

**CHAPTER 3**  
**CIRCULATION**

### 3.1 Authority and Purpose

The purpose of the Circulation Element of a General Plan is to identify the location and the extent of major thoroughfares, transportation routes, terminals, and other public utilities and facilities, all correlated with the Land Use Element (Government Code 65302[b]). The State of California General Plan Guidelines lists the following mandatory issues which are to be addressed in this Element:

- Major thoroughfares
- Transportation routes
- Terminals
- Other local public utilities and facilities

In addition to the mandatory issues, the optional topic areas, as well as important local issues covered in this Element are as follows:

- Streets and highways
- Public transit (e.g., buses, taxi, railroads, etc.)
- Bicycle and pedestrian routes
- Parking
- Railroads

The goals, policies, and programs of this element relating to the above issues are designed to maintain and improve circulation within the community.

Transportation is also a regional issue. This element is required by Government Code Sections 651039(f) and 65080 not to be in conflict with applicable state and regional transportation plans (General Plan Guidelines).

The accessibility of a place has a major impact upon land value and the intensity of land use. The location of a place in relation to the circulation network is important in determining its land use (LU). As an example, land located next to major highway and freeway interchanges tend to have commercial and/or industrial uses. Good transportation access is required to move a large amount of goods or to meet the needs of residents, shoppers, and recreators. Movement or a trip along a circulation network requires some sort of cost in either travel time and/or money. Generally, people place more importance on travel time and do not want to be very far from places they regularly visit. Land use and the distance someone has to travel to shop, work, and or reside are related to circulation (Hanson). The shorter this distance to shop, work, and back to place of residence reduces travel time, fuel consumption, congestion, air pollution, and noise. Mixed land uses tend to help in reducing vehicle miles traveled (VMT).

The existing, as well as future circulation needs are based on community concerns and the goals, policies, and programs of the Land Use Element. Future projections are based on the anticipated use of vacant land in the Land Use Element (LU).

The Circulation Element also has a relationship with the Noise Element (N) of the General Plan. The railroad, Interstate 80, and major streets and thoroughfares are noise producers. Mitigation for transportation noises are offered in the Noise Element.

The Safety Element (S) is also linked to the Circulation Element. The services of police, fire, and ambulance all require an adequate system of streets to access victims of crime, fire, and or other emergencies in a timely manner.

The Conservation Element (CON) and Circulation Element are related. Air pollution from mobile sources, such as automobiles, are added to the Sacramento Valley Air Basin of which Placer County is included.

## 3.2 Background

### 3.2.1 Roadway Classifications

The City of Colfax is served by five different classifications of roadways. These are freeway, state highway, arterial, collector and local streets. The definitions of these roadways are defined below.

#### Roadway Classifications

- **Freeway** - A limited access and high speed road serving inter-regional movement with no interference from local street patterns or at-grade- crossings. Freeways are divided highways and serve primarily regional and long distance travel.
- **State Highway** - Limited access and higher speed road for travel between communities. Medium capacity two-lane roadways with one lane in each direction. The passing of slower vehicles requires the use of the opposing lane where traffic gaps allow.
- **Arterial** - A street carrying the vehicular traffic of intra-community travel, as well as access to the rest of the county transportation system. Access to arterials should be by minor arterial, collector and local streets.
- **Minor Arterial** - A street for movement of intra-community traffic and less traveled than arterial streets.
- **Collector** - These roadways serve traffic between major and local roadways and neighborhoods. Collector's are used mainly for traffic movements within residential, commercial, and industrial areas.
- **Local Street** - Roadways used primarily for direct access to residential, commercial, industrial, or other abutting property with on-street parking. They do not generally include roadways carrying through traffic.

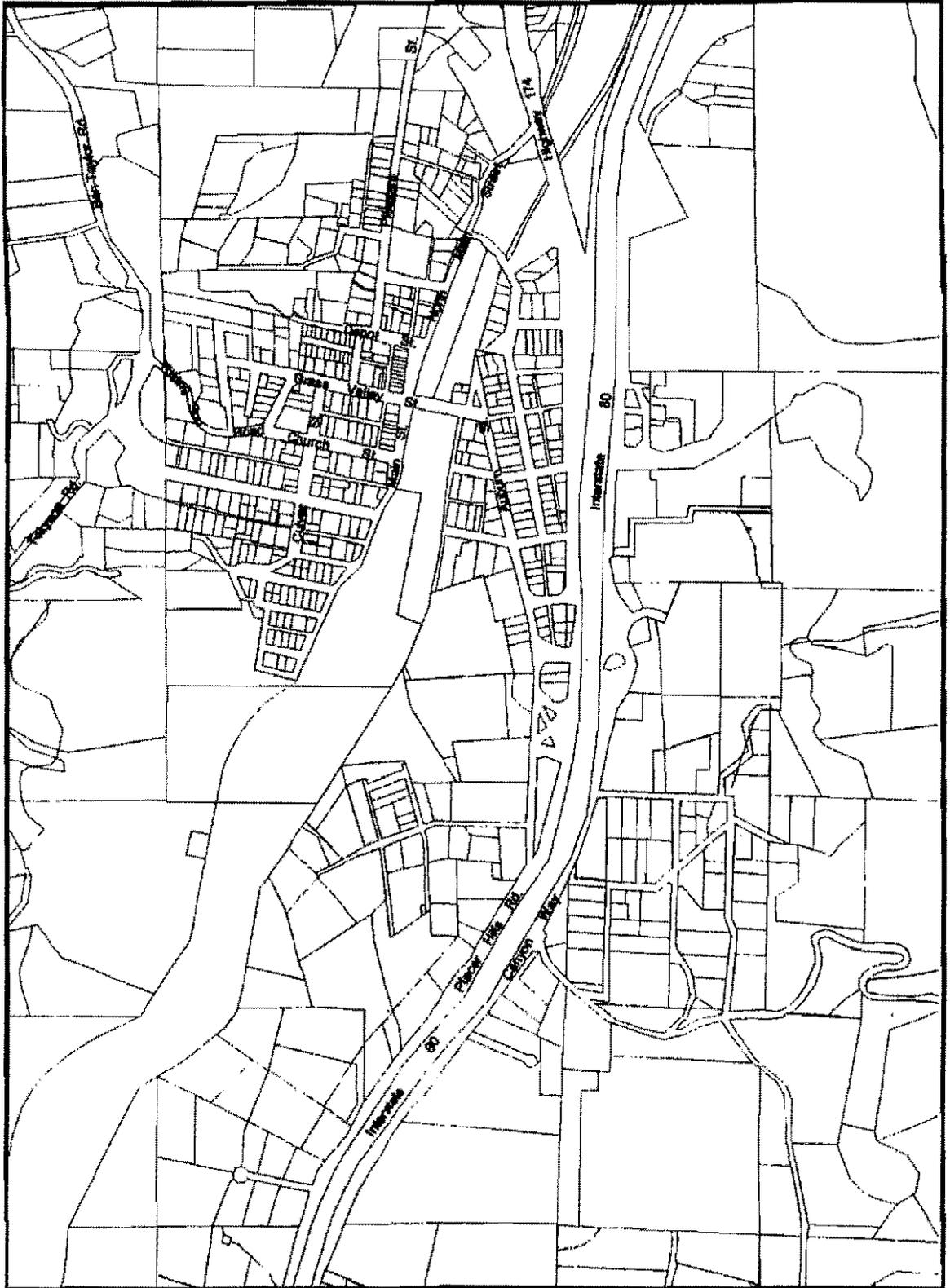
Source: Highway Capacity Manual, 1985

### 3.2.2 Existing Facilities

Figure 3.1 is a map of important streets and roadways in Colfax. Table 3.1 lists the arterial and collector streets in the City of Colfax. Local streets are not intended to carry through traffic. This does not mean local streets are not used for through traffic, only that the design and capacity of local streets is generally limited.

Figure 3-1

### City of Colfax Main Circulation Routes



**Scale**  
0 1000 2000 feet  
1 inch = 1000 feet



Produced for California State University, Chico  
in Cooperation with the Geographic Information Center  
Cartography by Kent Johannes

The collector and arterial streets are very important to the circulation system of a community. Congestion or traffic problems usually occur where roadways meet or traffic is impeded. Intersections are places where congestion is easily noticeable. Some examples of other impedance factors are: lane width, available lanes, exclusive turn lanes, parking, driveways, and railroad crossings.

I-80	Freeway
Highway 174	State Highway
Auburn Street	Collector
Grass Valley Street	Collector
Depot Street	Local Street
Church Street	Collector
Main Street	Collector
Rising Sun Road	Collector
Culver Street	Local Street
Pleasant Street	Local Street
Canyon Way	Arterial
Placer Hills	Arterial
Tokayana	Arterial
Ben Taylor	Arterial

### **Interstate 80**

Interstate 80 is the main transportation route and bisects the City of Colfax and, like its predecessor, Highway 40, exerts the major impact on circulation and transportation. It carries the majority of the traffic into and out of the City, while at the same time providing a physical barrier to intra-city circulation. The two interchanges located within the City of Colfax are Canyon Way and Auburn Street.

The Canyon Way exit is located at the southern edge of the city limits. This exit provides freeway access in the north and south bound direction and the southern portion of the City.

The Auburn Street interchange is the northern access point for I-80 in the City. Access to I-80 is available in both north and south bound traffic. This interchange also connects with Canyon Way. This area is an important intersection for travelers and trucks using Interstate 80. This interchange provides some of the needed services for both trucks and travelers. This exit also provides access to the historic downtown.

### **Highway 174**

Highway 174 is the next major traffic carrier and produces a mixing of local and through traffic at strategic intersections. It enters the city limits in the north and is connected to the historic downtown by way of Main Street. Highway 174 then crosses the railroad tracks and terminates on Auburn Street.

Highway 174 is used by local and regional traffic. This roadway provides access to and from the communities of Grass Valley and Nevada City, thus allowing access to Highway 20.

### **City Roadways and Intersections**

Important City streets are Depot Street, Culver Street and Pleasant Street. These streets connect residential areas to the network of collector roadways. Important collector roadways in the Colfax area include Auburn, Grass Valley, Church and Main Streets and Rising Sun Road. These collector roadways connect to the arterial streets that lead into the City. These include Canyon Way, Placer Hills, Tokayana and Ben Taylor.

Intersections are areas within a circulation system where the flow of traffic is often interrupted. Interruptions can occur from any number of sources (stop signs, traffic lights, bicycle and pedestrian crossings, etc.). Vehicle conflicts or accidents are more susceptible at intersections.

### **Parking**

The parking requirements are established in the City's Zoning Ordinance in Chapter 9-2, Article 10 "Off-Street Parking Requirements."

### **Bicycle Routes**

The City of Colfax currently has Class III routes. The use of bicycles within the City should be encouraged and expanded. An example to encourage bicycle use are: new developments that require collector or arterial streets should allow for bike route right-of-ways.

### Bicycle Pathway Definitions

**Class I** are bicycle pathways that are fully separated from any traffic lanes, either in a setback landscaped corridor adjacent to the road, or in a totally separated corridor apart from the street.

**Class II** bicycle pathways are within the right-of-way of streets, usually collectors and arterials. The lanes are up to seven feet wide, located adjacent to the travel lanes with signage and a stripe on the pavement demarking the lane.

**Class III** bicycle pathways are shared usage of streets with no specific separation of different modes of traffic. Street signage is often used to designate a roadway as a bicycle route.

### Pedestrians

Pedestrian needs can usually be accommodated by the construction of sidewalks and pathways. In areas with little or no development, adequate shoulders (4 to 6 feet wide) should be provided for pedestrians. The requirements for sidewalks is covered in the City's Zoning Ordinance and Standard Specifications.

It is desirable to combine pedestrian and bicycle facilities. This is important in planning new development areas. The use of pedestrian and bicycle facilities to link areas of home, work, school, and commercial uses can be used to reduce traffic and air pollution.

#### 3.2.3 Capacity and Level of Service

**Capacity** is usually defined as the maximum number of vehicles or pedestrians (volume) that can use a transportation system with various roadway, traffic, and control conditions.

As an example, under ideal conditions the capacity of a one lane freeway segment is 2,000 passenger cars per hour per lane. The capacity of a one lane unsignalized intersection with a four way stop is 450 vehicles per hour per lane.

**Volume** is usually defined as the number of vehicles passing a given point in the roadway at a certain time interval.

The counting of cars passing Main Street on Grass Valley Street for 15 minutes is an example of volume.

Level of Service (LOS) describes the operating conditions on a roadway. The LOS is measured with an "A" through "F" rating. Level of Service covers such concepts and factors as speed and travel time, delay, freedom to maneuver, traffic interruptions, comfort and convenience, and safety (Traffic Engineering Handbook 1992).

## Level of Service (LOS) Definitions

A description of the different Level of Service definitions is provided below.

**LOS A:** Free flow of individual users that are not interrupted by other users in the traffic pattern. Any intersection delays are less than 5 seconds.

**LOS B:** Constant flow with a large freedom to maneuver, but with some interference from other users. Intersection delays are between 5 and 15 seconds.

**LOS C:** Restricted flow which remains constant, but interference from other users is noticeable. Intersection delays range from 15 to 25 seconds.

**LOS D:** High-density but stable flow. Freedom to maneuver is restricted and intersection delays range from 25 to 40 seconds.

**LOS E:** Traffic flow is at or near capacity and freedom to maneuver is extremely difficult. Intersection delays of 40 to 60 seconds can be expected.

**LOS F:** Traffic flow approaches a level that exceeds the amount that can be served. Traffic is stop-and-go and queues form. Delays at intersections are greater than 60 seconds.

Source: Highway Capacity Manual 1985

Table 3.2 lists the Level of Service as a ratio of volume to capacity. As the volume and capacity get closer to the number 1.00, the LOS gets worse. For example, at a Level of Service of "B" the current volume of cars is 61% to 70% of capacity. In other words, the roadway or intersection has the capacity to accommodate 30% more cars (volume) before a LOS of "F" is reached.

<b>LOS</b>	<b>V/C Ratio</b>
A	0.00-0.60
B	0.61-0.70
C	0.71-0.80
D	0.81-0.90
E	0.91-1.00
F	>1.00

**Current Daily Traffic Volumes**

Current Circulation conditions in the City of Colfax are shown on Table 3-3. These conditions are expressed with peak hour volume and its level of service under those conditions. This does not take into account special conditions such as climatic or emergency conditions. These counts were for roadways, not intersections.

Roadway	Volume	LOS
I-80 Overpass	586	A
Highway 174	428	A
Auburn Street	748	A
Grass Valley Street	492	A
Depot Street	56	A
Church Street	180	A
Main Street	124	A
Rising Sun Road	308	A
Culver Street	108	A
Canyon Way	388	A
Placer Hills	392	A
Tokayana	72	A
Ben Taylor	132	A
I-80 Overpass (west)	248	A

<sup>1</sup> Peak Hour is usually 10 to 12 percent of the Average Daily Traffic (ADT) flow. All Peak Hour counts were taken Monday through Thursday between 7:00 a.m. and 9:00 a.m. and 4:00 p.m. and 6:00 p.m.

In a separate study prepared by Spectrum Engineering of Fair Oaks, 5 intersections and road segments were also evaluated. This information was provided by Paul Manuel at MBI. The traffic counts were taken only during the p.m. peak hour. The results of this study are shown on Table 3-4 and 3-5. All of the intersections studied were stop sign controlled. The MBI study shows somewhat different results than the previous study of existing conditions. The main focus of the MBI study was on intersections rather than just roadways.

**Table 3-4**  
**Traffic Count Summary** 1997  
**For The Year (1977)**

Street	Segment	1997 P.M. Peak	1997 Daily ADT
SR 174	Main St. to Auburn St.	500	5,000
SR 174	Auburn St to I-80	1,270	1,270
Auburn Street	SR 174 to I-80	1,270	12,700
I-80 Overpass	Auburn St to S. Canyon View	855	8,550
S. Canyon View	Overpass to I-80 EB Ramps	730	7,300

Source: Spectrum Engineering

**Table 3-5**  
**Level of Service Summary of Intersections**  
**For Existing Conditions**

No.	Intersection	Existing Level of Service
1.	S. Auburn St. At the I-80 WB ramps	LOS C
2.	S. Auburn St. at the Overcrossing (north side)	LOS D
3.	North Canyon at the Overcrossing (south side)	LOS C
4.	North Canyon at the I-80 EB ramps	LOS B
5.	S. Auburn St. at S.R. 174	LOS E

Source: Spectrum Engineering

It was concluded by Spectrum Engineering that a signal is warranted at intersection 5 to mitigate the unacceptable LOS. This recommendation should be considered as future buildout occurs. It is also recommended that a fair share mechanism should be developed to pay for deficiencies created by continued development. A recommended City policy is that the development project that impacts the circulation system should pay its proportionate share of mitigation measures required.

### Future Conditions

Future circulation needs and improvements must be based on the impacts of land use plan for the entire planning area. The land use plan indicates future population and its impact on circulation. Changes in density in the downtown residential area will cause an increase in traffic on those affected streets and roadways. The anticipated future traffic conditions in Colfax includes increased traffic on minor arterials and collectors. These roadways and their intersections will experience degradation generated by increased traffic. In addition to changes in density for residential locations the Land Use Element provides for the locating of industrial and commercial development on the current transportation corridors. This will help in redirection commercial traffic to more appropriate areas of the city. There are two intersections and roadways that are currently at an unsatisfactory LOS (see Table 3-5). The LOS at these locations will need to be mitigated with the installation of signals or other

acceptable traffic management methods to improve these areas to a LOS "C". It is understood that as buildout is accomplished, improvements in the circulation system must keep pace with this growth. The LOS for existing streets will change as the volume changes. These conditions must be monitored as development continues. With each new development the current and future circulation must be considered.

There are valid alternatives to reduce congestion and unsatisfactory LOS. As build out is accomplished these methods need to be implemented on a case by case basis. Methods that can improve circulation include; signaling intersections to improve consistent flow, restriction of left turns during peak hours or 24 hours per day or install turning lanes wherever appropriate to direct and channel traffic. The cost of some of these alternatives is sizable. In order to offset the City's cost of these measures, new development must provide its fair share of the cost for conditions created as buildout continues. Other alternative to improve circulation would be to encourage and cooperate with state and federal transportation officials for construction of another ramp from State Route 174 to I-80, as well as elimination of some on street parking to increase traffic flow. This would relieve current and future conditions for those commuters entering and exiting the City. The City, however, has very little control over the transportation decisions for ramps and cannot be sure of securing this alternative. The eliminations of parking is not possible in the downtown because of already inadequate parking in that area.

The projected future traffic LOS and Peak Hour Volumes are based on computer modeling with QRS II software. This network program is used to forecast impacts of urban development on roadway networks. This is accomplished by outlining a basic roadway network, dividing the City into zones, entering information specific about each zone (i.e. human activities, income level, occupations, family size, etc.), and current network or roadway configurations. Traffic volumes are distributed on the existing network using techniques as documented in the *National Cooperative Highway Research Program Report Number 187* (QRS II) and help forecast traffic levels after there have been changes in urban development.

These projections are affected by current traffic congestion problem intersections and roadways. These congestion areas include South Auburn Street at State Route 174 and South Auburn Street at the north side Overcrossing. It may be necessary to postpone approval of development proposals that result in degradation of LOS until improvements are accomplished.

Air quality problems resulting from increased traffic circulation will require the implementation of mitigation measures consistent with the Placer County Air Pollution Control District's 1991 Air Quality Attainment Plan (or updated version). Air quality is addressed more in the Natural Environment Element.

I-80 Overpass	1176	B
Highway 174	1147	B
Auburn Street	1253	B
Grass Valley Street	200	A
Depot Street	33	A
Church Street	178	A
Main Street	255	A
Rising Sun Road	231	A
Culver Street	212	A
Canyon Way	1395	C
Placer Hills	1496	D
Tokayana	72	A
Ben Taylor	132	A
I-80 Overpass (west)	1164	B

<sup>1</sup>The projected number are only estimates of possible future Peak Hour and LOS. Any number of factors can change them. For instance, a change in zoning will either lower or raise the allowable densities in a certain area. All projected traffic conditions were made using current zoning designations on vacant land.

### 3.3 Circulation Issues

The following circulation issues and concerns were identified by the Planning Commission:

- The City is divided into 3 distinct sections by the railroad and Interstate 80, preventing adequate circulation when trains move through town.
- Parking facilities (especially in the Historic area) are inadequate.
- There is a need to encourage pedestrian and bicycle travel within the City.
- Circulation plans need to be developed when I-80 is closed either due to weather, accident, or road work traffic is diverted through town along Hwy. 174.
- Congestion points exist at peak hours due to school and work commute.

- Potential off-ramp congestion with build out of vacant land along Auburn and Canyon Way may be a problem.
- A need to encourage the development of community gateways.

### 3.4 Findings

The following findings address the above issues and concerns:

- The planning of future roadways need to meet all acceptable standards to ensure a safe and efficient circulation network.
- Inadequate pedestrian and bicycle routes, including walkways, sidewalks and pedestrian crossings need to be changed and improved.
- Union Pacific and Southern Pacific Railroads have merged creating potential for more rail traffic through the City.
- Highway 174 has become a major commute route for morning traffic between Grass Valley to Interstate 80.

### 3.5 Circulation Goals, Policies, and Implementation Measures

**Goal 3.5.1** *Create a problem free and safe transportation system in the Colfax Planning Area.*

**Policy 3.5.1.1** Maximize the efficient use of existing transportation facilities.

**Policy 3.5.1.2** Maintain a level “C” service standard for City intersections and roadways.

**Policy 3.5.1.3** Take a pro-active position in regional transportation issues that involve the Colfax area.

**Policy 3.5.1.4** Traffic impacts must be considered in land use decisions and vice versa.

#### **Implementation Measures**

**3.5.1A** Monitor standards and requirements for future development of residential and commercial land, noting and prioritizing needed improvements such as streets, wastewater distribution / treatment system and storm drainage system. These needed improvements will be included in the City’s Capital Improvement Program..

**3.5.1B** Land uses that generate a high incidence of auto traffic, such as drive-ins, convenience stores, fast-food outlets, shopping centers, and large subdivisions,

shall be required to submit a site-specific traffic impact report prior to construction or expansion of such facilities.

**Goal 3.5.2 Encourage alternative forms of transportation.**

**Policy 3.5.2.1** Allow for alternative forms of transportation by providing necessary facilities, such as bicycle racks, pedestrian walkways and connections, as well as ride share parking.

**Policy 3.5.2.2** Place priority on walking and bicycle trails within the Colfax Planning Area.

**Implementation Measure**

**3.5.2A** Create an integrated network of pedestrian connections throughout the planning area.

**3.5.2B** Use transportation systems management techniques to lower vehicle miles traveled and to decrease air pollution emissions.

**3.5.2C** Utilize the strategies recommended in the *Transportation-Related Land Use Strategies to Minimize Motor Vehicle Emissions: An Indirect Source Research Study Final Report (1995) Chapter 1*. This report was prepared for the California Air Resources Board and the California Environmental Protection Agency. These recommendations, when applicable, will be used to mitigate impacts caused by new development throughout the City. These strategies include:

- Provide Pedestrian Facilities
- Increase Density Near Transit Corridors
- Increase Density Near Transit Stations
- Encourage Mixed-Use Development
- Encourage Infill and Densification
- Develop Concentrated Activity Centers
- Strengthen Downtowns
- Develop Interconnected Street Network
- Provide Strategic Parking Facilities