CIRCULATION ELEMENT

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PURPOSE

The City's circulation system supports growth and vitality in the community. From pedestrian walkways to state highways and local air service, the transportation network connects neighborhoods within the City to adjacent communities and to the region. If the network fails and this linkage is interrupted, quality of life in the community may be diminished.

The Circulation Element plans for the continued development of an efficient, cost-effective and comprehensive transportation system which is consistent with regional plans, local needs, and the City's character. The Circulation Element both complements and supports the Land Use Element, insofar as a cohesive land use pattern cannot be achieved without adequate circulation. Planning for the ultimate alignment, width and capacity of the City's roadways, as well as coordination with Caltrans regarding the three state highways connecting the City to the larger region, will also enhance the City's economic growth.

BACKGROUND

The California Government Code describes conditions and data which must be researched, analyzed and included in a Circulation Element. Government Code Section 65302(b) states that the General Plan shall include the general location and extent of existing and proposed major thoroughfares, transportation routes, terminals and other local public utilities and facilities. The City is also required to coordinate the Circulation Element provisions with the regional transportation plans, as set forth in Government Code Sections 65103(f) and 65080. Regional plans affecting the City of Big Bear Lake include those of the California Department of Transportation (Caltrans), the San Bernardino Associated Governments (SANBAG), the Southern California Association of Governments (SCAG) and the transit agency (MARTA). In addition, federal and state transportation planning must be coordinated with local planning, pursuant to Section 134, Title 23 of the U. S. Code, and California Government Code Section 65080(a), respectively.

The Circulation Element has been developed in conformance with State law and with the other portions of the General Plan, including the Land Use, Environmental Resources, Noise, Public Services and Facilities Elements. The proposed road network is based upon projected development permitted by the Land Use element, because the types and intensities of land uses in the City will influence the types and volumes of traffic traveling the City's roads now and in the future. The public transit and trip reduction policies are in conformance with State, County and regional programs. Policies requiring coordination of the circulation system with other public infrastructure conform with the Public Services and Facilities Element. Projected noise levels as contained in the Noise Element were based upon traffic volumes estimated for the Circulation Element. The Circulation Element also complements the City's air quality goals by planning for a smooth-flowing transportation system which reduces vehicle emissions. Additionally, as noted in the economic

development section of the Land Use Element, the viability of Big Bear Lake as a resort destination will be improved with better access to its six-county market area, and implementation of the Circulation Element will assist the City in reaching its economic development goals.

The Circulation Element addresses the City's plans to upgrade and expand its pedestrian walkways, surface streets, arterial roads, state highways and public transportation. In addition, it addresses the need for coordination with the Big Bear Airport District. Although the airport is located outside of the City limits, it is a key component of the Big Bear Valley's circulation system. Pedestrian access and bikeways are also included in the Circulation Element, as well as being addressed in the Open Space, Parks and Recreation Element.

The Circulation Element has been developed based upon an analysis of existing conditions in the City, future development within City limits, and anticipated growth in regional transportation. A variety of data were used to quantify and characterize existing traffic volumes and conditions along roadway links and at major intersections. The traffic model used is an enhanced version of the San Bernardino Mountain Model which was developed for SANBAG specifically for the Mountain Region, and reflects 1996-97 conditions. A traffic distribution process was used to analyze circulation and the effects of development on traffic. Based on this analysis, recommendations were formulated for the roadway designations shown on the Circulation Map, and for goals, policies and programs included in the Circulation Element.

SOME FUNDAMENTAL CONCEPTS FOR CIRCULATION PLANNING

Access and Mobility

A city's roadway system consists of a range of transportation facilities which serve two basic functions: mobility and land access. Mobility means providing the ability for motorists to travel between points of activity, and land access means providing for entrance and egress at the final destination. A circulation network is composed of facilities that emphasize the mobility or access functions to different degrees. For example, freeways or expressways provide limited access but good mobility between access points, while local neighborhood streets provide access to every residence but a low degree of mobility due to slow speeds and frequent stops. The transportation facilities found within the City, along with a description of each type of facility, is provided below.

- ***Arterial.*** This type of roadway provides a high degree of mobility as a major traffic carrier with access to collectors and some local streets. Arterials are typically the widest streets in terms of right of way and pavement width, and they generally have the highest speed limits. Arterials may be further classified as primary or secondary, based upon their width and capacity;

- ***Collector.*** This type of roadway connects local streets with arterials and also provides access to adjacent land uses, thus balancing mobility with access. While a collector street is not as wide as the arterial, it is often wider than local streets in terms of right of way and lane width;

- ***Local.*** This type of roadway is intended to provide access to adjacent land uses exclusively, and is not designed or intended to carry through-traffic or allow for high speeds.

Roadway systems are designed with different types of streets to balance mobility and access needs in an efficient manner. The different functions of various roadways require specific methods of analysis and design, because each street type must meet different traffic capacity and access requirements. While it might be considered desirable to provide both access and mobility on all roadways, most residents would not like their local neighborhood streets to be designed at arterial street standards for width and number of lanes. Conversely, problems occur when a street designed to provide mobility is expected to provide for land access as well. Land access typically requires driveways to move vehicles off the street and onto the property in question. When too many access points are provided on a street intended for mobility, friction and conflicts occur between vehicles needing access and vehicles using the facility for mobility. Therefore, the designation of streets for different uses has both a functional and economic value to the community, and must be considered in developing the City's circulation plan.

Because the City of Big Bear Lake is an alpine community where people value the natural environment, the trade-offs between mobility, traffic congestion and the effect of wider roadways on the community character must also be carefully weighed in developing circulation polices.

Capacity and Connectivity

In evaluating and planning for a functional circulation system, both capacity and connectivity should be considered. Capacity refers to the ability of the street system, including roadways and intersections, to adequately serve the demand placed on it. It is a measure of how well the mobility needs of the City are provided for. Connectivity is defined as a measure of how well various parts of the City are joined together, and how easy it is to move between different parts of the City. Connectivity is also related to how well land access is provided within the City.

The capacity of a roadway is affected by a number of factors, including the street's width, the number of cross streets, the amount of green time given to the street at each signal, the presence or absence of on-street parking, the number of turn lanes at each intersection and the number of driveways. Intersection capacity depends on the lane configuration, meaning the number of through lanes and turn lanes, their width and alignment, and the signal timing (e.g., the amount of green time for each movement). Daily capacity analysis is very general in nature and is typically used to identify roadways which are nearing or exceeding their capacity and which should be the subject of further peak hour analysis. Peak hour traffic operations analysis is described by a roadway or intersection's level of service.

The level of service (LOS) designation of a roadway or an intersection indicates whether the capacity is adequate to handle the volume of traffic using the facility. Levels of service provided by street segments and intersections are dependent upon traffic volumes, number of lanes, whether the

roadway is divided, the number of access points (driveways or cross streets) along the roadway, and the lane configuration at intersections. Level of service is a term used to describe prevailing conditions and their effect on traffic. It is a qualitative measure which describes operational conditions within a traffic stream, generally in terms of such factors as travel speed, travel time, traffic interruptions, freedom to maneuver, safety, and driving comfort and convenience. Levels of service are represented alphabetically, with Level A representing the least impacted roadway, and Level E representing the "maximum capacity" or forced flow roadway. Level of service F represents long queues of traffic and unstable flows.

The General Plan Traffic Impact Study included assumptions for roadway capacities for both summer and winter conditions. These capacities, by roadway type, are listed in Table C-1.

Table C-1
Daily Roadway Segment Capacities

Roadway Type	Travel Lanes	Summer Capacity	Winter Capacity*
2 Lane Undivided	2U	13,000	11,700
2 Lane Divided	2D	18,000	16,200
3 Lane Divided	3D	21,000	18,900
4 Lane Undivided	4U	25,000	22,500
4 Lane Divided	4D	37,500	33,800

* Winter conditions result in a 10% reduction in daily capacity.

Peak Hour and Average Daily Traffic Volumes

Average Daily Traffic (ADT) is a measurement of the average number of vehicles that travel a segment of roadway during a 24 hour period. The ADT is a useful benchmark for determining roadway capacities, but peak hour information, which is the highest volume of traffic to pass over a road in a one hour period, is a more meaningful and accurate basis for evaluating traffic conditions along roadways.

Intersection Capacity

The level of service along a roadway is typically dependent on the quality of traffic flow at the intersections along that roadway. Usually, bottlenecks and delays start at intersections, not the roadway segments in between. Level of service at intersections is expressed in terms of delay

time for the various intersection approaches, and varies for signalized and unsignalized intersections. Generally, if a vehicle is stopped for 60 seconds or more, the intersection is operating at LOS "F", while delays from 0 to 5 seconds are considered to be LOS "A".

Congestion Management Program

The Congestion Management Program (CMP) was enacted by the State legislature in 1989 to improve traffic congestion in California's urban areas. The program became effective with the passage of Proposition 111 in 1990, which increased the State gas tax over a five year period. The funds generated by Proposition 111 are available to cities and counties for regional road improvements, provided that these agencies are in compliance with CMP requirements. If a city does not comply with the CMP, it could lose funding under Proposition 111. Like other California cities, Big Bear Lake must develop and implement local programs to comply with the State's Congestion Management Program.

Under the legislation, regional agencies are designated within each county to prepare and administer the CMP. In San Bernardino County, the Congestion Management Agency is the San Bernardino Associated Governments (SANBAG). SANBAG's congestion management plan for San Bernardino County must be consistent with regional plans prepared by the Southern California Associated Governments (SCAG). The City's responsibilities include the following:

- Assisting in monitoring the roadways designated within the CMP system;
- Adopting and implementing a trip reduction and travel demand ordinance;
- Analyzing the impacts of local land use decisions on the regional transportation system; and
- Preparing annual deficiency plans for portions of the CMP system where level of service standards are not maintained.

SANBAG will review compliance with the CMP by cities under its jurisdiction. For any city out of compliance, SANBAG may give notice and establish a correction period, after which they may report the city to the State Controller, who may then withhold a portion of its state gas tax funds.

SANBAG adopted the County's Congestion Management Plan in 1992. Within the City of Big Bear Lake planning area and vicinity, the roadways included in the Congestion Management Plan are SR-18, SR-38 and SR-330.

Preparation of a new General Plan constitutes a project which must be evaluated for CMP compliance. If the new General Plan is found to further impact traffic conditions on CMP roadways, mitigation may be required. In accordance with CMP requirements, the City retained a traffic consultant to prepare a traffic impact analysis.[1] Based on SANBAG's requirements, this analysis included evaluation of impacts on state highways more than five miles from the City of

[1]RKJK & Associates, *City of Big Bear Lake General Plan Update Traffic Impact Study,* May, 1998, and *Addendum,* April, 1999.

Big Bear Lake, and specifically included the intersection of SR-18 and SR-330 in Running Springs. In addition, a level of service analysis was conducted on all existing segments and intersections on the CMP network potentially impacted by the General Plan. The San Bernardino CMP allows a jurisdiction to define acceptable levels of service up to LOS "E".

For deficiencies on the CMP roadways, the CMP requires the following further analysis by the City:

- Evaluation of mitigation measures needed to achieve acceptable levels of service;
- Calculation of the project share of new traffic on impacted CMP roadways during peak hours; and
- Estimation of the cost required to implement the needed improvements.

The General Plan traffic analysis addressed these issues, and its conclusions are presented in the above-referenced report.

Traffic Modeling Methodology

The traffic modeling effort for this Circulation Element was based on the San Bernardino Mountain Traffic Model developed for the San Bernardino Association of Governments (SANBAG), and refined by the traffic consultant to produce the Big Bear Lake Traffic Model. The modeling effort also included information from Caltrans, independent traffic count data, the 1994 Highway Capacity Manual and the County of San Bernardino Congestion Management Program. The model referenced land use designations described and assigned in the Land Use Element and Land Use Map, and considered traffic movements into and out of the planning area along the state highways. It was found that traffic problems are greater in the winter than the summer, although summer traffic volumes are generally higher, due to the reduced capacity caused by snowy, wet or icy roads. The more pronounced peaking of traffic in the late afternoon related to wintertime activities may also contribute to traffic congestion on winter weekend afternoons. Because winter weekend traffic conditions were the most problematic, the traffic analysis was based on typical winter weekend conditions at approximately 5:00 p.m. on Sundays.

The Big Bear Lake Traffic Model utilizes a series of 92 traffic analysis zones (TAZ's) to represent the City of Big Bear Lake. These TAZ's are a further refinement of the seven TAZ's assigned to the City in the San Bernardino Mountain Traffic Model. The increased number of TAZ's allows the model to assign and distribute trips within the City based on land uses within each zone. A complete description of the TAZ's, and the land uses assigned each zone can be found in the Traffic Impact Analysis Report. The model also assigns both regional (on and off the hill) and intra-mountain trips from SANBAG's mountain region model. The Big Bear Lake traffic model projects traffic patterns based on the Land Use Map, and has led to the development of design requirements needed to maintain acceptable traffic flow.

HISTORIC AND EXISTING TRAFFIC CONDITIONS WITHIN THE PLANNING AREA

Regional Access

The City, although somewhat isolated from the inland valleys and high desert by topography, is part of a complex regional transportation system linking the City to the greater southern California metropolitan region. Regional access to the City is provided directly by SR-18 and SR-38. Indirect access is provided by SR-30 and I-215 via SR-330 and SR-38. Regional roadway access to the Big Bear Valley is limited to three approaches: SR-18 from the west, serving traffic from San Bernardino and Lake Arrowhead; SR-18 (E) from the north and east, serving traffic from the Lucerne and Victor Valleys; and SR-38 from the south and east, serving traffic from Redlands. SR-18 and SR-38 serve the Los Angeles Basin, whereas SR-18(E) serves the high desert area to the north. All three state facilities are two-lane mountain roads with passing lanes and turnouts at strategic locations.

The City's efforts to achieve efficient transportation must be coordinated with a number of other plans and programs governed by other agencies. Caltrans has jurisdiction over Big Bear Boulevard (State Route 18), and is a source of funding for improvements on this roadway. San Bernardino Associated Governments (SANBAG) is the County's transportation authority; it is responsible for regional transportation planning, and is also a source of funding for roadway and alternative transportation projects. The County of San Bernardino has responsibility for maintenance of roadways other than the State Routes outside the City limits, and federal agencies have jurisdiction over the public lands and roadways adjacent to the City within U. S. Forest Service property. The traffic modeling effort for this General Plan was designed to ensure regional consistency in transportation planning. In order to continue to have a viable transportation system, the City will need to continue to actively participate in regional transportation planning efforts.

Existing Roadway System

The City of Big Bear Lake is located in a geographically constrained mountain valley. Circulation opportunities are further hindered by Big Bear Lake, which lies directly north of the City. State Route 18 (SR-18) passes directly through the community, serving both local and regional traffic. Most of the SR-18 alignment is along Big Bear Boulevard, with portions located along Paine Road and Lakeview Avenue. Existing roadways in the City are generally two lane undivided facilities. The exceptions to this general rule are segments of Big Bear Boulevard and Moonridge Road. Trees line most roadways in the study area, imparting a sense of the alpine forest environment. The following paragraphs describe the major roadways within the City:

- ***Big Bear Boulevard*** is the major through route in the City. It is a two lane undivided roadway between the west City limit and Paine Road, where it temporarily ends. Big Bear Boulevard resumes at the intersection of Pine Knot Avenue as a four lane divided roadway with a curb to curb width of 64 feet. The four lane divided cross-section is maintained on Big Bear Boulevard east through the intersection of Starvation Flats Road/Stanfield Cutoff,

where the cross-section transitions to a two lane undivided configuration. Typical winter Sunday daily traffic volumes range from a low of approximately 10,000 vehicles per day at the western end of the City to a maximum of approximately 22,800 vehicles per day between Summit Boulevard and Moonridge Road. All of the traffic signals in the City are located along Big Bear Boulevard; these are located at Pine Knot Avenue, Knickerbocker Road, Georgia Street, Summit Boulevard, Moonridge Drive/Garstin Drive, Fox Farm Road, Lakeview Center/Interlaken Center, and Starvation Flats Road/Stanfield Cutoff.

- ***Moonridge Road/Clubview Drive*** provides the primary access to Bear Mountain from Big Bear Boulevard. Moonridge Road varies between a four lane divided and four lane undivided cross-section. The four lane divided cross-section is initially provided in the vicinity of Big Bear Boulevard. Moonridge Road then transitions to a four lane undivided cross-section south of the intersection with Moonridge Way. The cross-section transitions back to a four lane divided configuration from south of Evergreen Drive to Sunset Drive, a "Y" intersection at Clubview Drive. From the "Y" intersection, Clubview Drive continues to the Bear Mountain ski resort, and consists of a two lane undivided cross-section. Traffic volumes on Moonridge Road range from approximately 5,600 vehicles per day between Big Bear Boulevard and Clubview Drive to 4,700 vehicles per day on Clubview Drive.

- ***Moonridge Way*** is a short four lane undivided roadway which connects Moonridge Road with Big Bear Boulevard. This roadway serves traffic traveling northbound on Moonridge Drive which is ultimately traveling towards destinations to the east.

- ***Summit Boulevard*** is a wide two lane undivided roadway which provides access to the Snow Summit ski area. The width of Summit Boulevard is sufficient to allow for right angle parking on the east side of the roadway, which is lined with residential units.

- ***Village Drive*** provides access from Big Bear Boulevard (SR-18) to the Village. Westbound traffic from Village Drive is allowed uncontrolled access to Big Bear Boulevard at the intersection with Big Bear Boulevard and Paine Road. The estimated winter Sunday daily traffic volume in Village Drive east of Big Bear Boulevard is 5,700 vehicles per day.

- ***Pine Knot Avenue*** is a two lane undivided roadway which provides access to the Village from Big Bear Boulevard (SR-18). The intersection of Pine Knot Avenue and Big Bear Boulevard/Lakeview Drive is controlled by a traffic signal. The estimated winter Sunday daily traffic volume on Pine Knot Avenue south of Big Bear Boulevard is 9,300 vehicles per day.

- ***Paine Road*** is a short segment of roadway which is part of SR-18 between Big Bear Boulevard and Lakeview Drive. Paine Road is a two lane undivided roadway which is estimated to carry 18,100 vehicles per day in winter Sunday daily traffic volume north of Big Bear Boulevard. The intersection of Paine Road at Big Bear Boulevard is a key congestion point for traffic which is traveling westbound on SR-18. The southbound Paine

Road to westbound Big Bear Boulevard movement is controlled by a stop sign, and a substantial queue of traffic develops as vehicles wait for the opportunity to perform this right turn.

- ***Stanfield Cutoff*** connects Big Bear Boulevard to North Shore drive just east of Big Bear Lake. The estimated typical winter Sunday daily traffic volume on Stanfield Cutoff is 4,200 vehicles per day.

- ***Division Road*** is located at the eastern end of the City. This two lane undivided roadway carries an estimated daily traffic volume of 3,500 vehicles per day under typical winter Sunday conditions.

- ***Garstin Drive*** is a two lane undivided roadway, with the exception of its intersection with Big Bear Boulevard and Moonridge Drive. Garstin Drive provides access to the industrial are of the City. The typical winter Sunday daily traffic volume on Garstin Drive is less than 1,000 vehicles per day.

The remaining roadways within the City are all two lane undivided facilities which carry less than 3,000 vehicles per day, with the exception of some collector streets which may carry slightly more than 3,000 vehicles per day.

Existing Traffic Volumes and Levels of Service

Existing traffic volume data were compiled from a variety of sources, and are summarized on Table C-2. The highest estimated 1998 winter Sunday daily traffic volumes occurred on SR-18, with estimated traffic volumes ranging from 10,000 vehicles per day up to 22,800 vehicles per day between the Snow Summit and Bear Mountain ski areas. The estimated daily traffic volumes on all other study area roadways were less than 10,000 vehicles per day, with the highest estimated volumes on Pine Knot Avenue, Moonridge Drive and Village Drive.

Volume/capacity ratios developed for winter Sunday conditions, and an indicator of traffic conditions, are also listed in Table C-2. SR-18, which includes Big Bear Boulevard and portions of Paine Road and Lakeview Drive, is near or over capacity throughout its two lane undivided cross-section during peak winter conditions. Those sections of Big Bear Boulevard which have been widened to a four lane divided cross-section operate at acceptable levels of service on a daily basis for existing conditions. Eight segments of SR-18 currently operate near or over capacity for existing daily conditions. All other roadways in the City carry acceptable existing daily traffic volumes in relationship to their existing cross-sections.

Table C-2
Existing Winter Sunday Daily Traffic
Volume/Capacity Analysis

Segment/Limits	Volume	Capacity	V/C	Condition
SR-18/SR-38 to w/o SR-38	11,800	11,700	1.01	O.C.
SR-18/Sr-38 to Cienega Rd.	10,000	11,700	0.85	A.
Big Bear Blvd./Cienega to Edgemoor	12,500	11,700	1.07	O.C.
Big Bear Blvd./Edgemoor to Lakeview	18,600	11,700	1.59	O.C.
Big Bear Blvd./Lakeview to Village	22,200	11,700	1.90	O.C.
Big Bear Blvd./Village to Lakeview	18,100	11,700	1.55	O.C.
Lakeview Dr./Big Bear to Pine Knot	18,000	11,700	1.54	O.C.
Village Dr./Big Bear to Pine Knot	5,700	11,700	0.49	A.
Pine Knot Ave./Big Bear to Village	9,300	11,700	0.79	A.
Big Bear Blvd./Pine Knot to Summit	20,100	33,800	0.59	A.
Summit Blvd./Brownie to Evergreen	900	11,700	0.08	A.
Big Bear Blvd./Summit to Moonridge	22,800	33,800	0.67	A.
Moonridge Rd./Big Bear to Sunset	5,600	22,500	0.25	A.
Clubview Drive/Moonridge to s/o Moonridge	4,700	11,700	0.40	A.
Big Bear Blvd./Moonridge to Stanfield	18,800	33,800	0.56	A.
Fox Farm Rd./Big Bear to Starvation Flats	800	11,700	0.07	A.
Fox Farm Rd./Starvation Flats to Division	400	11,700	0.03	A.
Starvation Flats/Sr-18 to Fox Farm	1,000	11,700	0.09	A.
SR-18/Stanfield Cutoff to Division	15,400	11,700	1.32	O.C.
SR-18/Division to Greenway	14,300	11,700	1.22	O.C.
A.=Acceptable O.C.= Over Capacity				

Peak hour traffic operations analysis was also conducted at eight intersections in the study area. Four of these intersections are within the City along SR-18. The remaining 4 locations are located outside the City but were required to be analyzed in accordance with CMP requirements. They are also key locations along regional access routes to the City. Table C-3 summarizes the results of this analysis. At those intersections located west of the City, overall level of service is

acceptable, but the minor street movements trying to cross or merge with the main street flows are subject to extensive delays. The intersection of Big Bear Boulevard, Paine Road and Village Drive experiences LOS "F" under existing peak winter conditions. The signalized intersection of Pine Knot Avenue at Big Bear Boulevard also experiences LOS "F" conditions overall, as westbound traffic on SR-18 merges from two travel lanes into a single westbound through lane at this intersection. All other intersections analyzed currently experience acceptable (LOS "D" or better) traffic operations.

Table C-3
Existing Winter Sunday PM Peak Hour Intersection Analysis Summary

Intersection	Traffic Control	Level of Service (PM)
SR-18 (NS) at: • SR 330 (EW)	Cross street stop	B
SR-38 (NS) at: • SR-18 (EW)	Cross street stop	A
Paine (NS) at: • Big Bear Boulevard	Cross street stop	F
Pine Knot Ave.(NS) at: • Big Bear Blvd. (EW)	Traffic signal	F
Moonridge Rd (NS) at: • Big Bear Blvd. (EW)	Traffic signal	B
Starvation Flats Rd. (NS) at: • Big Bear Blvd. (EW)	Traffic signal	C
Greenway Dr. (NS) at: • Big Bear Blvd. (EW) • North Shore Dr. (EW)	 Traffic signal Cross street stop	 B A

Estimate of Future Buildout Traffic Conditions

The traffic consultant estimated future buildout traffic conditions based upon the draft land use plan and the modeling methodology described above to determine estimated traffic volumes and recommended roadway designations and improvements within the City. The model considered travel to and from the area by visitors and by residents, and intra-mountain travel. The model was based upon a proposed network of arterial and collector roads. Based upon this analysis, the consultants formulated a series of recommendations for circulation planning within the City's General Plan, which are contained in the following sections of the element.

CIRCULATION PLAN RECOMMENDATIONS

Recommended Level of Service

One of the challenges for the City of Big Bear Lake will be to balance the circulation needs of the community with the residents' desire to maintain the natural mountain environment. As noted in the Introduction, two of the Guiding Principles of the General Plan are "*Providing and encouraging proper stewardship for the lake, forest, natural environment, our heritage and recreational resources*," and "*Constructively addressing the transportation and circulation needs of our Valley.*" While many residents want to improve circulation and ease traffic congestion, they are opposed to the construction of four-lane roadways within the community if these wide streets are not required to maintain acceptable levels of service. Therefore, it is critical that the community agrees on acceptable levels of service on its roads and highways.

The Traffic Impact Analysis conducted for the General Plan studied peak traffic conditions, which were identified as winter Sunday afternoons. Based on typical snow conditions during ski season, it may be assumed that between November and March there may be 20 to 25 weekend days during which traffic conditions will be most congested and when the level of service will be lowest. During the rest of the year, roads are less congested and the level of service will generally be better. The community must decide whether the City should plan for and build streets that are wide enough to handle peak traffic conditions without delays, or whether road widths that handle normal traffic conditions acceptably during non-peak times are adequate. Based on the discussions and workshops held during General Plan preparation, the community has expressed a desire to maintain the natural environment and forego widening of streets to four-lane roadways whenever possible. Therefore, it has been determined that the City will not attempt to build a roadway system to meet the peak traffic demands of winter ski weekends, but instead that a service level of E at peak hours on peak weekends will be acceptable. During weekdays and during off-seasons, a level of service D will be acceptable on roadways within the City. These service level goals have been incorporated into the policies of this element.

Recommended Roadway Designations

Three roadway designations are recommended to be included on the General Plan Circulation Map: primary arterials, secondary arterials and collectors. These designations, are described below. Local roads, which provide land access and neighborhood circulation throughout the City, are not included on the Circulation Map; however, policies are included in this element to ensure that these roadways function well to meet local access needs while protecting neighborhoods from through-traffic and high speeds.

Primary Arterials. The typical design section for primary arterials includes a right-of-way of 80 feet, of which 64 feet is paved. Two striping plans are possible for a primary arterial. The curb to curb pavement width of 64 feet can be designated for use by two lanes of traffic in each direction, with a shoulder wide enough to accommodate parked vehicles. Alternately, the pavement can be

striped to accommodate two lanes of through traffic in each direction, with a center left turn lane treatment and no parking on the shoulders; this alternative is the most typically used.

Secondary Arterials. The typical section for secondary arterials includes a 60 foot right-of-way with a pavement width of 44 feet. The secondary arterial can be striped to accommodate one through travel lane in each direction, and either a center turn lane or on-street parking, with sidewalks on each side. This cross-section may be modified based upon adopted specific plans or existing conditions.

Collector Roads. The typical section for a collector includes a sixty (60) foot right-of-way, allowing for one travel lane and on-street parking in each direction. Some designated collectors within existing neighborhoods contain only a forty (40) foot or fifty (50) foot right-of-way, which may be permissible as an existing condition in those areas provided that traffic safety is ensured. Within a forty (40) foot right-of-way, the paved width only allows for a single travel lane in each direction with no on-street parking. If on-street parking is allowed on both sides, there would be enough width for only one travel lane to carry traffic in both directions. Within a fifty (50) foot right-of-way, two travel lanes with on-street parking may be possible. City review of these road widths will be required to ensure that the City's circulation system is not impacted in the long term. In 1997, each of the designated collector roads in the City carried less than 3,000 vehicles per day.

Recommended Roadway Plan

Based on the traffic analysis, the consultants presented a number of recommendations which have been incorporated into the Circulation Element. Some of these recommendations represented a change from the 1984 General Plan Circulation Element. These recommendations are listed below, and the proposed Circulation Plan is shown on Exhibit C-1.

1. The 1984 Circulation Element identified a one-way street system in the vicinity of the Village. Experience with other resort communities indicates a strong resistance to one-way street systems in a resort settings, because they impart a sense of urbanization not typical of the resort setting and are inconvenient during non-peak conditions. Therefore, the Circulation Element does not contain one-way streets, and recommends that their use be carefully evaluated prior to any future proposed use.

2. The current route which SR-18 follows near the Village is the most appropriate location for further roadway widening. The Circulation Plan therefore designates the current SR-18 route near the Village (including Big Bear Boulevard, Paine Road and Lakeview Drive) as primary arterial roadway segments.

3. The only other roadways recommended to be designated as primary arterials are Moonridge Road from Big Bear Boulevard to Clubview Drive and Summit Boulevard from Big Bear Boulevard south to the Snow Summit ski area. These roadways were designated as primary

arterials previously, and the pavement cross-sections already conform to the primary arterial cross-section along most of the designated segments.

4. Most of the secondary arterials previously designated on the General Plan Circulation Map are recommended to be eliminated from this Circulation Element. These roadways serve low density residential uses and the anticipated daily traffic volumes indicate that the collector designation is suitable for these roadways.

5. Pine Knot Avenue between Village Drive and Big Bear Boulevard and Village Drive from Paine Road to Pine Knot Avenue have been retained as secondary arterials in this Circulation Element. These roadways serve to provide access to the Village commercial area.

6. The only roadway which has been upgraded in this Circulation Element compared to the previous General Plan is Stanfield Cutoff. The location of this roadway as a connection between SR-18 and SR-38 near the eastern end of the community results in projected increases in future traffic which will warrant designation as a secondary arterial.

7. All other roadways not listed above which are shown on the Circulation Plan are designated as collector roadways. Collectors are intended to provide access to the arterial roadway system, and they also provide emergency vehicle access to areas within the community.

8. Where a roadway changes designations, the higher designation should be carried through the intersection where the change occurs. A transition of at least 600 feet should be anticipated where this occurs. This recommendation has been incorporated into the element as a policy.

9. In addition to roadway widenings in accordance with the Circulation Plan, several intersection improvements are recommended to provide for acceptable traffic operations in the traffic analysis study area. These are listed below:

   - The intersection of SR-18 (NS) and SR-18/SR-38 (EW) just west of the City will require a traffic signal and additional turn lanes.

   - The intersection of Paine Road (NS) and Big Bear Boulevard/Village Drive (EW) will also require installation of a traffic signal and augmented turning lanes, in addition to the primary arterial cross-section improvements.

   - The intersection of Pine Knot Avenue (NS) and Big Bear Boulevard will require improvements on all four approaches.

   - Additional improvements at the intersection of Moonridge Road/Garstin Drive (NS) and Big Bear Boulevard (SR-18, EW) will be required, including an eastbound right turn lane.

10. Based on their analysis, the consultant concluded that the traffic impacts generated from the proposed Land Use Plan can be mitigated to a level of insignificance, if the recommended Circulation Plan is adopted and the augmented intersection improvements are made. Mitigation will also require the City to require that all future development contribute towards its fair share cost of the needed improvements. It will also be necessary for the City to pursue regional funding to mitigate traffic impacts. These recommendations have been incorporated as policies in this element.

11. Finally, the consultant recommended that the City require any new development projects to prepare opening year traffic studies, and that the City cooperate with Caltrans to ensure that the CMP monitoring requirements at CMP intersections within and near the City are fulfilled. Additionally, the City should continue to cooperate with San Bernardino County and SANBAG in ongoing efforts to evaluate mountain access issues. These recommendations have been incorporated as policies in this element.

Other Roadway Issues

SR 18 Bridge and Highway Realignment Project. Since 1990 the Federal Highway Administration and California Department of Transportation have been studying proposals to replace the Big Bear Lake Bridge located on State Route 18 near the City of Big Bear Lake. The bridge is located near the junction of SR-18 and SR-38, approximately one mile west of the city limit. Five alternatives were originally proposed for this project, but two alternatives were withdrawn after preliminary analysis. The withdrawn alternatives included constructing a new bridge over the existing dam or a new bridge downstream of the dam with realignment of the roadway through the mountainside, and they were eliminated due to potential adverse environmental impacts, engineering concerns and cost factors. The remaining three alternatives which were further evaluated included: 1) a no-build alternative; 2) a new bridge across Big Bear Lake east of the existing bridge; and 3) a new bridge downstream of the 1911 Bear Valley Dam.

The existing bridge is a two-lane roadway constructed in 1924 atop the 1911 Bear Valley Dam. The proposed project would consist of the following components: constructing an approximately 76-foot wide bridge; realigning and widening the approach roadways on SR-18 and SR-38; signalizing the junction of SR-18 and SR-38 at the west end of the new bridge; and constructing retaining walls on SR-18 and SR-38. It has been determined that alternatives 2 and 3 listed above would both have an adverse effect on historical resources in the area, namely the dam keepers's house and the Big Bear Southwest Shore Historic District.

One component of the undertaking, the west approach roadway, is on the Rim of the World Scenic Byway. In February 1990 the USFS designated the 107-mile long Rim of the World Scenic Byway as part of the agency's scenic byway program, created in May 1988. The highway qualified for designation due to its high degree of scenic, natural and historic qualities, which are significant at the state and national level.

Because this project is outside the City limits of Big Bear Lake and located on a State highway, the City has no jurisdiction over the project. However, the bridge reconstruction and roadway realignment will have a major impact on the City because of its location at one of the City's primary gateways. SR-18 is also a major access point from the San Bernardino Valley and serves as an emergency access route. The City has been participating in ongoing meetings and review of the proposed project, and will continue to do so. A policy has been added to this Element underscoring the City's commitment to cooperate in the planning and review of this project.

Circulation Issues Related to Local Streets. One of the major circulation issues facing the City in coming years will be the repair and reconstruction of local streets throughout the community. Many of the existing streets were originally developed as graded dirt or gravel roads. Beginning in the 1950s, local paving contractors were hired to surface these roads with asphalt paving. In many cases the paving materials were applied directly over the gravel road surface, rather than over base material as recommended by street engineering standards. Additionally, in many cases roadways were never aligned vertically and horizontally to provide optimum drainage and visibility, banking of curves and other design considerations meant to enhance driver safety. As a result, many of the City's existing roadways are deteriorating and are in need of resurfacing, pot-hole repair, or reconstruction. Over the past few years the City has undertaken roadway improvement projects on a few well-traveled streets such as Park Avenue and Fox Farm Road. In the future, the City must commit funding each year to repair and maintenance of the local road system. These improvements will not only enhance convenience and safety for City residents, but will assist the City's economic development efforts with respect to tourism by making the City a more inviting place for visitors. The City has prepared and will implement a Master Plan of Streets and Pavement Management Program to address this issue.

Related to the issue of street conditions is that of streets which, due to their narrow width, steep grades and sharp curves, are not deemed to be fully accessible to emergency equipment such as fire trucks, especially in winter conditions. Particularly in some portions of Moonridge, emergency access is constrained by substandard road conditions. This condition may inhibit certain types of development in these areas, particularly some forms of commercial uses, until such time as the streets can be improved or fire safety can be provided for by other means. In many cases, current development patterns preclude widening of streets because of the placement of adjacent structures.

Currently the City handles street maintenance, and contracts with private contractors for snow-plowing services. Snow-plowing requires a substantial portion of the roadway maintenance budget. The City will continue to evaluate methods of containing these costs and providing the most efficient and effective service to residents.

Another issue related to the condition of the local street system is that of connectivity within the community. Due to the lack of east-west street connections, often locally-generated traffic must use Big Bear Boulevard (SR-18) for intra-City trips such as shopping, obtaining services and conveying children to schools and parks. As noted above, the use of a roadway for local access may impact its capacity to provide mobility. If alternate routes for local trips were available Big

Bear Boulevard could function better as a primary arterial for through traffic. In reviewing possibilities for alternate routes north of the Boulevard, a potential alternate route connecting the central portion of the City to the east would include Park Avenue, Swan Drive and Fox Farm Road, which connect Knight Avenue to Division Drive. South of the Boulevard, Pennsylvania Avenue, Jeffries Road, Oak Drive, Eureka Drive, McWhinney Lane, Wren Drive, Brownie Lane and Evergreen Road provide a somewhat circuitous route connecting the Village to Moonridge Road. While many local residents know the streets well enough to find alternate routes, trying to route visitor traffic along these streets would be difficult and may impact residents with homes adjacent to these roads. In reviewing future development plans within the City the issue of connectivity should be considered, and a policy to address this need has been included in the element.

Roadway Design Issues. Roadway design issues include the optional placement of curb, gutter and sidewalks; preservation of clear sight distance for drivers; adequate street width and striping; use of maximum grades for driver safety; and allowance for on-street parking. In general, the City has required curbs, gutters and sidewalks only within new residential subdivisions and commercial developments. These improvements are not required on infill residential development, and have been deferred for some new commercial/industrial development where there are no existing improvements along the adjacent street. Driver sight distance within the City is primarily hindered by the placement of illegal signs adjacent to driveways and intersections, especially along Big Bear Boulevard. Provisions to maintain clear driver visibility should be strictly enforced. Maximum road grade within the City will continue to be 10 percent, unless otherwise approved for short distances by the City Engineer. Finally, the City allows on-street parking on all City streets except for restrictions during winter conditions for snow plowing, or as determined by the City Council on a case by case basis, and this policy will be continued.

Truck Routes. Prior to adoption of this General Plan the City had no designated truck routes. This Element proposes designating State Route 18 as a truck route. This designation will allow the City to ensure that trucks do not use other streets for travel routes, other than to reach a delivery point.

Constraints to Improving the Circulation System

The primary constraint for the City in improving the existing and planned roadway system will be fiscal. It has been estimated that over $20 million will be required to resurface the existing roads within the City. Since most of the City is already developed, financing mechanisms which depend upon new development, such as traffic impact fees, are not a viable option. Issuance of bonds to pay for needed improvements through formation of assessment districts or community facilities districts would require a 2/3 vote of the registered voters residing in the City, which may be difficult to achieve. Therefore, it may be necessary for the City to use general fund moneys in addition to Measure I, State gas tax revenue and state and federal grants to improve its roadway system.

Another constraint to upgrading the circulation system is the pattern of subdivided land and existing structures, which precludes street widening and local connections in many areas unless right of way is purchased from adjacent property owners. Some condemnation and removal of existing structures and buildings would be necessary for certain street widenings or intersection improvements. The cost of right of way acquisition may be prohibitive in all but a few instances where road widening is needed for traffic safety purposes.

ALTERNATIVE MODES OF TRANSPORTATION

Transit Service

Bus transportation is provided by the Mountain Area Regional Transit Authority (MARTA). The agency is a joint powers authority formed by the City of Big Bear Lake and the County of San Bernardino, which are both member agencies.

MARTA provides bus service between Big Bear Lake, Lake Arrowhead, Crestline and San Bernardino. Off-the-mountain (OTM) service is provided Monday through Saturday, with three runs provided on weekdays and two on Saturdays. Destination points for OTM service within the mountain areas include Big Bear Lake, Fawnskin, Running Springs, Lake Arrowhead, Blue Jay, Rim Forest and Crestline. Destination points within San Bernardino include the Metrolink station, the Greyhound bus station, the transit mall, various shopping centers, the County hospital Saint Bernardine's Hospital and the Department of Motor Vehicles.

Within the Big Bear Lake area, fixed-route service is provided daily with stops at Boulder Bay, the Village, Bear Valley hospital, Snow Summit, Bear Mountain, Stater Brothers shopping center, Big Bear City, Sugarloaf and Erwin Lake.

Dial-a-ride service is also available from MARTA on a year-round basis, provided that all trips must be booked the day before.

The City will continue to participate in provision of public transit to serve the residents of Big Bear Lake, and will seek to meet service needs as they may increase or change over time.

Alternative Regional Access Modes

In 1995 SANBAG received a grant from the California Department of Transportation for a "Big Bear Enhanced Ground Access Feasibility Study" to recommend an alternative to link the Big Bear area with the San Bernardino Valley floor. A Technical Advisory Committee consisting of officials from different city, county, and state agencies and the USDA Forest Service, as well as other stakeholders, helped to develop the document. The study, completed in 1997, evaluated several alternatives, all of which would require funding in the millions of dollars for implementation.

From time to time for several years, the idea of an alternative transportation mode connecting the Big Bear Valley with the Inland Empire has been advanced. Each time, the cost of constructing

such a transportation link has rendered the idea infeasible. At some point in time, given technological advances in transportation, it may be feasible to plan for an alternative access route. The City will continue to participate in any such planning efforts.

Pedestrian access

Sidewalks are provided within the City only in a few areas, including portions of Big Bear Boulevard, two streets in the Village, along portions of Moonridge Road and within the larger shopping centers. There are no sidewalks leading from residential areas to nearby schools or parks, although the low traffic volumes on most residential streets allows safe for pedestrian use.

The lack of convenient pedestrian access in many areas represents a challenge for the City in light of its economic goal to be a destination resort community. In many resort areas walking paths are an important part of the tourist amenities provided, especially adjacent to bodies of water. Additionally, the Village's role as a center for dining, entertainment and specialty retail would be enhanced if it were possible to walk to it directly from some of the nearby lodges and hotels.

From Pine Knot Avenue west to the City limits along Highway 18 there are no continuous sidewalks, and pedestrians walk on the shoulder of the roadway. Again due to high traffic volumes and speeds, this situation raises safety concerns.

In many areas it will be difficult to retrofit sidewalks and walkways into the existing development pattern due to the cost of right-of-way acquisition and lack of street connectivity. However, the need for pedestrian access should be considered when the City approves new development plans and upgrades existing streets. Additionally, the development of pleasant and attractive walkways connecting the Village and the lakeshore in the vicinity of Pine Knot Park and adjacent marinas should be considered, along with pedestrian connections from the Village to lodges and hotels within a half mile radius.

Bicycle Routes

The City's 1984 General Plan contained an exhibit showing bicycle routes and bicycle storage facilities. The proposed routes under this plan included Fox Farm Road and Swan Drive, from the eastern City limit to Meadow Park; Starvation Flats Road from Big Bear Boulevard to Fox Farm Road; Moonridge Road and Garstin Drive from Fox Farm Road to Bear Mountain; and a route connecting the Village to Moonridge Road via Pennsylvania Avenue, Oak Avenue , and Brownie Lane. Implementation of this plan has taken the form of signs indicating bicycle routes within portions of the City. No on-street bike lanes have been striped, and not all the routes on the General Plan exhibit have been signed. Additional right-of-way has not been required on the designated roadways to accommodate on-street bike lanes. No off-street bikeways were designated or have been constructed in the City.

In 1994 the San Bernardino Associated Governments (SANBAG) prepared a Regional Bicycle Plan for San Bernardino County. An exhibit included in this document shows proposed bike trails

the Big Bear Lake area. Within the City limits, only one bicycle route was designated, which followed the alignment of State Route 18 with a connecting link along Stanfield Cutoff between SR-18 and SR-38.

There are several constraints to designating an on-street bikeway along SR-18 (Big Bear Boulevard) throughout the City. In many portions of the City the right-of-way for this roadway is only about 40 feet. Within the four-lane segments of Big Bear Boulevard, the striping for travel lanes and a continuous left turn lane leave little room for bicyclists adjacent to the curb. The two-lane portions of the Boulevard contain a narrow pavement width of and no curbs and gutters, forcing bicyclists onto the dirt shoulders when traffic is heavy. Additionally, due to high traffic volumes and speeds, the highway tends to be noisy and dusty for cyclists, in comparison with other potential routes. SANBAG will be revising the County's bike trail plan in the future, and the City will participate in this effort with respect to the Big Bear planning area.

The City's preference for bicycle routes is to designate them off of the State highway. As noted in the Parks, Recreation and Open Space Element, the City will develop a Master Plan for Trails which includes bikeways. The goals for creating an effective, convenient bicycle trail plan will be to connect the trails with focal points such as the Village, the Lake, parks and schools, and to connect trails with other trails so as to achieve a continuous network within the City. The bike trail system should also connect with other regional trails, such as the North Shore trail on Forest Service property along the north side of the lake and other trails used by mountain bikers in the mountains south of the City.

Air Transportation

The Valley's air transportation needs are served by the Big Bear City Airport. The airport has a seventy-five foot wide, 5,850 foot long runway which currently handles approximately 40,000 general aviation takeoffs and landings annually. There is a charter service available at the airport, but no commercial carrier services the area. Although the airport is located outside the City and the City has no jurisdiction over its operations, the airport provides a valuable transportation link which serves City residents. The City will continue to provide support and coordination on any airport issues which affect City residents.

FUTURE DIRECTIONS

Provision of adequate circulation is vital to the long-term planned development of the City. Additionally, maintaining links between the City and the surrounding region is critical for sustaining economic development and developing jobs for Big Bear Lake residents. Construction of needed facilities will occur over a long time frame. The primary challenge for the City is to assure that adequate circulation improvements are properly phased and available for use at the time they are needed. The rate at which circulation facilities are constructed will be determined by their cost and availability of funding. This Element sets forth the City's goals to ensure that the circulation system is adequate to serve the community and visitors, now and in the future.

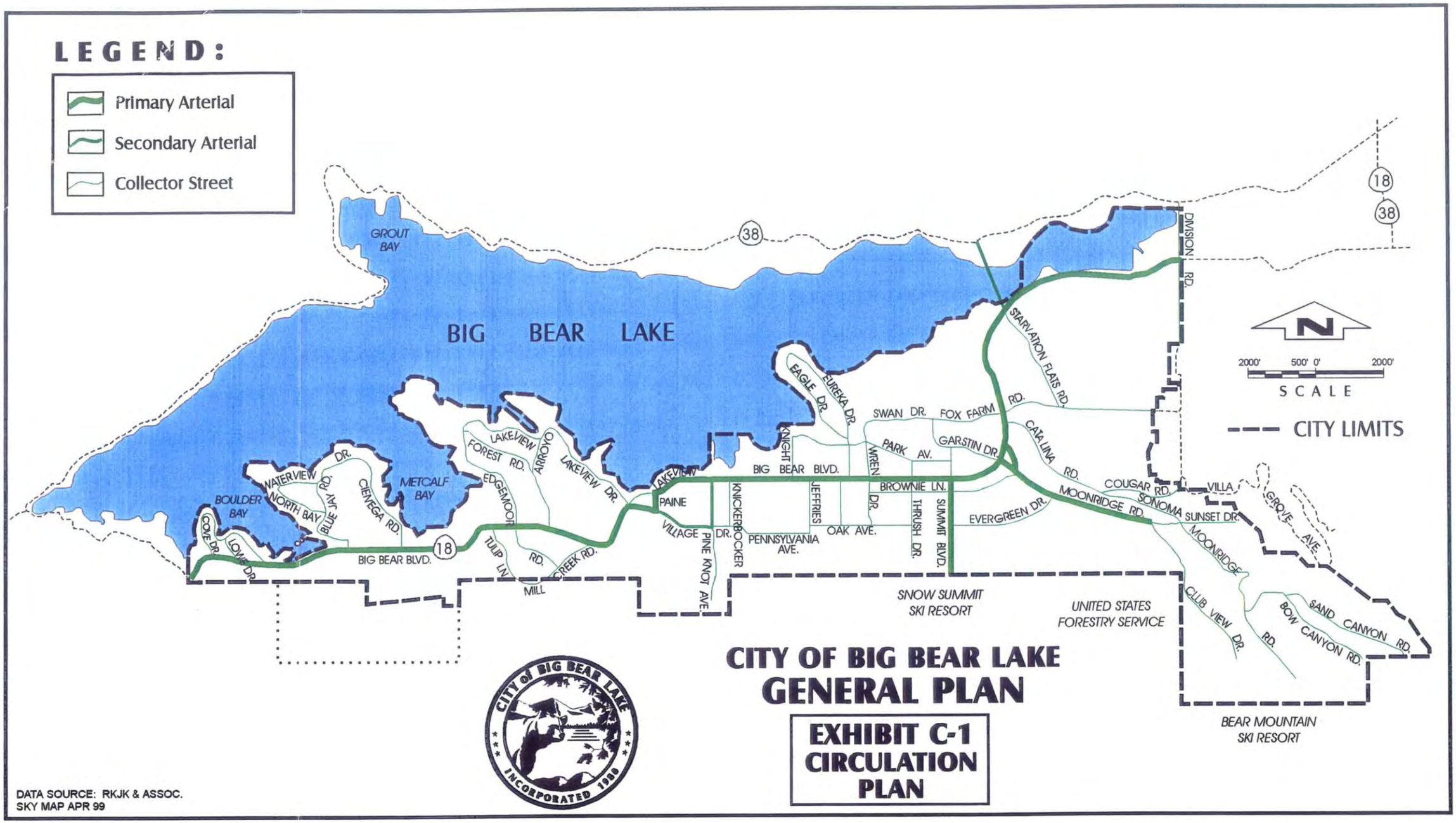
LEGEND:
Primary Arterial
Secondary Arterial
Collector Street
BIG BEAR LAKE
GROUT BAY
BOULDER BAY
NORTH BAY
METCALF BAY
38
18
BIG BEAR BLVD.
LAKEVIEW
PAINE
VILLAGE
PINE KNOT AVE.
KNICKERBOCKER DR.
PENNSYLVANIA AVE.
JEFFRIES
OAK AVE.
WREN
PARK AV.
KNIGHT
BROWNIE LN.
THRUSH DR.
SUMMIT BLVD.
EAGLE DR.
EUREKA DR.
SWAN DR.
FOX FARM RD.
GARSTIN DR.
EVERGREEN DR.
STARVATION FLATS RD.
CATALINA RD.
COUGAR RD.
MOONRIDGE RD.
SONOMA
SUNSET DR.
VILLA GROVE AVE.
MOONRIDGE
CLUB VIEW DR.
BOW CANYON RD.
SAND CANYON RD.
DIVISION RD.
TULIP LN.
MILL CREEK RD.
WATERVIEW DR.
BLUE JAY RD.
CIENEGA RD.
EDGEMOOR
FOREST RD.
LAKEVIEW ARROYO
LAKEVIEW DR.
COVE DR.
LOMA DR.
SNOW SUMMIT SKI RESORT
UNITED STATES FORESTRY SERVICE
BEAR MOUNTAIN SKI RESORT
2000' 500' 0' 2000'
SCALE
CITY LIMITS
CITY OF BIG BEAR LAKE
GENERAL PLAN
EXHIBIT C-1
CIRCULATION
PLAN
DATA SOURCE: RKJK & ASSOC.
SKY MAP APR 99
EXHIBIT C-1

Exhibit C-1
Circulation Plan Map

TO BE REPLACED WITH MAP EXHIBIT

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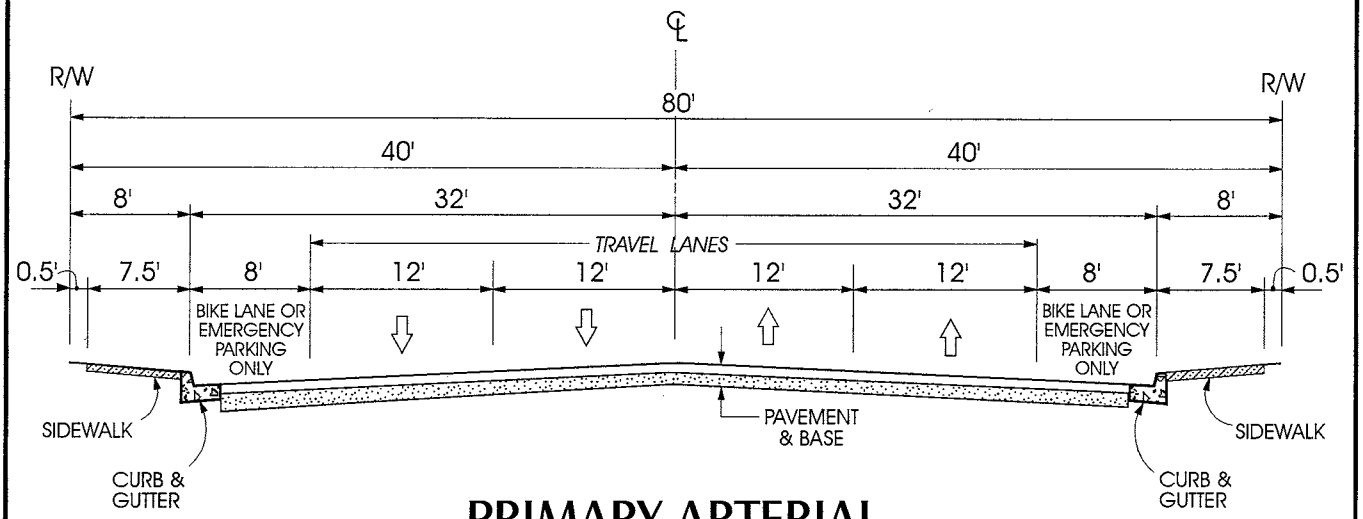
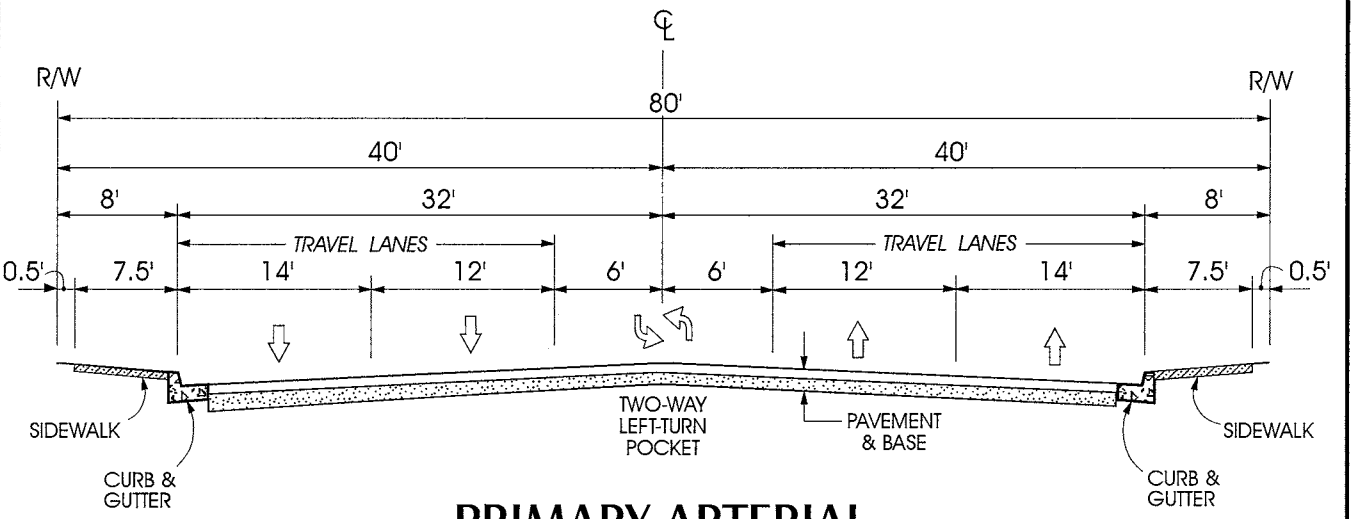


PRIMARY ARTERIAL

(WITH BIKE LANES OR EMERGENCY PARKING)

TYPICAL SECTION



PRIMARY ARTERIAL

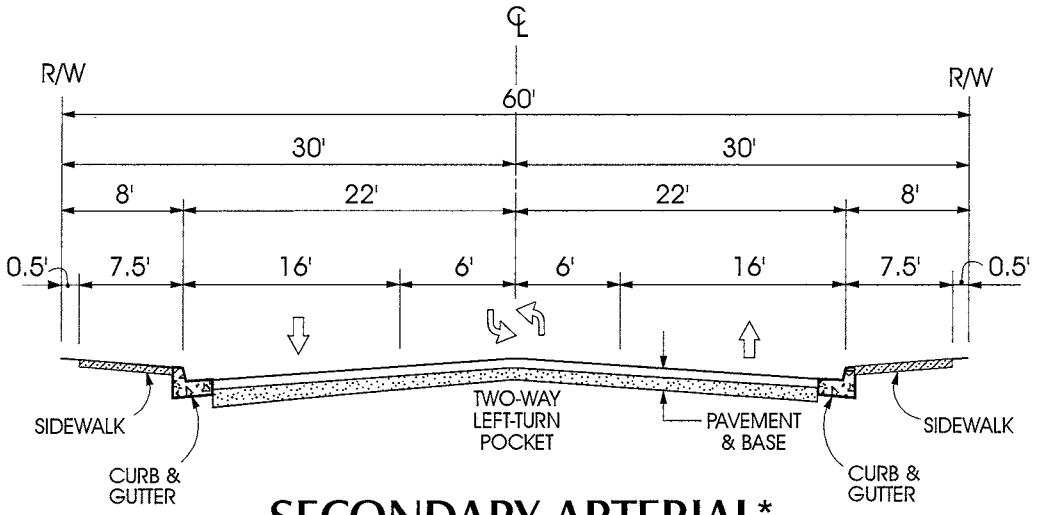
(WITH TWO-WAY LEFT-TURN POCKET)

TYPICAL SECTION

CITY OF BIG BEAR LAKE
GENERAL PLAN

EXHIBIT C-2a
RECOMMENDED TYPICAL ROADWAY CROSS-SECTIONS

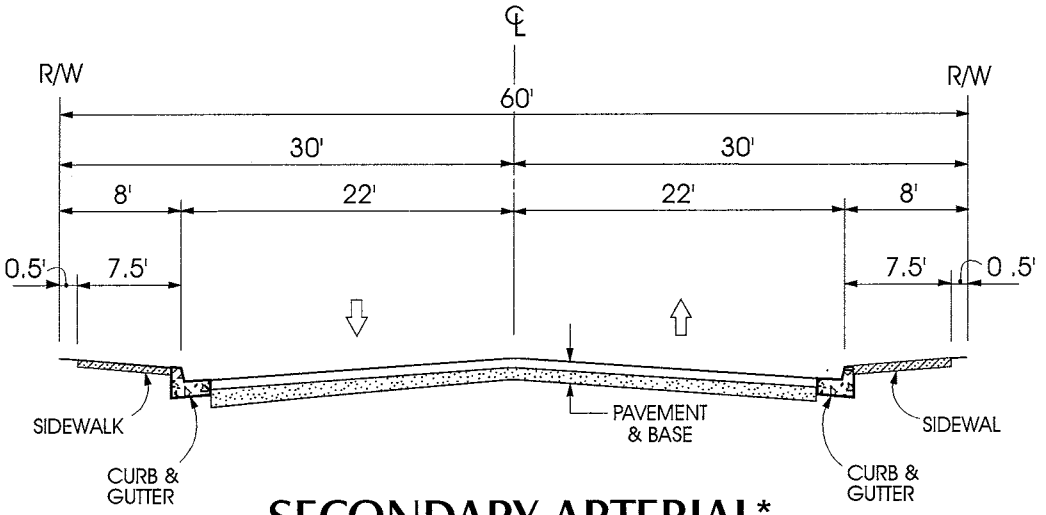
EXHIBIT C-2b



SECONDARY ARTERIAL*

(WITH TWO-WAY LEFT-TURN POCKET)

TYPICAL SECTION



SECONDARY ARTERIAL*

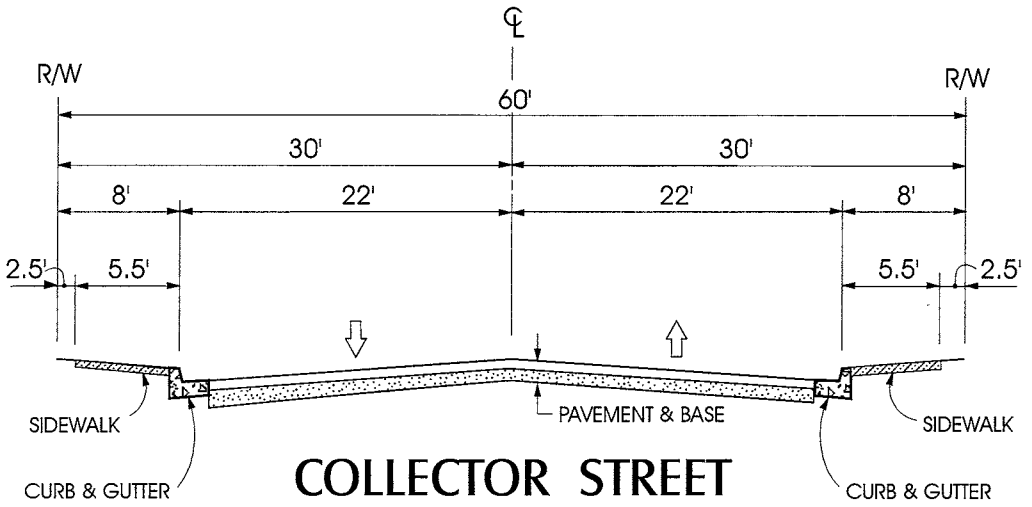
(NO TWO-WAY LEFT-TURN POCKET)

TYPICAL SECTION

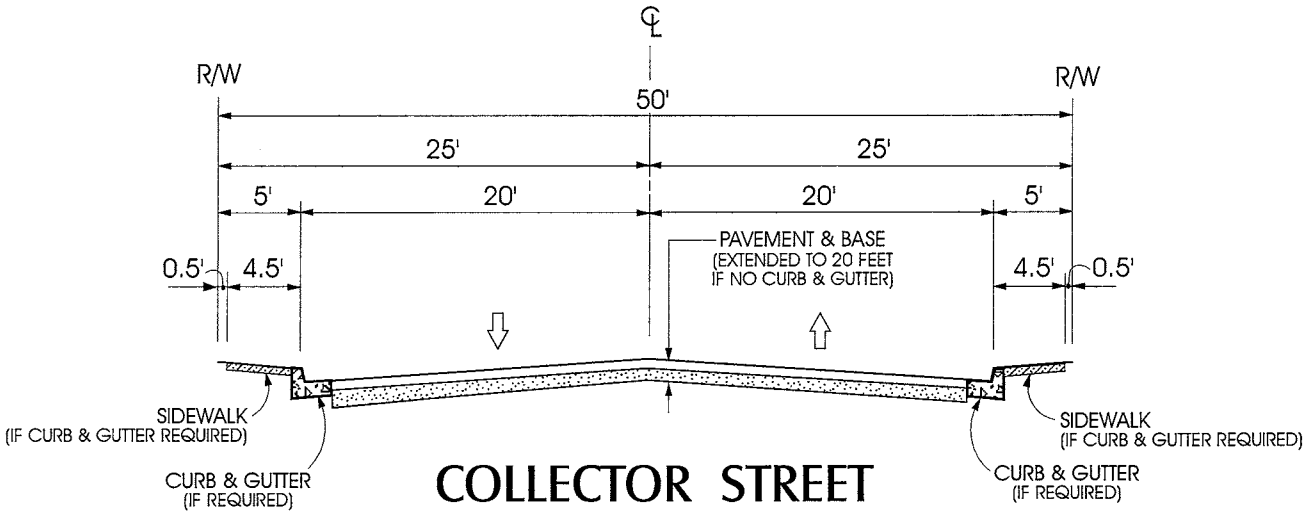
*THESE CROSS SECTIONS MAY BE MODIFIED BASED UPON ADOPTED SPECIFIC PLANS OR EXISTING CONDITIONS

CITY OF BIG BEAR LAKE
GENERAL PLAN

EXHIBIT C-2b
RECOMMENDED TYPICAL ROADWAY CROSS-SECTIONS



COLLECTOR STREET
(60 FOOT RIGHT OF WAY)
TYPICAL SECTION



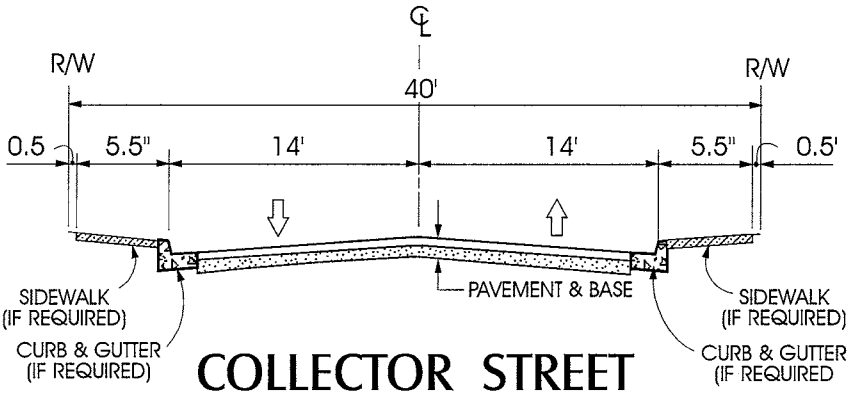
COLLECTOR STREET
*(50 FOOT RIGHT OF WAY)
TYPICAL SECTION

*ACCEPTABLE ONLY IF EXISTING DEVELOPMENT PRECLUDES A 60 FOOT RIGHT OF WAY.

CITY OF BIG BEAR LAKE
GENERAL PLAN

EXHIBIT C-2c
RECOMMENDED TYPICAL ROADWAY CROSS-SECTIONS

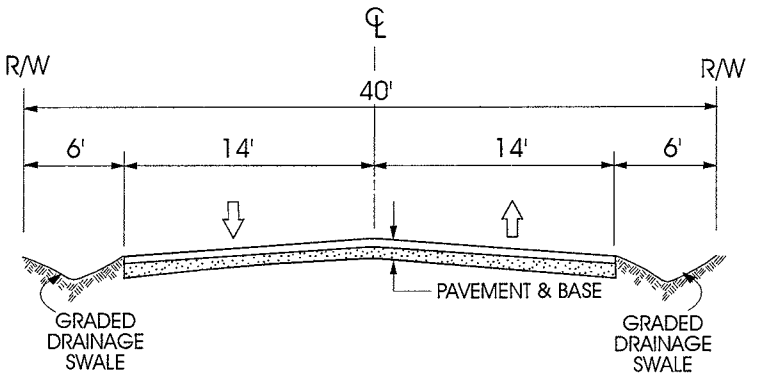
EXHIBIT C-2d



COLLECTOR STREET

*(40 FOOT RIGHT OF WAY)

TYPICAL SECTION



COLLECTOR STREET

with no curb and gutter

*(40 FOOT RIGHT OF WAY)

TYPICAL SECTION

*ACCEPTABLE ONLY IF EXISTING DEVELOPMENT PRECLUDES A 60 FOOT RIGHT OF WAY.

CITY OF BIG BEAR LAKE
GENERAL PLAN

EXHIBIT C-2d
RECOMMENDED TYPICAL ROADWAY CROSS-SECTIONS

CIRCULATION ELEMENT
GOALS, POLICIES AND PROGRAMS

GOAL C 1

Maintain and enhance the system of streets and highways so as to provide a safe, efficient, attractive and economical circulation network meeting current and future demands while minimizing adverse environmental impacts and maintaining community character.

Policy C 1.1
Adopt and implement a street and highway plan designed to meet existing and future circulation needs, including but not limited to the following:

a. Street widths and design standards shall be established to accommodate the projected traffic to be generated by build-out of the land use plan;
b. Roadways within the planning area shall be designated as major arterial, secondary arterial, collector or local streets, with all streets other than local streets shown on the Circulation Plan as depicted on Exhibit C-1;
c. All roadways shall be required to be designed and constructed in accordance with the adopted Circulation Plan (Exhibit C-1), to ensure appropriate capacity and level of service for each roadway;
d. The circulation system should be designed so as to protect existing neighborhoods and/or significant environmental resources, wherever feasible.

Program C 1.1.1
Adopt a Master Plan of Roads which conforms to the adopted Circulation Plan, and maintain these documents with amendments as needed to ensure that the circulation system will be adequate to support planned land uses.
Responsible Agency: Engineering Division, reviewing authority
Schedule: 1999 and ongoing

Policy C 1.2
Adopt standards for roadway design and level of service which promote public safety, convenience and efficiency, including the following:

a. Strive to maintain a Level of Service E or better on all intersections and roadway segments within the City during peak traffic times, and a Level of Service D or better during weekdays and off-peak times, to the extent practical;
b. Require that streets be constructed and maintained in accordance with standard cross sections as shown on Exhibit C-2, except as modified by adopted specific plans or as otherwise approved by the City Engineer, when it can be demonstrated that deviating from these cross sections will not impair public safety;
c. Require installation of curb, gutter, match-up paving and sidewalks within public rights-of-way or where deemed necessary to protect public safety and enhance public convenience,

except that these requirements may be deferred by the City Engineer in cases where adjacent streets are not otherwise improved and assurance of future participation in improvements is provided;

d. Require that public streets be designed with a maximum grade of ten (10) percent, except for short distances as approved by the City Engineer when it is determined that the street design provides for public safety. On private driveways, grades should not exceed fourteen (14) percent and adequate landing areas should be provided at driveway approaches;

e. Require that clear sight distance be maintained at all intersections and driveway approaches. This requirement may necessitate the removal or relocation of landscaping, signs or other visual obstructions which may impair drivers' views of oncoming traffic;

f. Allow on-street parking on City streets, except for State Route 18 or where otherwise restricted for snow removal or as determined by the City Council;

g. Where a roadway changes designations, the higher designation should be carried through the intersection where the change occurs. A transition of at least 600 feet should be anticipated where this occurs;

h. Avoid the use of one-way streets unless traffic analysis warrants their use and other alternatives to achieving mobility and capacity of the affected streets have been evaluated and found to be infeasible;

i. Require a minimum 26-foot wide paved access from an improved public street to all developments other than single family residences on existing lots; access roads should be increased to 28 feet in width within 200 feet of an intersection with a public street. The City Engineer may approve a reduction of these standards when it can be determined that site grading would be minimized and that adequate public safety and emergency access can be otherwise provided.

j. Roadways should be designed to function safely and effectively, without the subsequent need for excessive traffic control devices;

k. Private streets, other than driveways and alleyways typically associated with multiple family development, should be constructed to City standards for public rights-of-way, and should be used only for gated communities.

l. Require provision of secondary access for new development to provide emergency ingress and egress when deemed necessary to protect public health and safety, which may include provision of a 24-foot paved or all-weather surface secondary access roadway or other improvements as determined by the City Engineer and Fire Chief.

Program C1.2.1
Evaluate circulation plans and street improvement plans for all new developments and capital improvement projects to ensure compliance with these policies.
Responsible Agency: City Engineer and reviewing authority
Schedule: Ongoing

Policy C1.3
Intersections shall be designed and located to promote safe and efficient circulation, through application of the following policies:

a. Local to local street intersections and local to collector street intersections should be spaced at least 150 feet apart, from centerline to centerline, unless additional room is needed for queuing in a left turn lane. Intersections on arterial streets should be spaced at least 300 feet apart;
b. Intersections, including knuckles, should generally be perpendicular. Public streets should intersect at a 90 degree angle plus or minus five degrees. Knuckles should be constructed at a 90 degree angle, plus or minus 10 degrees;
c. Excessive grade variations, curves or other features which impair sight distance at intersections should be avoided;
d. For intersections of collector or larger streets, four-way intersections are preferable to offset or "T" intersections.

Program C1.3.1
Evaluate circulation plans and street improvement plans for all new developments and capital improvement projects to ensure compliance with these policies.
Responsible Agency: City Engineer and reviewing authority
Schedule: Ongoing

Policy C1.4
Ensure that the City street system is adequately maintained to promote safety and extend the useful life of roadways, through the following measures:

a. Pro-actively maintain City streets, and include appropriate funding for this in the City's annual budgeting process;
b. Require assurance of long-term maintenance for any private streets constructed within the City;
c. Improve the existing street network through implementation of the Capital Improvement Program and through requirements placed upon new development approvals;
d. Identify and mitigate existing areas of deficiency within the street system and provide mitigation and improvements to the extent practical;
e. Periodically monitor levels of service, traffic accident patterns and physical conditions of the existing street system, and upgrade roadways as needed through the Capital Improvement Program;
f. Establish and maintain a pothole repair program which emphasizes timely response;
g. Establish and maintain a roadway pavement management program that sets forth budgeting, timelines and schedules for maintenance of existing roadways in the City;
h. Regularly evaluate snow-plowing services provided in the City to ensure that providers minimize damage to streets.

Program C1.4.1
Annually prepare and implement the City's Capital Improvement Plan and Pavement Management Program to ensure compliance with these policies.
Responsible Agency: City Engineer, Public Works Department, City Council to authorize funding
Schedule: Ongoing

Policy C1.5
Seek to maintain and improve the capacity and service levels of arterial streets and highways within the City to enhance mobility, through the following measures:

a. Provide for turn lanes at arterial intersections and along roadway segments where needed to achieve acceptable levels of service;
b. Assure safe and efficient arterial operations through control of access points, signal spacing and other design considerations;
c. Discourage direct residential driveway access onto arterials, except where no other feasible access is available;
d. Encourage use of shared access points for non-residential development to limit the number of driveways along arterial streets;
e. Arterial streets should be designed so as to eliminate jogs and discontinuities and facilitate regional traffic flow;
f. Investigate and evaluate the use of alternate east-west access routes to serve intra-city trips, so as to reduce congestion on SR-18 from local traffic.

Program C1.5.1
Evaluate circulation plans and street improvement plans for all new developments and capital improvement projects to ensure compliance with these policies. Require traffic studies or traffic impact analyses for new developments, when appropriate.
Responsible Agency: City Engineer and reviewing authority
Schedule: Ongoing

Program C1.5.2
Seek funding for design and construction of intersection improvements at the following locations, and implement these improvements when feasible:

a. The intersection of Paine Road, Big Bear Boulevard and Village Drive;
b. The intersection of Pine Knot Avenue and Big Bear Boulevard;
c. The intersection of Moonridge Road/Garstin Drive and Big Bear Boulevard.

Responsible Agency: City Engineer, Public Works Department, City Council
Schedule: Ongoing

Policy C1.6
Ensure that the local street system provides safe and convenient access to residential neighborhoods while protecting the character of these areas, through the following measures:

a. Limit the use of local residential streets by through traffic, except along designated collector streets. To discourage excessive speed and through traffic, street width should not exceed that required for the level of use;
b. Cul-de-sac length should not exceed six hundred (600) feet, and "dog-leg" cul-de-sacs with one or more turns between the bulb and the outlet should be avoided;
c. Direct driveway access should be onto local streets rather than collectors, where feasible;
d. Local streets should be designed to create logical and understandable travel paths for the user;
e. Local street patterns should provide access between neighborhoods, with the exception of through traffic which should be directed onto collectors and arterial streets.

Program C1.6.1
Evaluate circulation plans and street improvement plans for all new developments and capital improvement projects to ensure compliance with these policies.
Responsible Agency: City Engineer and reviewing authority
Schedule: Ongoing

Policy C1.7
Ensure that traffic impacts resulting from new development in the City are adequately evaluated and that applicants are required to construct or provide a fair share contribution towards the improvements needed to mitigate impacts to the local and regional circulation system which are attributable to each development project, through the following measures:

a. Development proposals with the potential to generate traffic volumes or other impacts not adequately evaluated in the Circulation Element and General Plan Environmental Impact Report may be required to prepare and submit a traffic study or traffic impact analysis, as determined by the City Engineer;
b. Projects will be conditioned to ensure that right-of-way is reserved wherever needed to implement the Circulation Plan;
c. All development projects will be evaluated to ensure their conformance with the Circulation Plan;
d. New development will be required to pay a fair share contribution towards the cost of needed regional improvements;
e. In reviewing new development projects, the issue of connectivity will be evaluated as well as roadway capacity, in order to achieve an efficient overall circulation system;
f. Cumulative and regional impacts of new development on the circulation system will be required to be mitigated to the extent feasible, concurrent with development;
g. Ensure that new developments are required to provide improvements or mitigation necessary to maintain the existing or recommended level of service, whichever is less, which may include construction of improvements or payment of in-lieu fees.

Program C1.7.1
Through the development review and environmental review processes, evaluate circulation plans and street improvement plans for all new developments and capital improvement projects to ensure compliance with these policies, and require mitigation of traffic impacts through appropriate means.
Responsible Agency: Development Review Committee, City Engineer and reviewing authority
Schedule: Ongoing

Policy C1.8
Plan for the development of streetscapes on arterials which present an aesthetically pleasing appearance, promote ease of use for pedestrians and bicycles, and provide for maximum public safety through their design features, including the following measures:

a. Encourage use of landscaping and construction materials which discourage graffiti on walls adjacent to public rights-of-way.
b. Encourage the use of street furniture such as seating, light standards, trash receptacles and other similar features to establish design themes on arterial streets and provide amenities for pedestrians, where appropriate.
c. Promote unified landscape treatment on arterial streets, where appropriate. Where a design theme has been established on a street, promote the extension of that theme along other portions of the street, where feasible and appropriate.

Program C1.8.1
Through the development review and environmental review processes, evaluate circulation plans and street improvement plans for all new developments and capital improvement projects to ensure compliance with these policies, and require improvements when warranted.
Responsible Agency: Development Review Committee and reviewing authority
Schedule: Ongoing

Policy C1.9
Participate in multi-jurisdictional efforts to upgrade and expand the regional street and highway network, and to plan for feasible alternate modes of transportation connecting the Big Bear Valley with other areas, through the following measures:

a. Cooperate with other agencies and jurisdictions, including Caltrans, SANBAG, San Bernardino County and the U. S. Forest Service, regarding regional transportation issues relating to the City which may include but are not be limited to the SR-18 bridge project and improvements to State Highways 38, 18 and 330;
b. Support local, regional, state and federal agencies in identifying and implementing funding alternatives to upgrade the circulation system within the City;
c. Communicate regularly with Caltrans to obtain advance notice of construction schedules, road closures, winter road conditions, alternative routes and other conditions which affect the City's residents and visitors;
d. Cooperate and coordinate with Big Bear Airport District regarding issues affecting the City.

Program C1.9.1
Participate on regional transportation committees and coordinate with other agencies regarding plans, programs, funding sources and services which affect the quality and safety of the City's circulation system.
Responsible Agency: Planning, Engineering, Public Works Divisions, City Manager and City Council
Schedule: Ongoing

Policy C1.10
Ensure adequate access within the planning area for trucks while protecting incompatible uses from through truck traffic, by designating SR-18 throughout the City limits as a truck route and by restricting through truck routes within residential neighborhoods.

Program C1.10.1
Coordinate with Caltrans to designate and sign SR-18 as a truck route within City limits.
Responsible Agency: Engineering Division
Schedule: 1999 and ongoing

GOAL C2

Reduce the number of trips and vehicle miles traveled by individuals within the City, and to and from the City.

Policy C2.1
Continue to participate in provision of public transit services for City and Valley residents, and expansion of transit service to meet growth when warranted and feasible.

Program C2.1.1
Continue to participate in the Mountain Area Rapid Transit Authority (MARTA) as a member of the joint powers agency, and provide support and coordination as needed.
Responsible Agency: Public Works, City Manager, City Council
Schedule: Ongoing.

Program C2.1.2
Promote the use of public transit by assisting in the designation of safe and convenient transit stops, with seating and shelters where appropriate.
Responsible Agency: City Engineer, Planning Division
Schedule: Ongoing

Policy C2.2
Ensure compliance with the County's Congestion Management Plan (CMP).

Program C2.2.1
Require that new development projects which have the potential to affect the level of service on designated CMP roadways shall comply with the CMP.
Responsible Agency: City Engineer, reviewing authority
Schedule: Ongoing

Program C2.2.2
Assist with monitoring requirements on CMP roadways, if needed.
Responsible Agency: City Engineer
Schedule: Annually or as required by the CMP.

Policy C2.3
Evaluate the feasibility of providing shuttle service within the City for special events, to reduce congestion and provide more convenient access between parking and such events.

Program C2.3.1
Work with event promoters and other interested parties to assist in studying the feasibility and cost effectiveness of establishing remote parking and shuttle services for special events.
Responsible Agency: Planning and Engineering Divisions
Schedule: Ongoing as needed

GOAL C3
Encourage the use of non-vehicular transportation throughout the city.

Policy C3.1
Enhance accessibility and convenience for bicyclists and pedestrians, and plan for provision of scenic recreational trails in the City where practical.

Program C3.1.1
Prepare a Master Plan for Trails for the City which includes but is not limited to the following issues:

a. Use of flood control easements and public utility easements for trails;
b. Use of public rights of way for trails;
c. Trail links needed between open space and recreational areas;
d. Potential locations for trails near the lakefront;
e. Potential locations for trails along Rathbun Creek;
f. Appropriate locations for on-street bikeways;
g. Links with existing and planned trails in unincorporated County areas and the U. S. Forest Service;
h. Trail locations for bicycles as well as multi-purpose hiking trails;
i. Convenient trail links to activity areas, including schools, parks and shopping districts;
j. Availability of funding mechanisms for trail acquisition and development.

Responsible Agency: Planning and Engineering Divisions to prepare master plan; Planning Commission and City Council to review and adopt
Schedule: Master plan to be completed in 2001; implementation ongoing.

Program C3.1.2
Require bicycle parking in commercial developments where appropriate, located in a convenient area of the site which is visible from adjacent storefronts for security purposes.
Responsible Agency: Planning Division, reviewing authority
Schedule: Ongoing

Program C3.1.3
Promote accessibility to all City-owned facilities by bicycles and pedestrians, to include secure bicycle parking areas where appropriate.
Responsible Agency: Planning Division, lead agency and reviewing authority
Schedule: Ongoing

Program C3.1.4
In review of new development proposals, evaluate the accessibility of proposed facilities for pedestrians and bicyclists, and ensure that safe convenient access links are provided on site as well as connections from the site to public sidewalks and adjacent developments, where appropriate.
Responsible Agency: Planning Division and reviewing authority
Schedule: Ongoing

Policy C3.2
Expand opportunities for pedestrian access within the community by providing for sidewalks where needed for public safety and convenience.

Program C3.2.1
Require provision of sidewalks on all new commercial and residential development and within residential developments, except for individual homes on existing lots where no improvements exist or are required. Where appropriate, safe and convenient walkways should be provided within and adjacent to commercial centers to provide access between stores and between parking areas and stores.
Responsible Agency: City Engineer and reviewing authority
Schedule: Ongoing