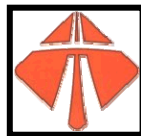




Placer County
Transportation Planning Agency

Transit Master Plan for South Placer County



- *Auburn Transit*
- *Lincoln Transit*
- *Placer County Transit*
- *Roseville Transit*
- *Consolidated Transportation Services Agency*

Prepared by

URS CORPORATION
URS

With the assistance of

DKS Associates, Inc.

June 2007



TABLE OF CONTENTS

SUMMARY OF FINDINGS AND OPPORTUNITIES	S-1
1.0 Introduction	1
1.1 Background and Purpose	1
1.2 Master Plan Objectives	1
1.3 Master Plan Participants and Development Process.....	2
1.4 Organization of This Document.....	2
2.0 Existing Transit Service and Public Perceptions.....	3
2.1 Existing Transit Service	3
2.2 Public Outreach Findings	3
3.0 Conceptual Long-Range Service Plan	8
3.1 Background and Approach	8
3.2 Service and Ridership Analysis Methodology	8
3.3 Scenario Details and Modeling Results.....	11
3.4 Comparison with Peer Operators and Regions	18
3.5 Recommendations	18
4.0 Capital Needs and Integration Opportunities.....	23
4.1 Purpose and Scope.....	23
4.2 Vehicles and Operations Technology.....	23
4.3 Fixed Facility Needs and Options.....	34
4.4 Fare Collection Options and Opportunities.....	37
5.0 System Costs and Funding.....	39
5.1 System Costs	39
5.2 Funding Availability and Options	40
5.3 Recommendations.....	45
6.0 System Integration Needs and Options	46
6.1 Purpose and Approach.....	46
6.2 Current Structure	46
6.3 Issues and Considerations	47
6.4 Alternative Structures and Experience Elsewhere.....	47
6.5 Recommendations	50



LIST OF TABLES

Table 2.1 – Summary of Views on Transit Expressed at Placer County MTP Workshop	7
Table 3.1 – Summary of South Placer County Growth Assumptions (As of 2005)	10
Table 3.2 – Comparison of Transit Service By Scenario	12
Table 3.3 – Changes in Bus Fleet and Mileage Under Future Scenarios	13
Table 3.4 – Estimated Daily Boardings By Transit Operator	16
Table 3.5 – Comparison of Projected Operating Characteristics with Peer Operators	19
Table 4.1 – Standard Transit Vehicle Characteristics By Vehicle Type	23
Table 4.2 – South Placer County Transit Operators – Current Vehicle Inventory	24
Table 4.3 – Horizon Year Fleet Sizes By Service Type, Operator, and Scenario	25
Table 4.4 – Local Fixed Route Service Fleet Procurement Strategies (Scenario 3)	27
Table 4.5 – Commuter Service Fleet Procurement Strategies (Scenario 3)	27
Table 4.6 – BRT Service Fleet Procurement Strategies (Scenario 3)	28
Table 4.7 – Dial-a-Ride Service Fleet Procurement Strategies (Scenario 3)	29
Table 4.8 – Vehicle Characteristics: CARB 2005 Fleet Rule for Transit Agencies	30
Table 5.1 – Estimated Operations and Maintenance Costs By Service Type (2007-35) ...	39
Table 5.2 – Estimated Revenue Vehicle Costs By Service Type (2007-35)	39
Table 5.3 – Estimated Costs for Other Capital Needs By Service Type (2007-35)	40
Table 5.4 – Summary of Transit Costs By Service Type (2007-35)	40
Table 5.5 – Projected Funding From Existing Sources, Costs, and Surplus (Deficit): 2007-35	44
Table 6.1 – Comparison of Institutional Models for Transit Service	48



SUMMARY OF FINDINGS AND OPPORTUNITIES

DISTRIBUTION AND INTENSITY OF FUTURE TRANSIT SERVICE

Three scenarios were considered for forecasting increased demand for transit service over the planning horizon (2030-40):

Scenario 1 (Funding-Constrained Service Level)

- 2005-2012 SRTP bus service improvements
- Additional limited services to new growth areas
- 140% increase in annual transit vehicle-miles and vehicle-hours

Scenario 2 (Transition Service Level)

- Increased BRT service frequency on Watt Avenue
- Additional services to new growth areas in south Placer County, between Lincoln and Sierra College, between Auburn and Folsom, and through Rocklin
- 190% increase in annual transit vehicle-miles and vehicle-hours

Scenario 3 (Urban Service Level)

- New BRT services between Galleria and Hazel and between Sac State and Watt/I-80
- Connecting services between Sierra College and new Sac State campuses
- Rationalized local routes, overall increased frequencies
- 320% increase in annual transit vehicle-miles and vehicle-hours

The following conclusions are drawn from the forecast results:

- Percent increases in transit boardings would exceed percent increases in vehicle-miles for all transit operators under each of the long-range scenarios.
- Placer County Transit boardings would increase dramatically under all scenarios, primarily due to service to new growth areas in south Placer County.
- Lincoln Transit boardings would increase dramatically under all scenarios, primarily due to service to new growth areas.
- Roseville Transit would see substantial increase in use of commuter bus routes and a more modest increase in boardings on local bus routes.

Due to growth and increased demand, transit services overall are forecast to evolve toward standard fixed-route operations, with more frequent service and larger fleets.

OPPORTUNITIES: As transit services increases, opportunities emerge to consolidate service and operations:

- Integrate schedules and routes among transit operators, particularly around major transit nodes, including SRTD LRT and Amtrak stations, medical centers, college campuses, shopping centers, etc.



- Adopt common fare policy, media and equipment – reinforce ‘seamless’ passenger service and simplify regional transit cost and revenue structures.
- Adopt common policies and practices for on-demand and deviated route operations among all providers, so that users can expect similar services.
- Adopt common service planning and performance measurement criteria – foster common understandings about transit service purpose and need, even if operations and management are not consolidated.

VEHICLE PURCHASING

OPPORTUNITIES: As fleets become larger and more similar, opportunities emerge to consolidate aspects of fleet management.

- Joint specification and procurement of vehicles and sub-systems will enable properties to exploit economies of scale and develop common fleets, technologies, and sources of supply.
- Common practices for operations, repair, and maintenance, supported by joint training of operations and maintenance personnel, will foster integration of service and management.
- Common inventories of spare parts and consumables will enable economies of scale, common maintenance, and more efficient use of facilities.
- ‘Smooth out’ retirement and replacement cycles to procure more efficiently, make use of joint contracts, and minimize capacity surpluses and shortfalls.
- Joint investigation and implementation of new technologies will maximize value of study funds and enable joint procurement.
- Coordinated approaches to emission reduction may support efficient vehicle and fuel procurement, as well as common operations and maintenance practice.

MAINTENANCE FACILITIES

Forecast transit service demand and resultant fleet requirements indicate the need for greater maintenance capacity and capability:

- Placer County Transit is forecast to experience manifold increase in service demand and total fleet size, and will require as many as two new maintenance facilities.
- Roseville Transit, which is projected to have service demand and fleet size increases, will be better served by a new, dedicated transit maintenance facility.
- Lincoln Transit is developing a new maintenance and storage facility for its growing fleet, but will require more than twice the planned capacity to accommodate the 2030 forecast fleet.
- Auburn Transit’s current maintenance facility is sized to accommodate forecast growth, and will have its own CNG fueling station.
- CTSA’s Roseville maintenance facility is adequately sized to accommodate forecast fleet growth, but does not have the capability to maintain planned improvements, such as GPS technology and CNG fuel.



OPPORTUNITIES: Increased levels of service and fleet sizes would be served by improvements in maintenance facilities and their utilization:

- Consolidate maintenance for multiple operators, particularly in light of common vehicle technologies and fleet management practices. PCT and Roseville would particularly benefit from joint maintenance of large combined commuter and local fleets.
- Upgrade capabilities of existing facilities to accommodate new technologies, such as GPS, automated vehicle location, passenger information systems, and 'smart' fare media.
- Rationalize utilization of maintenance and storage facilities on the basis of service density and vehicle types, particularly among the largest operations.

INSTITUTIONAL STRUCTURES AND INTEGRATION

“Integration” represents a range of strategies that may enable more efficient operation and management of transit services. Following are options for increased integration:

- Establish a new umbrella transit agency via State legislation;
- Consolidate the existing powers and authorities of several operators under those of an existing agency within or outside Placer County (e.g., PCT, Roseville Transit, Sacramento RT);
- Establish a new joint powers agency (JPA) comprising representation from all operating entities;
- Execute a memorandum of understanding (MOU) among operating entities;
- Establish a subsidiary to the PCTPA to jointly operate and manage combined transit services;
- Establish a contractual arrangement for provision of combined transit services by commercial operators, under the financing and oversight of the PCTPA.

OPPORTUNITIES: Depending on the goals of the agencies, integration of aspects of their operations may increase the transparency of transit services to the public:

- Develop Common Branding: Establishing a clear and common identity for transit agencies to portray a complete and 'seamless' service to the region.
- Purchase Similar Equipment: Similar equipment can provide a common passenger experience, and enable joint procurement and maintenance.
- Integrated Schedules and Routes: Evaluate existing transit services to determine how services can be combined, modified, or revised to serve passenger needs and provide seamless service across the area.
- Develop a Centralized Information Center: A centralized information center provides information for the system in one location for passenger ease.
- Develop a Consistent Wayfinding System: Wayfinding allows for a standardized look and portrays to the public of a unified transit system.



OPPORTUNITIES: Integration may also offer benefits to the efficient operation and management of regional transit agencies:

- Integrate Operations and Maintenance Facilities: Examine the location of existing facilities, capacities, uses, routes, and vehicle types to determine the optimal number of facilities and locations.
- Integrate Policies, Procedures, Standards, and Criteria: Identify and incorporate the “best” policies and procedures among all agencies, including personnel qualifications, labor, operating standards, etc.
- Develop Centralized Dispatching: Centralized dispatching allows service to operate as one unit for the area and allows for a coordinated response to service.
- Examine the Need for Transit Hubs: Transit hubs allow service to be located in important transportation corridors and allows for pulsed or time-transferred operations.
- Develop a Universal or Simplified Fare Structure: Integrated procurement of fare equipment and unified fare structure will simplify and modernize transit fare revenue collection and reinforce seamless service.

PARATRANSIT SERVICES

Demographic trends in Placer County indicate the continuing importance of paratransit and dial-a-ride services.

- Based on general population growth and an even more rapid increase in the elderly, paratransit fleet requirements will more than double by the 2030-40 horizon period.

OPPORTUNITIES: Many of the advantages of integration accruing to other services would accrue to paratransit as well.

- Analysis indicates that the following issues may be addressed by an integrated approach to paratransit and dial-a-ride services:
 - Increased coverage area;
 - Cross-jurisdictional service integration;
 - Responsiveness and timeliness; and
 - Passenger convenience and information accuracy.



1.0 INTRODUCTION

1.1 Background and Purpose

A wide range of transit services are offered to Placer County residents by five independent but coordinated transit provider/operators:

- Auburn Transit
- Lincoln Transit
- Placer County Transit (PCT)
- Roseville Transit
- Consolidated Transportation Services Agency (CTSA)

In 2005, the Placer County Transportation Planning Agency (PCTPA) concluded a series of short-range (five-year) transit plans for the five operators. A result of that effort was the conclusion that a longer-range study of future needs, resources, and opportunities would assist with both strategic policy planning and short-term decision-making. Over the next 25 years, local, regional, and state demographic and land use forecasts all point to extensive growth in south Placer County, and public service agencies – including transit operators – must be prepared to address ever-growing demand for their services.

The principal objective of preparing a Transit Master Plan for Placer County was to examine all aspects of transit service delivery and prepare a consistent, coordinated vision for Placer County transit operators by addressing the following issues and objectives:

- Long-Range service concept;
- Vehicle maintenance needs and arrangements;
- Capital needs and options (vehicles and facilities);
- Technology upgrade/modernization issues and options;
- Costs and funding options; and
- Management and governance (“institutional”) arrangements.

The outcome of the master planning process is a policy blueprint to guide planning for future transit service delivery, with a focus on coordination and integration opportunities in light of anticipated land use and demographic changes. The material in this report is not intended for and should not be used for detailed route planning or other short-term operational actions.

1.2 Master Plan Objectives

The master planning effort was designed to respond to seven specific objectives that encompass desired outcomes, namely:

1. Define a conceptual long-range service plan (network and operations) for all modes including fixed route, demand response, commuter, rail station feeder, bus rapid transit, and social service (elderly and disabled).
2. Identify long-term capital needs, including facilities and vehicles. Address impact of new CARB fleet rules and accommodation of alternative fuels.



3. Review technology opportunities and options for improved and more cost-effective service in areas such as safety and security, customer information, dispatch, and fare systems.
4. Identify areas for better coordination of service and management, including fare policy, administrative policies, vehicle maintenance, dispatch, etc.
5. Prepare an analysis of cost and funding options, showing sources and uses of funds, including identification of future shortfalls, potential new sources of funds, and issues associated with receipt of FTA formula and discretionary funds.
6. Review alternative institutional and management models for service delivery, including alternatives for partial integration of service.
7. Prepare a schedule for proposed changes, including roles and responsibilities of participants, near-, mid-, and long-term actions, and recommended follow-up studies.

Other important issues considered in preparation of the transit service master plan included:

- Service delivery management and responsiveness to customer needs;
- Efficiency and cost-effectiveness of dispersed versus integrated service delivery;
- Flexibility to respond to unforeseen long-term changes in demand, roadway capacity and congestion, air quality regulation, etc.; and
- Control and allocation of federal, state, and local funds;
- Effectiveness in guiding short-range planning and implementation.

1.3 Master Plan Participants and Development Process

Preparation of the Transit Master Plan was guided by the Transit Operators Working Group (TOWG). The TOWG consists of representatives from the five participating transit operators and the PCTPA who meet monthly to consider issues of common interest such as operations, finance, scheduling, service planning, marketing, and fare policy. TOWG members were instrumental in defining and evaluating future service scenarios, technology options, funding issues, and institutional arrangements leading to a workable, long-range blueprint for transit service in south Placer County.

1.4 Organization of This Document

The remaining five chapters of this South Placer County Transit Master Plan are as follows:

- Chapter 2 – Existing Service and Public Perceptions
- Chapter 3 – Conceptual Service Plan
- Chapter 4 – Capital Needs and Integration Opportunities
- Chapter 5 – System Costs and Funding
- Chapter 6 – Service Integration and Integration Opportunities

Specific recommendations for additional study or action are provided at the end of each chapter.

IMPORTANT NOTE: Current or recent operations data presented in this report are generally based on the FY 2005 or 2006 period. Exceptions are noted in the text or tables.



2.0 EXISTING TRANSIT SERVICE AND PUBLIC PERCEPTIONS

2.1 Existing Transit Service

Transit service in south Placer County (generally bounded by Sacramento County on the south, Sutter County on the West, Nevada County on the north, and the town of Colfax on the east) is currently provided by five independent but cooperating agencies:

- **Auburn Transit** – Two deviated fixed-routes throughout the City and into the unincorporated county on weekdays. One route is operated on Saturdays and Sundays.
- **Lincoln Transit System (LTS)** – Two deviated fixed-routes and dial-a-ride services on weekdays. No service is available on weekends. All services are open to the general public, though currently service is utilized primarily by school children.
- **Placer County Transit (PCT)** – Five fixed routes (Monday-Saturday), one commuter route (weekdays). In addition, two deviated fixed routes and general public dial-a-ride in five areas are provided through CTSA.
- **Roseville Transit** – Thirteen (13) fixed routes (Monday-Saturday), one (1) peak period route (Monday-Friday), dial-a-ride service (daily), and commuter service to downtown Sacramento (weekdays).
- **Consolidated Transportation Services Agency (CTSA)** – Elderly and disabled service. Provides contract service to several social service agencies, including dial-a-ride, deviated/fixed route, subscription (charter) services, I-Ride Program, Voucher Program, and Foothill Volunteer Service.

2.2 Public Outreach Findings

In 2006, three separate efforts were made to canvas opinion from the general public, elected officials, and other stakeholders regarding the future of transit service in south Placer County. The three efforts were:

- South Placer County Transit Master Plan
- SACOG Long-Range Transit Plan
- SACOG 2035 Metropolitan Transportation Plan (MTP)

Summaries of findings from the three efforts are presented below.

2.2.1 Transit Master Plan Interviews

A series of meeting were held with officials in Placer County regarding the roles of transit in the county, possible changes to transit service 10 to 20 years in the future, priorities for addressing current and future needs, and the possibility of consolidating transit services in the county.

Persons interviewed and the dates of the interviews are as follows:



November 3, 2005		
Kathy Lund	Councilmember	City of Rocklin
Bruce Cosgrove	Director	Auburn Chamber of Commerce
Candace Roeder	Director	Seniors First
Susan (Tink) Miller	Executive Director	Placer Independent Resource Services, Inc.
November 9, 2005		
Tom Cosgrove	Mayor	City of Lincoln
Charles Clark	Public Works Director	City of Auburn
Mandy Davies	VP for Student Services	Sierra College
Lanny Schwenk	Chief - Police Services	Sierra College
November 16, 2005		
Bob Snyder	Councilmember	City of Auburn
Ted Gaines	Supervisor	Placer County
Rocky Rockholm	Mayor Pro Tem	City of Roseville
Wendy Gerig	CEO	Roseville Chamber of Commerce

A consistent set of questions was asked at each interview:

- What is the role of transit in Placer County?
- What is working well with current transit services and what needs improvement?
- What changes or improvements should be made in the next 10–20 years?
- What are your personal views on transit service in Placer County?
- What are your priorities for addressing current and future needs?
- What are some strategies for increasing transit funding?
- What are your views on various types of transit vehicles?
- Should south Placer transit services be consolidated, and if so, how?

Following are summaries of responses given.

Transit is perceived in two ways: first, providing services for seniors, the disabled, and those without cars; second, providing services for commuters.

Fixed route and commuter services are viewed as adequate in allowing people to utilize transit for the trip as opposed to driving. However, the current system is perceived as “bewildering to the average user” and timetables are not always followed. Further, there is not enough penetration into neighborhoods to attract new riders, and the individual operator service areas make it difficult for long distance trips.

Demand response service is perceived as a very important transit service in south Placer County and will remain so as the number of elderly residents is growing rapidly. It was felt that this type of service needs to be strengthened and improved.

Regional rail (Capital Corridor) is viewed as providing excellent service to the community and should be expanded to provide service to Lincoln (from Roseville) and beyond. Commuter bus services (PCT and Roseville Transit) are also viewed as useful, and should grow as the market



increases. BRT or streetcar service should be implemented in the south County development areas (e.g., Watt Avenue corridor, etc.). LRT is too expensive.

Consolidation or integration of transit services was perceived as positive for the county and particularly beneficial for the senior community. Integration of transit service would also lead to better coordination of routes, vehicles, facilities, and staff, and could result in a reduction of operating expenses by eliminating duplicative service, staff, and operating and maintenance practices. It would also provide seniors a seamless transit service and bring demand response service under the same service umbrella as fixed route and commuter service.

Suggested future changes and improvements included:

- Expand services for seniors and the disabled.
- Add more reliable demand response services.
- Improve coordination of services by transit providers, including across county lines.
- Provide better service to activity centers (i.e., shopping, education, employment).
- Expand service to areas not now served or only minimally served.
- Provide better information to all transit users (including other languages).
- Provide a unified fare system and integrated schedule to facilitate “seamless” travel.
- Provide more fare options to encourage more transit use.
- Encourage higher density housing to support greater transit use.
- Use smaller vehicles (including vans) to match actual demand and use.
- Provide new high-capacity service where warranted.

2.2.2 SACOG Long-Range Transit Plan Workshops

In February and March 2006, a series of interviews were conducted with 50 stakeholders in the Sacramento region regarding key themes and future vision for transit services. The findings are categorized into:

- Perceptions of Existing Services
- Evolving Market Needs
- MTP 2035 Planning Process
- Institutional Considerations (not part of the original interview guide)
- Funding Availability and Transportation Pricing
- Technology Advancements
- Future Vision for Mobility in the Sacramento Region

Three key themes emerged during the stakeholder interviews:

1. Modal investment decisions need to be driven by land use decisions and desires. The Blueprint process significantly increased the awareness of the connection between land use and transportation decisions.
2. As a region, Sacramento is not adequately planned for implications of the aging population. Several operators mentioned that they were not confident with the projections of demand for the aging population in their short range transit plans.



3. There is growing demand for commuter transit services in the region. There was strong interest expressed in Bus Rapid Transit and other services that provided higher speed and more convenient service.

Stakeholders were also asked to identify what works well and what does not well with transit services in the region:

- Light rail service provided by Sacramento Regional Transit has a very positive image.
- The Capital Corridor service is identified as a regional success story.
- A growing number of neighborhood and commuter shuttles serve distinct markets well. N
- Commuter bus services to downtown Sacramento have attracted significant ridership.
- Most paratransit services in the region go beyond the requirements of the Americans with Disabilities Act (ADA), and the senior and disabled communities have a strong foundation of paratransit services.
- There is a general dissatisfaction with the transit service levels that currently exist, particularly the frequency of service and the span of service outside of Sacramento.
- The perception of fear for personal security is currently a limiting factor for ridership.
- Inter-jurisdictional trips have coordination barriers, such as being limited to a particular city or transit service area.
- The current service level for paratransit services is not adequate and should be increased.

Comments indicated that transit needs to be organized differently to meet the future mobility demands. There was no consensus on the type of governance structure, but there should be an open and comprehensive dialogue on the subject in the future. Models that could be appropriate for the Sacramento region include, Houston, Seattle, AC Transit, and BART.

Most transit operators in the region are comfortable with CNG but are open to other clean propulsion systems such as hybrid electric. There is a small minority of operators who plan on continuing with or switching to clean diesel.

2.2.3 2035 Metropolitan Transportation Plan (MTP) Workshops

As part of its MTP update process, SACOG held a “scoping” workshop in Placer County. Participants were organized into 37 tables (groups) and asked to develop a “base scenario” that express their view of what transportation services and improvements should be included in the MTP. Views expressed at that workshop regarding transit are summarized in Table 2.1, below.



Table 2.1
Summary of Views on Transit Expressed at Placer County MTP Workshop

Improvement Type	No. of Tables	Pct	Base Scenario	Common Themes
Shuttles	36	97%	All 37 tables had shuttles in their base scenario	Additions very common in M, L scenarios that had few shuttles in base
Streetcars	23	62%	26 of 37 tables started with at least one streetcar line in their base scenario	Kept base scenario lines in downtown Roseville and Lincoln, but removed in Placer Vineyards
BRT	35	95%	All 37 tables had BRT in their base scenario	Common additions were to Lincoln and W. Placer
Regional Rail	23	62%	11 of 37 tables had regional rail in their base scenario	9 of 14 additions were county line to Auburn, 5 only extended to Rocklin/Loomis
Light Rail	10	27%	No table had light rail in their base scenario	Nearly all additions were extending service from Sacramento County to downtown Roseville



3.0 CONCEPTUAL LONG-RANGE SERVICE PLAN

3.1 Background and Approach

In order to provide a basis for evaluating future technology and facility needs, estimate costs and funding options, and examine alternative institutional frameworks, three long-range transit service options (“scenarios”) were developed and evaluated. The scenarios were formulated based on:

- Population growth, land use/development forecasts, and traffic growth;
- Current operations;
- History of prior planning; and
- Financial constraints (for Scenario 1);

Other inputs to this process included:

- The SACOG Preferred Blueprint Scenario and the Placer County habitat conservation planning effort;
- Other major new development plans in south Placer County; and
- A general concept of providing trunk line service with feeder buses on major corridors. The trunk line service could include regional rail or BRT.

Extensive input from the Transit Operators Working Group (TOWG), a committee of representatives from the five transit operators, was used to define and evaluate the three service plan concepts.

3.2 Service and Ridership Analysis Methodology

3.2.1 SACMET Model

The travel forecasting tool used for the Placer County Long-Range Transit Plan is a focused version of the Sacramento Metropolitan Travel Demand Model or “SACMET” model that was first developed for the Placer Parkway Preservation Project Tier 1 EIS/EIR.

The SACMET model has been used for development of SACOG’s Metropolitan Transportation Plan (MTP), and for regional air quality conformity analyses. It has provided the basis for other recent regional studies, corridor analyses, and environmental documents. For all of these reasons, this model provides the best starting point for travel forecasts for the Long-Range Transit Plan.¹

3.2.2 Long-Range Development Forecasts

The horizon year development scenario (2030-40) represents a 139 percent increase in households (population) over 2004. The land use development (growth) scenario used for the Placer County Long-Range Transit Plan was based on the “Super-Cumulative” development scenario used for the evaluation of traffic impacts of major development projects in Placer County,

¹ Documentation for this model can be found in “Sacramento Regional Travel Demand Model Version 2001 - SACMET 01 (SACOG and DKS Associates, March 2002).



and was prepared in consultation with TOWG members. The horizon year growth forecast used for the travel demand forecasts (2030-40) is summarized in Table 3.1 and was based on the following assumptions:

- Full build out of all residential land within existing general plan areas in Placer County west of Sierra College Boulevard, including the following major development proposals:
 - Creekview and Sierra Vista specific plans (Roseville);
 - Sphere of Influence expansion areas of Lincoln;
 - Placer Vineyards, Regional University, and Placer Ranch Specific Plans (unincorporated Placer County); and
 - Curry Creek Community Plan Area.
- Growth in south Placer County total and retail employment that balances the growth in residential development.
- Full buildout of residential development in the proposed South Sutter Measure M area, along with a non-residential development level that balances the residential development in that area.
- Development in all other portions of SACOG's six-county region based on straight-line growth between 2005 levels and the 2050 Preferred Blueprint scenario.

3.2.3 Development of Long-Range Transit Service Scenarios

Three long-range service plans, representing alternative overall levels of service, were developed and tested with the travel demand model to provide input to the Transit Master Plan. All were based on the future population (household) and employment estimates presented in Table 3.1. The three scenarios, with their underlying policy basis, are:

- **Scenario 1 (Funding-Constrained)** – 140% increase in annual transit vehicle-miles and vehicle-hours. Service growth is tied to population growth and revenue growth from existing funding sources only. Most new service is placed in new growth areas west of Roseville. This is the “baseline” scenario.
- **Scenario 2 (Transition Service Level)** – 190% increase in annual transit vehicle-miles and vehicle-hours. New service (coverage and frequency) is targeted to rapidly growing areas north and west of Roseville, at levels up to 50 percent higher than traditionally found in rural areas. This service level represents a policy of accommodating the region's transition from rural to urban.
- **Scenario 3 (Urban Service Level)** – 320% increase in annual transit vehicle-miles and vehicle-hours. This level embraces the south Placer region's transition to urban function and density consistent with the Blueprint Preferred Alternative.

The scenarios were developed and tested sequentially based on input from the Transit Operator Working Group (TOWG), PCTPA staff, and the consultant team. Scenario 1 was developed by the consultant and tested first. Based on resulting ridership, operating statistics, and fleet sizes, the TOWG recommended changes that became Scenario 2. The process was repeated to create Scenario 3.



Table 3.1
Summary of South Placer County Growth Assumptions (As of 2005)

	Residential ¹		Retail ²		Office ²		Industrial ²	
	2004	2030-40	2004	2030-40	2004	2030-40	2004	2030-40
Cities (Current General Plans)								
Roseville	40,889	60,039	9,857	14,334	5,712	12,441	8,630	17,403
Rocklin	19,641	28,606	2,126	4,590	797	5,788	2,791	6,494
Lincoln	10,478	22,218	431	3,000	584	2,491	3,779	5,899
Loomis	2,274	4,087	323	932	94	492	1,038	1,124
Auburn	5,135	7,022	1,375	1,758	613	943	266	555
Colfax	622	921	250	448	35	68	175	204
Unincorporated Areas (Current General Plans)								
Auburn/Bowman	9,056	17,144	1,545	2,932	1,480	2,946	953	2,767
Granite Bay	7,140	7,892	602	919	286	819	12	62
Sunset	-	-	0	357	166	762	3,527	7,528
Bickford	9	1,890	3	105	-	-	-	-
Riolo Vineyard	6	958	-	88	-	-	-	-
Other Dry Creek	956	3,461	47	224	-	157	172	897
Other Unincorporated	13,457	19,938	450	1,225	137	400	533	747
Major Projects in West Placer County								
Curry Creek (Placer Co.)	-	16,206	-	2,025	-	2,122	-	-
Regional University (Placer Co.)	-	4,387	-	215	-	75	-	-
Lincoln SOI Expansion	-	33,720	-	5,659	-	5,748	-	2,700
Placer Ranch (Placer Co.)	-	6,759	-	1,047	-	5,243	-	4,185
Placer Vineyards (Placer Co.)	147	14,132	-	1,857	-	2,073	31	-
Creekview (Roseville)	-	2,600	-	300	-	-	-	-
Sierra Vista (Roseville)	-	10,000	-	1,000	-	700	-	-
Total Placer County	109,810	261,980	17,008	43,015	9,904	43,268	21,906	50,565
Pct Change	139%		153%		337%		131%	

1. Dwelling units. Projected household growth (139%) is the same as projected population growth. 2. Thousands of square feet.
 Source: SACOG, PCTPA, Placer County, Listed Cities, DKS Associates



It should be noted that new service to serve Rocklin growth areas, listed under Scenario 2, is actually part of Scenario 1 (baseline, funding-constrained), even though it was not included in Scenario 1 for modeling purposes.

Further, some routes and service levels (headways) were modified in Scenarios 2 and 3 to improve service delivery apart from the assumed higher funding level. Thus, the three scenarios are successively more optimized, and cannot be strictly compared with one another.

A comparative summary of fixed route, commuter, and BRT services included in each scenario can be found in Table 3.2.

3.3 Scenario Details and Modeling Results

3.3.1 Scenario 1 (Funding Constrained)

This scenario assumes that TDA funds used for transit operations would increase at the same rate as population in Placer County. Table 3.3 compares the growth in dwelling units to the growth in bus fleet and bus-miles in areas covered by the transit operators in Placer County. This table shows that Scenario 1 attempts to define a transit system that would grow at the same rate as population in the area served by each of the transit operators in Placer County.

The horizon year development scenario represents about a 140 percent increase in population over 2004. Based on this change, a transit system was defined that represented about a 140 percent increase in bus-miles above 2004 levels. (Stated differently, service under Scenario 1 would be 2.5 times current levels.)

The assumed changes in bus service between 2004 and the horizon year were defined by the following:

- First, the 2005 to 2012 bus service improvements in the Short Range Transit Plans for each of the transit providers in Placer County were assumed.
- Second, other “potential future services” that were discussed in each of Short Range Transit Plans were assumed.
- Third, additional but limited bus service was added to new growth areas (i.e. West Lincoln Annexation area, Placer Ranch, Sierra Vista, Regional University, Placer Vineyards) that would develop after the 2012 horizon year of the Short Range Transit Plans.

As shown in Table 3.3, the percent increase in bus-miles would be somewhat higher in mid-day service than during peak commute periods under this scenario.



Table 3.2
Comparison of Transit Service By Scenario (Page 1 of 2)

Operator	Line	Type*	Existing	Scenario 1	Scenario 2	Scenario 3
Auburn Transit	AUBBB	L	Yes	Incr	NC	NC
	AUBBR	L	Yes	Incr	NC	NC
Lincoln Transit	LIN102	LP	Yes	Incr	NC	NC
	LIN202	L	Yes	NC	NC	NC
	LIN203	L	Yes	Incr	NC	NC
	LIN301	L		New	NC	NC
	LIN303	I			New	NC
Placer County Transit	PCT1	I	Yes	Incr	NC	NC
	PCT2	I	Yes	Incr	NC	Incr
	PCT3	L	Yes	Incr	NC	NC
	PCT4	C	Yes	Incr	NC	NC
	PCT5/110	I	Yes	Incr	NC	NC
	PCT6	LL		New	NC	NC
	PCT102	L		New	NC	NC
	PCT103	L			New	NC
	PCT104	L			New	NC
	PCT105	L		New	NC	NC
	PCT106	L		New	NC	Elim
	PCT107	L			New	NC
	PCT108	L		New	NC	NC
	PCT109	I			New	NC
	PCT111	L		New	NC	NC
	PCTAF	LL			New	Incr
	PCTBO?	L		New	Elim	Elim
	PCTBR	L		New	NC	NC
	PCTWR	L		New	NC	NC
	PCX	C	Yes	NC	NC	Incr

*Key: L - Local LP - Local/Peak Only LL - Local/Lifeline C - Commuter
 BRT - Bus Rapid Transit. Incr - Increase; NC - No change.



Table 3.2
Comparison of Transit Service By Scenario (Page 2 of 2)

Operator	Line	Type*	Existing	Scenario 1	Scenario 2	Scenario 3
Roseville Commuter	RSVC1	C	Yes	NC	NC	NC
	RSVC2	C	Yes	NC	NC	NC
	RSVC3	C	Yes	NC	NC	NC
	RSVC4	C	Yes	Incr	NC	NC
	RSVC5	C	Yes	NC	NC	NC
	RSVC6	C	Yes	NC	NC	NC
	RSVC7	C	Yes	NC	NC	NC
	RSVC8	C		New	NC	NC
	RSVC9	C		New	NC	NC
	RSVC10	C		New	NC	NC
	RSVC11	C		New	NC	NC
	RSVCFO	C		New	NC	NC
	RSVCRC	C		New	NC	NC
Roseville Local	RSVLA	L	Yes	Incr	NC	NC
	RSVLB	L	Yes	Incr	NC	NC
	RSVLC	L	Yes	NC	NC	Incr
	RSVLD	L	Yes	NC	NC	Incr
	RSVLE	L	Yes	NC	NC	Incr
	RSVLF	L	Yes	NC	NC	NC
	RSVLG	L	Yes	NC	NC	NC
	RSVLH	L	Yes	Incr	NC	Elim
	RSVLI	L	Yes	Incr	NC	NC
	RSVLJ	L	Yes	Incr	NC	Elim
	RSVLK	L	Yes	NC	NC	Elim
	RSVLM	L	Yes	Incr	NC	Incr
	RSVLN	L		New	NC	Incr
	RSVLO	L		New	NC	Elim
	RSVLR	L	Yes	NC	NC	Incr
	RSVLX	L				New
	RSVLY	L				New
RSVLZ	L				New	
Rocklin	RCLN1	L		New	NC	NC
Regional Transit	0084A	L	Yes	Incr	NC	Incr
BRT (New)	80BR1	BRT				New
	80BR2	BRT		New	NC	Incr
	BRT3	BRT				New

*Key: L - Local LP - Local/Peak Only LL - Local/Lifeline C - Commuter
 BRT - Bus Rapid Transit. Incr - Increase; NC - No change.



Table 3.3
Changes in Bus Fleet and Bus Mileage Under Future Scenarios

Operator	Peak Periods		Mid-Day		Ratio: Future/2004 (Peak plus Mid-Day)	
	Bus Fleet (Vehicles)	Bus-Miles /Hour	Bus Fleet (Vehicles)	Bus-Miles /Hour	Bus Fleet (Vehicles)	Bus-Miles /Hour
2004 System						
Auburn	0.9	13.3	1.4	20.0		
Lincoln	0.3	5.1	1.3	23.0		
PCT	4.5	135.9	3.4	90.6		
PCX	1.4	58.5	NA	NA		
Rsvl Comm	4.2	150.8	NA	NA		
Rsvl Local	6.7	130.9	6.1	118.2		
BRT	NA	NA	NA	NA		
Total	17.9	494.5	12.2	251.8		
Scenario 1						
Auburn	1.3	20.5	1.3	20.5	1.1	1.2
Lincoln	3.3	71.2	3.9	83.1	4.5	5.5
PCT	16.7	415.4	16.7	411.7	NA	NA
PCX	1.3	56.5	NA	NA	NA	NA
Rsvl Comm	9.2	311.1	NA	NA	2.2	2.1
Rsvl Local	8.7	175.2	8.7	175.2	1.4	1.4
BRT	0.7	16.6	0.7	16.6	NA	NA
Total	41.2	1,066.4	31.3	707.0	2.4	2.4
Scenario 2						
Auburn	1.3	20.5	1.3	20.5	1.1	1.2
Lincoln	4.2	94.4	4.9	106.3	5.7	7.1
PCT	23.0	575.2	21.2	507.5	NA	NA
PCX	1.3	56.5	NA	NA	NA	NA
Rsvl Comm	9.2	311.1	NA	NA	2.2	2.1
Rsvl Local	8.7	175.2	8.7	175.2	1.4	1.4
BRT	2.7	60.5	2.7	60.5	NA	NA
Total	50.4	1,293.3	38.7	870.0	3.0	2.9
Scenario 3						
Auburn	1.4	20.5	1.3	20.5	1.2	1.2
PCT	41.9	859.2	30.2	669.4	NA	NA
PCX	3.1	112.9	NA	NA	NA	NA
Rsvl Comm	15.0	398.9	NA	NA	3.6	2.6
Rsvl Local	14.3	257.9	11.3	220.5	2.0	1.9
BRT	10.6	259.8	4.9	133.0	NA	NA
Total	90.9	2,003.5	52.8	1,149.6	4.8	4.2

	Dwelling Units			Scenario	Growth in Bus Miles Super-Cuml/2004		
	2004	Forecast*	Ratio		Peak	Mid-Day	Total
Auburn	5,135	7,022	1.4	1	116%	181%	138%
Lincoln	10,478	55,852	5.3				
PCT	NA	NA	NA				
PCX	NA	NA	NA	2	162%	246%	190%
Rsvl Comm	40,899	72,600	1.8				
Rsvl Local							
BRT	NA	NA	NA	3	305%	357%	322%
Total	109,650	261,700	2.4				

*Super-Cumulative

Source: DKS Associates



3.3.2 Scenario 2 (Transition Service Level)

The TOWG provided input for a “new vision” for transit service to meet long-range development levels beyond that defined in the Funding-Constrained Scenario. These changes, listed in Table 3.3 (above), included:

- Increasing the assumed frequency on a BRT route along Watt Avenue from I-80 to Placer Ranch that was previously assumed in the Funding-Constrained Alternative.
- Adding new service in south Placer County growth areas:
 - Internal route through Placer Vineyards;
 - Internal route through Placer Ranch;
 - Local route between Regional University and Curry Creek; and
 - Connection between the West Lincoln annexation area and Roseville via Fiddymont Road.
- Creating a more direct route between Lincoln and Sierra College via SR-65 and the Galleria.
- Adding service between Auburn and Folsom through Granite Bay.
- Creating a new Rocklin local loop via Stanford Ranch Road, Park Drive, Whitney Ranch Parkway, University Avenue, Atherton Road, Lonetree Boulevard, and Fairway Drive.

As shown in Table 3.3, Scenario 2 would increase total system bus-miles by 190 percent compared to today’s levels. This represents a modest 35 percent increase over the amount of new service provided by the funding-constrained Scenario 1. The percent increase in bus-miles would be somewhat higher in mid-day service than during peak commute periods under this scenario.

3.3.3 Scenario 3 (Urban Service Level)

The TOWG reviewed the projected ridership levels by transit line from Scenario 2 and met to discuss service changes that could be tested in a second long-range scenario for the countywide transit system.

The TOWG recommended the following changes in transit service beyond those defined in Scenario 2:

- A new BRT route from the proposed Sacramento State campus (in Placer Ranch) to Watt/I-80 via Fiddymont Road, Blue Oaks Boulevard, Washington Boulevard, Roseville Parkway, the Galleria, SR 65 and I-80 (using HOV lanes).
- Revised routing and frequency for a BRT route along Watt Avenue from I-80 to Placer Ranch from that assumed in the Funding-Constrained Alternative or Long-range Scenario 1.
- A new BRT route from the Galleria to Hazel LRT via Roseville Parkway, Douglas Boulevard and Hazel Avenue
- Modify the Lincoln to Sierra College route to a Campus-to-Campus-to Campus route that includes connection to proposed Sacramento State campus in Placer Ranch.

An overall change to Roseville’s local routes that keeps buses on major arterial roadways instead of current routing that loop through collector roadways by modifying and eliminating/consolidating several routes



- The following additional service in the new growth areas in South Placer County:
 - An internal route through Placer Vineyards
 - An internal route through Placer Ranch
 - A local route between Regional University, Curry Creek, Placer Ranch and Sierra Vista
 - A connection between the West Lincoln annexation area and Roseville via Fiddymont Road
 - Two routes connecting Placer Ranch to Roseville via Fiddymont Road and via Woodcreek Oaks Boulevard
- Increased frequency on the new Placer County Transit routes that were added as part of the Funding-Constrained Scenario or Long-range Scenario 1.
- A more direct route connecting Lincoln and Sierra College via SR 65 to Galleria
- Adding service between Auburn and Folsom through Granite Bay
- A route between Sierra College and the Sierra Gardens transit center via Taylor Road.
- A new Rocklin local loop via Stanford Ranch Road, Park Drive, Whitney Ranch Parkway, University Avenue, Atherton Road, Lonetree Boulevard, and Fairway Drive.

These changes are listed in Table 3.2. Scenario 3 represents a further 70 percent increase in bus miles over Scenario 2, or more than twice the baseline service level of Scenario 1.

3.3.4 Summary of Results

The following measures were used to demonstrate how the long-range transit scenarios would perform with the assumed development levels:

- Bus-miles by transit operator
- Boardings by transit operator
- Mode share by place of residence by subarea of Placer County
- Mode share by place of business by subarea of Placer County

Table 3.4 shows the projected transit boardings by transit operator for each of long-range scenarios. This table also provides the percent increase in both bus-miles and transit boardings by operator from 2004 under each scenario. This table indicates following:

- The percent increase in transit boardings would exceed the percent increase in bus-miles for all of the transit operators under each of the long-range scenarios.
- Placer County Transit boardings would increase dramatically under all scenarios, primarily due to service to new growth areas in south Placer County.
- Lincoln Transit boardings would increase dramatically under all scenarios, primarily due to service to new growth areas in the City's western annexation area.
- Roseville Transit would see substantial increase in use of commuter bus routes and a more modest increase in boardings on local bus routes.



Table 3.4
Estimated Daily Boardings by Transit Operator

Scenario	Operator	Walk Access			Drive Access			Total Boardings		Change Over 2004
		Peak	Mid Day	Total	Peak	Mid Day	Total	Model	Observed	
Existing (2004)	Auburn	131	213	344	41	42	83	427	170	--
	Lincoln	24	50	74	-	-	-	74	90	--
	PCT	259	410	669	48	46	94	763	860	--
	PCX*	7	-	7	13	-	13	20	74	--
	Rsvl Commuter	132	-	132	38	-	38	170	356	--
	Rsvl Local	497	685	1,182	39	67	106	1,288	900	--
	BRT (Placer Co)	NA	NA	NA	NA	NA	NA	NA	NA	--
	Total	1,050	1,358	2,408	179	155	334	2,742	2,450	--
Scenario 1 (Funding Constrained)	Auburn	164	239	403	47	59	106	509	--	19%
	Lincoln	616	1,005	1,621	-	-	-	1,621	--	2091%
	PCT	1,945	2,819	4,764	294	401	695	5,459	--	615%
	PCX	21	-	21	9	-	9	30	--	50%
	Rsvl Comm	946	-	946	410	-	410	1,356	--	698%
	Rsvl Local	1,190	1,772	2,962	221	321	542	3,504	--	172%
	BRT (Placer Co)	NA	NA	NA	NA	NA	NA	1,222	--	NA
	Total	4,882	5,835	10,717	981	781	1,762	13,701	--	400%
Scenario 2	Auburn	167	242	409	46	59	105	514	--	20%
	Lincoln	696	1,102	1,798	-	-	-	1,798	--	2330%
	PCT	2,632	3,689	6,321	315	410	725	7,046	--	823%
	PCX	22	-	22	10	-	10	32	--	60%
	Rsvl Comm	927	-	927	416	-	416	1,343	--	690%
	Rsvl Local	1,203	1,771	2,974	232	334	566	3,540	--	175%
	BRT (Placer Co)	NA	NA	NA	NA	NA	NA	2,749	--	NA
	Total	5,647	6,804	12,451	1,019	803	1,822	17,022	--	521%
Scenario 3	Auburn	175	251	426	43	52	95	521	--	22%
	Lincoln	816	1,285	2,101	-	-	-	2,101	--	2739%
	PCT	4,615	5,515	10,130	279	264	543	10,673	--	1299%
	PCX	71	-	71	20	-	20	91	--	355%
	Rsvl Comm	1,511	-	1,511	817	-	817	2,328	--	1269%
	Rsvl Local	1,621	2,372	3,993	242	502	744	4,737	--	268%
	BRT (Placer Co)	NA	NA	NA	NA	NA	NA	5,871	--	NA
	Total	8,809	9,423	18,232	1,401	818	2,219	26,322	--	860%

*Current (2007) PCX daily boardings average 176.

Source: South Placer County transit operators and DKS Associates



3.4 Comparison with Peer Operators and Regions

Operating results for the three scenarios were compared with a cross-section of transit operations across the country serving areas similar in size (population) to south Placer County in the planning horizon year. The following data are summarized in Table 3.5:

- Population and population density
- Vehicles Operating in Maximum Service (VOMS) (Total and Per Million Residents)
- Annual Vehicle Revenue Miles and Hours (Total and Per Capita)
- Annual Unlinked Passenger Trips (Boardings) (Total and Per Capita)
- Boardings per Revenue Mile (Total Annual)

Also shown in Table 3.5 and the figures are means and medians of the peer system data and data for Sacramento RT, YoloBus, and Roseville Transit (today), the latter included for in-region comparisons. Values for Sacramento RT are not included in the mean and median calculations due to its large size and heavy urban emphasis.

In general, the scenarios compare and fit well with the peer system data, often lying between the mean and median values. The one exception to this is annual vehicle revenue miles and vehicle revenue miles per capita, which are somewhat higher for the test scenarios than the mean and median of the peer systems. This result is consistent with the still slightly more rural character of the south Placer region.

3.5 Recommendations

3.5.1 Horizon Year Service Level

The TOWG has recommended that Scenario 2 be used for planning and policy analysis purposes in future system development. This level of service is appropriate for the south Placer region in the horizon period (2030-40), and represents a level of service that, while exceeding the resources of current funding mechanisms, is well within reach using approaches successfully employed in other regions, including a new sales tax, development impact fees, county service areas, joint development, and some reallocation of current revenues. (See Chapter 5 for details on funding issues and options.)



Table 3.5
Comparison of Projected South Placer County Operating Characteristics with Peer Urban Areas and Operators
Fixed Route Bus

UZA	Area/Scenario	Population and Density			Operating Statistics					Operating Statistics Per Capita			
		Population	Area (Sq Mi)	Pop Density (Pers/Sq Mi)	Vehicles Operating in Maximum Service (VOMS)	Annual Vehicle Revenue Miles (000)	Annual Vehicle Revenue Hours (000)	Annual Unlinked Pass Trips (Brdings) (000)	Boardings /Rev-Mile	Vehicles Operating in Maximum Service (VOMS)**	Annual Vehicle Revenue Miles	Annual Vehicle Revenue Hours	Unlinked Passenger Trips (Boardings)
28	Sacramento RT	1,363,482	369	3,695	235	8,566	697	19,447	2.3	172	6.3	0.5	14.3
58	Allentown-Beth., PA-NJ	576,408	290	1,988	65	2,494	191	4,256	1.7	113	4.3	0.3	7.4
59	Springfield, MA-CT	573,610	309	1,856	187	4,549	366	10,644	2.3	326	7.9	0.6	18.6
60	Akron, OH	570,215	308	1,851	169	3,677	303	6,899	1.9	296	6.4	0.5	12.1
61	Sarasota-Bradenton, FL	559,229	270	2,071	42	2,511	174	3,019	1.2	75	4.5	0.3	5.4
63	Tulsa, OK	558,329	261	2,139	52	2,033	127	2,851	1.4	93	3.6	0.2	5.1
64	Fresno, CA	554,923	139	3,992	84	3,957	302	10,855	2.7	151	7.1	0.5	19.6
65	Concord, CA	552,624	176	3,140	155	5,580	408	6,411	1.1	280	10.1	0.7	11.6
73	Colorado Springs, CO	466,122	197	2,366	54	2,208	140	2,596	1.2	116	4.7	0.3	5.6
76	Wichita, KS	422,301	179	2,359	42	1,503	97	1,966	1.3	99	3.6	0.2	4.7
82	Bakersfield, CA	396,125	110	3,601	65	3,441	267	6,916	2.0	164	8.7	0.7	17.5
29	Yolo Bus	184,900	109	1,696	33	1,450	70	1,263	0.9	178	7.8	0.4	6.8
28	Roseville	106,000	31	3,419	15	615	40	378	0.6	142	5.8	0.4	3.6
--	Mean*	460,066	198	2,540	80	2,835	207	4,838	1.5	170	6.2	0.4	9.8
--	Median*	553,774	188	2,249	60	2,503	183	3,638	1.4	146	6.1	0.4	7.1
	Scenario 1	575,740	250	2,303	41	3,320	138	4,275	1.3	71	5.8	0.2	7.4
--	Scenario 2	575,740	250	2,303	51	4,049	169	5,311	1.3	89	7.0	0.3	9.2
--	Scenario 3	575,740	250	2,303	91	5,902	246	6,285	1.1	158	10.3	0.4	10.9

*Does not include Sacramento Regional Transit figures

**Per 1 million people

Source: Federal Transit Administration NTD data; DKS Associates.



3.5.2 General Recommendations

Following are recommendations governing the provision south Placer County transit services over the next 25 years:

- Implement new services using the following general priorities: (1) New coverage, (2) More peak and mid-day frequency, and (3) More evening and weekend frequency.
- Focus on corridors and routes that link existing and new activity centers. Minimize routing through low-density residential areas. Design routes for maximum cost-effectiveness, not provider/service area. Nevertheless, provide limited “lifeline” service to more isolated communities such as Foresthill.
- Establish local service zones and new “intercity” or “regional” routes between zones. Tie these new routes to availability of new funding.
- Provide additional new service in Rocklin.
- Add new park/ride lots and transfer stations.
- Provide “universal access” for all services. (See Chapter 4 for more details on vehicle options, capacity implications, and cost.)
- Consider using more community shuttles instead of more costly extended fixed route service.

It is recommended that these principles be applied to the next series of Short Range Transit Plan updates and the next update of the Regional Transportation Plan (RTP). Providers may wish to consider doing a consolidated SRTP for the entire south Placer region. (See Chapter 6 for more issues and options associated with service integration.)

3.5.3 Recommendations By Mode

Following are recommendations governing the provision transit services by specific mode:

- Local Fixed Route
- Regional Fixed Route
- Commuter Bus
- Bus Rapid Transit
- Paratransit
- Regional Rail
- Associated Street and Road Projects

The last category is included to address needs and potential benefits to transit from roadway improvements such as intersection queue jump lanes.

Local Fixed Route

- Provide a base backbone system with 30 or 60 minute headways.
- Where justified, provide greater frequencies during peak periods (15 minute headways).
- Provide a limited number of “express” routes to link specific pairs or groups of activity centers with limited stops in between.



Regional Fixed Route

- Identify and “brand” specific routes as providing longer-distance trips between urban or community zones such as Lincoln-Roseville, Auburn-Roseville, Placer Vineyards-Roseville, and Citrus Heights-Roseville.
- Make limited “lifeline” service a priority: Foresthill, Meadow Vista, Sheridan, and Bickford Ranch.

Commuter Bus

- Continue with all existing routes. Look for a significant increase in Placer County Transit PCE service and Roseville Transit commuter services. Optimize both operations as required.
- Add routes as new development occurs at origins and destinations.
- Add or remove service in concert with changes in Capitol Corridor rail service.
- Consider adding limited commuter service to the Bickford Ranch area.

Bus Rapid Transit (BRT)

- Continue close coordination with major development projects and Sacramento Regional Transit BRT service planning. In particular, continue a dialog with RT on a Watt Avenue BRT system extension.
- Preserve right-of-way for stations, bypass lanes, transition lanes, and other needs. Continue to work with developers to set aside right-of-way for these needs.
- Implement proposed BRT routes in the following order: BRT-1, BRT-2, and BRT-3.

Paratransit

- Develop an administrative structure to support cross-jurisdictional trips. Address key issues such as fare collection/distribution and cost allocation.
- Consider consolidation of all paratransit under one provider, or with separate providers under one managing/coordinating entity. At a minimum, establish one farecard for all ADA travel.
- Expand the CTSA dial-a-ride voucher program to include non-emergency medical trips. Provide a senior discount.
- Identify areas with most intensive growth in senior populations, such as Rocklin. Identify key trip attractors in other jurisdictions such as the Galleria, Wal-Mart, and Kaiser.
- Set up “Ambassador” program for seniors to assist with trip planning.
- Consider removing dial-a-ride service from the Roseville farebox recovery ratio calculation, especially with respect to ADA services.
- Conduct a paratransit needs study to guide design and provision of services targeted to each user group. Include consideration of developing an “accessibility database.”



- Coordinate near-term actions with ongoing dial-a-ride study results in areas such as service integration, addressing cross-jurisdictional problems, establishing ADA certification.

Regional Rail

- Work with CCJPA and UPRR to increase Capitol Corridor service to Roseville and Auburn. Identify bus (BRT) and/or HOV alternatives if additional rail service is determined to be infeasible.
- Study the feasibility of adding regional rail service along SR-65 corridor to Lincoln and Marysville.
- Optimize feeder service to Capitol Corridor stations in Sacramento, Roseville, and Auburn.

Associated Street and Road Projects

- Work with local and regional planners and public works staff to ensure that transit-benefiting roadway projects are programmed and constructed – e.g., bus turnouts, paving, curbs for low floor buses, sidewalk connections to stops, etc.



4.0 CAPITAL NEEDS AND INTEGRATION OPPORTUNITIES

4.1 Purpose and Scope

This section of the South Placer County Transit Master Plan addresses technology strategies that the PCTPA and transit operators may pursue in light of anticipated service demand, evolving vehicle technology and regulatory changes such as CARB transit fleet rules. Using the estimated increases in demand for service, the consequent increases in transit fleet requirements developed in Chapter 3 and the rates at which vehicles are to be replaced, alternative strategies for investment in new vehicles were examined. The strategies considered the composition and ages of the existing fleets, their estimated useful lives, and opportunities for updating the fleet in response to emerging needs.

Fixed facility requirements for south Placer County transit operators were estimated based on the projected size of the various fleets identified in earlier sections of this report. Assessments of existing facilities in terms of their capacity to effectively maintain additional vehicles were based upon discussions with management personnel for each of the service providers and on-site inspection of their facilities.

4.2 Vehicles and Operations Technology

4.2.1 Transit Vehicle Types and Current Fleets

A typology of standard transit vehicle types can be found in Section 8 of Federal Transit Administration (FTA) circular 9300.1A. Vehicles that most resemble those currently in use by south Placer County transit operators are briefly described in Table 4.1.

Table 4.1
Standard Transit Vehicle Characteristics By Vehicle Type

Service Category	FTA Vehicle Type	Capacity (Seated/Whlchr)	Minimum Normal Service Life
Local Fixed Route	Medium-size, heavy-duty transit buses (approximately 30 feet)	29(28)*/2	10 years / 350,000 miles
Commuter	Large, heavy-duty transit buses (approximately 35-40 feet, fixed and articulated)	43(38)*/2	12 years / 500,000 miles
BRT	Large, heavy-duty transit buses (approximately 35-40 feet, fixed and articulated)	43(38)*/2	12 years / 500,000 miles.
Dial-A-Ride	Light-duty vehicles such as small buses and regular and specialized vans	14/2	4 years / 100,000 miles.

*Figures in parentheses are for low-floor designs.
 Source: Federal Transit Administration, NABI, and Gillig.

The five south Placer County transit operators that are the subject of this plan currently operate fleets of vehicles that are diverse in their ages, sizes, and duty cycles. Services provided by these



operators include local fixed route, intercity and suburban commuter, deviated fixed route, school bus, and on-demand paratransit. Discussions with fleet managers indicate that their vehicles have in the past been “lighter” in design than vehicles used in more intensive, higher-volume urban operations. At the same time, some vehicles are operated in less rigorous duty cycles, and can be maintained for longer service lives than the minimums set by the FTA. This is now changing as service requirements are growing and duty cycles are lengthening. Both PCT and Roseville Transit are now purchasing heavier “urban” equipment. An inventory of current fleet vehicles by operator and type is shown in Table 4.2.

Table 4.2
South Placer County Transit Operators – Current Vehicle Inventory

Operator	Fixed Route (Diesel)	Fixed Route (CNG)	Commuter	Dial-a-Ride	TOTAL
Auburn Transit	2*	3	--	--	5
Lincoln Transit	4	--	--	--	4
Placer County Transit	9**	10**	2***	--	21
Roseville Transit	7	8	7	12	34
CTSA	--	--	--	33	33
TOTAL	22	21	9	45	97

*Gasoline-powered. **Current figures are 3 and 13, respectively. ***Contractor-provided.
 Source: South Placer Transit Operators

4.2.2 Horizon Year Fleet Requirements

Approach

Forecasts of the retirement and replacement of vehicles operated in each of the four service categories listed in Table 4.1 were prepared based on the planned retirements of current fleet vehicles and on the procurement and retirement of new vehicles. For each service category, fleet requirements were considered in the aggregate to illustrate the consolidated vehicle requirements corresponding to the three growth scenarios described in Chapter 3.

Planned retirement dates for current vehicles were taken directly from the Short-Range Transit Plans for Placer County Transit, Auburn Transit, Lincoln Transit, Roseville Transit, and the CTSA. Subsequent hypothetical vehicle procurements are phased according to the “Service Life Policy” for transit vehicles defined by the Federal Transit Administration (FTA) in FTA Circular 9300.1A, Capital Program: Grant Application Instructions.

Future technological advances could enable the service life expectancy of these vehicle types to be extended. For example, there is evidence that CNG-fueled buses are subject to less engine wear and cleaner combustion than those powered by diesel, and may therefore have longer service lives. At the same time, CNG vehicle repair is costlier and availability of parts can be more limited. For this analysis, however, vehicle life spans are maintained consistent with the FTA service life policy shown above over the entire forecast period.

Mid-life cycle overhauls also could extend vehicle service life, thereby enabling properties to maximize the leverage of their capital funds for fleet replacement. It also could be possible to



update or replace specific systems to enable better service or more efficient operation. Vehicle rehabilitation typically makes economic sense for larger, heavier, more complex and more costly vehicles, such as those operated in fixed-route local and commuter services. Mid-life overhauls may enable the extension of a vehicle's service life by as much as 5 years. For example, Sacramento RT performs engine overhauls that can extend bus service life to as long as 15 years.

For this analysis, it was not assumed that any vehicle types would be overhauled to extend or fulfill their planned service lives. Such strategies could certainly help reduce the number of procurements over the forecast period and minimize overall fleet capital costs.

Calculations and Results

Future fleet requirements were estimated using the three alternative growth scenarios defined and analyzed in Chapter 3. Vehicle fleet growth factors for each scenario were applied to current fleets to obtain estimated fleet sizes for the three scenarios.

The resulting future fleet requirements under each scenario are shown in Table 4.3. This table differentiates among four types of service: local fixed-route, commuter, Bus Rapid Transit (BRT), and dial-a-ride.

Table 4.3
Horizon Year Fleet Sizes By Service Type, Operator, and Scenario

Category of Service	Current	Scenario 1	Scenario 2	Scenario 3
Local Fixed Route	43	125	156	236
Auburn Transit	5	6	6	6
Lincoln Transit	4	18	23	25
Placer County Transit*	19	81	107	175
Roseville Transit	15	20	20	30
Commuter	9	17	17	30
Placer County Transit	2	2	2	5
Roseville Transit	7	15	15	25
Dial-A-Ride	45	100	100	100
Roseville Transit	12	21	21	21
CTSA	33	79	79	79
BRT**	0	2	4	12
TOTAL	97	244	277	378

*Vehicles are allocated to PCT based on service what is currently unincorporated Placer County. This may change as areas are annexed into existing cities or are newly incorporated.

**Size under Scenario 1 is technical minimum. Actual fleet could be 3 or 4.

Again, while these vehicle types have generally been more robust than those currently employed by south Placer County transit operators, their minimum normal service lives are comparable to those of the Placer County fleets. Projected future services indicate that these more robust vehicle types are appropriate to the forecast service scenarios and are in fact now being purchased by



PCT and Roseville Transit. It is also likely that future new vehicle technologies will enable longer vehicle service lives. For consistency however, the FTA service life expectancies shown above are maintained throughout this analysis.

These estimates also assume a homogeneous vehicle size and capacity within each category, derived from the descriptions of the vehicles in the current fleets. For each category of service, the average passenger capacities shown in Table 4.1 and may be considered vehicle equivalent units for the purposes of the forecasts. The composition of future fleets may in fact include vehicles of different capacities, according to the decisions made regarding vehicle technology and fleet integration among the various properties.

4.2.3 Vehicle Procurement Schedule

Issues and Approach

In planning vehicle procurements, transit agencies must consider the diversity of fleets they must maintain, the economy and manageability of vehicle order sizes, the incorporation of new technologies, and ensuring sufficient capacity is available to meet demand. Depending on the technical complexity of the vehicles, the responsiveness of the industry, and the contract terms, the process may take up to 18 months before the award of a contract. Because of the “lead time” that characterizes vehicle procurements, most transit properties adopt fleet strategies that entail procurements of economical numbers of vehicles at intervals of several years, in quantities that offset the retirement of older vehicles or enable the expansion of services.

There are strategies that may shorten the procurement cycle for new transit vehicles. In some cases, transit properties may make use of other properties’ selection processes, “piggy-backing” their vehicle orders or making use of quantity options to the base contract. Smaller, less complex vehicles, particularly those used in dial-a-ride services, are effectively commodities and may be procured in smaller order sizes, perhaps even annually, using agency or state procurement contracts. The vans used in dial-a-ride services by PCT, Roseville Transit, and CTSA are in fact procured via contracts held by the State of California.

To procurement strategies were considered: (1) Continuous – vehicles procured annually or as needed, and (2) Periodic – Vehicles procured in larger amount every few years. The periodic approach requirements more financial planning, but can result in larger, more cost-effective purchases. Frequent, small purchases, by comparison, can become very expensive and result in greater maintenance complexity.

Local Fixed Route Service

Fixed-route local services represent the most intensive type of service operated in south Placer County, and the one requiring the largest vehicle fleet. One fleet replacement strategy would involve continuous procurement and retirement from year to year to fit forecast demand.

Due to contracting rules, funding, and ‘stepped’ changes in technology, regulation, and operating practices, transit properties more typically procure vehicles periodically and spread vehicle delivery over several years. An alternate fleet replenishment strategy would assume periodic procurements driven by the vehicles’ service lives. This approach assumes that all vehicles of this type are procured jointly for the consolidated agencies.



Table 4.4 summarizes hypothetical strategies for the consolidated replacement of local fixed-route vehicles operated in south Placer County.

**Table 4.4
 Local Fixed Route Service Fleet Procurement Strategies (Scenario 3)**

Procurement Strategy	Number of Purchases	Interval (Years)	Number of Vehicles (Ea. Purchase)	Total Vehicles Procured	Total Vehicles Retired	Maximum Fleet Diversity
Continuous	Continuous	≤ 1	8-46 (average 20)	541	306	Indeterminate
Periodic	6	3-5	40-125	435	263	4 Vehicle Types

Commuter Service

Commuter services are represented in this analysis by operations of Roseville Transit and the Placer Commuter Express, a service operated by Placer County Transit. The continuous fleet retirement and replacement strategy over the forecast period would seek to maintain vehicle population as closely as possible to the demand forecast line. A periodic strategy also is possible. Table 4.5 summarizes the preceding hypothetical strategies for the consolidated replacement of fixed-route commuter service buses by south Placer County transit operators.

**Table 4.5
 Commuter Service Fleet Procurement Strategies (Scenario 3)**

Procurement Strategy	Number of Purchases	Interval (Years)	Number of Vehicles (Ea. Purchase)	Total Vehicles Procured	Total Vehicles Retired	Maximum Fleet Diversity
Continuous	Continuous	≤ 1	1-12 (average 2.7)	72	42	Indeterminate
Periodic	5	3-5	6-12	45	29	4 Vehicle Types

Bus Rapid Transit Service

No BRT services are currently operated by south Placer County transit agencies. The service forecasts presented in Chapter 3, however, include the implementation of BRT services on up three routes. BRT fleet replenishment requirements were estimated assuming a simple straight-line growth function.



This idealized strategy depends on a procurement of one new bus every other year until the first vehicles begin to be retired, after which the order quantity increases by one bus each successive order, for an average procurement rate of 1.29 buses per year. Vehicles are retired at a similar rate after an average service life of twelve (12) years, at an average rate of 0.22 buses per year. This results in a total procurement of 18 new buses and the retirement of 6 buses over the period of the forecast.

As in the case of the local and commuter bus services, it should be assumed that the actual procurement strategy would be dictated by other factors than simple regressed demand, and that procurement orders would be sized and phased accordingly. Given the small size of any vehicle procurement for BRT services, a more plausible scenario would be to combine the procurement of BRT vehicles with orders for buses to be used in other services. This would be even more likely for the smaller number of BRT vehicles indicated for Scenarios 1 and 2.

Table 4.6 summarizes hypothetical strategies for the procurement of buses used in BRT services in Placer County.

**Table 4.6
 BRT Service Fleet Procurement Strategy (Scenario 3)**

Procurement Strategy	Number of Purchases	Interval (Years)	Number of Vehicles (Ea. Purchase)	Total Vehicles Procured	Total Vehicles Retired
Continuous	Continuous	2	1-2 (Average 1.3)	18	6

Dial-A-Ride Service

Dial-A-Ride services are currently provided by Roseville Transit and Placer County Transit. (PCT services are operated by Pride Industries under the CTSA name). These are typically small vehicles, with an average capacity of 12-14 passengers. Because their designs are based on consumer or light commercial van products, the vehicles used in dial-a-ride services have a shorter service life in comparison with other vehicle types, but are also much less expensive, particularly if purchased in quantity.

Given that the service plan analysis in Chapter 3 did not include specific demand forecasts for dial-a-ride services, a calculated factor of 2.39 was applied to estimate future fleet sizes based on the projected increase in the number of dwelling units in the communities encompassed by the forecasts. Dial-a-ride fleet replenishment requirements were estimated assuming a simple straight-line growth function.

Table 4.7 summarizes hypothetical strategies for the consolidated replacement of buses used in Dial-A-Ride services by the south Placer County properties operating local fixed-route service.



Table 4.7
Dial-a-Ride Service Fleet Procurement Strategy (Scenario 3)

Procurement Strategy	Number of Purchases	Interval (Years)	Number of Vehicles (Ea. Purchase)	Total Vehicles Procured	Total Vehicles Retired
Periodic/ Continuous	5 Major Other Ongoing	5 (Major)	65-76 (Major)	643	536

4.2.4 Integration Opportunities

The compositions of the existing vehicle fleets operated by PCT, Roseville, Lincoln, Auburn, and CTSA reflect the characteristic uses of public transit by these individual communities and markets. These uses include suburban fixed route and commuter, deviated fixed route, and contracted on-demand van services, each operator providing a different mix in their community.

The future scenarios defined in Chapter 3, however, depict increasing commonality among these properties' operations, characterized by increasing overall service and a shift from predominantly deviated fixed-route services to local fixed-route operations. For the horizon year, local fixed-route service becomes the predominant service among all of transit properties except the CTSA.

Given the increasing commonalities of service among the five transit agencies, the fleet investment forecasts presented in Table 4.3 (above) indicate real opportunities to consolidate or integrate such aspects of fleet management as:

- Vehicle and sub-system specifications;
- Vehicle and subsystem procurement;
- Training of operations and maintenance personnel, including increased emphasis on safety and security standards, policies, and procedures;
- Inventories of spare parts and consumables;
- Utilization of maintenance and storage facilities;
- Response to fluctuations in demand among the various properties;
- Operating, repair and maintenance practices; and
- Fleet replacement schedules.

It is clear that reducing the overall diversity of vehicle types, even among multiple properties, would simplify operations and maintenance requirements, and result in lower cost. This would have the additional benefit of enabling properties to deliver a more seamless product and establish a stronger overall public transit identity in south Placer County. Consolidating vehicle procurements into single orders would clearly offer opportunities for economies of scale in acquisition.

Specific recommendations include:

- Develop a consolidated vehicle procurement schedule and begin joint procurement planning.
- Study the appropriateness and feasibility of consolidating technology by mode (e.g., CNG for local, clean diesel for commuter, etc.)



4.2.5 Fleet Emissions and Fuel Options

Under the California Air Resources Board (CARB) Transit Fleet Rule, adopted in February 2000, transit properties must choose to pursue one of two fuel strategies – diesel or “alternative” – to incrementally reduce emissions of Nitrogen oxides (NOx) and particulate matter (PM) from buses used in urban transit service, toward the objective of zero emissions by 2015. Operators that have selected the diesel path with more than 200 buses are also required to perform zero emission bus (ZEB) demonstrations. In February of 2005, the CARB adopted a new ‘transit fleet’ rule, requiring transit agencies to reduce emissions from the buses and trucks they own or operate but which are not covered under the preceding rule. Relevant sections of the California Code of Regulations (CCR) are summarized in Table 4.8:

Table 4.8
Characteristics of Urban Buses and Transit Fleet Vehicles
CARB 2005 Fleet Rule for Transit Agencies
(Summarized from title 13, CCR, section 2023)

Vehicle Designation	Urban Buses Section 2023.1	Transit Fleet Vehicles Section 2023.2
Gross Vehicle Weight Rating (GVWR)	<ul style="list-style-type: none"> ▪ 33,000 lbs or greater 	<ul style="list-style-type: none"> ▪ 8,500 – 33,000 lbs (and not otherwise Urban Bus)
Length	<ul style="list-style-type: none"> ▪ ≥ 35' 	<ul style="list-style-type: none"> ▪ <35'
Type of Operation	<ul style="list-style-type: none"> ▪ Short rides & frequent stops, within city or metropolitan area; 	<ul style="list-style-type: none"> ▪ Commuter service; operations during peak commute hours, 10 or fewer stops per day.
Engine Type	<ul style="list-style-type: none"> ▪ Urban bus – heavy-duty diesel engine 	<ul style="list-style-type: none"> ▪ Heavy-duty engines fueled by diesel or alternative fuel
NOx Emission Requirement	<ul style="list-style-type: none"> ▪ Fleet NOx Average 	<ul style="list-style-type: none"> ▪ Fleet NOx Average
PM Emission Requirement	<ul style="list-style-type: none"> ▪ % PM Reduction from 2002 Diesel UB Baseline 	<ul style="list-style-type: none"> ▪ % PM Reduction from 2005 Diesel TFV Baseline
Suggested Compliance	<ul style="list-style-type: none"> ▪ Ultra Low Sulfur Fuel ▪ Zero Emission Bus Purchases. 	<ul style="list-style-type: none"> ▪ Use Alternative Fuels ▪ Retrofit, Re-power or Replace

Whereas the current composition of vehicle fleets among Roseville, Auburn, Lincoln, and CTSA is heavily weighted toward the CARB’s definition of ‘Transit Fleet Vehicles,’ future heavier service requirements may require the procurement of vehicles that may be classified by design and operation as ‘Urban Buses.’ (For PCT, 11 buses are “Urban Buses,” while the remaining five are classified as “Urban Fleet Vehicles.”) In the near term, however, all the subject properties must address the requirements of the CARB’s requirements for Transit Fleet Vehicles, and report their compliance progress annually to the CARB.



A range of alternative fuels may meet the new CARB Transit Fleet Vehicle emission requirements. As defined by the EPA, "alternative fuels" are non-petroleum based energy sources including compressed natural gas (CNG), alcohols, liquefied petroleum gas (LPG) and electricity. While CNG is currently the prevalent alternative fuel for transit fleets, other alternatives include liquefied natural gas (LNG), electric propulsion and propane, as well as bio/soy fuels, hydrogen, jet fuel and propane blends. The most important of these are described in the following paragraphs.

Compressed Natural Gas

CNG is a proven low-emission fuel, thoroughly developed and commercially available, but is more expensive than diesel and requires dedicated infrastructure and facilities. Contemporary studies have demonstrated that CNG engines can provide a significant emissions benefit and better fuel economy than their diesel counterparts. After diesel, CNG is the most commonly used bus fuel in the United States, accounting for about 7.5% of the total transit bus population.

Engines that meet current and planned emissions regulations are commercially available, installed in bus platforms of all sizes, types, and applications, from heavy transit buses to passenger vans. However, there are concerns within the industry whether there will be a strong enough market to continue production of CNG engines. Recently, two engine manufacturers, John Deere and Detroit Diesel, have discontinued their CNG engine line for heavy-heavy duty uses such as transit.

Current experience indicates that vehicles and maintenance for a CNG fleet are generally more expensive than those for a conventional diesel fleet, and that CNG requires investment in unique delivery, storage, and dispensing infrastructure. The cost of this infrastructure can range from several hundred thousand dollars to the millions, and may discourage transition to CNG, particularly for small transit agencies. Fueling also typically takes up to twice as long as it does for conventional diesel or gasoline, unless the CNG facility is equipped for "fast fueling."

Biodiesel

Biodiesel is an easily-implemented, renewable fuel, but offers lower energy density than other alternatives, and is still relatively costly by volume. Commercial biodiesel is the product of a chemical process and has to meet ASTM International fuel quality specifications. Derived from plant oils and animal fats, biodiesel is a renewable energy source, normally blended with regular diesel. In higher concentrations certain solvent characteristics of biodiesel can harm conventional diesel fuel systems, but a blend of 20 percent biodiesel and 80 percent regular diesel can be safely operated in conventional, unmodified diesel engines.

Converting a transit operation to biodiesel does not typically require major infrastructure changes to a conventional diesel facility. However, biodiesel needs to be maintained at temperatures above 35 to 60 degrees Fahrenheit, depending on the formulation, or it will congeal and cause problems in dispensing and operation.

Among the properties using biodiesel fueled buses are Metro St. Louis, Cincinnati Metro, and Central Ohio Transit Authority.



Electric Bus Technology

Among the means encouraged by the CARB fleet rules for urban buses to meet their compliance goals is that of Zero-Emission Buses (ZEB). The principal technologies being developed under this designation are electric and hybrid propulsion systems, of which several are in demonstration and test. These technologies may represent future opportunities for commercially available transit bus applications.

Hybrid Bus Technology

In hybrid bus power plants, tractive effort is produced by a motor powered by batteries that is charged by an internal combustion engine. Typically, hybrid electric buses use conventional automobile or truck engines to generate electricity, supplemented by regenerative braking for greater fuel efficiency. Hybrid-electric buses may be operated using on a wide variety of combustion fuels. Diesel-electric hybrids enable a property transitioning from conventional diesel propulsion to maintain and use existing infrastructure. New York City Transit, Oahu Transit, and King County Metro operate sizable hybrid electric fleets.

4.2.6 Other Vehicle Technology Issues and Options

Projected growth in transportation demand and the responsive increases in transit service and capacity will engender the need for greater efficiency in fleet operations and management. A number of technologies, developed for urban transit systems in response to these same growth effects, will become increasingly applicable to transit operations in south Placer County.

Bus Rapid Transit Technology

Bus Rapid Transit (BRT) is an evolving family of technologies and operating practices that may be categorized as vehicle, guideway, control systems, fare systems, and traveler information systems. BRT system deployments may include some or all of these families of technology, and individual elements, such as traveler information systems, may offer efficiencies to conventional (non-BRT) bus operations. BRT can offer many advantages of a fixed guideway system such as light rail or streetcars, without the same investment in infrastructure.

Vehicles operated in BRT services may range from conventional buses operated on a prioritized or exclusive guideway, to buses specifically designed and equipped for differentiated services and markets. Particularly if BRT is intended to attract an appreciable share of a market, it may be advantageous to clearly differentiate BRT vehicles, their capabilities, and features. Vehicles may be equipped for BRT by the inclusion of specialized navigation, collision avoidance, signal management, communications, and condition monitoring systems.

Guideway and station facilities define the locations and means via which BRT vehicles operate and by which passengers enter and leave the system. BRT guideway designs may range from existing traffic lanes in which buses are given priority, to exclusive guideways with limited or no interface with other vehicles. Passenger access may range from conventionally configured bus stops to transit stations.



Low Floor Buses

Low floor buses are well-established at many transit properties throughout North America, offering convenience of boarding and alighting to elderly and disabled passengers as well as to the overall riding public. Low-floor vehicle technology is still 'young' in comparison to standard floor height vehicles. Standard buses still predominate in the US market, owing to their compatibility with existing fleets and facilities, and their still lower life cycle costs than those of low-floor buses.

In south Placer County, particular routes and markets can be better served by low-floor buses than by standard buses, such as downtown circulators or routes that serve hospitals and elderly populations. Low floor buses may not be immediately applicable on routes that serve unincorporated areas, particularly where there are not continuous sidewalks or boarding facilities. New vehicles may be introduced when there is a confluence between the need for efficiency, the availability and expense of appropriate products, complementary wayside facilities, and a cost-effective order size.

Other Technology Issues and Opportunities

Control system technologies enable the location and operation of vehicles to be monitored and controlled to maintain the efficiency and convenience of the system, and may be categorized as serving either dispatching or signaling functions. Dispatching entails communicating with vehicle operators at the start of their runs and along their routes to maximize service reliability, vehicle spacing, and passenger safety. Signaling systems define when and how vehicles travel, and can prioritize vehicle movements at intersections and within mixed traffic.

Fare collection systems can be employed to expedite passenger boarding and transfer among connecting routes and services. The technologies available to accomplish this include simple fare system integration among operators, stored value media, smart cards, and 'transactionless' media that electronically register transit system use and independently debit the user's own account. Minimizing the need for cash can reduce dwell times and increase operating speeds, and can increase passenger safety.

Passenger information systems enable users and potential users to make informed decisions about their time, route, and mode of travel. They can also be used to inform passengers already in the system of their location, next stop, arrival time, or arrival of the next vehicle. Real-time information provides system users assurance about their travel decisions, and can be an effective marketing tool to those who might make other choices. Traveler information systems range from displays and announcements made on vehicles and at stations to websites and information numbers that provide transit information upon request. Increasingly, these systems are being expanded to provide vital lifeline information to the general public in areas subject to natural disaster.

4.2.7 Technology Recommendations

Specific recommendations affecting near- and medium-term technology policies include:

- Consider reducing reliance on CNG technology due to a decline in the number of suppliers and higher engine maintenance costs. Prepare a study on this issue that can be applied to any future fixed route operator in south Placer County.



- Consider employing CNG for local fixed route service where there is exposure to more people, and clean diesel for commuter services.
- Initiate a policy of joint vehicle and IT procurements. Piggyback on vehicle purchases by larger operators in this and other regions. Develop cooperative IT procurements with other transit operators in the region.
- Implement IT technology as necessary, but in a coordinated fashion, including: automated vehicle location (AVL), MDC navigation system, digital sign boards, and cameras on vehicles and at stations. Explore shared contracts for maintenance and operations of IT technology.

4.3 Fixed Facility Needs and Options

4.3.1 Maintenance Facilities – Existing Conditions and Future Needs

Currently, vehicles of the four municipal operators – PCT, LTS, Auburn Transit, and Roseville Transit, are maintained by municipal staff at their respective corporate yards. The sole private operator, CTSA, maintains its own vehicles at their private non-profit PRIDE Industries facility. (PCT's Placer Commuter Express vehicles are maintained by Amador Stage Lines.)

All of the operators typically undertake what is termed in the industry as “light” maintenance, with major mechanical work and body work performed by outside contractors.

Following are brief descriptions of existing maintenance facilities and capabilities for the current fleet and an assessment of the capacity of current facilities to provide effective maintenance for projected fleet levels.

Auburn Transit Maintenance Facility

Auburn Transit's fleet of vehicles is currently maintained and stored at the city's Corporate Yard. Fueling of existing CNG vehicles is done at the PG&E Auburn Service Center. Auburn Transit is now in the process of designing a CNG fueling station at the Corporate Yard, which is projected to be operational by the end of 2007.

Auburn's Corporate Yard is adequate to maintain and store Auburn Transit's current fleet of 5 vehicles and could accommodate an additional transit vehicle as well without any significant infrastructure modifications. In addition, Auburn Transit is not contemplating the purchase and installation of any auxiliary equipment for the transit fleet which would result in an increase in space of the maintenance and/or storage of such equipment in the future.

Lincoln Transit System (LTS) Maintenance Facility

The City of Lincoln Department of Public Works maintains all of the vehicles of LTS as well as all other municipal vehicles. The City has purchased property on Flightline Drive to accommodate the City's expanding fleet of vehicles, including those operated by LTS. The property includes a building which will be renovated for fleet operating and maintenance purposes.

LTS has recently obtained an FTA 5309 bus discretionary grant to upgrade to their bus maintenance facilities. The renovated building will provide the opportunity for further expansion sufficient to service up to and including the most optimistic growth scenarios discussed earlier in



this report. Also there is sufficient property at this location to accommodate an expanded LTS fleet in an efficient manner.

No significant modifications to the renovated facility at the new location, beyond those that are currently being undertaken are necessary to accommodate LTS through the horizon period.

Placer County Transit (PCT) Maintenance Facility

All of PCT's vehicles are maintained, serviced, and fueled at the Placer County Corporate Yard by the Department of Public Works. Like the other south Placer County operators, major components and body repairs are performed by an outside contractor.

Based on project service requirements and fleets, PCT is projected to experience the largest growth in its fleet of vehicles, increasing from 19 vehicles today to as many as 175 by the forecast horizon year. (Note that this fleet growth is primarily based upon land use changes in the South Placer area, just outside of the City of Roseville. Thus, if these growth areas were to be incorporated at some time in the future, many of the buses and facilities recommended would still be needed to serve the growth currently anticipated in these specific plan areas.)

Due to the projected size of the fleet coupled with the spatial distribution of PCT services, it is recommended that two new facilities be developed to serve as PCT maintenance and operations bases. These facilities could be developed as part of new corporate yards or independently for PCT. If developed as part of new corporate yards, some economies of scale could be realized in areas such as property acquisition, vehicle access drives, etc.

If it was assumed that two facilities were to be developed to service the long-term needs of PCT and that the vehicles would be distributed equally between the two facilities, each would be approximately 80,000 square feet in size. The total cost of each facility would approximate \$17 million in current dollars, exclusive of property acquisition costs. Thus, the combined cost of the two facilities would approximate \$35 million.

The reality is that one of the two new facilities located in south Placer County would, in all likelihood, be somewhat larger than 80,000 square feet due to the greater growth in population projected for that area. Should this be the case, the size of the other new facility (closer to Roseville and Rocklin) could be reduced, with a proportionate reduction in the associated costs.

As a result of the magnitude of the Placer County Transit fleet expansion, there will be sufficient PCT vehicles and maintenance functions to warrant separate facilities and maintenance staff even if the transit component is developed as part of a new Corporate Yard complex.

Roseville Transit Maintenance Facility

Roseville Central Services Staff maintains vehicles for Roseville Transit as well as for all other City departments. The vehicle maintenance facility at the Corporate Yard has six heavy-duty vehicle maintenance bays and five light vehicle bays for all of the City's vehicles. There is also a bus wash rack and CNG fueling station at this location.

An on-site visit of the Corporate Yard maintenance facility revealed that there is insufficient capacity available to accommodate and promote efficient maintenance practices for the Roseville



Transit bus fleet in the short term. Further, Roseville Transit is contemplating equipping new vehicles with state-of-the art fare collection, automatic vehicle locator (AVL) systems, stop enunciators, automatic passenger counters (APC), digital signs, closed circuit television (CCTV) monitors, and on-board data recorders. This ancillary equipment will also require additional space in the maintenance facility for parts storage, unit repair areas, and technical support.

Given the current size of the Roseville Transit fleet, coupled with the added maintenance requirements attributable to the proposed introduction of new technology to improve the efficiency and effectiveness of transit operations, there is a demonstrable need today for a separate maintenance and operating facility solely for the use of Roseville Transit. By so doing, Roseville Transit could develop a maintenance staff which is adept at servicing the unique requirements of transit vehicles attributable to their heavy duty operating cycle.

Assuming that Roseville Transit elected to pursue the strategy of developing its own operating/maintenance facility, a building of approximately 70,000 square feet would be necessary to accommodate the maximum projected operating transit fleet and associated functions described as being desirable by Roseville Transit management staff. The cost of this facility would approximate \$15 million in current dollars, exclusive of property acquisition costs.

It is recommended that the two operators conduct a study to identify and reserve sites for new maintenance facilities in the south County growth areas, specifically including sites in Placer Vineyards and Placer Ranch. The operators should also explore options for joint or shared use of facilities between Roseville Transit and PCT.

Consolidated Transportation Service Agency (CTSA) Maintenance Facilities

The CTSA fleet is currently maintained at Pride's offices in Roseville. In addition to housing CTSA, this facility also contains a sheltered workshop, training facilities, and other functions necessary to improve the quality of life for disabled individuals. The fleet is maintained by three (3) mechanics in two (2) service bays. The facility also has an exterior vehicle wash rack.

CTSA has indicated that it would like to begin equipping vehicles with Global Positioning Systems (GPS) to improve their monitoring and management of the in-service fleet. Due to the sensitive instrumentation of this GPS equipment, when a defect occurs, the entire unit is replaced. Consequently, sufficient additional space must be made available to accommodate an inventory of spare units.

The PRIDE facility has sufficient capacity to absorb projected fleet growth without having a negative impact on the operations. In order to effectively maintain and operate an expanded fleet of vehicles, the following relatively low-cost actions would be required:

- Relocate storage of PRIDE Industries materials and supplies from the area adjacent to the CTSA maintenance bays to a location elsewhere in the PRIDE building.
- Secure an additional small area for the storage of GPS units and related equipment.



- Consider installing a CNG fueling facility to accommodate new vehicles acquired with this propulsion system. Due to the projected size of the fleet, the CNG fueling facility should be of the “fast fill” type. Of the recommended modifications for CTSA, this would be the costliest.

4.3.2 Facility Consolidation Opportunities

An option worthy of consideration is development of maintenance facilities capable of accommodating the combined fleets of PCT and Roseville Transit particularly in the growth areas north and west of Roseville. Conceptually, this approach would enable the development of two separate operating/maintenance facilities of 125 vehicles each, for a total of 250 vehicles. One of the facilities would be located between Roseville and Lincoln, while the other would be located west of Roseville.

This consolidation would allow development of two larger operating/maintenance facilities a cost of \$25 million each, for a total investment of \$50 million, compared to three new facilities under existing operations (one for Roseville and two for Placer County Transit). Further, some economies of scale (efficiencies) would be realized through the development of the two larger operating/maintenance facilities rather than three intermediate size facilities.

Development time for a transit operating/maintenance facility is 48-60 months. The times could be reduced somewhat if matters such as the City or County owning and providing available property suitable for this purpose to the ultimate transit operating agency. Activities such as acquiring property and beginning the design process can occur well in advance of the need for the facility and would expedite the completion of a new facility. If appropriate, new facilities can be developed in a phased manner consistent with the availability and growth in the transit fleet(s) to insure that provisions for maintaining additional vehicles are in place prior to the receipt of additional vehicles.

4.4 Fare Collection Options and Opportunities

4.4.1 Types of Fare Collection Systems

Cash Fares

From a historical perspective, cash has dominated the mass transit fare collection process, with fares routinely purchased on board a transit bus or from ticket agents located in a transit station for rail systems.

Electronic Magnetic Stripe Cards

Cash proved to be inefficiency, and subject to fraud and abuse. In the 1970s, the concept of the electronic magnetic stripe paper ticket and the electronic entrance/exit gate were introduced, with the hope of curtailing the problems inherent in this “cash-based honor system.” The functionality of most magnetic stripe ticketing systems, however, is limited to a single operator environment – whereby the payment mechanism is only operable on the individual transit operator’s system and can only be used for transportation. Magnetic stripe-based systems addressed the inherent problems with the cash-based honor system, but they tend to be more costly to maintain and do not solve the regional interoperability challenge. Nevertheless, magnetic stripe cards can be implemented as an interim measure until smart card technology becomes more readily available.



Smart Cards

Smart cards have now become the replacement for the magnetic stripe paper ticket. A smart card is a pre-loaded fare card that looks like a credit card in shape and size. Inside the cards is an embedded microprocessor. The host computer and card reader actually "talk" to the microprocessor. The microprocessor enforces access to the data on the card. Smart cards can be contact less (being in proximity to the card reader) or contact (inserted into a card reader).

Smart cards have a tendency for faster throughput for passengers, thus speeding up boarding; fraud reduction; innovative ticketing options such as flexible fare schemes, multi-operator ticketing options, stored value, and direct debit options. Smart cards tend to have lower operating costs due to due to reduced token, cash, and coin handling.

Smart cards can be used in conjunction with individual fare systems for each transit agency or the use of a universal fare system that encompasses each transit operator.

Smart cards systems include front end and back end computer hardware and software and back office services such as fare processing, ticket sales (multiple fare products), customer service, scheduling/timetable questions, complaint handling, and lost/stolen card processing

4.4.2 Advantages of Smart Cards

Smart cards address many of the key issues facing mass transit agencies today and provide the passengers of Placer County convenience and the ability to carry one fare media. If Placer County decides to offer an integrated and seamless transit system, the use of a smart card system helps achieve this goal. Smart cards can also:

- Increase customer convenience and satisfaction. Finding ways to make it easier for more people to use mass transit will in turn increase ridership and generate more revenue. The smart card can improve passenger's speed during boarding, reduce times in the queue, and allow for easier access to multiple forms of mass transit using the same payment mechanism.
- Reduce costs of collecting fares. Studies show that mass transit agencies spend on average 15 cents out of every \$1 just collecting the fare. Automating this labor intensive and time consuming process can help drive down ticketing costs by at least a half of that, improve traffic-pattern monitoring, minimize cash handling and decrease errors – all while increasing customer satisfaction.
- Lower lost revenues due to fraud. Losses from passengers traveling without a ticket can greatly reduce revenue. With smart cards, passengers whose smart card payments are not up-to-date are not allowed access to the transit system.



5.0 FINANCIAL ANALYSIS

5.1 System Costs

5.1.1 Operations and Maintenance Costs

System level operations and maintenance costs were estimated for each type of transit service for the period 2007-35 (inclusive) based on (1) current unit costs (per vehicle revenue mile) and (2) projected growth in service provided under each of the operating scenarios. A summary of those costs, expressed in terms of constant 2006 dollars, is provided in Table 5.1.

Table 5.1
Estimated Operations and Maintenance
Costs By Service Type: 2007-35
 (Constant 2006 Dollars in Thousands)

	Scenario 1	Scenario 2	Scenario 3
Local/Fixed Route	\$ 297,000	\$ 406,900	\$ 691,700
Commuter	\$ 24,000	\$ 32,900	\$ 55,900
BRT	\$ 10,700	\$ 14,600	\$ 24,800
Dial-a-Ride	\$ 54,800	\$ 75,100	\$ 127,700
Regional Rail	\$ -	\$ 44,600	\$ 44,600
TOTAL	\$ 386,500	\$ 574,100	\$ 944,700

Note that Regional Rail costs were based on a study prepared in 2005 examining service and cost characteristics for new regional rail service between Auburn and Oakland, Placer County's pro rata share of that cost is shown in Table 5.1

5.1.2 Capital Costs

Capital outlay for the period 2007-35 (inclusive) was estimated for three categories of investment: (1) vehicles, (2) major facilities, and (3) other needs. Vehicle costs were estimated using the "levelized" procurement schedule developed in Section 4.2 and 2006 unit costs for four categories of vehicles: Local/Fixed Route, Commuter, BRT, and Dial-a-Ride. Estimated vehicle costs for all service types with the exception of Regional Rail (which are included with "Other Capital Needs" in Table 5.3, below), are shown in terms of constant 2006 dollars in Table 5.2.

Table 5.2
Estimated Revenue Vehicle Costs
By Service Type: 2007-35
 (Constant 2006 Dollars in Thousands)

	Scenario 1	Scenario 2	Scenario 3
Local/Fixed Route	\$ 128,000	\$ 175,400	\$ 298,200
Commuter	\$ 19,600	\$ 26,900	\$ 45,700
BRT	\$ 2,300	\$ 3,200	\$ 5,400
Dial-a-Ride	\$ 59,700	\$ 81,800	\$ 139,100
Regional Rail*	--	--	--
TOTAL	\$ 209,600	\$ 287,300	\$ 488,400

*Included with "Other Capital Needs"



Three new major maintenance facilities were identified in Section 4.3 with a total cost of \$58 million. Other smaller capital needs, including stops, transfer station, equipment, small structures, and non-revenue vehicles, were estimated using past average outlay levels applied to projected service level growth under each of the operating scenarios. A summary of other capital needs, expressed in terms of constant 2006 dollars, is shown in Table 5.3.

Table 5.3
Estimated Costs for Other Capital Needs
By Service Type: 2007-35
 (Constant 2006 Dollars in Thousands)

	Scenario 1	Scenario 2	Scenario 3
Local/Fixed Route	\$ 101,500	\$ 139,100	\$ 236,500
Commuter	\$ 14,700	\$ 20,100	\$ 34,200
BRT	\$ 4,200	\$ 5,800	\$ 9,900
Dial-a-Ride	\$ 5,800	\$ 8,000	\$ 13,600
Regional Rail*	\$ -	\$ 45,500	\$ 45,500
TOTAL	\$ 126,200	\$ 218,500	\$ 339,700

*Placer County share. Includes rolling stock.

Regional Rail costs are calculated based on Placer County's share of total estimated capital investment.

5.1.3 Total Estimated System Cost

Total costs for the 29-year period 2007-35 are shown in Table 5.4 for each service type under each of the three operating scenarios.

Table 5.4
Total South Placer County Transit Costs
By Service Type: 2007-35
 (Constant 2006 Dollars in Thousands)

	Scenario 1	Scenario 2	Scenario 3
Local/Fixed Route	\$ 526,500	\$ 721,400	\$ 1,226,400
Commuter	\$ 58,300	\$ 79,900	\$ 135,800
BRT	\$ 17,200	\$ 23,600	\$ 40,100
Dial-a-Ride	\$ 120,300	\$ 164,900	\$ 280,400
Regional Rail	\$ -	\$ 90,100	\$ 90,100
TOTAL	\$ 722,300	\$ 1,079,900	\$ 1,772,800

5.2 Funding Availability and Options

5.2.1 Current Funding Sources

Transit service in south Placer County is currently funded principally from a combination of the following sources:



- Fare Revenue;
- State Transportation Development Act/Local Transportation Fund Program (LTF);
- State Transportation Development Act/State Transit Assistance Program (STA);
- Federal Urbanized Area Formula Grants (Section 5307);
- Federal Discretionary Bus and Bus Facility Grants (Section 5309);
- Federal Formula Grants for the Elderly and Disabled (Section 5310);
- Federal Formula Grants for Other than Urbanized Areas (Section 5311);
- Federal Congestion Mitigation and Air Quality Improvement program (CMAQ); and
- Miscellaneous Local Funds (general funds, SPRTA fees, etc.).

Brief overviews of the state and federal programs are provided below.

State Local Transportation Fund (LTF)

The Transportation Development Act (TDA) of 1971 added 0.25% to the statewide sales tax to fund transit services throughout the state. These monies, known as the Local Transportation Fund, are returned to the county of origin for use to operate the transit systems in that area. The funds are administered by the regional transportation planning agency in accordance with TDA regulations. While the primary focus of the LTF is transit service, there are provisions for use of the funds for other transportation modes. For example, under Section 99233.3 of the TDA statute, regions may elect to set aside up to 2% of the LTF for pedestrian and bicycle projects. In regions with less than 500,000 in population, some funds may also be used for street and road purposes upon completion of an annual unmet transit needs process. Funding levels vary both annually and by locale, depending on the sales tax generated.

State Transit Assistance (STA)

In addition to the LTF, the Transportation Development Act (TDA) of 1971 also established a program of direct subvention for transit services through state generated funding, known as the Public Transportation Account (PTA). Funds are allocated through the annual state budget. Distribution is calculated by the State Controller and administered by the regional transportation planning agency. Funds are distributed under Section 99313 of the Public Utilities Code based on population, and under Section 99314 based on the fares generated by the various transit operators. The funds provide transit and paratransit operating assistance, capital projects, and regional transit coordination.

The STA is currently funded with 50 percent of PTA revenues, which come from a sales tax on motor fuel via two formulas: one defined by Proposition 42, and the other involving a “spillover” formula that dates from the 1970s. Funding levels are volatile and vary annually, based on the state budget.

FTA Urbanized Area Formula Grants (Section 5307)

This program makes federal resources available to urbanized areas and to governors for transit capital and operating assistance in urbanized areas and for transportation related planning. An urbanized area is an incorporated area with a population of 50,000 or more designated by the U.S.



Bureau of the Census. For urbanized areas with 200,000 population and over, funds are apportioned and flow directly to a designated recipient selected locally to apply for and receive Federal funds. For urbanized areas under 200,000 in population, the funds are apportioned to the Governor of each state for distribution.

Eligible purposes include planning, engineering design and evaluation of transit projects and other technical transportation-related studies; capital investments in bus and bus-related activities and construction of maintenance and passenger facilities; and capital investments in new and existing fixed guideway systems. All preventive maintenance and some Americans with Disabilities Act complementary paratransit service costs are considered capital costs.

For urbanized areas with populations of 200,000 or more, operating assistance is not an eligible expense. The Federal share is not to exceed 80 percent of the net project cost, except the Federal share may be 90 percent for the cost of vehicle-related equipment attributable to compliance with the Americans with Disabilities Act and the Clean Air Act.

FTA Discretionary Bus and Bus-Related Facility Grants (Section 5309)

The Bus and Bus-Related Facilities program provides capital assistance for new and replacement buses and related equipment and facilities. Eligible capital projects include the acquisition of buses for fleet and service expansion, bus maintenance and administrative facilities, transfer facilities, bus malls, transportation centers, intermodal terminals, park-and-ride stations, acquisition of replacement vehicles, bus rebuilds, bus preventive maintenance, passenger amenities such as passenger shelters and bus stop signs, accessory and miscellaneous equipment such as mobile radio units, supervisory vehicles, fare boxes, computers and shop and garage equipment.

Eligible recipients for capital investment funds are public bodies and agencies (transit authorities and other state and local public bodies and agencies thereof) including states, municipalities, other political subdivisions of states; public agencies and instrumentalities of one or more states; and certain public corporations, boards and commissions established under state law. Funds are allocated on a discretionary basis.

Private companies engaged in public transportation and private non-profit organizations are eligible sub recipients of FTA grants. Private operators may now receive FTA funds as a pass through without competition if they are included in a program of projects submitted by the designated public authority acting as the direct recipient of a grant. The Secretary of Transportation has the discretion to allocate funds, although Congress fully earmarks all available funding.

FTA Formula Grants for the Elderly and Disabled (Section 5310)

This program provides formula funding to states for the purpose of assisting private nonprofit groups in meeting the transportation needs of the elderly and persons with disabilities when the transportation service provided is unavailable, insufficient, or inappropriate to meeting these needs. Funds are allocated by a formula that considers the number of elderly individuals and individuals with disabilities in each State.

Funds are obligated based on the annual program of projects included in a statewide grant application. Eligible purposes include capital projects are eligible for funding. Most funds are used to purchase vehicles, but acquisition of transportation services under contract, lease or other



arrangements and state program administration are also eligible expenses. Matching requirements are 80 percent federal and 20 percent local.

FTA Formula Grants for Other than Urbanized Areas (Section 5311)

This program provides formula funding to states for the purpose of supporting public transportation in areas of less than 50,000 population. It is apportioned in proportion to each state's non-urbanized population. Funding may be used for capital, operating, state administration, and project administration expenses. Each state prepares an annual program of projects, which must provide for fair and equitable distribution of funds within the states.

Eligible recipients are state and local governments, non-profit organizations, and public transit operators. The maximum Federal share for capital and project administration is 80 percent (except for projects to meet the requirement of the Americans with Disabilities Act (ADA), the Clean Air Act, or bicycle access projects, which may be funded at 90 percent. The maximum Federal share for operating assistance is 50 percent of the net operating costs.

Congestion Mitigation and Air Quality Improvement Program (CMAQ)

The CMAQ Program was established by the 1991 Federal Intermodal Surface Transportation Efficiency Act (ISTEA) and was reauthorized with the passage of TEA-21 and SAFETEA-LU. Funds are directed to transportation projects and programs which contribute to the attainment of maintenance of National Ambient Air Quality Standards in non-attainment or air quality maintenance areas for ozone, carbon monoxide, or particulate matter under provisions in the federal Clean Air Act. Eligible federal-aid projects include public transit improvements; high occupancy vehicle (HOV) lanes; Intelligent Transportation Infrastructure; traffic management and traveler information systems (i.e., electric toll collection systems); employer-based transportation management plans and incentives; traffic flow improvement programs (signal coordination); fringe parking facilities serving multiple occupancy vehicles; shared ride services; bicycle and pedestrian facilities; flexible work-hour programs; outreach activities establishing Transportation Management Associations (TMAs); fare/fee subsidy programs; and under certain conditions, PM-10 projects.

5.2.2 Baseline Funding Forecast

In order to compare the costs of the three service scenarios against future funding from currently available sources, potential revenue yields from the funding sources described above in Section 5.1.1 were estimated for the 29-year period (2007-35) in terms of constant 2006 dollars. The estimates, along with total capital and O&M cost and resulting surplus (deficit) for each scenario, are presented in Table 5.5.

Assumptions underlying the funding estimates are as follows:

- Fare revenue is based on estimated operations and maintenance costs and the following farebox recovery percentages:

Local/Fixed Route	10%
Commuter	75%
BRT	25%
Dial-a-Ride	10%



Table 5.5
Projected Funding from Existing Sources,
Costs, and Surplus (Deficit): 2007-2035
 (Constant 2006 Dollars in Thousands)

	Scenario 1	Scenario 2	Scenario 3
Available Funding*			
Fares	\$ 55,855	\$ 96,075	\$ 149,615
TDA/LTF	\$ 583,927	\$ 583,927	\$ 583,927
TDA/STA	\$ 26,200	\$ 26,200	\$ 26,200
FTA 5307	\$ 63,600	\$ 63,600	\$ 63,600
FTA 5309 Bus	\$ 9,200	\$ 9,200	\$ 9,200
FTA 5310	\$ 6,300	\$ 6,300	\$ 6,300
FTA 5311	\$ 5,600	\$ 5,600	\$ 5,600
CMAQ	\$ 15,200	\$ 15,200	\$ 15,200
Total Funding	\$ 765,882	\$ 806,102	\$ 859,642
Estimated Cost			
Total	\$ 722,300	\$ 1,079,900	\$ 1,772,800
Surplus (Deficit)			
Total	\$ 43,582	\$ (273,798)	\$ (913,158)

*See text for assumptions.

For Regional Rail, it is estimated that fare revenue could cover approximately \$20 million of the O&M cost, leaving \$70 million in combined capital and operating needs to be covered from other sources

- TDA/LTF – Sales tax growth based on constant revenue per capita. Future yield in constant (non-inflated) terms will grow based on projected population growth. The share of total LTF receipts allocated to transit (as opposed to streets and roads) is assumed to remain unchanged from current practice.
- TDA/STA – Based on an estimate for Placer County prepared by SACOG for the current update of the Metropolitan Transportation Plan (MTP 2035).
- FTA Section 5307 – Based on a regional estimate prepared by SACOG for the current update of the Metropolitan Transportation Plan (MTP 2035), apportioned to Placer County based on population share.
- FTA Section 5309 Bus – Based on an estimate for Placer County prepared by SACOG for the current update of the Metropolitan Transportation Plan (MTP 2035).
- FTA Section 5310 – Based on an estimate for Placer County prepared by SACOG for the current update of the Metropolitan Transportation Plan (MTP 2035).
- FTA Section 5311 – Based on an estimate for Placer County prepared by SACOG for the current update of the Metropolitan Transportation Plan (MTP 2035).
- CMAQ – Assumed 20% of total CMAQ funding for Placer County, estimate prepared by SACOG for the current update of the Metropolitan Transportation Plan (MTP 2035).



The figures in Table 5.5 indicate that Scenario 1 could be funded entirely with current sources. Approximately 75 percent of the cost of Scenario 2 could be met from existing sources, but only 46 percent of Scenario 3. Additional funding could come from a number of new sources, potentially including a share of a new sales tax and multimodal impact fees on new development.

5.3 Recommendations

Securing funding sufficient to provide effective and efficient transit service in south Placer County is perhaps the most critical issue facing policy-makers today. Issues and opportunities to explore include:

- Maximize use of federal and state grants, paying particular attention to federal formula funding programs 5307 and 5311 as areas change from rural to urban status (e.g., Lincoln). Seek discretionary federal funding for studies. Seek federal discretionary bus capital funds (Section 5309) for bus acquisition (growth and replacement).
- Examine current policies regarding TDA/LTF allocations to streets and roads. Create a consistent policy on TDA spending for transit among all jurisdictions. Explore the feasibility of increasing shares going to transit.
- Establish uniform farebox recovery ratios for all operators as part of the next round of short-range transit plan (SRTP) updates.
- Ensure that transit is a component of any future sales tax expenditure plan.
- Add or increase the transit share of development impact fee revenue. Consider fees for special user groups such as Sierra College students.
- Establish one or more county service areas (CSAs) in unincorporated areas for transit operations and community facilities districts (CFDs) for capital needs.
- Explore funding of new “regional” service from sources such as the FTA Section 5307 program, such as fixed route service connecting with light rail, offered by PCT, Roseville, El Dorado, Yuba/Sutter, and/or YoloBus. These light rail feeder services could be considered an extension of the regional light rail system and could be eligible for regional funding.
- Identify specific roadway projects that could benefit transit yet be funded from highway sources (e.g., widen bridge in downtown Lincoln, I-80 HOV lanes, etc.). Seek participate in any future toll lane projects on I-80.



6.0 SYSTEM INTEGRATION NEEDS AND OPTIONS

6.1 Purpose and Approach

As the communities of south Placer County develop and their populations increase, transit service will be a vital means of assuring quality of life and mobility for their residents. The preceding chapters illustrate strategies that address, via service, technology, facilities and procurement, ways in which public transit may respond to increasing demand. Underlying these discussions is the hypothesis that transit services may be most efficiently be delivered via some degree of integration – of routes, fleets, maintenance, fare structures and systems, and administration.

An integrated coordinated transit system could provide from a passenger point of view a seamless system that allows for more transit choices. Such a system could take many forms, including:

1. Establish a new umbrella transit agency via State legislation.
2. Consolidate the existing powers and authorities of several operators under one of the existing agencies.
3. Establish a new joint powers agency (JPA) comprising representation from all operating entities.
4. Execute a memorandum of understanding (MOU) among operating entities.
5. Establish a subsidiary to the PCTPA to jointly operate and manage County transit services.

Once an institutional model is established, the delivery of transit service can be accomplished by providing the service with its own work force or contracting for service.

This section of the Plan considers potential institutional models for the integration of south Placer County transit operations, and means by which such institutional strategies could be implemented.

6.2 Current Structure

The services that are the subject of this Plan are identified below:

Auburn Transit – Two deviated fixed routes are operated by the City of Auburn Public Works Department.

Lincoln Transit – Three deviated fixed routes and Dial-a-Ride paratransit services are operated by the City of Lincoln Public Works Department.

Placer County Transit – The Placer County Department of Public Works operates four long distance fixed routes. The County also contracts with CTSA for two deviated fixed-route and dial-a-ride paratransit services, and with Amador Stage Lines for the PCE commuter service.

Roseville Transit – The City directly operates fourteen fixed routes, dial-a-ride paratransit services, and peak hour commuter service to downtown Sacramento.



CTSA – CTSA provides community transit service under contract to social service agencies, and county-wide dial-a-ride service under contract to PCT.

6.3 Issues and Considerations

Response to increasing transit service demand engenders issues that could be addressed by a consolidated approach, including:

Passenger Convenience – For public transit to effectively respond to the population's transportation needs, services must be seamless across the area, and information on fares, routes, and schedules must be consistent among all jurisdictions. Consistent standards of service must respond to the public's expectations of timely and cost-effective services. These needs imply that some degree of integration is necessary, whether under the auspices of an agreement among the operating agencies, or under a single authority.

Management Efficiency – As fleets grow in response to increasing demand, the discreet capital, operating, and maintenance costs of five different transit services may be greater than those of a consolidated provider. Some degree of integration among these services will offer greater efficiency and standardization of vehicle types, procurement, fleet maintenance, dispatch, and other technology programs.

Capacity of Garages – Current PCT and Roseville Transit bus facilities do not have the capacity to handle additional vehicles that will be needed for increased service. The organization structure of transit services for Placer County could influence the location of a new facility, what it will accommodate, and what services may operate out of it. Providing new capacity under the current institutional models may not result in the most efficient location or specification for a new facility.

Safety and Security Enhancement – Integrated transit operations would permit and facilitate policies and procedures leading to improved safety and security for transit patrons, employees, and the general public. The Department of Homeland Security has identified public transit as a key service and infrastructure resource, deserving of and eligible for federal funding assistance.

CNG Fueling Facilities – With a new institutional model, the location of a CNG fueling facility, preferably fast fueling based on additional vehicles, would need to be resolved. A new institutional model may require all CNG transit vehicles to operate out of one facility that is equipped to handle the operations and maintenance of the CNG vehicles due to the high cost of a fueling facility and the need to explosive proof the maintenance area. Currently up to four operators may have CNG fueling facilities while under a new institutional model only one facility may be needed.

Contract Services – Currently, PCT contracts with CTSA for paratransit service. In addition, Roseville Transit contracts for its transit operations, excluding vehicle maintenance and fueling. With development of an institutional model, contracting becomes a service delivery option and needs to be evaluated along with operating the service.

6.4 Alternative Structures and Experience Elsewhere

The range of institutional models that could be applied to consolidating transit services in south Placer County includes:



1. Establish a new umbrella transit agency via State legislation;
2. Consolidate the existing powers and authorities of several operators under one of the existing agencies;
3. Establish a new joint powers agency (JPA) comprising representation from all operating entities;
4. Execute a memorandum of understanding (MOU) among operating entities; and
5. Establish a subsidiary to the PCTPA to jointly operate and manage County transit services.
6. Join an existing regional operator (i.e., Sacramento Regional Transit).

These options are summarized in Table 6.1, below.

Table 6.1
Comparison of Institutional Models for Transit Service

Alternative	Advantages	Disadvantages
1. Establish a new umbrella transit agency via State legislation.	<ul style="list-style-type: none"> ▪ Responsibilities, powers, terms, structures, etc. can be specifically defined according to needs and objectives. ▪ Ability to specify powers to the Agency. ▪ Legislation legitimizes project and agency at state government level. ▪ Certain critical terms and provisions can be locked into statutory language. ▪ Independent entity, not beholden to interests of representative agencies. 	<ul style="list-style-type: none"> ▪ Significant time to legislate and establish. ▪ Uncertainty of legislative process. ▪ Changes require legislation.
2. Consolidate the existing powers and authorities of several operators under one of the existing agencies.	<ul style="list-style-type: none"> ▪ Builds on capabilities and credibility of existing entity. ▪ Legislation legitimizes project and agency at state government level. ▪ Ability to consolidate staffs in certain operations areas (i.e. accounting, human resources) thus reducing expenditures. ▪ Costs associated with administration of services by individual jurisdictions could be reduced by elimination of duplicated efforts. 	<ul style="list-style-type: none"> ▪ Time to legislate and establish. ▪ Added responsibility may create or imply conflict with basic charter of agency. ▪ Existing transit agencies may not agree with approach and potential difficulties in coming to an agreement among all jurisdictions involved. ▪ Potential need for additional specialized staff such as road supervisors for the additional expanded service.
3. Establish a new joint powers agency (JPA) comprising representation	<ul style="list-style-type: none"> ▪ Does not require legislation, sponsorship, electoral approval. ▪ JPA can adopt all the powers of its constituent agencies 	<ul style="list-style-type: none"> ▪ Decisions can require consensus agreement. ▪ Goals of JPA may be frustrated by one or more of the constituent



Table 6.1
Comparison of Institutional Models for Transit Service

Alternative	Advantages	Disadvantages
<p>from all operating entities.</p>	<ul style="list-style-type: none"> ▪ Management may be delegated or contracted. ▪ Dedicated policy and management body geared solely to program objectives. ▪ Conflicts can be resolved expeditiously depending on the nature of the implementing agreements. ▪ Costs associated with administration of services by individual jurisdictions could be reduced by elimination of duplicated efforts. 	<p>agencies.</p> <ul style="list-style-type: none"> ▪ Creation can be time and resource consuming. ▪ Detailed legal and administrative nature of a JPA can sometimes lead to greater administrative costs and delays. ▪ Existing transit agencies may not agree with approach and potential difficulties in coming to an agreement among all jurisdictions involved.
<p>4. Execute a memorandum of understanding (MOU) among operating entities.</p>	<ul style="list-style-type: none"> ▪ Simplicity – does not require legislation or new structure. ▪ Flexibility – structure defined by whatever agencies can legally agree to. ▪ Ability to acquire services and development of a coordinated and centralized administration without legal, political, and administrative complexity. ▪ Relatively low-cost method of improving transit services in the region. 	<ul style="list-style-type: none"> ▪ Institutions may be vulnerable to disagreements. ▪ Inability to independently implement transit improvements. ▪ Added responsibility may create or imply conflict with basic charter of agency. ▪ Interest of service usually subordinate to those of MOU signatories. ▪ Decisions can require consensus agreement. ▪ No identifiable entity visible to the public.
<p>5. Establish a subsidiary to the PCTPA to jointly operate and manage south Placer County transit services.</p>	<ul style="list-style-type: none"> ▪ Builds on capabilities and credibility of existing entity. ▪ Separate subordinate need not detract from parent agency's functions. ▪ Parent agency defines structure, roles, and responsibilities. ▪ Costs associated with administration of services by individual jurisdictions could be reduced by elimination of duplicated efforts. 	<ul style="list-style-type: none"> ▪ Parent agency not protected from liability or risk of subordinate. ▪ Does not consolidate transit services, thus increasing costs. ▪ Can lead to duplicate transit services. ▪ Existing transit agencies may not agree with approach and potential difficulties in coming to an agreement among all jurisdictions involved.



6.5 Recommendations

6.5.1 Overview

The principal goal for south Placer County transit service providers is to offer seamless and integrated transportation for the riding public. Achievement of a more integrated institutional structure would be accomplished incrementally over an extended period of time. A planning process would be necessary to guide development of the integrated system.

Institutional models that would be applicable for the integration of transit services in Placer County include (a) consolidation of all or some existing powers and authorities into one operator, (b) establishment of a JPA, or (c) establishment of a tiered system of planning and service delivery under the PCTPA or other regional agency. Any of these models could respond to the needs of Placer County.

The integration process would occur in several phases, focusing first on administrative and support services, and later on service delivery and maintenance activities. The planning phase of the project could take a minimum of 12 months up to three years depending on the motivation of the current transit operators to fully support the new institutional model.

6.5.2 Integration Phasing

Service integration would occur in several phases, as described below. Not all phases or actions would be necessary to achieve real improvements and benefits to the riding public.

- Phase 1 – Initial administrative integration of marketing, planning, capital development, and major procurement functions. Also includes maintenance of bus stops, signs, and shelters once a regional identity is adopted.
- Phase 2 – Integrated systems for fares, passes, service nomenclature, livery, and graphics.
- Phase 3 – Consolidation of administration and management services (excluding transportation and maintenance), including finance, accounting, risk management, insurance, grants administration, legal, government affairs, human resources, and engineering. The phase also features integration of demand response service, integration of farebox and body shop maintenance, and retained management of transportation and maintenance at the local level.

Also in Phase 3, the new system becomes the sole designated recipient of state and federal funds. Responsibility for the provision of fixed-route transportation and many maintenance functions remains with existing systems throughout Phase I.

- Phase 4 – Complete service Integration, including centrally-managed transportation and maintenance. (Transportation and maintenance activities could continue at decentralized garages throughout the region.

Development of a new institutional model has challenges that need to be addressed. Before integration can take place governing authorities must receive the integration plan and authorize negotiation of a new institutional model. Following negotiations and approval by the governing authorities, coordinators and working groups representing the participating transit agencies will develop policies and procedures for integration to occur.



It is notable that several of actions described above are already underway, including integration of Schedules, establishment of fare and funding agreements, joint advertising of services, special programs such as the Summer Youth Pass and Ambassador Program, cross-jurisdiction DAR improvements, execution of MOUs for funding and service delivery, and increased reliance on the Transit Operators Working Group (TOWG) for development of solutions to common problems.

6.5.3 Institutional Issues and Recommendations

Following is a summary of general issues and selected recommendations associated with possible integration of transit services in south Placer County.

Integration Phasing

Integration can be accomplished in three general phases:

1. Administrative coordination – Route planning
2. Unified Customer “Interface” – Fare policy and collection, route numbering, graphics/signage
3. Full integration

Possible Sequence of Functional Integration

A typical integration effort will include the following sequence of actions and activities:

1. Service planning and policies (beginning with “Regional/Intercity” routes)
2. Fare policy and collection
3. Marketing/Branding/“Customer Interface”
4. Maintenance and Procurement
5. Operations (including training and other labor policies)
6. Policy and Administration

Initial Service/Operator Integration Candidates (Examples)

1. Merge CTSA and Roseville paratransit services.
2. Incrementally merge PCT, Roseville, and Lincoln fixed route services.
3. PCT assumes Auburn Transit operations.
4. Merge PCT and Roseville commuter bus operations.

Funding and Fare Policies

1. Integrate fare structures and collection methods. Establish a universal fare card system within five years (all services and operators). Conduct study to determine appropriate methods and systems for distributing revenue.
2. Examine issues associated with minimum farebox recovery ratios. Set policies – e.g., 75% for commuter, 10% for local and 10% for DAR.
3. Study options for integrating all TDA/LTF funding from south Placer jurisdictions for transit operations.



Other Issues and Recommendations

1. Conduct a detailed integration study.
2. Focus on Realistic Short-Term Strategies: Establish common branding, DAR call-taking and dispatching, telephone information center(s), and website; prepare integrated schedule flyers & books; implement universal fare media, and implement joint procurement of major capital items (e.g., fareboxes).
3. If an integration policy is adopted, consider using PCT for intercity service only as an interim measure.
4. Consider consolidating commuter operations under one operator (Roseville?).
5. Consider employing the PCTPA as an interim transit planning entity and fund programming entity. Identify initial set of regional routes and establish a cost-sharing formula for all participants.
6. Maintain control of transit service in Placer County. Examine alternative board structures to help ensure that proper representation is achieved. Consider using different structures and membership arrangements for different services (e.g., local fixed route, commuter, ADA paratransit, etc.).
7. Maximize use of contract providers, including charter services. Address this issue specifically in any integration study.