



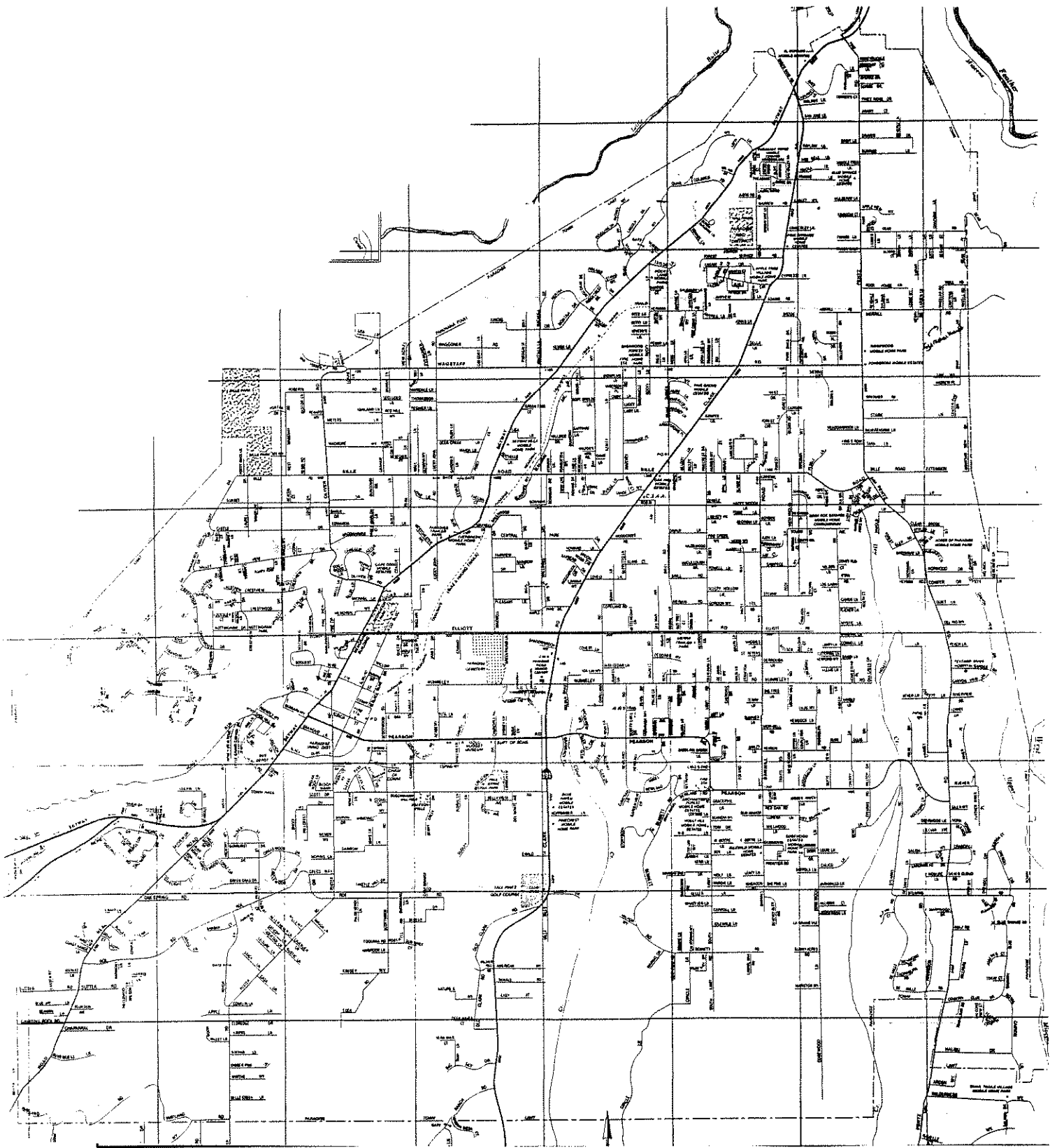
## 13.0 TRANSPORTATION/CIRCULATION

Regional access to the Town of Paradise is provided via the Skyway from the southwest and State Route 191, a two lane rural highway, northerly from State Route 70. Near State Route 70, Route 191 carries about 4,300 vehicles per day. In Paradise, just south of Pearson Road, State Route 191 carries about 8,600 vehicles. State Route 70 is a two-lane north/south highway connecting Sacramento, Marysville and Oroville to the south of State Route 191 and Chico and Red Bluff to the north of State Route 191. South of State Route 191, Route 70 carries about 7,100 vehicles while north toward Coal Canyon Road it carries about 3,400 vehicles (1989 *Traffic Volumes of California State Highways*, Caltrans).

In Paradise, the major mode of travel is by private automobile. The pedestrian system and bicycle systems are not extensive. However, the Town of Paradise has provided the Paradise Memorial Trailway, a pedestrian and bicycle path along segments of the abandoned Southern Pacific Railroad right-of-way between Skyway and Clark Road. The pedestrian sidewalk system is very limited. This is due in part to the desire of the community to maintain the rural character of the town. There are a number of roadways, however, which carry high volumes of traffic, including Elliott Road, Skyway, Pentz Road, Clark Road and Pearson Road. Paradise presently has about eighty-five miles of paved public roads and an estimated 280 miles of private, largely nonpaved roads.

Very limited use is made of public transit, rail or other non-automobile modes of travel. A transit needs assessment was prepared by Butte County and Caltrans in 1979 and updated in May of 1993 which outlines the needs of Paradise. More than twenty regional agencies provide some form of transportation services in Paradise, including Butte County Transit, Greyhound bus, Butte College bus, Paradise Unified School District, local taxi services and the Paradise Express. Paradise Express, the local transit service, is operated by American Transportation Company under contract with the Town of Paradise. It provides weekday service with four sedans and two lift-equipped vans. Butte County operates scheduled transit service between Paradise and Oroville (on a limited basis), hourly daytime service between Paradise and Chico, and a dial-a-ride system. The contract for this dial-a-ride service is administered by Butte County Transit for the Town of Paradise.

The street system in Paradise is shown on Figure 13-1. The system is comprised of three major north/south and four east/west arterial streets. The north/south arterials include: Skyway, Clark Road (State Route 191 - south of Pearson Road) and Pentz Road. The east/west facilities include: Wagstaff Road, Bille Road, Elliott Road and Pearson Road. Other arterial streets include: Sawmill Road, a north/south roadway connecting Bille Road with Pearson Road; Nunneley Road, an east/west collector, between Elliott Road and Pearson Road; and South, Middle and North Libby Roads; which are north/south facilities that intersect a number of the east/west streets in Paradise.



**PARADISE STREET SYSTEM**

**FIGURE 13-1**



## 13.1 STREET CLASSIFICATION SYSTEM

Paradise is a rural community; therefore, the street system does not include freeways or expressways. State Route 191 is designated by Caltrans as a "conventional (no access) control" facility, a highway with no control of access, which may or may not be divided or have grade separations at intersections. Within Paradise the street system is comprised of arterial, collector and local residential streets. Street classification is used to designate the various streets within a community including the design standards for the street, street width, number of travel lanes, access control and other features. Arterial streets are generally the wider streets and carry the major traffic volumes. Collector streets carry less traffic and provide connections between adjacent land uses and the arterial street system. Collector streets do not generally function as residential streets; however, collector streets can access residential land uses. In Paradise, many of the collector streets serve residential uses. Local streets normally serve isolated or smaller residential areas.

The 1982 *General Plan* does not specifically classify street types. A field reconnaissance was conducted in 1991 and the street system was observed in terms of traffic volume levels, roadway widths, access and relationship to adjacent land uses. These factors were used to provide a preliminary designation for the major and secondary streets in Paradise.

### Arterial Streets

A class of street serving a major movement of traffic not served by a freeway or expressway. In addition, arterials tend to accommodate through traffic such as trips between Paradise Pines and Chico or Paradise Pines and Butte College. In Paradise the following streets operate as arterial roadways:

#### North/South Arterials

Skyway  
Clark Road  
Pentz Road

#### East/West Arterials

Wagstaff Road  
Bille Road  
Elliott Road  
Pearson Road

### Collector Streets

Surface streets providing land access and traffic circulation service for residential, commercial and industrial areas. In Paradise the following streets operate as collector roadways:



#### North/South Collectors

Moore Road  
Rocky Lane  
Oliver Road  
Graham Road  
Lucky John Road  
Berkshire Avenue  
Oak Way  
Forest Lane  
Maxwell Drive  
North Libby Road  
Sawmill Road  
Kibler Road  
Foster Road  
Scottwood Road  
Academy Drive  
Edgewood Lane  
Almond Street  
Copeland Road (Elliott to  
Nunneley Road)  
Neal Road  
South Libby Road

#### East/West Collectors

Dean Road  
Merrill Road  
Stark Lane  
Valley View Drive  
Central Park Drive  
Young Avenue (Partial)  
Honey Run Road  
Nunneley Road  
Fir Street  
Birch Street  
Buschmann Road  
Wayland Road  
Stearns Road

#### Local Streets

Surface streets providing land access and traffic circulation service within residential areas. The remaining streets within Paradise, non-arterial and collector streets, could be designated as local streets. In Paradise, there are many streets which are private or do not provide linkages with adjacent collector or arterial streets. Numerous streets have been allowed to be constructed which do not provide connectivity within the street system.

#### The Arterial System

The Town of Paradise has seven major arterials. Each of these facilities is discussed below. Consideration is given to describing the number of travel lanes, signalization, adjacent land uses and levels of service. Average daily traffic volumes have been measured along numerous segments of the street system. Butte County compiled counts from 1955 until 1977. The Town of Paradise counted an extensive number of local intersections during 1989 as part of the development by Butte County of the Paradise traffic model. Table 13-1 indicates the average daily traffic volumes on the major streets in Paradise. Table 13-1 also includes historical data along many of the local streets.



- **Clark Road (State Road 191).** Clark Road is a four-lane roadway with a central two-way left turn lane from Pearson Road to Wagstaff Road. Clark Road carries between 9,000 and 25,000 daily trips. North of Wagstaff Road, Clark Road is two lanes carrying about 17,000 trips with stop sign controls at most local intersections. Clark Road intersects Skyway at its northern terminus. Clark Road at Skyway is stop sign controlled with the movements along Clark Road controlled.

Many of the intersections along Clark Road are signalized with left turn lanes. No onstreet parking is allowed along most of the length of Clark Road. The major intersections along Clark Road include: Pearson Road, Elliott Road, Bille Road, Wagstaff and Skyway. Local collector intersections are provided at Buschmann Road, Nunneley Road, and Central Park Drive.

Between 1982 and 1989 traffic volumes along Clark Road have doubled. Generally, the growth has occurred north of Pearson Road. However, traffic levels have also increased markedly to the south of Pearson Road. The intersections along Clark Road operate at generally acceptable levels of service during peak hours.

- **Skyway.** Skyway is a four-lane roadway with a central two-way left turn lane from Pearson Road to Wagstaff Road and carries between 11,000 and 21,000 daily trips. North of Wagstaff Road, Skyway is two lanes with stop sign controls at most local intersections. Many of the major intersections along Skyway are signalized with left turn lanes. The significant intersections along Skyway include: Neal Road, Pearson Road, Elliott Road, Oliver Road, Maxwell Drive, Bille Road, Wagstaff Road, Rocky Lane, Clark Road and Pentz Road.

Between 1982 and 1989 traffic volumes along Skyway have increased substantially. Generally, the growth has occurred the entire length of Skyway. The intersections along Skyway between Elliott Road and Bille Road operate at generally acceptable levels of service during peak hours. South of Elliott Road and north of Bille Road peak hour levels of service are worse. Peak hour conditions at Clark Road and Wagstaff in the north and at Honey Run Road and Neal Road in the south are at or approaching unacceptable levels.

- **Pentz Road.** Pentz Road is a two-lane arterial which extends from the southern town limits to Skyway. Pentz Road carries about 7,000 trips per day. Most of the intersections along Pentz Road are stop sign controlled, with the stop control on the streets intersecting with Pentz Road. The intersections of Wagstaff Road and Pentz Road and Bille Road and Pentz Road are all-stop. Traffic volumes along Pentz Road have increased about fifty percent since 1982. The levels of service along Pentz Road are acceptable.
- **Pearson Road.** Pearson Road is the most southerly arterial in Paradise and carries about 1,000 daily trips. It extends from Skyway to Pentz Road. Between Skyway and Clark Road it is a four-lane facility. Stop sign controls are provided at many intersections with four-way stops at Black Olive Drive and Recreation Drive. East of Clark Road, Pearson Road is a two-lane facility. Pearson Road is the last roadway in the southern portion of the town that provides continuous



east/west access between Pentz Road and Skyway. South of Pearson Road, many of the residential areas must use north/south arterial and collector streets to access Pearson Road.

- **Remaining Arterial Streets.** The remaining arterial streets are all two-lane facilities with traffic controls at most of the north/south arterial intersections. Bille Road and Wagstaff Road provide continuous east/west connections between Skyway and Pentz Road. Elliott Road provides connections between the area west of Skyway and just east of Sawmill Road. Nunneley Road extends east/west from Academy Drive (on the west) to Oak Creek Drive (on the east).

### The Collector System

There are many collector streets in Paradise. The designation of collector and local street can be misleading when used in Paradise. Collector streets tend to provide the linkages between segments of the arterial street system while local streets serve immediate residential or other isolated land uses. Using this concept, the connection of Forest Service Road and Moore Road provides a collector linkage between Skyway and Clark Road north of Wagstaff Road. Within the Town of Paradise roadway system, there are some missing linkages in the collector street system. These include:

- The connection of Young Avenue to Bille Road over public streets.
- The easterly extension of Elliott Road to Kibler Road.
- The westerly extension of Buschmann Road to Skyway.
- The westerly extension of Anchor Way to Clark Road at Noffsinger Lane or alternative intersection.
- The connection of South Libby Road and Edgewood Lane.
- The connection of Pinewood Drive and Honey Run Road.

Other similar situations may occur elsewhere in Paradise. New collector road connections, and the standard of design they should provide, need to be identified. The levels of service within the collector street system are acceptable. There are some locations where stop sign controls and pedestrian facilities may be warranted (e.g., along Maxwell Road near the high school).

### The Local Street System

The local street system is composed of numerous public and private roadways throughout Paradise. The system appears to be based upon individual infill developments and subdivision activities rather than a comprehensive townwide circulation plan. Most streets serve a limited number of land uses, primarily residential. Further, the street standards vary substantially from area to area. The minimum allowable street width appears to be sixteen feet established in the 1982 *General Plan* for fire access. The minimum street width standard is twenty feet.



As traffic grows in Paradise, the potential for increased concentrations of traffic along existing collector and arterial streets will grow as well. Without an improved collector and local street system of interlinked roadways, the potential for required widening of the existing collector and local street system to be required will increase.

**TABLE 13-1**  
**AVERAGE DAILY TRAFFIC VOLUMES<sup>1</sup>**

Roadway Segment	1982 Traffic Volumes	1989 Traffic Volumes
<b>Skyway</b>		
North of Wagstaff	7,000	11,000
Bille to Wagstaff	13,000	15,900
Elliott to Bille	17,200	20,700
Pearson to Elliott	17,600	17,700
South of Neal	10,800	17,600
<b>Clark Road (SR191)</b>		
North of Wagstaff	5,700	9,300
Bille to Wagstaff	8,900	17,700
Elliott to Bille	11,800	24,700
Pearson to Elliott	11,200	22,100
South of Pearson	6,700	8,600
<b>Pentz Road</b>		
North of Bille	4,900	7,375
South of Stearns	4,800	6,375
<b>Wagstaff Road</b>		
Skyway to Clark	8,200	7,700
Clark to Pentz	4,500	5,550
<b>Bille Road</b>		
Skyway to Clark	NA	10,600
Clark to Pentz	NA	11,000





Roadway Segment	1982 Traffic Volumes	1989 Traffic Volumes
<b>Elliott Road</b>		
Skyway to Maxwell	6,800	19,800
Clark to Pentz	3,200	9,600
<b>Pearson Road</b>		
Skyway to Clark	10,800	10,900

<sup>1</sup> 1982 traffic data from the Town of Paradise, traffic safety study, September 1982. The 1989 counts provided to the Town of Paradise by Butte County except State Route 191 south of Pearson Road which was provided by Caltrans District 3. Some counts were factored at eight percent from peak hour to daily estimates.



## 13.2 EXISTING LEVELS OF SERVICE

Level of service is determined differently for signalized and unsignalized intersections. For signalized intersections, a percentage of capacity is calculated which results in a specific overall intersection level of service. For unsignalized intersections, an amount of reserved capacity for each movement is calculated. The lowest amount of reserved capacity is used to determine the intersection level of service. It should be noted that for unsignalized intersections, some movements may experience acceptable levels of service while others may not. For this assessment, the level of service for the worst case traffic movement on each approach is shown. For example, a level of service shown as "A/A/D/E" would mean that the level of service for the north and southbound approaches is "A" while the level of service for the eastbound approach is "D" and the westbound approach "E."

The level of service (LOS) rating system of LOS A through LOS F is used to indicate the average level of traffic utilization of an intersection. LOS A indicates little or no congestion and LOS F indicates severe congestion. The 1982 *General Plan* does not appear to establish a specific standard for acceptable level of service. In general, most rural communities use level of service "C" for a standard. Table 13-2 describes the various level of service categories and intersection performance characteristics for signalized intersections. For the unsignalized intersections, the 1985 Highway Capacity Manual was used to determine level of service (Table 13-3). The Butte County Congestion Management Program has adopted a level of service (LOS) standard "D" for the principal arterial road system in Paradise.

Using the existing peak hour data provided by the Town of Paradise, the existing peak hour levels of service were determined at a number of intersections. Table 13-4 details the peak hour levels of service. For the unsignalized intersections, the level of service by approach together with the reserved capacity for the worst case traffic movement are noted. For consistency, the order of the results is northbound, southbound, eastbound and westbound. In other words, a LOS result shown in the various tables within this report noted as "A/A/B/B" would mean LOS "A" for the northbound and southbound approaches and LOS "B" for the eastbound and westbound approaches. Further, a "-" is used when a particular approach and/or left turn movement does not exist. For example, a "T" intersection such as Skyway and Clark Road would show the existing worst case level of service of "D" and the various approach levels of service as "A/A/-/D."

### Level of Service Evaluation

Most of the intersections in Paradise operate at acceptable levels of service. Of the twenty-eight intersections evaluated, twelve were signalized and sixteen unsignalized. The results of the LOS analysis are discussed below.



Along Skyway, the signalized intersections at Wagstaff Road and Pearson Road operate at LOS "D" and "C" respectively. All of the signalized intersections along Clark Road operate at LOS "B" or better.

For the unsignalized locations, many of the intersections operate at unacceptable levels of service. Specifically, Skyway at Clark Road operates at LOS "D." Skyway at Honey Run Road and Neal Road both operate LOS "E." Pearson Road at Scottwood Road operates at LOS "D" while Elliott Road at Maxwell Drive operates at LOS "E." The remaining intersections operate at LOS "C" or better. The locations that operate at LOS "C" include: Skyway at Pentz Road, Clark Road at Buschmann Road, Pentz Road at Wagstaff Road, and Sawmill Road at Pearson Road.

**TABLE 13-2**  
**LOS CRITERIA SIGNALIZED INTERSECTIONS**

Level of Service	Vehicle Delay (seconds)	Volume to Capacity Ratio	Description
A	≤ 5.00	0.00 - 0.59	<b>Free Flow/Insignificant Delays:</b> No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication.
B	5.1 - 15.0	0.60 - 0.69	<b>Stable Operation/Minimal Delays:</b> An occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within platoons of vehicles.
C	15.1 - 25.1	0.70 - 0.79	<b>Stable Operation/Acceptable Delays:</b> Major approach phases fully utilized. Most drivers feel somewhat restricted.
D	25.1 - 40.0	0.80 - 0.89	<b>Approaching Unstable/Tolerable Delays:</b> Drivers may have to wait through more than one red signal indication. Queues may develop but dissipate rapidly, without excessive delays.
E	40.1 - 60.0	0.90 - 0.99	<b>Unstable Operation/Significant Delays:</b> Volumes at or near capacity. Vehicles may wait through several signal cycles. Long queues form upstream from intersection.
F	≥ 60	N/A	<b>Forced Flow/Excessive Delays:</b> Represents jammed conditions. Intersection operated below capacity with low volumes. Queues may block upstream intersections.

Source: *Highway Capacity Manual*, Transportation Research Board, Special Report No. 209, Washington, D.C., 1985.

**TABLE 13-3**  
**LOS CRITERIA UNSIGNALIZED INTERSECTIONS**

Level of Service	Expected Delay	Reserve Capacity (Vehicles/Hour)
A	Little or no delay	$\geq 400$
B	Short traffic delays	300 - 399
C	Average traffic delays	200 - 299
D	Long traffic delays	100 - 199
E	Very long traffic delays	0 - 99
F	Extreme delays potentially affecting other traffic movements in the intersection	$\leq 0$

Source: *Highway Capacity Manual*, Transportation Research Board, Special Report No. 209, Washington D.C., 1985.

**TABLE 13-4**  
**PEAK HOUR LEVEL OF SERVICE<sup>1</sup>**

Intersection	Reserved Capacity (Critical Movement) or Volume Capacity Ratio (Percentage of Capacity)	PM Peak Hour Level of Service
<b>Skyway at</b>		
Pentz Road	245 Vehicles	A/A/B/C
Clark Road	158 Vehicles	A/A/-/D
Rocky Lane	423 Vehicles	A/A/-/A
Wagstaff Road	Not Applicable	D
Bille Road	0.52	A
Maxwell Drive	0.45	A
Oliver Road	0.48	A
Elliott Road	0.62	B
Honey Run Road	57 Vehicles	A/A/E/D
Pearson Road	0.71	C
Neal Road	2 Vehicles	A/A/E/E
<b>Clark Road at</b>		
Wagstaff Road	0.39	A
Bille Road	0.51	A
Central Park	0.39	A
Elliott Road	0.67	B
Nunneley Road	0.43	A
Pearson Road	0.59	A
Buschmann Road	250 Vehicles	A/A/C/-

Intersection	Reserved Capacity (Critical Movement) or Volume Capacity Ratio (Percentage of Capacity)	PM Peak Hour Level of Service
<b>Pentz Road at</b>		
Wagstaff Road	255 Vehicles	A/A/C/A
Bille Road	353 Vehicles	A/A/B/-
Pearson Road	372 Vehicles	A/A/B/-
Stearns Road	499 Vehicles	A/A/A/A
<b>Pearson Road at</b>		
Scottwood Road	169 Vehicles	D/D/A/A
<b>Elliott Road at</b>		
Maxwell Drive	98 Vehicles	B/E/A/A
<b>Sawmill Road at</b>		
Bille Road	306 Vehicles	B/B/A/A
Elliott Road	451 Vehicles	A/A/A/A
Nunneley Road	528 Vehicles	A/A/A/A
Pearson Road	238 Vehicles	B/C/A/A

<sup>1</sup> Applies Transportation Research Board Circular 212 Planning Method for Signalized Intersections and 1985 Highway Capacity Manual Unsignalized Methodology for all Stop Sign Controlled Intersections.

Source: Dowling Associates, 1991.



### 13.3 PARKING

As part of the 1982 *General Plan*, a parking inventory was conducted. The general policy since 1982 has been to restrict parking to offstreet areas and not develop additional onstreet parking spaces. As part of the current General Plan, the town's current offstreet parking standards will be reviewed and warranted changes to these standards will be recommended.



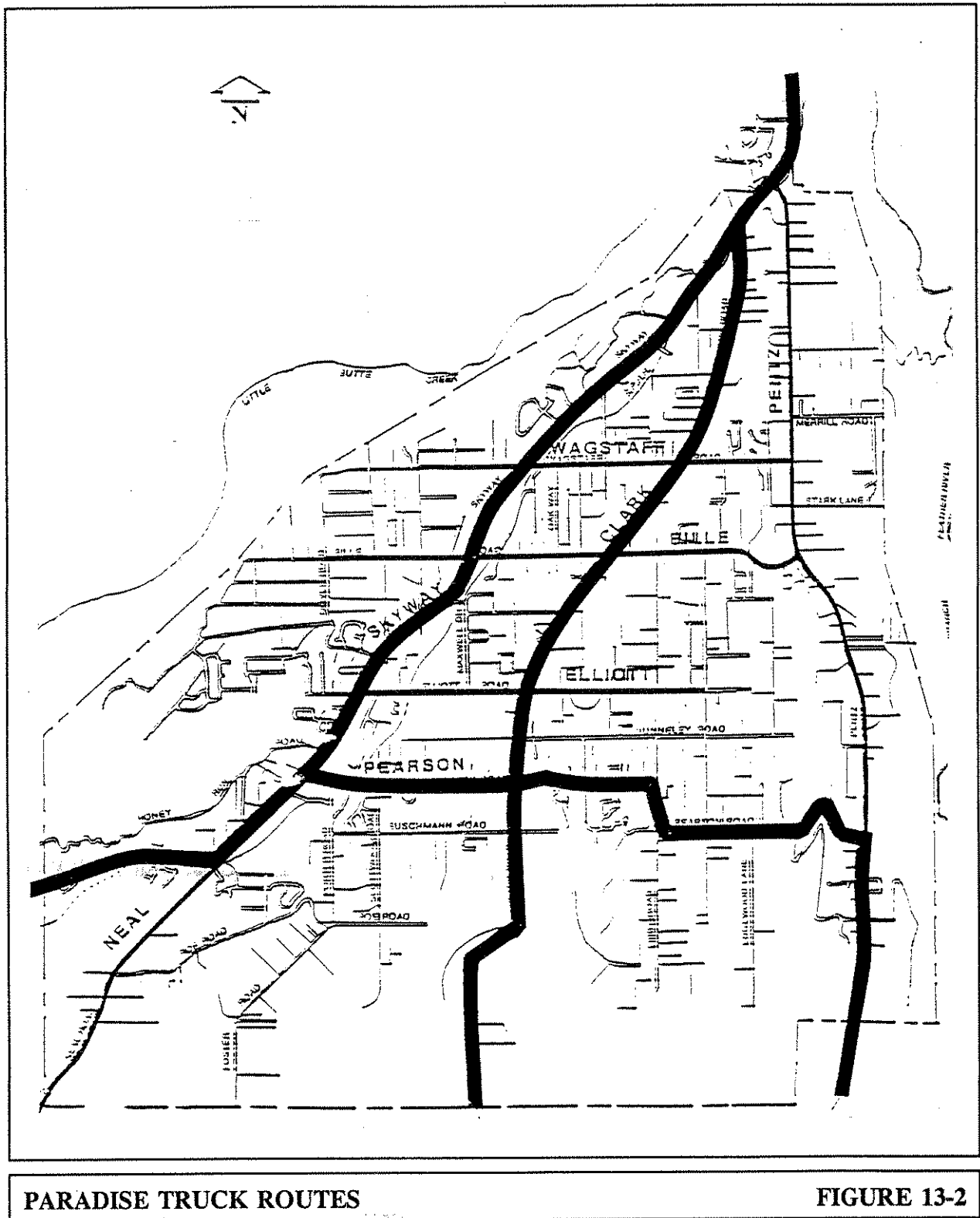


## 13.4 TRUCK ROUTES

Traffic safety studies conducted in 1982 recommended the designation of specific routes for truck traffic. Consideration of appropriate truck routes within Paradise should be based on several factors, including: the location of businesses served by large trucks, the origin and destination of logging trucks, and the location of exclusively residential areas.

Given the location of existing commercial development along Skyway, Pearson Road and Clark Road, the following routes were recommended as truck facilities (see Figure 13-2).

- Skyway from the south town limit to the north town limit.
- Clark Road from the south town limit to Skyway.
- Pearson Road from Skyway to Pentz Road.
- Pentz Road south of Pearson Road to the town limit.





### 13.5 THE PARADISE AREA TRANSPORTATION PLANNING MODEL

Butte County, with the assistance of a professional traffic consulting firm, has recently completed a traffic model for the Paradise area. The model was calibrated to 1989 conditions and includes the Town of Paradise, the communities of Magalia and Paradise Pines and the area south of Paradise to Route 70. External traffic zones include Chico, Route 99 south, Route 70 south and Route 70 east from Pentz Road. The model was reviewed for use during the *General Plan* to evaluate future land use conditions. In general, the model appears to be adequately calibrated for application in the *General Plan* process. To date, three land use conditions have been modelled and analyzed. These include: the existing conditions, a five-year build out of the study area and a twenty-year build out of the study area. The build out land use intensities assumed that no major expansion of the existing sewage disposal system would occur. Therefore, the growth in single and multiple family dwelling units for the five-year period was restricted to 2,371 units. The twenty-year growth scenario provided 1,259 additional units. The existing conditions include about 14,750 single family and 777 multiple family units. Further, 3,681,600 square feet of nonresidential land use was included in the model.