Table of Contents

Table of Contents *(cont.)*

List of Figures

List of Tables

Appendices

Acknowledgements

We would like to thank and acknowledge the following individuals and firms for their dedicated work on this project:

Kimley-Horn and Associates – Overall Project Management

6130 Stoneridge Mall Road, Suite 370, Pleasanton, CA 94588

Jim Daisa, PE, Principal in Charge
Julie Eldridge, AICP, Project Manager
Jeff Allen, AICP, Transit Technical Analysis
Norman Wong, P.E., BRT Small Starts Application
Luke Schwartz, EIT, GIS Mapping and BRT Small Starts Application
Kalai Kubendran, GIS Mapping

Dowling Associates, Inc. - Travel Demand Forecasting (modeling)

180 Grand Avenue, Suite 250
Oakland, California USA 94612

Mike Aronson, Task Manager
Pratyush Bhatia, Assistant Task Manager

Fregonese Associates, Inc. - Land Use Modeling

1525 SW Park Avenue, Suite 200
Portland, OR 97201

Glen Bolen, Task Manager
Sarah Loguidice, Assistant Task Manager
Julia Reisemann, GIS Mapping

Newlands & Company, Inc. – Visual Simulations

740 SW 21st Avenue, Suite 330
Portland, OR 97205

Matthew Noyes
Donald Newlands

Strategic Economics – Economic Impacts Analysis

2991 Shattuck Avenue, #203
Berkeley, CA 94705

Dena Belzer, Task Manager
Sujata Srivastava, Assistant Task Manager

TPG Consulting, Inc. – Walkability Surveys

222 N. Garden, Suite 100
Visalia, CA 93291

Charlie Clouse
Mary Beattie

The Lockwood Agency – Public Outreach

500 N. Willis Avenue
Visalia, CA 93291

Nancy Lockwood – Task Manager
Becky Kelch – Events Planning

Nancy Whelan Consulting – Infrastructure Financing

221 Main Street, Suite 420
San Francisco, CA 94105

Nancy Whelan

Moy and Associates – Stakeholder Interviews

6082 Millerton Road
Friant, CA 93626

Ellen Moy

JKaplan & Associates – Transit Planning

3048 Ebano Drive
Walnut Creek, CA 94598

Jerry Kaplan
Susan Kaplan

Rhodes Consulting – Streetcar Advisor

1308 NW Everett Street
Portland, OR 97209

Vic Rhodes

AIS Market Research, Inc. – Public Polling

1320 East Shaw Avenue, Suite 155
Fresno, CA 93710

Jennifer Dawson

Wilbur Smith Associates – Streetcar Advisor Principal Transportation Engineer

201 Mission Street, Suite 1450
San Francisco, CA 94105

Peter C. Martin P.E.

1.0 Introduction to the PTIS

1.1 Purpose and Need for the PTIS

Purpose

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.

Fresno County is one of eight counties in the San Joaquin Valley Unified Air Pollution Control District (Valley Air District), which currently does not meet several of the air quality standards set forth in the Federal Clean Air Act or the California Clean Air Act. The Valley Air District is a designated non-attainment area for ozone ("extreme") and particulates (both PM10 ["extreme"] and PM2.5) and is a maintenance area for carbon monoxide. The Valley Air District similarly fails to meet California standards for these pollutants. As a result, the County must satisfy Federal requirements calling for consideration of transportation control measures to reduce emissions and demonstrate conformity with the State Implementation Plan for Air Quality. It follows that whatever transportation projects are considered and ultimately implemented must not deteriorate existing problems and must support efforts to bring the County into air quality attainment. Given auto and truck travel is a major source of critical emissions, the County must consider implementing more-efficient (e.g. increased occupancy, reduced travel times, lower costs), high-capacity modes of transportation that provide competitive options to the auto. Such transportation modes must also address the need to provide suitable alternative travel options to parts of the population who have limited mobility, and parts of the County currently inadequately served by public transportation.

Need for the PTIS Study

Fresno County's population, estimated at 954,000 people, is projected to grow to 1.5 million people by 2050. The Fresno-Clovis Metro region has the most freeway lane miles per capita and local medium area sized street lane miles per capita of all the major Cities in California with more lane miles planned and programmed into the long range transportation investment plan. Fresno County and City need new policies, goals and funding priorities that support a new direction in transportation and land use planning, along with education and public awareness of the issues and trade-offs that must occur with the shift away from automobile-dominated transportation planning.

Table 1: Medium Area California Cities Lane Miles Comparison

City	Freeway Lane Miles ('000)	Arterial Lane Miles ('000)	Total Lane Miles ('000)	Population in 2009 ('000)	Lane Miles/ Capita
Fresno	300	1470	1770	669	2.65
Oxnard-Ventura	395	1260	1655	697	2.37
Bakersfield	200	1085	1285	527	2.44
Indio-Cathedral-Palm Springs	110	950	1060	572	1.85
Lancaster-Palmdale	80	970	1050	600	1.75

Source: Texas Transportation Institute December 2010 Urban Mobility Report

Public Transportation Infrastructure Study

Fresno Council of Governments

More people will walk, bike and use transit if Fresno considers all modes of travel as they build their future transportation system. People will live closer to the core of the metro region if Fresno builds a transportation system that is designed around all modes of transportation and provides attractive places for people to live in close proximity to transit. Transportation issues exemplify the type of challenge that many cities in California face. The recent passage of SB375 calls all metropolitan planning areas in the state for a commitment to sustainable solutions. Building a transportation system solely with the automobile in mind based on a level of service "C or D" for the peak 15 minute demand is one of the most expensive transportation systems to build and maintain. Fresno City and County need a new approach or thought process for determining what is needed to attain an alternative future that provides transportation alternatives to the car for a majority of the population. Fresno's metro region is a top five leader in the nation with the least amount of commute congestion and travel time and travel speeds of all major metropolitan regions. In fact, the Fresno COG Travel Demand model suggests that in the next 20-30 years the travel speeds of our region will only decrease by one or two miles per hour, whereas in the same timeframe, the Sacramento metro region's travel speeds will nearly be cut in half.

Fresno County currently does not meet air quality standards, including ozone and particulates. As a result, the County must satisfy Federal requirements calling for consideration of transportation control measures to reduce emissions and demonstrate conformity with the State Implementation Plan for Air Quality. It follows that whatever transportation projects are considered and ultimately implemented must not deteriorate the existing air quality and must support efforts to bring the County into air quality attainment.

Given that auto and truck travel account for about one-third of greenhouse gas emissions, the County must consider implementing more-efficient, high-capacity modes of transportation that provide attractive options to the auto. Such transportation modes must provide suitable alternative travel options to parts of the population who have limited mobility, with a focus on higher density and mixed use corridors where large numbers of households and businesses can be well served by transit investments. Currently the majority of Fresno's transit riders use the system out of necessity, rather than choice. To maximize transit ridership and reduce congestion in the future, it will be important to continue to serve and attract ridership among households that need transit, as well as those who might choose to take transit though they can afford to drive.

The PTIS study also mares specific recommendations on land use densities that are needed to support the transit investment. Land use densities are zoning decisions that only local governments can make. Fresno COG can set the overall vision for growth but cannot mandate local land use decisions.

However, without the support of elected leaders across all levels of government, the improvements in quality of life, public health and air quality cited in this study cannot be achieved.

Fresno County needs to plan, design and implement public transportation services and supportive land use types and development patterns that will support alternatives to single-occupant vehicles, improve mobility for all users, and seek to reduce traffic congestion, urban sprawl, and air quality impacts.

Study Background

The Public Transportation Infrastructure Study (PTIS) was originally conceived in two parts or phases to spur a dialogue between Fresno County and local cities about the possible futures of the region and the steps needed to be taken to shape that growth in a conscious way. Phase I of the study was published in May, 2006 under contract to the Fresno County Council of Governments (FCOG). The Phase I study was a broad overview of the growth-related challenges faced by Fresno County in the next 50 years, comparing Fresno to the cities of Portland, Sacramento, and San Diego to illustrate possible futures. The study identified the need to develop corridor-based strategies for land use and transportation investments and to look at transportation system planning strategies.

The December 2008 Phase II of the PTIS study takes a much more detailed approach in developing regional sustainability goals and policy recommendations for Fresno County. Through a systematic analysis of identified future high-density travel corridors, the PTIS Phase II study makes specific recommendations to achieve various levels of transit, bicycle and pedestrian mode share increases identified in three growth scenarios with related transit investments and zoned land use densities to the year 2035.

Land use densities and residential/employment mix alternatives were developed for three potential high capacity transit corridors:

1) Blackstone Avenue from downtown Fresno to the River Park Transit Center

2) Ventura/Kings Canyon from downtown Fresno to the edge of development (Clovis Avenue)

3) Shaw Avenue from Highway 99 to CSU Fresno, then along Highway 168 to a high density employment destination planned for north Clovis.

A fourth potential corridor between Fresno and Kingsburg along Highway 99 was also assessed for potential light rail or commuter rail, but subsequently dropped from further analysis due to the lack of planned residential and employment densities by the cities along the corridor. The theoretical densities in the corridors were modeled at three incremental levels to predict the changes in travel behavior and mode choice resulting from the high number of residents and employment centers in close walking or transit distance proximities of each other. Transportation modeling for the project was performed, using the Fresno COG 2035 Travel Demand Model. Based on the model results of trips by mode for the three scenarios, recommendations are made for transit investments and service frequencies with associated costs. Air quality improvements for the three scenarios are modeled by the Fresno COG and will be applied to the COG air quality committee tasked with meeting greenhouse gas emission reductions under SB375.

Finally, a list of policy recommendations is put forth by the consulting team for implementation by the City of Fresno and Fresno County in order to realize the future scenarios as described and modeled. Phase II of the PTIS Study began in December, 2008, with final deliverables on the project due by the end of May, 2011.

1.2 PTIS Study Outline

The Fresno PTIS Study follows this basic outline and approach:

1) Introduction to the PTIS Study
   - Goals, Objectives, and Performance Measures
   - Assessment of Existing Conditions
   - Transit Technology and Service Alternatives

2) Alternatives Analysis
   - Transit Technology Alternatives
   - No Build, TSM and Build Scenarios
     - Land Use Scenario Modeling and Analysis
     - Transportation Modeling Outcomes
     - Application of Performance Measures
     - Transit Ridership and Operations Plan
     - O&M Cost Analysis

3) The Locally Preferred Alternative
   - Multimodal Transportation System Plan
   - Sustainability Benchmarks
   - Infrastructure Financing Plan
   - Policy Recommendations

4) Appendices
   - Public Outreach
     - Public Opinion Surveys and Stakeholder Interviews
     - Newsletters, Boards, E-Blasts and Website
     - Events, Workshops and Presentations

   - Feasibility Study for a Downtown Fresno Streetcar
   - Bus Rapid Transit Very Small Starts Application
   - Personal Rapid Transit Test Application at CSU Fresno

1.3 Goals, Objectives, and Performance Measures

Study Goals – From the Fresno Blueprint Process

Starting with the rationale for the Fresno PTIS framework and the Fresno Blueprint, a set of five goals were identified for this study. One additional goal "To improve air quality" was added subsequent to passage of SB375 and AB32 requiring all MPO's to submit a plan to reduce greenhouse gas emissions to pre-1990 levels. For each goal, multiple objectives were identified. From the Fresno Blueprint process, the following goals were applied to this study:

1) Increase personal mobility by providing functional access to work, education, health care, recreation, and other essential services for all County residents.

2) Implement viable public transportation projects that will increase and integrate other modes of transportation including bicycle/pedestrian and multiuse trails and increase access to transit and principal activity centers.

3) Propose economical, efficient, and convenient alternatives to private automobiles.

4) Enhance public transportation connectivity to existing or planned (transportation) services and facilities.

5) Maintain and enhance public transportation over a 50-year planning horizon.

6) Improve air quality in the region.

The goals and objectives contributed to the development of potential performance measures or evaluation criteria. The purpose of performance measures is to measure the success of each strategy explored in order to determine the best approach, or preferred alternative, for the region. Under new regulations by several Federal agencies, this approach is used to identify "Benchmarks" for achieving sustainability for a planning area. Sustainability is discussed in terms of environmental sustainability, with an overall goal of reducing vehicle miles travelled and increasing the number of trips taken by transit, on foot and by bicycle in order to reduce greenhouse gas emissions, improve air quality, and reducing our impact on the built environment.

Study Objectives – From the Study Team

- Evaluate current and realistic future potential usage of public transportation based on current build-out of general plans in Fresno County communities.
- Define, evaluate and identify the most economical, convenient, effective, and efficient public transportation services to address the forecast demands.
- Promote transit-oriented development, transit-supportive corridor and neighborhood design, and multi-modal network and street design.
- Encourage local jurisdictions to implement the goals, objectives and policies contained in the Regional Transportation Plan relating to bicycle and pedestrian facilities.
- Support County Health Department efforts to promote walking and cycling as healthy transportation and recreational alternatives.
- Integrate bicycle facilities such as bicycle racks on and in transit vehicles and at transit stations.
- Encourage public agencies to adopt pedestrian-friendly development and transportation network guidelines and standards within public transportation corridors.
- Promote intermodal facilities including integration of park and ride, rideshare, bicycle, rail and transit centers.
- Promote the coordination of service, scheduling, pricing, universal fare collection and infrastructure.
- Support and integrate new services with High-Speed Rail and the downtown Fresno rail station.
- Expand public transportation to new growth areas and areas without such service where need exists and can be reasonably met.
- Provide transportation alternatives that provide convenient, fast, efficient, and reliable access to essential functions and services, emphasizing special needs communities.
- Expand and promote Transportation Demand Management (TDM) programs and strategies that provide incentives to developers to integrate multimodal access elements into projects.
- Encourage private sector participation in shuttles and connections to public transportation.
- Develop regional traveler information systems.
- Identify and evaluate practical and cost-effective public transportation connections.
- Promote preservation of major transportation corridors for multiple technologies (rail, bus, HOV).
- Encourage rail consolidation.
- Identify and support public/private partnership opportunities that provide funding for operations, maintenance and capital expansion of public transportation and help sustain regional economic vitality.
- Align the Regional Transportation Plan to fund the PTIS recommendations as critical elements of the capital improvement plan for the region.

- Promote transit-oriented development, and encourage Fresno County jurisdictions to adopt transit-supportive land use designations, pedestrian-friendly development and transportation network guidelines and standards within public transportation corridors.
- Maintain and grow the fare box revenue percentage through careful ongoing service planning to match fiscal realities.
- Enhance the vehicle fleet to minimize the greenhouse gas emissions and minimize net energy usage of the public transportation system.
- Help expedite the development of advanced transit systems such as personal rapid transit, and other fully automated transit networks.
- Determine phasing of public transportation for short term (10 yrs), mid-term (20 yrs), and long term (50 yrs) growth based on current general plan build-out.
- Estimate costs to implement plans and possible funding sources

Performance Measures – For Application to the Scenarios

The following performance measures were identified to be used as benchmarks to evaluate the performance of the three land use scenarios:

Travel Data

- Average weekday total transit trips
- Transit mode share
- Growth in ridership
- Total walk/bike trips
- Walk and Bike mode share

Demographics/Land Use

- Number of residents and dwelling units/acre within BRT corridors and downtown
- Total jobs and employment per acre within BRT corridors and downtown
- Percent of housing in mixed use developments
- Percent of jobs in mixed use development

User Benefits

- Person-hours of delay (vehicle and transit) per person
- Cost per mile of travel (compare driving versus transit)
- Travel times or speeds between selected origins and destinations (compare driving versus transit) in the TOD corridors

System Performance

- Vehicle Miles Traveled (VMT) system-wide or per person
- VMT in congestion, percent of travel in congestion

Operations & Maintenance – BRT vs LRT

- Capital costs
- Annualized total capital cost
- Total annual cost per rider
- Total annual cost per new rider
- Operating cost per transit passenger mile

Emissions (to be prepared by COG)

- Change in greenhouse gas emissions by scenario

2.0 Existing Conditions in Fresno County

The Existing Conditions section describes existing transit service providers, existing travel markets and travel patterns and existing land use and development patterns in Fresno County. These conditions establish the background for the analysis of transportation needs analysis and the alternatives analysis.

2.1 Existing Transit Service Providers

There are a total of seven agencies or companies providing transit services in Fresno County, and dozens of transit providers, both public and private. Transit service operators in the greater Fresno area include Fresno Area Transit (FAX), Clovis Transit System, Amtrak, Greyhound, Kings County Area Transit (KART), and Fresno County Regional Transit Authority (FCRTA). In addition, a significant and growing program run by KART/AITS subsidizes vanpools and carpools to select work destinations.

Fresno Area Express (FAX): FAX is the largest provider of transit services in the region, with 18 million annual boardings and an operating budget of approximately $43 million per year. An efficient operation for its size, FAX service consists of 17 fixed routes in the City of Fresno with three major hubs: the downtown transit mall, the Manchester transit station along Blackstone Avenue north of downtown, and a transfer point at the River Park shopping center in north Fresno. A fourth transfer center, the "Transit Village", includes 129 units of affordable housing for seniors, is planned in the Ventura/Kings Canyon Road Corridor.

Under Measure C local tax initiative, senior fares are 60 cents, and the standard adult fare is just $1.25, considerably below market compared to other cities this size. Children under age 6 also ride for free, and the disabled pay just 60 cents. There is no express bus service for commuters, and no park and ride lots. Regular service stops at 10:00 pm (for high-demand routes) and 7:30 pm (on lower demand routes) on weekdays and 7:00 pm on weekends. These service characteristics limit the viability of transit for many workers, students and low-income people who need public transportation outside of current operating hours.

There are no express buses in the FAX system for commuters, and all buses operate as local service, with frequent stops.

Clovis Transit System: Two transit lines serve the Clovis area. Stageline operates along fixed routes with regularly scheduled stops. Round Up is a demand-response service for senior (age 65+) and disabled residents who call in advance to schedule trips. The Stageline service operates weekdays from approximately 6:15 am to 6:15 pm. FAX route 28 operates in Clovis on Shaw Avenue weekdays from 6:30 am to 7:30 pm and weekends from 8:11 am to 3:15 pm. The fare for the general public from age 6 to 64 is $1.25 per one-way trip. Seniors 65 and over and children under age 6 ride for free. Seniors and disabled ride for $.50 with proof of disability. Clovis Transit does not accept the Fresno Area Express regular monthly metro pass and all transit trips between Clovis and Fresno require a forced transfer between to the two systems and delays that make transit unattractive to most users.

Amtrak: makes four daily roundtrips between Bakersfield and Oakland daily. A one-way ticket from Bakersfield to downtown Fresno costs about $19.00.

Greyhound: Operates inter-city bus service, with a dozen daily departures from Fresno for Bakersfield and seven departures from Merced to Fresno. Service to communities not located on the Highway 99 corridor is more limited, but still available. The fare from Fresno to Bakersfield is over $20.00.

Kings County Area Rural Transit (KART): Serves Fresno, Selma, Layton, Hanford, and Visalia. Provides two round trips each weekday to Layton (in Fresno County) and one weekday trip to hospitals in the City of Fresno. The KART Hanford to Fresno Hospitals operates at 1.6 passengers per hour, a very low productivity rate.

Fresno County Rural Transit Agency (FCRTA): Provides rural transit service in Fresno County through a Joint Powers Agency consisting of 13 incorporated cities and Fresno County. Operations are contracted out to 18 separate providers, both public and private. Under recently approved Measure "C" sales tax funding Fresno COG has initiated its own vanpool program (that was previously provided by FRCTA). Transit providers under FCRTA include the cities of Auberry, Coalinga, Firebaugh, Fowler, Huron, Herman, Kingsburg, Laton, Mendota, Orange Cove, Parlier, Reedley, Sanger, San Joaquin, Selma, South Sierra, Southeast, and Westside.

The individual city systems typically have a fixed-route component and a Dial-A-Ride component. The fixed-route systems link each city with the City of Fresno with one bus in the morning and one bus in the afternoon. The Dial-A-Ride Program is free to riders, providing transportation services within the city limits of Coalinga and operates five (5) days a week Monday thru Friday from 8:30 a.m. thru 4:15 p.m. with the exception of holidays to persons with disabilities and to senior citizens 65 years of age or older. The Dial-A-Ride Program is designed to take passengers to and from local social events, community services and personal local appointments.

Regional Agency Formation Study: In May of 2007 the Council of Fresno County Governments contracted with Nelson Nygaard to study the possibility of consolidating FAX, Clovis Transit and FCRTA (the three transit agencies operating in Fresno County) into one agency for the purpose of improving coordination of services. In spite of obvious benefits to users of the transit system, consolidation has not been embraced by the agencies themselves.

A second study on transit consolidation is currently under way to assess the opportunities and challenges of consolidated services to connect Fresno, Clovis and the rural transit system operators.

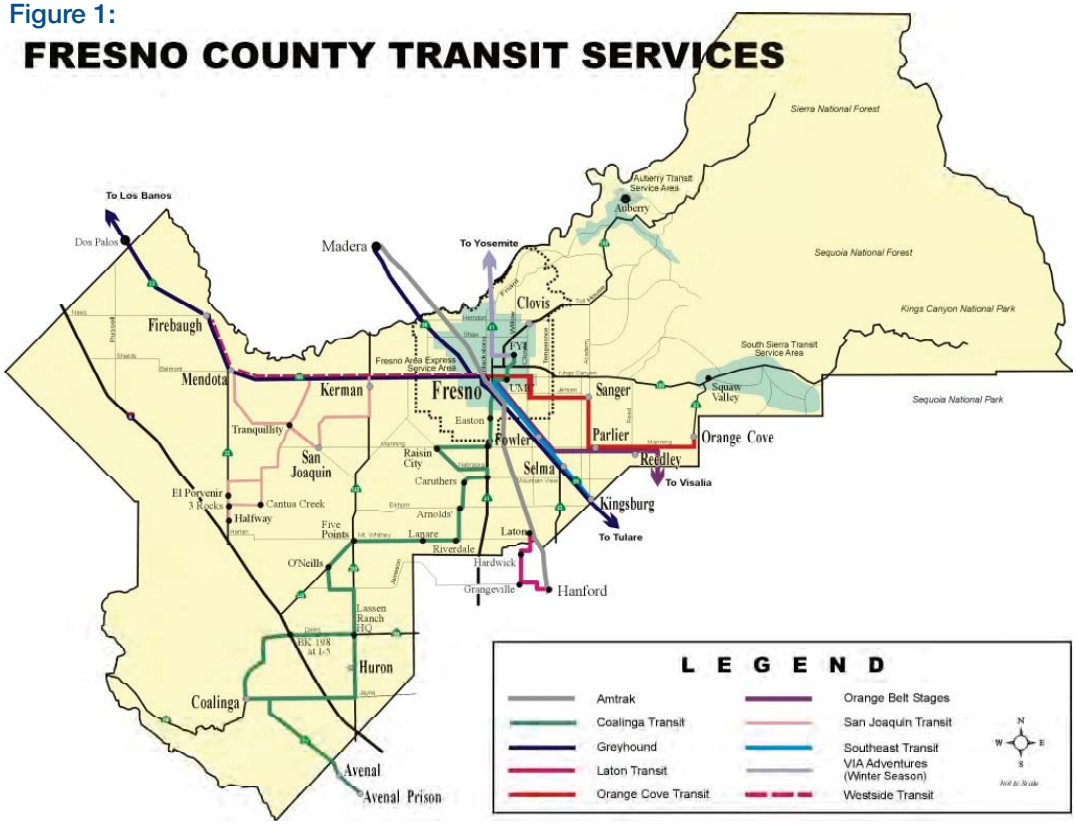
Existing Demand for Carpools and Vanpools

Table 2: 2003 Survey Target Mode Shares

Mode	Work		Non–Work		Total	
Drive Alone	351,445	82.0%	1,108,956	34.2%	1,460,401	39.8%
Shared Ride 2	40,135	9.4%	850,318	26.2%	890,452	24.3%
Shared Ride 3+	20,353	4.7%	991,317	30.6%	1,011,670	27.6%
Transit Walk Access	8,709	2.0%	21,580	0.7%	30,289	0.8%
Transit Drive Access	88	0.0%	218	0.0%	306	0.0%
Bicycle	2,056	0.5%	16,447	0.5%	18,503	0.5%
Walk	6,017	1.4%	253,503	7.8%	259,520	7.1%
	428,803	100.0%	3,242,339	100.0%	3,671,142	100.0%
	12%		88%			

These results from the COG's 2003 travel survey are the foundation of the mode split assumptions used in the Fresno COG travel model. The high percentages of trips taken with shared rides, particularly for non-work trips indicates a significant demand for carpools and vanpools in Fresno, far exceeding the transit mode share.

Figure 1:



KART/AITS Vanpool Program: Operated by Kings County Area Public Transit Agency (KCAPTA), and Agricultural Industries Transportation Service (AITS), a joint powers agency made up of Kings County and the cities of Hanford, Lemoore, and Avenal. The agency also has agreements with the Counties of Madera, Fresno, Tulare and Kern. With a $3.2 million budget for general workers and $3.6 million for farm workers in 2008, the service has approximately 350 vehicles, most of which are 15-passenger vans, carrying more than 900,000 trips per year. Just over 100 vehicles serve agricultural workers. The agency leases and maintains the vehicles, but they are operated by commuters. The State of California subsidizes workers $65 a month for the cost of vanpools. Another subsidy program for farm worker vanpools covers half the cost of the program and charges workers a fixed fee of $25.00 per month.

In 2001, KCAPTA initiated its vanpool program with several vanpools transporting State workers to prison facilities in Corcoran and Avenal. The vanpool program expanded in 2002 with the successful funding of the AITS project. This project focused on farm workers and was undertaken in cooperation with Tulare County. KCAPTA now provides between 300 and 350 vanpools. In the San Joaquin Valley, vans travel between multiple counties, including Fresno, Kern, Kings, Madera, and Tulare. Vans also operate in Monterey and Ventura Counties and will soon be initiated in Sacramento County. The number of farm worker vanpools varies between 80 and 140 vans throughout the agricultural season. Riders are comprised primarily of State and federal workers, teachers, college students, and casino workers.

The long-term viability of the vanpool program is insured through the shared use of vans between traditional (i.e., prison) vanpools and AITS vanpools and through the potential use of SB716 funds. Vans are initially acquired through a five-year

lease/purchase or purchased using AITS grant funds. Traditional vanpools lease/purchase vans while farm worker vanpools use grant-funded vans. Vanpool expenses are billed monthly to the traditional vanpools. Farm worker vanpools pay weekly based on the number of miles driven. Rates are adjusted as necessary to cover costs. All passenger subsidies are used to reduce participant costs and do not generate additional revenue for KCAPTA.

What started as a local experiment to see if vanpools could be used by farm workers to travel to and from work, has grown into a successful regional vanpool operation that benefits residents in several counties. Ridership has grown to include all forms of work trips connecting riders of adjoining cities and counties. The only requirement for becoming a vanpool driver is that he/she must be traveling to or from a member county, have a Class C license, Class B medical exam, clean driving record, and the ability to make payments on time. Who rides, and where and how far they travel is up to the vanpool group.

The vanpool operation continues to grow and is now seen as a key part of the San Joaquin Valley's effort to reduce single-occupancy vehicles and traffic congestion, and to meet future air quality emission reduction requirements. The current vanpool program does not require outside funding for its operation, and it is not anticipated that any member agency would be obligated to provide funding to the new agency. This would not prevent an agency, however, from providing support if it so chooses. An example of this is the Council of Fresno County Governments' Measure C support of vanpools originating in Fresno County, or the Tulare County Association of Governments' annual contribution to promote ridesharing. In addition, KCAPTA staff has secured San Joaquin Valley Air Pollution Control District grants, Congestion Mitigation and Air Quality grants, and Job Access and Reverse Commute grants.

2.2 Existing Fresno Travel Markets

For the purpose of this study, transit travel markets are defined by their unique characteristics:

1) Transit Commuters by Necessity
2) Transit Commuters by Choice
3) Discretionary Riders (includes recreational trips, visiting friends, etc.)
4) Institutional Riders (trips to doctors, schools or social service appointments)

A discussion of transit riders or the transit market is typically described in these four groups with distinct travel needs: commuters by necessity, commuters by choice, institutional riders and discretionary riders. Commuters are discussed in terms of travel distance; intra-city commuters and inter-county Commuters.

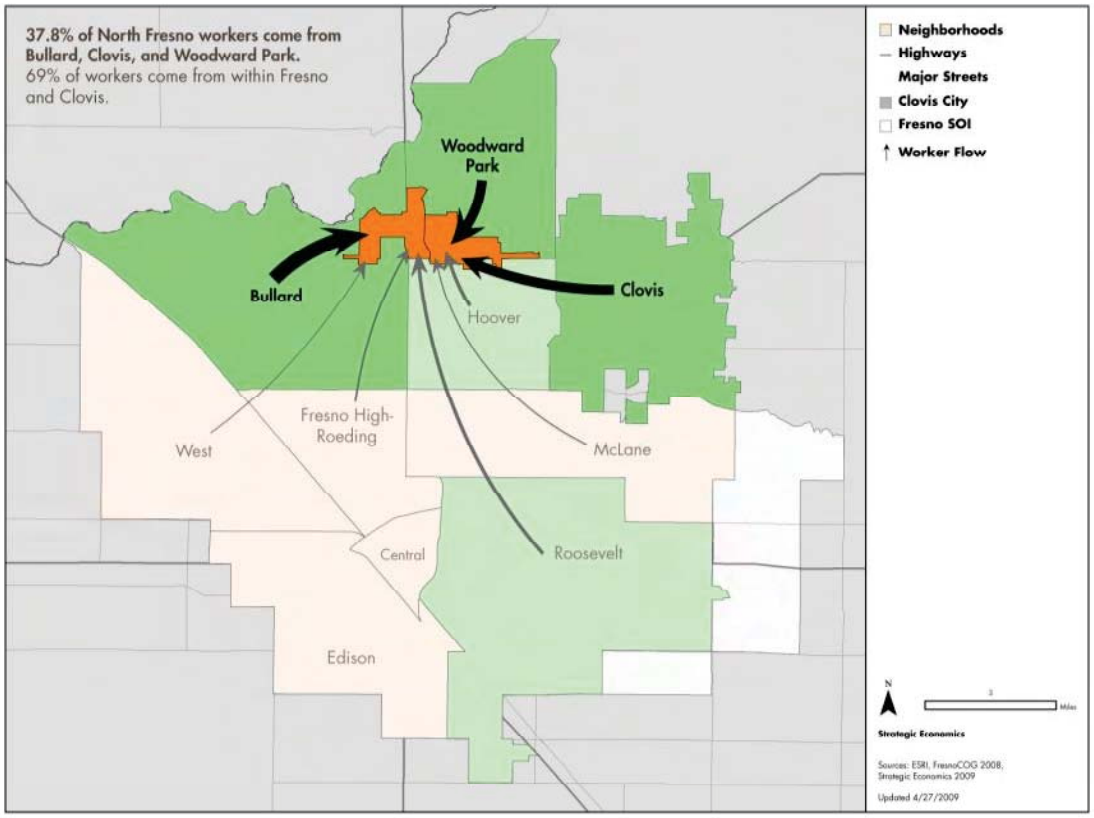
1) **Transit Commuters by Necessity** (also called captive riders) are defined as individuals who cannot afford a car (families or individuals living below the poverty line) or households with two primary wage earners who own only one car. These people take transit because they have no choice. As of the 2000 Census, the median income for a household in the city of Fresno was $32,236, and the median income for a family was $35,892. Males had a median income of $32,279 versus $26,551 for females. The per capita income for the city was $15,010. About 20.5% of families and 26.2% of the population were below the poverty line. In addition, 36.5% of the population that is under age 18 and another 10.7% of those aged 65 or over. Fresno's total captive transit market represents 73.4% of the population. This is a considered a very large captive transit market.

   The United States Census Bureau issued a report entitled the American Community Survey in 2007, which found that six San Joaquin Valley counties had the highest percentage of residents living below the federal poverty line in 2006. The report also revealed that the same six counties were among the 52 counties with the highest poverty rate in the United States. Commuters by necessity are fairly well served at a low cost with the regional vanpool and carpool programs, and a very low cost local bus system (FAX). Some minor improvements to existing programs could make these options very attractive for a minor additional investment.

2) **Commuters by Choice** can afford a car and typically own at least one, but for economic or environmental reasons, they choose to take transit anyway. Riders by choice are typically commuters who make a decent wage and have a lower tolerance for delays and slow travel times by local bus, and will take an express bus if available. Commuters by choice are not as well served in Fresno. Without express bus service or dedicated bus lanes on the streets or on the highways, transit riders are stuck in the same congested traffic as car drivers are, and buses typically take twice as long as a similar trip by car, simply because of the number of stops a bus must make, and the difficulty of re-entering the traffic stream during congested peak travel times. There is likely a large unmet travel demand for high-quality express transit service in Fresno.

In most larger urban areas a specialized high-quality transit service is offered to attract riders who would choose to take transit, in spite of having a car at their disposal. Riders by choice demand top-quality transit service that competes favorably with the car, both in door to door travel time and perceived operating cost. This travel demand market is not met in Fresno. All of FAX and Clovis bus routes are local in nature and do not offer competitive service to the automobile. This quality of service has been attempted by FAX service planners in the past, but with poor ridership results, so service was scrapped. Without much congestion in Fresno, bus service has a hard time competing with the automobile in terms of travel time comparisons and convenience.

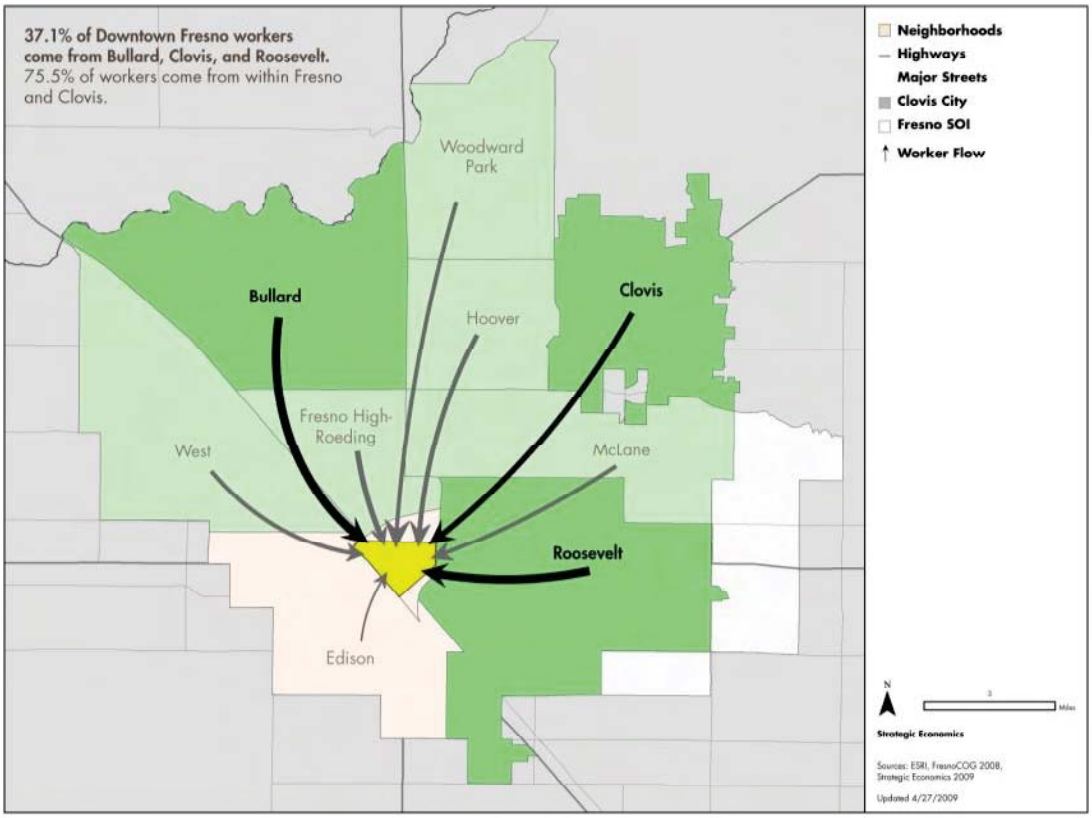
Figure 2: Commute Patterns to the North Fresno Job Center



Source: U.S. Census Bureau: Longitudinal Employer Household Dynamics, 2006; City of Fresno; Strategic Economics, 2009.

3) **Fresno's Intra–City Commuter Market** is defined as home to work based trips that occur within the developed Fresno metropolitan area, which includes the City of Clovis. Two top employment destinations were identified: one in Clovis along Herndon Avenue and the other in downtown Fresno. Analysis by the project team shows that 37.8% of north Fresno workers travel from nearby Bullard, Woodward Park and Clovis areas, as illustrated in Figures 10 and 11 below. These trip patterns identify the key commute corridors that would be well-served by high quality transit that could compete well with the automobile in order to capture riders by choice.

Figure 3: Commute Patterns to the Downtown Fresno Job Center

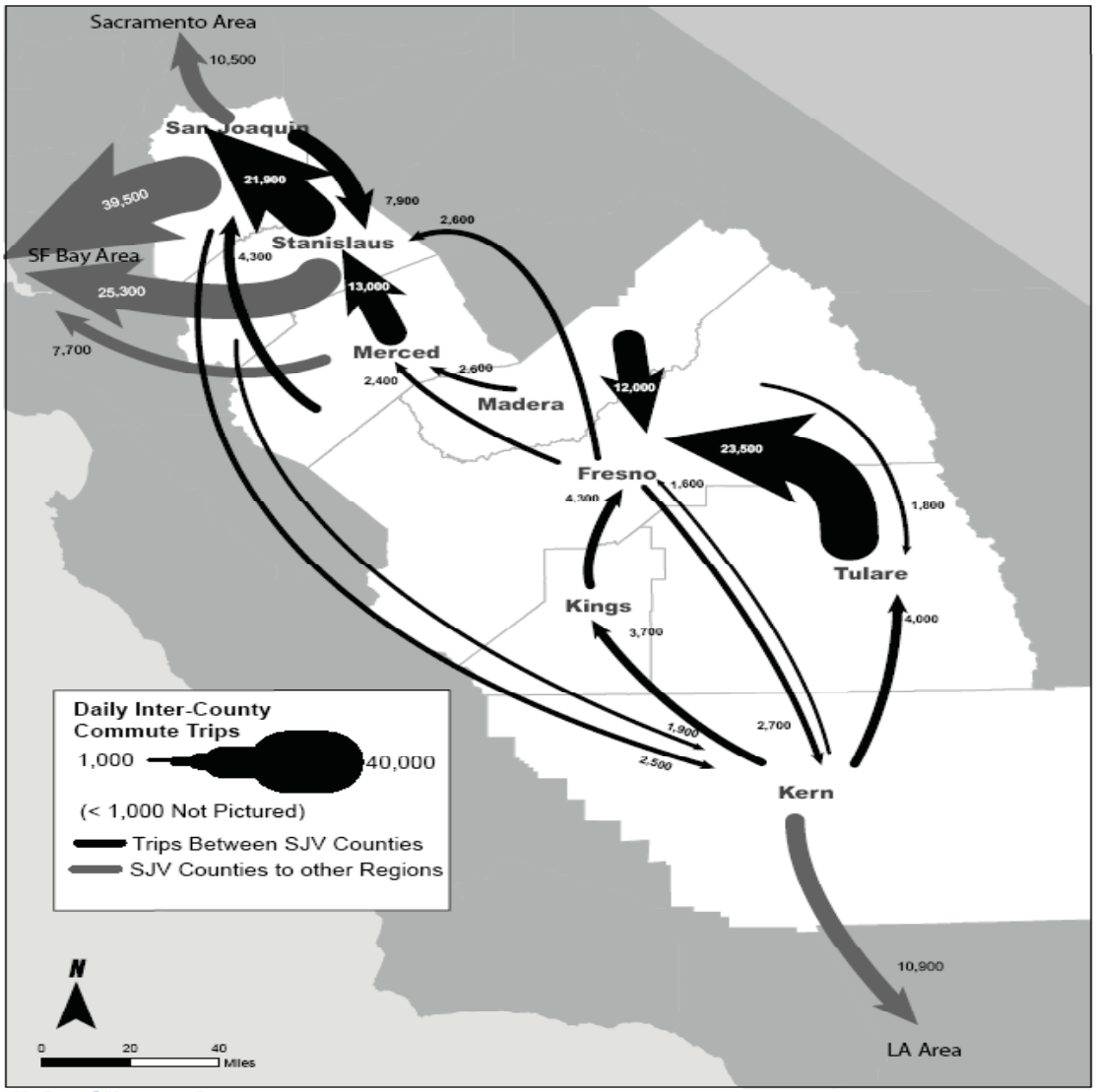


Source: U.S. Census Bureau: Longitudinal Employer Household Dynamics, 2006; City of Fresno; Strategic Economics, 2009.

The Inter-County Commute Market. Recent transportation studies in the area have identified a significant and growing commute travel pattern into Fresno along Highway 99. The May 2009 Study "San Joaquin Valley Express Transit Study" estimates that about 5,000 commute trips leave Fresno County each day for Stanislaus County (1,500), Merced County (1,300), Tulare County (1,115) and Kern County (1,200).

However, Fresno County, as the major employment center for the region, attracts far more commuters than it exports. Approximately 23,0000 more commuters travel from Madera County (6,500), Kings County (2,800) and Tulare County (14,000).

Figure 4: Projected Inter-County Commute Trips 2030



Forecasts for 2030 see dramatic increases in inter-county commuting. It is projected that the largest inter-county markets are Tulare to Fresno (24,000 daily trips) and Madera to Fresno (12,000 daily trips). The number of workers coming to Fresno County from surrounding counties is expected to grow to nearly 40,000 by 2030. Daily commute trips to Fresno along Highway 99 are expected to double from the current 2,400 trips per day from non-urban Madera County by 2030.[1]

[1] *Cambridge Systematics Statewide Model. GIS Source: ESRI, CASIL*

3) **Discretionary Riders** take transit to shopping, recreational and entertainment destinations. Sometimes discretionary riders are either too old or too young to drive. They typically travel at off-peak times during the day and do not mind the extra travel time the bus takes but choose to take the bus because of the lower cost. Discretionary riders are commonly seniors during the daytime hours and teenagers after school hours, going to the local mall or after school jobs.

   Fresno County contains many recreational destinations of significance, including Yosemite National Park, and a dozen others. Transportation is one of the major issues facing many of the national parks. The growing numbers of visitors to the national parks is increasing congestion on the roads leading to and inside the parks. Automobile congestion brings air quality issues and several of the nation's parks have visibility and health issues now associated with the influx of visitors. This is particularly evident in Yosemite National Park, which has as many as four million visitors each year.

   The Yosemite Area Regional Transportation System (YARTS) is a regional joint powers authority formed by Mariposa, Merced, and Mono Counties to implement transit service to Yosemite from surrounding communities. The YARTS experience has been a positive one that Fresno COG is looking to replicate to other recreational destinations. Since it began operating in May of 2000 YARTS, now in its 10th year, has provided an alternative to driving to over 515,000 riders traveling in the Yosemite Region.

Other recreational destinations that could benefit from improved transit service include:

- Kings Canyon National Park
- Sequoia National Park
- John Muir Wilderness Area
- Millerton Lake Recreational Area
- San Joaquin River
- Kings River
- Shaver Lake
- Huntington Lake and the Kaiser Wilderness Area
- Pine Flat Reservoir
- Mendota Wildlife Reservoir

Recreational destinations in the Fresno metro area include the Fresno Convention Center, California State University sporting events, Chukchansi Park (Grizzlies Baseball Stadium), Fresno City Zoo, Island Water Park, Roeding and Woodward Regional Parks, Kearney Park and Lost Lake Park along the San Joaquin River.

4) **Institutional Riders** take transit for visits to doctors, for classes at schools and colleges, or to get to social service appointments. Institutional riders typically must meet an appointment schedule and are significantly inconvenienced if they are delayed or if bus service is cancelled. Institutional riders are typically willing to pay more for more reliable and faster service. They are frequently transit dependent.

   FCRTA provides local service to institutional riders in many smaller communities in Fresno County, with some variation in service hours and type between communities. Most provide local response service on weekdays. Kingsburg and Selma also offer demand response Saturday service. Demand response service in the greater Fresno area is available to all residents in outlying communities to get to doctor's appointments, grocery shopping,

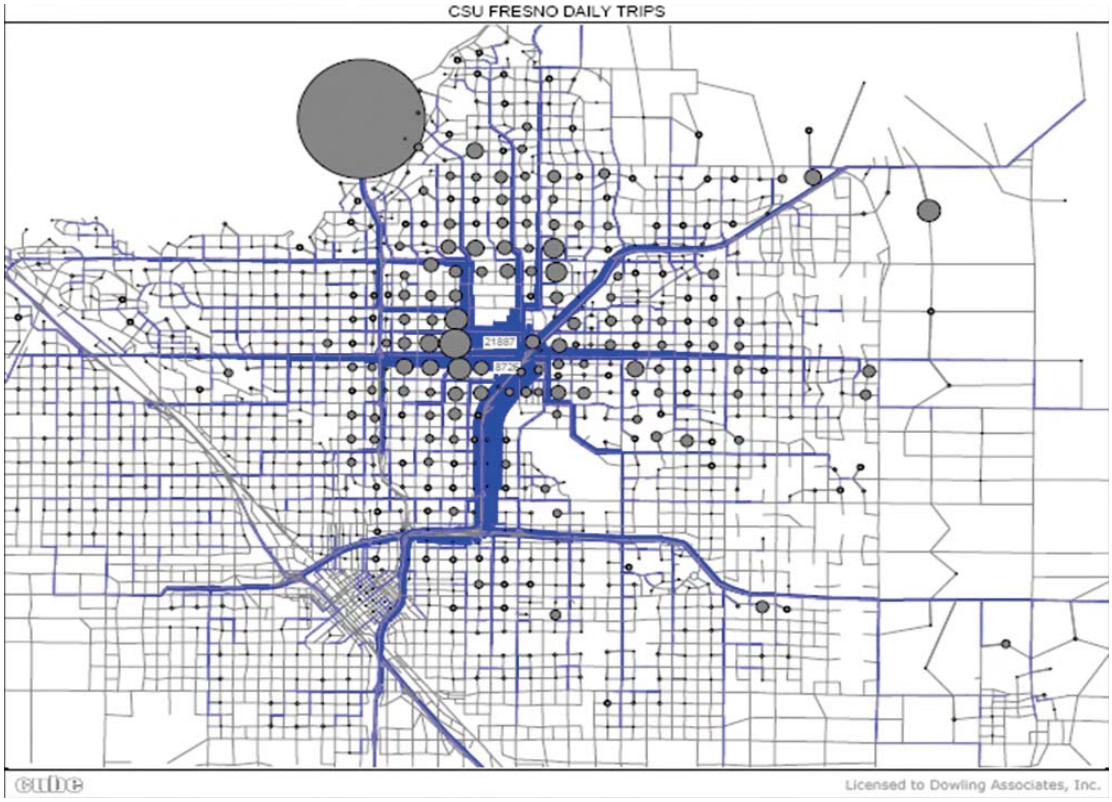
or other basic needs. Use of the system has no user requirements, like proof of a disability, proof of age and/or an ID card. Patrons wanting a ride simply make a call to the call center when they want to go with no advanced notice requirement.

CSU Fresno

The California State University campus at Fresno represents a unique set of travel patterns and a highly concentrated transit-dependent population of institutional riders. With about 20,000 students currently enrolled and another 10,000 students expected to be added at this campus in the future, parking, congestion and campus circulation are ongoing issues. The January 2008 Campus Master Plan calls for the addition of five more parking structures scattered throughout the campus to handle the expected demand for student parking on campus. A need for a transit center on the campus and bicycle parking has also been identified.

There are four transit routes currently serving the CSU Fresno campus. Clovis Transit Route #10 circulates through the city of Clovis and then makes a loop along Barstow through the campus to Shaw Avenue. FAX Route #9 links the campus to lower income residential areas on the west side of Highway 99 along Shaw Avenue. FAX Route 28 links the campus with downtown Fresno and the Manchester Transit Center, stopping on the south end of campus on Shaw Avenue. And, FAX Route 38 links the campus with the River Park Transit Center and downtown Fresno with stops on the west side of the campus along Cedar Avenue.

Figure 5: CSU Fresno Daily Trip Origins

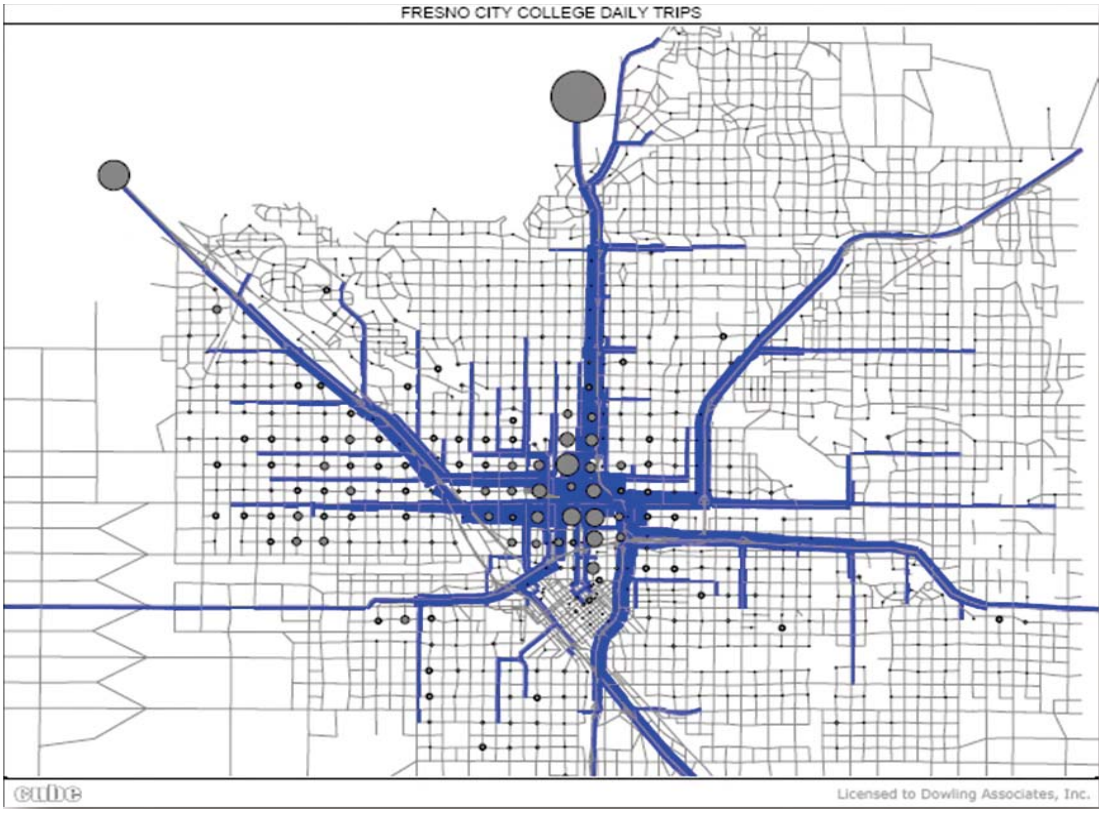


A travel demand model run for trips destined to the CSU campus shows heavy concentrations of student housing around the campus within about a 3-mile radius, and a large number of students commuting to the campus from points north along Highway 41. Figure 5 identifies areas of need for transit service where none currently exists. Recommendations for improving transit service to the CSU Campus include: 1) implement a circulator shuttle in the 3-mile area around the campus, linking to destinations in the center of the campus; 2) survey students who commute in to the campus from points north to determine if there are common trip origins for grouping student pickups for either a vanpool program or commuter express-type bus service for these trips; and 3) Adoption of a Travel Demand Management (TDM) program on campus to provide incentives to take transit, including assessing an impact fee for parking which will offset program costs. A bicycle circulation study around the campus area is also recommended to improve student's comfort with riding bikes to school.

Fresno's Community College Campuses

Fresno City College, or FCC, is a community college in Fresno, California. The main campus is situated in the heart of Fresno, near the Tower District. Four other campuses in the community college system include Reedley College, Willow International Center, Madera Center and Oakhurst Center. FCC is part of the California Community Colleges system within the State Center Community College District (SCCCD). Student enrollment for the combined campus locations was 21,624 in 2007-2008 (13,379 full-time equivalent) plus about 326 teachers.

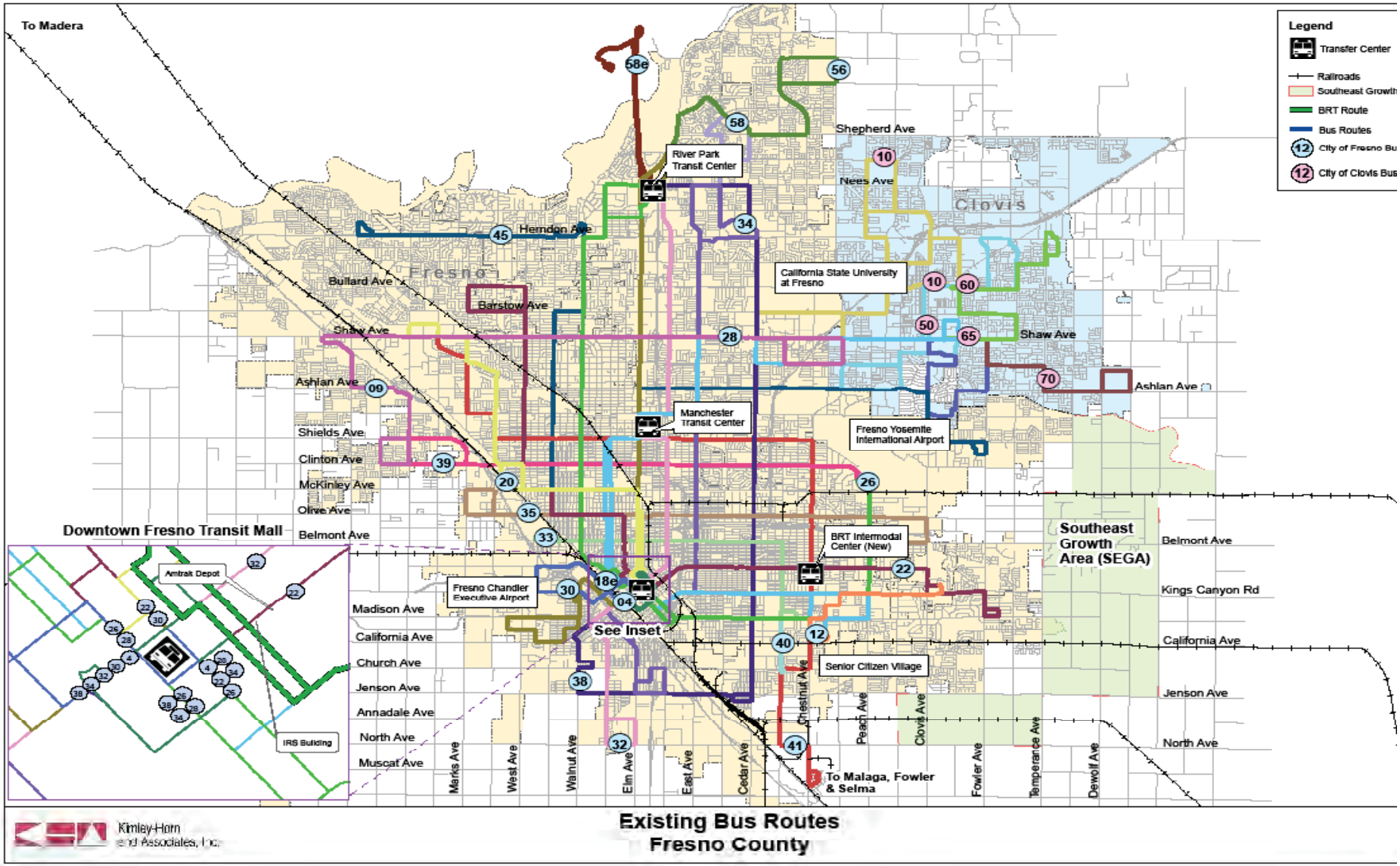
Figure 6: Fresno City College Daily Trip Origins



Travel patterns to the City College Campus location are illustrated in Figure 6. The City College Campus trip origins more dispersed than the CSU Fresno trips, with students coming to the campus from points north along Highway 41, Highway 99, from Clovis and other points east and south. Some students do live near the campus and would benefit from local transit service. This area is well served by transit with five FAX bus lines within a block of the campus: Routes #30, #39, #20, #45 and #26. However, there are no direct bus routes from the City of Clovis for students who live in Clovis and attend Fresno City College.* The travel time from Clovis to the City College Campus by transit, including transfers between systems, is nearly 2 hours.

**Route 28 provides direct service to Fresno City College from Kings Canyon/Venture, Downtown Fresno, Van Ness and Fulton, Shields and Blackstone/Dakota/1st Street to Shaw. Clovis residents would take Clovis Route 10 and transfer to Route 28 at CSU Fresno.*

Figure 7: FAX and Clovis Existing Transit Routes



2.3 Existing Transit Supportive Development

An assessment of development densities in residentially zoned land in Fresno County revealed that rural Fresno County does not yet exhibit development patterns that will support high volume modes of travel. Also lacking is the concentration of activity centers that could support lower volume, advanced technology circulator systems. Employment densities are probably more important than residential densities when considering high volume BRT and rail modes. It appears that, at minimum, central business districts with 15,000 to 20,000 jobs per square mile (found in San Jose and Phoenix, respectively) are necessary for light rail to be considered[2]. Fresno City and County currently fall short of these thresholds.

The City of Fresno currently has about 43,000 employees and 19,000 households in the Central Business District. By comparison, the City of Portland has 145,000 employees and 27,000 households in their central business district. Currently Fresno County carries 2.17% all trips to work on transit while Portland carries 20% of its work trips on transit.

Changes can be brought about to provide for development patterns that will support certain higher capacity transit modes in metropolitan Fresno. In fact, in some corridors within the city of Fresno, demand appears high enough to support Bus Rapid Transit (BRT) service at 10-minute peak hour frequencies. FAX has applied for federal funding support to implement the first major BRT service and capital improvements in the next two to three years along Blackstone Avenue heading north from downtown and Ventura/Kings Canyon, heading east from downtown Fresno. The most promising BRT corridors generate transit demand from a combination of high transit dependency (due largely to low auto availability), concentrations of commercial and retail uses along the proposed BRT arterial, and also concentrations of employment in downtown Fresno, which would be served by proposed BRT routes.

However, what we see from the modeled ridership projections is that as the density and mix of land uses increases, so does the percentage of people who choose to take transit instead of driving. This trend will balance out the mix of captive and choice riders in the future

2.4 Existing Transit Technologies in Fresno

Standard buses and demand responsive vans and minibuses are currently the dominant transit technologies in Fresno because they are most effective in meeting both the type and level of demand. Currently, bus transit is the primary transit technology in use in metropolitan Fresno County. The common bus type operated on fixed-route service is an approximately 35- to 40-foot, compressed natural gas (CNG) or clean diesel powered vehicle. This vehicle is often referred to as a standard transit bus. To provide paratransit services (for seniors and the disabled) in the Fresno-Clovis metropolitan area and both paratransit and demand responsive services in smaller communities elsewhere, smaller vans and minibuses powered by gasoline, diesel or CNG are used. About the only other transit technologies commonly operating within Fresno County are over-the-road transit coaches (diesel) and passenger rail trains (diesel-electric) for long-distance intercity or interstate travel.

Table 2 in the Alternative Analysis section presents the range of all existing transit technologies for consideration for Fresno's future.

[2] Other central business district job densities are: San Diego–33, 179 and Sacramento–30, 364.

Numbers of daily or peak hour passenger trips, operating costs, farebox recovery, etc. by transit technology mode are modeling outcomes that are particular to each application and dependent on a number of factors including residential and employment densities in the capture area of the stations or stops, fequency of service and number of cars in a trainset, relative congestion in the corridor, the year of operation, etc... This level of analysis for all technology modes is beyond the scope of this study.