


7.0 PLANNING POLICY RECOMMENDATIONS

Policy Recommendations Summary

Policy recommendations were made by the consulting team on the PTIS Study for implementation by the City of Fresno, Fresno County, LAFCo, and the cities and towns of greater Fresno County to meet the study objectives. The following summary recommendations were coordinated with City of Fresno staff and presented to the combined TTC meeting on May 13, 2010:

1. Locate a major portion of all new households, office and retail/commercial employment within planned and proposed high capacity transit corridors.
2. Approve general plan and zoning authorization to support high capacity transit corridors: 15 to 18 du/ac average residential infill density within ½ mile proximity and 8 to 12 du/ac within ½ to 1 mile proximity of planned and proposed transit corridors and downtown of Fresno.
3. Implement general plan and zoning authorization, together with other incentives and creative public-private partnerships to facilitate establishment of transit oriented developments that provide a variety of housing types to serve broad range of household sizes and incomes within BRT and other identified transit corridors and downtowns of Fresno, Clovis and other Fresno County cities.
4. Reduce the parking requirements for new development within planned BRT and other designated transit corridors and downtown Fresno and Clovis to promote a higher return on investment for TOD projects.
5. Reduce the existing over-supply of surface parking within the planned BRT corridors and downtown Fresno, utilizing shared parking agreements, reciprocal access agreements, public parking facilities and the conversion of surface parking to other uses.
6. Limit the extent of fringe development and expansion of the sphere of influence within the County of Fresno and the incorporated cities in conjunction with the other identified strategies to promote infill development and achieve the smart growth objectives.
7. Require that proposed new development located within the fringe areas of the Fresno-Clovis Metropolitan Area and the surrounding Fresno County area bear the full costs of providing public infrastructure improvements together with the long-term maintenance of these public facilities.

Policy changes that direct how and where development is allowed to occur will be critical to the success of future transit investments and meeting air quality requirements.



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Policy Recommendations in Detail

1. **Locate a major portion of all new households, office and retail/commercial employment within planned and proposed high capacity transit corridors.**


Specific strategies and recommendations...

...for the City of Fresno to implement:

Overview. Focus as much growth downtown as possible, particularly employment uses. Maximizing growth downtown optimizes the use, viability and efficiency of public transportation, pedestrian and bicycle use, and shortens the average trip lengths made by car. Successful residential development will rely on the sense of security felt by prospective residents, as well as provision of fundamental services residents need. Therefore, development and growth strategies need to be augmented by a Clean & Safe program (as proposed through the new Downtown PBID) and incentives to attract and retain grocery and support retail.

The approval processes for downtown development and redevelopment should be simplified and expedited, and fees and improvement costs should show a clear nexus. The concept of using incentives such as fee waivers to attract development has been proposed by the City of Fresno Public Works and Downtown and Community Revitalization Departments. A high priority for the City of Fresno should be the renovation of downtown infrastructure such as water, sewer, and storm drain systems. This requires an infrastructure Master Plan (that is now being developed in conjunction with the Fulton Corridor Specific Plan and a shared funding mechanism that maximizes public sources of funds to keep development costs low. Finally, a policy is needed to address vacant historic buildings that are in such a state of disrepair that they cannot be feasibly renovated. The PTIS recommends the following strategies to support the goal above.

- A. Make downtown Fresno the top priority for investment and redevelopment, allowing for the highest densities in this area. (A new form-based code is proposed to accompany the Fulton Corridor Specific Plan). Target public investments in “place making” and infrastructure in Downtown Fresno to incent private development.
 - B. 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. The second tier corridors include Shaw Avenue and the extension of the Shaw Avenue corridor along Highway 168 to Clovis. 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) particularly TOD at key nodes and where transit routes intersect.
 - C. Explore public/private partnerships to facilitate projects that could act as catalysts for Downtown and Transit Corridor revitalization. But any investment in development projects should be concentrated within the Fulton Corridor Plan area to contribute to “critical mass” in the downtown area.
 - D. Monitor where development occurs in relation to target corridors and create performance indicators to track the growth in housing units, commercial/retail, etc. within walking distance of the priority transit corridors and downtown. This “market information” can be used, if necessary, to shift or refine development related policy.
 - E. (Cities of Fresno and Clovis) Create a Transit Overlay District and associated Form Based Code with density requirements, mix of building types and development guidelines that will support the transit investment in Downtown and Transit Corridors.
1. Develop and adopt Form-Based Codes to illustrate and specify the density and quality of development required in transit corridors and downtown. (The Fulton Corridor Specific Plan that is currently in progress with the City of Fresno proposes to create new form-based codes for downtown Fresno).



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2. Approve general plan and zoning authorization to support high capacity transit corridors: 15 to 18 du/ac average residential infill density within ½ mile proximity and 8 to 12 du/ac within ½ to 1 mile proximity of planned and proposed transit corridors and downtown of Fresno.
 3. Prohibit or restrict auto-oriented uses such as big box retail, strip commercial and low intensity distributed office parks fronting and within ¼-mile of high capacity Transit Corridors and in the Downtown area (through the TOD overlay district policies or a new form-based code) –and encourage the conversion of existing auto-oriented development in these corridors to residential and residential mixed use projects.
 4. Adopt reduced off street parking requirements for projects built in the Downtown and high capacity Transit Corridors – this should reduce construction costs, provide better pedestrian environments and perhaps increase building FARs. (The form-based code being developed for the Fulton Corridor Specific Plan proposes to accomplish this).
- F. Prepare a Master Plan and establish a funding mechanism to rebuild the infrastructure (water, sewer, storm drain) in the designated high capacity Transit Corridors and Downtown to add the capacity needed to accommodate higher density development (with Downtown as the highest priority). (The Fulton Corridor Specific Plan is making recommendations to achieve this, but for the downtown area only).
- G. Streamline and expedite the approvals process for higher density mixed use development projects and major employment uses Downtown. (Recommendations are being made through the Fulton Corridor Specific Plan to reduce the time and cost of development approvals).
- H. Encourage additional growth as possible within ¼ mile of other current FAX bus routes – particularly Cedar (to support 15 to 20 minute headway service) and perhaps also First, Fresno and Palm bus lines.
- I. 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.
- J. Create incentives to locate new employment centers in the Downtown and high capacity Transit Corridors. Locate new office and retail employment only in the BRT corridors and downtown.
- ...for Fresno County, COG and Fax to implement:**
- K. (FAX) 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).
- L. (COG) Study the feasibility of reprogramming available flexible transportation funds to make infrastructure and place-making investments that promote TOD and infill development.
- 2. Implement general plan and zoning authorization, together with other incentives and creative public-private partnerships to facilitate establishment of transit oriented developments that provide a variety of housing types to serve broad range of household sizes and incomes within BRT and other identified transit corridors and downtowns of Fresno, Clovis and other Fresno County cities.**

Specific strategies and recommendations...

...for the City of Fresno to implement:

- A. Create a development code that will allow more flexibility in how residential density is designed or redeveloped.



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For example, allow for the creation of common living and dining areas for communal or group-style family housing to accommodate extended families; allow for in-law units (or accessory units) to be added on to existing homes to increase density in place; allow for home-based businesses in TOD areas, etc. (Note: The new form-based code is purported to create this kind of flexibility in the downtown neighborhoods area).

- B. Reduce the parking requirements for new and modified residential developments to allow for a higher percentage of units to be set aside for people who would choose to live car-light in new TOD developments. (Note: this is also being addressed through the Fulton Corridor Specific Plan and the form based code).
- C. Reduce the parking requirements for commercial development in the TOD corridors and Downtown and provide eco-passes (transit passes) to employees. (Parking requirements are being reduced through the Fulton Corridor Specific Plan and the form based code).
- D. Build medium density housing for a mix of income groups along the second tier of bus corridors as infill development. (Proposed through the Downtown Neighborhoods Community Plan and accompanying form-based code).
- E. Work with the Housing Authority to subsidize a percentage of new development for lower income residents along all transit corridors, mixed among market rate units.
- F. Explore the use of the Low Income Housing Tax Credit program to develop mixed-income housing Downtown and along Transit Corridors.
- G. Set up a series of instructional workshops for developers to teach them (and learn from them) about how to use the new form based code and how to fund, market and build flexible TOD products for the Fresno market.

3. Grow the transit, bicycle and pedestrian mode shares by making it more attractive to use alternate modes, with a priority of making Downtown Fresno more attractive to pedestrians.


Specific strategies and recommendations...

...for the City of Fresno to implement:

- A. Develop and adopt Complete Streets Design Guidelines and designate priority streets in the General Plan circulation element for transit, bicycle and pedestrian improvements.
- B. Use CDBG funds for bike/ped projects in Transit Corridors and downtown.
- C. Set up a series of instructional workshops for developers to teach them (and learn from them) about creating bicycle and pedestrian connectivity for their projects.
- D. Prioritize projects in the CIP, and Measure "C" to match the identified priority corridors and Downtown.
- F. Traffic signals should be timed for people as well as cars. Allocation Green time allocation and max cycle lengths should reflect transit routings and pedestrian flows.

...for Fresno County, COG and Fax to implement:

- G. Create a new source of funds for bicycle and pedestrian projects similar to Safe Routes To Transit (SR2T) <http://transformca.org/sr2t/history>



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- H. Expand the Rideshare program office in Fresno staffed with Trip Reduction Coordinators who actively promote and market carpooling, vanpooling, bicycling and walking to work.
- I. Consider requiring employers with 50 or more employees to survey and measure their employees' mode of travel for commuting annually and establish targets to reduce the single occupant vehicle mode.
- J. Prioritize projects in the RTP and Measure "C" to match the identified priority Transit Corridors and Downtown.

4. Decrease the drive alone mode share and reduce VMT with Travel Demand Management (TDM) programs and policies.

Specific strategies and recommendations...

...for the City of Fresno to implement:


- A. Through the new form based code for the Fulton Corridor Specific Plan, amend the development code to replace the current parking minimums with new maximums and to encourage shared parking.
- B. Invite owners of privately owned parking lots Downtown to talk about collective parking pricing approaches instead of undercutting each other. Parking collective meetings could also discuss items of common interest like priority spaces for carpoolers, signage, and crime prevention.
- C. After a review of the supply and demand for parking downtown, eliminate excess capacity by pulling up asphalt and installing landscaped pathways, planter boxes, community gardens, and trees or by developing the land. This will also help reduce the heat island effect of so much asphalt and improve the pedestrian friendliness of Downtown.
- D. Consider implementing a public awareness campaign to educate the public of the impacts and consequences of driving for every trip and to promote ridesharing, transit, bicycling and walking.

5. Increase the number of residents in Fresno who would be willing to live in market priced TOD-style development, including young urban professionals, seniors, and future high speed rail commuters.

Specific strategies and recommendations...

...for the City of Fresno to implement include:

- A. Increase the number of people who are responsible for marketing the City of Fresno as a desirable place to live and to relocate or start a business in.
- B. Partner with the Chamber of Commerce and the PBID Partners of Downtown Fresno to create an effective marketing campaign for Downtown Fresno.
- C. Work with the community colleges and CSU Fresno to retain graduates and place them in local businesses. Develop incubator businesses to grow the kind of employment desired in Fresno. (Keep young people from leaving Fresno.)
- D. Clean up the decay, homeless encampments and crime areas downtown. Safe streets will be as important as complete streets in attracting seniors to the Downtown.



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6. Cross jurisdictional and departmental boundaries with processes to link transportation and land use planning decisions together.

Specific strategies and recommendations...

...for the City of Fresno, Fresno County, COG and Fax to implement together include:

- A. Create an inter-jurisdictional “compact” to support and implement the Blueprint principles and achieve SB 375 targets.
- B. COG should consider creating flexible sources of funding (similar to TLC funding in the San Francisco Bay Area) to incentivize TOD development projects in the City of Fresno. Also see description of the Pedestrian Connectivity Program in Portland, Oregon, in the section on interagency coordination.
- C. COG should consider creating a performance monitoring system (like the new Federal Sustainability Benchmarks concept) to track development performance over time on key indicators (from the COG travel model). For example, measure the number of new (housing units, residents, square feet of development by type) permitted or built in the priority Transit Corridors and Downtown.
- D. Measure VMT per capita and compare the Transit Corridors against the outlying areas to illustrate the impact of living on the fringes. Large developments like SEGA should be monitored as they build out to ensure that they do not exceed smart growth VMT levels.

Discussion on Interagency Coordination

Developing and implementing strategies to award transportation funds for projects consistent with Fresno’s Blueprint and Public Transportation Infrastructure Study recommendations.

Benefits of coordination

It is important not just to plan for smarter growth, but to take the steps to implement it. The coordination would forge a stronger connection between regional transportation planning and local land use planning and decision-making.

Land use influences travel behavior and can be a powerful tool to improve the efficiency and effectiveness of the regional transportation system. If it is convenient for people to travel to common destinations by public transit, walking, or biking, the County can reap air quality and congestion-relief benefits at the local and regional scale.

Many aspects of the relationship between land use and transportation are well understood. We know, for example, about the effect that population and employment density have on travel behavior, and what happens to land use when a transportation investment is made.


The use of transportation funds

A coordination program would use transportation funds to provide financial incentives to encourage transit supportive development near transit centers and/or capital grants to local jurisdictions for small-scale transportation improvements.

Proposals would be submitted by public agencies, and evaluated for how well they promote the Blueprint and PTIS Principles, and the level of project maturity and commitment to actual physical construction.

Other regions in California are using transportation funds to link land use and transportation

Programs are underway in the Bay Area, Sacramento and San Diego that use federal and state transportation funds as well



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as sales tax measure proceeds for the purpose of linking land use and transportation. (Fresno is currently using CDBG and Prop 84 funds for planning work).

In California, the San Francisco Bay Area- Metropolitan Transportation Commission's (MTC) Transportation for Livable Communities (TLC) has used this approach since 1996. Other noteworthy programs outside of California include:

- Atlanta, Georgia - Atlanta Regional Commission (ARC)'s Livable Centers Initiative (LCI); and
- Chicago, Illinois - Regional Transportation Authority (RTA)'s Regional Technical Assistance Program (RTAP).

While it is still an emerging field, there are three types of approaches from around the United States where transportation investments decisions have been linked to land use.

The most basic approaches are those where transportation dollars are being invested in land use planning to realize long-term changes in land use that are supportive of the desired transportation system.

Generally, programs provide a set of incentives and financial support to communities wishing to integrate transportation and land use planning for the purposes of place-making and reducing automobile trips. In these programs, public agencies have invested in funding for local land use planning to help create a framework where transportation improvements and land use plans are better integrated.

Use of the funds

The program would fund both planning activities and construction of improvements consistent with those planning activities. It would place an emphasis on involving the public in decision-making and taking steps to create places that have the physical attributes that supports walking trips, compact development and civic vitality.

Capital grants will direct transportation dollars to support smaller-scale capital projects that can help promote transportation choices as well as support land use changes in the form of infill housing and transit-oriented development.

Examples of programs that use this targeted approach

The Federal Transit Administration's (FTA) New Starts Land Use Criteria is the most notable example at the national level of linking transportation investment decisions to land use conditions, plans and policies.


Land use is one of three factors FTA uses in rating projects. The other two factors are the User Benefit calculation (essentially travel time savings for new and future riders divided by capital cost) and the strength of the local financial commitment. For a project to advance, it needs at least a combined rating of "medium."

The federal government estimates there are over \$48 billion in New Starts projects in the "funnel" competing for \$22 billion in funding with another 120+ projects considering pursuing New Starts funding. At current funding levels, it has been estimated that it would take 50 years to fund all the projects in the New Starts pipeline.

Federal policy gives special consideration to land use in funding decisions for New Starts. In today's environment, where over a hundred projects are chasing a limited amount of federal dollars, the implications of a "low-medium" rating on FTA's land use criteria can be significant.

Other examples of a targeted approach of linking transportation investment decisions to land use

An emerging example of linking transportation investment decisions to land use is the San Francisco Bay Area Rapid Transit



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District (BART) “Policy Framework for System Expansion.” The policy was adopted by the BART Board in 1999 and is unique among transit agencies in the United States.

Perhaps the most significant element of the System Expansion Policy is how it has begun to change the dynamics of the conversation between BART and local jurisdictions. The policy has been an effective tool in helping local governments to see the transportation implications of their land use actions and how they are an important partner in the success of a new transit project.

The BART policy provides a clearly defined two stage “project advancement process” for how projects are screened and can advance through the process. At the first stage, BART staff relies on an initial planning assessment of a transit expansion project and evaluates the proposed project against their criteria and decides whether to recommend a project to the BART Board for advancement to the next stage.

Once the project advances to stage two, BART staff will work in partnership with local jurisdictions to develop a Memorandum of Understanding (MOU) laying out coordinated timelines for the environmental review of the proposed project and the “Ridership Development Plan” process.

The Ridership Development Plan process appears to constitute the essential element of the system expansion project advancement process. At this stage BART would enter into a partnership with local jurisdictions to achieve transit ridership thresholds by balancing TOD with community desires.

In the MOU, BART would be seeking local jurisdictional commitments to adopt transit-friendly General Plans and/or Specific Plans with sufficient levels of density to make the project cost-effective.

More direct approaches being used to link land use and transportation

The most direct approaches are those where an anticipatory decision was made to condition a specific transportation investment on binding commitments to change land use in a manner supportive of the transportation investment.

This approach ties the allocation of funding for specific transportation infrastructure to the delivery of projects that are expected to provide substantial ridership to the new system and/or financial support for the cost of delivering the transit infrastructure.

The Valley Transportation Authority in Santa Clara County is a good example of this approach. In 2002 the Santa Clara Valley Transportation Authority (VTA) adopted the Community Design and Transportation (CDT) Program as its primary program to integrate transportation and land use. The CDT program set out to aid the implementation of transit-supportive development that would broaden and strengthen the range of viable transportation choices in the region while making the most efficient use of transportation and other resources in the county.

VTA collaborated with its member agencies, the cities and county of Santa Clara, to develop the goals, and later asked each municipality to formally adopt the principles and best practices identified in the CDT program into planning, public works, and redevelopment projects, and in project development, review, and approval processes. VTA drafted a model resolution for cities establishing a minimum level of commitment to the CDT program and its principles.

While thus far the agency has not enforced the arrangement, the program and the best practices manual that was designed to support it has helped to make the requirements for access, pedestrian-friendly urban design, and transit-supportive land use programming explicitly clear to developers and to the cities that partner with developers. During its use several cities have amended their zoning codes and regulations.



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Another Example

Portland's regional government, Metro, operates an innovative TOD Implementation Program using federal transportation funds that was designed to help stimulate the construction of "transit villages".

The TOD Program operates through a series of cooperative agreements between Metro and local jurisdictions, and utilizes Development Agreements with private developers. Metro has funding by which they purchase and entitle land, and then using these agreements they sell the property to the private sector.

Another Metro program is the CMAQ TOD Program run by the Portland Development Commission. The program was funded with \$3.5 million in CMAQ funds to acquire land, and design and construct transit amenities as part of TODs. A total of nine projects have received this funding.

Transportation system benefits from Metro's program

Metro's TOD Program pushes the development envelope by using public-private partnership techniques to secure more TOD-like projects than would otherwise be developed on a given site. For example, on a site where the market would likely produce three-story apartments with surface parking and no retail, the TOD Program would push for five-stories with podium parking and ground floor retail that may have four to five times more dwelling units and induce significantly more transit ridership. Property is acquired, re-parceled and planned, then sold with conditions to private developers for constructing TOD and/or dedicated to local governments for streets, plazas, and other public facilities where appropriate. In many cases, the land value is reduced to cover the high development costs required to construct a specific TOD project. In such cases, a "highest and best transit use" appraisal is used to establish the sale price.

According past Metro employee Marc Guichard, "real estate development economics often make the dense mixed-use TODs sought in local plans infeasible in much of the region. A development rule of thumb is buildings should be constructed over parking, and uses should be stacked when land is more expensive than a parking structure. In the Portland region, this rarely occurs if market dynamics are generating land values less than \$50 to \$60 per square foot. In fact, parcels near most of the transit stations in the region, outside downtown Portland, generate land values of only \$6 to \$10 per square foot.

7. Limit the extent of fringe development and expansion of the sphere of influence within the County of Fresno and the incorporated cities in conjunction with the other identified strategies to promote infill development and achieve the smart growth objectives.

Specific strategies and recommendations....

...for Fresno County and COG to implement include:

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 implement 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.

7.1 Discussion on Urban Growth Boundaries

Urban Growth Boundaries (UGBs) can act an instrument to help preserve farm and forest uses in rural areas and promote efficient job and housing growth in urban areas. The intended effect is to limit urban sprawl for the purpose of:

- Reducing costs of public infrastructure
- Preserving rural lands (farm, forest and scenic)
- Coupled with general plans, concentrating job and housing density toward central areas, nodes and corridors to enhance urban places

Urban growth boundaries help signal that growth is expected within existing cities, where amenities such as transit, parks, schools, and utilities already exist. As a result, more public and private investment is focused into existing nodes and corridor for infill development. This investment can help improve and build on the County's downtowns, corridors, and main streets. These urban places offer unique opportunities. For some residents, the townhouses and condos mean more options for buying a home. Other residents move to these areas to be closer to urban amenities.

Urban places are able to provide more options for people's daily lives, be they housing, transportation or even access to cultural amenities and the arts. Development in these areas often also allows residents to drive less and walk more, leading to cleaner air and healthier lives.

UGBs, by various names are used in numerous places around the country and within the State of California. San Jose, Contra Costa County and Ventura County all employ UGBs to limit urban sprawl and concentrate development. Some of the most well known UGBs include the Portland Metro area of Oregon and Boulder, CO.

Example from Ventura County: Fiscal Impacts of Sprawl


Low density urban expansion usually contributes to fiscal losses and city deficits – e.g. Ventura County agriculture requires about \$0.65 in services for every \$1.00 it generates in revenue – low density urban development requires about \$1.25 in services for every \$1.00 it generates in revenues. Annual revenue statistics for the six cities adjacent farmland (Camarillo, Fillmore, Moorpark, Oxnard, Santa Paula and Ventura) – low density urban development produces a negative cash flow of \$5.2 million vs. a compact growth scenario that results in a positive cash flow of \$4.9 million – difference of \$10.1 million annually.

Growth boundaries can take multiple forms, and can be implemented both locally and regionally. For various reasons, regional boundaries (typically comprising at least one full county) are the most successful.

Following are some optional techniques for growth boundaries in Fresno County.

Management by Voter Approval

This approach may require voting at the City level and then forming a compact (or other form of intergovernmental agreement) for coordinating the boundaries. After each city set its boundary any expansion would need to be thoroughly examined by the voting public. Ideally this should result in both slower expansion of public services (and therefore the ability to better invest in the more focused service provision, especially transit and transportation in general), and the development community putting forth high quality projects for consideration. Places that have voter control of urban expansion often see a slower rate of land development than other similarly situated places. However, in these places development that does happen occurs as smaller projects designated for only one type of housing or employment. From the standpoint of encouraging development closer to established transit, these future developments, while minimized, would not support the expansion of ridership.



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General Plan Density Adjustments

This description assumes that boundaries are formed either countywide, by vote or government action. The more permanent a UGB is the more important it will be to examine planning practices within developed areas. One technique has been to re-evaluate density patterns within existing cities, especially in downtowns or along significant transportation corridors. Planning for increases in density in the right places help to minimize the pressure on the boundary while simultaneously providing a means for community revitalization, and for the purpose of this project, increases in potential transit users. This approach has been shown to decrease the distance that people drive and increase alternate mode transportation. Infill development would likely result in the type of housing provided to future residents to shift away from single-family homes at the edge to more townhouses, apartments and condominiums closer to goods and services, and better served by transit.

Concurrency Requirements

Some communities with UGBs use them to control the rate of urban expansion so that growth does not get ahead of local governments ability to build infrastructure (i.e. roads, transit, schools, pipes). With a concurrency based system boundaries can be expanded whenever desired so long as plans and funding are in place to handle the needs of the people that will live and work in the expansion areas. Local or regional officials usually act as decision makers to ensure that projects are evaluated based on their ability to provide services rather than on other aspects of the project such as aesthetics or future land uses. Montgomery County Maryland is the most well known example of a concurrency based boundary. The effect there has been primarily to limit suburban expansion, with minimal focus on building higher density places.

Land Capacity Monitoring

One potential boundary management strategy is to monitor growth trends and land capacity to ensure that there is enough land available for housing and job growth over time while also keeping infill and other urban development commonplace. A capacity threshold could be created, such as a certain percentage growth or even room for a number of years of development. Ensuring a certain amount of vacant land at any given time can help to avoid causing a spike in land values that can reduce affordability or choke off development.

Using past growth rates and current land use designations it is relatively straightforward to calculate the amount of housing and job capacity within a given UGB area. Combining the capacity information with a forecast of future growth enables a city to estimate of the number of years of capacity remaining within a UGB. A capacity based management program would include a periodic evaluation of capacity, ideally in coordination with neighboring jurisdictions.

The Fresno PTIS research has shown that the region's current zoned or planned capacity is primarily at the edges of the urban areas where transit and other public services are minimal. A targeted approach for Fresno would likely include an adoption of performance targets for infill development. Under a system like this, boundaries would not be expanded significantly unless jurisdictions, through capacity analysis determined that there would be insufficient opportunities through increased zoning densities in existing urban areas.

Expanding UGBs

One of the key functions of a UGB is to establish a greater degree of certainty about the possible uses of land, and thus its value. Overly speculative real estate investment cannot be eliminated by a UGB, but it can serve to moderate the practice. Sale prices of agricultural land in the County are often higher than they should be if viewed only through the land's ability to generate income through farming. This suggests that some are buying land outside of cities with the hope and intention of eventual development. One option is for government to identify long in advance, the location of future UGB expansions. If, for example, all of the land that will be added to the UGBs during the next 30 years were mapped and readily available,

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speculation on the lands outside of the identified growth areas would likely cease. The added benefit is that the responsible agencies can do their infrastructure and land use planning far in advance of development. Having this time to do the planning will help to ensure that the land is used efficiently and that transit and other infrastructure can be provided efficiently. Another factor to consider, small incremental urban expansions, (whether or not there are UGBs), often provide just one type of development, such as subdivisions or office parks. Successful communities need a full range of housing and job options. Identifying future expansion areas and planning them based on the County's needs can help build better, more successful places.


8.0 Transit System and Investment Recommendations

In general, local agencies are not expected to generate additional analyses, documents, or quantitative data addressing land use issues in order to satisfy the reporting requirement for the existing land use, transit supportive land use plans and policies, and performance and impacts of policies criterion. In most instances, agencies will be able to rely on readily available materials that have been prepared in conjunction with the alternatives analysis or preliminary engineering effort, or other local studies and analyses (local and regional land use plans, local government land use actions, livable communities initiatives, economic development activities, etc.).

FTA Land Use Rating Categories and Factors

I. Existing Land Use <ul style="list-style-type: none"> a. Existing Land Use 	III. Performance and Impact of Policies <ul style="list-style-type: none"> a. Performance of Land Use Policies b. Potential Impact of Transit Project on Regional Land Use
II. Transit Supportive Plans and Policies <ul style="list-style-type: none"> a. Growth Management b. Transit Supportive Corridor Policies c. Supportive Zoning Regulations Near Transit Stations d. Tools to Implement Land Use Policies 	IV. Other Land Use Considerations <p>Exceptional examples, e.g.:</p> <ul style="list-style-type: none"> • Historic • Environmental • Community preservation • Brownfields redevelopment • Designated Federal Enterprise Zone/ Empowerment Community

To assist the development of accurate project ratings, FTA requests agencies to submit corridor and station area maps, local comprehensive plans and zoning ordinances, local and regional policies and agreements regarding land use planning, documentation of station area planning efforts, and documentation of other tools, incentives, and programs affecting



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corridor and station area land use. Additional descriptions of the information requested for the existing land use, transit supportive land use plans and policies, and performance and impacts of policies criterion are provided in FTA's Reporting Instructions for Section 5309 New Starts Criteria.

8.1 Urban Transit Investment Recommendations:


Most of Fresno's travel market has its origins and destinations in metropolitan Fresno. 92% of Fresno residents work in Fresno County, and only 8% commute to destinations outside the county. Of the total commute trips in Fresno County, 77% drive alone, 20% carpool or vanpool, and 1% take transit, walk and work from home. ¹

The Public Transportation Infrastructure study makes the following recommendations for the urbanized metropolitan Fresno area:

1. Continue to pursue federal funding assistance to build bus rapid transit corridors along Blackstone Avenue and Ventura/Kings Canyon Road within 3 years (by 2013).
2. A current need was identified to expand transit service hours, days and the number of routes to serve the CSU Fresno campus. Construct the campus transit center and include bike lockers and shelters. Add a campus circulator shuttle to connect the large number of students who reside within 3 miles of campus. 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.
3. Apply for funding for a third bus rapid transit corridor along Shaw Avenue from Highway 99 to Clovis, serving CSU Fresno within 5 or 6 years (2015 to 2020). The eastern end of the Shaw alignment could be either north on highway 168 to a future high density employment center, or it could continue into downtown Clovis on Shaw Avenue if sufficient base zoning has been implemented to support the high capacity investment.
4. The fourth priority for high capacity transit investments was identified for Cedar Avenue from Sheppard Avenue to near Butler Avenue (and serving the CSU Fresno campus). The timeframe for this investment has not been identified, but would depend on an assessment of transit travel demand on existing local buses serving that route.
5. Continue to pursue consolidation of transit services, particularly between Fresno and Clovis urban areas to create a seamless and time efficient transit travel experience between the two cities.

If policy decisions are made to implement higher density development, housing and mixed use projects downtown, and if the High Speed Rail project becomes a reality, the following transit investments are recommended for the 10 to 15 year horizon (2020 to 2025):

6. Recommend providing a direct link between the planned BRT system and the planned High Speed Rail (HSR) system to serve as a transit connection to destinations beyond downtown and to minimize the parking footprint needed for the future HSR station.
7. Pursue funding to build and operate a streetcar in downtown Fresno, serving Chinatown, the future High Speed Rail station and the regional medical center along Fresno Street, and terminating at San Joaquin Memorial High School as the top priority.
8. Pursue funding for an expansion of the streetcar project that would operate along Fulton or Van Ness to connect the downtown convention center, the Fulton Mall, and continuing up to the Tower District, terminating at Fresno City College.



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If development densities are achieved in the BRT corridors that support a high capacity transit investment (about 21 dwelling units per acre), and if headways on the existing BRT lines are approaching or at 7 minutes to serve existing travel demand, then

9. Pursue federal funding assistance to convert the BRT lines to LRT, particularly along Blackstone Avenue and Ventura/Kings Canyon Road.

^{1,2} *San Joaquin Valley Express Transit Study, funded by the Merced Association of County Governments, Nelson Nygaard, May 2009.*

8.2 Rural Transit Investment Recommendations

This Existing Conditions Analysis identified the following transit improvement needs for the future of rural Fresno County's transit system.

- A future need for commuter express bus service on Highway 99 to the north and south of Fresno, and north up Highway 41 as populations expand in these outlying areas.
- Coordinate future land use planning efforts with the recommended transit investment corridors to increase population and employment densities to the level where they will support the transit investment.
- Develop a range of strategies to market the City of Fresno and downtown Fresno in particular to employers who pay good wages for jobs in order to attract workers who will take transit by choice and can afford to live in TOD-style development in transit corridors.
- Develop a range of strategies to encourage development in the desired transit corridors and downtown and discourage fringe development projects like SEGA where transit expansions cannot be supported or are financially unsustainable.
- Recommend launch of a Title VI and Limited English Proficiency (LEP) outreach plan to understand the transit community's needs for communication and information translation.

8.3 Recommendations from Other Studies

Several other studies have looked at transportation improvement needs in the greater Fresno County area. The following recommendations are endorsed here by reference:


From the Blueprint Study: The broad transportation recommendations from the San Joaquin Valley Blueprint Study were the impetus for the more detailed plans and policies recommended by the PTIS Study:

Provide a Variety of Transportation Choices

Providing people with more choices in housing, shopping, communities, and transportation is a key aim of smart growth. Transportation is the key factor that will shape urban and rural development around the greenprint. The region's transportation investments will support the shared regional vision by providing:

- Connectivity between centers and to other regions.

Existing or new corridors will connect the major city centers within Fresno County. Where possible, the preference should be to enhance existing corridors, but new corridors may be needed where there are gaps in this system. It also will be important to work with the state to enhance the corridors that connect Fresno County to other parts of California, other states, and other nations, using a mix of road, rail, water and air.



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- Develop Regional Transportation Corridors

The transportation and other infrastructure needed to connect our city centers to each other and to other regions will be identified. Transportation corridors will link centers into a region, and together with the greenprint, will establish the broad framework for where future growth should occur. The long-range regional transportation plan will address connectivity, relieve congestion, and expand travel choices. Particular emphasis will be given to developing regional transit corridors that can serve as the future backbone for travel, much like the major highways do today. To do so, we will need to coordinate planning activities across jurisdictions to include all modes—highway, rail, water, air, and space.

- Choices for moving people and goods.

Residents of Fresno County envision a regional transit system that connects existing and future urban centers in all parts of the region. They also envision local light rail, street car, or bus rapid transit systems that connect neighborhoods with the regional transit service. They seek to expand the use of freight rail and high-speed passenger rail to move people and freight between Fresno County and other regions. They desire a transportation system that includes accommodations and access for the disabled.

They also desire a street circulation system for bicyclists that encourages and supports bicycling as an alternative form of transportation. Residents also desire a system of greenways and trails for walking or bicycling. Such a system would improve the health of residents and result in a more active citizenry. A regional transportation plan should identify where these choices are most feasible and set priorities to implement these investments.

Governor Schwarzenegger signed the Complete Streets Act of 2008 into law September 30, 2008. The law requires cities and counties statewide to incorporate complete streets when updating their general plans.

- Concurrency with new development.

Local governments should work with developers to implement needed roads and transit systems along with anticipated growth. This balancing of growth and infrastructure should occur at both local and regional levels to better address impacts of growth that spill over city or county lines. Regional standards can help ensure that development in one county or municipality does not adversely impact other counties or municipalities.

- Strengthen and Direct Development Toward Existing Communities

Smart growth directs development toward existing communities already served by infrastructure, seeking to utilize the resources that existing neighborhoods offer, and conserve open space and natural resources on the urban fringe.

- Develop centers that will function as hubs of economic activity.


Jobs and housing can be spread throughout the region, enabling people to live close to their jobs. Plans should ensure that sufficient land is designated for economic centers with appropriate transportation and other infrastructure already in place.

- Take Advantage of Compact Building Design

Smart growth provides a means for communities to incorporate more compact building design as an alternative to conventional, land consumptive development.

- Build up not out

More compact building design provides an alternative to conventional, land consumptive development. Compact building design suggests that communities be designed in a way which permits more open space to be preserved, and that buildings be constructed which make efficient use of land and resources.



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- Supports other modes of travel

Compact building design is necessary to support wider transportation choices in the county, and provides cost savings for localities. As we seek to encourage transit use to reduce air pollution and congestion, we recognize that minimum levels of density are required to make public transit networks viable.

From the San Joaquin Valley Express Study: For a majority of the region, investments in ridesharing are the most cost-effective strategy. The region's focus should be on expanding vanpool offerings in both the northern and southern parts of the Valley. The new Air District rule requiring trip reduction programs from large employers offers the opportunity for both a new funding stream, and an effective marketing strategy for expanded vanpool offerings.

Key Findings and Recommendations

1. The existing transit providers and carpool/vanpool programs are operating fairly efficiently considering the sprawling geographic area they are serving. The Vanpool program appears to be particularly successful in the region, serving low income farm and agricultural workers and should be expanded to serve more people.

Recommendations to improve carpooling and vanpooling in the Fresno area from the San Joaquin Valley Express Transit Study include:


- a) Continue with plans to form a Joint Powers Authority in the southern portion of the Valley to operate KART and AITS Vanpool.
- b) Prioritize vanpooling to Fresno.
- c) Provide a single Valley-wide ride-matching and vanpool website.
- d) Invest in more vanpool marketing to choice riders.
- e) Expand park-and-ride opportunities.
- f) Offer Guaranteed Ride Home throughout the Valley.
- g) Seek to influence the development of the new Air District trip reduction rule, so that it can fund and promote ridesharing to large employers.

From the 2007 Fresno COG Regional Transportation Plan

The Fresno COG Regional Transportation Plan assumes public transit use, including passenger rail, will keep pace with the rise in population and that additional incentives, such as voluntary trip reduction programs, will be initiated to encourage transit use.

Recommends improvements to Amtrak service in the San Joaquin rail corridor, including:

- a) Increasing service frequencies and improving on time performance;
- b) Improving utilization of equipment so as to get the maximum number of car miles from this expensive equipment;
- c) Extending service to fill the gaps in the current route. The first priority is to extend through service with an existing train on an overnight schedule from Bakersfield to Los Angeles with connections to San Diego;



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- d) Continuing efforts to make incremental track and signal system upgrades to improve speed, efficiency, and capacity;
- e) Creating a fare structure to maximize revenue per passenger mile;
- f) Restructuring on-board services in order to satisfy the needs of passenger train travelers, and;
- g) Increasing the level of public awareness of the San Joaquins as their trains and communities along the route develop a pride of ownership.

From the Caltrans December 2005 Study: "California State Rail Plan 2005-06 to 2015-16"

- a) Improve on-time performance to 90 percent by 2015-16.
- b) 2010-11 Bakersfield to Sacramento, third round-trip to extend from Stockton to Sacramento (seventh round-trip on route).
- c) Bakersfield to Oakland, fifth round-trip from Stockton to Oakland (eighth round trip on route).
- d) Supports the investment in High Speed Rail in the San Joaquin Valley along the SR99 corridor with stations at Bakersfield, Visalia, Fresno, Merced, Modesto, Stockton and Sacramento.

9.0 Transit Operations and Maintenance Plan

BRT vs LRT Costing Methodology

This section summarizes the methodology used to estimate the annual operating and maintenance costs (O&M) for two transit investment scenarios: Bus Rapid Transit (BRT) versus Light Rail Transit (LRT) in phased investments for each of the three proposed land use density scenarios as described in detail in the Alternatives Analysis section of this report:

1. 2035 Build (COG Trend)
2. 2035 Constrained TOD with Exclusive Lanes
3. 2035 Full Buildout TOD with Exclusive Lanes (Aggressive TOD)

Each scenario above includes proposed bus rapid transit (BRT) on Blackstone Avenue (Audubon to Downtown), Ventura Avenue-Kings Canyon Road (Downtown to Clovis and to Southeast Growth Area), and Shaw Avenue (SR 99 to SR 168 at Temperance). It is assumed that high speed rail is funded and operational by this time and that the Blackstone/ Ventura/ Kings Canyon BRT alignments are extended downtown to interface directly with the future High Speed Rail station. With the exception of Year 2035 Full Buildout TOD, the Ventura Avenue/Kings Canyon BRT would extend to the Southeast Growth Area (SEGA). And, a modern streetcar would be operating downtown on two radial alignments along Van Ness or Fulton and along Fresno Street between high speed rail and the regional medical center.

If population and employment densities reach the levels as forecast in the Constrained or Full Build-out TOD scenarios by the year 2035, BRT on Blackstone and Ventura/Kings Canyon could be upgraded to LRT. As bus service frequencies are increased to less than 10 minute intervals in order to meet growing travel demand, the need to upgrade to LRT service becomes increasingly attractive with the larger carrying capacity of the vehicles, the ability to chain multiple vehicles

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together using just one driver, and the resulting lower operating cost per passenger. Table 1 and Table 2 provide a summary of the limits and phasing for each corridor for 2035 Constrained TOD with Exclusive Lanes and 2035 Full TOD with LRT on Blackstone and Ventura/Kings Canyon scenarios, respectively.

Table 9: 2035 Constrained TOD with Exclusive Lanes

Corridor	Description	Length (mi)	Begin Revenue Operations	Phasing Notes
Blackstone	BRT Service along Blackstone Ave from Audubon Dr south to Downtown Fresno	9.29	2013	Funding requested through FTA Very Small Starts Application (submitted Fall 2010)
Ventura/Kings Canyon	BRT Service along Ventura Ave/Kings Canyon Rd from Downtown Fresno east to Southeast Growth Area (SEGA)	7.95	2013	Funding requested through FTA Very Small Starts Application (submitted Fall 2010)
Shaw	BRT Service along Shaw Ave and SR 168 from SR 99 east to SR 168 at Temperance Ave	13.25	2020	Future project, estimated opening year of 2020. Funding yet to be identified

Table 10: 2035 Full TOD w/LRT on Blackstone and Ventura/Kings Canyon

Corridor	Description	Length (mi)	Begin Revenue Operations	Phasing Notes
Blackstone	BRT Service along Blackstone Ave from Audubon Dr south to Downtown Fresno	9.29	2030	Long-term project to be implemented 15-20 years (assume opening 2030) after beginning operations of Blackstone BRT system (2013). Assumes ridership will warrant LRT service and BRT rolling stock and infrastructure will be reaching the end of 20 year service life
Ventura/Kings Canyon	BRT Service along Ventura Ave/Kings Canyon Rd from Downtown Fresno east to Southeast Growth Area (SEGA)	7.95	2030	Long-term project to be implemented 15-20 years (assume opening 2030) after beginning operations of Ventura/Kings Canyon BRT system (2013). Assumes ridership will warrant LRT service and BRT rolling stock and infrastructure will be reaching the end of service life)
Shaw	BRT Service along Shaw Ave and SR 168 from SR 99 east to SR 168 at Temperance Ave	13.25	2020	Future project, estimated opening year of 2020. Funding yet to be identified

9.1 BRT and LRT Ridership Forecasts

9.1.1 BRT Only Service in Transit Improvement Corridors

Daily ridership forecasts for each planned BRT corridor were developed using the Fresno COG travel demand model. The following table lists the projected daily ridership for each corridor. The ridership for the Shaw corridor ranges from 6,000 to 12,000 daily riders for the three Year 2035 scenarios. Ventura-Kings Canyon corridor ranges between 10,000 and 20,000 riders depending upon the assumed growth scenario. Blackstone has the highest ridership at 14,000 to 27,000 daily riders.

9.1.2 LRT Service Along Blackstone and Ventura/Kings Canyon Corridors

The change in technology from BRT to LRT results in higher ridership numbers for the same population base, due to an “attractiveness factor” built into the model that reflects the actual experience of LRT ridership numbers in cities where it has been implemented. The reasons for the added attractiveness of LRT have been documented in other studies. The causes range from a sense of rider’s security from seeing tracks in the street and knowing a train will come there soon, to the perception that a train is a step above a bus in terms of the onboard space and comfort of the ride.

Daily ridership projections were modeled for Blackstone and Ventura/Kings Canyon corridors for BRT ridership versus LRT ridership using the Fresno COG travel demand model. The last column of the table shows LRT and BRT ridership for the 2035 Full TOD with LRT growth scenario. In total across the three corridors, transit ridership increases by approximately 1,458 riders daily or 8% over the forecast for BRT only services operating in the three corridors. Even the Shaw corridor under the 2035 Full TOD with LRT scenario, which would continue to have BRT service, experiences a moderate increase in riders due to transfers from and to the Blackstone corridor which has LRT service.

Moreover, in the future land use scenarios with population and employment built up on both Blackstone and Ventura/Kings Canyon in addition to downtown, it was discovered that the two high capacity transit corridors worked as a pair, with multiple trip origins and destinations along both streets that link through the downtown. In the future scenario, the downtown is a strong destination, but not the only destination for transit riders. The daily ridership projections for BRT and LRT service are presented in Table 3.

9.2 BRT and LRT Service Levels

Transit service frequencies can reflect either policy direction (for example, vehicle headways—the time between consecutive arrivals at a transit stop—should not exceed 15 minutes peak, 30 minutes midday no matter the level of passenger demand) or be set to accommodate projected hourly and daily ridership. The latter approach was used to establish appropriate peak period service levels for future BRT and LRT improvements that are proposed in future land use development scenarios. Service levels feed into the operating plans for BRT or LRT improvements, which are then translated into the operating and maintenance costs of transit service.

Table 11: BRT and LRT Daily Ridership Projections

Corridor	2035 Build w/ BRT Service All Corridors	2035 Constrained Excl Lanes w/ BRT Service All Corridors	2035 Full TOD w/ BRT Service All Corridors	2035 Full TOD w/LRT on Blackstone and Ventura/Kings Canyon
Blackstone	14,704	23,717	26,540	26,877
Ventura/Kings Canyon	10,648	17,175	19,219	20,275
Shaw	6,100	8,743	12,066	12,131 ²
Total Daily Riders	31,452	49,635	57,825	59,283

[1] Source: Dowling and Associates; FCOG Travel Demand Forecast Model

[2] This is slightly higher than the 12,066 BRT riders under the 2035 Full TOD without LRT service and reflects the increased transfers from primarily the Blackstone and Ventura/Kings Canyon rail services.

Forecasts of daily transit ridership by mode were evaluated to determine the expected peak hour volume by direction on a proposed service. The peak load in each direction was calculated assuming approximately 10 percent of daily trips are made during the peak hour, both a.m. and p.m. A directional split was then applied, with 60 percent of the trips assumed for the peak travel direction (i.e., to the major destination points, such as downtown Fresno or a major office/commercial center along the transit route) and 40 percent of the trips assumed to be traveling in the off-peak direction. The a.m. peak and p.m. peak directions typically are the opposite of the other. The peak factors applied were derived from the experience of FAX and other urban transit providers and by consulting available research.

The division of daily trips to hourly peak and off-peak direction trips provides an estimate of the number of riders passing by a point—designated the maximum load point—on a transit route and thereby the transit vehicle capacities required to accommodate these riders. Based on the carrying capacity of 75 riders per bus, the number of buses required to serve the demand was estimated. The resulting number of buses was used to determine the service frequency (headways) in minutes for BRT routes by converting buses per hour into minutes between bus arrivals/departures at any point along the BRT route, as indicated in the below table.

For proposed LRT service, a vehicle capacity of 130 riders was assumed and trains of up to two cars in length would be possible. Thus, single train capacity would be 250 riders if two-cars and 130 if one car. Forecast riders are higher for LRT service in a corridor than if it remained BRT only service. The estimated passenger demand per hour was divided by this train capacity to obtain trains per hour. LRT service frequency in minutes was similarly determined by converting trains per hour into minutes between train arrivals/departures.

For other periods of the day, including midday hours and evenings, service frequencies were established based on a combination of methods: estimating demand by applying factors for off-peak periods and establishing maximum headways based on policy. With respect to the latter, for example, the Federal Transit Administration (FTA) requires that service during the midday cannot exceed 15 minutes if federal transit system development funds (e.g., Small or Very Small Starts funds) are used to build a project. During peak commuter periods frequencies should be not greater than 10 minutes, based on FTA criteria.

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Table 4 shows the service headways proposed for BRT or LRT service in 2035 under the various development scenarios. LRT service is not proposed for the Shaw corridor and therefore BRT service would remain on Shaw under the 2035 Full TOD with LRT scenario.

Table 12: Proposed BRT Headways (min) and LRT Headways on Blackstone/Ventura (min)

Corridor	Period	AM / Mid-day / PM Peak			
		2035 Build w/ BRT Service on All Corridors	2035 Constrained Excl Lanes w/ BRT Service on All Corridors	2035 Full TOD w/ BRT Service on All Corridors	2035 Full TOD w/ LRT on Blackstone & Ventura–KC
Blackstone	Weekday	7.5 / 10 / 7.5	5 / 5 / 5	5 / 5 / 5	10 / 10 / 10
	Weekend	15 / 15 / 15	15 / 15 / 15	15 / 15 / 15	15 / 15 / 15
Ventura/Kings Canyon	Weekday	10 / 15 / 10	7.5 / 10 / 7.5	5 / 5 / 5	10 / 10 / 10
	Weekend	20 / 20 / 20	15 / 15 / 15	15 / 15 / 15	15 / 15 / 15
Shaw	Weekday	10 / 15 / 10	10 / 15 / 10	7.5 / 10 / 7.5	(BRT Service)
	Weekend	15 / 15 / 15	15 / 15 / 15	15 / 15 / 15	(BRT Service)

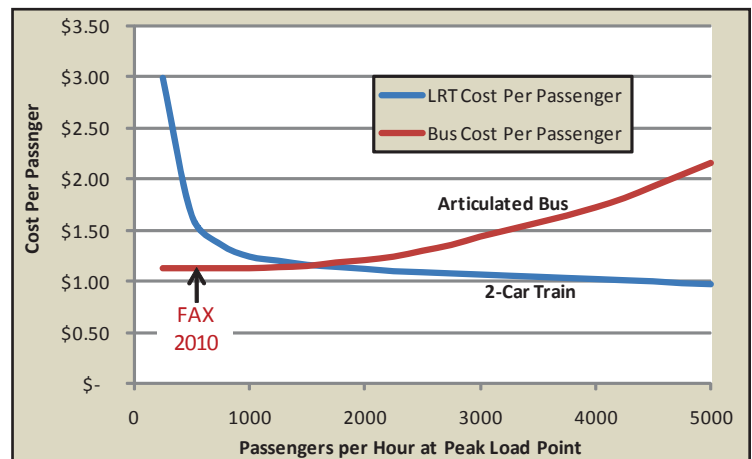
Source: Kimley–Horn and Associates, Inc.

The assumed weekend service frequencies are the same throughout the day for all lines and are 15 minutes. Weekday peak frequencies range from 10 minutes under the 2035 Build scenario to 5 minutes for the 2035 Full TOD Buildout scenario. When service frequencies approach 7 minutes, additional service technologies should be considered, such as streetcar or light rail. At 7 minute headways the BRT system will begin to become less efficient since buses cannot maintain equidistant spacing on increasing congested roadways and they tend to bunch. Uneven headways and unreliable service tend to discourage use of transit and would dampen transit growth in the Blackstone and Ventura/Kings Canyon corridors and also Shaw at some point.


At some level of demand and service frequencies, light rail becomes more cost efficient than buses to operate.

Figure 27 compares the costs, on a per passenger basis, of bus and LRT over increasing levels of passenger demand at the peak load point in a corridor. The capacity of an articulated bus, as used to develop the chart, is estimated to be 75 passengers. An single LRT vehicle is estimated to have room for 130 passengers; a two-car train has room for 260 passengers, therefore. At low to moderate volumes the bus is more efficient. But when demand begins to exceed 1200 passengers per hour

Figure 27: Operating Cost Efficiency: Bus and LRT



Source: Kimley–Horn and Associates, Inc.



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in the peak direction and bus frequencies fall below 5 minutes to provide sufficient capacity, a two car LRT train operating at 10 minute frequencies is probably cost competitive. The comparison is conceptual and influenced by an agency's cost structure and other corridor characteristics besides simply passenger demand.

The following sections summarize the estimated costs of the proposed transit improvements, both operating and capital, for each of the 2035 improvement alternatives. The operating costs are first shown as the total annual costs for the proposed services; then the incremental costs compared to a no-build, or no improvement, condition are shown. Incremental costs represent the additional costs that would be incurred to improve service as described relative to making no improvements and continuing to operate as previously.² Capital costs are the total costs as the proposed investment represents entirely new facilities and not a replacement of existing facilities.

9.3 BRT Annual O&M Costs

The annual O&M costs to operate proposed service under each development scenario are shown in Table 5. Costs are in constant 2010 dollars. BRT service in the Blackstone, Ventura/Kings Canyon and Shaw corridors were estimated by taking the service frequencies discussed in the previous section, converting the service to hours and miles of weekday and weekend bus operations, and applying FAX-established service-cost factors to the hours and miles of service.

The following factors were provided by FAX and reflect the incremental cost of each hour and mile of a change in bus service, with an adjustment in the cost per vehicle mile to reflect the proposed change in bus fleet that will be used to operate high-capacity BRT service.

\$37.17 per vehicle hour

\$1.58 per vehicle mile

The hourly cost reflects FAX's current marginal hours-related cost of a service change. The cost FAX per mile of \$1.58 has been adjusted to be 125 percent (or 1.25 times) of FAX's current cost of miles-related expenses, which is \$1.26. FAX proposes to procure and assign 60-foot articulated buses (possibly CNG hybrid propulsion) to BRT service. These vehicles will have somewhat lower fuel economy and higher maintenance costs than standard 40-foot buses due to the greater weight, additional tire wear (eight tires per bus), and more parts (e.g., windows, doors).

Marginal cost factors are appropriate in the analysis as BRT service represents a change in service composition for FAX. In large part BRT will replace existing local services, which is operating on lower frequencies than proposed for new BRT service and using 40-foot buses. Total or average cost factors are appropriate for estimating the impacts of totally new services that are in addition to existing services and which therefore would affect FAX administrative and related overhead costs.

Multiplying daily hours and miles of service by these factors provides an estimate of daily operating costs of BRT service in each corridor.

Weekday service costs were expanded to annual O&M costs by multiplying by the number of weekdays operated per year—253 on average. Weekend service was similarly expanded by multiplying by the number of Saturdays and Sundays in the year—104—and additional days of holiday service—8—which also is operated on the weekend schedule. Total weekend days is therefore 112.

² New BRT or LRT service would replace no-build (e.g., existing) bus service in the corridor. Thus the costs of no-build bus service in the corridor will be replaced by the costs of new service. However, new service is expected to cost somewhat more than the existing service as higher levels of service, reflected in increased miles and hours of bus operations, are proposed. This represents the incremental cost.

Table 13: BRT Total Annual O&M Costs (\$2010) for 2035 Operating Plan

Transit Corridor	2035 Build w/ BRT Service All Corridors		2035 Constrained TOD w/ Exclusive Lanes		2035 Full TOD w/ BRT Service on All Corridors	
	Length (ml)	Cost	Length (ml)	Cost	Length (ml)	Cost
Blackstone	9.29	\$3,575,166	9.29	\$4,862,344	9.29	\$4,862,344
Ventura/Kings Canyon BRT	7.95	\$2,668,616	7.95	\$3,208,210	7.95	\$3,559,391
Shaw	13.25	\$3,487,734	13.25	\$2,758,490	13.25	\$4,091,522
Total Daily Riders	30.49	\$9,731,516	30.49	\$10,829,044	30.49	\$12,513,257

[1] BRT O&M Cost estimates based on procedures from 2010 Blackstone/Ventura/Kings Canyon Very Small Starts submittal to FTA

Table 14: BRT Incremental Annual O&M Costs (\$2010) for 2035 Operating Plans

Transit Corridor	2035 Build w/ BRT Service All Corridors		2035 Constrained TOD w/ Exclusive Lanes		2035 Full TOD w/ BRT Service on All Corridors	
	Length (ml)	Cost	Length (ml)	Cost	Length (ml)	Cost
Blackstone	9.29	\$2,420,781	9.29	\$3,707,959	9.29	\$3,707,959
Ventura/Kings Canyon BRT	7.95	\$2,072,787	7.95	\$2,612,381	7.95	\$2,963,563
Shaw	13.25	\$2,641,612	13.25	\$1,912,368	13.25	\$3,245,400
Total Daily Riders	30.49	\$7,135,180	30.49	\$8,232,708	30.49	\$9,916,921

[1] BRT O&M Cost estimates based on procedures from 2010 Blackstone/Ventura/Kings Canyon Very Small Starts submittal to FTA.

[2] Incremental costs reflect the net increase in O&M costs of operating new BRT service with the elimination of existing FAX bus service for each BRT corridor (Blackstone-Route 30; Ventura/Kings Canyon-Route 28; Shaw-Route 9).

Other Costs Required to Operate and Maintain BRT Service and Facilities

The proposed BRT corridors include various capital improvements that will generate maintenance costs for FAX that are not accounted for in the vehicle hours and miles cost estimates. These include maintenance of enhanced passenger stations and the passenger amenities provided. Among the latter are fare collection equipment, automated passenger information, and possibly other equipment. In addition, BRT service is proposed to operate with off-board fare collection wholly or in part. This will significantly reduce boarding and alighting time at stations. Passengers must have proof-of-payment of fares and FAX will use inspectors to check and enforce fare payment.

These costs were estimated as part of the overall cost estimates provided to FTA in FAX's September 2010 Very Small Starts submittal and are approximately \$925,000 annually for BRT on Blackstone and Ventura/Kings Canyon. They have been prorated to reflect any changes in the length of BRT improvements in these corridors proposed under each of the 2035 land use development scenarios and also to reflect similar costs that would be associated with new BRT service along Shaw Avenue. The costs have been combined with the service hours and miles costs.

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The resulting total annual operating costs for each BRT service scenario are shown in Table 5. As noted, these services will replace existing local service in each corridor, and thus the costs of eliminating local service can be credited towards the total costs of new BRT service. This provides an estimate of the incremental costs to FAX of BRT service. The calculation is summarized in Table 6.

9.4 BRT Capital Costs

Capital costs for the BRT improvements in the Blackstone and Ventura/Kings Canyon corridors were derived from the cost estimated prepared for FAX's Very Small Starts submittal to FTA in September 2010. The submittal was the basis of FAX's request for federal funds to implement a near term BRT project in these corridors. FTA has given FAX and the city of Fresno approval to continue with project development activities with a likely commitment of federal funds. The project could be completed in 2013.

The estimated costs for BRT stations, passenger amenities, traffic signal priority systems for BRT buses, bus queue jump lanes at congested intersections, and other transit lane improvements were approximately \$48 million, or about \$3 million per mile. The assumption of the FTA submittal was service along Kings Canyon will end at Clovis Avenue. Also, as the downtown HSR station would not exist, there was no extension of BRT improvements to west Fresno. Under the 2035 Build and 2035 Constrained Exclusive BRT Lanes growth scenarios, BRT improvements—and service—would be extended to the planned high speed rail station in west Fresno and also farther east of Clovis Avenue to fast growing east Fresno. Therefore the additional costs of these extensions were added to the baseline capital cost estimate developed for the Very Small Starts submittal. The result is BRT improvements along Blackstone are estimated to cost \$27.9 million and improvements along Ventura/Kings Canyon are estimated to cost \$23.9 million, or \$51.7 million combined.


The third BRT project is along the Shaw Avenue corridor, with initial improvements proposed over 13.6 miles from Route 99 to Highway 68. One alternate alignment for an extension of Shaw BRT service proposes operations on Highway 168 to North Clovis in a future HOV lane with no stops until it reaches its final destination. Another alternative would have BRT continue on Shaw Avenue through downtown Clovis and terminate at the planned Loma Vista Community Center between DeWolf and Leonard Streets. The Central Clovis alignment option would depend on the City of Clovis adopting significantly higher zoned densities along Shaw Avenue in order to support the BRT investment, in addition to restricting the supply and development of future public and private parking spaces. The average cost per mile of the Blackstone/Ventura/Kings Canyon BRT project provided a reasonable basis for estimating the costs of future BRT improvements along Shaw.

Table 15 shows the estimated capital costs of BRT service in the three corridors.

Table 15: BRT Total Capital Costs (\$2010) of BRT Improvements

Transit Corridor	2035 Build w/ BRT Service All Corridors		2035 Constrained TOD w/ Exclusive Lanes		2035 Full TOD w/ BRT Service on All Corridors	
	Length (mi)	Cost	Length (mi)	Cost	Length (mi)	Cost
Blackstone	9.29	\$27,870,000	9.29	\$27,870,000	9.29	\$27,870,000
Ventura/Kings Canyon BRT	7.95	\$23,850,000	7.95	\$23,850,000	7.95	\$16,350,000
Shaw	13.25	\$39,750,000	13.25	\$39,750,000	13.25	\$39,750,000
Total Daily Riders	30.49	\$91,470,000	30.49	\$91,470,000	30.49	\$83,970,000

[1] Kimley-Horn and Associates, Inc.



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The Cost of Extending BRT to SEGA

Under both the 2035 Full Build and the 2035 Constrained TOD with Exclusive BRT Lanes growth scenarios BRT service would extend to the SEGA development area of southeast Fresno. The Very Small Starts submittal to FTA assumes the line will initially terminate at Clovis Avenue. The incremental cost of extending BRT along Ventura/Kings Canyon for 2.5 miles to the SEGA development is estimated to generate approximately \$847,000 in additional annual O&M costs for FAX and have capital costs of approximately \$7.5 million compared to the costs of FAX's proposed Very Small Starts project. The O&M cost is an estimate based on prorating costs on a per route mile basis. The capital cost is derived from the average capital cost per mile of \$3.0 million. As such, both figures are order of magnitude.

9.5 Summary of BRT Improvement Costs

Annual O&M costs of the proposed BRT improvements range from \$9.7 million under 2035 Build conditions, to \$12.5 million under 2035 Full TOD conditions. The incremental annual O&M Costs, which exclude the annual costs of providing existing bus service, as they will be replaced by the new BRT service, ranges from \$7.1 million to \$9.9 million. These costs would be in addition to the O&M costs of operating the rest of the transit routes in the region.

The capital costs of construction of the BRT system improvements in the Blackstone, Ventura/Kings Canyon, and Shaw corridors are estimated to range from \$84.0 million to \$91.5 million. The primary factor behind the range in capital costs is the varying extent of the Ventura/Kings Canyon BRT corridor between project alternatives. As discussed previously, the Ventura/Kings Canyon corridor would extend 7.95 miles from Downtown Fresno to SEGA under 2035 Build and 2035 Constrained TOD alternatives. However, under the 2035 Full TOD scenario, the Ventura/Kings Canyon BRT alignment would operate along 5.45 miles from Downtown Fresno to Clovis Avenue. This shortened alignment results in lower total capital costs for the 2035 Full TOD scenario.


9.6 LRT O&M Costs

Methodology for Estimating Costs

FAX does not have experience with light rail operations; therefore, no cost history is available from which to establish cost estimating factors for application to future service scenarios. Instead, cost factors from industry experience were developed and applied in a similar fashion as bus O&M cost factors were applied to BRT service scenarios. This is a reasonable approach as the assumption is, should LRT be implemented in the Fresno region (and FAX be the operator), the costs of system operation would mirror those of other current LRT operators with similar systems as proposed for Fresno. The envisioned system is light rail running within public rights of way, possibly in a dedicated transitway (or guideway) and/or in a shared lane with traffic. LRT along the Blackstone and Ventura/Kings Canyon corridors is not anticipated to be grade separated, such as on viaducts or in tunnel, except in limited locations where grade separations are necessary for the safety and reliability of rail operations. An example is the crossing of other passenger (e.g., Amtrak) or freight rail lines or a major expressway.

The Fresno system, if built, is envisioned to be similar to existing light rail in Sacramento, San Diego, Phoenix, Salt Lake City, or Portland, for examples. Therefore the cost experience of these peer systems is assumed to be representative of future LRT costs in Fresno. An evaluation was made of these systems to determine, as for bus, unit costs of each vehicle hour or mile of service. The estimated cost of service per vehicle hour was selected as the preferred cost factor for cost estimation. (INSERT FOOTNOTE) This is shown in Table 8.

³ Costs per vehicle mile were not estimated for LRT as cost databases for peer agencies supported the calculation of either cost per hour or cost per mile separately; cost per hour was preferred for cost estimation purposes.



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The service assumptions in Table 4 were converted to daily and annual hours of LRT service in the Blackstone and Ventura/Kings Canyon corridors for the 2035 Full TOD land use development scenario. This is the only growth scenario for the Fresno region where LRT improvements are proposed. Annual O&M costs were calculated by applying a cost factor of \$180 per revenue vehicle hour (i.e., to each hour a vehicle is in passenger-carrying service).

The total annual O&M costs for LRT service in the Blackstone and Ventura/Kings Canyon corridors are summarized in Table 9. The table also shows the BRT O&M costs for the Shaw corridor, which are the same as in Tables 5 and 6 for this service scenario.

While Table 9 reflects total annual O&M costs, the proposed services will replace existing bus services in the three transit corridors. It can be assumed along Blackstone and Ventura/Kings Canyon LRT service will replace all existing local bus just as BRT service is assumed to replace all local bus services under the 2035 Build, 2035 Constrained TOD with Exclusive Lanes, and the 2035 Full TOD with BRT Service All Corridors. Table 10 shows this incremental cost increase of implementing LRT service on the Blackstone and Ventura/Kings Canyon corridors, with BRT service on the Shaw corridor for the 2035 Full TOD scenario.

To estimate the capital costs of implementing LRT facilities along the Blackstone and Ventura/Kings Canyon corridors, a second peer group of LRT systems was evaluated to determine a reasonable range in construction costs. The peer group included six agencies and nine projects, most currently in progress. One project was completed in 2006. The capital costs per mile were calculated and then compared with industry research as a second check. Capital costs for transit projects can range considerably and depend on the level of improvements, and particularly are affected by the inclusion of structures and tunnels. The peer systems selected are typically at-grade and include in-street running or running along a surface corridor.

The analysis determined that a reasonable cost for a new LRT system, as envisioned for Fresno, would be in the range of \$50 million per mile, including the light rail vehicles necessary for operations. This figure is in \$2010. Basic amenities for passengers are assumed in this figure; however, adding amenities and separating major portions of any alignment from the roadway or other obstacles, such as railroads or major expressways, would increase this average cost substantially.

Multiplying the average capital cost per mile times the length of each LRT corridor give the total capital cost of the improvements. The costs, shown in Table 11 are in \$2010 and would need to be escalated to the midpoint of construction, termed the average year of expenditure, to give the estimated cost at completion with an allowance for inflation from today through the period of construction.

The financial analysis takes account of future inflation and should be referred to if inflated capital costs are desired, rather than \$2010 presented below.

Capital costs of improvements to Shaw Avenue are for BRT facilities only. In the other corridors, LRT improvements are estimated to cost \$273 million along Ventura/Kings Canyon Road and \$465 million along Blackstone Avenue over the distances shown.

Combined, LRT and BRT improvements under the 2035 Full TOD with LRT on Blackstone and Ventura/Kings Canyon growth scenario are estimated to cost \$777 million in current dollars.

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Table 16: Operating Costs of Peer Group LRT Systems

System	Length (miles)	Vehicle Revenue Hours	Annual O&M Cost (\$2010) ¹	Cost per Vehicle Revenue Hour (\$2010)
SRTD (Sacramento, CA)	37.5	213,129	\$51,683,065	\$236.58
SDMTS (San Diego, CA)	51.1	409,519	\$60,725,827	\$134.34
UTA (Salt Lake City, UT)	19.0	265,490	\$29,739,095	\$109.28
Metro Transit (Minneapolis-St. Paul, MN)	12.3	134,557	\$25,627,485	\$185.81
LYNX (Charlotte, NC)	9.6	54,687	\$17,220,202	\$307.21
RTD (Denver, CO)	39.4	412,796	\$52,275,044	\$123.55
Simple Average	28.15	248,363	\$39,545,119	\$180.00²

[1] Escalated to 2010 from reported year (2009 or 2006 for SDMTS) at 2.5% per year.

[2] Rounded and simple average of costs excluding high and low values of peer group.

Source: National Transit Database, 2009

Source: National Transit Database

9.7 Summary of LRT Improvement Costs

Table 17: LRT Total Annual O&M Costs (\$2010) for 2035 Operating Plan

System	2035 Full TOD w/ LRT on Blackstone and Ventura/Kings Canyon w/ BRT on Shaw	
	Length (mi)	Cost
Blackstone LRT	9.29	\$9,792,880
Ventura/Kings Canyon LRT	5.45	\$7,042,300
Shaw BRT	13.25	\$4,091,522
Total	27.99	\$20,926,702

[1] BRT O&M Cost estimates based on procedures from 2010 Blackstone/Ventura/Kings Canyon Very Small Starts submittal to FTA.

[2] LRT O&M Cost estimates based on average costs per vehicle revenue hour for comparable existing LRT systems. (Source: National Transit Database 2009 O&M Data by Mode)

Under the 2035 Full TOD with LRT on Blackstone and Ventura/Kings Canyon growth scenario, LRT is a transit improvement option along the Blackstone and Ventura/Kings Canyon corridors in approximately 2035 when development generates high transit demand. High capacity transit is then viable.

Annual O&M costs of the proposed improvements total \$20.9 million. These are the costs of LRT and BRT service improvements only. The incremental cost of the service improvement, which removes from the estimate the costs of providing existing bus service as they will be replaced by new LRT and BRT services, is approximately \$18.3 million annually. These costs would be in addition to the O&M costs of operating the rest of the transit routes in the region.

Table 18: LRT Incremental Annual O&M Costs (\$2010) for 2035 Operating Plan

Transit Corridor	2035 Full TOD w/ LRT on Blackstone and Ventura/Kings Canyon w/ BRT on Shaw	
	Length (mi)	Cost
Blackstone LRT	9.29	\$8,638,495
Ventura/Kings Canyon LRT	5.45	\$6,446,471
Shaw BRT	13.25	\$3,245,400
Total	27.99	\$18,330,366

[1] BRT O&M Cost estimates based on procedures from 2010 Blackstone/Ventura/Kings Canyon Very Small Starts submittal to FTA.

[2] LRT O&M Cost estimates based on average costs per vehicle revenue hour for comparable existing LRT systems. (Source: National Transit Database 2009 O&M Data by Mode)

[3] Incremental costs reflect the net increase in O&M costs of operating new BRT service with the elimination of existing FAX bus service for each BRT corridor (Blackstone—Route 30; Ventura/Kings Canyon—Route 28; Shaw—Route 9).

The capital costs of construction LRT improvements in the Blackstone and Ventura/Kings Canyon corridors are estimated to be \$465 million and \$273 million, respectively. Adding to these costs the construction of BRT along Shaw Avenue would bring the total capital costs for this growth scenario to approximately \$777 million.

Table 12 summarizes the estimated capital costs and annual O&M costs of the proposed BRT and LRT improvements for each of the growth scenarios. The total capital costs (2010 dollars) for BRT service on the Blackstone, Ventura/Kings Canyon and Shaw corridors ranges from approximately \$84.0 million to \$91.5 million. The total capital costs to implement LRT service on the Blackstone and Ventura/Kings Canyon corridors, with BRT service along the Shaw corridor, equates to approximately \$777 million. The average annual O&M costs for BRT service along all three transit corridors ranges from \$9.7 to \$12.5 million, while the average annual cost for LRT service on Blackstone and Ventura/Kings Canyon, and BRT service on Shaw is approximately \$20.9 million.

9.8 Evaluation of Alternatives

Overall assumptions applied to all of the land use alternatives include:

1. That population growth is a constant and the figures match the COG model forecast for the region. It is assumed that Fresno County will continue to absorb about 15,000 new residents per year, as it has over the past 10 years. The population forecast for Fresno County is estimated to be 1.5 million people by 2035. Only the amount of the new population that will be living in the BRT corridors and downtown changes in the scenarios.
2. The eventuality of the Central Valley High Speed Rail project coming to fruition will create an anomaly in the forecasts that is not incorporated into the modeled population and travel forecasts. However, for the purposes of this study, assumptions were made about mode share and ridership numbers on BRT linked to boardings at the high speed rail station downtown. Those assumptions are detailed below.

Table 19: LRT Capital Improvement Costs (\$2010)

Transit Corridor	2035 Full TOD w/ LRT on Blackstone and Ventura/Kings Canyon w/ BRT on Shaw	
	Length (mi)	Cost
Blackstone LRT	9.29	\$464,500,000
Ventura/Kings Canyon LRT	5.45	\$272,500,000
Shaw BRT	13.25	\$39,750,000
Total	27.99	\$776,750,000

[1] Note: LRT costs based on an average of \$50 million per mile, inclusive of facilities and vehicles. Average costs are based on review of similar LRT projects and industry research.

Impact of High Speed Rail on BRT Ridership and Growth Forecasts

Ridership on BRT, LRT and Streetcars is thought to be enhanced by the operation of high speed rail service between Sacramento and San Jose with a station in Fresno. Ridership assumptions used for the analysis are from the high speed rail planning consultants:

This information represents year 2030 forecasts from the HSR ridership and revenue model for the “May 2009 Operating Plan scenario” with the full statewide HSR system. The results in the shapefile are total trips for all modes of station access and egress. The results assume that the Fresno HSR station will be served by local bus (public transit and private shuttles) and Amtrak rail, and will also have access/egress by bicycle, walking, rental car, taxi and private vehicle (park and drop-off). On a daily basis, the Fresno HSR station is predicted to have up to 16,625 passengers entering and exiting at this location. It is estimated that 12% of those passengers would take transit to access the station, adding nearly 2,000 passengers to the FAX transit system each day.

In the PTIS land use scenarios for 2035, six times more growth was assumed to occur in downtown Fresno compared to the growth forecast by the COG travel model. The TOD scenarios shifted approximately 15,000 households from other types of housing choices throughout the region into downtown. This is a substantial housing profile change for Fresno.

The future impact of HSR stations in downtowns is currently a topic of considerable debate. Though it is difficult to predict the impact of a high speed rail station in Fresno, consultants working on the HSR project for California predict that most of the growth will be in jobs. The estimate of new jobs downtown was considerably increased by 35,000 to 37,000 new jobs over the COG forecast and housing was increased by nearly 15,000 new units (see the table above). In the planning phase of High Speed Rail, few examples exist in the United States, therefore, planned growth was shifted to downtown Fresno based on economic analysis, land use and transportation scenarios using transportation models to inform our best assumptions.

Table 20: BRT/LRT Total Capital and Operations & Maintenance Costs (\$2010)

Transit Corridor	2035 Build w/ BRT Service on All Corridors		2035 Constrained TOD w/ Exclusive Lanes		2035 Full TOD w/ BRT Service on All Corridors		2035 Full TOD w/ LRT on Blackstone and Ventura/Kings Canyon w/ BRT on Shaw	
	Length (mi)	Cost	Length (mi)	Cost	Length (mi)	Cost	Length (mi)	Cost
CAPITAL COSTS								
Blackstone BRT/LRT	9.29	\$27,870,000	9.29	\$27,870,000	9.29	\$83,970,000	9.29	\$464,500,000
Ventura/Kings Canyon BRT/LRT	7.95	\$23,850,000	7.95	\$23,850,000	5.45	\$16,350,000	5.45	\$272,500,000
Shaw BRT	13.25	\$29,750,000	13.25	\$39,750,000	13.25	\$39,750,000	13.25	\$39,750,000
Total	30.49	\$91,470,000	30.49	\$91,470,000	27.99	\$83,970,000	27.99	\$776,750,000
ANNUAL OPERATING & MAINTENANCE COSTS								
Blackstone BRT/LRT	9.29	\$3,575,166	9.29	\$4,862,344	9.29	\$4,862,344	9.29	\$9,792,880
Ventura/Kings Canyon BRT/LRT	7.95	\$2,668,616	7.95	\$3,208,210	5.45	\$3,559,391	5.45	\$7,042,300
Shaw BRT	13.25	\$3,487,734	13.25	\$2,758,490	13.25	\$4,091,522	13.25	\$4,091,522
Total	30.49	\$9,731,516	30.49	\$10,829,044	27.99	\$12,513,257	27.99	\$20,926,702

[1] Source: Kimley-Horn and Associates

9.9 Summary Findings and Conclusions


1. As population density and mix of uses in the major transit corridors and downtown Fresno increases, so does the performance of the transit system. At about 36 dwelling units per acre, the Full Build Out scenario with dedicated BRT lanes performs the best overall: VMT is reduced 5.83%, work based transit trips increase 138% and total walking and bicycle trips increase over 15% ¹
2. The Constrained TOD Scenario, at about 21 dwelling units per acre, and with dedicated BRT lanes, results in a VMT reduction of 2.64% and an 89.5% increase in work based transit trips. Total walking and bicycle trips increase by 4.8%.
3. Maintaining the status quo in density (2.5 units per acre in Fresno County and 7.8 units per acre in the City of Fresno) results in a continued decline in transit's share of regional trips and an increase in VMT, even with the current planned investment of \$251 million in the transit system, including building BRT on Blackstone and Ventura/Kings Canyon.
4. Because of ample roadway capacity in Fresno, and the tendency of traffic to divert to other streets to avoid delays and congestion, travel time comparisons between transit and autos along major transit corridors do not show any deterrence to driving, even in the high density future. Transit travel times only improve with the introduction of BRT in dedicated lanes. For example, in the Blackstone corridor from the Riverpark Transit Center to downtown Fresno, it currently takes 20 minutes longer to take the bus than it does driving a car. In the future scenarios with BRT and dedicated travel lanes, transit improves significantly but still takes 8 to 10 minutes longer than driving a car. Travel times by car, even with the increased density in the corridor, only increase on average 2 minutes in the future scenario. With increased transit oriented development transit would become truly competitive with the auto in these corridors. ²

Table 21: Downtown Growth Increment for 2035

Measure	Virtual Future (COG Forecast)	Constrained TOD Strategy	Aggressive TOD Scenario
Housing Units	2,780	17,000	17,072
Employment	3,265	38,285	40,288

Source: Fregonese and Associates

5. In the higher density future, with employment and residential land use densities built up along the BRT corridors and downtown Fresno, LRT becomes a viable transit investment option. However travel forecasts of ridership potential demonstrate that connectivity is important in attracting people to LRT. Both Blackstone and Ventura/Kings Canyon should be linked as there is limited ridership improvement if only converting BRT to LRT on just one leg of the corridor (i.e. adding LRT to just Blackstone or just Ventura/Kings Canyon). This is because the two corridors are linked with multiple trips that begin and end on both corridors. Downtown Fresno is not the only destination in the higher density future. The two corridors function together as a unit.
6. In the future, when transit travel demand requires BRT buses to operate on headways of 7 minutes or less to provide sufficient capacity, this is the time to begin planning the conversion from bus to rail service in the corridor. At 5 minute headways on BRT, the transit system begins to create its own delays unless separated from traffic and grade separated through major intersections. Buses can queue up at stations, waiting to board and alight passengers.



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7. The operating costs of bus service in city streets—even in dedicated lanes—begin to exceed those of LRT at high service frequencies. LRT capacity can be expanded without adding another driver (LRT cars can be added to create longer trainsets). For example, an articulated bus has room for approximately 75 passengers as the average peak load. In contrast, a two-car LRT train can carry over 250 passengers, more than a 3-to-1 capacity advantage. Industry research indicates that when demand reaches a certain threshold, definite operating cost efficiencies exist with upgrading a system from BRT to LRT. The future demand along the Blackstone and Ventura/Kings Canyon BRT corridors requires operating with headways of 7 minutes or less. As frequencies increase beyond this point, LRT could become a more effective option from a service standpoint.
8. High capacity transit, whether BRT or LRT, which has a distinct identity and operates in dedicated lanes or, at minimum, is designed to include preferential treatments through congestion, has been shown to attract more riders than comparable express or high frequency local bus service. Designed properly and integrated into the fabric of the communities through which it operates, BRT or LRT will attract choice riders in addition to transit dependent riders. This is important to getting people out of their cars and stopping, or at least slowing, the growth in congestion. Transit can be a catalyst for change.
9. TOD will be necessary to tip the balance towards transit in certain transportation corridors, based on the results of future scenarios evaluated in this study. TOD means establishing origin and destination nodes that generate substantial trips, many of which are possible on transit and by walking or bicycling. Environments favorable to transit and a demographic looking for alternatives to the auto should be developed along high capacity corridors such as Blackstone, Ventura/Kings Canyon and Downtown Fresno in the near term and along Shaw Avenue in the longer term future.

¹ See Fresno PTIS Performance Measures by Dowling Associates in the technical appendix of this document.

² See Table G5: Travel Times for Selected Origins and Destinations in the Appendix G of this document.

10.0 Infrastructure Financing Plan

The outlook for funding new transit infrastructure in Fresno exists within a larger economic and transit environment. This section of the Financing Plan places the identified infrastructure expansions within this larger context, and identifies opportunities and challenges for paying to build, operate, and maintain them. The Financing Plan includes:

- Current and future environment for transit infrastructure investment
- Potential funding sources for capital and operating needs
- Key elements of a successful financial plan
- Funding plans for specific projects
- Summary

CURRENT AND FUTURE ENVIRONMENT FOR INFRASTRUCTURE INVESTMENT

Current Environment

The situation for capital and operating transit funding in Fresno County is very challenging. Sources that traditionally fund transit capital and operating costs include sales taxes and gas taxes, and these have been adversely affected by the economic slowdown. The state of California has diverted some transportation revenues to be used for other purposes. Regional transit funds have also been affected in Fresno. In 2006 voters reauthorized the local sales tax for transportation (Measure C). Measure C was anticipated to generate \$1.7 billion over the life of the Measure. However, it is unlikely that those revenue targets will be achieved. Federal funding sources have been and are projected to be more stable over the near and mid-term.

The consequences of these revenue cutbacks can be seen by looking at the largest transit provider in the region, Fresno Area Express (FAX). When Measure C was approved, it was assumed that by FY2010, FAX would receive more than \$9 million annually in funds. The approved FY2011 budget shows that FAX is estimated to receive \$5.1 million or approximately 40 percent less than the anticipated revenue.

The consequences of the revenue shortfalls can be seen in Table 22. FAX has had to reduce its budget and staff.

Table 22: FAX Budget Changes

	FY2009 Actuals	FY2011 Approved Budget	Percentage Change: FY2009 to FY2011
FAX Operating Expenditures	\$38,057,191	\$24,986,600	-34.3%
Authorized Positions	420.8	342.0	-18.7%

These reductions were necessary to balance the budget, even though FAX ridership grew significantly from 1999 to 2009. Revenue miles increased from 3.3 million to 4.7 million (42.9 percent) and ridership increased from 11 million to 18 million (63.8 percent) during this period.¹

The challenges in Fresno extend to employment as well. In December 2010, the unemployment rate in Fresno County was 17.2 percent, up from 16.9 percent in November 2010 and higher than the 16.6 percent rate in December 2009. By comparison, in December 2010, the unadjusted unemployment rate for California was 12.3 percent, and for the nation as a whole was 9.1 percent.²


¹ 2011 Regional Transportation Plan, Council of Fresno County Governments.

² Data are from www.labormarketinfo.edd.ca.gov Unemployment Rates and Labor Force data for the Fresno County Local Area Profile.

Table 23: Annual BRT Performance Metrics (\$2010)

O&M Costs (\$2010)	Metric	2035 Build	BRT 2035 Constrained Excl Lanes	BRT 2035 Full TOD	2035 Full TOD w/ LRT on Blackstone & Ventura–KC	2008 FAX Metric
Blackstone	Service Efficiency					
	Operating cost/Vehicle Revenue Mile (annual)	\$6.82	\$6.14	\$6.14	\$17.81	\$7.88
	Operating cost/Vehicle Revenue Hour (annual)	\$72.82	\$67.18	\$67.18	\$198.78	\$91.99
	Cost Effectiveness					
Ventura/Kings Canyon	Operating expense/passenger mile	\$0.38	\$0.32	\$0.28	\$0.56	\$1.02
	Operating expense/unlinked passenger trip	\$0.82	\$0.69	\$0.62	\$1.23	\$2.17
	Service Efficiency					
	Operating cost/Vehicle Revenue Mile (annual)	\$7.93	\$7.16	\$7.66	\$22.91	\$7.88
Shaw/Hwy 168	Operating cost/Vehicle Revenue Hour (annual)	\$81.76	\$75.62	\$69.53	\$207.22	\$91.99
	Cost Effectiveness					
	Operating expense/passenger mile	\$0.39	\$0.29	\$0.29	\$0.54	\$1.02
	Operating expense/unlinked passenger trip	\$0.85	\$0.63	\$0.63	\$1.17	\$2.17
	Service Efficiency					
	Operating cost/Vehicle Revenue Mile (annual)	\$5.81	\$7.67	\$5.48	\$5.48	\$7.88
	Operating cost/Vehicle Revenue Hour (annual)	\$80.12	\$80.95	\$76.44	\$76.44	\$91.99
	Cost Effectiveness					
	Operating expense/passenger mile	\$0.88	\$0.49	\$0.52	\$0.52	\$1.02
	Operating expense/unlinked passenger trip	\$1.93	\$1.07	\$1.15	\$1.14	\$2.17

Source: Nancy Whelan Consulting, Kimley-Horn and Associates, Inc.



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The situation faced by FAX is mirrored by transit agencies across the country. In May 2009, the American Public Transportation Association (APTA) surveyed 98 transit agency members. The responders represented more than half of the nation's transit riders and included 10 of the top 15 agencies in terms of annual ridership³. Key survey findings include:

- More than 80 percent report flat or decreased local and/or regional funding and flat or decreased state funding.
- For those with decreased state, regional, and/or local funding, 89 percent have had to raise fares or cut service and 47 percent have had to do both.
- Half of the systems have had to eliminate staff positions.
- Of those facing decreases in either local/regional or state funds, 55 percent have transferred capital funds to support operating costs.
- Even given increased fares, service cuts, lower fuel costs, and job losses, 60 percent of the systems reported increased ridership in the first quarter of 2009 compared to the first quarter of 2008.

Future Environment

Some of the infrastructure scenarios presented in this report are based upon aggressive assumptions about population growth. In order for this growth to occur, the economic situation must change to permit the creation of new jobs. In addition, housing and job growth would need to occur along existing transit corridors, rather than being permitted to occur in outlying low density areas.

High Speed Rail (HSR) is expected to increase the demand for transit in the region; it is not clear that this would translate into additional funding for transit service in Fresno. Final plans for HSR are not yet complete. The goal is to intensify development around HSR station sites; however, locations have not been finalized and the financial impact of increased densities is not yet known. Revenue generation opportunities may be available from impact fees and other development based revenue sources.

FUNDING CAPITAL AND OPERATING NEEDS

Overview


Support for public transportation is derived from a broad range of sources, many of which have been established to avoid competing with other public services. Sales taxes are the most widely used source of dedicated local and regional funding for transit.⁴ In Fresno, approximately 20 percent of the operating budget is supported with local sales tax revenue.

Transit revenue sources are generally grouped into two categories based on eligible uses: capital and operating. Capital funds may only be used on physical items that have a lifespan of more than a year, and meet certain cost thresholds. Examples of capital expenditures are new track, new transit stations, and the acquisition of rolling stock (such as buses and rail cars). With very limited exceptions (such as federal Congestion Mitigation and Air Quality Improvement funds), capital funds cannot be used to pay for operating costs, or for maintaining assets already built or owned. Rather, only operating funds may be used to pay for the ongoing, daily cost of operating and maintaining a transit system. Many sources of operating funds are eligible for use on either operating or capital purposes.

New or expanded transit service may consist of operations expenses and/or capital expenses. For example, a service expansion that uses existing vehicles but increases hours of service would not be eligible for capital revenues. By contrast,

³ *Challenge of State and Local Funding Constraints on Transit Systems: Effects on Service, Fares, Employment and Ridership, Survey Results, June 2009, American Public Transportation Association.*

⁴ *Local and Regional Funding Mechanisms for Public Transportation, TCRP Report 129, Transportation Research Board, 2009.*



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an expansion that requires construction (i.e., creation of a dedicated bus lane as part of Bus Rapid Transit project), would be eligible for capital revenues for those elements and the increased operating costs would require operating sources of funds.

Sources and Uses of Capital and Operating Funds

The proposed Bus Rapid Transit and Light Rail Transit investment over the next 20 years will require between \$51.7 and \$828.5 million in capital funding, and incremental operating costs are estimated to be between \$6.3 and \$18.3 million annually (in 2010 dollars). These investments are viewed within a timeframe of near terms, mid term and long term. In that context, in the near term two of the three corridors are designed for BRT service in the near term, with a third BRT corridor in the mid term. The first two BRTs would be converted to LRT service when demand grows to require the added capacity in the long term.

Major capital investments such as new rail lines or extensions are costly and almost always require a variety of funding sources from all levels of government. Rarely is a new fixed guideway project funded from one or two sources. Given the state of the economy, California's traditional capital funding sources have decreased or have been deferred or eliminated. Federal sources, in particular New Starts funding, remain critical for significant capital investment. The Federal Transit Administration's New Starts program is a competitive funding program for expansions to "fixed guideway" transit systems including dedicated Bus Rapid Transit. FAX submitted a proposal for Very Small Starts funding as a part of the New Starts program in September 2010 and has been selected for funding.

Funding transit operations is relatively more difficult than funding capital projects. The number and variety of sources is not as varied or plentiful, and most sources are not within the control of the transit agency. The possibility of fare increases is always considered as a potential revenue source because transit agencies directly control fares. There are limits to fare increases as riders will choose other modes of transportation if they cannot afford it or if they perceive that the fare is too high. Thus, fare increases alone cannot address significant funding gaps. In its Short Range Transit Plan, FAX projected that fare revenues would cover 19.3 percent of its operating costs from FY2010 through FY2015, or about \$9.2 million annually.⁵ Fresno's travel model assumes that fares will increase over time, consistent with the cost of living index. However, FAX has not increased fares for several years, so fares have not been keeping up with inflation. FAX is currently working on a plan to increase fares from the current \$1.25 to \$2.00 at the end of five years.

Revenues are only one half of the financial picture. The other side of the budget equation is costs. As with transit agencies across the country, FAX has dealt with revenue shortfalls through cost cutting measures including cuts in service and driver and management staff layoffs.

Transit agencies are finding that service cuts and layoffs are not sufficient to address significant shortfalls. The underlying structural problem of costs increasing at a pace greater than revenues is getting serious attention. Some agencies have begun to implement efficiencies through better scheduling and routing, new work rules within labor contracts, revising benefits and pensions structures, and contracting for services. In the San Francisco Bay Area, the Metropolitan Transportation Commission has embarked on a Transit Sustainability Project to study the cost structure of the largest transit operators and how costs can be controlled through revisions to labor contracts, more efficient service provision, contracting out, and increasing revenues. AC Transit has recently implemented a contract with its operators that addresses many of these issues.

Transit capital and operations and maintenance have been funded from variety of federal, state, and regional/local

⁵ *Short Range Transit Plan: 2010–2014, June 30, 2009, prepared by the City of Fresno.*

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sources in Fresno. Existing capital funds, most of which have been used in the past or are presently in use in Fresno, are summarized in Table 24. Operating and maintenance funds are summarized in Table 25. These revenues are currently fully used to operate the transit system and are unlikely to increase in the near future. More detailed descriptions of these sources, eligible uses, and potential for use on Fresno transit projects are provided in Appendices 1 and 2.

Table 24: Revenues Available for Transit Capital

Level	Source
Federal	SAFETEA-LU — Congestion Mitigation and Air Quality Improvement Program (CMAQ) SAFETEA-LU — Surface Transportation Program (STP) SAFETEA-LU — Safe Routes to School FTA Section 5307 - Urbanized Area Formula Program FTA Section 5309 - Bus and Bus Facilities FTA Section 5309 - Fixed Guideway Modernization FTA Section 5309 - New and Small Starts Program ³ FTA Section 5311 - Formula Grants for Other than Urbanized Areas FTA Section 5316 - Jobs Access Reverse Commute (JARC) FTA Section 5317 - New Freedom Program Highway Safety Improvement Program (HSIP) American Recovery and Reinvestment Act (ARRA) - Various Programs
State	Transportation Development Act/Local Transportation Fund (LTF) - Art. 4 Transportation Development Act/State Transit Assistance Funds (STA) Caltrans Community Based Transportation Program (CBTP) Bicycle Transportation Account (BTA) Safe Routes to School (SR2S) STIP - RTIP STIP - TE Proposition 1B/Traffic Light Synchronization Program Proposition 1B/Public Transportation Modernization, Improvement, and Service Enhancement Account (PTMISEA) Proposition 1B/TSSDRA AB 2766 Air District Funds Gas Tax Apportionments AB 118 - Alternative & Renewable Fuel and Vehicle Technology Program
Regional/Local	Measure C Property-Based Business Improvement District (PBID) Developer Fees City Sources Fares

Table 25: Revenues Available for Transit Operations and Maintenance

Level	Source
Federal	SAFETEA-LU -- Congestion Mitigation and Air Quality Improvement Program (CMAQ) FTA Section 5307 Urbanized Area Formula Program FTA Section 5311 - Formula Grants for Other than Urbanized Areas FTA Section 5317 New Freedom Program
State	Transportation Development Act/Local Transportation Fund (LTF) - Art. 4 Transportation Development Act/State Transit Assistance Funds (STA)
Regional/Local	Measure C Property-Based Business Improvement District (PBID) City Sources Fares

Given the imbalance of cost and revenue growth in transit, most agencies continue to seek new sources of revenue in addition to implementing cost control measures. Opportunities exist for new revenue sources at all levels. Reauthorization of the federal transit bill is on the horizon and transit agencies across the nation will be weighing in with their congressional delegations and industry organizations on the content of the bill. In California, the new administration has pledged to align state and local funding with responsibility for service provision. The details of how this will impact transit are not known. Additionally, SB 375 provides a structure for transit to be part of planning for a sustainable future, and future revenues may be available to support those plans. Fresno will need to be a strong advocate for federal and state initiatives benefitting the maintenance and expansion of the system.

Numerous potential new funding opportunities are available at the regional and local level. Selected sources that might be applicable to new and existing transit service in Fresno are listed in Table 26. A more detailed description of these new sources can be found in Appendix 3.

In addition to these new revenue sources, there are sometimes existing sources that have not yet been funneled into specific grant opportunities. For example, the San Joaquin Valley Air Pollution Control District has recently increased the vehicle registration fee to collect funds to pay penalty fees mandated under Section 185 of the Federal Clean Air Act. They may collect more funds than necessary to pay the penalty, and in that case, these additional funds may be available to invest in projects that reduce emissions. It is possible for a public agency to work with the San Joaquin Valley Air Pollution Control District to create a funding opportunity for specific programs or projects. These opportunities need to be sought out and monitored by FAX and Fresno Council of Governments in order to best position transit projects to take advantage of this funding.

Implementing new revenue sources is time consuming and can be costly. Many sources require technical studies and long lead times for ballot initiatives. Certain sources do not require voter approval, but they do require approval by governing boards and some require approval of property owners or business owners. Potential sources should be evaluated for revenue yield, administrative and compliance costs, equity, political and public acceptance, and technical feasibility. Certain of these evaluation criteria are addressed in Appendix 3.

Table 26: New Revenues Sources

Type	Potential Sources
Voter Approval Required	<div>Local Sales Tax</div> <div>Utility Users Tax</div> <div>Business Taxes (Payroll)</div> <div>Parcel Tax</div> <div>Local Gas Tax</div> <div>Regional Gas Tax</div> <div>Vehicle Miles Travelled Tax (VMT)</div>
Voter Approval Not Required	<div>Parking Fees and Surcharges</div> <div>Transient Occupancy (Hotel) Tax</div> <div>Employer Sponsored Transit</div> <div>Development Impact Fee</div> <div>Benefit Assessment Districts</div> <div>Mello-Roos Community Facilities District</div> <div>Business Improvement Districts (BID)</div>


KEY ELEMENTS OF A SUCCESSFUL FINANCIAL PLAN

It is not sufficient to identify potential capital and operating sources to build and operate expansion projects. A successful funding strategy will be based on sound project planning, and will require a good deal of political will. The efforts undertaken through the PTIS to identify strategies for transportation investments and land use policies provides an excellent foundation for the financial plan. Specifically, the following achievements will facilitate implementation of the financial plan:

- Transit needs have been identified and public consensus reached on transit investments
- Specific improvements, the rationale, and benefits have been identified
- Roles and responsibilities have been established. The Fresno Council of Governments and FAX are responsible for executing the planned improvements, partnering with the community and other local entities
- Policies to focus development on transit corridors create the potential for land based or development based revenues dedicated to transit

Building on these achievements, several important elements are needed to be successful in funding the program:

- Conduct a thorough evaluation of all existing and potential funding sources needed to support capital and operating requirements.
- Target likely sources of funds.
 - Building on the success of Fresno's Very Small Starts application, future Small Starts and New Starts are very likely sources.
 - A preliminary assessment of locally controlled sources indicates that an expansion of the existing Development Impact Fee program could address a variety of transit needs. A nexus study is required to make transit costs eligible for Development Impact Fees.
 - Consider a parcel tax or utility tax dedicated to transit.
- Monitor existing traditional transit sources and non-traditional sources for funding availability. Position the projects and services to take advantage of funding opportunities as they become available.
- Design and execute an advocacy strategy including:
 - Identification of champions and community leaders for the plan



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- Support from elected officials at all levels
 - Creation of coalitions of opinion leaders, stakeholders, and citizens
 - Financial support for technical studies, polling, and campaigns
 - Preparation of public education materials
 - Presentations to the media and the public
- Establish a timetable for achieving milestones on the path to full funding.
 - Persist in the effort to raise new revenues. It may take longer than expected.
 - Ensure that technical requirements are met. The projects must be included in regional planning documents.
 - Advance project development, including both federal and California (NEPA/CEQA) environmental clearance. Project readiness is essential to take advantage of funding that becomes available unexpectedly. Project readiness is a competitive advantage.
 - Stabilize and maintain existing transit service. Controlling costs and seeking new revenues to maintain the core system is essential to any expansion strategy. Financial sustainability of the system is evaluated in the New Starts rating process and it is important to the public. It is difficult to have successful ballot measures while service is being cut.

PROJECT SPECIFIC FUNDING PLANS

The previous sections presented an overview of the universe of opportunities to address operating and capital needs for projects and defined the elements of a successful financial plan for Fresno. This section focuses on the specific infrastructure investments under consideration in Fresno and how those projects might be funded.

The timing of the projects varies, depending on estimates regarding population growth, demand for transit, and funding. The timeframes can be characterized as near term, mid term, and long term. Each is considered separately, as a standalone scenario.

In the near term, two Bus Rapid Transit (BRT) projects are well underway in terms of planning, with revenue ready dates of 2013. In the mid term, a third BRT project is planned for to be revenue ready in 2020. Finally, in the longer term, the Light Rail Transit (LRT) projects are planned to replace the Blackstone and Ventura/Kings Canyon BRT projects when demand grows in those corridors. If demand warrants, they are expected to be in service in 2030. Their implementation is dependent on significant population growth, focused on the BRT corridors.

For significant capital investments in transit, the federal New Starts Program continues to be the likely source from which to seek funding. In September 2010, FAX prepared a Very Small Starts Submittal Request to Enter Project Development for Blackstone and Ventura/Kings Canyon BRT. Financial plans include 80 percent New Starts funding with a 20 percent match from state Proposition 1B funds these two projects. FAX proposes to cover operating costs with existing operating revenues, plus new or increased revenues that can be used in support of operating costs. The net, combined annual cost of operating both services is projected to be \$6,320,340. The net cost reflects the fact that there will be some operating savings as well, since this service will replace existing service. It should be noted that the operating cost of \$6.3 million annually represents 25 percent of FAX's total FY2011 Adopted Expenditure budget.

For the near term scenarios, a summary of the two BRT projects currently planned, and their funding plans can be seen in Table 27.

Table 27: Proposed Near Term Bus Rapid Transit (BRT) Scenario

Blackstone BRT	
Description	Service along Blackstone Ave. from Audubon Dr. South to Downtown Fresno
Length	9.29 miles
Begin Revenue Operations	2013
Capital Cost (2010 \$)	\$27,870,000
Capital Revenues	\$22,296,000 – Very Small Starts Funding (New Starts) \$5,574,000 – California Prop 1B funds
Incremental O&M Cost (2010 \$)	\$3,707,959
Ventura/Kings Canyon BRT	
Description	Service along Ventura Ave/Kings Canyon Rd from Downtown Fresno east to Southeast Growth Area (SEGA)
Length	7.95 miles
Begin Revenue Operations	2013
Capital Cost (2010 \$)	\$23,850,000
Capital Revenues	\$19,080,000 – Very Small Starts Funding (New Starts) \$4,770,000 -- California Prop 1B funds
Incremental O&M Cost (2010 \$)	\$2,612,381

Note: Cost estimates used are that of 2035 Constrained TOD with Exclusive Lanes scenario

Source: Nancy Whelan Consulting, Kimley-Horn and Associates, Inc.

In the mid term, a third BRT project is planned for Shaw Avenue. This project is planned to begin revenue service in 2020. Because this project is nine years in the future, the financing plan is more general. It is assumed that the New Starts program will still be in existence with a similar structure, or that it will have been replaced by a program that is very similar. The Shaw BRT project fits within the Small Starts Program, as the total cost is less than \$250 million and the federal funding requested is less than \$75 million. Even when costs are inflated to Year of Expenditure, it should still qualify for Small Starts. For preliminary planning purposes, 80 percent federal New Starts funding is assumed. FAX would need to identify match funds, which are almost \$8.0 million in 2010 dollars.


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For the mid term scenario, a summary of the three BRT projects and their funding plans can be seen in Table 28.

Table 28: Proposed Mid-Term Bus Rapid Transit (BRT) Scenario

Blackstone BRT	
Description	Service along Blackstone Ave. from Audubon Dr. South to Downtown Fresno
Length	9.29 miles
Begin Revenue Operations	2013
Capital Cost (2010 \$)	\$27,870,000
Capital Revenues	\$22,296,000 – Very Small Starts Funding (New Starts) \$5,574,000 – California Prop 1B funds
Incremental O&M Cost (2010 \$)	\$3,707,959
Ventura/Kings Canyon BRT	
Description	Service along Ventura Ave/Kings Canyon Rd from Downtown Fresno east to Southeast Growth Area (SEGA)
Length	7.95 miles
Begin Revenue Operations	2013
Capital Cost (2010 \$)	\$23,850,000
Capital Revenues	\$19,080,000 – Very Small Starts Funding (New Starts) \$4,770,000 -- California Prop 1B funds
Incremental O&M Cost (2010 \$)	\$2,612,381
Shaw BRT	
Description	BRT Service along Shaw Ave and SR 168 from SR 99 east to SR 168 at Temperance Ave
Length	13.25 miles
Begin Revenue Operations	2020
Capital Cost (2010 \$)	\$39,750,000
Capital Revenues	\$31,800,000 – Small Starts Funding (New Starts) \$7,950,000 -- Local, regional, or state funds
Incremental O&M Cost (2010 \$)	\$1,912,368
<i>Note: Cost estimates used are that of 2035 Constrained TOD with Exclusive Lanes scenario</i>	
<i>Source: Nancy Whelan Consulting, Kimley-Horn and Associates, Inc.</i>	



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In the long term, if demand warrants it, it is proposed that the first two BRT projects be converted to LRT, an expensive capital investment. Projects that exceed the thresholds for Small Starts can participate in the New Starts program. One of the features of this larger program is the need to match the New Starts funding dollar for dollar. The two LRT projects that are proposed to replace the Blackstone and Ventura/Kings Canyon BRT in 2030 fall under the New Starts heading, and would require a 50 percent local match. It should be noted that residential and employment densities would need to exceed those in the Full Buildout TOD scenario in order to justify the investment of LRT. It is unlikely that these densities will be surpassed; consequently LRT is unlikely to be built in the next 25 years. Because these projects would not be built in the near future, it is difficult to identify the sources that would comprise the matching funds. The local match for the LRT projects totals more than \$368 million in 2010 dollars. By the time these projects are in operation, new capital and operating revenue sources will be required.

For the long term scenario, a summary of the LRT projects and funding plans, with LRT replacing BRT on two of the three corridors, is shown in Table 29.

Table 29: Proposed Long Term Bus Rapid Transit (BRT) with upgrade to Light Rail Transit (LRT) Scenario

Blackstone LRT	
Description	Service along Blackstone Ave from Audubon Dr. South to Downtown Fresno
Length	9.29 miles
Begin Revenue Operations	2030
Capital Cost (2010 \$)	\$464,500,000
Capital Revenues	\$232,250,000 — New Starts Funding \$232,250,000 — Local, regional, and/or state funds
Incremental O&M Cost (2010 \$)	\$8,638,495
Ventura/Kings Canyon LRT	
Description	LRT Service along Ventura Ave/Kings Canyon Rd from Downtown Fresno east to Clovis Ave
Length	7.95 miles
Begin Revenue Operations	2030
Capital Cost (2010 \$)	\$272,500,000
Capital Revenues	\$136,250,000 — New Starts Funding \$136,250,000 — Local, regional, and/or state funds
Incremental O&M Cost (2010 \$)	\$6,446,471
Shaw BRT	
Description	BRT Service along Shaw Ave and SR 168 from SR 99 east to SR 168 at Temperance Ave
Length	13.25 miles
Begin Revenue Operations	2020
Capital Cost (2010 \$)	\$39,750,000
Capital Revenues	\$31,800,000 — Small Starts Funding (New Starts)
Incremental O&M Cost (2010 \$)	\$7,950,000 — Local, regional, or state funds \$3,245,400
<i>Note: Cost estimates used are that of 2035 Full Buildout TOD with Exclusive Lanes scenario</i>	

Source: Nancy Whelan Consulting, Kimley-Horn and Associates, Inc.



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Because the funding plans for all of the BRT and LRT projects include New Starts funding, it will be important for Fresno to plan for continued participation in the Small Starts portion of the program for BRT projects and to prepare for the more rigorous evaluation and analysis required under the full New Starts process for LRT projects. FAX's experience in the Very Small Starts program provides a good background for pursuing future New Starts funding.

The New Starts planning and development process is a very detailed, proscribed series of analyses and milestones undertaken by the project sponsor and the FTA together, and can take several years to complete, depending on the complexity of the project and its finances.

The New Starts project development process follows Federal statutory requirements, including coordination with local and regional planning efforts, technical evaluations using standardized methodologies in an effort to "level the playing field" for all New Starts projects, and regular coordination and review by FTA. Based on the results of the technical analyses – including an extensive review of the financial condition of the project and the project sponsor – FTA must approve the project to enter into Preliminary Engineering and Final Design. Upon approved entry into Final Design, FTA may enter into a multi-year commitment to fund a portion of the project's construction, referred to as a full funding grant agreement.

The ongoing technical analyses and updates provide FTA with data for evaluating the project readiness against several mandated criteria including project cost effectiveness, transit supportiveness of existing and future land uses, and the local financial commitment. Additional requirements include assurance that the cost and benefit analyses are reliable, and that the project sponsor has the financial and technical capacity to design, build, operate and maintain the project both within budget and schedule. Projects in the New Starts pipeline are required to conduct more extensive technical analyses than those not funded by New Starts.

FAX will need to demonstrate the financial capacity to operate and maintain the service, once it is built. Given the current fiscal realities, new funding sources and innovative service delivery options are needed in the next few years to help achieve financial stability and to demonstrate future financial capacity as required by FTA.

Streetcar Project

There have been discussions about building and operating a streetcar in downtown Fresno. This project is still in the early planning stages, without final determination of boundaries or routes. As those details are evaluated and finalized, a funding plan can be developed.

SUMMARY

Transit in Fresno County faces the challenge faced by transit agencies across the nation, namely operating and maintaining current service levels. A financial strategy is needed in the very near term to ensure that current transit service levels can be maintained and that future expansions are affordable. A variety of funding sources will be required to accomplish the vision set out in the PTIS. Initiating the development of a strategy now will help realize the funding needed over the next 20 years.

¹ FY2010–2011 Fresno City Adopted Budget

Table 30: Potential New Revenue Sources For Fresno Transit Projects

Source	Description	Capital or Operating Expenditure Eligibility	Legal/ Legislative Requirements	Voter Approvals Required	Revenue Stability	Ease of Administration and Collection	Implementation Experience
Local Sales Tax	An incremental addition to County/local sales for transportation	Both	Requires governing Board to approve a ballot measure to be submitted for voter approval	Approval by two thirds of the electorate	Medium	High	Half Cent Sales tax measure (Measure C) in place in Fresno since 2006; most counties in California
Utility Users Tax	Tax imposed on utility services to be used for a specific or general purpose	Both	Requires governing Board to approve a ballot measure to be submitted for voter approval	Approval by two thirds of the electorate if dedicated to specific use, such as transit	High	High	Pullman, Washington
Business Taxes (Payroll)	A local payroll tax imposed through employer withholding	Both	Requires the Board of Supervisors to approve a ballot measure to be submitted for voter approval	Majority vote of the electorate if general tax. Two thirds approval required if dedicated (special tax).	Medium	Medium	San Francisco
Parcel Tax	Flat tax on each parcel of real property.	Both	Requires governing Board to approve a ballot measure to be submitted for voter approval	Approval by two thirds vote of the electorate	High	High	Cities and counties throughout California; AC Transit in Alameda and Contra Costa Counties
Employer Sponsored Transit	Employers participate financially in the transit service serving their business.	Both	None	None	Low	Low	San Mateo, San Francisco, and Alameda Counties
Local Gas Tax	Tax imposed on each gallon of gas sold in local community	Both	Governing Board must approve ballot initiative.	Two thirds vote of the electorate.	Low	Medium	None known
Regional Gas Tax	Tax imposed on each gallon of gas sold in the region	Both	Governing Boards of any communities in the region affected must approve ballot initiative	Approval by two thirds of the region's electorate	Medium	Medium	None known
Parking Fees and Surcharges	Local government imposed fee or surcharge on on-street and garage parking, usually metered	Both	Governing Board approval	None	Medium	High	Most California cities, including Fresno; revenue dedicated to transit in San Francisco

Source: Nancy Whelan Consulting

Source	Description	Capital or Operating Expenditure Eligibility	Legal/Legislative Requirements	Voter Approvals Required	Revenue Stability	Ease of Administration and Collection	Implementation Experience
Transient Occupancy (Hotel) Tax	Tax imposed on hotel users by local government	Both	Governing Board approval	None	Low	High	Most California cities, including Fresno
Vehicle Miles Travelled Tax (VMT)	Tax on automobile miles travelled	Both	Likely to require state enabling legislation and Governing Board approval of ballot initiative.	Two thirds vote of the electorate.	Medium	Low	Oregon pilot project
Development Impact Fee	One- time fee charged on new development.	Capital	State law requires demonstration of a direct nexus between the fee charges and the impact improvements funded. Approval by governing Board required.	None	Low	Low	Cities and counties throughout California. Only San Francisco specific to transit.
Benefit Assessment Districts	An assessment on properties within a defined area; the assessment is related to the amount of benefit that the property receives.	Both	Local government to determine funding needs and establish boundaries.	Property owners within the district must approve. A majority of the weighted ballots exceed the weighted ballots opposing the creation of the district.	Low	Medium	Cities and counties throughout California. Los Angeles specific to transit.
Mello-Roos Community Facilities District	Tax on properties within a defined area to fund public improvements within that district.	Capital	Local government establishes boundaries and sets rate.	Two-thirds majority vote of property owners within the proposed boundaries of the district.	Low	Medium	Cities and counties throughout California
Business Improvement Districts (BID)	Assessment district in which business owners choose to be assessed a fee, which is collected on their behalf by the City, for use in improving the business in the area	Both	Governing Board approves creation of the district	A majority of business owners may protest the formation of the BID.	Low	Medium	Cities and counties throughout California. Emeryville specific to transit.

Source: Nancy Whelan Consulting