V. TRAFFIC CIRCULATION ELEMENT

A. Introduction

The primary purposes of this Element of the Auburn/Bowman Community Plan are to identify future transportation needs, identify feasible ways to meet those needs, develop a transportation capital improvement program, and develop a financing plan (including mitigation fees) for proposed improvements.

B. GOALS

- 1. PROVIDE FOR A TRANSPORTATION SYSTEM THAT SUPPORTS THE SOCIAL AND ECONOMIC WELL-BEING OF THE PEOPLE AND ENVIRONMENT OF THE PLAN AREA.
- 2. PROVIDE SAFE AND EFFICIENT TRANSPORTATION SYSTEMS FOR RESIDENTS OF THE PLAN AREA AND OTHERS WHO USE THE SYSTEMS.
- 3. ENCOURAGE AND ENABLE THE USE OF PUBLIC AND PRIVATE TRANSIT AS WELL AS OTHER ALTERNATIVE MODES OF TRANSPORTATION. EXPAND PUBLIC TRANSPORTATION OPPORTUNITIES TO MEET THE NEEDS OF THE PLAN AREA'S RESIDENTS, REDUCE TRAFFIC CONGESTION, AND IMPROVE AIR QUALITY.
- 4. ENCOURAGE THE USE OF TRANSPORTATION SYSTEMS MANAGEMENT (TSM) STRATEGIES -- SUCH AS FLEX TIME, PARK AND RIDE LOTS, ETC. -- TO REDUCE PEAK-PERIOD TRAFFIC AND TOTAL VEHICLE MILES TRAVELED (VMT).
- 5. COORDINATE THE ROAD NETWORK AND ALTERNATIVE TRANSPORTATION SYSTEMS WITHIN THE PLAN AREA WITH SIMILAR SYSTEMS IN SURROUNDING AREAS.
- 6. KEEP TO A MINIMUM THE NUMBER OF DRIVEWAY ENCROACHMENTS ALONG PUBLIC ROADWAYS -- PARTICULARLY ALONG MAJOR CORRIDORS.
- 7. ELIMINATE POTENTIAL HAZARDS AND OTHERWISE IMPROVE EXISTING, SUBSTANDARD ROADS IN THE PLAN AREA.
- 8. DEVELOP A COMMUNITY TRAIL SYSTEM PARALLEL TO PUBLIC ROADWAYS IN ORDER TO:
 - a. PROVIDE SAFE, PLEASANT, AND CONVENIENT TRAVEL BY FOOT, HORSE, OR BICYCLE WITHIN THE PLAN AREA.

- b. PROVIDE RECREATIONAL OPPORTUNITIES TO RESIDENTS OF THE PLAN AREA.
- c. CONNECT LOCAL TRAILS TO REGIONAL TRAIL SYSTEMS.
- d. LINK SCHOOL FACILITIES, PARKS, COMMUNITY BUILDINGS, AND OTHER COMMUNITY-ORIENTED PUBLIC SERVICES WITH RESIDENTIAL DEVELOPMENTS.
- 9. PROVIDE SAFE BICYCLE FACILITIES ALONG EXISTING AND PROPOSED ROADWAYS.
- 10. IMPLEMENT A CAPITAL IMPROVEMENT PROGRAM (CIP) SUFFICIENT TO ENSURE THAT ADOPTED LEVELS OF SERVICE FOR TRAFFIC ON THE PLAN AREA'S ROAD NETWORK AND FOR TRANSIT ARE ACHIEVED AS DEVELOPMENT OCCURS.
- 11. MAINTAIN ROADS, TRAILS, AND OTHER TRANSPORTATION FACILITIES AT A STANDARD WHICH ASSURES SAFE PUBLIC USE.
- 12. ENSURE THAT SUFFICIENT FUNDING IS AVAILABLE TO COMPLETE ROAD NETWORK PROJECTS INCLUDED IN THE CIP.
- 13. PROVIDE ADEQUATE SPACE FOR ALTERNATIVE MODES OF TRANSPORTATION WITHIN OR ADJACENT TO EXISTING TRANSPORTATION CORRIDORS.
- 14. IDENTIFY AND PROTECT EXISTING AND PROPOSED RAIL CORRIDORS AND FACILITY SITES.

C. Policies

- 1. Rights-of-way for roads shall be wide enough to accommodate roadways, trails, bikeways, drainage, public utilities, landscaping, and suitable separations. Minimum right-of-way criteria for roadways throughout the Plan area are shown in the Background Report.
- 2. Traffic signals shall be installed at roadway intersections in accordance with Caltrans standards.
- 3. Off-street vehicular parking shall be provided by all new development.
- 4. Safety shall be a heavily-weighted criterion in determining priorities for projects in the Capital Improvement Program (CIP).
- 5. The level of service (LOS) minimum standard for roadways and intersections throughout the Plan area shall generally be LOS C. Exceptions to this standard are listed in Table 17. Land development improvement requirements shall be set to sustain LOS C at all roadway and intersection locations for as long as possible.

Table 17
Exceptions to Level of Service (LOS) C Standard within Auburn/Bowman Community Plan Area

LOS

			LUS
ROADWAYS	1	a) SR 49 Nevada County line to Joeger Road line	F
		b) SR 49 Joeger Road to Dry Creek Road	E
		c) SR 49 Dry Creek Road to Bypass	F
		d) SR 49 Bell Road to Atwood Road	D
		e) SR 49 Atwood Road to Edgewood Road	E
		f) SR 49 Edgewood Road to Auburn city limits	F
		g) SR 49 Auburn city limits to El Dorado County line	F
	2	a) I-80 Newcastle to Auburn city limits	F
		b) I-80 Auburn city limits to Auburn Ravine interchange	F
		c) I-80 Auburn Ravine interchange to Bowman interchange	E
	3	SR 49 Bypass I-80 to Bell Road	D/E
	4	Auburn Ravine Road I-80 overcrossing	E
	5	Lincoln WaySylvan Vista to Bowman	D
INTERSECTIONS	1	SR 49/Florence Drive	Е
	2	SR 49/Bell Road	D
	3	SR 49/Luther Road	E
	4	SR 49/Nevada Street	E
	5	I-80 (Eastbound)/SR 49 Bypass	D
	6	Bowman Road/SR 49 Bypass	D
	7	Bell Road/Bypass	D
	8	SR 49/Bypass	F

NOTE: This list does not include LOS deficiencies for the City of Auburn.

6. Land development projects shall be approved only if the identified LOS standards can be sustained on the Plan area road network and intersections after:

- a. Traffic from approved projects has been added to the system, and
- b. Improvements funded by this program are in place.

NOTE: This will sometimes result in temporary violation of level of service (LOS) standards until adequate funding has been collected for the construction of program improvements.

- 7. The CIP shall be constructed in response to buildout of the Plan area. Traffic mitigation fees to fund the CIP (or in lieu construction) shall be required as conditions of approval on land development projects within the Plan area.
- 8. Any part of a CIP-listed improvement which is "on-site" or "frontage" to a land development project, shall be constructed by that project. Such construction shall be required by conditions of approval placed on that project.
- 9. Priority and scheduling of the CIP projects shall be determined by the Placer County Board of Supervisors.
- 10. Traffic mitigation fee programs and ordinances shall be based on peak-period road network usage by traffic from proposed projects. Such road network usage shall be estimated using standard reference sources, such as the Institute for Transportation Engineers (ITE). Fees shall be collected when building permits are issued. The fee program shall be implemented by County ordinance.
- 11. The road network within the Plan area shall be coordinated with road networks of adjacent jurisdictions, particularly the City of Auburn.
- 12. "Through" traffic which must pass through this Plan area shall be accommodated in a manner which will not encourage the use of neighborhood roadways. This through traffic shall be directed to appropriate routes in order to maintain public safety and local quality of life in outlying sections of the Plan area.
- 13. As development of the Plan area occurs, dedication of public rights-of-way shall be required for the roads, trails, and bikeways identified in the Plan. Dedication of right-of-way as well as construction of such roads, trails, and bikeways shall be required as conditions of approval placed on land development projects.
- 14. Trail rights-of-way shall not be abandoned unless there is substantial evidence of no practical use for trail purposes.
- 15. Transit stops, turnouts, and shelters shall be required at appropriate locations as conditions of approval for land development projects.
- 16. "Park and ride" shelters and parking areas shall be required at appropriate locations as conditions of approval for land development projects.
- 17. In residential areas, concrete curb, gutter, and sidewalk shall be provided on both sides of roadways where lot sizes are 1/2 acre or smaller. In areas with lot sizes

between 1/2 acre and 40,000 sq. ft., concrete curb and gutter shall be provided on both sides of the roadway; concrete sidewalk shall be provided on one side of the roadway. In areas with lot sizes larger than 40,000 sq. ft., an off-street, multipurpose walkway shall be provided together with 4' (min.) wide paved roadway shoulders.

- 18. The traffic mitigation fee program described in this Plan shall not supersede or otherwise affect Placer County's Street Improvement Ordinance or other authority to require road improvements.
- 19. The preservation of a Highway 49 Bypass as a viable future transportation facility shall be considered in all land use decisions along the corridor. The precise alignment shall be adopted by the Board of Supervisors based upon a route alignment study and EIR.

D. Level of Service

The planning of the future road network proposed by the Plan is partially based on the concept of "level of service" (LOS). LOS is a quantitative and qualitative measure of traffic conditions on isolated sections of roadways ("links") or intersections (see Table 18). LOS ranges from Level A, with no congestion, to Level F, where the system fails with "gridlock" or stop-and-go conditions prevailing. The quantitative basis for determining LOS is the ratio between existing traffic volume (V) and the calculated capacity (C), the "V/C ratio." Normally, intersection capacity will be the limiting factor in an area's road network.

The use of a performance standard approach to road network planning assumes that a specified LOS becomes a general standard for the area's road network. Land development projects must satisfy this performance standard in order to receive permit approval; in other words, it must be shown that a certain performance standard for traffic operations will exist after a proposed project is in place. The existing road network in the area of such a project may have sufficient reserve capacity for the project's traffic; or it may be necessary to increase the available capacity by capital improvements (i.e., increasing the number of lanes, signalizing an intersection, etc.).

In the past, there has been no adopted level of service standard for the Plan area. The lower limits of LOS C have been adopted for other community plans within Placer County; however, this standard does not presently exist at several locations along the Highway 49 corridor and will not be sustainable in the future -- even after significant improvements to the transportation system.

Table 18

Level of Service Definitions

LOS	INTERSECTION	ROADWAY SECTION
A	Uncongested operations all queues clear in a single signal cycle V/C* = 0.00 - 0.60**	Free flow, vehicles unaffected by other vehicles in the traffic stream
В	Uncongested operations, all queues clear in a single cycle $V/C = 0.61 \cdot 0.70$	Higher speed range of stable flow, volume 50% of capacity or less
С	Light congestion, occasional backups on critical approaches $V/C = 0.71 \cdot 0.80$	Stable flow with volumes not exceeding 75% capacity
D	Significant congestion of critical approaches, but intersection functional. Cars required to wait through more than one cycle during short peaks. No lone queues formed $V/C=0.81 \cdot 0.90$	Upper end of stable flow conditions. Volumes do not exceed 90% of capacity
Е	Severe congestion with some long, standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es)	Unstable flow at roadway capacity. Operating speeds 30 to 25 mph or less
F	Total breakdown, stop-and-go operation V/C = 1.00	Stop-and-go traffic with operating speeds less than 30 mph

^{*} V/C ratio same for road sections, except as noted

E. <u>Computerized Traffic Model</u>

A computerized traffic model was developed for the Plan area (as well as the City of Auburn) to forecast future traffic conditions. The model was developed jointly by Omni-Means, Ltd. (consulting traffic engineers) and Placer County staff. This model was developed to be able to evaluate future traffic conditions and the effects of proposed road network improvements and/or land use changes. This model is unusually detailed for the area and population of the area being evaluated--primarily because of the two separate jurisdictions and separate planning efforts. The traffic model has been used by both Placer County and the City of Auburn in preparing their respective circulation elements. Both daily and p.m. peak-period models were developed.

Different trip generation rates were discovered for different areas of the Plan. For example, there are very different trip-generation characteristics for suburban shopping centers than for commercial areas of downtown Auburn on an acreage basis. The traffic model was tested and validated to much better than standard tolerances for existing (1988) conditions. Forecasting considers the effects of buildout

of the Plan area together with increased traffic within, into, out of, and through the Plan area on all major roadways. Forecasts of future traffic volumes at the boundaries of the traffic model area for I-80 and Highway 49 were obtained from Caltrans. The traffic model was also used as a basis for evaluating Highway 49 bypass alternatives as part of a separate study. Intersection capacity analysis was performed using future traffic volumes and turning movements projected by the model.

Traffic forecasts by the computer model indicated the roadway sections and intersections where undesirable levels of service would occur. The effects of different roadway improvements were then tested in order to determine the cost-effectiveness of various "fixes" to the future level of service problems. The most cost-effective set of roadway improvements which corrected future level-of-service deficiencies was then incorporated into the Capital Improvement Program (CIP).

The primary indicator of congestion which is output from the traffic model is "total system delay", which is measured in daily vehicle-hours. Total system delay is a good indicator of overall operating conditions of the area's road network. It avoids the problem of ignoring congestion which is shifted to other areas that can result from focusing on specific locations (such as the Highway 49 corridor, alone).

Within the Plan area, full buildout of residential land use was assumed to be 80% of maximum density—the balance being streets, vacant parcels, larger than minimum lots, etc. This is consistent with Placer County's experience in other community plan areas. Non-residential land use was assumed to buildout to 100% of development potential. The cost of the CIP has been assigned to the increment of future land development which is forecast to occur during the next 20-year period.

The most heavy traffic loadings will occur on I-80 and Highway 49. Because I-80 traffic is mostly interregional, very little can be done by the Plan to improve future traffic conditions. However, over two-thirds of the future traffic on Highway 49 is forecasted to be traffic with either an origin or destination within the Plan area. Therefore, traffic conditions on Highway 49 can be greatly affected by land use in the Plan area.

The 1978 Auburn Area General Plan includes a Highway 49 bypass on the west side of the Plan area. The traffic model was used to analyze several bypass alternatives. In very general terms, a westerly Highway 49 bypass would have the most beneficial effects on traffic congestion and would be the most expensive alternative; an easterly bypass would have fewer environmental problems--such as displacement of existing homes and potential growth inducement. Much can be done to mitigate future traffic problems with a combination of improvements to the existing road network and land use changes without any Highway 49 bypass.

Early in the bypass study, it became apparent that the criteria being used to evaluate the traffic benefits of bypass alternatives were not the best. Using relief of traffic congestion on Highway 49 as the primary criterion ignores what happens elsewhere. It was decided that it is better to evaluate bypass alternatives (and other road network alternatives) in terms of effect on the entire road network for the Auburn area.

The modeling effort also raised questions about the viability of a "no bypass" alternative. The traffic model was used to evaluate the effect of improving the existing road network wherever possible (for example, improving Highway 49 to six lanes, improving Bell Road to four lanes, etc.), both with and without a bypass.

The third issue that changed the evaluation criteria was the development of proposed land use alternatives by the Planning Department. It became apparent that future traffic conditions could be greatly affected by the location, density, distribution, and mix of proposed land uses. Therefore, the traffic model was used to evaluate the effect of such land use changes on traffic conditions with and without a bypass.

F. <u>Transportation Capital Improvement Program (CIP)</u>

The proposed CIP, including cost estimates and cost-spread for the traffic mitigation fee program, is shown on Table 19. In addition to road network and intersection improvements, the CIP also includes shoulder widenings on approximately 20 miles of existing roadways to provide much safer roadways for motor vehicles, bicycles, and pedestrians.

The CIP includes a State Route 49 Bypass of Auburn. The Plan includes the bypass as part of a long-term strategy to reduce congestion along the Highway 49 corridor as forecast by the transportation model. Highway 49 is predicted to still have significant congestion even with the bypass. Travel time through the Plan area in a north/south direction would be reduced with a bypass.

The bypass alignment would be to the north and east of Auburn and is shown in its approximate location on Figure 15. The bypass would leave the present alignment of Highway 49 south of Dry Creek Road, pass between the airport and Rock Creek Reservoir, cross Bell Road and connect to I-80 at the Bowman Road interchange. The exact alignment must be approved by the Board of Supervisors based upon a formal "Route Alignment Study." The alignment study will include an engineering and environmental analysis of alternatives and an EIR. After a route has been selected and adopted, preservation of the corridor and the reduction of land use conflicts adjacent to the route should be a consideration in all land use decisions along the route.

The bypass is estimated to cost \$36 million; however, the many decisions made during the route alignment process will affect the cost. The CIP divides the project into two parts: 1) Route alignment selection, environmental review, engineering, surveying and some initial right-of-way acquisition, and 2) The remainder of the right-of-way acquisition and construction. The first phase (\$4 million) is proposed for inclusion in the mitigation fee program. The source of funding for the second phase (\$32 million) is currently unknown.

The bikeway facilities proposed by this Plan are consistent with the Bikeways Master Plan in that all Master Plan routes are included. However, many more miles of bikeways are provided by the Auburn/Bowman Community Plan, and many such facilities will be provided at an upgraded standard (refer to the Parks and Recreation Element trails section for a discussion of Plan area trails).

Table 19

Table 19

Figure 15

G. Financing Plan

Funding for the projects included in the CIP will likely be provided from several sources. However, the financing plan and fee schedule assume that the Plan area's share of these projects will be funded in the amounts shown in Table 19 by land development as it builds out the Plan area. In general, the CIP included in the Plan should allow LOS C to be maintained on the area's road network excepting only sections of I-80, State Highway 49, the 49 Bypass and a few signalized intersections.

Table 19 indicates that only a portion of the cost of the CIP would be funded by future land development. Other sources of funding include the County Road Fund, Transportation Development Act (TDA) monies, existing mitigation fee programs, and contributions from other jurisdictions, such as Caltrans and the City of Auburn.

A separate County Ordinance establishes the traffic mitigation fee program which will collect funds from future land development.

H. Other Future Transportation Measures

1. Future Transit

Over the next seven years, Placer County Transit is planning to change and expand transit service for the Auburn/Bowman Community Plan area. The service will be changed by adding two 25-30 passenger buses that operate on fixed routes with 30-minute headways. These buses will provide local transit service and accomplish timed-transfers to other transit systems such as intercity rail, vanpools, etc. This will require more coordination among transit systems than presently exists.

This service would operate 12 hours per day for five days per week for the first year. In the second year, service would operate for 12 hours each day for six days per week. In the third year (and thereafter), service would be expanded to 16 hours each day for six days each week.

2. Future Rail

Intercity rail services are planned between Colfax and San Jose via Sacramento. Trains currently run from Roseville to San Jose and service will be expanded when rolling stock and stations become available. A station is planned within the City of Auburn near the intersection of Nevada Street and Fulweiler Avenue. Although the purpose of the system is to provide intercity and not commuter service, there will be one morning and evening train that could serve this function. If intercity rail service proves to be successful, expanded service for commuters would be added.

3. Future TSM

Placer County will implement the following Transportation Systems Management (TSM) measures during the Plan lifetime:

a. <u>Trip Reduction Ordinance</u>

Placer County adopted a countywide Trip Reduction Ordinance in August, 1993. This Ordinance requires all businesses, government agencies, etc. to reduce anticipated trip generation. Small employers have only a minimal posting of notice requirement. Larger employers have requirements for a designated coordinator, performance monitoring, and reporting.

b. Park and Ride Lots

Private land development (both residential and commercial/office) will be required to designate parking areas for commuter parking at appropriate additional locations. Public Park and Ride lots will be constructed within surplus road rights-of-way and adjacent to interchanges on I-80.

c. Signal Coordination

Under certain circumstances, through-movement highway capacities can be improved on a major corridor (such as Highway 49) by signal coordination. To be effective, this coordination requires high traffic volumes, certain minimum spacing between signals, and relatively high through-traffic/cross-traffic ratios. All signal controllers installed in the last 10 years along Highway 49 have the capability of being coordinated by a master controller.

Conditions in the Highway 49 corridor are now approaching the point where signal coordination could be effective. Caltrans has initiated a study to determine the first locations where coordination would be established. There may be problems with a reliable power source for the signal system if coordination is established for the full length of the Highway 49 corridor. A solution to this appears to be several separate blocks of signals with separate power sources. Under ideal conditions, signal coordination can improve effective capacity (10-15%) during peak periods.

Other measures that could be implemented that would reduce peak-period traffic generation include the following: "flex-time" for employees, non-peak shift changes, parking fees or parking limitations, telecommuting, financial incentives/ disincentives by employers, a safe network of bike trails and pedestrian walkways, "guaranteed ride home" carpooling, etc.

I. <u>Summary and Conclusion</u>

If the assumptions of this Circulation Element are correct regarding land use development patterns, road improvements, etc., traffic conditions will be significantly worse in the future than at present. This will be the case despite major road improvements to improve capacity. There will be more traffic signals, increased delay on the road network and intersections, and generally, less overall

mobility. Travel time will increase for most routes within the Plan area--particularly on heavily-travelled routes such as the Highway 49 corridor. The miles of roadway which will operate at undesirable levels of service (at peak periods) will more than double, as will the number of intersections operating at undesirable levels of service. Total vehicle miles travelled will double. Within the City of Auburn, conditions would be much worse. Road improvement solutions to congestion problems (such as additional lanes) which work at most places in the unincorporated area, may be impossible to implement in the City where surplus rights-of-way and setbacks are minimal.

On the positive side, many existing safety deficiencies will be corrected. More and better facilities will be available for pedestrians and bicyclists. Alternative transportation opportunities will be improved by an expanded local transit service, coordination with other transit services, and intercity rail service.

It should be noted that without the proposed CIP, traffic conditions on the road network would be much worse. Within financial constraints, the CIP includes all improvement projects (excepting only I-80 improvements) which would significantly reduce delay on the Community Plan area's road network. The traffic mitigation fee program should ensure that sufficient funding is available for road improvements made necessary by land development through the year 2010. This should also be true for the additional road improvements required to serve the increment of growth between 2010 and full buildout of the Plan area. There is a great deal of uncertainty about the timing, location, and land use mix of future development; these factors will largely determine the timing and sequence of proposed road improvements.

The Highway 49 Bypass is part of a long-term strategy to reduce congestion along major arterial highways in the north Auburn area. It is predicted to be only partially successful at reducing congestion and will require continuing political and financial support in order to become a reality. The first step is to determine and formally adopt the route alignment, then implement measures to preserve the corridor. Funding for construction and land acquisition has not been identified.

J. <u>Implementation</u>

The following programs and policies will implement the Traffic/Circulation Element of the Auburn/Bowman Community Plan:

1. Prepare/adopt an ordinance implementing traffic mitigation fees for Road Network Capital Improvement Program.

Responsible Agency/Department: Department of Public Works/Board

Supervisors

Time frame: 1994 **Funding**: Road Fund

2. Revise road improvement and right-of-way dedication requirements for land development projects within the Plan area.

Responsible Agency/Department: Department of Public Works

Time frame: 1994 **Funding**: Road Fund

3. Prepare/adopt a Trip Reduction Ordinance which includes the Plan area.

Responsible Agency/Department: Department of Public Works/Board of

Supervisors

Time frame: 1993

Funding: Transportation Development Act (TDA)

4. Coordinate transportation planning with City of Auburn and Caltrans.

Responsible Agency/Department: Department of Public Works

Time frame: Ongoing

Funding: General Fund/Road Fund

5. Require land development projects to construct public transportation improvements.

Responsible Agency/Department: Department of Public Works

Time frame: Ongoing

Funding: General Fund/Road Fund

6. Pursue other sources of funding for transportation improvements.

Responsible Agency/Department: County Executive Office/Department of

Public Works

Time frame: Ongoing

Funding: General Fund/Road Fund

7. Continue existing transportation construction and maintenance programs.

Responsible Agency/Department: Public Works/Caltrans

Time frame: Ongoing **Funding**: Varied

8. Adopt an alignment for the Highway 49 Bypass.

Responsible Agency/Department: Department of Public Works/Caltrans/Auburn

Time frame: 3 - 5 years

Funding: Mitigation Fees/Road Fund