifics: Service Deleted

To create resources for new coverage, the Coverage scenario cuts midday frequency from 20 minutes to 30 minutes on all of the current 20-minute services except Blackstone (30 north of downtown) and Route 28, which covers East Ventura, Fulton/Van Ness, and the direct link from Manchester TC to Fresno State. In other words, frequent service is retained on the most productive route, and on major straight routes that are candidates for BRT.

A brief period of 20-minute service is retained during school peaks to handle overcrowding on First (34) and Cedar (38).

These cuts will cause significant ridership losses and may cause further incidents of overcrowding, but compared to other things that could be cut, these cuts will cause the least ridership loss and hardship.

A few other modest efficiencies are made:

- North First service (32) on longer ends in a large one-way loop north of Herndon. Instead, it ends in the River Park area. The senior citizen and medical destinations on that loop are served by revised feeder route 58.
- Route 41 Shields-Chestnut no longer extends south of Jensen Ave to Malaga. Instead, Malaga is served by a new route identified below.
- Route 9-Shaw's Highway City segment is replaced by an extension of Route 39-Clinton. This route is slightly streamlined to complement the newly added 60-Highway City route.

Specifics: Service Added

Coverage could be designed in many ways. However, because the goal here is basic access, and because all of the areas to be covered lack the conditions that drive high ridership on the core network, this scenario deploys hourly service in order to get minimal service to as many areas as possible. Another approach would be to

offer a higher level of service to the new coverage areas, at the expense of not being able to extend any service other areas.

To maximize the amount of coverage provided, the network uses hourly service as the basic coverage tool. The areas covered are as follows:

- 45. The existing route is retained except that Fruit Ave. service extends north to River Park TC and then onward to Childrens Hospital. The route's southward deviation goes only to Shields instead of McKinley. West Herndon is covered by new feeder route 50
- 50. New West Herndon feeder extending west from River Park TC to just past Blythe, replacing 45.
- 58. Revised NE feeder as two-way hourly loop, also replacing coverage to the senior and medical areas near Spruce & Milbrook. St Agnes is now served by the 34 loop.
- 60 Highway City. New radial from downtown through neighborhoods west of Hwy 99 as far north as Bullard & Grantland, ending at Brawley & Shaw for connections to other services.
- 61. E Church St., between East and Chestnut. This radial route covers an area once served by Route 12, and continues south, replacing Route 41 to cover Malaga.

Tradeoffs between the Coverage and Ridership scenarios are presented in Figure 5-4.

Figure 5-2: Tradeoffs between Ridership and Coverage Scenarios

	Ridership Scenario	Coverage Scenario
% of residents and jobs covered by any service	↓	↑
% of residents and jobs covered by frequent service	↑	↓
Travel time benefits	↑	↓
Support for land use intensification	↑↑	↓
Positivity of Most Public Feedback	↓	↑
Ridership and Productivity	↑	↓

5.4 Conclusion

The Ridership and Coverage scenarios are both rough sketches of what might happen if the system were adjusted in either the Productivity or Coverage directions. These scenarios are presented to help guide understanding of what is possible given the current constraints of this exercise – net zero change in service

hours. The Ridership Scenario began, necessarily, by cutting low-ridership coverage. Under the Coverage Scenario, whose goal is expanded coverage despite low ridership, there is no choice but to cut relatively high-ridership service.

The Ridership scenario increases productivity only by shrinking the coverage area – cutting off remote social service and medical destinations that serve important needs but not high ridership. The Coverage scenario does the opposite, responding to most stakeholder requests only by cutting high-ridership service at the risk of further overcrowding and a net ridership loss.

Appendix A: Final Policy Report (August 2013)

FCMA Public Transportation Strategic Service Evaluation Project

Final Policy Review

Task No. 1.1

Prepared for:

Fresno Council of Governments

Prepared by:

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Review Copy		
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Revised by	August 9, 2013	RK
Checker	August 12, 2013	JW
Back Checker	August 29, 2013	RK
Verified by	August 30, 2013	TM

August 30, 2013

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1.0 INTRODUCTION

The objective of the Fresno-Clovis Metropolitan Area (FCMA) Public Transportation Strategic Service Evaluation is to make transit a more viable alternative and improve local transit service. The goals are to reduce transit travel times, improve linkages to major trip generators and improve overall productivity, cost effectiveness and sustainability of transit. This policy review documents and evaluates the existing policies that dictate the design and operation of the current fixed-route transit system in the FCMA. The purpose of this policy review is to determine whether any current policies conflict with one another or unintentionally result in less productive transit service. This policy review explores the issue of ridership versus coverage trade-off, whereby policies that promote coverage may decrease ridership potential and vice versa. This policy review lays the framework for the policy recommendations that will result from further analysis and will be documented in the *System Assessment Final Report*.

The Study Area for this evaluation is defined as the City of Fresno and City of Clovis city boundaries. Fresno Area Express (FAX) operates a modified grid system with intersecting east-west and north-south routes. The system serves the FCMA including the City of Fresno, portions of unincorporated Fresno County and supplements the City of Clovis system. The City of Clovis is served by both FAX and Stageline Transit. The City of Fresno and the City of Clovis are also served by two demand-responsive programs – HandyRide and Round-Up, respectively – which are not included in this policy evaluation.

FAX is a department of the City of Fresno and is governed by the Fresno City Council. Likewise, Stageline is a department of the City of Clovis and is governed by the Clovis City Council. FAX and Stageline are also subject to the laws, regulations and policy decisions of several external agencies, including: the State of California Department of Transportation (Caltrans), the Fresno Council of Governments (Fresno COG), Fresno County, the City of Clovis, the Fresno County Rural Transit Agency (FCRTA), the Consolidated Transportation Service Agencies (CTSA) and various private transportation operators. In addition, because FAX received federal funds, it is subject to the regulations and policy decisions of the Federal Transit Administration (FTA). This policy review focuses on the FAX and City of Clovis transit systems and local policies, with references to state and federal policies as appropriate.

The following transit service categories were considered for each policy document reviewed:

- **Coverage** - Where is service provided? Is service location determined by geography, population density or another metric? Where is service being expanded or reduced?
- **Frequency** - What are headway requirements? What are the criteria for determining headways along different routes?
- **Stop Spacing/Location –** What is the minimum and maximum distance between transit stops? How is spacing determined?
- **Shelter/Amenities** - What are the transit station amenities required?
- **Span of Service –** What are the required hours of operation? What are service requirements on weekends and holidays?
- **On-Time Performance** – Are there requirements for on-time performance of the transit network?
- **Route Deviations –** How are route deviations identified and corrected?
- **Load Standards –** What are maximum loads for transit vehicles?

- **Customer Complaints/Customer Service –** How are customer complaints addressed? What customer service policies are in place?
- **Accidents/Security** - What polices are in place to provide a safe and secure transit system?
- **Number of Transfers** - Are there policies limiting the number of transfers necessary?
- **Productivity –** How is service productivity measured and what are the productivity requirements? Metrics could include passengers per hour and cost per passenger.

The findings of this policy review will be incorporated into the *Performance Evaluation Final Report*.

2.0 OVERVIEW OF POLICIES

This policy review includes both adopted policies as well as non-adopted policies from recent studies, which have not necessarily been formally adopted. The following sections provide a high level overview of each of the policy documents reviewed, including major goals and objectives.

The recently completed *San Joaquin Valley Blueprint Integration Project* and the *Public Transportation Infrastructure Study* recommend a set of policies that would better integrate land use and transportation planning. These recommended policies would promote higher density, mixed-use development projects clustered around high capacity transit corridors. The2014 Regional Transportation Plan and City of Fresno General Plan are currently in the process of being updated to incorporate many of these policy recommendations, but these documents are not included in this policy review because they are not yet final.

2.1 Local Policies and Recent Studies

2.1.1 Regional Transportation Plan

The Fresno Council of Governments (COG) is in the process of updating the 2014 Regional Transportation Plan (RTP). The Adopted 2011 RTP Policy Element sets the following goals for Mass Transportation:

- Provide public transportation mobility opportunities to the maximum number of people in the region.
- Provide quality, convenient and reliable public transportation service.
- Provide an efficient and effective public transportation system.
- Promote public transit's service and image in the community.
- Provide for an integrated multimodal transportation system which facilitates the movement of people and goods.
- Coordinate public transportation policies with land use and air quality policies.

These goals are the basis for the FAX and City of Clovis Short Range Transportation Plans.

2.1.2 FCMA 2014-2018 Short Range Transportation Plan

The *Fresno Clovis Metropolitan Area (FCMA) 2014-2018 Short Range Transportation Plan (SRTP)* was adopted on June 27, 2013 by the Fresno Council of Governments (FCOG). The SRTP is the bi-annual update to the operating plan and capital program for FAX. The purpose of the SRTP is to promote a comprehensive, coordinated and continuous planning process for transit service in the FCMA over a five-year planning horizon. The SRTP proposes specific policy recommendations for implementing the long-range objectives of Fresno COG's RTP and will guide the provision of transit services in the FCMA over the next five years. This document includes the SRTP for both the Fresno Area Express (FAX) the City of Clovis.

2.1.2.1 FAX 2014-2018 Short Range Transportation Plan

In order to implement the policy goals listed in the RTP, the SRTP sets forth the following objectives and standards. The objectives to respond to each RTP goal are listed here and the standards are listed by appropriate topic area in Section 3.

- **Goal 1:** Provide public transportation mobility opportunities to the maximum number of people in the region.
    - **Objective A:** To provide a transit system that meets the public transportation needs of the service area.
    - **Objective B:** To provide a transit service (both fixed-route and demand-responsive) that adequately serves the elderly and disabled population.
    - **Objective C**: To secure a stable and sufficient local funding mechanism.
- **Goal 2:** Provide quality, convenient and reliable public transportation service.
    - **Objective A:** To provide reliable and convenient public transit service.
    - **Objective B:** To provide clean, attractive and comfortable vehicles and facilities.
    - **Objective C:** To provide a safe system.
    - **Objective D:** To record and respond to all public comments.
- **Goal 3:** Provide an efficient and effective public transportation system.
    - **Objective A:** To establish and maintain system-wide productivity indicators.
- **Goal 4:** Promote public transit's service and image in the community.
    - **Objective A:** To maintain an active marketing program.
    - **Objective B:** To provide complete and accurate public transit information.
- **Goal 5:** FAX will provide opportunities for citizens and private business to participate in public transportation operations.
    - **Objective A:** To provide opportunities for citizen input into FAX's operations.
- **Goal 6:** Provide for an integrated multimodal transportation system which facilitates the movement of people and goods.
    - **Objective A:** Develop a multi-modal transportation network.
- **Goal 7:** Coordinate public transportation policies with land use and air quality policies.
    - **Objective A:** Support transportation investments that work toward accomplishing air quality goals, optimize utilization of land and encourage a stable economic base.

2.1.2.2 City of Clovis Short Range Transportation Plan

The *City of Clovis SRTP* includes the following goals and objectives. Standards are listed in the appropriate topic area in Section 3.

- **Goal 1:** Clovis Transit will provide public transportation mobility opportunities to the maximum number of people in the Fresno-Clovis Metropolitan Area.

  - **Objective A:** To provide a transit system that meets the public transportation needs of the service area.
  - **Objective B:** To provide a transit service that adequately serves the elderly and disabled population.
  - **Objective C**: To secure a stable and sufficient local funding mechanism.
- **Goal 2:** Provide quality, convenient and reliable public transportation service.
  - **Objective A:** To provide reliable and convenient public transit service.
  - **Objective B:** To provide clean, attractive and comfortable vehicles and facilities.
  - **Objective C:** To provide a safe system.
  - **Objective D:** To record and respond to all public comments.
- **Goal 3:** Clovis Transit will operate an efficient and effective public transportation system.
  - **Objective A:** To establish and maintain system-wide productivity indicators.
- **Goal 4:** Clovis Transit will strive to promote its service and image in the community.
  - **Objective A:** To develop and implement a Clovis Transit Marketing Program.
  - **Objective B:** To provide complete and accurate public transit information.
  - **Objective C:** To provide for community involvement in transit system affairs.

2.1.3 City of Fresno General Plan

The City of Fresno is currently in the process of updating its 2035 General Plan. Because the update is in process, this policy review includes the 2025 General Plan. The General Plan is intended to serve as a guide to enable government at all levels, private enterprise, community groups and individual citizens to make decisions and utilize community resources in a manner that will realize progress toward a common vision of a measurably enhanced physical, economic and social environment. This policy review focused on the Public Facilities Element, which includes the following objectives related to Transportation/Transit Systems:

- Serve future population concentrations with feasible alternative transportation modes which are efficient, safe and minimize adverse environmental impacts.
- Provide public transportation opportunities to the maximum number of people in the service area.
- Provide quality, convenient, and reliable public transportation service through an efficient and effective public transportation system.

2.1.4 City of Clovis General Plan

The City of Clovis is also in the process of updating its General Plan, which is expected to be completed in 2013. This policy review is based on the 1993 General Plan and focuses on the Circulation Element. The Circulation Element presents goals and policies that: coordinate the transportation and circulation system with planned land uses; promote the efficient movement of people, goods and services within the Project Area; utilize the existing system to its fullest extent; and plan for practices that will improve the quality of the environment of Clovis. The following goals are included in the Circulation Element:

- Provide for the development of a street system to adequately address the mobility needs of the community.
- Provide adequate, safe, well maintained and efficient access to employment, educational, commercial, recreational, and recreational uses throughout the community, including downtown core area.
- Promote all modes of transportation, including transit, bicycle, and walking for development of alternatives to the private automobile.
- Provide for the development and maintenance of the community's transportation infrastructure.

2.1.5 Fresno Area Express Transit Facilities and Development Standards

The purpose of the Facilities and Development Standards (2005) is to establish uniform guidelines for the location, design, maintenance and operation of transit related facilities. Uniform guidelines assist transit staff as well as developers, planners, and engineers integrating mass transit facility requirements into urban development and roadway improvement projects. Additionally, uniform guidelines eliminate the need for each bus stop evaluation to be on a prototype or custom engineered basis.

The following policy objectives are listed in the *Standards*:

- Minimize impedance to traffic flow
- Maximize accessibility for disabled people
- Participate in the City's development review process
- Maintain bus stop facilities database
- Bus stop spacing

2.1.6 2006 Measure "C" Extension Expenditure Plan

In 2006, the voters of Fresno County extended the Measure "C" half-cent transportation sales tax for another 20 years. The 2006 Expenditure Plan, developed by a Steering Committee, will address major regional transportation needs in Fresno County through the Year 2027. The Implementing Guidelines for the Regional Public Transit Program states the following:

It will be the goal of all transit agencies within Fresno County, which derive funding allocations from this program, to improve the level of public transit services within the County and to continue to seek ways to coordinate and/or consolidate services in order to achieve a seamless passenger travel system for the public. Priority service improvements planned for each of the existing transit agencies are described below. Primary Programs are those that are anticipated to reasonably be funded by the new Measure "C" program. Secondary Programs are improvements that will be funded after Primary Programs are fulfilled and provided that funding is available.

City of Fresno

Primary Program

- Improve frequencies to every 15 minutes on the busiest routes on the public transportation system in Fresno
- Enhance the delivery of paratransit to the disabled community consistent with federal and state law

- Install and integrate a regional automated farebox system to enhance transit coordination and seamless passenger travel between transit systems
- Complete fleet conversion to low emission buses
- Expansion of service areas to all riders, as Fresno's Sphere of Influence changes

Secondary Program

- Extend weekend service hours
- Enhance the delivery of paratransit services to the senior community
- Pursue other alternative mass public transportation options such as bus rapid transit, automated people movers, light rail, etc.
- Deploy other operational and infrastructure improvements such as "real time" bus arrival and departure information

City of Clovis

Primary Program

- Improve frequencies to every 15 minutes on the busiest routes on the public transportation system in Clovis
- Enhance the delivery of paratransit to the disabled community consistent with federal and state law
- Install and integrate a regional automated farebox system to enhance transit coordination and seamless passenger travel between transit systems
- Complete fleet conversion to low emission buses
- Expand service areas to all riders, as Clovis's Sphere of Influence changes

Secondary Program

- Extend weekend service hours
- Enhance the delivery of paratransit services to the senior community
- Pursue other alternative mass public transportation options such as bus rapid transit, automated people movers, light rail, etc.
- Deploy other operational and infrastructure improvements such as "real time" bus arrival and departure information displays to provide better services to transit users

2.1.7 Public Transportation Infrastructure Study

The purpose of the Public Transportation Infrastructure Study (PTIS) is to identify strategies for land use and transportation investments that will result in measurable reductions in vehicle miles traveled and provide increased mobility for Fresno County residents. The PTIS presents policy recommendations under six broad categories:

- Increase the number of people and businesses in Downtown Fresno and in close proximity to designated high-capacity Transit Corridors, with a priority on making downtown more attractive to pedestrians.

- Plan for and build TOD housing developments for a mix of middle and lower incomes and families.
- Grow the transit, bicycle and pedestrian mode shares by making it more attractive to use alternate modes.
- Decrease the drive alone mode share and reduce vehicle miles traveled (VMT) with Travel Demand Management (TDM) programs and policies.
- Attract residents to Fresno who would be willing to live in market priced TOD-style development, including young urban professionals, seniors and future high speed rail commuters.
- Cross jurisdictional and departmental boundaries with processes to link local and regional transportation and land use planning decisions.
- Restrict the growth of new development on the urban fringes and into farmlands with incentives, disincentives and growth boundaries.

The specific recommended polices that pertain to transit service are detailed below. Many of the policy recommendations focus on land use and infrastructure investments. While these policies are indirectly related to transit service, they are not direct transit service policies and therefore are not included below. The PTIS policy recommendations are being incorporated into the RTP update.

2.1.8 Transit Productivity Evaluation FY2011-12

The productivity evaluation is conducted annually to assess the progress of transit operators that receive State Transportation Development Act funds and to recommend potential productivity improvements. The Transit Productivity Evaluation includes the following language regarding policy trade-offs:

The ADA, air quality, congestion management, land-use and population growth, system productivity, on-time performance, and passenger requests are all major concerns that directly impact public transit service in the Fresno-Clovis Metropolitan Area (FCMA). Each of these elements must be evaluated thoroughly when planning service adjustments and modifications. Customer Satisfaction Surveys are one method which is used to evaluate service. The last survey identified that passengers were most concerned about bus hours of operation on weekends. In addition to these self evaluations, FAX has participated in a triennial audit and annual audits conducted by the FTA and the City of Fresno to verify that all of our transit programs are being operated in an effective and efficient manner.

The Planning Division at FAX continues to participate in the City of Fresno Development Review Process and has a staff person dedicated to that process. This enables FAX to comment on potential impacts of proposed public or private developments. Staff also provides assistance to developers in designing transit friendly facilities. The Transit Long Range Master Plan identified two transit scenarios for the future; Productivity and Coverage. The Productivity scenario would be a transit strategy of maximizing ridership per unit of cost. This system would encourage high quality service where demand is high and little or no service where demand is low.

Obviously, since transit is a public service paid for by all taxpayers, the Productivity goal must be balanced against its opposite, the need to provide some benefit to everyone. The opposite of the Productivity goal is the Coverage goal which would be designed to provide some coverage to everyone. This system penetrates parts of the community where transit cannot expect to operate with high productivity, either due to low densities or a built environment that is unsafe or unpleasant for pedestrians. In the future, FAX will continue to focus on the Coverage scenario by ensuring that service is

provided to as many new areas as is feasible, and will not stress providing service solely for productivity purposes. However, future funding sources will play an integral part in the determination of the Coverage strategy since any shortfall in funding may inhibit FAX from providing any service beyond what is currently being provided.

2.1.9 Fresno FAX Route Restructure Study

In 2010, Nelson\Nygaard prepared a Memorandum which recommended FAX Route Restructuring with a goal of reducing annual revenue hours by 18 percent. The analysis was structured around a number of core service principles:

- Retain as much of the grid system as possible
- Retain as much of the high frequency service as possible
- Prepare the system for the first phase of implementation of BRT
- Reduce route duplication
- Reduce out-of-direction travel
- Improve service to major generators
- Improve route structure and operations in Southwest Fresno

A restructured system was designed that cut 208 daily hours of service, eliminated the need for 17 buses and reduced daily revenue hours by 6.5 hours, or 1.1 percent of the system total revenue hours, for a total annual savings of about 53,700 hours or 16.5 percent.

2.2 Federal Policies

2.2.1 Title VI Report

Fresno Area Express (FAX) prepared a Title VI Report in 2011 to document FAX's compliance with Title VI of the Civil Rights Act of 1964, which states:

> "*No person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discriminations under any program or activity receiving Federal financial assistance*."

The report is divided into two sections. The first section, General Reporting Requirements, contains information concerning active lawsuits and complaints, a description of any pending applications for federal financial assistance, a summary of civil rights compliance review activities, FTA civil rights assurances and fixed-facility impact analysis. The second section, Program Specific Requirements, contains information regarding the Title VI internal review process for service delivery, the internal monitoring process, the service standard policies and a description of service changes specific to the FAX fixed-route transit system and its impacts on the minority population.

The report concluded that as a result of the Title VI compliance assessment requirements as stated in FTA Circular 4702.1, FAX, as a recipient of federal financial assistance, is operating an accessible, efficient, and affordable transit service to all minority groups within the Fresno-Clovis Metropolitan Area (FCMA). One hundred twenty-six census tracts comprise the FCMA. Of these tracts, more than half (68 or 54 percent) are termed minority. The FCMA minority population makes up 70 percent (346,153

residents) of the total population. Currently, all FAX routes operate to or within one or more minority census tract. No minority group is excluded from, or denied the benefits of, this federally subsidized transit system.

Title VI analysis must occur whenever there is a service adjustment of 25 percent or more in daily route miles or hours.

2.2.2 Americans with Disabilities Act (ADA)

The ADA prohibits discrimination on the basis of disability in employment, state and local government, public accommodations, commercial facilities, transportation, and telecommunications. The transportation provisions of Title II of the ADA cover public transportation services, such as city buses and public rail transit (e.g. subways, commuter rails, Amtrak). Public transportation authorities may not discriminate against people with disabilities in the provision of their services. They must comply with requirements for accessibility in newly purchased vehicles, make good faith efforts to purchase or lease accessible used buses, remanufacture buses in an accessible manner, and, unless it would result in an undue burden, provide paratransit where they operate fixed-route bus or rail systems. Paratransit is a door-to-door pick-up and drop-off service for individuals who are unable to use the regular transit system independently (because of a physical or mental impairment).

3.0 SUMMARY OF POLICIES BY TOPIC AREA

This discussion focuses on the relevant policies from the documents identified above. For each topic area, existing policies are identified followed by a discussion of non-adopted policy changes from completed studies. The purpose of this discussion is to identify areas where policies could be improved or clarified to result in more efficient transit service within the FCMA.

3.1 Coverage

3.1.1 Existing Policies

The *2014-2018 SRTP* includes the following policies related to service coverage:

- FAX's fixed-route bus system should be designed so that a minimum of 90 percent of the service area population resides within one-half mile of a bus route.
- FAX will provide transit service to all airport and passenger rail facilities in the FCMA.

The *City of Fresno General Plan* includes the following policies related to service coverage:

- Plan and develop the major street network to facilitate efficient direct transit routing that provides one-half mile coverage throughout the metropolitan area. Circuitous streets are more difficult for public transit to efficiently serve than consistently spaced linear or semi-grid patterns for arterial and collector streets. (Policy E-8-b)
- Promote the development of the Central Area as the region's principal employment center and public transportation hub. (Policy E-9-s).

The *Measure "C" Extension Expenditure Plan* states:

- Expansion of service areas to all riders, as Fresno's Sphere of Influence changes.
- Expand service areas to all riders, as Clovis's Sphere of Influence changes.

3.1.2 Non-Adopted Policies

The PTIS recommends shifting from a geographic based coverage policy to a density based coverage policy. The PTIS recommends policy changes that link transit service and land use, including the following policies:

- FAX should adopt a transit service expansion policy that FAX will not subsidize or expand transit service to new areas without minimum transit supportive densities (8 du/ac for local bus, up to 12 to 18 du/ac for BRT/LRT).
- Only locate low density residential in areas not already served by transit with no expectation that transit services will be extended to these areas in the future. Require that developers communicate this fact to the potential property buyers.
- Do not allow location of new employment centers outside of the Downtown or high capacity Transit Corridors.
- Require development to fully fund the cost of expanding infrastructure to serve development in the outer ring of the sphere of influence of any incorporated city. This can either be achieved by requiring new development to fund construction and operations of the infrastructure and services

necessary (e.g. streets and transportation, water, sewer, sewer treatment, schools, fire stations, police, etc.) or through implementing a multi-faceted infrastructure impact fee to be imposed on any new development. A benefit assessment district could be used to fully assign costs to fringe developments.

The PTIS also recommends expanding service coverage to better serve the CSU Fresno Campus with the following policies:

- Expand routes to serve the CSU Fresno Campus.
- Add a campus circulator shuttle to connect the large number of students who reside within 3 miles of CSU Fresno campus.

3.1.3 Observations and Recommendations

The coverage policies provide a basis for the design of the transit network, but some policies could be clarified to better guide transit service. Policy E-9-s provides a strong basis for establishing a street criterion and diverts service from less productive circuitous streets. However, the Measure "C" Extension Expenditure Plan policies related to expanding service areas to all riders and the Sphere of Influence changes is vague and is open to interpretation.

The proposed policies in the PTIS could be reworded slightly to more clearly guide development and transit. For example, in establishing minimum transit supportive densities, it would be helpful to include a continuous area for which the density must be maintained. For the policy limiting employment centers outside of Downtown or high capacity Transit Corridors, the policy could be clarified to define the density of "employment centers" and to indicate that heavy industry and agricultural uses are permitted outside of these areas.

The PTIS policy recommending the expansion of routes to serve the CSU Fresno Campus would be better worded as expansion of "service", which includes both routes and frequency of service. The policy recommending the addition of a campus circulator may be too prescriptive and not allow for enough flexibility to identify the best transit service for the area.

3.2 Frequency

3.2.1 Existing Policies

The *2014-2018 SRTP* includes the following policies related to service frequency:

- FAX scheduled service should provide for maximum headways of 60 minutes on every route whenever service is operated.

The *Measure "C" Extension Expenditure Plan* includes as part of the Primary Program:

- Improve frequencies to every 15 minutes on the busiest routes on the public transportation system in Fresno.
- Improve frequencies to every 15 minutes on the busiest routes on the public transportation system in Clovis

3.2.2 Non-Adopted Policies

The PTIS recommends improving bus frequencies for Fresno's public transportation system to every 15 minutes on the busiest routes. These routes include:

- Tier A - The first "tier" of priority investment in high capacity Transit Corridors is the Blackstone and Ventura/Kings Canyon corridors for which FAX is anticipating federal funds.
- Tier B -The second tier corridors include Shaw Avenue and the extension of the Shaw Avenue corridor along Highway 168 to Clovis.
- Tier C - The third tier of corridors with potential for 15 minute bus service to downtown should also be considered for medium density development (i.e. Cedar, Palm, First and Fresno Streets)

3.2.3 Observations and Recommendations

Frequency could be overprescribed in areas requiring service for very limited hours of the day. A hub-spoke system can be managed with limited frequencies that could offer savings.

3.3 Stop Spacing/Location

3.3.1 Existing Policies

The *FAX Transit Facilities and Development Standards* includes the following policies related to bus stop spacing:

- Maintain minimum spacing of every one-half mile
- Maintain optimum spacing of every two-tenths mile
- Maintain specialized spacing of every block in Central Business Districts

The *Transit Facilities and Development Standards* also includes the following policies related to bus stop locations:

- Bus stops are generally located at the near or far-side of intersections, or in the mid-block between intersections. It should be noted that far-side stops are the most common and the most preferable due to a variety of factors as listed below. Mid-block stops are less common and typically occur in dense commercial areas such as Central Business Districts. Near-side stops are the least common and generally occur when the previous two types are not feasible.

3.3.2 Observations and Recommendations

The policy to maintain optimum spacing of every two-tenths mile should be revisited as other spacing configurations may better serve a grid pattern, improve travel time, reduce costs and improve reliability.

3.4 Shelter/Amenities

3.4.1 Existing Policies

FAX places and maintains bus stop signs at all bus stop locations. Other amenities revolve around bus stop

improvements such as benches, shelters, bus bays, and major transfer centers. The determination of how bus stops are improved is limited by financial resources and site specific considerations, accessibility to persons with disabilities, vehicle operating safety, and passenger volume. These standards are published in the FAX *Transit Facilities and Development Standards* document dated December 2005 and are made available to planning agencies and developers upon request. Construction of bus stop amenities such as curb cuts, sidewalks, and bus bays are the direct responsibility of city and county public works and traffic engineering departments. FAX is required to coordinate with those departments when planning for and constructing such improvements.

All newly constructed transit facilities such as bus stops and transit centers must meet ADA accessibility design guidelines. In addition, the *Transit Facilities and Development Standards* includes the following guidelines for bus stop amenities:

- Place street furniture in a manner conducive to mobility on the sidewalk and for bus boarding and alighting.
- Daily boarding volume at a bus stop is the major criterion in determining how that bus stop is to be improved. FAX has examined boarding volumes by bus stop and has created the following chart to demonstrate typical facility allocation. Facilities may be allocated outside specific thresholds represented by this exhibit.

Limitations on financial resources and site specific considerations may restrict development with the full range of possible improvements.

- Limiting Improvements: Bus stops may not receive some improvements despite the boarding threshold due to site-specific constraints. Examples are as follows:
    - Stops adjacent to unimproved property
    - Stops without curb, gutter and sidewalk
    - Property owner protest
    - Stop improvements obscure traffic visibility
    - Narrow sidewalk
    - Steep property slope
- Adding Improvements: Bus stops exhibiting minimal boarding thresholds with special circumstances may receive additional improvements. Examples are as follows:
    - Stops adjacent to senior centers
    - Stops adjacent to hospitals
    - Stops adjacent to public facilities

Placement of bus stop signs, benches, concrete pads, and shelters are not explicitly regulated by any agency. Placement is, therefore, done on a best case basis per site. However, review of the *California State Accessibility Standards Interpretive Manual* and *City of Fresno Standard Public Works Drawings* does reveal information that is useful in designing site improvements. Design objectives are as follows:

- Signs shall be placed near the traffic lane so as to be visible from both the sidewalk and traffic lanes
- On wide sidewalks, benches shall be placed against the back of the sidewalk from the traffic lane
- On narrow sidewalks, benches shall be placed against the back of the sidewalk away from the traffic lane if no concrete bench/shelter pad has been created
- On narrow sidewalks, concrete bench/shelter pads will be built where feasible
- Benches, refuse containers and signs will be juxtaposed in a manner that will allow a wheelchair to pass between the two improvements without obstruction

- Benches will be juxtaposed with any other sidewalk obstruction in such a manner that will allow a wheelchair to pass without obstruction
- Benches and signs will be placed in such a manner that will not obstruct wheelchair boardings/alightings at curb-side stops

Table 3-1: Facility Improvements by Boardings

Type of Service	# of Daily Boarding Required for Provision of Service
Sign	All Bus Stops
Bench	25-50
2 Benches	35-175
Shelter	60-275
Shelter + Bench	100-300
Shelter + 2 Benches	125-400
2 Shelters + 2 Benches	150-500
Major Center	300>

ADA requires that in general, the minimum continuous width of an accessible path is 36 inches (49 CFR 37: section 4.2.1 of Appendix A).

The *City of Fresno General Plan* includes the following policy:

- Bus bay turnouts and site improvements (including improvements associated with bus stop accessibility for the physically impaired such as curb cuts for wheelchair access) should be required where development occurs along established or proposed transit routes. The costs associated with these improvements should be paid by the site developer. Bus bay development standards and stop accessibility standards are contained in the Fresno Area Express *Facilities Development Standards* document. (Policy E-9-cc)

The *Measure "C" Extension Expenditure Plan* includes as part of the Secondary Program:

- Deploy other operational and infrastructure improvements such as "real time" bus arrival and departure information in Fresno and Clovis.

3.4.2 Observations and Recommendations

In cases where bus stops may not receive some improvements despite the boarding threshold due to site-specific constraints, it is important to document these constraints. Another example special circumstances that may quality a bus stop that exhibits minimal boarding to receive additional improvements is stops with high lift deployment rates. Bus bay turnouts are not always a preferred option, as they can make it difficult for buses to return to the travel lane. An option could include curb

extensions to provide more passenger waiting areas, and maintain the priority position of buses in traffic. Additional amenities to shelters and benches could be included in Table 3-1, to coincide with passenger use – these include real time information, trash cans, system maps, community maps, and advertising space.

3.5 Span of Service

3.5.1 Existing Policies

The *2014-2018 SRTP* includes the following policies related to span of service hours:

- Regular FAX service stops at 10:00 p.m. on weekdays and 7:00 p.m. on weekends.
- Clovis Transit fixed-route service (Stageline) should operate weekdays (Monday-Friday) from 6:15 a.m. to 6:15 p.m. and Saturday from 7:30 to 3:30 p.m.

The *Measure "C" Extension Expenditure Plan* includes as part of the Secondary Program:

- Extend weekend service hours in Fresno and Clovis.

3.5.2 Non-Adopted Policies

Although unfunded, the *2014-2018 SRTP*, recommends the following service hour enhancements:

- Extend weekend service hours (unfunded)
- Owl service on all routes until midnight (unfunded)

The *PTIS* also recommends:

- Expand transit service hours, days and the number of routes to serve the CSU Fresno campus.

3.5.3 Observations and Recommendations

The span of service hours should be reconsidered to better reflect travel behavior. For example, evening demand on the weekends might be higher than evening demand during the week, warranting the extension of evening service on the weekends. Likewise, Clovis's evening service may end too early to allow riders to connect to FAX service. Locations with strong potential for service expansion will be identified in as part of the Strategic Service Evaluation. Span of service suggestions will be included in the Final Report to match hours of operations to major destinations.

For the PTIS recommendations related to the CSU Fresno service, in addition to expanding service hours and days, consider expanding frequency of service.

3.6 On-Time Performance

3.6.1 Existing Policies

The *2014-2018 SRTP* includes the following policies related to on-time performance:

- FAX should operate its fixed-route buses so that on-time performance is achieved 90 percent of the time. A bus is considered "on-time" if it arrives no more than five minutes after the scheduled

arriving time. The system average for FY2012 was 81.3 percent. Routes that consistently fall below the system standard are examined and evaluated by the Service Evaluation Committee.

- FAX should complete 99.5 percent of all scheduled trips.

The *Title VI Report* includes the following policies related to on-time performance, which vary slightly from the language in the SRTP:

- FAX should operate its fixed-route buses so that on-time performance is achieved 93 percent of the time. A bus is considered "on-time" if it arrives no more than five minutes after the scheduled arriving time. The system average for FY2011 was 79.9 percent. Routes that consistently fall below the system standard are examined and evaluated by the Service Evaluation Committee.

3.6.2 Observations and Recommendations

The on-time performance standard could also include guidance for early arrival /departure (i.e. no more than one minute early). For clarification, the policies could include a discussion of the role of traffic congestion in on-time performance, which is not within the control of the transit agencies. Bus stop spacing or locations of stops, traffic signal adjustments, bus pullouts, length of route (and/or interline), and the directness of the route to decrease turns can all contribute to on-time performance and will be reviewed as part of the Strategic Service Evaluation.

3.7 Route Deviations

There are no existing or recommended policies related to route deviations.

3.7.1 Considerations

Routes that divert off a major arterial to serve a transit center or other destination should be evaluated to determine whether the added travel time has an overall positive or negative effect on ridership. There are circumstances where ridership should not be the only criteria, however. Clientele is an important consideration, especially if the route deviates to access a population that would otherwise require door-door service. Safety of street crossings should also be a consideration in determining whether a deviation is warranted.

3.8 Load Standards

3.8.1 Existing Policies

The *2014-2018 SRTP* includes the following policies related to load standards:

- Maximum seat to passenger load ratio of 1:1.1, or 110 percent of vehicle capacity.

The *Title VI Report* states that although this is the desired load factor, due to financial constraints, this standard is frequently exceeded.

3.8.2 Observations and Recommendations

The existing load standard policy could be forcing more service than necessary. A higher load may be acceptable for several trips during peak periods.

3.9 Customer Complaints/Customer Service

3.9.1 Existing Policies

The *2014-2018 SRTP* includes the following policies related to customer complaints/customer service:

- FAX will continue to track, evaluate, and follow up to all compliments, complaints and inquiries from the public.

The *FAX Transit Facilities and Development Standards* also includes the following policies related to customer complaints/customer service:

- Monitor citizen comments about bus operations
- Monitor driver comments about service
- FAX staff reviews all complaints and suggestions whether they are made to drivers, directly mailed in, phoned in or referred from City Hall. All requests for follow-up information are acted upon promptly. Certain requests are brought before the Service Evaluation Committee to determine if the complaint or suggestion warrants an immediate service change.

3.9.2 Non-Adopted Policies

The PTIS recommends launching a Title VI and Limited English Proficiency (LEP) outreach plan to understand the transit community's needs for communication and information translation.

3.9.3 Observations and Recommendations

Customer complaints could be categorized to identify those that need immediate attention and those that can be reviewed on an annual or semi-annual basis – such as major service changes – that should be reviewed in context of other comments and policy considerations.

3.10 Accident Prevention/Security

3.10.1 Existing Policies

The *2014-2018 SRTP* includes the following policies related to accident prevention:

- FAX buses should, at a minimum, operate in excess of 100,000 miles between preventable accidents, and bus operators should be formally recognized for their safe driving.
- Buses should be checked daily for proper operation and condition of lights, mirrors, radios and fluid. Detailed mechanical inspections should be done every 1,000 miles. Operations, maintenance and other employees will be provided safety training at the beginning of their employment and such training will be updated on a regularly scheduled basis.

The *Clovis SRTP* includes the following policies related to accident prevention:

- Clovis Transit buses should operate in excess of 150,000 miles between preventable accidents, and bus operators should be formally recognized for their safe driving.
- Buses should be checked daily for proper operation and condition of lights, mirrors, radios and fluid; detailed mechanical inspections should be done every 3,000 miles/45 days. Operations,

maintenance and other employees will be provided safety training at the beginning of their employment and such training will be updated on a regularly scheduled basis.

The *2014-2018 SRTP* presents following maintenance policies:

- Regular maintenance is performed at prescheduled cycles to ensure optimal performance, efficiency, safety and reliability of assigned equipment. Preventative maintenance inspections are performed within four hundred miles of scheduled cycles.

Table 3-2: FAX Maintenance Schedule

Maintenance Type	Inspection	Cycle
Minor/safety	A	6,000/7,000 miles +/- 400 miles
Intermediate	B	12,000/14,000 miles +1,000/-400 miles
Intermediate	C	18,000/21,000 miles +1,000/-400 miles
Major	D	24,000/28,000 miles +1,000/-400 miles
Special Service	Winter	Seasonal
	Summer	Seasonal

The *Transit Facilities and Development Standards* includes the following policies related to accident prevention:

- FAX has established an Accident Review Committee, who reviews accidents and monitors accident patterns. Specific recommendations are made regarding bus operations.

The *2014-2018 SRTP* includes the following policies related to system security:

- FAX security plan provides a highly visible security presence for our transit customers and employees. FAX uses City of Fresno police officers to deliver system wide protection. FAX customers see uniformed patrol officers on buses and at transit facilities.
- As part of FAX's American Recovery and Reinvestment Act (ARRA) capital project grant funding, FAX enhanced the look and safety of its passenger amenities, including increased security cameras, lighting and electrical work at shelters and bus stops.

The *Title VI Report* summarizes FAX's security:

- In FY 2011, a Safety and Security Grant funded the purchase and installation of bus video systems on all FAX buses. This system is 100% digital and utilizes eight cameras per bus. All future bus procurements will require video surveillance as a standard feature.
- FAX contracts annually with the City of Fresno Police Department for officers assigned to the Department of Transportation. In fiscal year 2008 FAX added two police officers dedicated to transit, bringing the total to four.

3.10.2 Observations and Recommendations

Safety of passengers at bus stops should be considered. This includes an evaluation of lighting, crossings and sidewalk conditions within an immediate area.

3.11 Number of Transfers

3.11.1 Existing Policies

The *Measure "C" Extension Expenditure Plan* includes the following policies related to transfers as part of the Primary Program:

- Install and integrate a regional Automated Fare Collection System (AFC) to enhance transit coordination and seamless passenger travel between transit systems in Fresno and Clovis.

3.11.2 Observations and Recommendations

The number of transfers can impact the travel time and attractiveness of transit. Major origins/destinations will be evaluated throughout this study to determine if more direct routing can be provided to reduce the number of transfers required. A policy statement could be developed to help align service changes to match a desired threshold of transfers.

3.12 Productivity

3.12.1 Existing Policies

The *2014-2018 SRTP* includes the following policies related to system productivity:

- FAX should achieve a 24 percent farebox recovery ratio. The State Transportation Development Act (TDA) only requires FAX to meet a 20 percent farebox return, and in FY12, FAX exceeded this requirement with a 24.6 percent farebox return.
- FAX should achieve a system wide standard of 40 boardings per revenue hour system wide.
- FAX should record and report at least, monthly, the following performance indicators:
    - Total Monthly Ridership
    - Total Monthly Revenue
    - Total Monthly Expenses
    - Total Revenue Hours
    - Total Revenue Miles
    - Farebox Ratio
    - Total Operating Expense per Passenger
    - Total Operating Expense per Revenue Hour
    - Total Revenue per Revenue Hour
    - Total Operating Expense per Revenue Mile
    - Total Revenue per Revenue Mile
    - Passengers per Revenue Mile
    - Passenger per Revenue Hour

- Average Weekday Ridership
- Average Saturday Ridership
- Average Sunday Ridership
- Percentage of Trips on Time
- Percentage of Scheduled Trips Completed
- Total Road Calls

The *Clovis SRTP* includes the following policies related to system productivity:

- Clovis Transit should achieve a 20 percent farebox recovery rate for fixed route services (Stageline).
- Through effective marketing, Clovis Transit should increase overall system ridership by at least 5 percent during the fiscal year.
- Clovis Transit should record and report, at least monthly, the following performance indicators:
  - Total Monthly Ridership
  - Total Monthly Revenue
  - Total Monthly Expenses
  - Total Revenue Hours
  - Total Revenue Miles
  - Farebox Ratio
  - Total Operating Expense per Passenger
  - Total Operating Expense per Revenue Hour
  - Total Revenue per Revenue Hour
  - Total Operating Expense per Revenue Mile
  - Total Revenue per Revenue Mile
  - Passengers per Revenue Mile
  - Passenger per Revenue Hour
  - Average Weekday Ridership
  - Average Saturday Ridership
  - Average Sunday Ridership
  - Percentage of Trips on Time
  - Percentage of Scheduled Trips Completed
  - Total Road Calls

The *Title VI Report* includes the following policies related to system productivity:

- In 1981, a Transit Corridor Analysis was completed which evaluated the efficiency and effectiveness of service on a route-by-route basis. At that time, service measures were developed to assist in

evaluating individual route performance in relation to the system wide performance. Those minimum performance measures continue to be the basis of local service evaluation. At a minimum, an individual route should exceed 60 percent of the system wide average for a number of key indicators. The 60 percent figure is an overall industry standard that assumes a transit system may tolerate some low performing routes if they provide an important component of the system, and especially if the component helps meet the needs of the transit dependent riders. FAX uses several operational indicators to measure the performance and financial status of the system and individual routes. Individual routes should achieve 60 percent of the system average, except for those indicators which measure cost efficiency. Cost performance measures should not exceed 140 percent of the total system average, with 140 percent representing the system maximum.

3.13 Other

3.13.1 Non-Adopted Policies

The *PTIS* includes the following policy recommendations that could influence future transit service:

- Work with CSU Fresno campus administrators to implement a Travel Demand Management (TDM) program to incentivize student and faculty bus use by discounting bus passes and increasing parking charges to subsidize the bus pass program.
- Continue to pursue consolidation of transit services, particularly between the Fresno and Clovis urban areas to create a seamless and time efficient transit travel experience between the two cities.

3.13.2 Observations and Recommendations

TDM incentives are a proven method to form partnerships between transit providers and the community. Transit pass incentive programs, such as recommended in the PTIS for CSU Fresno, can also be applied to business areas, neighborhoods and other schools.

4.0 CONCLUSION

Table 4-1 summarizes the existing and proposed policies for each category discussed in this policy review. Many of the transit policies currently in place aim to deliver a transit system that serves as many people as possible while still operating an efficient system. As discussed in the introduction, one of the major policy trade-offs in service planning is ridership/productivity versus coverage. Some of these issues were discussed in the observations and recommendations section for each topic. Table 4-2 summarizes the policies for the ridership/productivity and coverage goals, highlighting the conflicts that exist with current policies. Some of the transit policies currently in place in the FCMA make it challenging to support a highly efficient transit system that would draw new riders to transit and target transit service in high capacity corridors:

- *Coverage:* The policy requiring a minimum of 90 percent of the service area population to reside within one-half mile of a bus route may require providing large amounts of predictably unproductive service. Service could be better targeted to areas with high transit ridership rather than spreading it across a large geographic area. The recommended policy in the PTIS to limit transit service to only those areas with minimum transit supportive densities may provide a more efficient system that in turn would attract more new riders.
- *Frequency:* Improving headways to every 15 minutes on the busiest bus routes could attract new riders because the service will be more reliable, more useful and more conducive to easy connections. However, the current policy to provide 60 minute headways on every route should be reconsidered to determine which routes would be better served by improved frequency and which routes may not need any service. In addition to improving frequency on popular routes, FAX might consider providing less frequent service on commuter routes during off-peak periods and more frequent service during peak periods to provide more efficient service during times of high demand.
- *Stop Spacing*: Maintaining a minimum spacing of every one-half mile might impede the further development of bus-rapid transit (BRT) networks that can efficiently move transit riders over long distances without making frequent, unnecessary stops. Also, requiring a stop every block in the CBDs may be slowing down service unnecessarily. A system that allows for a combination of BRT and local service might better serve the various transportation needs of FCMA residents. Bus service that makes fewer stops and therefore provides shorter travel times may also attract more new riders to the system.

Because the Fresno COG, the City of Fresno and the City of Clovis are in the process of updating several important policy documents that will guide transit service in the FCMA for years to come, it is important to carefully consider the implications of each policy on the quality and efficiency of the transit network.

Drawing from the observations and recommendations included in this policy review, the *System Assessment Final Report* will present recommendations for a set of policies that Fresno COG, the City of Fresno and the City of Clovis can adopt to establish a policy framework that would result in an efficient transit system.

Table 4-1. Policy Summary Matrix

	Existing Policies Currently Guiding Service	Non Adopted Policies	Recommendations and Observations
Coverage	▪ Minimum of 90 percent of the service area population resides within one-half mile of a bus route.[1] ▪ Plan and develop the major street network to facilitate efficient direct transit routing that provides one-half mile coverage throughout the metropolitan area.[2]	▪ FAX should adopt a transit service expansion policy that FAX will not subsidize or expand transit service to new areas without minimum transit supportive densities (8 du/ac for local bus, up to 12 to 18 du/ac for BRT/LRT).[3]	▪ Policy E-9-s provides a strong basis for establishing a street criterion and diverts service from less productive circuitous streets. ▪ Measure "C" Extension Expenditure Plan policies related to expanding service areas to all riders and the Sphere of Influence changes is vague and is open to interpretation. ▪ Reword PTIS recommended policies to more clearly guide development and transit.
Frequency	▪ FAX scheduled service should provide for maximum headways of 60 minutes on every route whenever service is operated.[1]	▪ Improve bus frequencies to every 15 minutes on the busiest routes.[4]	▪ Frequency could be overprescribed in areas requiring service for very limited hours of the day. A hub-spoke system can be managed with limited frequencies that could offer savings.
Stop Spacing	▪ Maintain minimum spacing of every one-half mile.[5] ▪ Maintain optimum spacing of every two-tenths mile.[5] ▪ Maintain specialized spacing of every block in Central Business Districts.[5]	N/A	▪ Other spacing configurations may better serve a grid pattern, improve travel time, reduce costs and improve reliability.
Shelter/ Amenities	▪ Daily boarding volume at a bus stop is the major criterion in determining how that bus stop is to be improved.[5]	▪ Deploy other operational and infrastructure improvements such as "real time" bus arrival and departure information.[4]	▪ Document these constraints that may result improvements at bus stops varying from criteria (i.e. physical constraints, high lift deployment rates, etc).

	Existing Policies Currently Guiding Service	Non Adopted Policies	Recommendations and Observations
			▪ Bus bay turnouts are not always a preferred option and curb extensions may be preferable.
Span of Service	▪ Regular FAX service stops at 10:00 p.m. on weekdays and 7:00 p.m. on weekends.[1] ▪ Clovis Transit fixed-route service (Stageline) should operate weekdays (Monday-Friday) from 6:15 a.m. to 6:15 p.m. and Saturday from 7:30 to 3:30 p.m.[1]	▪ Extend weekend service hours.[4] ▪ Owl service on all routes until midnight.[1]	▪ The span of service hours should be reconsidered to better reflect travel behavior. ▪ For the CSU Fresno service, in addition to expanding service hours and days, consider expanding frequency of service.
On-Time Performance	▪ FAX should operate its fixed-route buses so that on-time performance is achieved 90 percent of the time.[1]	N/A	▪ The on-time performance standard could also include guidance for early arrival /departure (i.e. no more than one minute early). ▪ For clarification, the policies could include a discussion of the role of traffic congestion in on-time performance. ▪ Bus stop spacing or locations of stops, traffic signal adjustments, bus pullouts, length of route (and/or interline), and the directness of the route to decrease turns can all contribute to on-time performance and will be reviewed as part of the Strategic Service Evaluation.
Route Deviations	N/A	N/A	▪ Routes that divert off a major arterial to serve a transit center or other destination should be evaluated to consider the trade-offs on effects to ridership, access for specific populations and safety.

	Existing Policies Currently Guiding Service	Non Adopted Policies	Recommendations and Observations
Load Standards	▪ Maximum seat to passenger load ratio of 1:1.1, or 110 percent of vehicle capacity.[1]	N/A	▪ The existing load standard policy could be forcing more service than necessary. A higher load may be acceptable for several trips during peak periods.
Customer Complaints/ Customer Service	▪ Track, evaluate, and follow up with all compliments, complaints and inquiries from the public.[1]	▪ Title VI and Limited English Proficiency (LEP) outreach plan to understand the transit community's needs for communication and information translation.[3]	▪ Customer complaints could be categorized to identify those that need immediate attention and those that can be reviewed on an annual or semi-annual basis
Accidents/ Security	▪ Regular maintenance is performed at prescheduled cycles to ensure optimal performance, efficiency, safety and reliability of assigned equipment.[1] ▪ FAX security plan provides a highly visible security presence for our transit customers and employees.[1]	N/A	▪ Safety of passengers at bus stops should be considered. This includes an evaluation of lighting, crossings and sidewalk conditions within an immediate area.
Number of Transfers	▪ Install and integrate a regional Automated Fare Collection System (AFC) to enhance transit coordination and seamless passenger travel between transit systems.[4]	N/A	▪ A policy statement could be developed to help align service changes to match a desired threshold of transfers.
Productivity	▪ 24 percent farebox recovery ratio.[1] ▪ 40 boardings per revenue hour system wide.[1] ▪ Each individual route should exceed 60 percent of the system wide average for a number of key indicators.[6]	N/A	N/A

[1] *2014-2018 SRTP*
[2] *City of Fresno General Plan*
[3] *Public Transportation Infrastructure Study*
[4] *Measure "C" Extension Expenditure Plan*
[5] *Transit Facilities and Development Standards*
[6] *Title VI Report*

Table 4-2: Ridership/Productivity versus Coverage Goals

	Ridership/Productivity Goal	Coverage Goal
FCMA 2014-2018 Short Range Transportation Plan	▪ **Goal 3, Objective A:** To establish and maintain system-wide productivity indicators ▪ **Goal 7, Objective A:** Support transportation investments that work toward accomplishing air quality goals, optimize utilization of land and encourage a stable economic base.	▪ **Goal 1, Objective B:** To provide a transit service (both fixed-route and demand-responsive) that adequately serves the elderly and disabled population ▪ Regular FAX service stops at 10:00 p.m. on weekdays and 7:00 p.m. on weekends. ▪ Clovis Transit fixed-route service (Stageline) should operate weekdays (Monday-Friday) from 6:15 a.m. to 6:15 p.m. and Saturday from 7:30 to 3:30 p.m. ▪ Extend weekend service hours (unfunded) ▪ Owl service on all routes until midnight (unfunded)
2006 Measure "C" Extension Expenditure Plan	N/A	▪ Expansion of service areas to all riders as Fresno's Sphere of Influence changes ▪ Expand service areas to all riders, as Clovis's Sphere of Influence changes ▪ Extend weekend service hours in Fresno and Clovis.
PTIS	▪ Increase the number of people and businesses in Downtown Fresno and in close proximity to designated high-capacity Transit Corridors, with a priority on making downtown more attractive to pedestrians. ▪ Plan for and build TOD housing developments for a mix of middle and lower incomes and families. ▪ Grow the transit, bicycle and pedestrian mode shares by making it more attractive to use alternate modes. ▪ Decrease the drive alone mode share and reduce vehicle miles traveled (VMT) with Travel Demand Management (TDM) programs and policies. ▪ Attract residents to Fresno who would be willing to live in market priced TOD-style development, including young urban professionals, seniors and future high speed rail commuters. ▪ Cross jurisdictional and departmental boundaries with processes to link local and regional transportation and land use planning decisions.	▪ Expand transit service hours, days and the number of routes to serve the CSU Fresno campus.

	Ridership/Productivity Goal	Coverage Goal
	▪ Restrict the growth of new development on the urban fringes and into farmlands with incentives, disincentives and growth boundaries.	
Transit Productivity Evaluation FY2011-12	▪ "FAX will continue to focus on the Coverage scenario by ensuring that service is provided to as many new areas as is feasible, and will not stress providing service solely for productivity purposes."	N/A

Appendix B: Major Travel Markets Memorandum (September 2013)

FCMA Public Transportation Strategic Service Evaluation Project

Major Travel Markets

Task No. 1.2

Prepared for:

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1.0 PERFOMANCE EVALUATION APPROACH

In preparation for the study of travel patterns in the Fresno/Clovis region, two complementary analyses were undertaken to identify the origin and destination "hot spots": a Transit Suitability Index (TSI) study and a trip activity study based on cell phone data (AirSage). These studies are described below. Their methodologies and their results are outlined further in the remainder of this memo.

1.1 Transit Suitability Index (TSI)

The "Transit Suitability Index" (TSI) map illustrates transportation analysis zones (TAZs) in which socioeconomic factors indicate where transit ridership potential would be highest. The use of socioeconomic indicators allows for an assessment of ridership potential that is independent of existing ridership data analyses. This separate TSI analysis is useful because, unlike analyses that use existing ridership data, the TSI evaluates ridership potential without taking into account variables such as existing service levels, which can be changed.

1.2 AirSage Data Collection

The AirSage analysis used cellular device activity data to evaluate trip activity by day, time of day, and duration to determine travel patterns and destinations with many trip arrivals.

2.0 PERFORMANCE EVALUATION METHODOLOGY

2.1 Transit Suitability Index (TSI)

The TSI is a composite of four separate analyses of the following socio-economic factors:

- Population density (persons per square mile)
- Employment density (jobs per square mile)
- Household income (percent of low income households)
- Car ownership (percent of zero-vehicle households)

The population, employment, and household income data used were from the 2008 FCOG Regional Transportation Plan (RTP). With the objective of combining these four factors into one, an index was created by classifying the data in each of the four factors into six categories (from low to high) and then assigning each category a corresponding "score" on a scale of 1 to 6.

For the population and employment density factors, high values (densities) corresponded to high scores on the scale (since high density supports transit ridership potential); for auto ownership and household income, high percentages of low-income and zero-vehicle households corresponded to high scores on the scale (since transit ridership is correlated with lower income and low auto ownership).[1]

The scales from each factor were then added to create a combined index with values ranging from 4 to 24, with lower scores indicating less "transit suitability" and higher scores indicating more. Areas with the very highest transit suitability scores have comparatively high population density, high employment density, low household incomes, and low rates of car ownership.

This transit suitability index (TSI) is represented graphically on "heat map" that was developed using ArcGIS, a mapping and data analysis software program. The TSI is represented on the TAZ map using a color scale, with lighter shades indicating TAZs with lower transit suitability (and lower ridership potential) and darker shades highlighting TAZs with higher transit suitability (and higher ridership potential).

2.2 AirSage Data Collection

The AirSage data were collected between October 16 and November 22, 2012 from weekday cellular device activity locations and are aggregated to Census Block Groups (CBG). Activity locations are determined by typical weekday observations, time of day, and duration over 30 days and are used to determine movement patterns over the study time period. Only trips that had both an origin and destination within the study area are included, because these trips represent the coverage areas of FAX and Stageline, the focus of this study. The maps were created to show the activity centers that have the highest number of observed trips departing or arriving for the AM peak period (6-10) and over the

[1] Note: "Low income" is defined as all households with income under $20,000 (2008 $), representing approximately 21% of total households in the TAZ region.

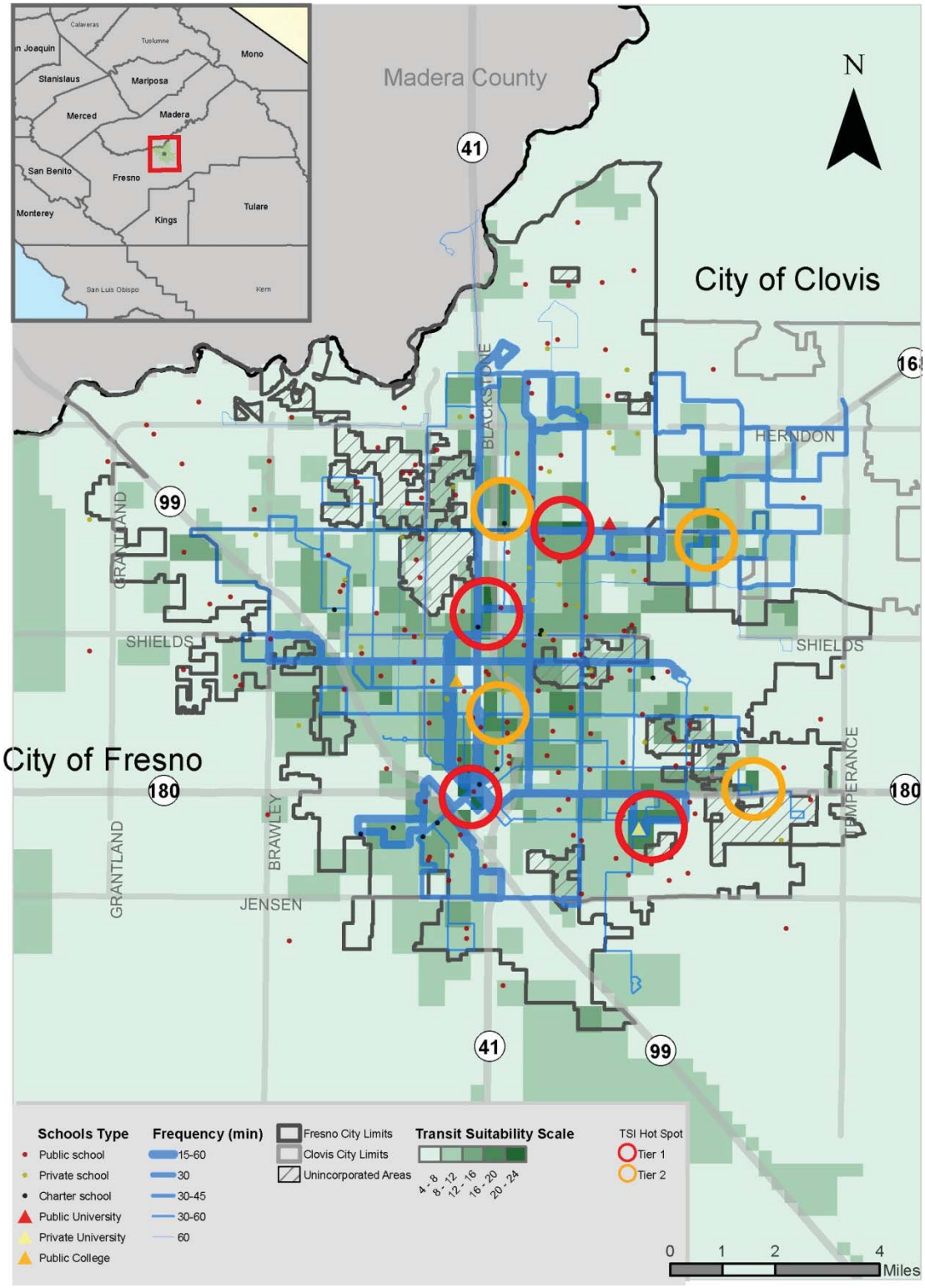
course of an entire day that had both the start and end location within the study area to identify potential transit riders. After filtering the trips that occur within the study area, the activity centers were grouped into the following categories based on the percentage of overall trips: Low (Fewer than 30%), Medium (Between 30%-60%), and High (60% or greater). This information, combined with transit suitability and review of sub-CBG level information can be used to identify the locations where we will collect AirSage data to overlap with the on-board surveys and counts.

3.0 SUMMARY OF TSI AND AIRSAGE RESULTS

3.1 TSI

TSI maps show where the socioeconomic factors indicate where the greatest transit ridership potential exists. The TSI analysis reveals that high ridership potential areas (as denoted in Figure 1 by darker shades of green) are generally served by existing bus routes.

Figure 1. TSI Map of Fresno-Clovis Area



To identify the areas with the very highest ridership potential ("hotspots"), the TAZs that fell within the top 25% of the index were selected: these 4 hotspots are called out in Figure 1 as "Tier 1" hotspots. The 4 "second tier" hotspots from the top 33% of index results were identified, and are also called out in Figure 1.

The TSI hotspots include the following areas:

Tier 1

- Area near Downtown/Downtown Transit Mall
- Area near Fresno Pacific University
- Area near Manchester Transit Center
- Area near Belden Field/Bulldog Stadium

Tier 2

- Area southeast of Cal State, Fresno
- Area near Hoover High School
- Area near San Joaquin High School
- Area near Sunnyside High School

3.2 AirSage

The AirSage analysis identified areas where trip activity is highest. Hotspots identified in the AirSage analysis include zones that roughly correspond with the following major activity centers, as shown in Figure 2:

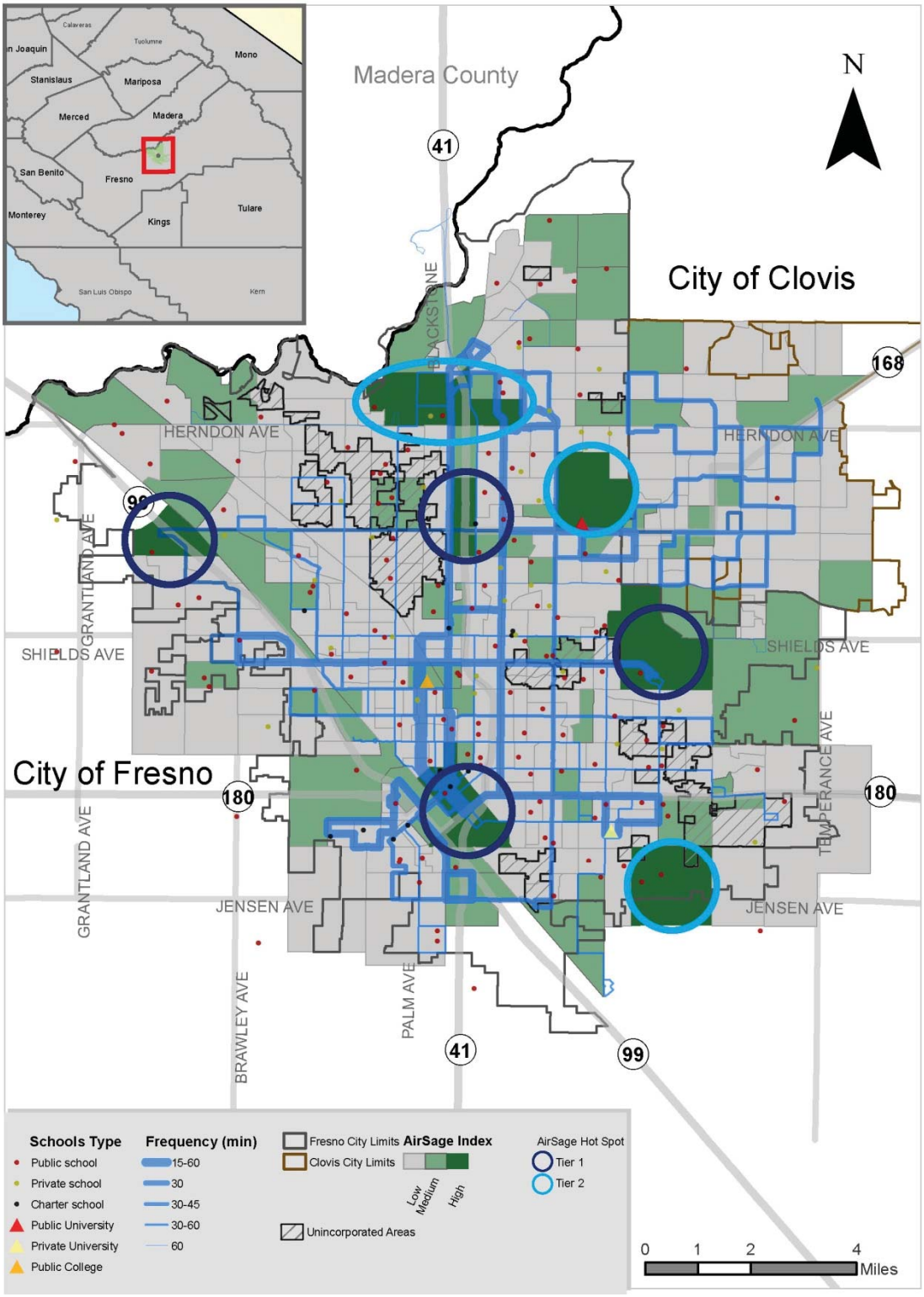
Tier 1

- Downtown
- Residential area near Highway City
- Shaw City/Northgate Shopping Centers
- Fresno Yosemite Airport

Tier 2

- Cal State, Fresno
- Medical Center, University Campus & Commercial/Industrial zone in Pinedale
- Residential area south of Sunnyside Country Club

Figure 2. Origin-Destination Data (AirSage Analysis)



3.3 TSI and AirSage results compared

Whereas the TSI captures socioeconomic factors drawn from Census data, the AirSage analysis is based on trip activity. The two studies complement each other, as TSI is oriented more toward trip origins, and AirSage more toward trip destinations.

Note that the TSI weights residential population heavily, as the index comprises three population-based factors (namely income and household vehicle ownership in addition to population) and only one employment factor (employment). Highly populated areas with large percentages of households that are low-income and zero-vehicle will therefore score higher on the TSI index than an unpopulated area with high employment.

The AirSage results, on the other hand, do not account for probabilistic factors influencing ridership potential and instead focuses on where trips are currently made.

Table 1 shows the complementary results that emerge from the separate analyses (areas identified in both analyses are in boldface).

Table 1. TSI and AirSage Hotspots Compared

Tier	Landmark closest to TSI Hotspot	Tier	AirSage Hotspot
1	Downtown/Downtown Transit Mall	1	Downtown
1	Fresno Pacific University	1	Highway City residential area
1	Manchester Transit Center	1	Shaw City/Northgate Shopping Centers
1	Belden Field/Bulldog Stadium	1	Fresno Yosemite Airport
2	Area southeast near Cal State, Fresno[2]	2	Cal State, Fresno
2	Hoover High School	2	Medical Center/ Pinedale Commercial/Industrial zone
2	San Joaquin High School	2	Residential area south of Sunnyside Country Club
2	Sunnyside High School		

Figure 3 and Figure 4 show the combined results of the TSI and AirSage hotspots analysis with and without an aerial reference image (respectively).

[2] Note: TAZ analysis is based on Census data, which exclude major institutional and governmental sites such as universities and airports. As a result, important trip generators such as Cal State and Fresno Yosemite Airport are not identified in the TSI analysis as "hot spots" though they are in the AirSage analysis.

Figure 3. Combined TSI and AirSage Analysis with Aerial Reference

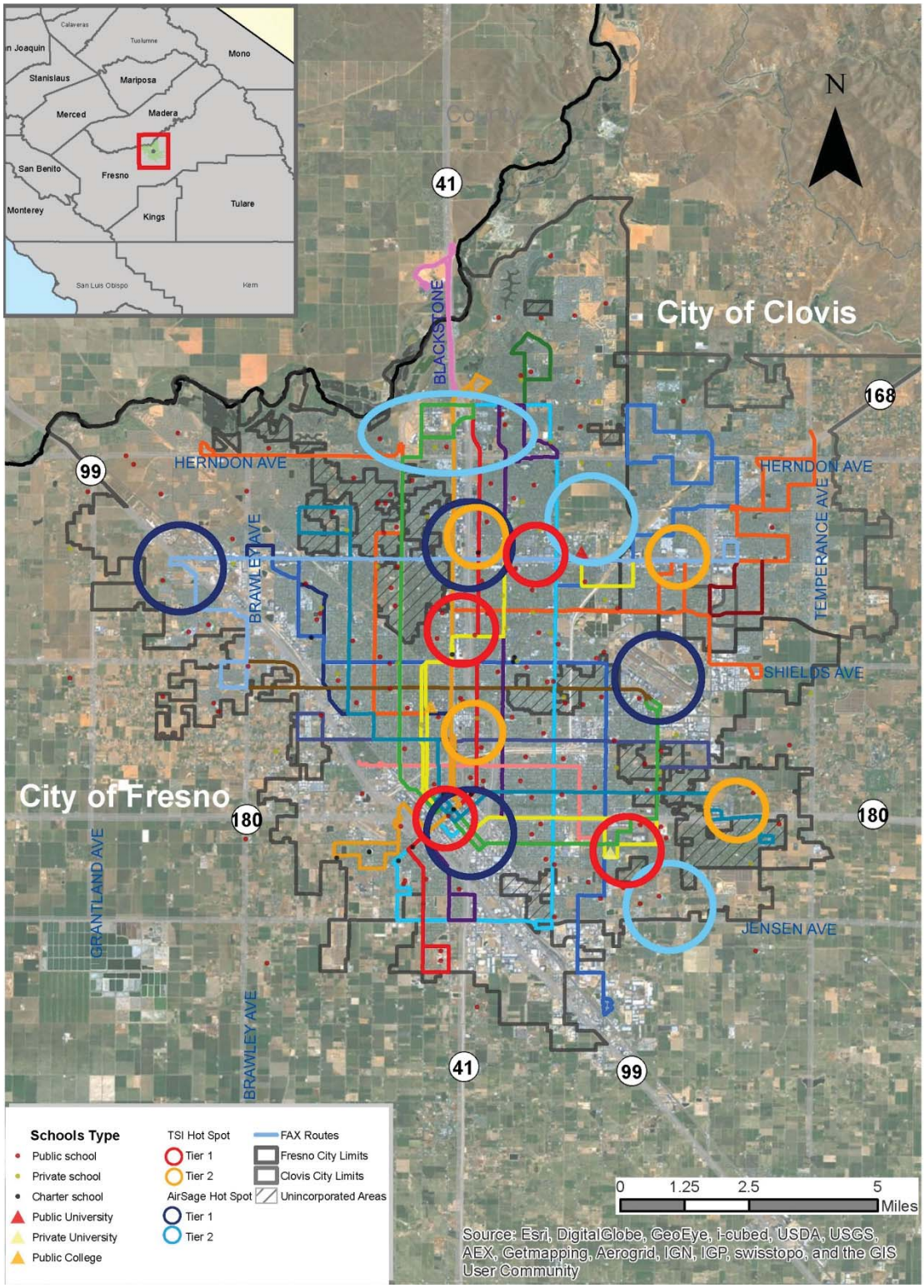
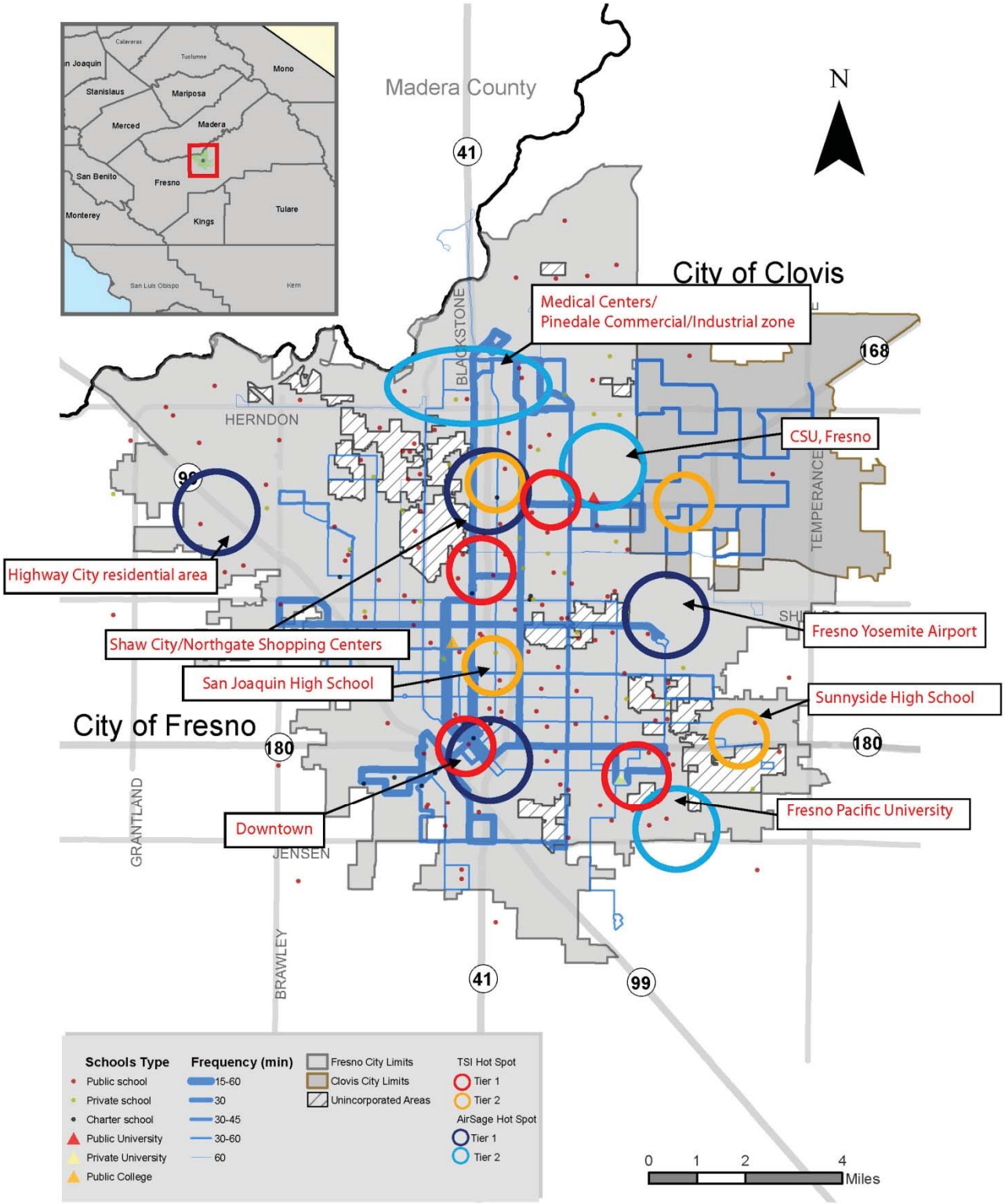


Figure 4. Combined TSI and AirSage Analysis without Aerial Reference



3.4 Next Steps

From the hotspots identified in the TSI and AirSage analyses, five to seven will be selected by the TAC for the next stage of the study: evaluating travel times from selected "hotspots" to determine whether the existing transit system efficiently connects these areas, taking into account frequency of service, number of transfers required, traffic congestion and number of stops.

Based purely on the data from the two studies, the top seven hotspot candidates are the ones near the following areas:

- Downtown
- Fresno Pacific University
- Manchester Transit Center
- Belden Field/Bulldog Stadium
- Highway City residential area
- Shaw City/Northgate Shopping Centers
- Fresno Yosemite Airport

A series of "heatmaps" illustrating the transit travel times to the selected "hotspots" will identify the level of access that FAX riders have to these major destinations/origins via transit within 15 minutes, 30 minutes, 60 minutes, and 90 minutes. Access is a strong measure of how well a transit system is serving the highest demand.

Appendix C: Performance Evaluation Memorandum (September 2013)

FCMA Public Transportation Strategic Service Evaluation Project

Performance Evaluation

Task No. 1.1

Prepared for:

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Introduction

This report is an assessment of the performance of transit routes in the cities of Fresno and Clovis. Its primary objective is to evaluate transit routes based on well-established measures of transit service efficiency. This analysis helps identify routes that perform below average in terms of their productive hours of operation (revenue hours) as well as identifies the most and least efficient portions of individual routes (in terms of balancing bus capacity with passenger loads).

The automatic passenger counting system installed on approximately 75% of the FAX fixed route fleet, provides large amounts of data that, when paired with automatic vehicle locator (AVL) system, provides a robust set of data to analyze the geographic and temporal performance of the system.

A revenue/vehicle hours analysis provides one view of the relative performance of transit routes within an entire transit system in terms of operational efficiency. To provide a more robust analysis, this analysis is coupled with a systemwide analysis of passenger loads. Such an analysis measures the number of passengers on a route at any given time relative to the capacity of a bus. Peak bus loads near the capacity of an individual bus are indicative of a route that is well utilized – another measure of efficiency. However, passenger loads significantly higher or lower than capacity indicate an inefficient service.

This report also includes a mapping of passenger activity (ons and offs) of each bus stop in the FAX system for average weekdays, Saturdays and Sundays. These maps provide a visual reference of the most and least active areas on the system.

An appendix is included with this report that provides an analysis of the percent of stops not served within each route. Indentifying underutilized stops within each route can help to identify inefficiencies within the transit network.

FAX Route Efficiency Performance Indicators – Weekday

One measure of transit service efficiency is the revenue/vehicle hours ratio. This ratio measures the percentage of time that a transit vehicle serves passengers (and collects revenue). A higher ratio is indicative of a route with more efficiently deployed service – as the bus spends more time serving passengers and less time deadheading, at layovers, or driving to and from its bus storage/maintenance facility. A lower ratio suggests routes that could benefit from scheduling or operational changes to reduce deadheading and non-revenue operation. Routes 32, 30, and 26 have the three highest revenue/vehicle hour ratios, respectively, and exceed the systemwide average ratio of 89.5 percent. Conversely, Routes 35, 9, and 33 are the least efficient routes in terms of their revenue/vehicle ratios, performing below the systemwide average ratio. Fifty seven percent of FAX routes perform below the system average on weekdays.

Table 1 shows the three highest and lowest performing routes in terms of revenue/vehicle hours ratio for the entire FAX system.

Table 1: Highest and Least Efficient FAX Routes by Revenue/Vehicle Hour (Weekday)

Route	Revenue/Vehicle Hours Ratio	Revenue/Vehicle Hour +/- Average
Route 32	**94.8%**	**5.4%**
Route 30	**93.4%**	**3.9%**
Route 26	**92.9%**	**3.4%**
Systemwide Average	**89.5**	
Route 35	86.8%	**-2.7%**
Route 9	86.5%	**-3.0%**
Route 33	82.1%	**-7.4%**

FAX Route Efficiency Performance Indicators – Weekend

The relative performance of FAX routes revenue hours/vehicle hours changes minimally from weekdays to weekends. Routes 32, 20 and 38 have the highest revenue/vehicle hours ratios and are above the average ratio. The three least efficient routes are the same as for weekdays, as Routes 35, 9, and 33 have the lowest ratio out all of the routes.

To improve efficiency of the revenue/vehicle hour ratio, some service changes can be explored such as interlining, removing interlining, changes in route, examination of layover per route. These measures help inform the development of network alternatives in Task 2.

Stageline Route Efficiency Performance Indicators – Weekday

Table 2 displays the operating efficiency of Stageline routes as measured by their respective revenue/vehicle ratios. Based on a systemwide ratio of 77.3 percent, Routes 10 and 50 perform above the system average. However, determining the efficiency of these routes is difficult because the system average is based on a limited amount of routes, two of which primarily operate only for a small number of hours per day. This skews the average to a much lower number of hours. If Routes 10 and 50 are compared to an average ratio two routes, they operate almost equally efficient. Efficiency of these routes may be more effectively determined by comparing this data with their performance in a load factor analysis.

Table 2: Stageline Route Efficiency Performance Indicators Weekday

Route	Revenue Hours	Vehicle (Platform) Hours	Revenue/Vehicle Hours Ratio	Revenue/Vehicle Hour +/- Average
Route 10	37.1	49.3	12.2	**5.25**
Route 50	36.7	48.5	11.8	**4.85**
Route 70	5.3	7.1	1.8	**-5.15**
Route 80	4.7	6.7	2.0	**-4.95**
Total	83.8	111.6		
Average			**6.95**	

FAX Passenger Load Summary - Systemwide

Based on a baseline average of max load factors for all weekday-operating FAX routes, about 57 percent of all routes exceed the systemwide average max load factor (130 percent). Routes 38, 26, 41 have the highest average max load factors, ranging from 159 percent to 223 percent. These routes, on average, are more highly patronized than all other routes in the system, which is one indicator of service efficiency. Routes 35, 33, and 58 are the least efficient routes in the system in terms of max load factors, ranging from 11 to 38 percent. This indicates that these routes are not well-utilized, since even the runs with highest loads fare well below the systemwide average. While some individual runs within a route may have load factors that are higher than those in higher ranking routes, these rankings are based on an average of the top three max load factors by route. Table 3 shows the three highest performing runs for each route in terms of peak passenger loads for the entire FAX system. The routes in the ranking column highlighted in red indicate routes that perform below the systemwide average max load factor.

Table 3: Route Performance by Peak Load Averages - Weekday

Rank (avg. of top 3 highest loads per route)	Route	Time	Direction	Peak Load Location	Average Max Load	Max Load Factor
1	Route 38	6:35 AM	North	B Shelter	87	223%
	Route 38	2:46 PM	South	Blackstone – El Paso	67	172%
	Route 38	2:26 PM	South	Blackstone – El Paso	67	172%
2	Route 26	1:35 PM	South	Nees – Blackstone	73	187%
	Route 26	5:50 AM	North	Shields - Brawley	70	179%
	Route 26	6:20 AM	North	Shields - Brawley	58	149%
3	Route 41	2:35 PM	North	Grand - Harding	72	185%
	Route 41	2:05 PM	North	Grand - Harding	64	164%
	Route 41	7:05 AM	South	Marks - Shaw	62	159%
4	Route 34	6:40 AM	North	Jensen – Cherry	67	172%
	Route 34	2:27 PM	South	First - Nees	63	162%
	Route 34	2:47 PM	South	First - Nees	62	159%
5	Route 9	6:40 AM	South	Brawley - Shields	65	167%
	Route 9	3:10 PM	North	Shaw/Cole	60	154%
	Route 9	2:08 PM	South	Brawley - Shields	59	151%
6	Route 30	3:04 PM	North	SE Crystal - Kearney	59	151%
	Route 30	11:52 AM	South	SW Blackstone - Nees	58	149%
	Route 30	12:24 PM	North	SE Crystal - Kearney	56	144%
7	Route 28	6:05 AM	South	NW Shaw - Cedar	58	149%
	Route 28	12:32 PM	South	Willow – Shaw	56	144%
	Route 28	8:30 AM	North	Kings Canyon - Winery	53	136%
8	Route 20	7:40 AM	South	Brawley - Walmart	54	138%
	Route 20	2:55 PM	North	L Shelter	53	136%
	Route 20	7:10 AM	South	Brawley - Walmart	52	133%
Average Max Load and Average Max Load Factor (all routes)					**50**	**130%**
9	Route 45	2:40 PM	North	Herndon - Milburn	58	149%
	Route 45	1:40 PM	North	Herndon - Milburn	47	121%
	Route 45	6:40 AM	North	Herndon - Milburn	40	103%
10	Route 32	1:58 PM	South	El Paso EB	48	123%
	Route 32	2:24 PM	North	North - Elm	47	121%

Rank (avg. of top 3 highest loads per route)	Route	Time	Direction	Peak Load Location	Average Max Load	Max Load Factor
	Route 32	11:54 AM	North	North - Elm	46	118%
11	Route 22	3:05 PM	South	West - Bullard	55	151%
	Route 22	8:05 AM	South	West - Bullard	42	108%
	Route 22	10:35 AM	South	West - Bullard	40	103%
12	Route 35	3:00 PM	North	Belmont - Clovis	38	97%
	Route 35	12:45 PM	South	NE Marks - Olive	35	90%
	Route 35	4:30 PM	North	Belmont - Clovis	32	82%
13	Route 33	8:30 AM	North	Maple - Butler	30	77%
	Route 33	7:30 AM	North	Maple – Butler	21	54%
	Route 33	12:30 PM	South	Belmont – Delno	19	49%
14	Route 58	8:02 AM	North	Champlain – Perrin	22	56%
	Route 58	7:32 AM	South	Maulpin - Peck	11	28%
	Route 58	6:32 AM	South	Maulpin - Peck	11	28%

FAX Estimated Average Weekday Boardings

Table 4 shows the estimated average boardings per hour by route and run. The number of boardings shown were calculated by taking the sum of their weekday "OnProj" boarding numbers (projected number of boardings based on actual boarding accounting for additional boardings on buses without APC equipment) by route and run, and divided those summed monthly boarding figures by 20 (weekdays/month) to get an approximate figure for projected daily boardings. To get to approximate hourly boarding, revenue hours were divided by route by the number of runs per route (to get "hours per run"). "Daily boardings" were then divided by the "hours per run" to get to the final figure, approximate "boardings per hour." The numbers in Table 4 can be read as "estimated average weekday boardings." The routes with below average boardings are highlighted in red.

Table 4: Estimated Average Weekday Boardings Per Hour by Route and Run

ROUTE	RUNDESC	Estimated Boardings Per Hour
9	BRAWLEY - SHIELDS 05:40	26
9	BRAWLEY - SHIELDS 06:10	33
9	BRAWLEY - SHIELDS 06:40	70
9	BRAWLEY - SHIELDS 07:08	53
9	BRAWLEY - SHIELDS 07:38	52
9	BRAWLEY - SHIELDS 08:08	62
9	BRAWLEY - SHIELDS 08:38	41
9	BRAWLEY - SHIELDS 09:08	53
9	BRAWLEY - SHIELDS 09:38	53
9	BRAWLEY - SHIELDS 10:08	59
9	BRAWLEY - SHIELDS 10:38	54
9	BRAWLEY - SHIELDS 11:08	62
9	BRAWLEY - SHIELDS 11:38	35
9	BRAWLEY - SHIELDS 12:08	57
9	BRAWLEY - SHIELDS 12:38	46
9	BRAWLEY - SHIELDS 13:08	51
9	BRAWLEY - SHIELDS 13:38	60
9	BRAWLEY - SHIELDS 14:08	68
9	BRAWLEY - SHIELDS 14:38	71
9	BRAWLEY - SHIELDS 15:08	74
9	BRAWLEY - SHIELDS 15:38	53
9	BRAWLEY - SHIELDS 16:08	58
9	BRAWLEY - SHIELDS 16:38	56
9	BRAWLEY - SHIELDS 17:08	50
9	BRAWLEY - SHIELDS 17:38	25
9	BRAWLEY - SHIELDS 18:08	33
9	BRAWLEY - SHIELDS 19:08	34
9	BRAWLEY - SHIELDS 20:08	29
9	BRAWLEY - SHIELDS 21:00	17
9	CEDAR - GETTYSBURG 20:10	21
9	CEDAR - GETTYSBURG 21:10	28
9	SHAW - CEDAR 06:15	25
9	SHAW - CEDAR 06:45	35
9	SHAWCOLE W/B 06:40	47
9	SHAWCOLE W/B 07:10	44

9	SHAWCOLE W/B 07:40	**48**
9	SHAWCOLE W/B 08:10	**32**
9	SHAWCOLE W/B 08:40	**53**
9	SHAWCOLE W/B 09:10	**40**
9	SHAWCOLE W/B 09:40	**54**
9	SHAWCOLE W/B 10:10	**34**
9	SHAWCOLE W/B 10:40	**58**
9	SHAWCOLE W/B 11:10	**47**
9	SHAWCOLE W/B 11:40	**53**
9	SHAWCOLE W/B 12:10	**53**
9	SHAWCOLE W/B 12:40	**76**
9	SHAWCOLE W/B 13:10	**44**
9	SHAWCOLE W/B 13:40	**66**
9	SHAWCOLE W/B 14:10	**53**
9	SHAWCOLE W/B 14:40	**74**
9	SHAWCOLE W/B 15:10	**73**
9	SHAWCOLE W/B 15:40	**78**
9	SHAWCOLE W/B 16:10	**48**
9	SHAWCOLE W/B 16:40	**83**
9	SHAWCOLE W/B 17:10	**43**
9	SHAWCOLE W/B 17:40	**43**
9	SHAWCOLE W/B 18:10	**41**
9	SHAWCOLE W/B 18:40	**34**
9	SHAWCOLE W/B 19:10	**25**
20	BRAWLEY - WALMART 05:40	**21**
20	BRAWLEY - WALMART 06:10	**31**
20	BRAWLEY - WALMART 06:40	**46**
20	BRAWLEY - WALMART 07:10	**85**
20	BRAWLEY - WALMART 07:40	**80**
20	BRAWLEY - WALMART 08:10	**65**
20	BRAWLEY - WALMART 08:40	**48**
20	BRAWLEY - WALMART 09:10	**47**
20	BRAWLEY - WALMART 09:40	**44**
20	BRAWLEY - WALMART 10:10	**50**
20	BRAWLEY - WALMART 10:40	**44**
20	BRAWLEY - WALMART 11:10	**43**
20	BRAWLEY - WALMART 11:40	**37**
20	BRAWLEY - WALMART 12:10	**42**

20	BRAWLEY - WALMART 12:40	**44**
20	BRAWLEY - WALMART 13:10	**46**
20	BRAWLEY - WALMART 13:40	**41**
20	BRAWLEY - WALMART 14:10	**47**
20	BRAWLEY - WALMART 14:40	**41**
20	BRAWLEY - WALMART 15:10	**40**
20	BRAWLEY - WALMART 15:40	**45**
20	BRAWLEY - WALMART 16:10	**37**
20	BRAWLEY - WALMART 16:40	**25**
20	BRAWLEY - WALMART 17:10	**34**
20	BRAWLEY - WALMART 17:40	**24**
20	BRAWLEY - WALMART 18:10	**26**
20	BRAWLEY - WALMART 18:55	**32**
20	BRAWLEY - WALMART 19:40	**26**
20	BRAWLEY - WALMART 20:25	**23**
20	BRAWLEY - WALMART 21:15	**13**
20	L SHELTER 05:40	**14**
20	L SHELTER 06:10	**18**
20	L SHELTER 06:25	**20**
20	L SHELTER 06:55	**40**
20	L SHELTER 07:25	**57**
20	L SHELTER 07:55	**35**
20	L SHELTER 08:25	**35**
20	L SHELTER 08:55	**42**
20	L SHELTER 09:25	**32**
20	L SHELTER 09:55	**40**
20	L SHELTER 10:25	**55**
20	L SHELTER 10:55	**41**
20	L SHELTER 11:25	**48**
20	L SHELTER 11:55	**51**
20	L SHELTER 12:25	**49**
20	L SHELTER 12:55	**59**
20	L SHELTER 13:25	**58**
20	L SHELTER 13:55	**53**
20	L SHELTER 14:25	**62**
20	L SHELTER 14:55	**83**
20	L SHELTER 15:25	**63**
20	L SHELTER 15:55	**74**

20	L SHELTER 16:25	**71**
20	L SHELTER 16:55	**52**
20	L SHELTER 17:25	**49**
20	L SHELTER 17:55	**47**
20	L SHELTER 18:55	**47**
20	L SHELTER 19:40	**42**
20	L SHELTER 20:25	**31**
20	L SHELTER 21:15	**30**
22	A SHELTER 05:55	**10**
22	A SHELTER 06:15	**6**
22	KINGS CANYON - CLOVIS 06:14	**33**
22	KINGS CANYON - CLOVIS 06:44	**47**
22	KINGS CANYON - CLOVIS 07:10	**46**
22	KINGS CANYON - CLOVIS 07:40	**53**
22	KINGS CANYON - CLOVIS 08:15	**42**
22	KINGS CANYON - CLOVIS 08:45	**41**
22	KINGS CANYON - CLOVIS 09:15	**53**
22	KINGS CANYON - CLOVIS 09:45	**47**
22	KINGS CANYON - CLOVIS 10:15	**44**
22	KINGS CANYON - CLOVIS 10:45	**51**
22	KINGS CANYON - CLOVIS 11:15	**46**
22	KINGS CANYON - CLOVIS 11:45	**49**
22	KINGS CANYON - CLOVIS 12:15	**41**
22	KINGS CANYON - CLOVIS 12:45	**54**
22	KINGS CANYON - CLOVIS 13:15	**48**
22	KINGS CANYON - CLOVIS 13:45	**48**
22	KINGS CANYON - CLOVIS 14:15	**49**
22	KINGS CANYON - CLOVIS 14:45	**68**
22	KINGS CANYON - CLOVIS 15:15	**60**
22	KINGS CANYON - CLOVIS 15:45	**62**
22	KINGS CANYON - CLOVIS 16:15	**42**
22	KINGS CANYON - CLOVIS 16:45	**49**
22	KINGS CANYON - CLOVIS 17:15	**30**
22	KINGS CANYON - CLOVIS 17:45	**35**
22	KINGS CANYON - CLOVIS 18:15	**10**
22	KINGS CANYON - CLOVIS 18:55	**29**
22	KINGS CANYON - CLOVIS 20:05	**30**
22	KINGS CANYON - CLOVIS 21:15	**5**

22	L SHELTER 05:55	**6**
22	L SHELTER 06:10	**6**
22	OLIVE - PALM 05:30	**3**
22	WEST - BULLARD 05:57	**26**
22	WEST - BULLARD 06:35	**57**
22	WEST - BULLARD 07:05	**57**
22	WEST - BULLARD 07:35	**54**
22	WEST - BULLARD 08:05	**58**
22	WEST - BULLARD 08:35	**45**
22	WEST - BULLARD 09:05	**44**
22	WEST - BULLARD 09:35	**49**
22	WEST - BULLARD 10:05	**51**
22	WEST - BULLARD 10:35	**58**
22	WEST - BULLARD 11:05	**54**
22	WEST - BULLARD 11:35	**60**
22	WEST - BULLARD 12:05	**54**
22	WEST - BULLARD 12:35	**52**
22	WEST - BULLARD 13:05	**50**
22	WEST - BULLARD 13:35	**48**
22	WEST - BULLARD 14:05	**56**
22	WEST - BULLARD 14:35	**53**
22	WEST - BULLARD 15:05	**64**
22	WEST - BULLARD 15:35	**54**
22	WEST - BULLARD 16:05	**48**
22	WEST - BULLARD 16:35	**47**
22	WEST - BULLARD 17:03	**36**
22	WEST - BULLARD 17:35	**40**
22	WEST - BULLARD 18:05	**33**
22	WEST - BULLARD 18:35	**14**
22	WEST - BULLARD 19:05	**31**
22	WEST - BULLARD 20:05	**35**
22	WEST - BULLARD 21:15	**9**
26	A SHELTER 05:55	**4**
26	A SHELTER 06:15	**7**
26	L SHELTER 06:10	**32**
26	L SHELTER 06:40	**33**
26	NEES - BLACKSTONE 06:05	**27**
26	NEES - BLACKSTONE 06:35	**55**

26	NEES - BLACKSTONE 07:05	**50**
26	NEES - BLACKSTONE 07:35	**51**
26	NEES - BLACKSTONE 08:05	**42**
26	NEES - BLACKSTONE 08:35	**51**
26	NEES - BLACKSTONE 09:05	**44**
26	NEES - BLACKSTONE 09:35	**51**
26	NEES - BLACKSTONE 10:05	**45**
26	NEES - BLACKSTONE 10:35	**45**
26	NEES - BLACKSTONE 11:05	**61**
26	NEES - BLACKSTONE 11:35	**58**
26	NEES - BLACKSTONE 12:05	**48**
26	NEES - BLACKSTONE 12:35	**63**
26	NEES - BLACKSTONE 13:05	**70**
26	NEES - BLACKSTONE 13:35	**81**
26	NEES - BLACKSTONE 14:05	**76**
26	NEES - BLACKSTONE 14:35	**65**
26	NEES - BLACKSTONE 15:05	**83**
26	NEES - BLACKSTONE 15:35	**50**
26	NEES - BLACKSTONE 16:05	**54**
26	NEES - BLACKSTONE 16:35	**48**
26	NEES - BLACKSTONE 17:05	**42**
26	NEES - BLACKSTONE 17:35	**10**
26	NEES - BLACKSTONE 18:05	**42**
26	NEES - BLACKSTONE 18:35	**5**
26	NEES - BLACKSTONE 19:30	**35**
26	NEES - BLACKSTONE 20:30	**13**
26	NEES - BLACKSTONE 21:30	**4**
26	SHIELDS - BRAWLEY 05:30	**44**
26	SHIELDS - BRAWLEY 05:50	**67**
26	SHIELDS - BRAWLEY 06:20	**78**
26	SHIELDS - BRAWLEY 06:50	**76**
26	SHIELDS - BRAWLEY 07:20	**52**
26	SHIELDS - BRAWLEY 07:50	**48**
26	SHIELDS - BRAWLEY 08:20	**48**
26	SHIELDS - BRAWLEY 08:50	**54**
26	SHIELDS - BRAWLEY 09:20	**52**
26	SHIELDS - BRAWLEY 09:50	**59**
26	SHIELDS - BRAWLEY 10:20	**58**

26	SHIELDS - BRAWLEY 10:50	**58**
26	SHIELDS - BRAWLEY 11:20	**57**
26	SHIELDS - BRAWLEY 11:50	**60**
26	SHIELDS - BRAWLEY 12:20	**51**
26	SHIELDS - BRAWLEY 12:50	**56**
26	SHIELDS - BRAWLEY 13:20	**80**
26	SHIELDS - BRAWLEY 13:50	**61**
26	SHIELDS - BRAWLEY 14:20	**63**
26	SHIELDS - BRAWLEY 14:50	**63**
26	SHIELDS - BRAWLEY 15:20	**57**
26	SHIELDS - BRAWLEY 15:50	**50**
26	SHIELDS - BRAWLEY 16:20	**47**
26	SHIELDS - BRAWLEY 16:50	**39**
26	SHIELDS - BRAWLEY 17:20	**35**
26	SHIELDS - BRAWLEY 17:50	**22**
26	SHIELDS - BRAWLEY 18:20	**32**
26	SHIELDS - BRAWLEY 19:20	**34**
26	SHIELDS - BRAWLEY 20:15	**19**
26	SHIELDS - BRAWLEY 21:20	**6**
28	A SHELTER 05:45	**9**
28	A SHELTER 06:05	**11**
28	A SHELTER 06:25	**12**
28	KINGS CANYON - WINERY 06:25	**32**
28	KINGS CANYON - WINERY 06:45	**39**
28	KINGS CANYON - WINERY 07:05	**45**
28	KINGS CANYON - WINERY 07:30	**46**
28	KINGS CANYON - WINERY 07:50	**48**
28	KINGS CANYON - WINERY 08:10	**42**
28	KINGS CANYON - WINERY 08:30	**58**
28	KINGS CANYON - WINERY 08:50	**48**
28	KINGS CANYON - WINERY 09:18	**63**
28	KINGS CANYON - WINERY 09:45	**67**
28	KINGS CANYON - WINERY 10:05	**51**
28	KINGS CANYON - WINERY 10:30	**66**
28	KINGS CANYON - WINERY 10:50	**60**
28	KINGS CANYON - WINERY 11:10	**55**
28	KINGS CANYON - WINERY 11:30	**65**
28	KINGS CANYON - WINERY 11:50	**55**

28	KINGS CANYON - WINERY 12:10	**54**
28	KINGS CANYON - WINERY 12:30	**59**
28	KINGS CANYON - WINERY 12:50	**55**
28	KINGS CANYON - WINERY 13:10	**56**
28	KINGS CANYON - WINERY 13:30	**54**
28	KINGS CANYON - WINERY 13:50	**53**
28	KINGS CANYON - WINERY 14:10	**66**
28	KINGS CANYON - WINERY 14:30	**85**
28	KINGS CANYON - WINERY 14:50	**63**
28	KINGS CANYON - WINERY 15:10	**59**
28	KINGS CANYON - WINERY 15:30	**58**
28	KINGS CANYON - WINERY 15:50	**58**
28	KINGS CANYON - WINERY 16:10	**60**
28	KINGS CANYON - WINERY 16:30	**45**
28	KINGS CANYON - WINERY 16:50	**51**
28	KINGS CANYON - WINERY 17:10	**40**
28	KINGS CANYON - WINERY 17:30	**38**
28	KINGS CANYON - WINERY 17:50	**23**
28	KINGS CANYON - WINERY 18:10	**24**
28	KINGS CANYON - WINERY 18:40	**35**
28	KINGS CANYON - WINERY 19:21	**36**
28	KINGS CANYON - WINERY 20:25	**43**
28	KINGS CANYON - WINERY 21:15	**4**
28	L SHELTER 05:55	**8**
28	L SHELTER 06:15	**13**
28	NW SHAW - CEDAR 05:45	**27**
28	NW SHAW - CEDAR 06:05	**70**
28	WILLOW - SHAW 06:15	**55**
28	WILLOW - SHAW 06:35	**53**
28	WILLOW - SHAW 06:55	**85**
28	WILLOW - SHAW 07:20	**68**
28	WILLOW - SHAW 07:40	**57**
28	WILLOW - SHAW 08:07	**91**
28	WILLOW - SHAW 08:27	**61**
28	WILLOW - SHAW 08:52	**79**
28	WILLOW - SHAW 09:12	**72**
28	WILLOW - SHAW 09:32	**70**
28	WILLOW - SHAW 09:52	**73**

28	WILLOW - SHAW 10:12	**60**
28	WILLOW - SHAW 10:32	**67**
28	WILLOW - SHAW 10:52	**69**
28	WILLOW - SHAW 11:12	**63**
28	WILLOW - SHAW 11:32	**81**
28	WILLOW - SHAW 11:52	**63**
28	WILLOW - SHAW 12:12	**76**
28	WILLOW - SHAW 12:32	**75**
28	WILLOW - SHAW 12:52	**41**
28	WILLOW - SHAW 13:12	**66**
28	WILLOW - SHAW 13:32	**68**
28	WILLOW - SHAW 13:52	**74**
28	WILLOW - SHAW 14:12	**83**
28	WILLOW - SHAW 14:32	**86**
28	WILLOW - SHAW 14:52	**75**
28	WILLOW - SHAW 15:12	**80**
28	WILLOW - SHAW 15:32	**71**
28	WILLOW - SHAW 15:52	**61**
28	WILLOW - SHAW 16:12	**50**
28	WILLOW - SHAW 16:32	**49**
28	WILLOW - SHAW 16:52	**50**
28	WILLOW - SHAW 17:12	**54**
28	WILLOW - SHAW 17:32	**40**
28	WILLOW - SHAW 17:52	**37**
28	WILLOW - SHAW 18:12	**22**
28	WILLOW - SHAW 18:32	**20**
28	WILLOW - SHAW 18:52	**54**
28	WILLOW - SHAW 19:55	**48**
28	WILLOW - SHAW 20:40	**31**
30	BLACKSTONE - SHAW 07:09	**37**
30	L SHELTER 05:45	**15**
30	NW EL DORADO - E ST 05:42	**2**
30	NW EL DORADO - E ST 06:12	**4**
30	NW EL DORADO - E ST 06:32	**3**
30	SE CRYSTAL - KEARNEY 05:54	**27**
30	SE CRYSTAL - KEARNEY 06:24	**48**
30	SE CRYSTAL - KEARNEY 06:44	**42**
30	SE CRYSTAL - KEARNEY 07:04	**45**

30	SE CRYSTAL - KEARNEY 07:24	**49**
30	SE CRYSTAL - KEARNEY 07:44	**47**
30	SE CRYSTAL - KEARNEY 08:04	**48**
30	SE CRYSTAL - KEARNEY 08:24	**45**
30	SE CRYSTAL - KEARNEY 08:44	**53**
30	SE CRYSTAL - KEARNEY 09:04	**48**
30	SE CRYSTAL - KEARNEY 09:24	**67**
30	SE CRYSTAL - KEARNEY 09:44	**59**
30	SE CRYSTAL - KEARNEY 10:04	**55**
30	SE CRYSTAL - KEARNEY 10:24	**63**
30	SE CRYSTAL - KEARNEY 10:44	**59**
30	SE CRYSTAL - KEARNEY 11:04	**47**
30	SE CRYSTAL - KEARNEY 11:24	**68**
30	SE CRYSTAL - KEARNEY 11:44	**45**
30	SE CRYSTAL - KEARNEY 12:04	**53**
30	SE CRYSTAL - KEARNEY 12:24	**66**
30	SE CRYSTAL - KEARNEY 12:44	**46**
30	SE CRYSTAL - KEARNEY 13:04	**53**
30	SE CRYSTAL - KEARNEY 13:24	**63**
30	SE CRYSTAL - KEARNEY 13:44	**49**
30	SE CRYSTAL - KEARNEY 14:04	**49**
30	SE CRYSTAL - KEARNEY 14:24	**61**
30	SE CRYSTAL - KEARNEY 14:44	**67**
30	SE CRYSTAL - KEARNEY 15:04	**59**
30	SE CRYSTAL - KEARNEY 15:24	**60**
30	SE CRYSTAL - KEARNEY 15:44	**53**
30	SE CRYSTAL - KEARNEY 16:04	**46**
30	SE CRYSTAL - KEARNEY 16:24	**41**
30	SE CRYSTAL - KEARNEY 16:44	**42**
30	SE CRYSTAL - KEARNEY 17:04	**28**
30	SE CRYSTAL - KEARNEY 17:24	**32**
30	SE CRYSTAL - KEARNEY 17:44	**21**
30	SE CRYSTAL - KEARNEY 18:04	**21**
30	SE CRYSTAL - KEARNEY 18:24	**3**
30	SE CRYSTAL - KEARNEY 18:54	**35**
30	SE CRYSTAL - KEARNEY 19:54	**41**
30	SE CRYSTAL - KEARNEY 21:10	**0**
30	SW BLACKSTONE - NEES 05:52	**27**

30	SW BLACKSTONE - NEES 06:14	**22**
30	SW BLACKSTONE - NEES 06:34	**29**
30	SW BLACKSTONE - NEES 07:10	**44**
30	SW BLACKSTONE - NEES 07:32	**61**
30	SW BLACKSTONE - NEES 07:52	**40**
30	SW BLACKSTONE - NEES 08:12	**52**
30	SW BLACKSTONE - NEES 08:32	**46**
30	SW BLACKSTONE - NEES 08:52	**35**
30	SW BLACKSTONE - NEES 09:12	**48**
30	SW BLACKSTONE - NEES 09:32	**54**
30	SW BLACKSTONE - NEES 09:52	**45**
30	SW BLACKSTONE - NEES 10:12	**58**
30	SW BLACKSTONE - NEES 10:32	**44**
30	SW BLACKSTONE - NEES 10:52	**58**
30	SW BLACKSTONE - NEES 11:12	**54**
30	SW BLACKSTONE - NEES 11:32	**49**
30	SW BLACKSTONE - NEES 11:52	**69**
30	SW BLACKSTONE - NEES 12:12	**64**
30	SW BLACKSTONE - NEES 12:32	**52**
30	SW BLACKSTONE - NEES 12:52	**59**
30	SW BLACKSTONE - NEES 13:12	**42**
30	SW BLACKSTONE - NEES 13:32	**63**
30	SW BLACKSTONE - NEES 13:52	**48**
30	SW BLACKSTONE - NEES 14:12	**55**
30	SW BLACKSTONE - NEES 14:32	**70**
30	SW BLACKSTONE - NEES 14:52	**61**
30	SW BLACKSTONE - NEES 15:12	**54**
30	SW BLACKSTONE - NEES 15:32	**57**
30	SW BLACKSTONE - NEES 15:52	**53**
30	SW BLACKSTONE - NEES 16:12	**68**
30	SW BLACKSTONE - NEES 16:32	**49**
30	SW BLACKSTONE - NEES 16:52	**42**
30	SW BLACKSTONE - NEES 17:12	**39**
30	SW BLACKSTONE - NEES 17:44	**53**
30	SW BLACKSTONE - NEES 18:14	**45**
30	SW BLACKSTONE - NEES 18:44	**45**
30	SW BLACKSTONE - NEES 19:14	**37**
30	SW BLACKSTONE - NEES 20:08	**46**

30	SW BLACKSTONE - NEES 21:08	**21**
32	B SHELTER 06:05	**2**
32	B SHELTER 06:35	**5**
32	EL PASO EB 06:10	**31**
32	EL PASO EB 06:40	**36**
32	EL PASO EB 07:10	**43**
32	EL PASO EB 07:40	**40**
32	EL PASO EB 08:10	**40**
32	EL PASO EB 08:40	**45**
32	EL PASO EB 09:00	**38**
32	EL PASO EB 09:25	**53**
32	EL PASO EB 09:50	**58**
32	EL PASO EB 10:28	**66**
32	EL PASO EB 10:58	**62**
32	EL PASO EB 11:28	**60**
32	EL PASO EB 11:58	**57**
32	EL PASO EB 12:28	**62**
32	EL PASO EB 12:58	**63**
32	EL PASO EB 13:28	**59**
32	EL PASO EB 13:58	**70**
32	EL PASO EB 14:28	**77**
32	EL PASO EB 14:58	**64**
32	EL PASO EB 15:28	**63**
32	EL PASO EB 15:58	**52**
32	EL PASO EB 16:28	**48**
32	EL PASO EB 16:58	**40**
32	EL PASO EB 17:28	**37**
32	EL PASO EB 17:58	**19**
32	EL PASO EB 18:25	**35**
32	EL PASO EB 19:30	**32**
32	EL PASO EB 20:05	**22**
32	EL PASO EB 21:06	**12**
32	L SHELTER 05:54	**9**
32	NORTH - ELM 05:51	**22**
32	NORTH - ELM 06:21	**37**
32	NORTH - ELM 06:51	**50**
32	NORTH - ELM 07:21	**54**
32	NORTH - ELM 07:51	**61**

32	NORTH - ELM 08:21	**49**
32	NORTH - ELM 08:51	**61**
32	NORTH - ELM 09:24	**66**
32	NORTH - ELM 09:54	**59**
32	NORTH - ELM 10:24	**63**
32	NORTH - ELM 10:54	**55**
32	NORTH - ELM 11:24	**58**
32	NORTH - ELM 11:54	**60**
32	NORTH - ELM 12:24	**58**
32	NORTH - ELM 12:54	**60**
32	NORTH - ELM 13:24	**59**
32	NORTH - ELM 13:54	**56**
32	NORTH - ELM 14:24	**66**
32	NORTH - ELM 14:54	**60**
32	NORTH - ELM 15:24	**54**
32	NORTH - ELM 15:54	**54**
32	NORTH - ELM 16:24	**46**
32	NORTH - ELM 16:54	**40**
32	NORTH - ELM 17:24	**26**
32	NORTH - ELM 17:54	**25**
32	NORTH - ELM 18:21	**24**
32	NORTH - ELM 18:51	**25**
32	NORTH - ELM 19:51	**28**
32	NORTH - ELM 20:41	**17**
33	BELMONT - DELNO 06:00	**10**
33	BELMONT - DELNO 06:30	**42**
33	BELMONT - DELNO 07:00	**42**
33	BELMONT - DELNO 07:30	**35**
33	BELMONT - DELNO 08:00	**37**
33	BELMONT - DELNO 08:30	**31**
33	BELMONT - DELNO 09:00	**34**
33	BELMONT - DELNO 09:30	**29**
33	BELMONT - DELNO 10:00	**33**
33	BELMONT - DELNO 10:30	**33**
33	BELMONT - DELNO 11:00	**34**
33	BELMONT - DELNO 11:30	**15**
33	BELMONT - DELNO 12:00	**29**
33	BELMONT - DELNO 12:30	**40**

33	BELMONT - DELNO 13:00	**42**
33	BELMONT - DELNO 13:30	**48**
33	BELMONT - DELNO 14:00	**43**
33	BELMONT - DELNO 14:30	**42**
33	BELMONT - DELNO 15:00	**44**
33	BELMONT - DELNO 15:30	**49**
33	BELMONT - DELNO 16:00	**39**
33	BELMONT - DELNO 16:30	**33**
33	BELMONT - DELNO 17:00	**44**
33	BELMONT - DELNO 17:30	**26**
33	BELMONT - DELNO 18:00	**26**
33	BELMONT - DELNO 18:30	**22**
33	BELMONT - DELNO 19:00	**16**
33	MAPLE - BUTLER 06:00	**12**
33	MAPLE - BUTLER 06:30	**24**
33	MAPLE - BUTLER 07:00	**52**
33	MAPLE - BUTLER 07:30	**58**
33	MAPLE - BUTLER 08:00	**40**
33	MAPLE - BUTLER 08:30	**40**
33	MAPLE - BUTLER 09:00	**20**
33	MAPLE - BUTLER 09:30	**36**
33	MAPLE - BUTLER 10:00	**31**
33	MAPLE - BUTLER 10:30	**36**
33	MAPLE - BUTLER 11:00	**36**
33	MAPLE - BUTLER 11:30	**33**
33	MAPLE - BUTLER 12:00	**28**
33	MAPLE - BUTLER 12:30	**32**
33	MAPLE - BUTLER 13:00	**34**
33	MAPLE - BUTLER 13:30	**27**
33	MAPLE - BUTLER 14:00	**35**
33	MAPLE - BUTLER 14:30	**34**
33	MAPLE - BUTLER 15:00	**52**
33	MAPLE - BUTLER 15:30	**33**
33	MAPLE - BUTLER 16:00	**44**
33	MAPLE - BUTLER 16:30	**38**
33	MAPLE - BUTLER 17:00	**25**
33	MAPLE - BUTLER 17:30	**27**
33	MAPLE - BUTLER 18:00	**14**

33	MAPLE - BUTLER 18:30	**19**
33	MAPLE - BUTLER 19:30	**22**
34	B SHELTER 06:00	**2**
34	B SHELTER 06:20	**3**
34	B SHELTER 06:40	**7**
34	FIRST - NEES 06:07	**32**
34	FIRST - NEES 06:27	**34**
34	FIRST - NEES 06:47	**37**
34	FIRST - NEES 07:05	**41**
34	FIRST - NEES 07:27	**44**
34	FIRST - NEES 07:47	**25**
34	FIRST - NEES 08:07	**32**
34	FIRST - NEES 08:27	**44**
34	FIRST - NEES 08:47	**32**
34	FIRST - NEES 09:07	**45**
34	FIRST - NEES 09:27	**42**
34	FIRST - NEES 09:47	**43**
34	FIRST - NEES 10:07	**50**
34	FIRST - NEES 10:27	**37**
34	FIRST - NEES 10:47	**43**
34	FIRST - NEES 11:07	**53**
34	FIRST - NEES 11:27	**42**
34	FIRST - NEES 11:47	**52**
34	FIRST - NEES 12:07	**50**
34	FIRST - NEES 12:27	**40**
34	FIRST - NEES 12:47	**48**
34	FIRST - NEES 13:07	**42**
34	FIRST - NEES 13:27	**44**
34	FIRST - NEES 13:47	**60**
34	FIRST - NEES 14:07	**45**
34	FIRST - NEES 14:27	**74**
34	FIRST - NEES 14:47	**89**
34	FIRST - NEES 15:07	**76**
34	FIRST - NEES 15:27	**58**
34	FIRST - NEES 15:47	**48**
34	FIRST - NEES 16:07	**49**
34	FIRST - NEES 16:27	**56**
34	FIRST - NEES 16:47	**38**

34	FIRST - NEES 17:07	**52**
34	FIRST - NEES 17:27	**40**
34	FIRST - NEES 18:07	**55**
34	FIRST - NEES 18:40	**36**
34	FIRST - NEES 19:20	**34**
34	FIRST - NEES 20:00	**36**
34	FIRST - NEES 21:05	**19**
34	JENSEN - CHERRY 06:20	**47**
34	JENSEN - CHERRY 06:40	**71**
34	JENSEN - CHERRY 07:00	**75**
34	JENSEN - CHERRY 07:20	**40**
34	JENSEN - CHERRY 07:40	**48**
34	JENSEN - CHERRY 08:00	**43**
34	JENSEN - CHERRY 08:20	**40**
34	JENSEN - CHERRY 08:40	**45**
34	JENSEN - CHERRY 09:00	**38**
34	JENSEN - CHERRY 09:20	**43**
34	JENSEN - CHERRY 09:40	**61**
34	JENSEN - CHERRY 10:00	**45**
34	JENSEN - CHERRY 10:20	**60**
34	JENSEN - CHERRY 10:40	**52**
34	JENSEN - CHERRY 11:00	**33**
34	JENSEN - CHERRY 11:20	**57**
34	JENSEN - CHERRY 11:40	**37**
34	JENSEN - CHERRY 12:00	**42**
34	JENSEN - CHERRY 12:20	**63**
34	JENSEN - CHERRY 12:40	**36**
34	JENSEN - CHERRY 13:00	**53**
34	JENSEN - CHERRY 13:20	**50**
34	JENSEN - CHERRY 13:40	**40**
34	JENSEN - CHERRY 14:00	**54**
34	JENSEN - CHERRY 14:20	**41**
34	JENSEN - CHERRY 14:40	**51**
34	JENSEN - CHERRY 15:00	**55**
34	JENSEN - CHERRY 15:20	**42**
34	JENSEN - CHERRY 15:40	**53**
34	JENSEN - CHERRY 16:00	**46**
34	JENSEN - CHERRY 16:20	**45**

34	JENSEN - CHERRY 16:40	**42**
34	JENSEN - CHERRY 17:00	**36**
34	JENSEN - CHERRY 17:20	**32**
34	JENSEN - CHERRY 17:40	**34**
34	JENSEN - CHERRY 18:00	**22**
34	JENSEN - CHERRY 18:20	**5**
34	JENSEN - CHERRY 18:40	**38**
34	JENSEN - CHERRY 19:45	**35**
34	JENSEN - CHERRY 20:40	**20**
34	JENSEN - CHERRY 21:05	**1**
34	L SHELTER 05:50	**15**
34	L SHELTER 06:20	**26**
35	BELMONT - CLOVIS 06:00	**42**
35	BELMONT - CLOVIS 06:30	**40**
35	BELMONT - CLOVIS 07:00	**55**
35	BELMONT - CLOVIS 07:30	**52**
35	BELMONT - CLOVIS 08:00	**42**
35	BELMONT - CLOVIS 08:30	**32**
35	BELMONT - CLOVIS 09:00	**46**
35	BELMONT - CLOVIS 09:30	**36**
35	BELMONT - CLOVIS 10:00	**35**
35	BELMONT - CLOVIS 10:30	**49**
35	BELMONT - CLOVIS 11:00	**49**
35	BELMONT - CLOVIS 11:30	**37**
35	BELMONT - CLOVIS 12:00	**62**
35	BELMONT - CLOVIS 12:30	**43**
35	BELMONT - CLOVIS 13:00	**44**
35	BELMONT - CLOVIS 13:30	**61**
35	BELMONT - CLOVIS 14:00	**47**
35	BELMONT - CLOVIS 14:30	**54**
35	BELMONT - CLOVIS 15:00	**91**
35	BELMONT - CLOVIS 15:30	**51**
35	BELMONT - CLOVIS 16:00	**44**
35	BELMONT - CLOVIS 16:30	**58**
35	BELMONT - CLOVIS 17:00	**45**
35	BELMONT - CLOVIS 17:30	**33**
35	BELMONT - CLOVIS 18:00	**41**
35	BELMONT - CLOVIS 18:30	**27**

35	BELMONT - CLOVIS 19:00	**29**
35	BELMONT - CLOVIS 20:00	**25**
35	BELMONT - CLOVIS 20:45	**18**
35	BELMONT - CLOVIS 21:25	**16**
35	NE MARKS - OLIVE 05:45	**15**
35	NE MARKS - OLIVE 06:15	**29**
35	NE MARKS - OLIVE 06:45	**48**
35	NE MARKS - OLIVE 07:15	**56**
35	NE MARKS - OLIVE 07:45	**37**
35	NE MARKS - OLIVE 08:15	**46**
35	NE MARKS - OLIVE 08:45	**33**
35	NE MARKS - OLIVE 09:15	**33**
35	NE MARKS - OLIVE 09:45	**51**
35	NE MARKS - OLIVE 10:15	**35**
35	NE MARKS - OLIVE 10:45	**44**
35	NE MARKS - OLIVE 11:15	**58**
35	NE MARKS - OLIVE 11:45	**45**
35	NE MARKS - OLIVE 12:15	**38**
35	NE MARKS - OLIVE 12:45	**56**
35	NE MARKS - OLIVE 13:15	**44**
35	NE MARKS - OLIVE 13:45	**46**
35	NE MARKS - OLIVE 14:15	**74**
35	NE MARKS - OLIVE 14:45	**54**
35	NE MARKS - OLIVE 15:15	**56**
35	NE MARKS - OLIVE 15:45	**65**
35	NE MARKS - OLIVE 16:15	**44**
35	NE MARKS - OLIVE 16:45	**40**
35	NE MARKS - OLIVE 17:15	**50**
35	NE MARKS - OLIVE 17:45	**24**
35	NE MARKS - OLIVE 18:15	**29**
35	NE MARKS - OLIVE 19:15	**31**
35	NE MARKS - OLIVE 19:55	**23**
35	NE MARKS - OLIVE 20:45	**20**
35	NE MARKS - OLIVE 21:17	**11**
38	B SHELTER 05:45	**41**
38	B SHELTER 06:15	**61**
38	B SHELTER 06:35	**102**
38	B SHELTER 06:55	**82**

38	B SHELTER 07:15	**46**
38	B SHELTER 07:35	**45**
38	B SHELTER 07:55	**48**
38	B SHELTER 08:15	**46**
38	B SHELTER 08:35	**42**
38	B SHELTER 08:55	**34**
38	B SHELTER 09:15	**36**
38	B SHELTER 09:35	**53**
38	B SHELTER 09:55	**38**
38	B SHELTER 10:15	**47**
38	B SHELTER 10:30	**29**
38	B SHELTER 10:55	**49**
38	B SHELTER 11:15	**40**
38	B SHELTER 11:35	**41**
38	B SHELTER 11:55	**45**
38	B SHELTER 12:15	**41**
38	B SHELTER 12:35	**59**
38	B SHELTER 12:55	**43**
38	B SHELTER 13:15	**43**
38	B SHELTER 13:35	**44**
38	B SHELTER 13:55	**53**
38	B SHELTER 14:15	**61**
38	B SHELTER 14:35	**54**
38	B SHELTER 14:55	**48**
38	B SHELTER 15:15	**59**
38	B SHELTER 15:35	**66**
38	B SHELTER 15:55	**46**
38	B SHELTER 16:15	**43**
38	B SHELTER 16:35	**39**
38	B SHELTER 16:55	**39**
38	B SHELTER 17:15	**36**
38	B SHELTER 17:35	**25**
38	B SHELTER 17:55	**29**
38	B SHELTER 18:15	**26**
38	B SHELTER 19:15	**47**
38	B SHELTER 20:15	**40**
38	B SHELTER 20:45	**15**
38	BLACKSTONE - EL PASO 05:46	**32**

38	BLACKSTONE - EL PASO 06:06	**28**
38	BLACKSTONE - EL PASO 06:26	**46**
38	BLACKSTONE - EL PASO 06:46	**45**
38	BLACKSTONE - EL PASO 07:06	**53**
38	BLACKSTONE - EL PASO 07:26	**34**
38	BLACKSTONE - EL PASO 07:46	**39**
38	BLACKSTONE - EL PASO 08:06	**49**
38	BLACKSTONE - EL PASO 08:26	**30**
38	BLACKSTONE - EL PASO 08:46	**30**
38	BLACKSTONE - EL PASO 09:06	**35**
38	BLACKSTONE - EL PASO 09:26	**30**
38	BLACKSTONE - EL PASO 09:46	**35**
38	BLACKSTONE - EL PASO 10:06	**30**
38	BLACKSTONE - EL PASO 10:26	**31**
38	BLACKSTONE - EL PASO 10:46	**36**
38	BLACKSTONE - EL PASO 11:06	**49**
38	BLACKSTONE - EL PASO 11:26	**38**
38	BLACKSTONE - EL PASO 11:46	**38**
38	BLACKSTONE - EL PASO 12:06	**45**
38	BLACKSTONE - EL PASO 12:26	**41**
38	BLACKSTONE - EL PASO 12:46	**38**
38	BLACKSTONE - EL PASO 13:06	**35**
38	BLACKSTONE - EL PASO 13:26	**47**
38	BLACKSTONE - EL PASO 13:46	**63**
38	BLACKSTONE - EL PASO 14:06	**70**
38	BLACKSTONE - EL PASO 14:26	**83**
38	BLACKSTONE - EL PASO 14:46	**75**
38	BLACKSTONE - EL PASO 15:06	**69**
38	BLACKSTONE - EL PASO 15:26	**64**
38	BLACKSTONE - EL PASO 15:46	**46**
38	BLACKSTONE - EL PASO 16:06	**44**
38	BLACKSTONE - EL PASO 16:26	**38**
38	BLACKSTONE - EL PASO 16:46	**41**
38	BLACKSTONE - EL PASO 17:06	**57**
38	BLACKSTONE - EL PASO 17:26	**30**
38	BLACKSTONE - EL PASO 17:46	**33**
38	BLACKSTONE - EL PASO 18:06	**21**
38	BLACKSTONE - EL PASO 18:46	**47**

38	BLACKSTONE - EL PASO 19:36	**32**
38	BLACKSTONE - EL PASO 20:38	**38**
41	GRAND - HARDING 05:55	**34**
41	GRAND - HARDING 06:25	**53**
41	GRAND - HARDING 06:50	**71**
41	GRAND - HARDING 07:20	**52**
41	GRAND - HARDING 07:55	**55**
41	GRAND - HARDING 08:35	**72**
41	GRAND - HARDING 09:05	**46**
41	GRAND - HARDING 09:35	**48**
41	GRAND - HARDING 10:05	**49**
41	GRAND - HARDING 10:35	**66**
41	GRAND - HARDING 11:05	**52**
41	GRAND - HARDING 11:35	**64**
41	GRAND - HARDING 12:05	**57**
41	GRAND - HARDING 12:35	**60**
41	GRAND - HARDING 13:05	**58**
41	GRAND - HARDING 13:35	**68**
41	GRAND - HARDING 14:05	**80**
41	GRAND - HARDING 14:35	**106**
41	GRAND - HARDING 15:05	**75**
41	GRAND - HARDING 15:35	**66**
41	GRAND - HARDING 16:05	**61**
41	GRAND - HARDING 16:35	**59**
41	GRAND - HARDING 17:05	**48**
41	GRAND - HARDING 17:35	**38**
41	GRAND - HARDING 18:30	**52**
41	GRAND - HARDING 19:05	**27**
41	GRAND - HARDING 19:54	**32**
41	GRAND - HARDING 20:49	**11**
41	MARKS - SHAW 05:40	**20**
41	MARKS - SHAW 06:10	**51**
41	MARKS - SHAW 06:40	**66**
41	MARKS - SHAW 07:05	**80**
41	MARKS - SHAW 07:35	**48**
41	MARKS - SHAW 08:05	**37**
41	MARKS - SHAW 08:35	**41**
41	MARKS - SHAW 09:05	**47**

41	MARKS - SHAW 09:35	**42**
41	MARKS - SHAW 10:05	**52**
41	MARKS - SHAW 10:35	**47**
41	MARKS - SHAW 11:05	**42**
41	MARKS - SHAW 11:35	**52**
41	MARKS - SHAW 12:05	**61**
41	MARKS - SHAW 12:35	**56**
41	MARKS - SHAW 13:05	**55**
41	MARKS - SHAW 13:35	**59**
41	MARKS - SHAW 14:05	**69**
41	MARKS - SHAW 14:35	**69**
41	MARKS - SHAW 15:05	**77**
41	MARKS - SHAW 15:35	**63**
41	MARKS - SHAW 16:05	**52**
41	MARKS - SHAW 16:35	**53**
41	MARKS - SHAW 17:05	**39**
41	MARKS - SHAW 17:35	**37**
41	MARKS - SHAW 18:10	**11**
41	MARKS - SHAW 18:40	**39**
41	MARKS - SHAW 19:40	**37**
41	MARKS - SHAW 20:15	**25**
41	MARKS - SHAW 21:15	**4**
41	SHIELDS - WEST 06:00	**2**
41	SHIELDS - WEST 06:30	**3**
45	HERNDON - MILBURN 06:40	**51**
45	HERNDON - MILBURN 07:40	**31**
45	HERNDON - MILBURN 08:40	**37**
45	HERNDON - MILBURN 09:40	**31**
45	HERNDON - MILBURN 10:40	**27**
45	HERNDON - MILBURN 11:40	**37**
45	HERNDON - MILBURN 12:40	**35**
45	HERNDON - MILBURN 13:40	**33**
45	HERNDON - MILBURN 14:40	**81**
45	HERNDON - MILBURN 15:40	**42**
45	HERNDON - MILBURN 16:40	**29**
45	HERNDON - MILBURN 17:40	**24**
45	HERNDON - MILBURN 18:40	**20**
45	HERNDON - MILBURN 19:40	**16**

45	MANCHESTER TRANSIT CENTER EB 06:35	**5**
45	SHIELDS - STANFORD 06:03	**33**
45	SHIELDS - STANFORD 07:01	**40**
45	SHIELDS - STANFORD 08:05	**24**
45	SHIELDS - STANFORD 09:05	**26**
45	SHIELDS - STANFORD 10:05	**27**
45	SHIELDS - STANFORD 11:05	**26**
45	SHIELDS - STANFORD 12:05	**32**
45	SHIELDS - STANFORD 13:05	**33**
45	SHIELDS - STANFORD 14:05	**30**
45	SHIELDS - STANFORD 15:05	**39**
45	SHIELDS - STANFORD 16:05	**47**
45	SHIELDS - STANFORD 17:05	**25**
45	SHIELDS - STANFORD 18:05	**21**
45	SHIELDS - STANFORD 19:05	**15**
58	CHAMPLAIN - PERRIN 07:02	**13**
58	CHAMPLAIN - PERRIN 08:02	**22**
58	CHAMPLAIN - PERRIN 09:02	**15**
58	CHAMPLAIN - PERRIN 10:02	**13**
58	CHAMPLAIN - PERRIN 11:02	**23**
58	CHAMPLAIN - PERRIN 12:02	**14**
58	CHAMPLAIN - PERRIN 13:02	**19**
58	CHAMPLAIN - PERRIN 14:02	**42**
58	CHAMPLAIN - PERRIN 15:27	**17**
58	CHAMPLAIN - PERRIN 16:27	**9**
58	CHAMPLAIN - PERRIN 17:27	**13**
58	CHAMPLAIN - PERRIN 18:27	**3**
58	EL PASO WB 06:20	**0**
58	MAULPIN - PECK 06:32	**14**
58	MAULPIN - PECK 07:32	**23**
58	MAULPIN - PECK 08:32	**9**
58	MAULPIN - PECK 09:32	**6**
58	MAULPIN - PECK 10:32	**19**
58	MAULPIN - PECK 11:32	**13**
58	MAULPIN - PECK 12:32	**16**
58	MAULPIN - PECK 13:32	**11**
58	MAULPIN - PECK 14:57	**17**
58	MAULPIN - PECK 15:57	**11**

58	MAULPIN - PECK 16:57	**15**
58	MAULPIN - PECK 17:57	**7**
Average		**44**

Conclusion

This report provides an understanding of the efficiency achieved by current transit routes in the cities of Fresno and Clovis. Efficiency, in this analysis, is measured in terms of the percentage of time that a bus route spends serving passengers compared to time spent traveling to and from a maintenance/storage facility, layovers, or deadheading (the revenue/vehicle hour ratio). The other measure of efficiency employed in this analysis, the maximum load factor, compares maximum load factors for individual runs by route. By comparing routes through two measures of efficiency, this analysis provides a more detailed view of efficiency for each route in the system. FCOG could use this analysis to identify specific areas in its system where it could add or reduce resources and also to maximize the productive use and deployment of individual routes. This could be justified based on the performance of each route in the system against the measures of efficiency used in this analysis. These indicators will be helpful in developing the network alternatives in Task 2.

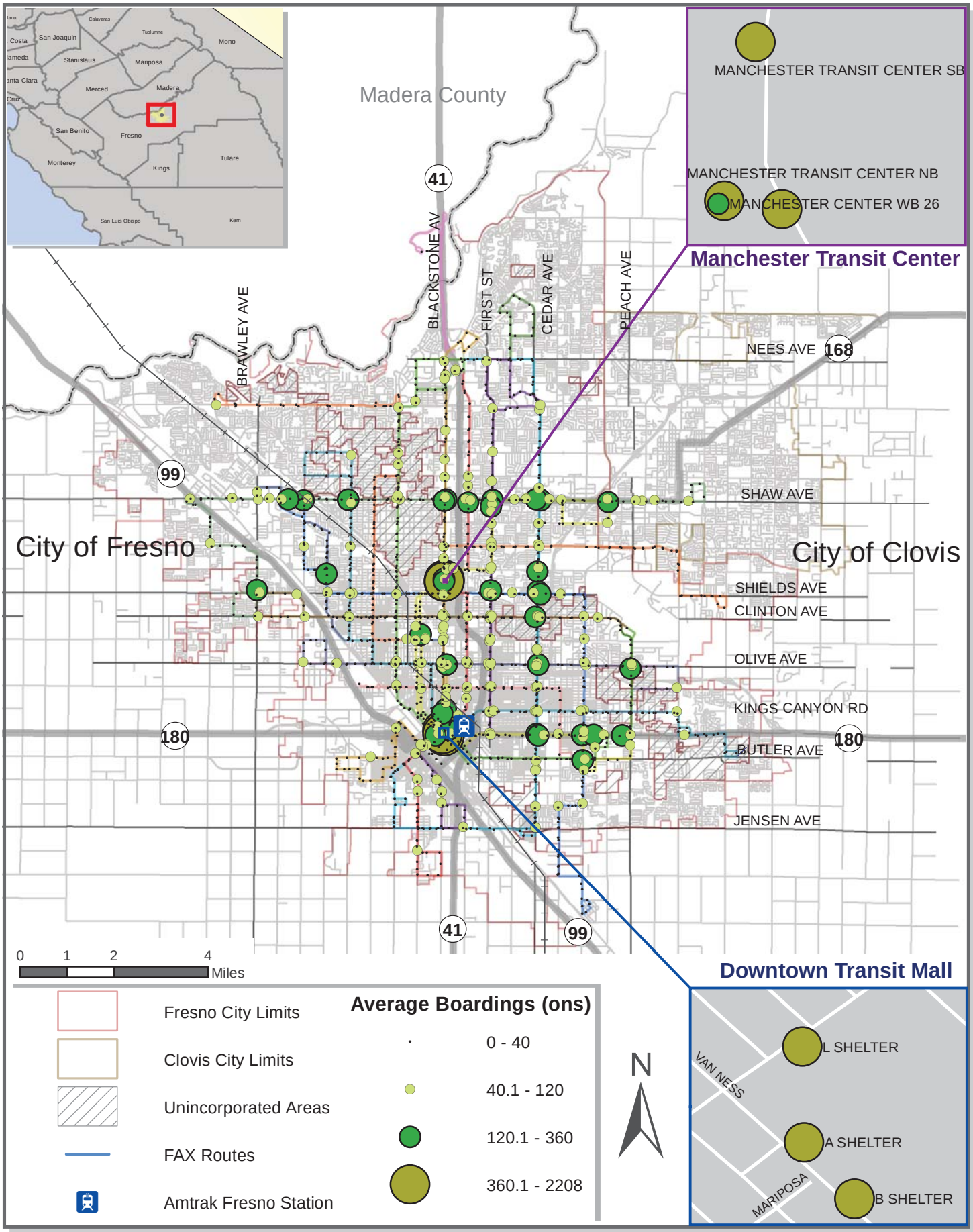
Appendix - Percent of Bus Stops Not Served Within Individual Routes

Table A-1 Percent of Stops Not Served

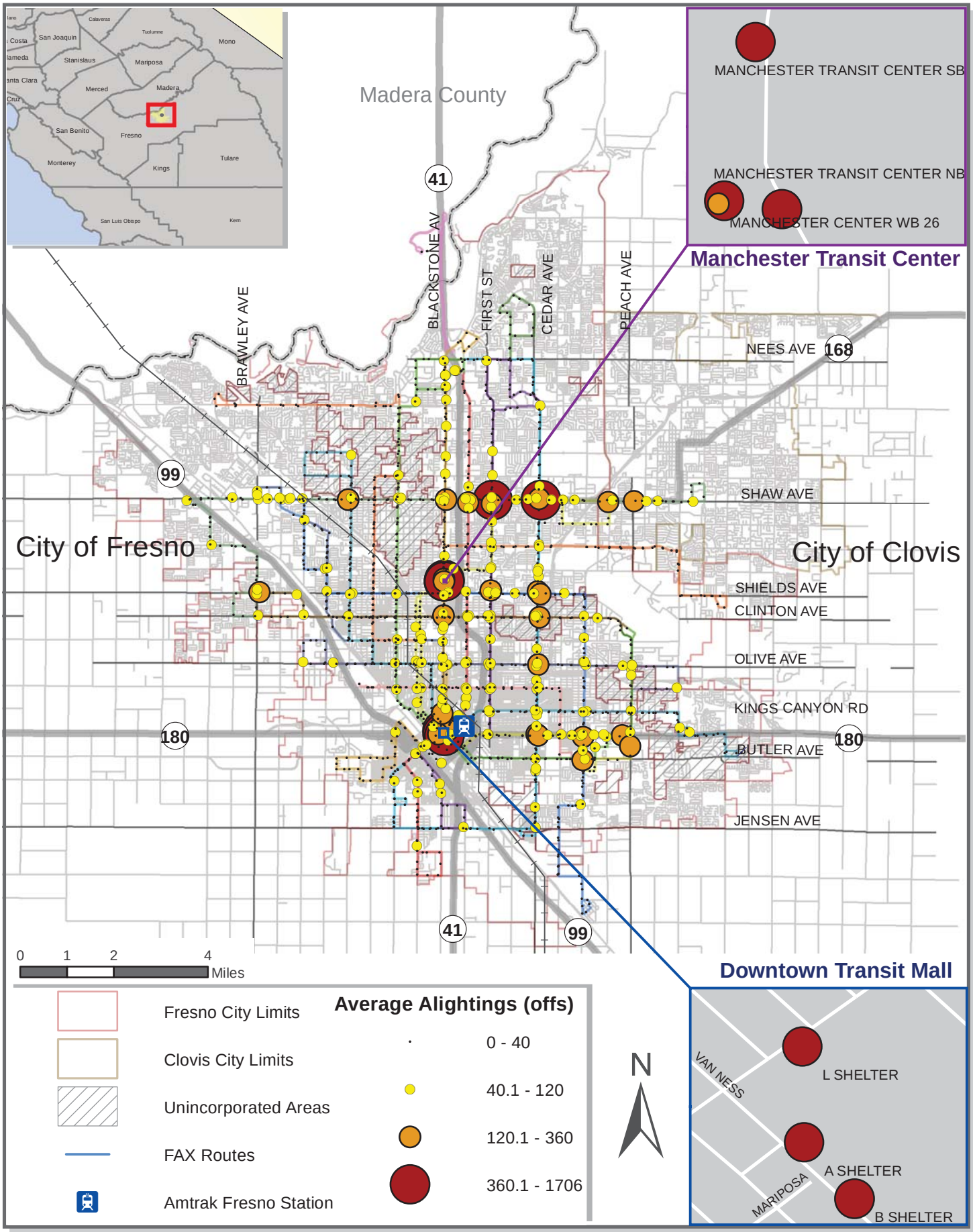
Route	North	South
9	24.7%	23.1%
20	20.3%	23.8%
22	31.8%	14.9%
26	33.9%	34.0%
28	34.9%	27.7%
30	27.6%	19.9%
32	23.6%	16.8%
33	49.9%	48.6%
34	24.3%	23.1%
35	30.3%	39.3%
38	28.2%	29.3%
41	26.7%	29.5%
45	34.1%	48.8%
58	45.4%	64.1%

Table A-1 shows the percentage of stops not served by route and direction, based on weekday averages for stops serviced over the course of a month. Routes shaded in orange and red have many stops that are scheduled but not serviced.

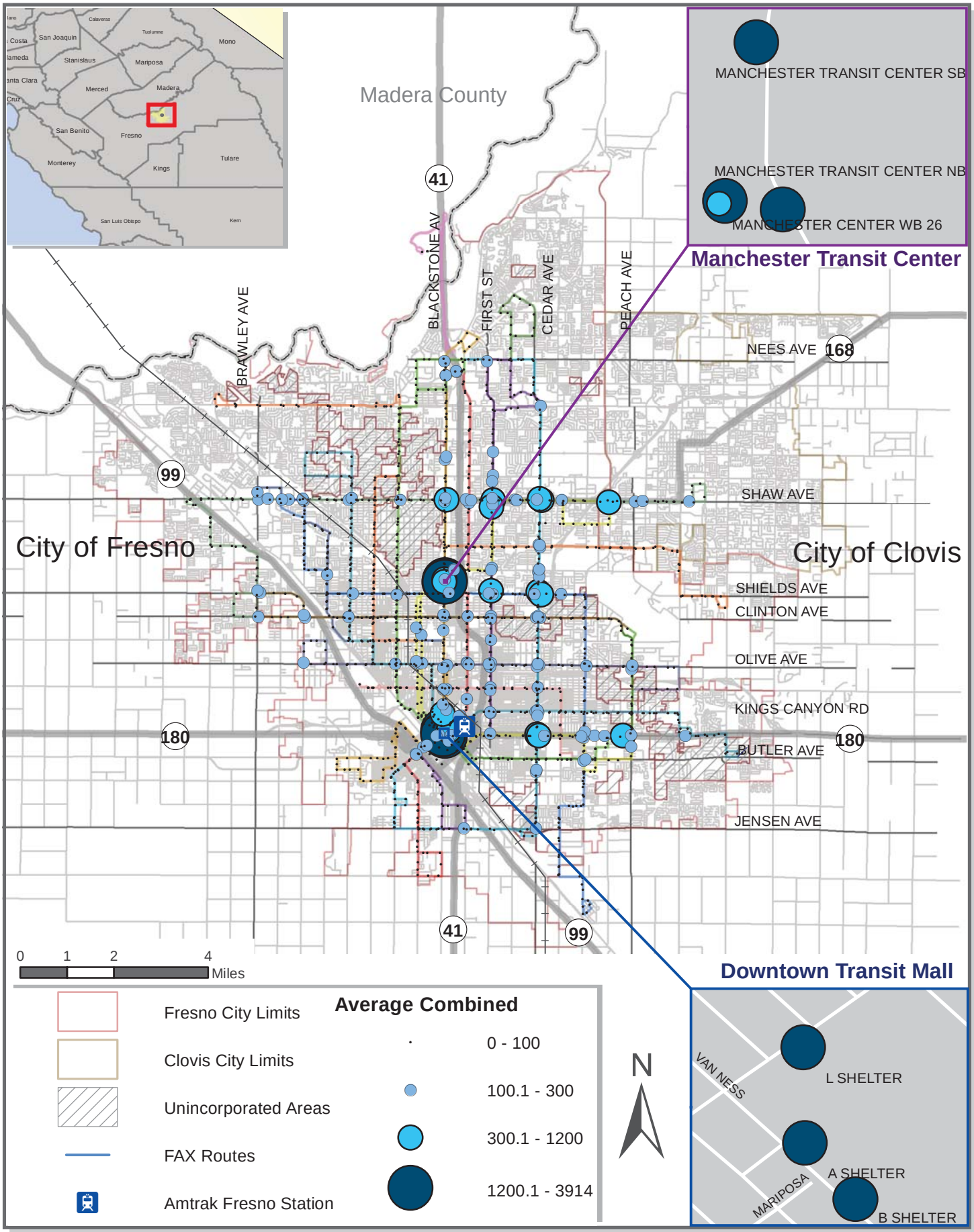
Average Weekday Boardings (ons)



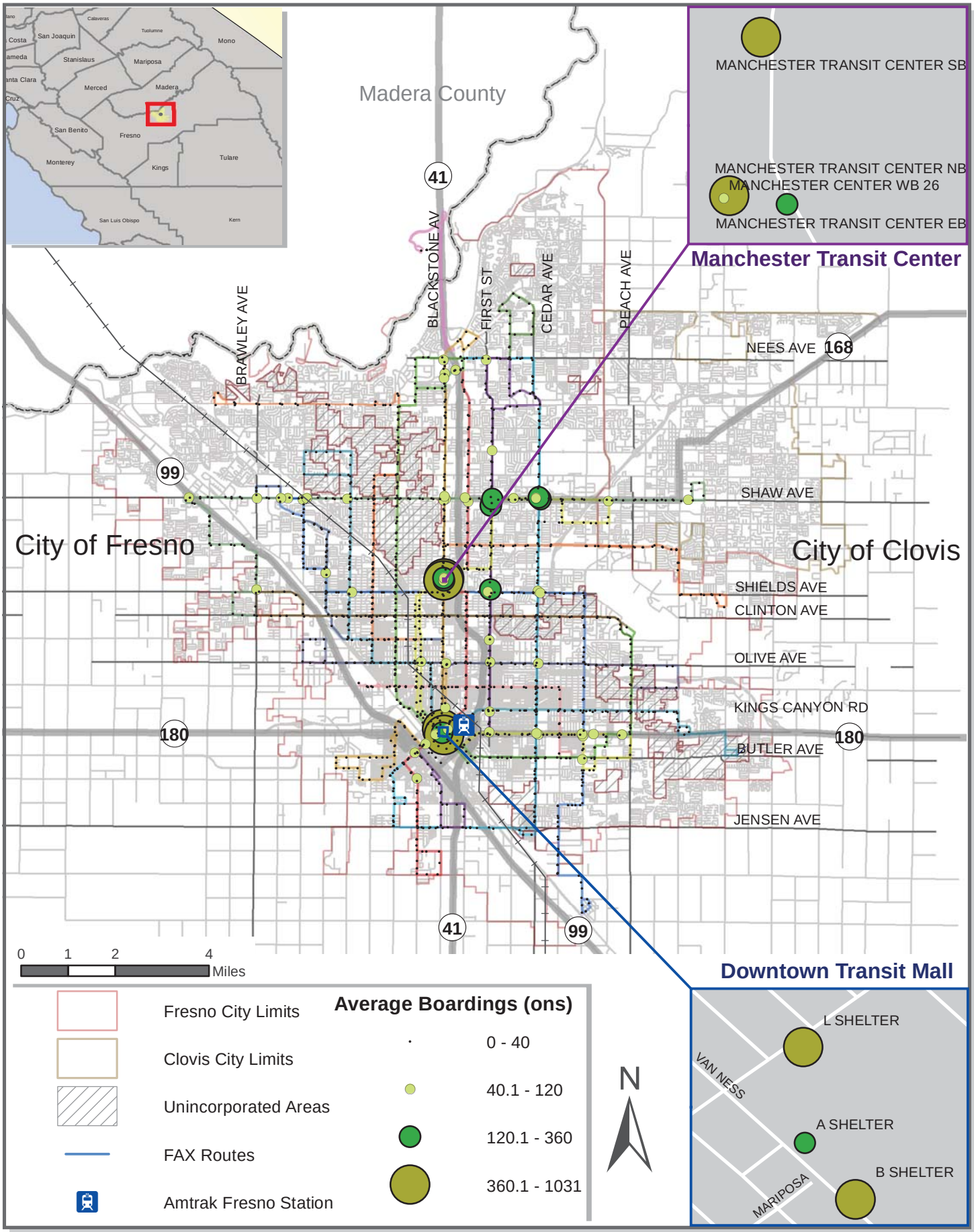
Average Weekday Alightings (offs)



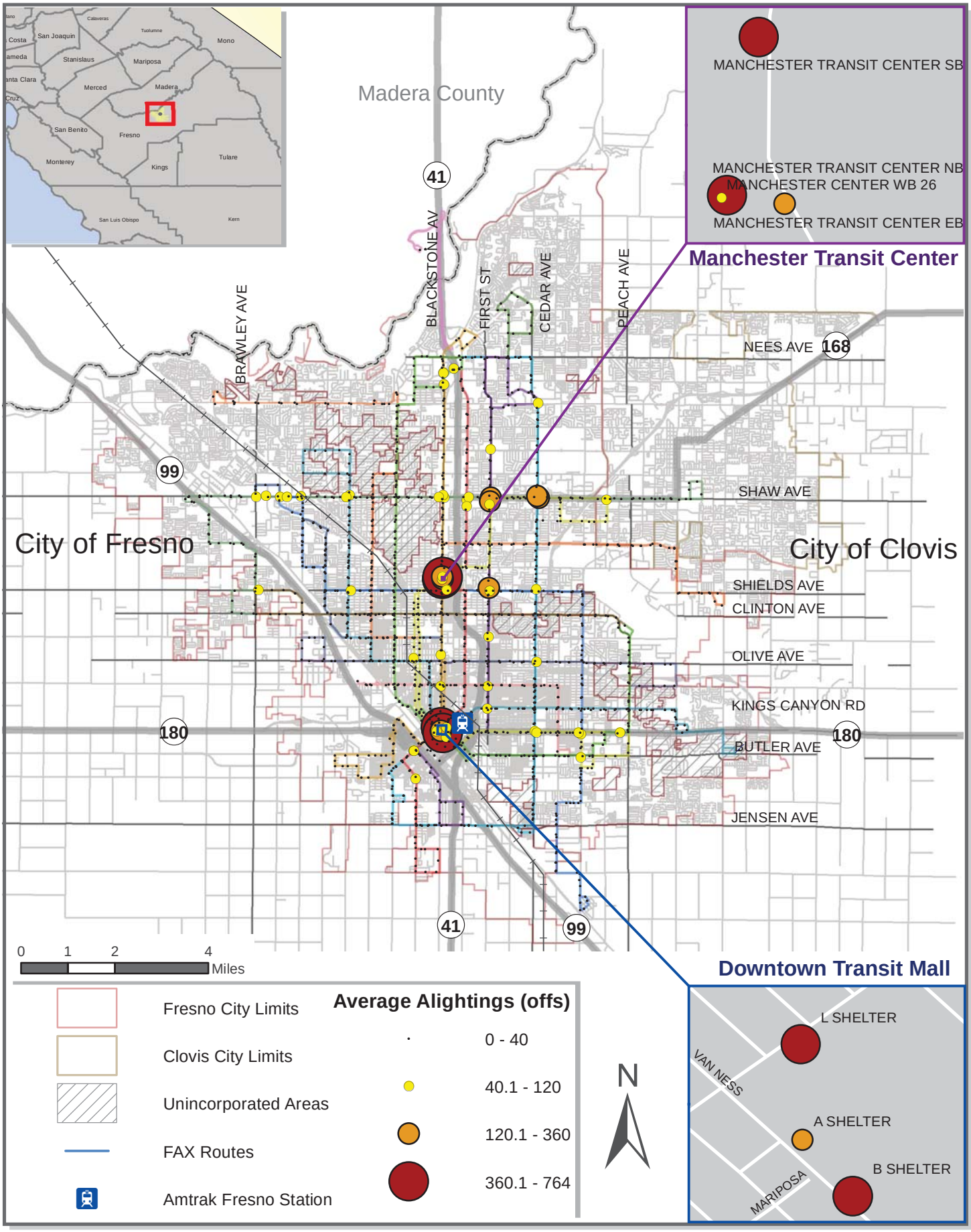
Average Weekday Combined Boardings (ons) + Alightings (offs)



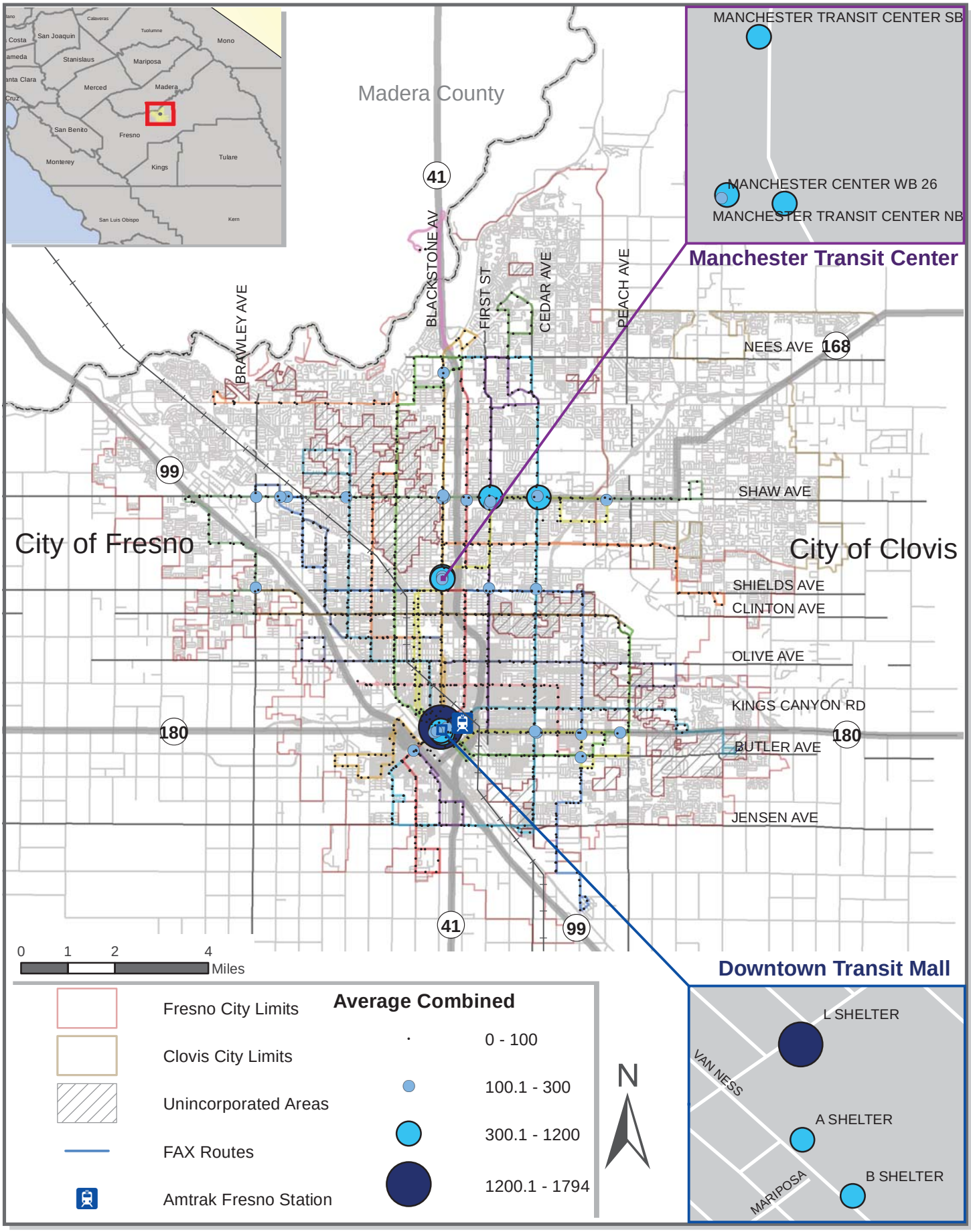
Average Saturday Boardings (ons)



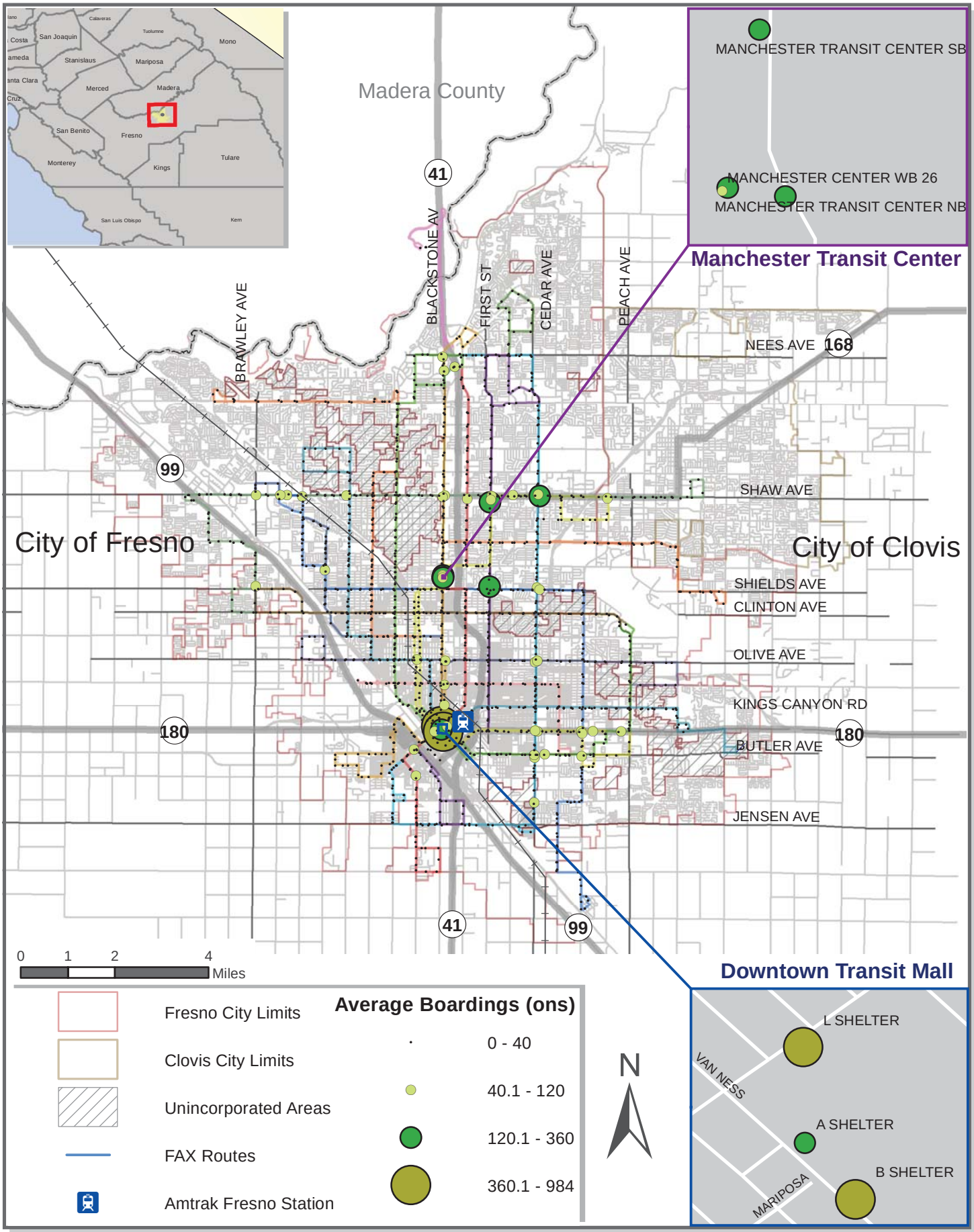
Average Saturday Alightings (offs)



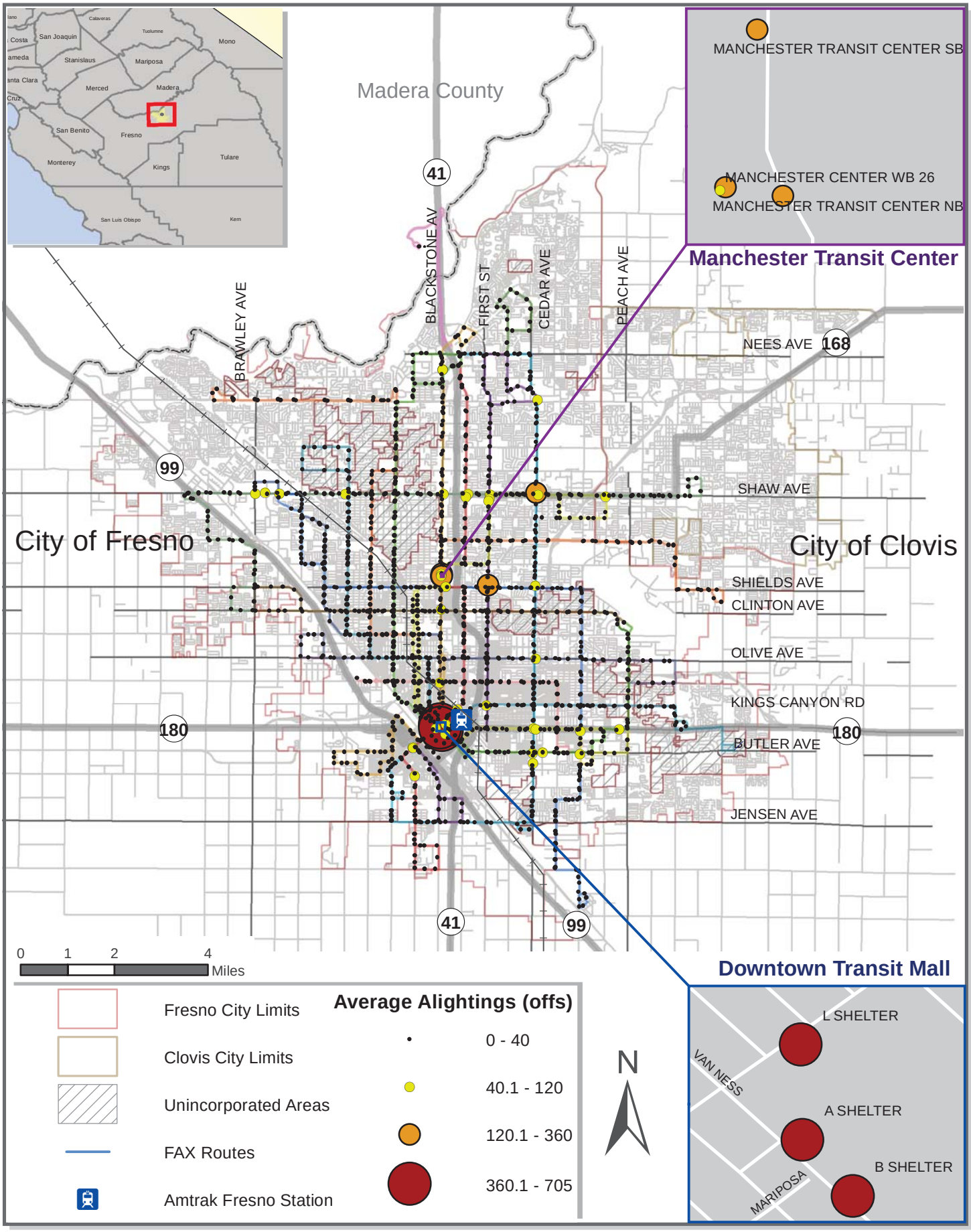
Average Saturday Combined Boardings (ons) + Alightings (offs)



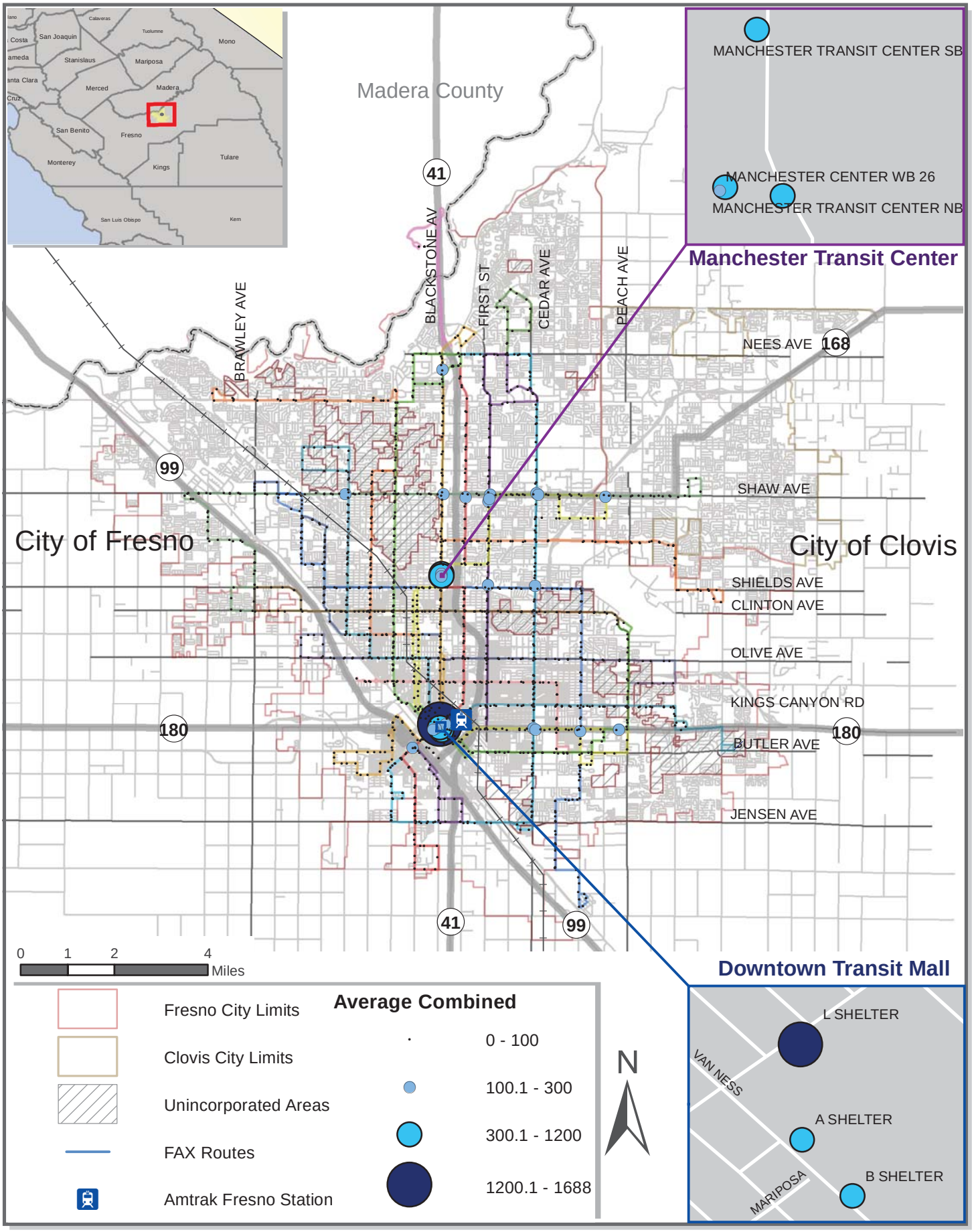
Average Sunday Boardings (ons)



Average Sunday Alightings (offs)



Average Sunday Combined Boardings (ons) + Alightings (offs)



Appendix D: Origins and Destinations Survey Report (January 2013)

FCMA Public Transportation Strategic Service Evaluation Project

Origins and Destinations Survey Report

Draft

Task No. 1.3

Prepared for:

Fresno Council of Governments

Prepared by:

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Review Copy		
	Date	Initials
Originator	12/21/13	RP
Checker	1/29/14	IG
Back Checker	3/25/14	JEG
Verified by	4/3/140	TM

April 2014

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1.0 INTRODUCTION

The stated purpose of the Strategic Service Evaluation is to examine metropolitan travel patterns through extensive origin-destination, transit ride check and transfer studies, and public and stakeholder input with a goal of reducing travel times and improving linkages to major trip generators and making transit in the Fresno and Clovis service area more productive, cost effective and sustainable.

This report presents the findings of the origin-destination survey.

1.1 Key Findings

- Fresno Area Express (FAX) and Clovis Stageline bus systems meet the transportation needs of their riders very well, with 85 percent indicating that their needs are very or relatively well met.
- Trip time is also satisfactory (80 percent). Although those who do not transfer buses at all are somewhat more satisfied with trip time than those who do transfer, satisfaction does not decrease as the number of transfers increases above one transfer.
- There is a very substantial student population that uses the Fresno and Clovis buses (26 percent of riders) making 24 percent of all trips (23 percent from home and an additional 1 percent miscellaneous). On weekdays, students make 28 percent of all trips.
- Home-work trips are the most frequent of all trip purposes (29 percent overall; 30 percent on weekdays, and 22 percent on weekends). On weekends, home--to/from--friends/recreation are most numerous (25 percent).
- The bus rider population is very low income (56 percent of households with annual incomes under $10,000), and 88 percent of bus riders have no automobile available to make their trip.
- Riders are 45 percent Hispanic/Latino.
- Two-thirds of riders have ridden FAX or Clovis buses for 3 or more years (49 percent have ridden 5 or more years and 18 percent 3-5 years).
- More than one-half (56 percent) ride the bus 5 or more days per week.
- Almost two-thirds of all riders (65 percent) transfer buses on their trip, with the average transferring rider making 1.37 transfers.
- More than 80 percent of bus riders walk to (82 percent) and from (83 percent) their bus stops to catch their first bus and to reach their final destination after their last bus.
- Riders want to make greater use of the Internet to obtain their transit information (from 29 percent currently to 39 percent in the future) and to decrease their use of the telephone to do so (from 40 percent currently to 26 percent in the future). They also indicate that they would like to obtain

transit information at bus stops more than they presently do (22 percent currently to 28 percent in the future).

2.0 METHODOLOGY

An on-board survey of Fresno Area Express (FAX) and Clovis Stageline bus riders was conducted in order and collected the following information:

- Bus routes ridden by bus riders in sequence, including transfers
- Initial origin for transit trip
- Initial bus stop
- Mode of access to initial bus stop
- Final bus stop after all transfers
- Mode of egress from final bus stop to destination
- Trip purpose
- Origins/Destinations by addresses or cross streets and by purpose
- Automobile availability as an alternative to the bus trip
- Satisfaction with FAX and Stageline in meeting transportation needs
- Satisfaction with time of trip
- Sources for receiving transit information—current and preferred
- Bus trip frequency
- Length of time that bus patron has ridden Fax or Stageline buses
- Ethnicity
- Age
- Work Status
- Income
- Gender
- Participation in CalFresh program

- Home Address and Zip Code

The survey was developed to not only provide origin-destination information but also certain other data of interest. The final survey questionnaire form is provided in the Appendix to the report.

Surveys on FAX buses were scheduled in such a manner as to obtain close to ± 5 percent margins of error on high volume bus routes (between 300 and 350 respondents) and close to ± 10 percent margins of error (approximately 50-90 respondents) on lightly used routes. Very lightly used routes (for example Route 58/58E with only 100 riders daily) would not likely be able to achieve ± 10 percent because more than one-half of all riders would be needed to respond in order to reach ± 10 percent. In such cases, the full census would generate as many responses as possible. Daily rider counts were used to make these determinations, which ranged from riding between 54 percent and a full 100 percent census of each bus route's trips on weekdays and between 4 and 8 hours per route on weekends. These trips, when less than a census, were selected at random in four-hour blocks.

Based on a 17.5 percent response rate of unlinked trips, approximately 3,700 surveys (3,200 weekday and 500 weekend) were estimated. The margins of error for this estimated number of responses would be ± 1.6 percent overall, ± 1.7 percent weekday and ± 4.3 percent weekend, all at the 95 percent level of confidence. More than 4,200 surveys were returned on the buses or by prepaid business reply mail. These surveys were reviewed individually, and only those with at least one geographic variable (origin, destination, bus stops, home address) and a satisfactory amount of other questions completed were ultimately included in the sample. The only exceptions to the geographic variable requirement were that Spanish language surveys and surveys from Asians (two groups typically underrepresented) were included if they completed a satisfactory number of the other questions. Ultimately, 3,730 surveys were included. Among these surveys were:

- 3,379 weekday surveys
- 351 weekend surveys
- 125 Spanish language surveys
- 154 Clovis Stageline surveys
- 55 percent female respondents and 45 percent male respondents

Three respondents who completed the entire survey were randomly selected to receive $100 each as a reward for their participation.

After pre-testing, surveying began on Wednesday, October 16 and concluded on Wednesday, October 20. A total of 659 hours were spent conducting on-board bus surveys and 16 hours were spent on-site at Asian Village (Kings Canyon between Willow and Winery). Approximately 5.5 useable surveys were obtained per hour.

Surveyors were assigned specific routes to follow each day, according to their Survey Assignment Log and were provided with specifically numbered survey forms to hand out and record on their Assignment Logs. An example of an Assignment Log is provided in the Appendix, as is the numbering system per

assignment. In this manner, the preprinted survey number could identify the day of week, time of day, bus route and direction for each survey that was returned. Figure 2-1 through Figure 2-4 depict this information for the sampled survey respondents.

Figure 2-1: Days of Week of Survey Respondents' Bus Trips

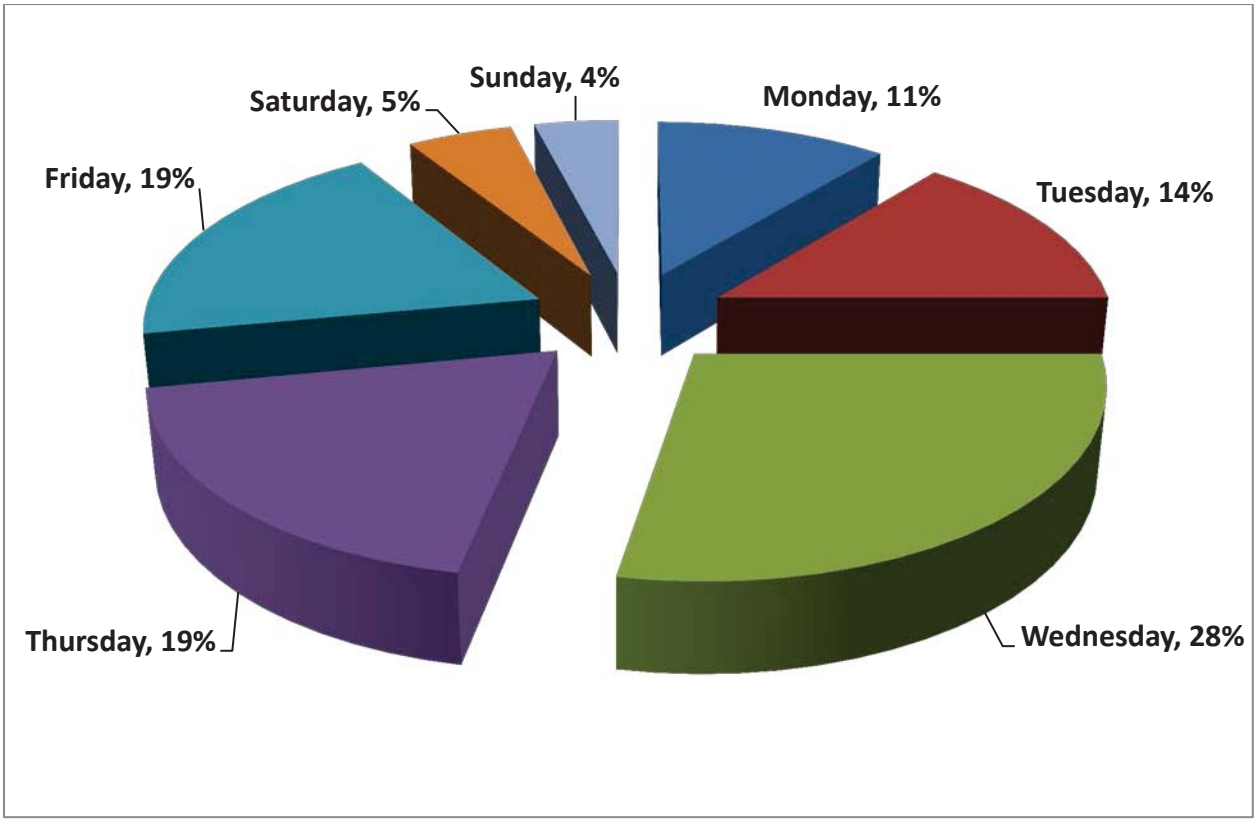
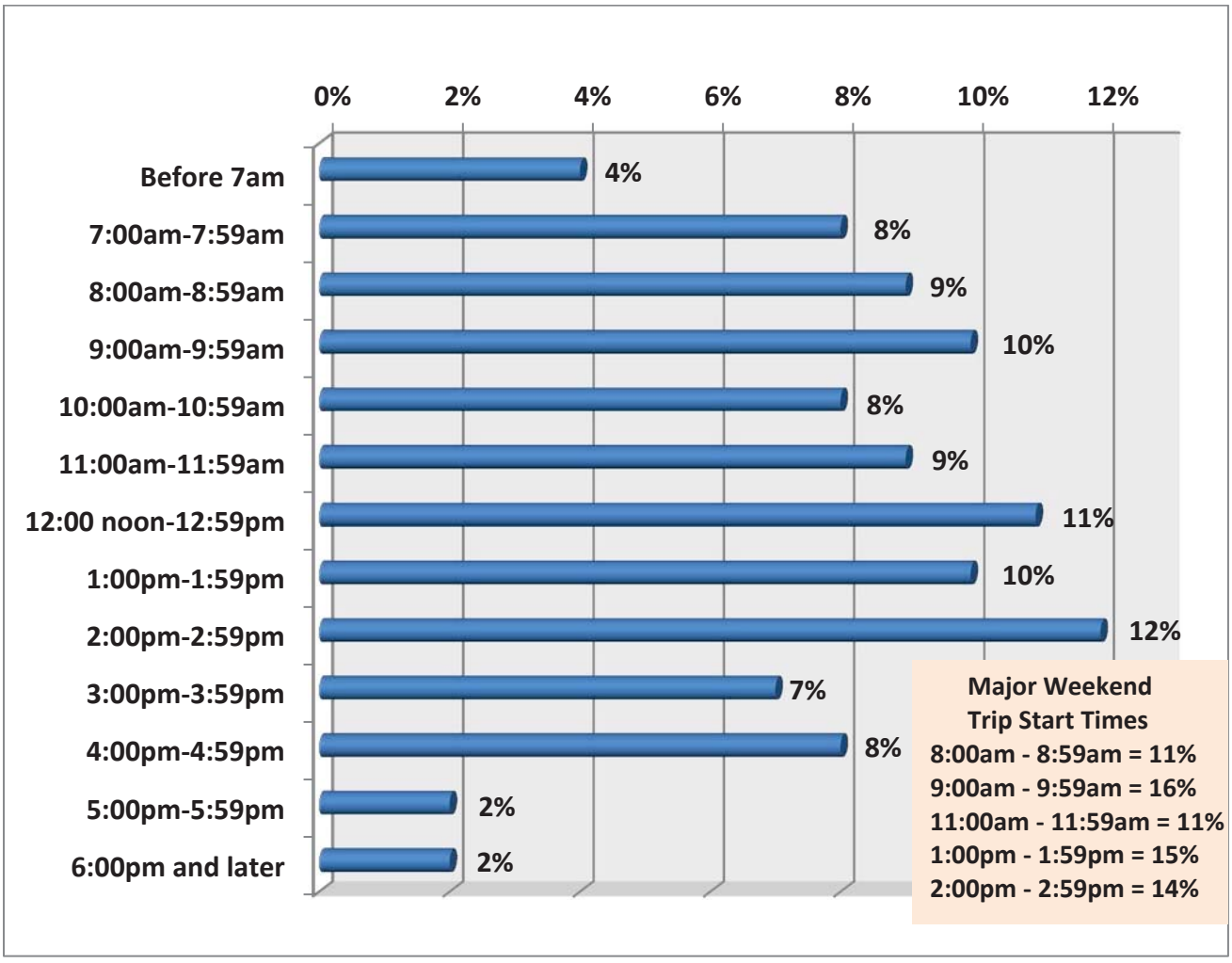


Figure 2-2 shows that the sample was distributed nicely over the course of the operating hours for the FAX and Clovis bus systems, with midday trips being most numerous in the sample. Weekends show even greater midday ridership than weekdays and tend to have fewer very early riders or late riders in comparison to weekdays.

Figure 2-3 indicates that riders on routes 28, 26/39 (combined), and 30 were the most responsive. These three routes, along with route 38, are the largest in the FAX system in terms of rider volume. The fewest responses were obtained from routes 58/58E and Clovis 50, two lightly used routes. On weekends, Route 22 had a high response rate, with Route 28 showing less responsiveness than on weekdays.

Figure 2-2: Time Bus Trip Started



Clovis also offers two one-way, 20-minute routes (70 and 80) that connect in the morning and afternoon to the main routes (10 and 50) to local schools in the morning and from the schools in the afternoon. Counts show that approximately 40 riders use these buses daily. The City of Clovis requested that only the afternoon buses on these routes be included. No responses were obtained on these routes due to the small number of riders and the very short trip length. There were, however, riders who indicated that these routes were a part of their overall trip when they were surveyed on other routes. Figure **2-3** displays the percentage of bus riders for each route.

Figure 2-3: Bus Route of Survey Respondents

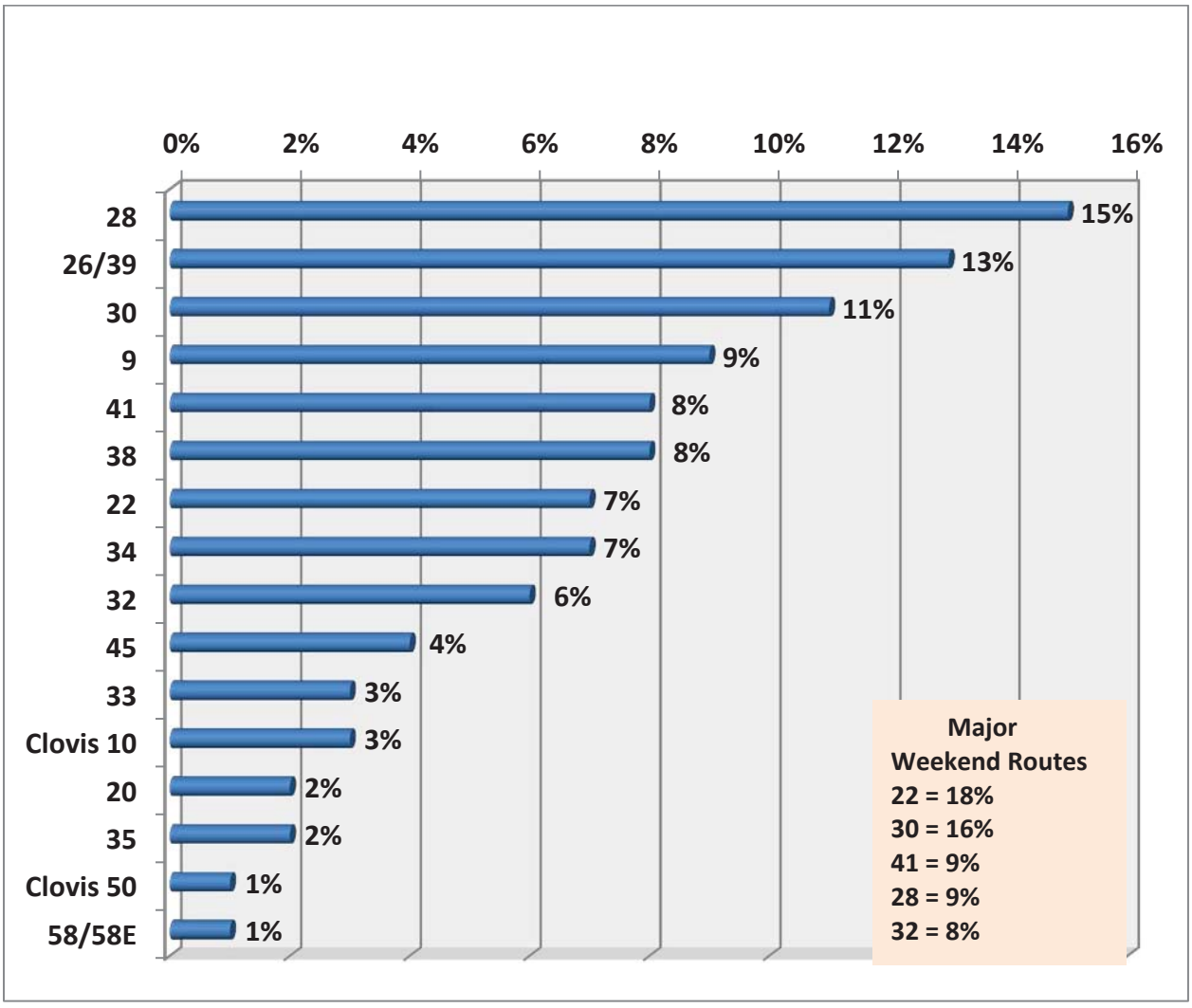


Table 2-1 shows the margins of error achieved overall, weekday and weekend, by FAX and Clovis, and by route for the survey at 95 percent confidence. Those routes targeted for ± 5 percent achieved between ± 3.9 percent and ± 6.1 percent. Those targeted for ±10 percent achieved between ± 7.9 percent and ± 12.1 percent. Overall and weekday margins of error exceeded the original objectives, with weekends being very close.

Table 2-1: Margins of Error for the Sample

(@ 95 percent confidence)

Route	Sample Respondents	Margin of Error
28	554	± 3.9%
26/39	481	± 4.3%
30	428	± 3.9%
9	347	± 4.9%
41	299	± 5.4%
38	286	± 5.6%
22	280	± 5.5%
34	249	± 6.0%
32	239	± 6.1%
45	135	± 7.9%
33	108	± 8.5%
Clovis 10	99	± 8.7%
35	63	± 11.9%
20	65	± 12.1%
Clovis 50	55	± 11.8%
58/58E	42	± 11.9%
Overall	3,730	± 1.5%
Weekday	3,379	± 1.6%
Weekend	351	± 5.2%
Fresno Area Express	3,576	± 1.6%
Clovis Stageline	154	± 7.2%

Figure 2-4 shows significant directional symmetry for the sample, with relatively equal North/South and East/West rider counts. There is also symmetry for the hybrid routes (26/39 and 58/58E) that are designated by FAX to run in the two directions that each of the combined routes run when considered separately.

Figure 2-5 depicts the major residential zip codes for survey participants. An excellent geographic distribution is shown, with zip codes 93702 and 93727 east of downtown, 93705 north central, 93726 northeast, 93722, northwest, and 93706 southwest.

Figure 2-4: Direction of Bus for Sampled Respondents

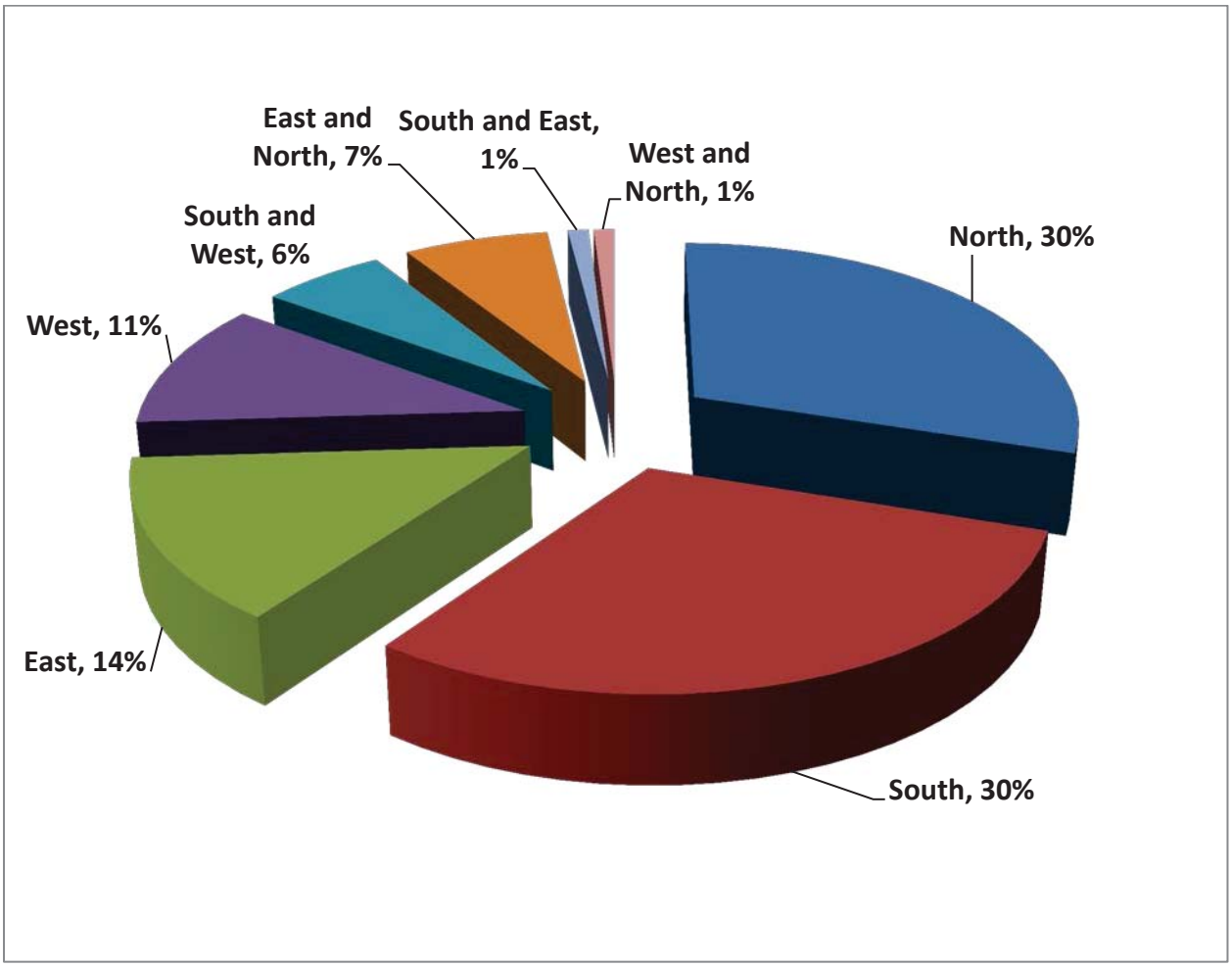
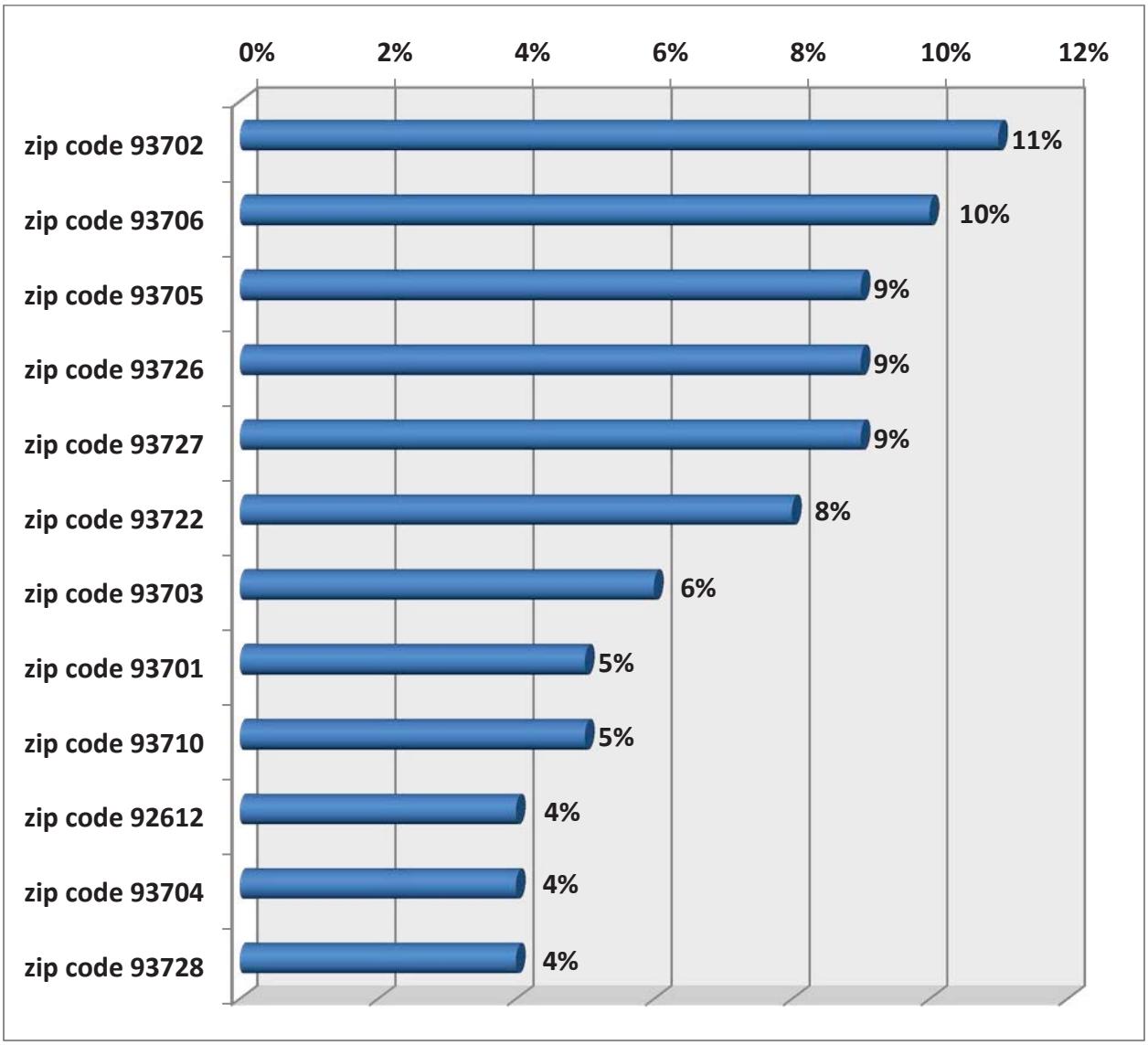


Figure 2-5: Major Bus Patron Residential Zip Codes



The balance of this report will present the survey findings, beginning with the demographic characteristics of the bus patron population, then exploring their travel behavior by bus, and, lastly discussing their opinions expressed. Complete frequency distributions for these findings are contained in the Appendix. Geocoded origin and destination information derived from this survey are included in the final Public Transportation System Assessment, dated April 2014.

3.0 SURVEY RESULTS

3.1 Respondent Demographic Characteristics

- **Figure 3-1** through

Figure 3-5 present the demographic characteristics of the survey respondents. Well over two-fifths (45 percent) of the sample respondents are employed either full time (28 percent) or part time (18 percent) as shown in **Figure 3-1**. It is also shown that students comprise over one-fourth (26 percent) of the sample respondents. The remaining sample respondents are not employed (17 percent), disabled and unable to work (11 percent), homemakers (5 percent), and retired (4 percent). The weekend sample respondents are more likely to be employed full time (28 percent) and, as expected, there are fewer student respondents on weekends (16 percent). Clovis respondents differ from the overall sample in the following ways: respondent part time employees in Clovis exceed the overall by 8 percent – 26 percent in Clovis versus 18 percent in the general sample population. On the other hand, there is a smaller percentage of student respondents (21 percent versus 26 percent) and unemployed respondents (12 percent versus 17 percent) in Clovis.

Figure 3-1: Work Status

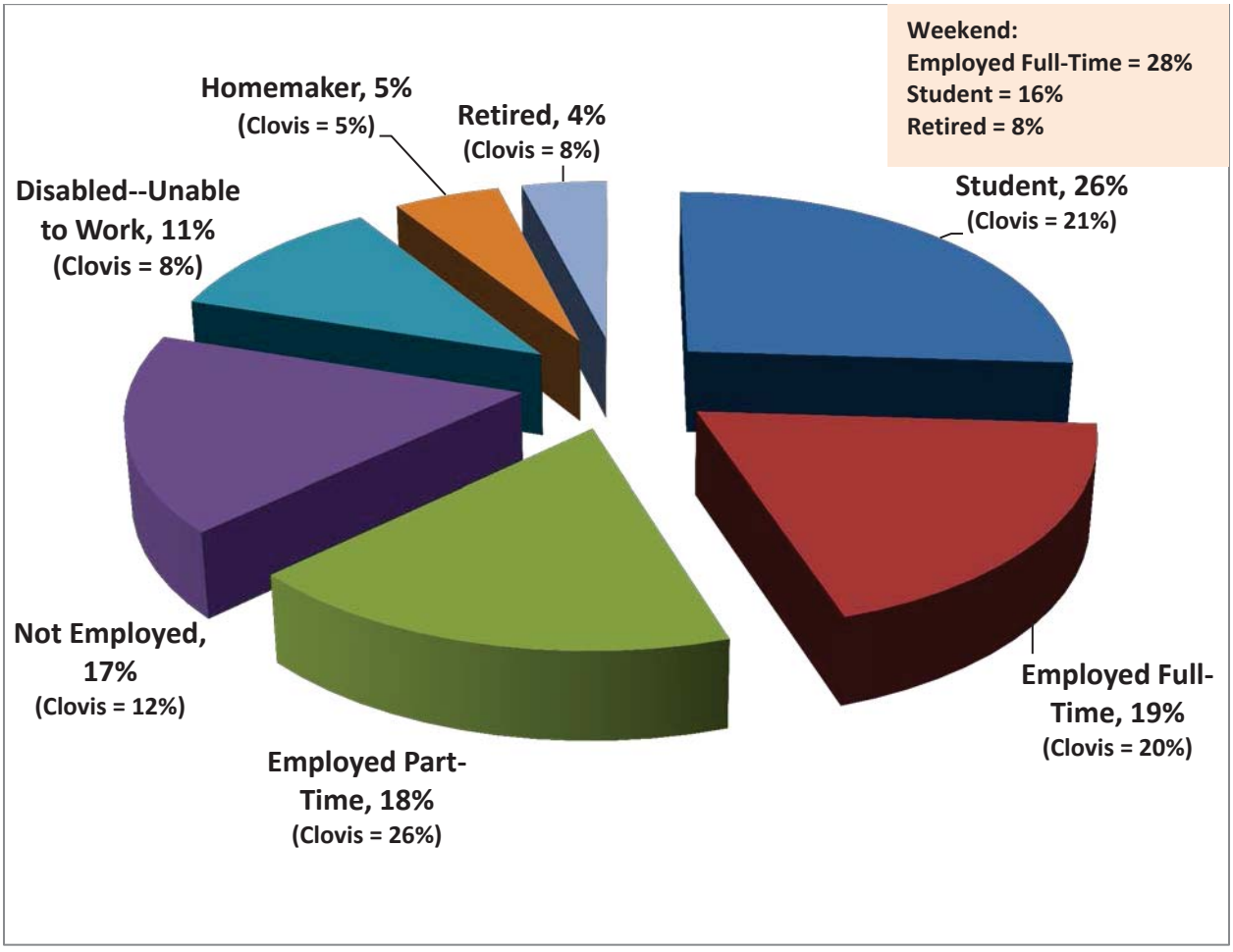
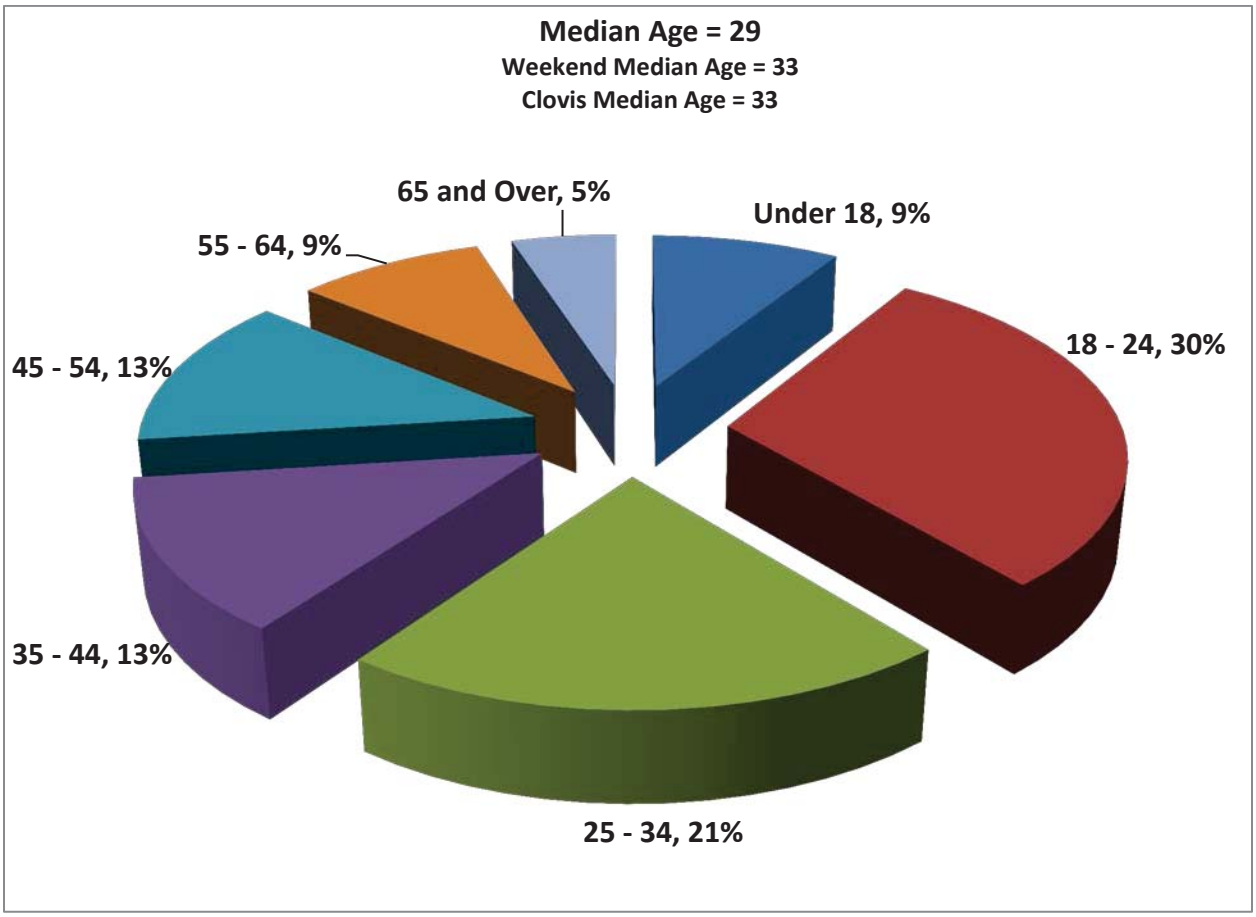


Figure 3-2 indicates that the median age of respondents in the current survey is 29 years old. The median ages of weekend respondents and Clovis Stagecoach respondents are somewhat higher (both at 33 years of age). More than one-half (51 percent) of respondents range between 18 and 34 years old, with 30 percent between 18 and 24, suggesting that a large student population is riding the buses.

Figure 3-2: Age of Respondents



Over two-fifths (45 percent) of the sample respondents are Hispanic/Latino **(Figure 3-3).** Nearly one-fourth (24 percent) are Caucasian/White, and another 19 percent are African-American/Black. Asians/Southeast Asians make up 5 percent of the sample respondents, including 3 percent who identified themselves as Hmong. Weekend riders demonstrate greater proportions of African-Americans and Asians, with fewer Hispanic/Latinos (Hispanic/Latino – 41 percent; African-Americans/Black – 21 percent; and Asians – 8 percent). The ethnic representation of the Clovis sample respondents differs from the overall in that well over one-third (36 percent) are Caucasian/White and less than 1 in 10 (9 percent) are African-American/Black.

Figure 3-3: Ethnicity of Riders

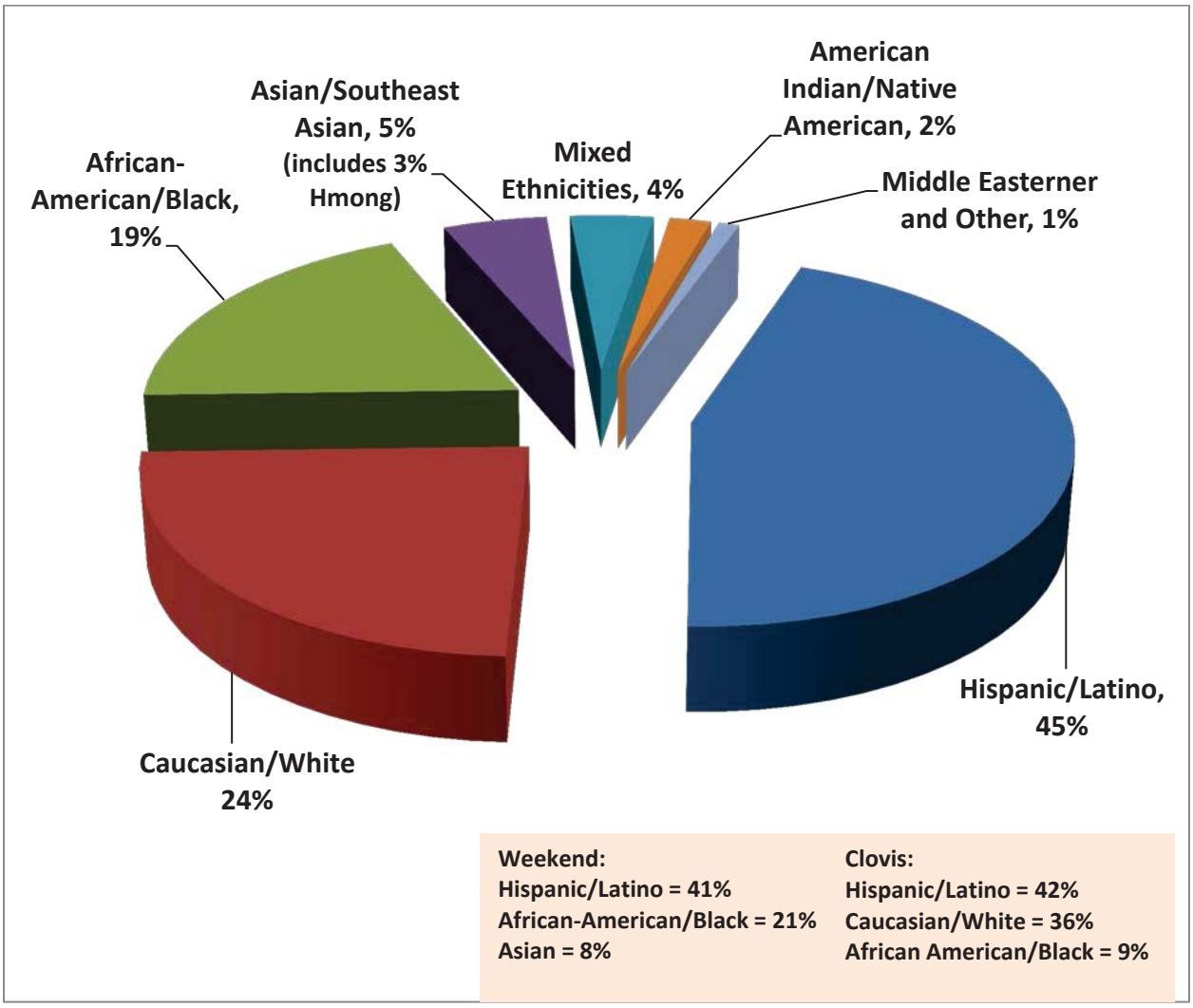
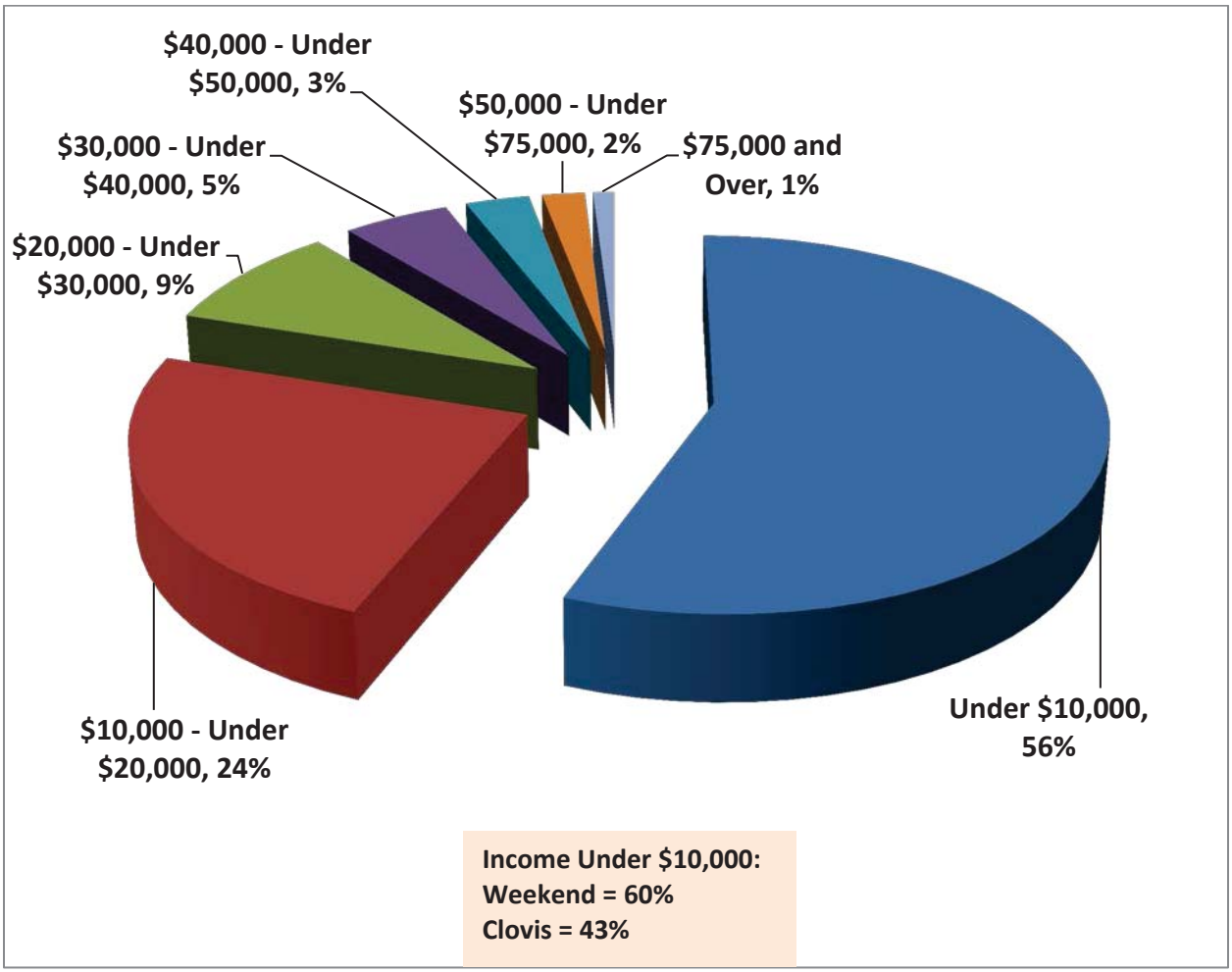


Figure 3-4 shows that the sample respondents are a very low income population. Specifically, nearly three-fifths (56 percent) earn an annual household income of under $10,000 and another 24 percent earn between $10,000 and under $20,000 annually. Weekend sample respondents reflect similar income statistics in that 60 percent earn an annual household income of under $10,000. The annual household income of the Clovis respondents is not as low as the overall sample with 43 percent earning under $10,000.

Figure 3-4: Annual Household Income



- **CalFresh Participation**: Almost one-half (45 percent) of the overall bus population participate in the CalFresh Program (

Figure 3-5). CalFresh is the California component of the federal Supplemental Nutrition Assistance Program (SNAP) that aids low-income families to meet their nutritional needs. Over one-third (35 percent) of Clovis respondents participate in this program.

Participation in the CalFresh Program is most prevalent among the following subgroups:

- Female respondents (51 percent) versus male respondents (37 percent).
- African - Americans/Blacks (48 percent) and Hispanic/Latinos (46 percent) versus Asians (34 percent).
- Inasmuch as this is an income based program, respondents with lower income levels (less than $30,000 annual income – 49 percent) participate much more than do respondents with higher income levels ($30,000 or more annually – 17 percent).

- Respondents who are not employed (54 percent) versus those who are employed (39 percent) and students (41 percent).

Figure 3-5: Participate In CalFresh Program

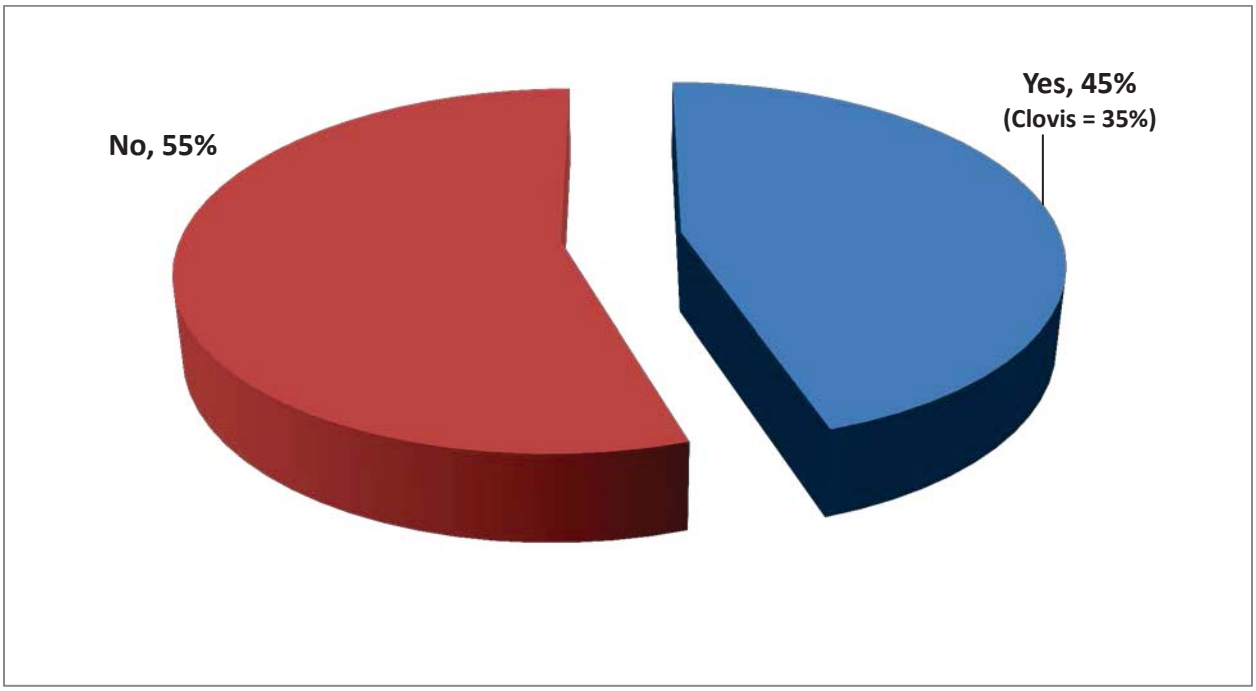


Figure 3-6 shows the relationship between work status and sample respondents who earn an annual household income of under $10,000. Among those who are currently unemployed, over three-fourths (76 percent) earn under $10,000 annually. This subgroup is followed by homemakers (68 percent), the disabled who are unable to work (65 percent), and part time employees (60 percent).

Automobile Availability: Figure 3-7 indicates that only a small minority of sample respondents (12 percent) have an automobile available to them for the trip that they make, instead, by bus. Other key subgroups have similarly low automobile availability: Clovis respondents (9 percent), those with an annual income of under $10,000 (10 percent), and full time workers and students (13 percent).

The following subgroups are more likely to have an automobile available to them:

- Male respondents (15 percent) versus female respondents (10 percent).
- Respondents with higher income levels ($50,000 and over – 26 percent) as opposed to respondents with lower income levels (under $10,000 – 10 percent).
- Respondents who are not participating in the CalFresh Program (14 percent) versus respondents who are participating (10 percent).

Figure 3-6: Percentage of Annual Household Incomes Under $10,000 by Work Status

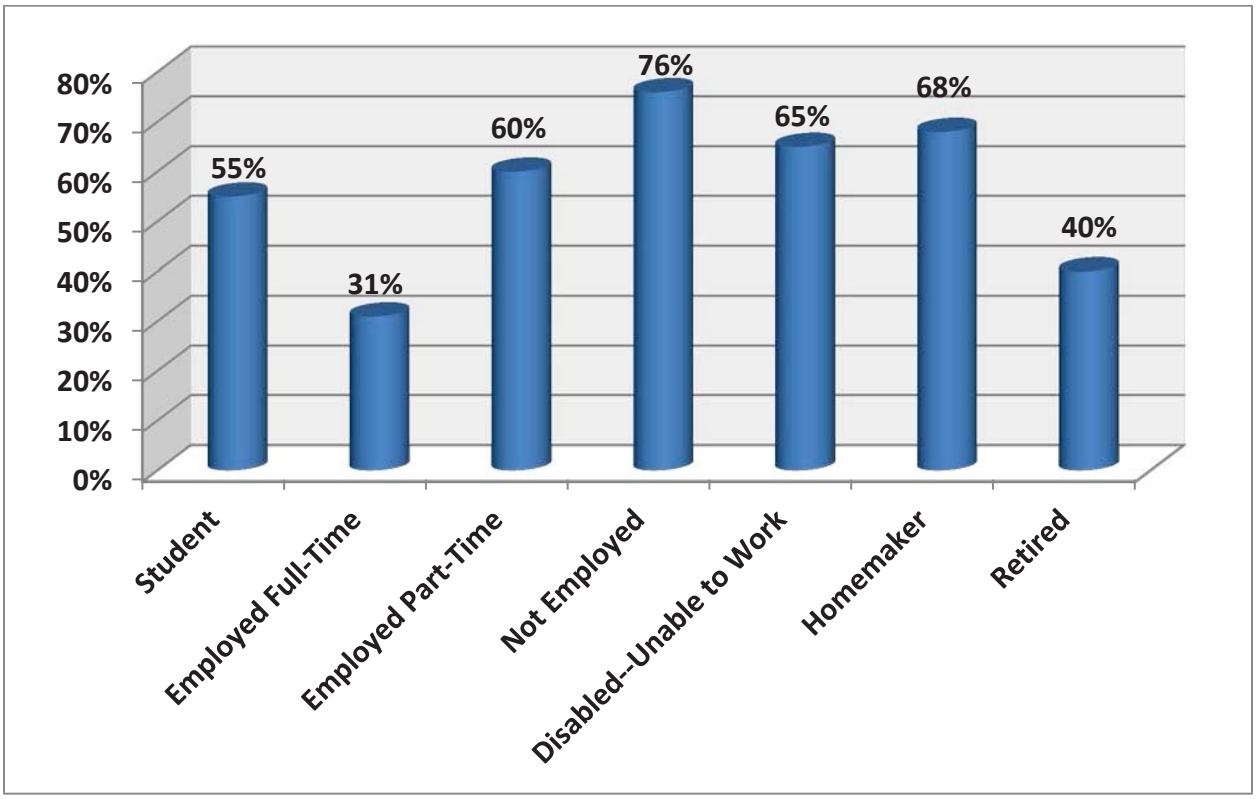
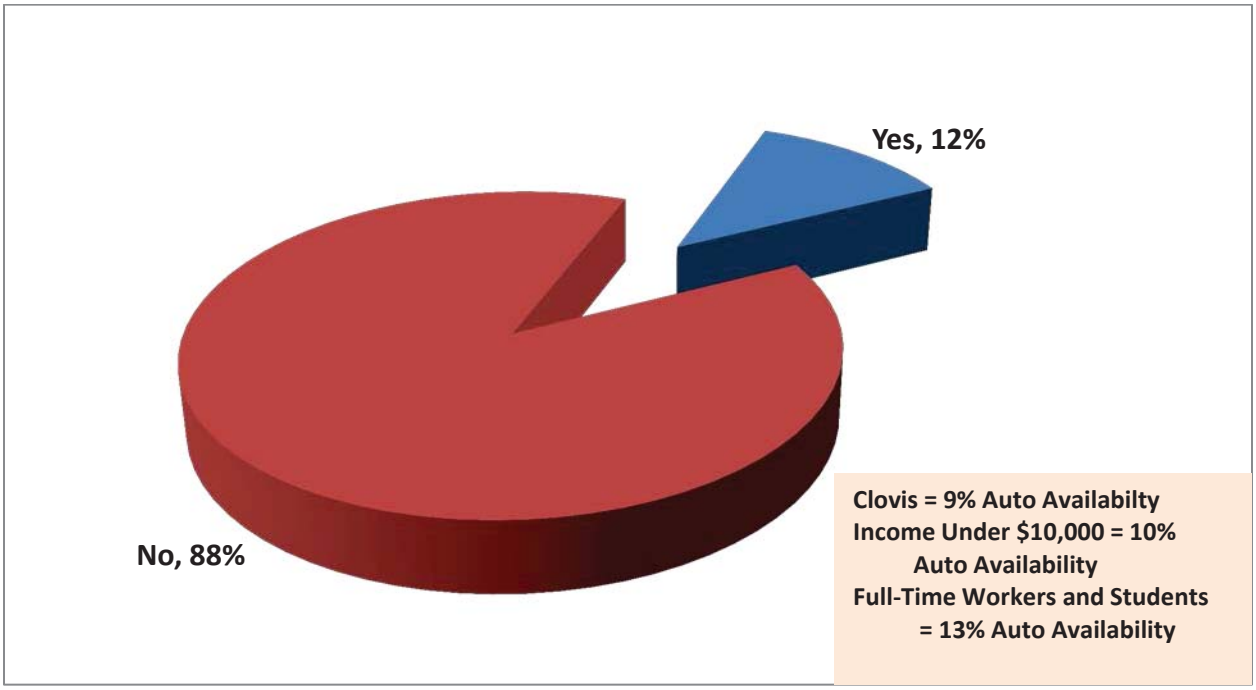


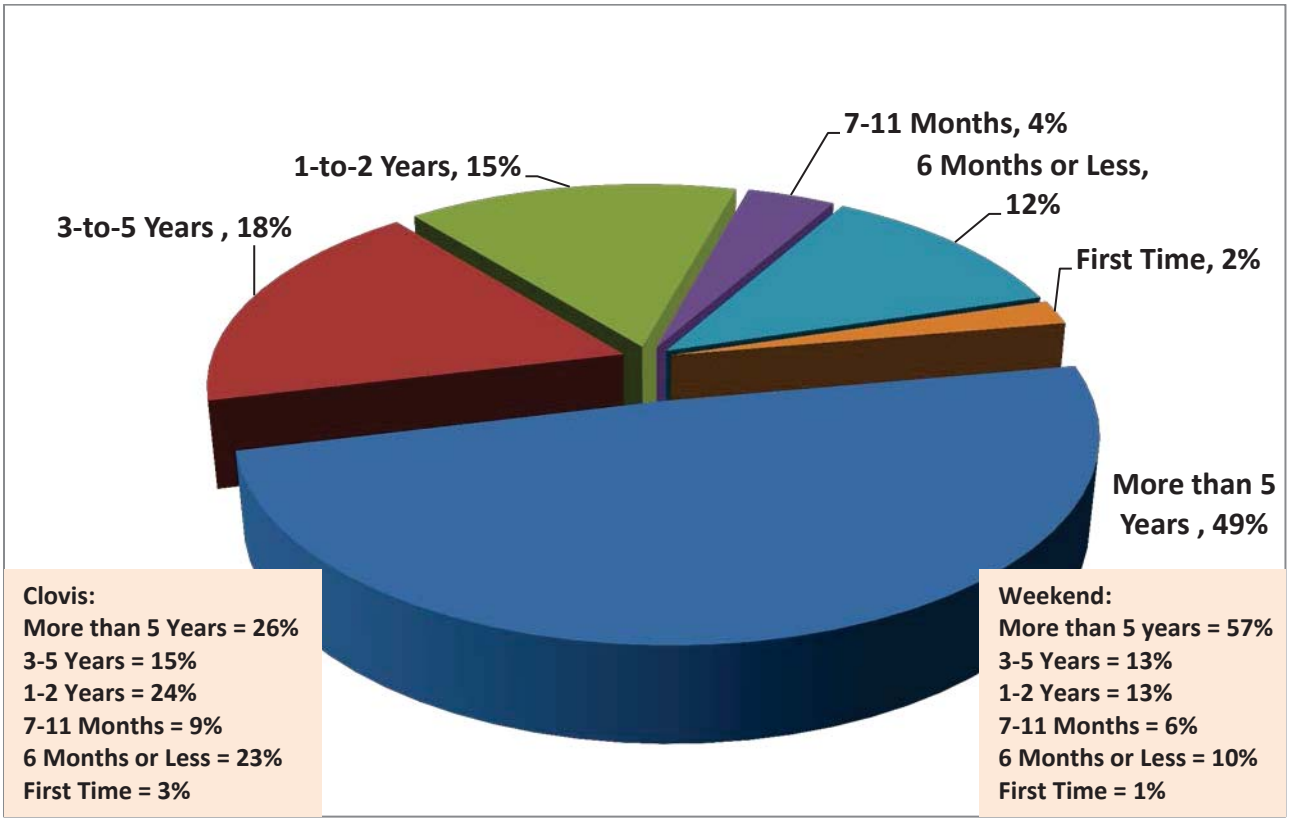
Figure 3-7: Automobile Available to Make Trip?



3.2 Respondent Behavioral Characteristics

Length of Time Riding FAX and Clovis Stageline: Sample respondents are long-term patrons of the FAX and Clovis bus systems. **Figure 3-8** shows that two-thirds (67 percent) have ridden these bus systems more than 3 years (including 49 percent 5 years or more). Only 14 percent have been bus riders for 6 months or less (including 2 percent who were riding for the first time). Similarly, weekend riders are also long-term patrons with 7 in 10 having ridden these bus systems for 3 years or more. The Clovis sample respondents have much less longevity as bus riders – only about two-fifths (41 percent) have been riding the bus for 3 years or more.

Figure 3-8: How Long Have Patrons Ridden FAX or Clovis Buses?



Respondents, who have been riding the FAX and Clovis bus systems over the long term (3 years or more or 5 years or more), are identified through the following comparisons:

3 years or more

- Respondents who are 35 years and over – 73 percent versus respondents who are 34 and under – 63 percent.
- African Americans/Blacks (71 percent) and Hispanic/Latinos (67 percent) versus Asians (60 percent).

- Respondents who completed the survey in Spanish are more likely to be longer-term riders of 3 or more years (76 percent) than are those riders who completed it in English (66 percent have ridden 3 or more years).

5 years or more

- Respondents with income levels under $50,000 (50 percent) versus those with income levels of $50,000 or more (31 percent).

- Respondents who are not employed (59 percent) versus students (38 percent). What is particularly interesting about this is that many students, who are generally younger than the overall population, still have been riders of the bus for a substantial number of years.

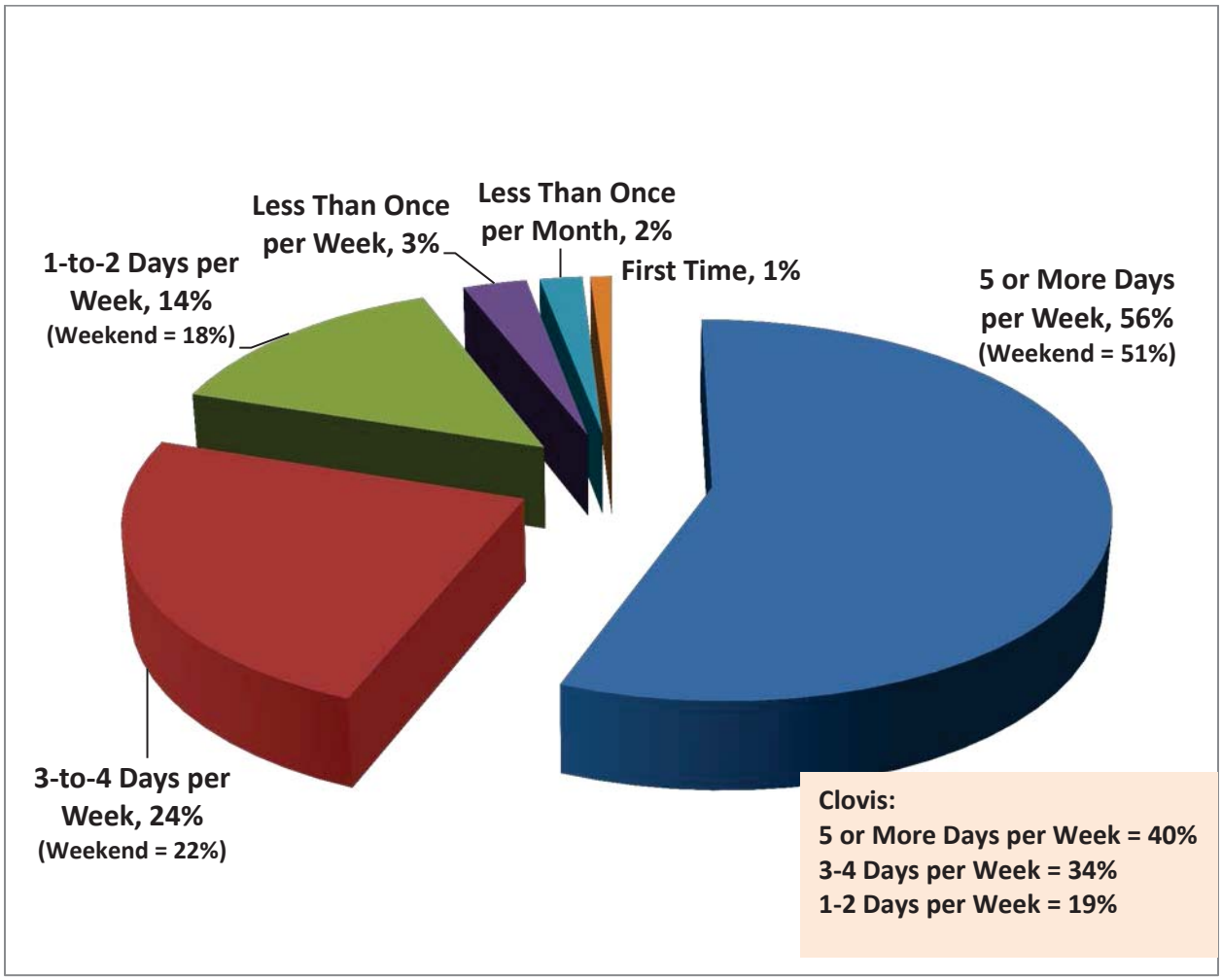
Frequency of Riding: Figure 3-9 indicates that sample respondents are frequent bus riders. Four-fifths (80 percent) ride the bus either 5 or more days per week (56 percent) or 3 to 4 days per week (24 percent). The frequency of bus riding among weekend respondents is slightly less than it is for the entire sample. For example, 51 percent of the sample respondents on weekends ride the bus 5 or more days per week – 5 percent less than the overall respondent population. Clovis sample respondents are also frequent riders but their frequency of ridership is not as great as the overall sample (40 percent five or more days -- 16 percent less than the overall sample).

The following subgroups are more likely to be particularly frequent riders of the FAX and Clovis bus systems:

- Among respondents who ride the bus 3 or more days per week, respondents who are 54 years of age and under (84 percent) versus those who are 55 years old and over (77 percent).

- Among respondents who ride the bus 3 or more days per week, students (85 percent) and employed persons (81 percent) versus individuals not employed (74 percent).

Figure 3-9: Frequency of Riding



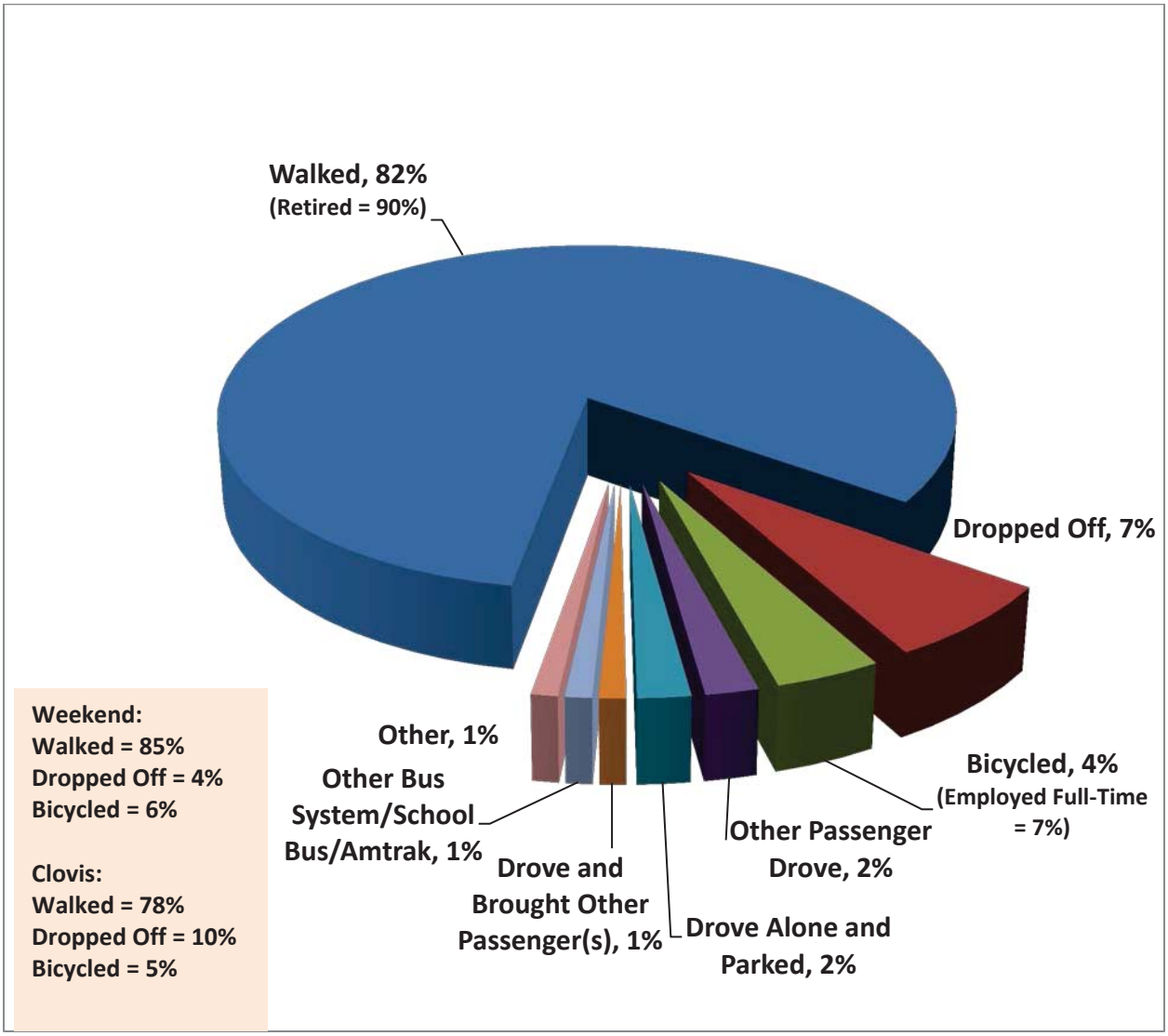
Method of Accessing First Bus: Figure 3-10 shows that over four-fifths (82 percent) of the sample respondents gain access to the first bus of their trip by walking. Among retirees, 90 percent gain access by means of walking. Another 7 percent of the sample respondents were dropped off by someone not riding transit and 4 percent bicycled to gain access to their first bus. Weekend bus rider respondents parallel this overall pattern with a somewhat greater proportion of walkers (85 percent) and a slightly smaller percentage being dropped off (4 percent). Clovis respondents also parallel the pattern of the overall sample. However, a smaller percentage walks (78 percent) and a somewhat higher percentage is dropped off (10 percent).

The method by which respondents access their first bus is associated with certain subgroups. The following relationships are significant:

- Females (87 percent) gain access by walking more so than do males (78 percent).

- English language respondents are more likely to be dropped off (7 percent) than are Spanish language respondents (4 percent).
- Students (10 percent) are more likely to get to their first bus by being dropped off to a greater extent than are unemployed riders (5 percent).
- Respondents who earn under $40,000 (83 percent) are likely to gain access to their first bus by walking more so than are those who earn $40,000 or more (75 percent).

Figure 3-10: Method of Accessing Bus

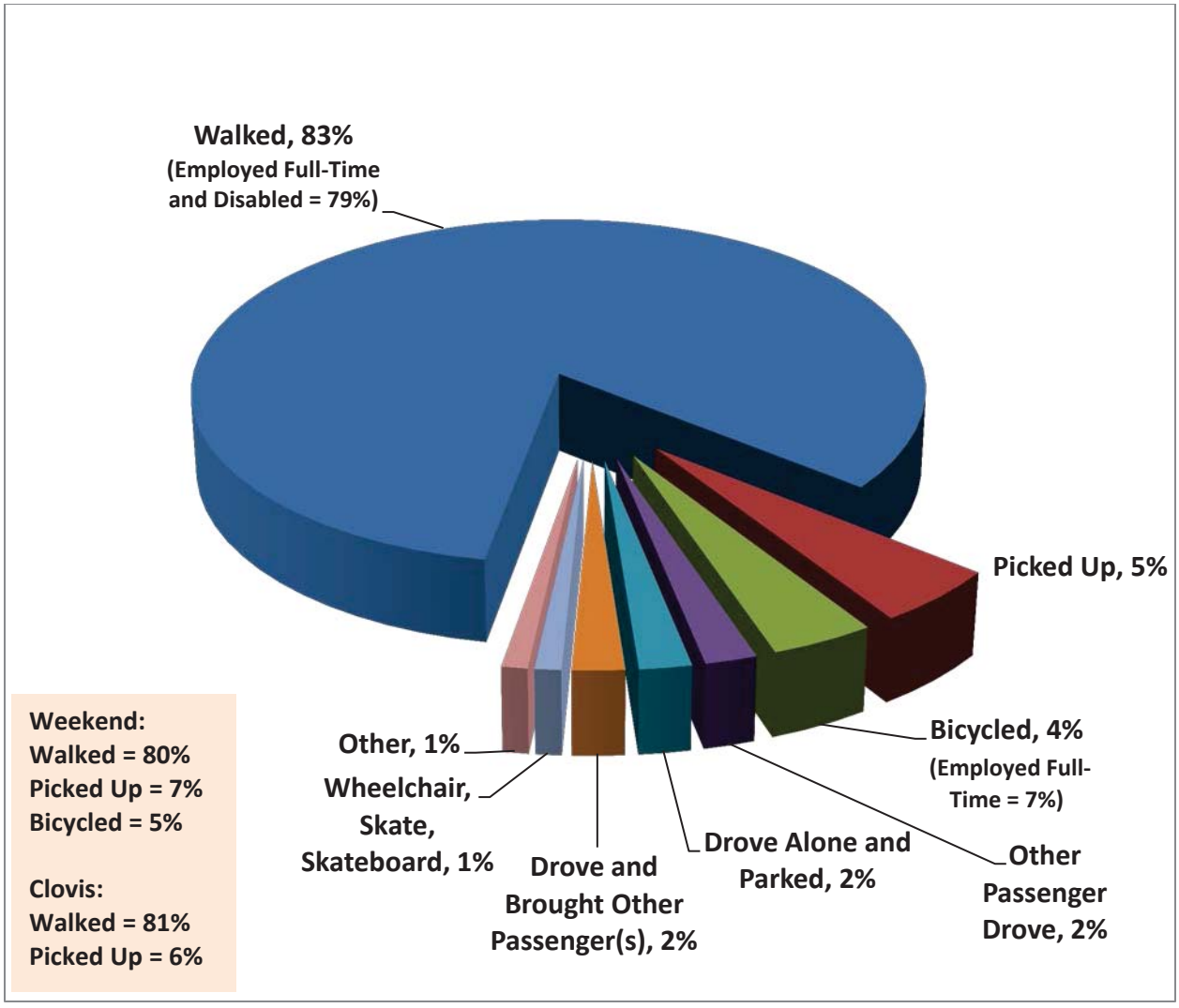


Getting to Final Destination: Figure 3-11 indicates that walking is also the dominant mode for getting from the last bus of the trip to the respondent's final destination. In fact, the similarity here with the access mode (**Figure 15**) is noteworthy. Specifically, over four-fifths (83 percent) of the sample respondents walk to their final destination, 5 percent are picked up by someone, and 4 percent use their bicycle. Weekend and Clovis respondents reflect this pattern very closely.

The method by which respondents get from their last bus to their final destination is associated with certain subgroups. The following relationships are significant:

- Females (87 percent) tend to walk to their final destination more so than males (79 percent).
- Students (87 percent) walk to their final destination more so than do those who are employed (80 percent).

Figure 3-11: Method of Going from Last Bus Stop to Destination



Transfer Analysis: **Figure 3-12** indicates that 46 percent of bus patrons make one transfer on their bus trip and 19 percent make two or more transfers. Among bus riders, 35 percent do not transfer at all and complete their trip using only one bus route. Clovis riders tend to make somewhat more transfers—26 percent making two or more transfers. **Table 3-1** presents the major transfer connections made by surveyed bus patrons. The full list of transfers is included in the Appendix.

Figure 3-12: Number of Transfers Made by Bus Riders

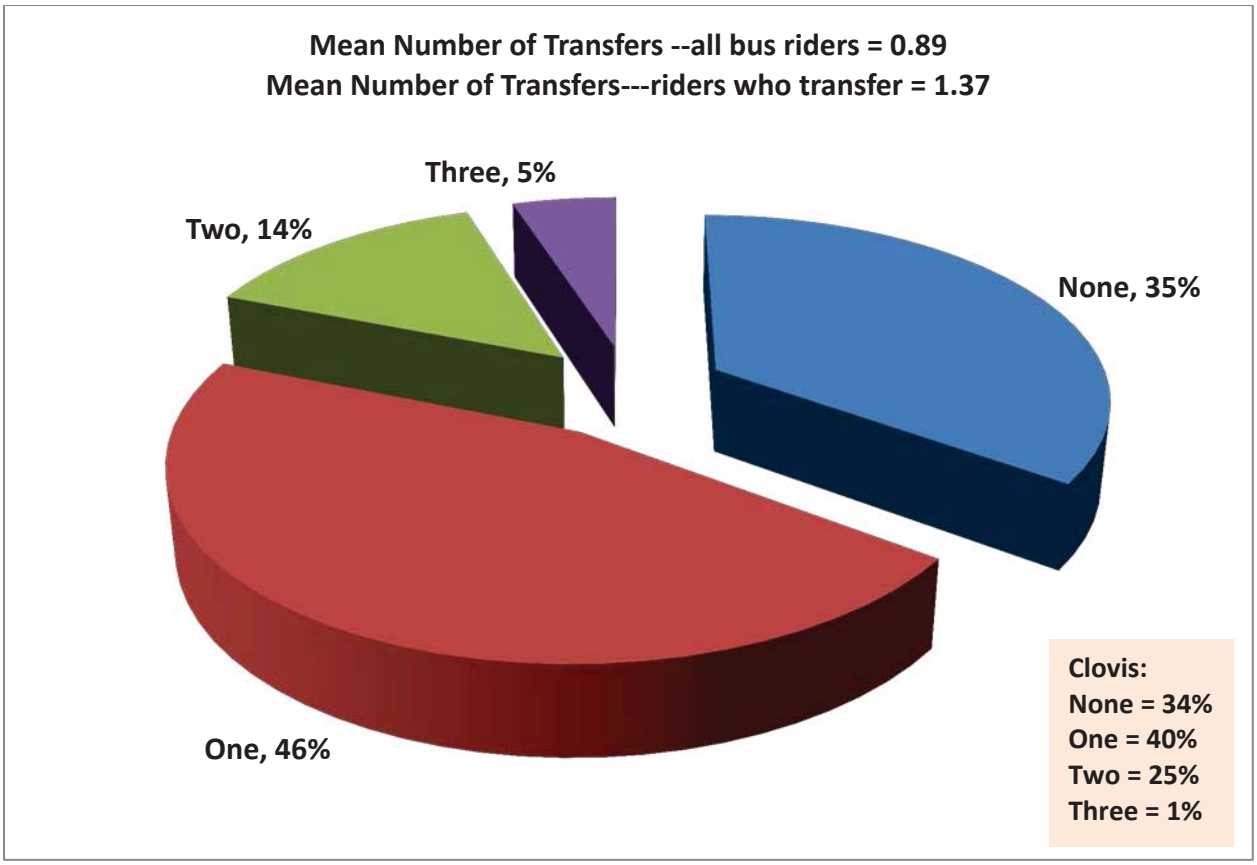
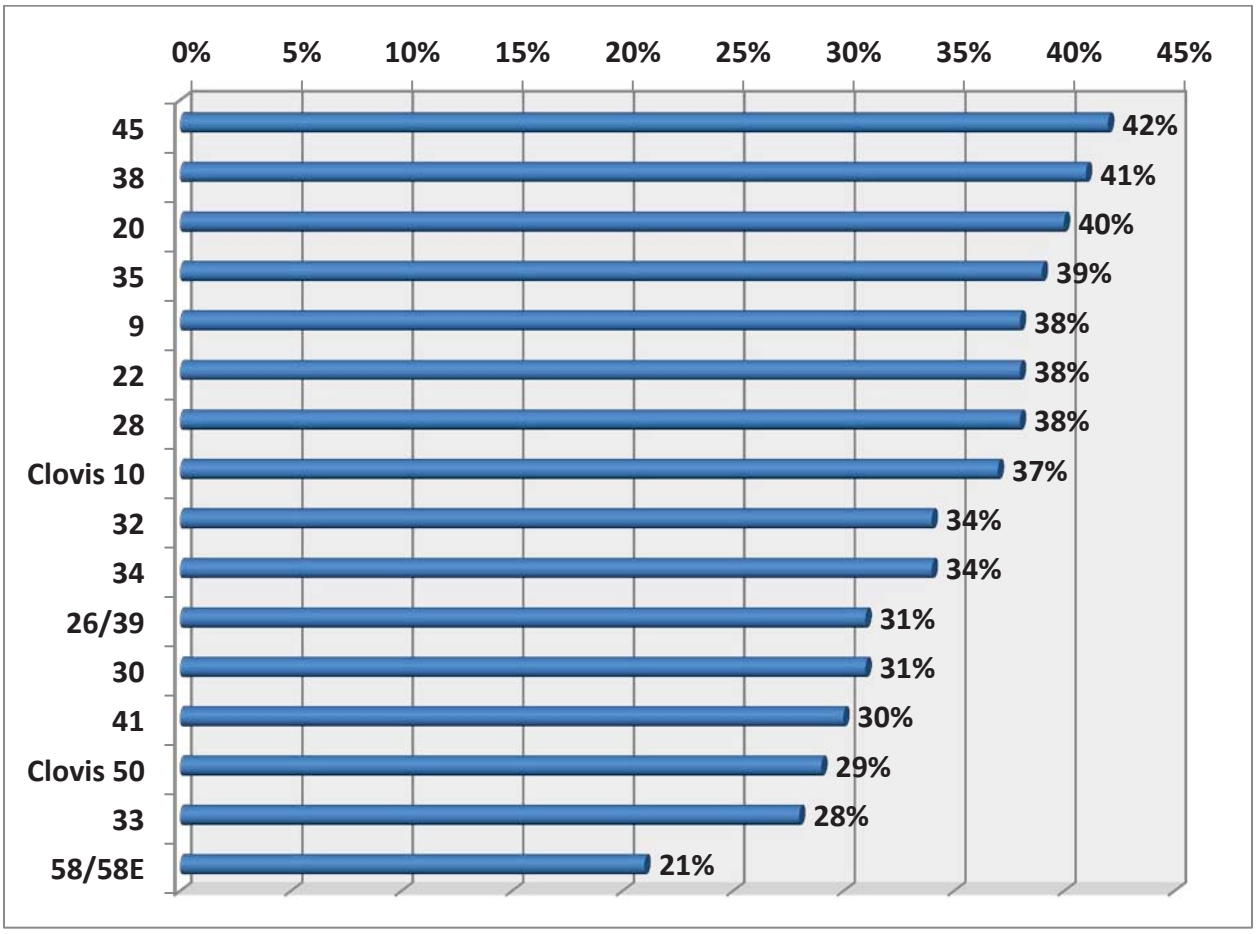


Table 3-1: Major Transfer Connections

First Transfer	# of First Transfers	Second Transfer	# of Second Transfers	Third Transfer	# of Third Transfers
28-to-30	52	28-to-30	15	30-to-26	7
41-to-28	50	38-to-9	14	32-to-28	6
30-to-28	44	9-to-38	13	28-to-41	6
9-to-30	43	28-to-26	13	41-to-30	5
41-to-30	43	28-to-32	13	28-to-38	5
28-to-9	40	28-to-34	13	30-to-28	4
38-to-28	39	32-to-30	13	38-to-30	4
22-to-28	38	28-to-9	12	41-to-28	4
28-to-38	36	28-to-41	12		
34-to-28	36	30-to-41	12		

Figure 3-13 indicates the routes that have the most and least transfer activity—namely the percentage that is depicted is the percentage of riders who do not require a transfer and are able to complete their trip on one bus only. Routes 45 (42 percent ride only one bus), 38 (41 percent) and 20 (40 percent) show less transfer activity than the other routes, and routes 58/58E (21 percent), 33 (28 percent) and Clovis 50 (29 percent) show the most transfer activity.

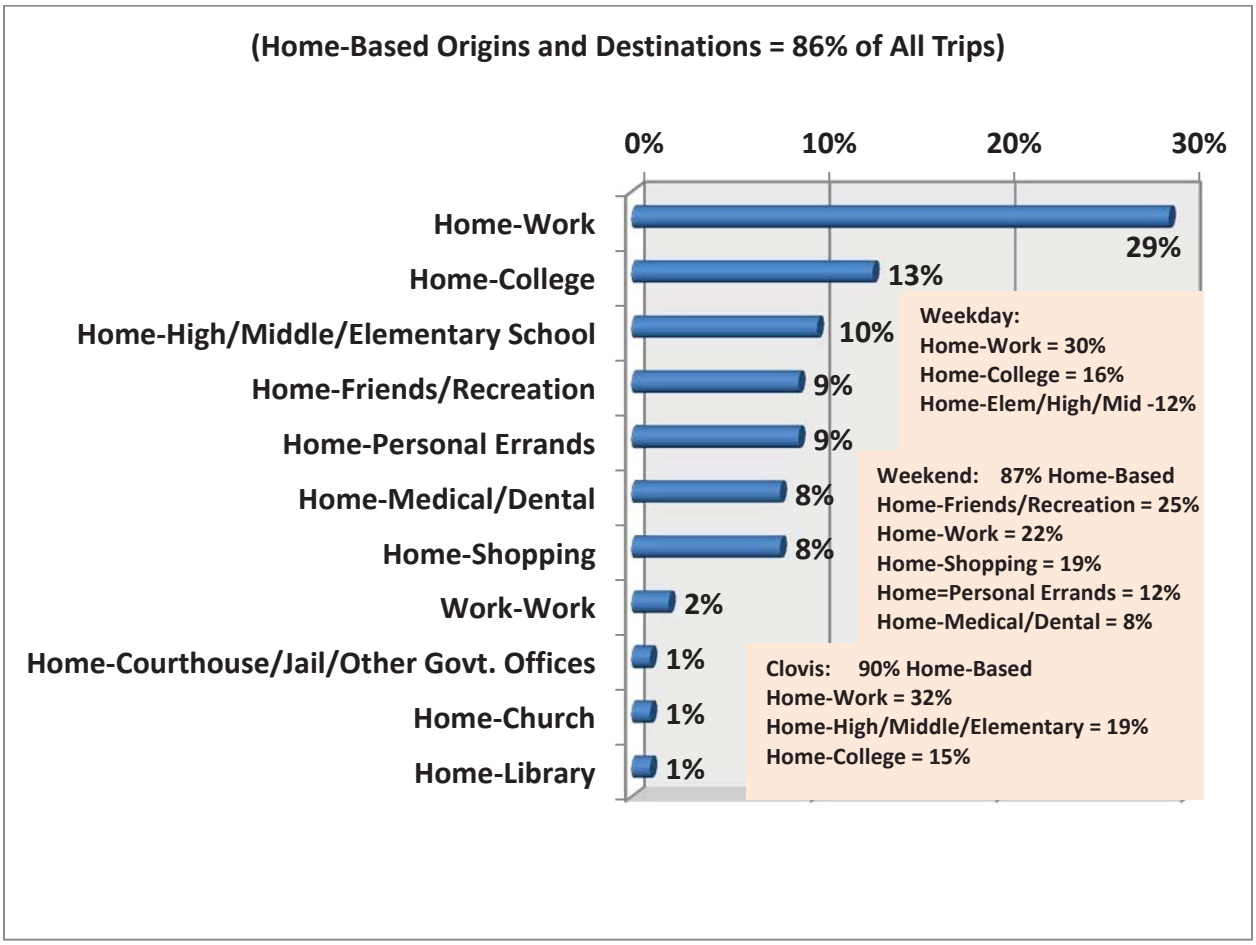
Figure 3-13: Percentage of Riders Who Do Not Require a Transfer by Route



Trip Purpose (Home-Based Trips): Figure 3-14 shows that nearly 9 in 10 trips (86 percent) are home-based, indicating that the home is either the origin or destination of the trip. Home-work trips comprise 29 percent of these trips, and another 23 percent relate home-school trips – 13 percent College and 10 percent high school, middle school, and elementary school. On weekdays, home-work trips represent 30 percent of all trips and home-school totals a very substantial 28 percent of all weekday trips. For weekend respondents, the home-based percentage is similar to the overall sample population – 87 percent. On weekends, however, work is a less prevalent destination and, consequently, the home-based percentages change to reflect a different pattern of trip purposes. For example, the dominant home-based weekend trip is home-friends/recreation (25 percent) followed by home-work (22 percent), and home-shopping (19 percent). School trips, as would be expected, are inconsequential on weekends.

Clovis home-based trips are similar in structure to the overall sample. That is, these home-based trips represent 90 percent of all trips. Nearly one-third (32 percent) are home-work – 7 percent more than the overall sample and another 34 percent are either home to high school, middle school, or elementary school (19 percent) or College (15 percent). The Clovis home-school trip purpose is 11 percent higher than the same trip purpose for the overall sample.

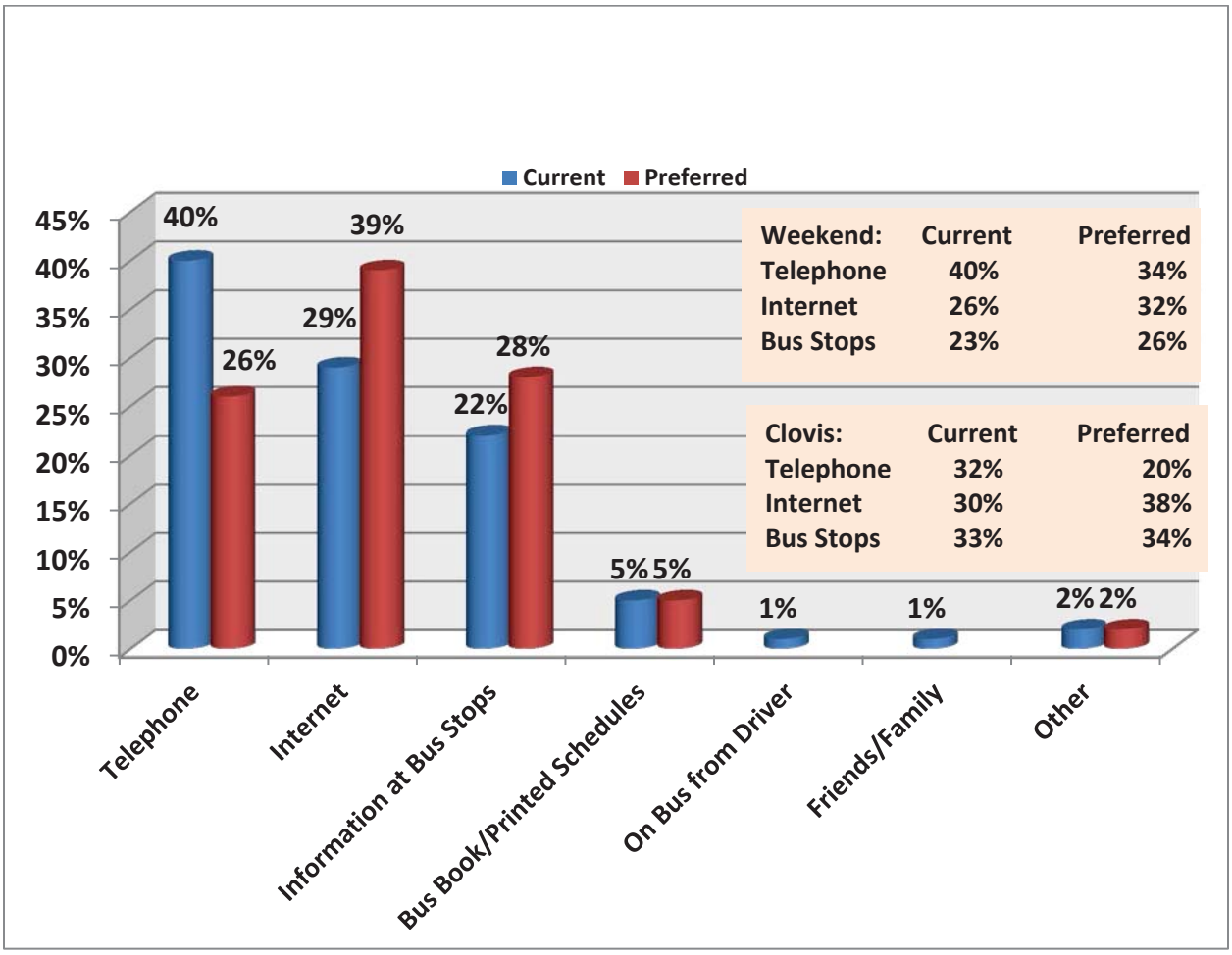
Figure 3-14: Major Trip Purposes--Origins/Destinations



Current and Preferred Methods for Receiving Transit Information: Figure 3-15 shows the source/method most used by sample respondents currently to obtain information about public transit; the preferred method of obtaining this information at some point in the future is also shown. The respondents express interest in three primary sources of information: telephone, Internet, and information at bus stops. Two-fifths (40 percent) of the respondents currently use the telephone but only approximately one-fourth (26 percent) would prefer to use the telephone as a source of information. Conversely, 29 percent currently use the Internet for transit information with nearly two-fifths (39 percent) preferring to do so in the future. It is clear that bus riders would like to move from older media such as the telephone into newer media available online. Regarding information obtained at bus stops, there is some sustained interest among respondents to use this method to obtain transit information. Currently, 22 percent receive information at the bus stops and 28 percent would prefer this method in the future.

Also indicated in Figure 3-15 are the current and preferred methods of receiving transit information for weekend respondents as well as Clovis respondents. The patterns for these two subgroups are consistent with the overall sample.

Figure 3-15: Current and Preferred Methods for Receiving Transit Information



- The patterns depicted in **Figure 3-15** are, by and large, reflected in

- **Figure** 3-16 where current and preferred methods of receiving information are shown by income category. For each income level, respondents prefer to reduce their reliance on the telephone and increase their use of the Internet (**Figure 3-15**). This is particularly true in the $40,000 and more income category where 36 percent currently obtain information from the telephone but only 16 percent would prefer this method in the future. In the $10,000 to under $20,000 category, 42 percent prefer the Internet in the future compared to only 30 percent who currently use it.

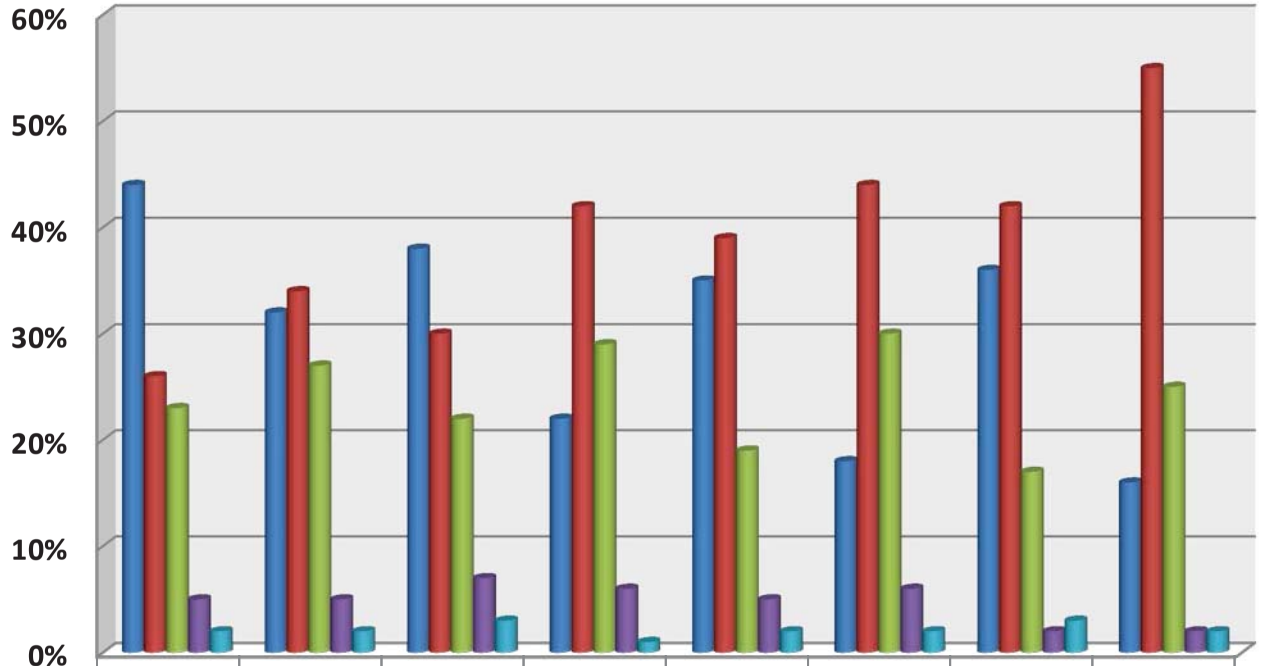
- **Figure 3-17** demonstrates the dominant pattern exhibited in **Figure 3-15** and. That is, there is strong interest, for each category of work status, in reducing reliance on the telephone to receive transit information and to increase reliance on the Internet. Students (40 percent) are more likely to use the Internet for transit information than are those who are disabled (12 percent) or retired (7 percent). In addition to their strong preference for Internet information in the future (48 percent), students also express interest in increasing their use of information at the bus stops (from 17 percent

currently to 27 percent in the future). Information at bus stops is currently used the most by retired (35 percent) and disabled riders (28 percent) and they retain essentially this same degree of interest in these information media in the future.

The following relationships are associated with **current sources of transit information** and indicate the subgroups that are more likely to use particular informational sources:

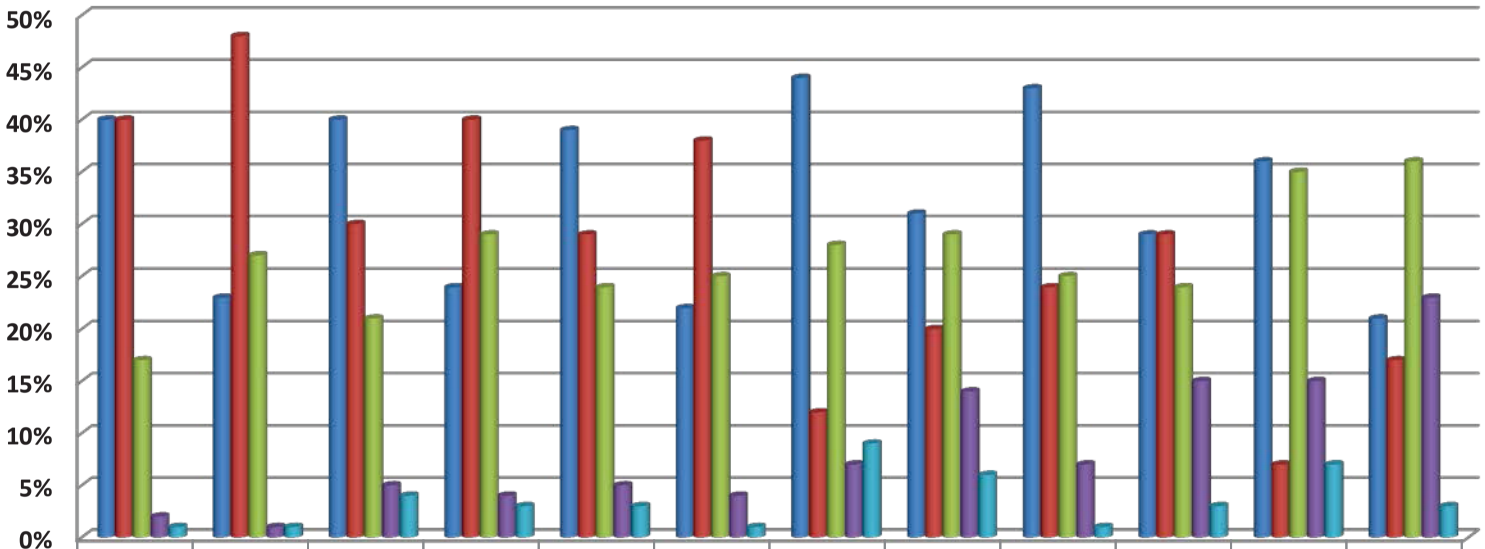
- The Internet is currently used largely by respondents who are 44 years of age and under (36 percent) as opposed to those who are 45 years of age and over (14 percent).
- Information at bus stops is currently pursued to a greater extent by respondents who are 45 years of age and over (32 percent) versus those who are 44 years of age and under (18 percent).
- With regard to ethnicity, the telephone is currently used, for the most part, by African-Americans/Blacks (48 percent) versus Asians (30 percent); the Internet is used currently by Hispanic/Latinos (32 percent) and Caucasian/Whites (31 percent) to a greater extent than it is used by African-Americans/Blacks (23 percent); Asians (30 percent) currently prefer to receive transit information at bus stops more so than do Hispanic/Latinos and African-Americans/Blacks (each 22 percent) and Caucasian/Whites (21 percent).
- The Internet is currently used by respondents who earn an annual household income of $20,000 or more (40 percent) as opposed to those who earn under $20,000 annually (27 percent).

Figure 3-16: Current and Preferred Sources of Transit Information by Income



	Current	Preferred	Current	Preferred	Current	Preferred	Current	Preferred
	Under $10,000		$10,000-to-Under $20,000		$20,000-to-Under $40,000		$40,000 and more	
Telephone	44%	32%	38%	22%	35%	18%	36%	16%
Internet	26%	34%	30%	42%	39%	44%	42%	55%
Information at Bus Stops	23%	27%	22%	29%	19%	30%	17%	25%
Bus Book/Printed Schedules	5%	5%	7%	6%	5%	6%	2%	2%
Other	2%	2%	3%	1%	2%	2%	3%	2%

Figure 3-17: Current and Preferred Sources of Transit Information by Work Status



	Student		Employed Full-Time		Not Employed		Disabled		Homemaker		Retired	
	Current	Prefer	Current	Prefer	Current	Prefer	Current	Prefer	Current	Prefer	Current	Prefer
Telephone	40%	23%	40%	24%	39%	22%	44%	31%	43%	29%	36%	21%
Internet	40%	48%	30%	40%	29%	38%	12%	20%	24%	29%	7%	17%
Information at Bus Stops	17%	27%	21%	29%	24%	25%	28%	29%	25%	24%	35%	36%
Bus Book/Printed Schedules	2%	1%	5%	4%	5%	4%	7%	14%	7%	15%	15%	23%
Other	1%	1%	4%	3%	3%	1%	9%	6%	1%	3%	7%	3%

- With regard to the language used to complete the survey, Spanish language respondents tended to use the telephone for transit information (49 percent) more than English language respondents (40 percent); English language respondents are more oriented to the Internet (30 percent) versus Spanish language respondents (14 percent); Spanish language respondents are more likely to use bus stop information (32 percent) than are English language respondents (22 percent).

The following relationships are associated with **preferred sources of transit information** and indicate the subgroups that may use particular informational sources at some time in the future:

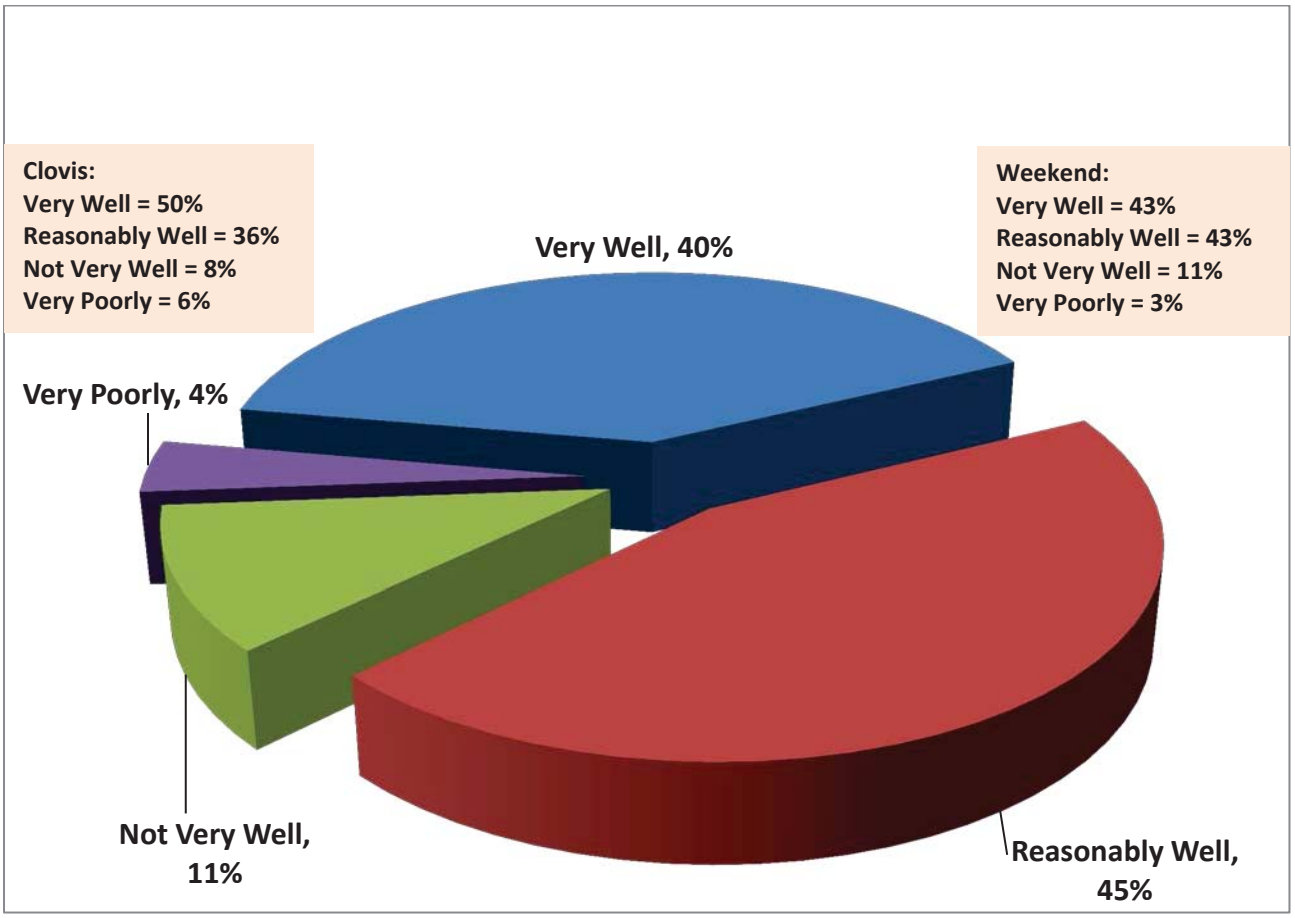
- More frequent bus users (1 day per week or more – 26 percent) versus less frequent riders (less than once per week – 20 percent) would prefer to use the telephone for transit information.

- The Internet would be preferred by those who earn $50,000 or more (63 percent) as opposed to those who earn under $50,000 (38 percent).

Respondent Satisfaction with the FAX and Clovis Bus Systems: In general, sample respondents are highly satisfied with the FAX and Clovis bus systems in terms of having their transportation needs met and regarding how long it takes to make their trip. The following analysis provides details to support this finding.

Satisfaction that Transportation Needs Are Met: Figure 3-18 shows that riders generally agree that their transportation needs are being met by the FAX and Clovis bus systems. It is noteworthy that 85 percent feel that their needs are being met either very well (40 percent) or reasonably well (45 percent). This positive sentiment is reflected among weekend respondents as well as among Clovis respondents. The dominant finding in **Figure 3-19** is that the sample respondents, across income categories, feel that their transportation needs are being met either very well or reasonably well, with at least 80 percent in each category being very well or reasonably well satisfied.

Figure 3-18: How Well Are Transportation Needs Met By FAX and Clovis Stageline?



It is clear from **Figure 3-20** that sample respondents, for each work status category, feel that their transportation needs are being well met by these Fresno area bus systems. Retired individuals (92 percent either very well or reasonably well) and homemakers (90 percent either very well or reasonably well) are most inclined to feel that their needs are being met. Those employed either part time (83 percent) or full time (82 percent) are least inclined to feel their transportation needs are being met, but are still highly positive about the bus systems meeting their needs.

Certain categories of respondents feel that their transportation needs are **very well** served by the FAX and Clovis systems. They are as follows:

- Respondents who completed the survey in Spanish (72 percent) versus those who completed it in English (39 percent).
- Infrequent respondent bus riders (first time – 58 percent and once per month – 46 percent) as opposed to more frequent riders (3 days or more per week – 38 percent).

Figure 3-19: How Well Transportation Needs Are Met According to Income

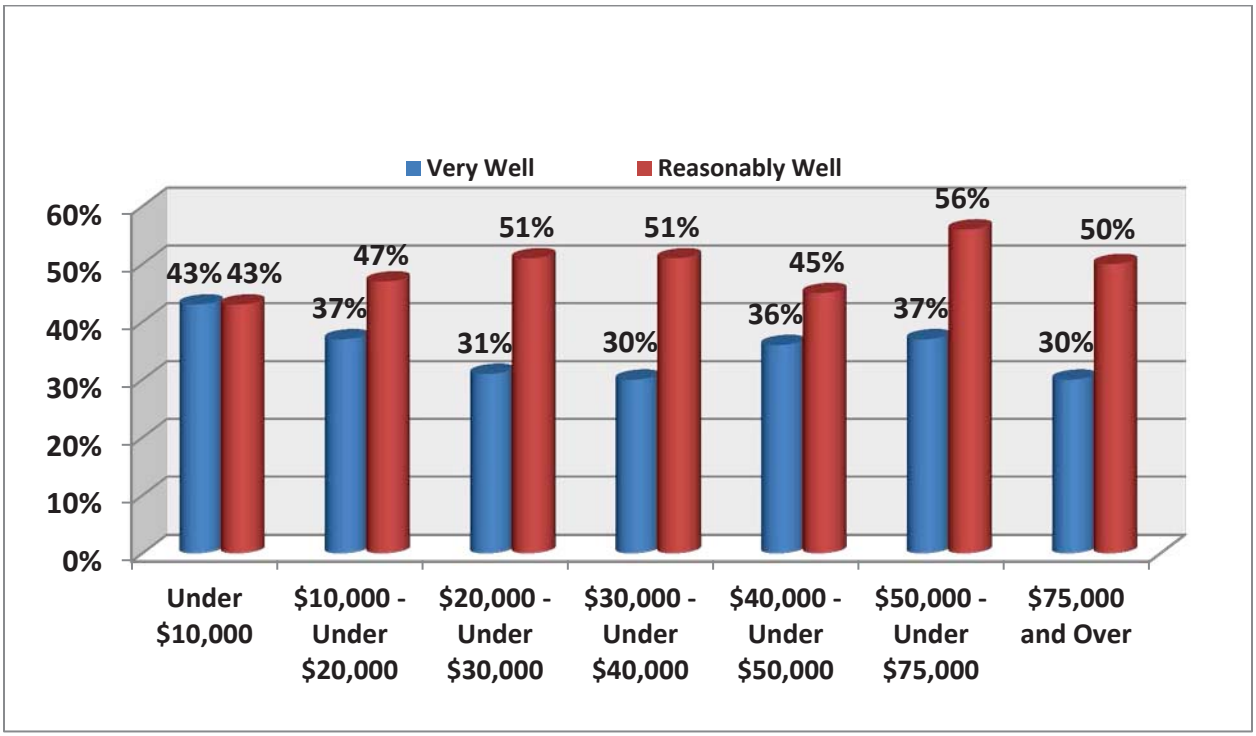
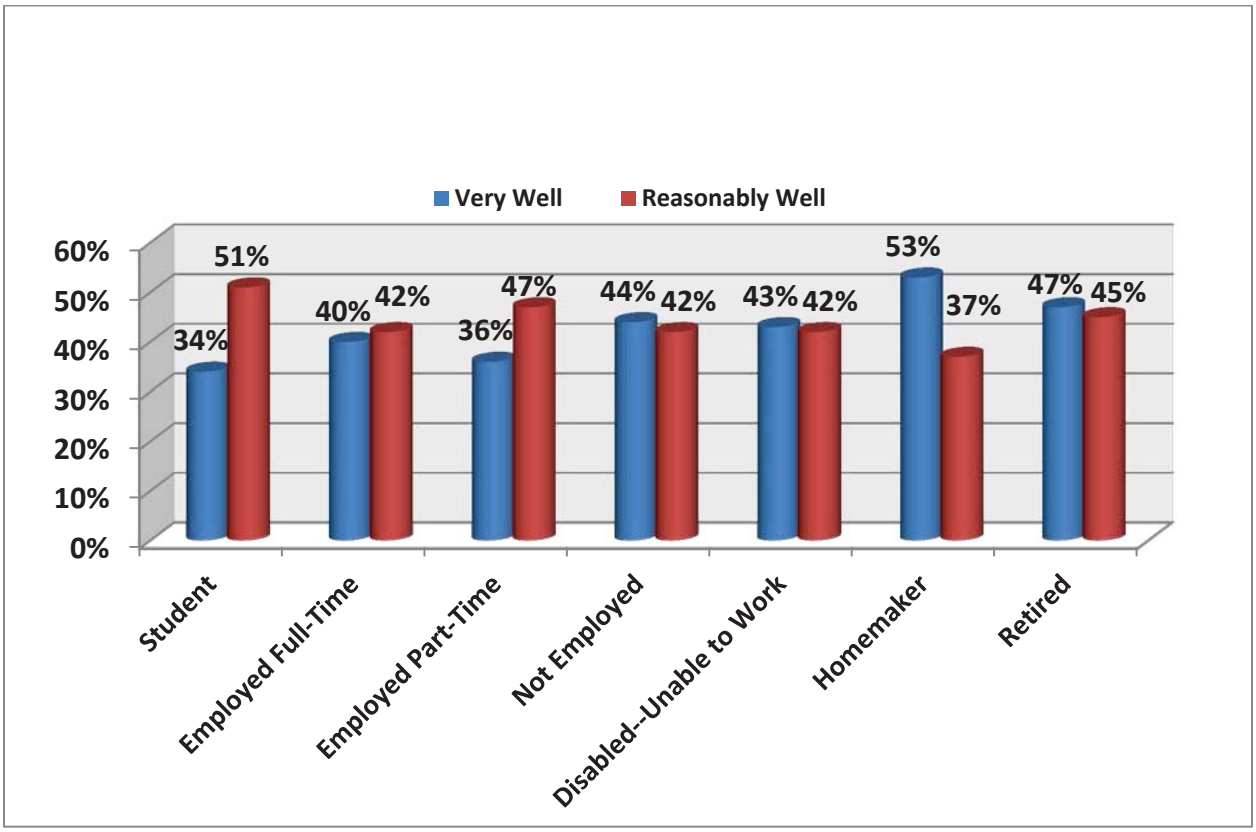
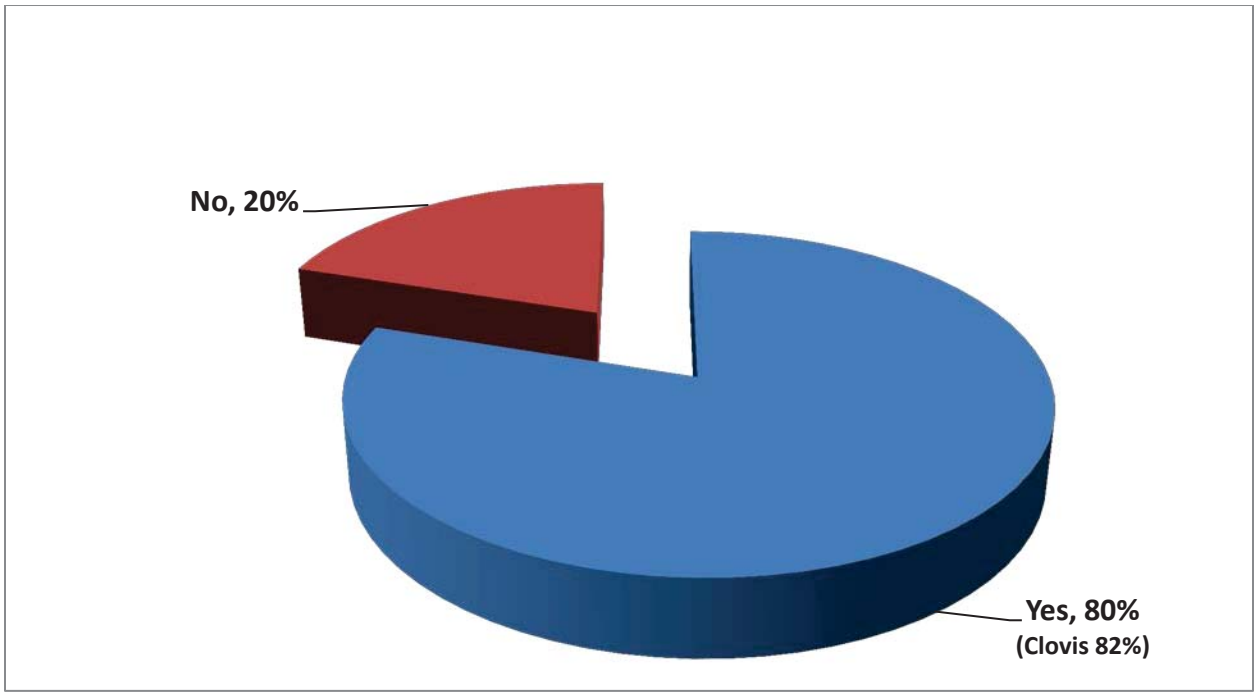


Figure 3-20: How Well Transportation Needs Are Met According to Work Status



Satisfaction with Trip Time: **Figure 3-21** indicates that four-fifths (80 percent) of sample respondents are satisfied with the time it takes to make their trip. Clovis respondents (82 percent) reflect this overall high level of satisfaction. As shown in **Figure 3-22**, this satisfaction with trip time cuts relatively equally across income levels, ranging between 74 percent and 81 percent satisfied.

Figure 3-21: Satisfied with Trip Time?



- There are some differences to highlight with regard to trip time satisfaction according to work status category. It is evident from **Figure 3-23** that students and those who are employed are not as satisfied as those who are not employed outside of the home. Students (76 percent) are satisfied while homemakers (87 percent) are the most satisfied of all work status subgroups.

- The following subgroups are more likely to be satisfied with their trip time:

    - Older respondents (45 years of age and over – 84 percent) as opposed to younger respondents (24 years of age and under – 76 percent).

    - Respondents who completed the survey in Spanish (91 percent) versus those who completed it in English (79 percent).

    - Less frequent riders of the bus (less than 1 month – 89 percent) versus more frequent bus riders (5 days or more – 78 percent).

    - Respondents who do not make any transfers (83 percent) are more satisfied with their trip time than are respondents who make 1 or more transfers (78 percent). It is noteworthy that the high level of satisfaction regarding trip time does not change for respondents making one, two, or three or more transfers.

Figure 3-22: Percentage Satisfied with Trip Time by Household Income

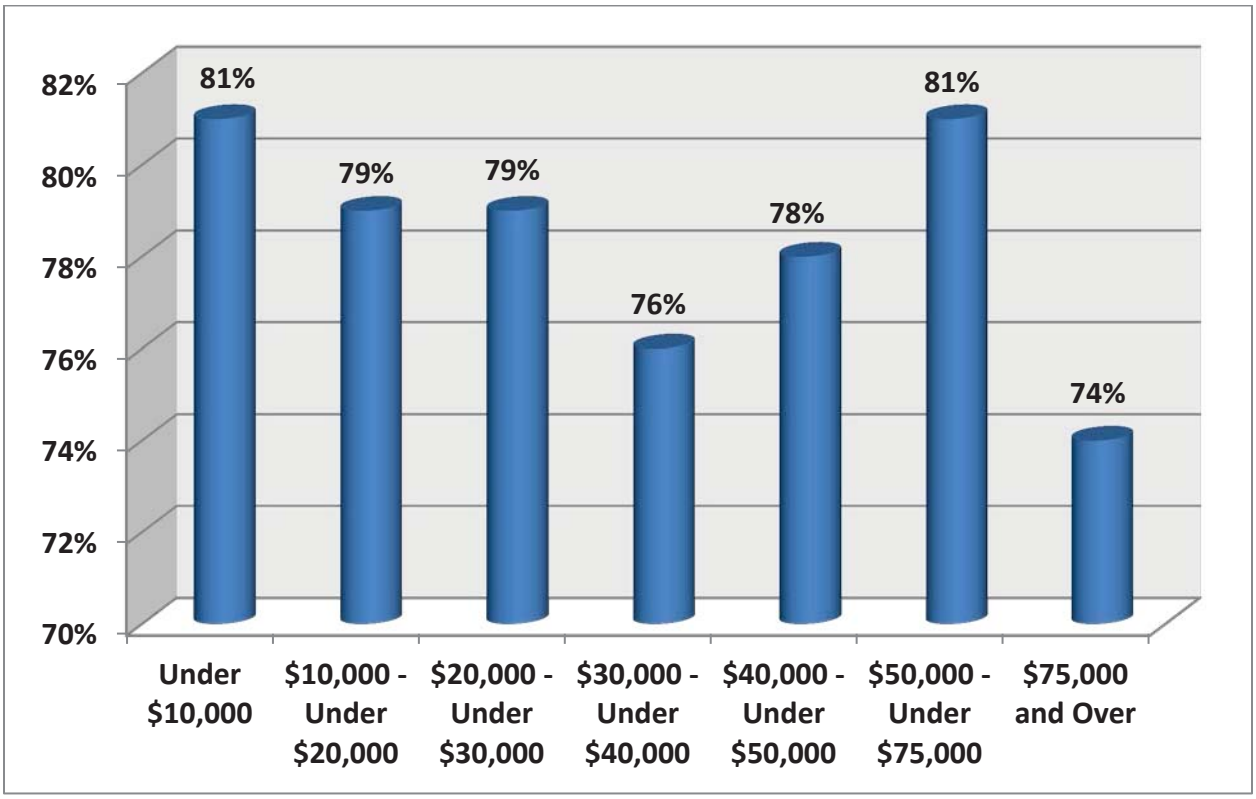
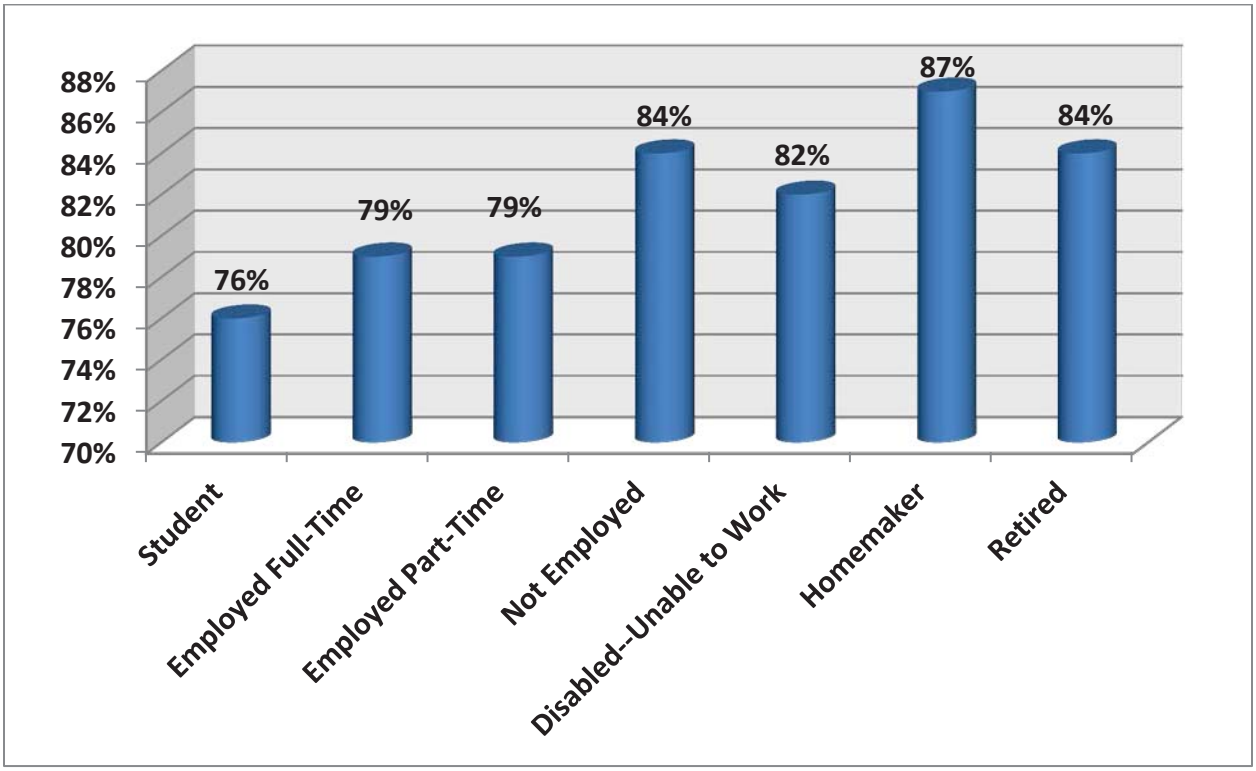


Figure 3-23: Percentage Satisfied with Trip Time by Work Status



APPENDIX

Questionnaires (English and Spanish)

Frequency Distributions

FAX CUSTOMER SATISFACTION SURVEY

If you can fill out this short questionnaire either while you are waiting for your bus or as you get off your bus, you will be providing important information to FAX about your bus service. If you do not have time before your bus arrives or before you need to get to your destination, please take the questionnaire with you to complete. Then mail it back at our cost, or drop it off at Manchester Transit Center (MTC) by March 28, 2014.

REGISTER TO BE ONE OF THREE TO WIN $100 BY FULLY COMPLETING THIS SURVEY, RETURNING IT BY MARCH 28, 2014 AND INCLUDING THE FOLLOWING CONTACT INFORMATION.

YOUR ANSWERS WILL STILL COUNT EVEN IF YOU CHOOSE NOT TO SUPPLY THIS INFORMATION

NAME:_____

ADDRESS:_____

CITY:_____ST_____ZIP_____

HOME PHONE OR CELL:_____

E-MAIL:_____

TRAVEL CHARACTERISTICS

Q1. What is the bus route number that you are getting ready to board or just finished riding? _____ (BUS ROUTE)

Q2. Is this one of your regular bus routes? 1.____Yes **[IF YES, SKIP Q2a and GO TO Q3]** 2. ___No

Q2a. [ANSWER IF Q2 = NO] What is the number of one of your regular bus routes? _____ (BUS ROUTE)

Q3. How many one-way trips on FAX do you take in a typical week?
(If you take a round trip, that would be counted as two trips) _____ (NUMBER OF WEEKLY TRIPS)

Q4. What is the purpose of your typical FAX bus trip? (CHECK ONLY ONE)

1. ____College
2. ____High/Middle/Elementary School
3. ____Work/Business
4. ____Shopping
5. ____Errands/Personal
6. ____Recreational/Social
7. ____Medical/Dental
8. ____Other, please specify

_____

Q5. Besides your most typical trip, what is the next most frequent purpose for your bus trips? (CHECK ONLY ONE)

1. ____College
2. ____High/Middle/Elementary School
3. ____Work/Business
4. ____Shopping
5. ____Errands/Personal
6. ____Recreational/Social
7. ____Medical/Dental
8. ____Other, please specify
_____
9.____ I do not make any other types of trips

Q6. How long have you been riding FAX, in terms of months or years?

___years ___months (write number of years and/or months)

Q7. Has the number of trips you take using FAX buses changed since started riding FAX?

1.____ Yes, it has increased
2. ____Yes, it has decreased
3. ____No change

Q8. How do you normally pay your fare? (CHECK ONLY ONE)

1. ____Cash
2. ____Token
3. ____Metro Pass
4. ____Special Rider Pass
5. ____Senior Pass
6. ____Other, please specify
_____

Q9. Do you have access to a car or other vehicle to make the same kinds of trips that you make by FAX?

1.____Yes 2. ___No [IF NO, SKIP Q9a AND GO TO #10)

Q9a. (ANSWER IF Q9 = YES) Why do you ride FAX instead of using that car or other vehicle for your trips?

_____

SATISFACTION

Q10. Please indicate your satisfaction or dissatisfaction with each of the FAX bus features listed below by placing a check mark in a box for each feature.

Bus Feature	RANK YOUR SATISFACTION WITH EACH BUS FEATURE ON A SCALE OF 1-to-6 CHECK ONLY ONE COLUMN FOR EACH BUS FEATURE					
	1 = Very Satisfied	2 = Satisfied	3 = Slightly Satisfied	4 = Slightly Dissatis-fied	5 = Dissatis-fied	6 = Very Dissatis-fied
1) On time performance						
2) Frequency of buses						
3) Time it takes to complete trip						
4) Cleanliness inside buses						
5) Cleanliness of bus stops and transfer stations						
6) Personal safety on board FAX buses						
7) Personal safety at bus stops and transfer stations						
8) Typical FAX bus drivers' courtesy						
9) Typical FAX bus drivers' helpfulness						
10) Typical FAX bus drivers' driving skills						
11) Typical FAX bus drivers' safety awareness						
12) Overall comfort of bus rides						
13) Availability of route/ schedule information						
14) Bus hours of operation on weekdays						
15) Bus hours of operations on weekends						
16) Closeness of bus stops to home						
17) Closeness of bus stops to destination						
18) Value provided by FAX for the price paid						
19) Overall service provided by FAX						

Q11a. Please write the number of the bus service feature that you consider to be MOST IMPORTANT to you _____.
Please include only features "1" through "18" above in your response.

Q11b. Please write the number of the bus service feature that you consider to be SECOND MOST IMPORTANT _____.
Please include only features "1" through "18" above in your response.

COMMUNICATION

Q12. Is FAX presenting information on fares, routes, and schedules in a clear, easily understood way?
1.____Yes [IF YES, SKIP Q12a AND GO TO #13) 2. ___No

Q12a. (IF Q12 = NO). What is unclear or hard to understand? _____

Q13. How would you prefer that FAX communicate fare, route, or schedule information/changes to you?
(CHECK ANY/ALL THAT APPLY)

1. ____Pamphlet or printed materials
2. ____FAX's website
3. ____Posters on board the buses
4. ____FAX's electronic signs at bus stops or transfer stations
5. ____Mobile/Cell Phone to cell number provided by you to FAX
6. ____Email to address provided by you to FAX
7. ____Other, please specify_____

Q14. Have you ever visited FAX's website?

1.____Yes [IF YES, GO TO #15) 2. ___No [IF NO, PLEASE ANSWER Q14a AND THEN SKIP Q15]

Q14a. [ANSWER IF Q14 = NO] Do you know how to go to the FAX website on a computer?

1. _____Yes 2. _____No

Q15. Are you satisfied with FAX's website?

1._____Yes 2. _____No

DEMOGRAPHICS

AGE. Which of the following age categories best describes your current age?

1. ____Under 18 years old
2. ____18 to 34 years old
3. ____35 to 54 years old
4. ____55 to 74 years old
5. ____75 years old or more

WORK. What is your work status?

1. ____Employed Full-Time
2. ____Employed Part-Time
3. ____Self-Employed
4. ____Student and Employed
5. ____Student and Not Employed
6. ____Homemaker
7. ____Retired
8. ____Unemployed
9. ____Disabled and Unable to Work

ETHNICITY. Which of the following most closely describes your ethnic background?

1. ____Hispanic
2. ____White/Caucasian
3. ____African American/Black
4. ____Asian/Southeast Asian (please specify national origin or Asian ethnic group_____)
5. ____American Indian
6. ____Pacific Islander
7. ____Middle Easterner
8. ____Other, please specify_____

GENDER. 1._____Male 2. _____ Female

EDUC. What is the last grade in school you have completed?

1. ____Less than 8th Grade Education
2. ____Some High School
3. ____High School Graduate
4. ____Vocational/Technical School
5. ____College Graduate

LANGUAGE. What is the primary language spoken in your home?

1. ____English
2. ____Spanish or Spanish Creole
3. ____Hmong
4. ____Laotian
5. ____Other Indic (Indo-Aryan) languages
6. ____Mon-Khmer, Cambodian
7. ____Chinese
8. ____Arabic
9. ____Vietnamese
10. ____Armenian
11. ____Tagalog
12. ____Other, please specify _____

INCOME. Which of the following categories best describes your total household income in 2013, before taxes?

1. ____Less than $10,000 per year
2. ____$10,000 to $19,999 per year
3. ____$20,000 to $29,999 per year
4. ____$30,000 to $39,999 per year
5. ____$40,000 to $49,999 per year
6. ____$50,000 or more per year

On behalf of FAX and Rea & Parker Research, thank you for your time and survey participation

Please return the completed form to the surveyor. You can also fold, seal, and mail it back at our cost or you can drop it off at the Manchester Transit Center by March 28, 2014.

ENCUESTA DE SATISFACCIÓN DE CLIENTES DEL SISTEMA DE TRANSPORTE FAX

Si puede usted llenar este breve cuestionario, ya sea mientras espera su autobús o cuando se baje de su autobús, estará proporcionando información importante a FAX acerca de su servicio de autobús. Si usted no tiene tiempo antes de que llegue su autobús o antes de que tenga que llegar a su destino, por favor llévese el cuestionario para que lo llene. Luego envíelo por correo por nuestra cuenta, o entréguelo en el Centro de Tránsito de Manchester (MTC, por sus siglas en inglés) a más tardar el 28 de marzo de 2014.

INSCRÍBASE PARA SER UNO/A DE TRES EN GANAR $100 POR LLENAR COMPLETAMENTE ESTA ENCUESTA, POR REGRESARLA A MÁS TARDAR EL 28 DE MARZO DE 2014 Y POR INCLUIR LA SIGUIENTE INFORMACIÓN DE CONTACTO.

SUS RESPUESTAS SERÁN TOMADAS EN CUENTA AUN SI USTED DECIDE NO PROPORCIONAR ESTA INFORMACIÓN.

NOMBRE_____

DIRECCIÓN_____

CIUDAD_____EDO___CÓDIGO_____

TELÉFONO CASA O CELULAR_____

CORREO-E _____

CARACTERÍSTICAS DEL VIAJE

P1. ¿Cuál es el número de ruta del autobús que usted está por abordar o de la que acaba de viajar? _____ (escriba ruta del autobús)

P2. ¿Es ésta una de sus rutas regulares de autobús? 1. _____Sí [SI CONTESTÓ SÍ, CONTINÚE EN LA P3] 2. _____No

P2a. [CONTESTE SI LA P2 = NO] ¿Cuál es el número de una de sus rutas regulares de autobús? _____ (escriba ruta del autobús)

P3. ¿Cuántos viajes sencillos (de ida; en una sola dirección) toma usted por FAX en una semana típica?
(Si usted realiza un viaje redondo [ida y vuelta], se cuenta como dos viajes) _____ (escriba número de viajes)

P4. ¿Cuál es el propósito de su viaje típico por autobús de FAX? (MARQUE SOLAMENTE UNA)

1. ____Universidad/Colegio comunitario
2. ____Escuela preparatoria/secundaria/primaria
3. ____Trabajo/Negocios
4. ____Compras
5. ____Encargos/Personal
6. ____Diversión/Social
7. ____Médico/Dental
8. ____Otro, favor de especificar _____

P5. Además de su viaje más típico, ¿cuál es el siguiente propósito más frecuente de sus viajes por autobús?
(MARQUE SOLAMENTE UNA)

1. ____Universidad/Colegio comunitario
2. ____Escuela preparatoria/secundaria/primaria
3. ____Trabajo/Negocios
4. ____Compras
5. ____Encargos/Personal
6. ____Diversión/Social
7. ____Médico/Dental
8. ____Otro, favor de especificar _____
9. ____Yo no realizo ningún otro tipo de viaje

P6. ¿Cuánto tiempo lleva viajando por FAX, en términos de meses o años?
___años ___meses (escriba número de años y/o meses)

P7. ¿Ha cambiado el número de viajes que realiza en los autobuses FAX desde que empezó a viajar por el sistema FAX?

1. ____Sí, ha aumentado
2. ____Sí, ha disminuido
3. ____No ha cambiado

P8. ¿Cómo paga normalmente su pasaje/boleto de autobús? **(MARQUE SOLAMENTE UNA)**

1____Efectivo
2____Ficha
3____Pase Metr
4____Pase especial de viajero
5____Pase para personas mayores/de la tercera edad
7. 6____Otro, favor de especificar _____

P9. ¿Tiene acceso a un automóvil u otro vehículo para realizar el mismo tipo de viajes que usted hace por FAX?

1. _____Sí 2. _____No [SI CONTESTÓ NO, SALTE LA P9a Y CONTINÚE EN LA #10)

P9a. (CONTESTE SI LA P9 = SÍ) ¿Por qué viaja en FAX en lugar de utilizar ese automóvil u otro vehículo para sus viajes?

_____

SATISFACCIÓN

P10. Por favor indique su satisfacción o insatisfacción con cada una de las características de autobuses de FAX que se enumeran a continuación, colocando una marca en la columna para cada característica.

Característica del Autobús	CALIFIQUE SU SATISFACCIÓN CON CADA CARACTERÍSTICA DEL AUTOBÚS EN UNA ESCALA DEL 1 AL 6 MARQUE SOLAMENTE UNA COLUMNA PARA CADA CARACTERÍSTICA					
	1 = Muy satisfecha/o	2 = Satis-fecha/o	3 = Ligera-mente satis-fecha/o	4 = Ligera-mente insatis-fecha/o	5 = Insatis-fecha/o	6 = Muy insatis-fecha/o
1) Desempeño en la puntualidad						
2) Frecuencia de los autobuses						
3) Tiempo que toma realizar el viaje						
4) Limpieza dentro de los autobuses						
5) Limpieza de las paradas de autobuses y estaciones de transferencia						
6) Seguridad personal a bordo de los autobuses FAX						
7) Seguridad personal en las paradas de autobuses y estaciones de transferencia						
8) Cortesía típica de los/las conductores de los autobuses FAX			1)			
9) Disposición típica para ayudar de los/las conductores de los autobuses FAX						
10) Destrezas típicas para conducir de los/las conductores de los autobuses FAX						
11) Concientización típica de seguridad de los/las conductores de los autobuses FAX						
12) Comodidad general en los viajes de autobús						
13) Disponibilidad de información de rutas/horarios						
14) Horas de operación de los autobuses en días laborales (entre semana)						
15) Horas de operación de los autobuses en fines de semana						
16) Cercanía de las paradas de autobuses a su hogar						
17) Cercanía de las paradas de autobuses a su parada final (destino)						
18) Valor que FAX proporciona por el precio pagado						
19) Servicio general que FAX proporciona						

P11a. Por favor escriba el número de la característica del servicio de autobús que considere la más importante para usted:_____.
Por favor incluya únicamente las características "1" al "18", especificadas arriba, en su respuesta.

P11b. Por favor escriba el número de la característica del servicio de autobús que considere la **segunda más** importante para usted: _____. **Por favor incluya únicamente las características "1" al "18", especificadas arriba, en su respuesta.**

COMUNICACIÓN

P12. ¿Está FAX presentando la información sobre tarifas, rutas y horarios de manera clara y fácil de entender?
1. _____Sí [SI CONTESTÓ SÍ, SALTE LA P12a Y CONTINÚE EN LA P13] 2. _____No

P12a. (SI P12 = NO). ¿Qué es lo que no está claro o es difícil de entender? _____

P13. ¿Cómo preferiría que FAX le comunicara a usted información/cambios sobre las tarifas, rutas u horarios?
(MARQUE CUALQUIERA/TODOS LOS QUE CONSIDERE)

8. ____Folleto o materiales impresos
9. ____Sitio web de FAX
10. ____Pósters/carteles a bordo de los autobuses
11. ____Letreros electrónicos de FAX en las paradas de autobuses o estaciones de transferencia
12. ____Teléfono móvil/celular al número de celular que usted proporcione a FAX
13. ____Correo electrónico a la dirección que usted proporcione a FAX
14. ____Otro, favor de especificar _____

P14. ¿Ha visitado alguna vez el sitio web de FAX?
1. _____Sí [SI CONTESTÓ SÍ, CONTINÚE EN LA P15) 2. _____No [SI CONTESTÓ NO, POR FAVOR CONTESTE LA P14a Y LUEGO SALTE LA P15]

P14a. [CONTESTE SI LA P14 = NO] ¿Sabe usted cómo ir al sitio web de FAX en una computadora?
2. _____Sí 2. _____No

P15. ¿Está usted satisfecha/o con el sitio web de FAX?
1._____Sí 2. _____No

DATOS DEMOGRÁFICOS

EDAD. ¿Cuál de las siguientes categorías de edad describe mejor su edad actual?
1. ____Menor de 18 años de edad
2. ____18 a 34 años de edad
3. ____35 a 54 años de edad
4. ____55 a 74 años de edad
5. ____75 años de edad o mayor

TRABAJO. ¿Cuál es su condición laboral?
1. ____Empleada/o tiempo completo
2. ____Empleada/o medio tiempo
3. ____Trabajador/a independiente
4. ____Estudiante y empleada/o
5. ____Estudiante y no empleada/o
6. ____Se dedica al hogar
7. ____Retirada/o (Jubilada/o)
8. ____Desempleada/o
9. ____Discapacitada/o y no puede trabajar

ORIGEN ÉTNICO. ¿Cuál de los siguientes describe con mayor precisión su origen étnico?
1. ____Hispano
2. ____Blanco/Caucásico
3. ____Afroamericano/Negro
4. ____Asiático/Asiático del Sureste
   a. (Por favor especifique origen nacional o grupo étnico asiático _____)
5. ____Indígena de EE.UU.
6. ____Isleño del Pacífico
7. ____del Medio Oriente
8. ____Otro, favor de especificar _____

SEXO. 1_____Masculino 2. _____Femenino

EDUC. ¿Cuál es el último año/grado que terminó en la escuela?
1. ____Menos del 8vo grado/año de educación
2. ____Algo de preparatoria (high school)

3. ____*Graduada/o de la preparatoria*
4. ____*Escuela vocacional/técnica*
5. ____*Graduada/o de la universidad*

IDIOMA. ¿Cuál es el idioma principal que se habla en su hogar?

1. ____*Inglés*
2. ____*Español o español criollo*
3. ____*Hmong*
4. ____*Laosiano/lao*
5. ____*Otros idiomas índicos (indoarias)*
6. ____*Mon-jemer, camboyano*
7. ____*Chino*
8. ____*Árabe*
9. ____*Vietnamita*
10. ____*Armenio*
11. ____*Tagalo*
12. ____*Otro, favor de especificar*

_____

INGRESOS. ¿Cuál de las siguientes categorías describe mejor los ingresos totales de su hogar en el 2013, antes de los impuestos?

1. ____*Menos de $10,000 por año*
2. ____*$10,000 a $19,999 por año*
3. ____*$20,000 a $29,999 por año*
4. ____*$30,000 a $39,999 por año*
5. ____*$40,000 a $49,999 por año*
6. ____*$50,000 o más por año*

Por favor devuelva el formulario completo al encuestador/la encuestadora. También lo puede doblar, sellar y enviar por correo por nuestra cuenta o puede entregarlo en el Centro de Tránsito de Manchester a más tardar el 28 de marzo de 2014.

En representación de FAX y de Rea & Parker Research, agradecemos su tiempo y participación en la encuesta.

Fresno (FAX)/Clovis Origin-Destination Survey Frequencies

Language of Survey

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	English	3605	96.6	96.6	96.6
	Spanish	125	3.4	3.4	100.0
	Total	3730	100.0	100.0	

Day of Week

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Monday	405	10.9	10.9	10.9
	Tuesday	526	14.1	14.1	25.0
	Wednesday	1038	27.8	27.8	52.8
	Thursday	701	18.8	18.8	71.6
	Friday	709	19.0	19.0	90.6
	Saturday	199	5.3	5.3	95.9
	Sunday	152	4.1	4.1	100.0
	Total	3730	100.0	100.0	

Route Number

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	9	347	9.3	9.3	9.3
	10	99	2.7	2.7	12.0
	20	63	1.7	1.7	13.6
	22	280	7.5	7.5	21.2
	26/39	481	12.9	12.9	34.0
	28	554	14.9	14.9	48.9
	30	428	11.5	11.5	60.4
	32	239	6.4	6.4	66.8
	33	108	2.9	2.9	69.7
	34	249	6.7	6.7	76.4
	35	65	1.7	1.7	78.1
	38	286	7.7	7.7	85.8
	41	299	8.0	8.0	93.8
	45	135	3.6	3.6	97.4
	50	55	1.5	1.5	98.9
	58/58E	42	1.1	1.1	100.0
	Total	3730	100.0	100.0	

Bus Line Surveyed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fresno Area Express (FAX)	3570	95.7	95.7	95.7
	Clovis Transit (Stageline)	160	4.3	4.3	100.0
	Total	3730	100.0	100.0	

Bus Direction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	North	1136	30.5	30.5	30.5
	South	1120	30.0	30.0	60.5
	East	523	14.0	14.0	74.5
	West	432	11.6	11.6	86.1
	S/W	228	6.1	6.1	92.2
	E/N	249	6.7	6.7	98.9
	S/E	18	.5	.5	99.4
	W/N	24	.6	.6	100.0
	Total	3730	100.0	100.0	

Trip Start Time (24 Hour)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5:00am-5:59am	3	.1	.1	.1
	6:00am-6:59am	149	4.0	4.0	4.1
	7:00am-7:59am	296	7.9	7.9	12.0
	8:00am-8:59am	343	9.2	9.2	21.2
	9:00am-9:59am	367	9.8	9.8	31.0
	10:00am-10:59am	318	8.5	8.5	39.6
	11:00am-11:59am	339	9.1	9.1	48.7
	12 noon-12:59pm	412	11.0	11.0	59.7
	1:00pm-1:59pm	365	9.8	9.8	69.5
	2:00pm-2:59pm	431	11.6	11.6	81.0
	3:00pm-3:59pm	250	6.7	6.7	87.7
	4:00pm-4:59pm	284	7.6	7.6	95.4
	5:00pm-5:59pm	83	2.2	2.2	97.6
	6:00pm-6:59pm	76	2.0	2.0	99.6
	7:00pm-7:59pm	1	.0	.0	99.7
	8:00pm-8:59pm	11	.3	.3	99.9
	9:00pm-9:59pm	2	.1	.1	100.0
	Total	3730	100.0	100.0	

First Bus Route #

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	9	334	9.0	9.0	9.0
	10	84	2.3	2.3	11.2
	20	88	2.4	2.4	13.6
	22	295	7.9	7.9	21.5
	26	268	7.2	7.2	28.7
	28	521	14.0	14.0	42.6
	30	355	9.5	9.5	52.1
	32	273	7.3	7.3	59.5
	33	98	2.6	2.6	62.1
	34	239	6.4	6.4	68.5
	35	106	2.8	2.8	71.3
	38	307	8.2	8.2	79.6
	39	219	5.9	5.9	85.4
	41	323	8.7	8.7	94.1
	45	153	4.1	4.1	98.2
	50	32	.9	.9	99.1
	58	29	.8	.8	99.8
	70	5	.1	.1	100.0
	80	1	.0	.0	100.0
	Total	3730	100.0	100.0	

First Bus Line

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fresno Area Express (FAX)	3606	96.7	96.7	96.7
	Clovis Transit (Stageline)	123	3.3	3.3	100.0
	Total	3729	100.0	100.0	
Missing	System	1	.0		
Total		3730	100.0		

Second Bus Route #

		Frequency	Percent	Valid Percent	Cumulative Percent
	9	234	6.3	9.6	9.6
	10	29	.8	1.2	10.8
	20	85	2.3	3.5	14.3
	22	128	3.4	5.3	19.6
	26	162	4.3	6.7	26.3
	28	364	9.8	15.0	41.3
	30	349	9.4	14.4	55.6
	32	219	5.9	9.0	64.6
	33	31	.8	1.3	65.9
Valid	34	158	4.2	6.5	72.4
	35	55	1.5	2.3	74.7
	38	223	6.0	9.2	83.9
	39	128	3.4	5.3	89.1
	41	159	4.3	6.5	95.7
	45	61	1.6	2.5	98.2
	50	19	.5	.8	99.0
	58	20	.5	.8	99.8
	70	5	.1	.2	100.0
	Total	2429	65.1	100.0	
Missing	System	1301	34.9		
Total		3730	100.0		

Second Bus Line

		Frequency	Percent	Valid Percent	Cumulative Percent
	Fresno Area Express (FAX)	2377	63.7	97.9	97.9
Valid	Clovis Transit (Stageline)	52	1.4	2.1	100.0
	Total	2429	65.1	100.0	
Missing	System	1301	34.9		
Total		3730	100.0		

Third Bus Route #

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	9	68	1.8	9.5	9.5
	10	20	.5	2.8	12.3
	20	19	.5	2.7	14.9
	22	42	1.1	5.9	20.8
	26	55	1.5	7.7	28.5
	28	80	2.1	11.2	39.7
	30	89	2.4	12.4	52.1
	32	55	1.5	7.7	59.8
	33	18	.5	2.5	62.3
	34	52	1.4	7.3	69.6
	35	15	.4	2.1	71.6
	38	62	1.7	8.7	80.3
	39	32	.9	4.5	84.8
	41	61	1.6	8.5	93.3
	45	23	.6	3.2	96.5
	50	19	.5	2.7	99.2
	58	6	.2	.8	100.0
	Total	716	19.2	100.0	
Missing	System	3014	80.8		
Total		3730	100.0		

Third Bus Line

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fresno Area Express (FAX)	676	18.1	94.4	94.4
	Clovis Transit (Stageline)	40	1.1	5.6	100.0
	Total	716	19.2	100.0	
Missing	System	3014	80.8		
Total		3730	100.0		

Fourth Bus Route #

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	9	11	.3	5.6	5.6
	10	1	.0	.5	6.2
	20	5	.1	2.6	8.7
	22	16	.4	8.2	16.9
	26	16	.4	8.2	25.1
	28	29	.8	14.9	40.0
	30	21	.6	10.8	50.8
	32	15	.4	7.7	58.5
	33	3	.1	1.5	60.0
	34	15	.4	7.7	67.7
	35	7	.2	3.6	71.3
	38	19	.5	9.7	81.0
	39	9	.2	4.6	85.6
	41	17	.5	8.7	94.4
	45	7	.2	3.6	97.9
	50	2	.1	1.0	99.0
	58	2	.1	1.0	100.0
	Total	195	5.2	100.0	
Missing	System	3535	94.8		
Total		3730	100.0		

Fourth Bus Line

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fresno Area Express (FAX)	195	5.2	99.5	99.5
	Clovis Transit (Stageline)	1	.0	.5	100.0
	Total	196	5.3	100.0	
Missing	System	3534	94.7		
Total		3730	100.0		

Starting Place for Trip

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Home	1997	53.5	54.4	54.4
	Work	464	12.4	12.6	67.1
	High/Middle/Elem School	216	5.8	5.9	73.0
	College	253	6.8	6.9	79.9
	Shopping	151	4.0	4.1	84.0
	Medical/Dental	176	4.7	4.8	88.8
	Friends/recreation	169	4.5	4.6	93.4
	Personal Errands	174	4.7	4.7	98.1
	Government Office (except court/jail)	6	.2	.2	98.3
	Other Transportation (Amtrak. Airport)	8	.2	.2	98.5
	Courthouse/Jail	12	.3	.3	98.9
	Church	10	.3	.3	99.1
	Library	7	.2	.2	99.3
	Other	25	.7	.7	100.0
	Total	3668	98.3	100.0	
Missing	System	62	1.7		
Total		3730	100.0		

Origin City

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		126	3.4	3.4	3.4
	Biola	1	.0	.0	3.4
	Calexico	1	.0	.0	3.4
	Calwa	1	.0	.0	3.5
	Clovis	198	5.3	5.3	8.8
	Fowler	1	.0	.0	8.8
	Fresno	3367	90.3	90.3	99.1
	Gilroy	1	.0	.0	99.1
	Hanford	2	.1	.1	99.1
	Madera	10	.3	.3	99.4
	Malaga	4	.1	.1	99.5
	Manteca	1	.0	.0	99.5
	Mendota	1	.0	.0	99.6
	Merced	1	.0	.0	99.6
	Orange Cove	1	.0	.0	99.6
	Pinedale	6	.2	.2	99.8
	Reedley	2	.1	.1	99.8
	Sacramento	1	.0	.0	99.9
	San Diego	1	.0	.0	99.9
	Sanger	2	.1	.1	99.9
	Selma	2	.1	.1	100.0
	Total	3730	100.0	100.0	

Mode of Access

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Drove Alone and Parked	57	1.5	1.6	1.6
	Drove with Other Transit Passengers	47	1.3	1.3	2.9
	Other Transit Passenger Drove	73	2.0	2.0	4.9
	Dropped Off	257	6.9	7.2	12.1
	Walked	2932	78.6	81.8	93.9
	Bicycled	143	3.8	4.0	97.9
	Other Bus System	11	.3	.3	98.2
	School Bus	6	.2	.2	98.4
	Skate, Skateboard, Wheelchair	16	.4	.4	98.9
	Amtrak	5	.1	.1	99.0
	Other Motorized (Taxi, Dial-a-Ride)	4	.1	.1	99.1
	Other	32	.9	.9	100.0
	Total	3583	96.1	100.0	
Missing	Bus (misunderstood question)	80	2.1		
	System	67	1.8		
	Total	147	3.9		
Total		3730	100.0		

Ending Place for Trip

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Home	1204	32.3	33.9	33.9
	Work	676	18.1	19.0	52.9
	High/Middle/Elem School	203	5.4	5.7	58.6
	College	286	7.7	8.0	66.6
	Shopping	239	6.4	6.7	73.3
	Medical/Dental	215	5.8	6.0	79.4
	Friends/recreation	316	8.5	8.9	88.3
	Personal Errands	277	7.4	7.8	96.1
	Government Office (except court/jail)	12	.3	.3	96.4
	Other Transportation (Amtrak. Airport)	8	.2	.2	96.6
	Courthouse/Jail	15	.4	.4	97.0
	Church	32	.9	.9	97.9
	Library	17	.5	.5	98.4
	Other	56	1.5	1.6	100.0
	Total	3556	95.3	100.0	
Missing	System	174	4.7		
Total		3730	100.0		

Destination City

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		315	8.4	8.4	8.4
	Auberry	1	.0	.0	8.5
	Calwa	1	.0	.0	8.5
	Clovis	189	5.1	5.1	13.6
	Firebaugh	1	.0	.0	13.6
	Fresno	3203	85.9	85.9	99.5
	Hanford	2	.1	.1	99.5
	Madera	7	.2	.2	99.7
	Malaga	1	.0	.0	99.7
	Mendota	1	.0	.0	99.8
	Nevada	1	.0	.0	99.8
	Pinedale	3	.1	.1	99.9
	Sanger	3	.1	.1	99.9
	Selma	1	.0	.0	100.0
	Visalia	1	.0	.0	100.0
	Total	3730	100.0	100.0	

Mode of Egress

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Drive Alone	69	1.8	2.0	2.0
	Drive with Other Transit Passengers	64	1.7	1.8	3.8
	Other Transit Passenger Drives	76	2.0	2.2	6.0
	Picked Up	159	4.3	4.6	10.5
	Walk	2888	77.4	82.7	93.3
	Bicycle	140	3.8	4.0	97.3
	Other Bus System	8	.2	.2	97.5
	School Bus	1	.0	.0	97.5
	Wheelchair, Skate, Skateboard	40	1.1	1.1	98.7
	Amtrak	2	.1	.1	98.7
	Other Motorized (Taxi, Dial-a-Ride)	1	.0	.0	98.8
	Other	43	1.2	1.2	100.0
	Total	3491	93.6	100.0	
Missing	Bus (misunderstood question)	121	3.2		
	System	118	3.2		
	Total	239	6.4		
Total		3730	100.0		

Auto Availability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	436	11.7	12.1	12.1
	No	3170	85.0	87.9	100.0
	Total	3606	96.7	100.0	
Missing	System	124	3.3		
Total		3730	100.0		

Transportation Needs Met by FAX/Stageline

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Well	1429	38.3	39.6	39.6
	Reasonably Well	1620	43.4	44.9	84.6
	Not Very Well	420	11.3	11.6	96.2
	Very Poorly	137	3.7	3.8	100.0
	Total	3606	96.7	100.0	
Missing	System	124	3.3		
Total		3730	100.0		

Satisfaction with Trip Time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Satisfactory	2622	70.3	79.6	79.6
	Not Satisfactory	674	18.1	20.4	100.0
	Total	3296	88.4	100.0	
Missing	System	434	11.6		
Total		3730	100.0		

Source for Current Transit Information

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Telephone	1196	32.1	40.1	40.1
	Internet	878	23.5	29.4	69.5
	Information at Bus Stops	662	17.7	22.2	91.7
	Bus Book/Printed Schedules	141	3.8	4.7	96.4
	On Bus or from Driver	31	.8	1.0	97.5
	Friends/Family	19	.5	.6	98.1
	Already know from experience	11	.3	.4	98.5
	News, newspaper, mail	8	.2	.3	98.7
	Other	38	1.0	1.3	100.0
	Total	2984	80.0	100.0	
Missing	System	746	20.0		
Total		3730	100.0		

Preferred Source for Transit Information

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Telephone	498	13.4	25.8	25.8
	Internet	759	20.3	39.4	65.2
	Information at Bus Stops	531	14.2	27.6	92.8
	Bus Book/Printed Schedules	98	2.6	5.1	97.9
	On Bus or from Driver	5	.1	.3	98.1
	Friends/Family	7	.2	.4	98.5
	News, newspaper, mail	4	.1	.2	98.7
	Other	25	.7	1.3	100.0
	Total	1927	51.7	100.0	
Missing	System	1803	48.3		
Total		3730	100.0		

Length of Time Riding FAX/Stageline

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	First Time	86	2.3	2.4	2.4
	6 Months or Less	417	11.2	11.7	14.1
	7-11 Months	160	4.3	4.5	18.6
	1-2 Years	537	14.4	15.1	33.7
	3-5 Years	630	16.9	17.7	51.4
	More Than 5 Years	1733	46.5	48.6	100.0
	Total	3563	95.5	100.0	
Missing	System	167	4.5		
Total		3730	100.0		

Frequency Riding FAX/Stageline

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5 or More Days per Week	1993	53.4	55.7	55.7
	3-4 Days per Week	843	22.6	23.6	79.2
	1-2 Days per Week	500	13.4	14.0	93.2
	Less than Once per Week	126	3.4	3.5	96.7
	Less than Once per Month	81	2.2	2.3	99.0
	First Time	36	1.0	1.0	100.0
	Total	3579	96.0	100.0	
Missing	System	151	4.0		
Total		3730	100.0		

Work Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employed Full-Time	682	18.3	19.2	19.2
	Employed Part-Time	647	17.3	18.2	37.4
	Not Currently Employed	600	16.1	16.9	54.3
	Disabled-Unable to Work	373	10.0	10.5	64.8
	Retired	145	3.9	4.1	68.9
	Homemaker	176	4.7	5.0	73.9
	Student	928	24.9	26.1	100.0
	Total	3551	95.2	100.0	
Missing	System	179	4.8		
Total		3730	100.0		

Full-Time College Student

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	204	5.5	100.0	100.0
Missing	System	3526	94.5		
Total		3730	100.0		

Attend College and Work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	87	2.3	100.0	100.0
Missing	System	3643	97.7		
Total		3730	100.0		

Ethnicity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Caucasian/White	859	23.0	24.1	24.1
	Hispanic/Latino	1614	43.3	45.2	69.3
	Asian/Southeast Asian	163	4.4	4.6	73.9
	African-American/Black	684	18.3	19.2	93.0
	Native American/American Indian	84	2.3	2.4	95.4
	Middle Easterner	11	.3	.3	95.7
	Mixed Ethnicities	133	3.6	3.7	99.4
	Other	21	.6	.6	100.0
	Total	3569	95.7	100.0	
Missing	System	161	4.3		
Total		3730	100.0		

Asian Origin

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		3670	98.4	98.4	98.4
	Asian	1	.0	.0	98.4
	Cambodian	1	.0	.0	98.4
	Cambodian	4	.1	.1	98.6
	Chinese	1	.0	.0	98.6
	Filipina	1	.0	.0	98.6
	Filipino	1	.0	.0	98.6
	Filipino	4	.1	.1	98.7
	Hawaiian	1	.0	.0	98.8
	Hmong	33	.9	.9	99.7
	Indonesian	2	.1	.1	99.7
	islander	1	.0	.0	99.7
	Japanese	2	.1	.1	99.8
	Laotian	3	.1	.1	99.9
	Micronesian	1	.0	.0	99.9
	Pacific Islander	1	.0	.0	99.9
	Pilipino	1	.0	.0	99.9
	pilipino	1	.0	.0	100.0
	Thai	1	.0	.0	100.0
	Total	3730	100.0	100.0	

Annual Household Income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under $10,000	1832	49.1	55.8	55.8
	$10,000 - less than $20,000	787	21.1	24.0	79.8
	$20,000 - less than $30,000	284	7.6	8.6	88.4
	$30,000 - less than $40,000	165	4.4	5.0	93.4
	$40,000 - less than $50,000	95	2.5	2.9	96.3
	$50,000 - less than $75,000	80	2.1	2.4	98.8
	$75,000 or more	41	1.1	1.2	100.0
	Total	3284	88.0	100.0	
Missing	System	446	12.0		
Total		3730	100.0		

Participate in CalFresh

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	1527	40.9	44.7	44.7
	No	1891	50.7	55.3	100.0
	Total	3418	91.6	100.0	
Missing	System	312	8.4		
Total		3730	100.0		

Year Born

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1926	2	.1	.1	.1
	1927	2	.1	.1	.1
	1931	5	.1	.2	.3
	1932	2	.1	.1	.4
	1933	2	.1	.1	.4
	1934	3	.1	.1	.5
	1935	1	.0	.0	.5
	1936	6	.2	.2	.7
	1937	3	.1	.1	.8
	1938	8	.2	.3	1.1
	1939	8	.2	.3	1.3
	1940	9	.2	.3	1.6
	1941	10	.3	.3	2.0
	1942	9	.2	.3	2.2
	1943	16	.4	.5	2.8
	1944	9	.2	.3	3.0
	1945	14	.4	.4	3.5
	1946	17	.5	.5	4.0
	1947	11	.3	.4	4.4
	1948	15	.4	.5	4.9
	1949	21	.6	.7	5.6
	1950	24	.6	.8	6.3
	1951	19	.5	.6	6.9
	1952	32	.9	1.0	8.0
	1953	28	.8	.9	8.9
	1954	19	.5	.6	9.5
	1955	28	.8	.9	10.4
	1956	32	.9	1.0	11.4
	1957	36	1.0	1.2	12.5
	1958	31	.8	1.0	13.5

1959	34	.9	1.1	14.6
1960	51	1.4	1.6	16.3
1961	34	.9	1.1	17.4
1962	40	1.1	1.3	18.6
1963	36	1.0	1.2	19.8
1964	37	1.0	1.2	21.0
1965	37	1.0	1.2	22.2
1966	40	1.1	1.3	23.5
1967	33	.9	1.1	24.5
1968	49	1.3	1.6	26.1
1969	36	1.0	1.2	27.2
1970	45	1.2	1.4	28.7
1971	37	1.0	1.2	29.9
1972	28	.8	.9	30.8
1973	37	1.0	1.2	32.0
1974	46	1.2	1.5	33.4
1975	40	1.1	1.3	34.7
1976	54	1.4	1.7	36.5
1977	48	1.3	1.5	38.0
1978	44	1.2	1.4	39.4
1979	45	1.2	1.4	40.9
1980	63	1.7	2.0	42.9
1981	63	1.7	2.0	44.9
1982	59	1.6	1.9	46.8
1983	74	2.0	2.4	49.2
1984	66	1.8	2.1	51.3
1985	72	1.9	2.3	53.6
1986	69	1.8	2.2	55.8
1987	71	1.9	2.3	58.1
1988	78	2.1	2.5	60.6
1989	97	2.6	3.1	63.7
1990	114	3.1	3.7	67.4
1991	112	3.0	3.6	71.0
1992	125	3.4	4.0	75.0
1993	138	3.7	4.4	79.4

	1994	174	4.7	5.6	85.0
	1995	184	4.9	5.9	90.9
	1996	104	2.8	3.3	94.2
	1997	81	2.2	2.6	96.8
	1998	58	1.6	1.9	98.7
	1999	22	.6	.7	99.4
	2000	13	.3	.4	99.8
	2001	5	.1	.2	100.0
	2002	1	.0	.0	100.0
	Total	3116	83.5	100.0	
Missing	System	614	16.5		
Total		3730	100.0		

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
	Male	1579	42.3	45.4	45.4
Valid	Female	1897	50.9	54.6	100.0
	Total	3476	93.2	100.0	
Missing	System	254	6.8		
Total		3730	100.0		

Home Zip Code

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	90020	1	.0	.0	.0
	92231	1	.0	.0	.1
	92336	1	.0	.0	.1
	92702	1	.0	.0	.1
	92703	1	.0	.0	.1
	92704	1	.0	.0	.2
	92725	1	.0	.0	.2
	92727	1	.0	.0	.2
	92744	1	.0	.0	.3
	92747	1	.0	.0	.3
	92837	1	.0	.0	.3
	93026	1	.0	.0	.3
	93102	2	.1	.1	.4
	93103	1	.0	.0	.4
	93105	2	.1	.1	.5
	93125	1	.0	.0	.5
	93126	1	.0	.0	.5
	93201	1	.0	.0	.6
	93202	3	.1	.1	.7
	93206	1	.0	.0	.7
	93212	1	.0	.0	.7
	93215	2	.1	.1	.8
	93222	1	.0	.0	.8
	93226	2	.1	.1	.9
	93230	4	.1	.1	1.0
	93245	3	.1	.1	1.1
	93266	1	.0	.0	1.1
	93274	2	.1	.1	1.1
	93276	1	.0	.0	1.2
	93277	1	.0	.0	1.2
	93291	1	.0	.0	1.2

93402	1	.0	.0	1.3
93405	1	.0	.0	1.3
93411	1	.0	.0	1.3
93412	2	.1	.1	1.4
93420	1	.0	.0	1.4
93464	1	.0	.0	1.4
93519	1	.0	.0	1.5
93602	2	.1	.1	1.5
93605	1	.0	.0	1.5
93606	1	.0	.0	1.6
93607	1	.0	.0	1.6
93608	1	.0	.0	1.6
93609	2	.1	.1	1.7
93611	34	.9	1.0	2.7
93612	137	3.7	3.9	6.6
93613	3	.1	.1	6.7
93617	2	.1	.1	6.7
93619	3	.1	.1	6.8
93622	1	.0	.0	6.9
93624	1	.0	.0	6.9
93625	1	.0	.0	6.9
93626	2	.1	.1	7.0
93627	2	.1	.1	7.0
93630	6	.2	.2	7.2
93631	1	.0	.0	7.2
93636	3	.1	.1	7.3
93637	2	.1	.1	7.4
93638	5	.1	.1	7.5
93640	4	.1	.1	7.6
93646	1	.0	.0	7.7
93650	22	.6	.6	8.3
93654	4	.1	.1	8.4
93657	6	.2	.2	8.6
93658	1	.0	.0	8.6
93662	1	.0	.0	8.6

	93667	1	.0	.0	8.7
	93672	2	.1	.1	8.7
	93701	157	4.2	4.5	13.2
	93702	388	10.4	11.1	24.4
	93703	202	5.4	5.8	30.1
	93704	135	3.6	3.9	34.0
	93705	295	7.9	8.5	42.5
	93706	333	8.9	9.6	52.0
	93707	7	.2	.2	52.2
	93708	7	.2	.2	52.4
	93709	2	.1	.1	52.5
	93710	161	4.3	4.6	57.1
	93711	68	1.8	2.0	59.1
	93712	4	.1	.1	59.2
	93713	2	.1	.1	59.2
	93715	3	.1	.1	59.3
	93716	3	.1	.1	59.4
	93718	1	.0	.0	59.4
	93720	65	1.7	1.9	61.3
	93721	71	1.9	2.0	63.3
	93722	306	8.2	8.8	72.1
	93723	11	.3	.3	72.4
	93724	5	.1	.1	72.6
	93725	108	2.9	3.1	75.7
	93726	322	8.6	9.2	84.9
	93727	318	8.5	9.1	94.0
	93728	142	3.8	4.1	98.1
	93729	8	.2	.2	98.3
	93730	2	.1	.1	98.4
	93733	1	.0	.0	98.4
	93736	1	.0	.0	98.5
	93737	1	.0	.0	98.5
	93738	2	.1	.1	98.5
	93740	1	.0	.0	98.6
	93744	2	.1	.1	98.6

93746	1	.0	.0	98.7
93752	1	.0	.0	98.7
93755	2	.1	.1	98.7
93756	1	.0	.0	98.8
93760	1	.0	.0	98.8
93763	1	.0	.0	98.8
93764	1	.0	.0	98.9
93765	1	.0	.0	98.9
93766	2	.1	.1	98.9
93775	1	.0	.0	99.0
93776	1	.0	.0	99.0
93777	2	.1	.1	99.1
93779	1	.0	.0	99.1
93781	2	.1	.1	99.1
93792	1	.0	.0	99.2
93854	1	.0	.0	99.2
93905	1	.0	.0	99.2
93906	1	.0	.0	99.3
93920	1	.0	.0	99.3
93927	1	.0	.0	99.3
93940	1	.0	.0	99.3
94801	1	.0	.0	99.4
95035	1	.0	.0	99.4
95333	1	.0	.0	99.4
95337	1	.0	.0	99.5
95343	1	.0	.0	99.5
95348	2	.1	.1	99.5
95350	1	.0	.0	99.6
95612	1	.0	.0	99.6
95670	1	.0	.0	99.6
95701	2	.1	.1	99.7
95702	1	.0	.0	99.7
95703	1	.0	.0	99.7
95710	1	.0	.0	99.8
95712	1	.0	.0	99.8

	95722	1	.0	.0	99.8
	95727	1	.0	.0	99.9
	95822	1	.0	.0	99.9
	96321	1	.0	.0	99.9
	97603	1	.0	.0	99.9
	98293	1	.0	.0	100.0
	98725	1	.0	.0	100.0
	Total	3486	93.5	100.0	
Missing	System	244	6.5		
Total		3730	100.0		