

Section III

CIRCULATION ELEMENT

GOALS, OBJECTIVES, POLICIES AND IMPLEMENTATION MEASURES

CIRCULATION SETTING

EXISTING AND PROJECTED TRAFFIC LEVELS

AREA GROWTH

ROAD IMPROVEMENTS NECESSARY UPON DEVELOPMENT

CLAYTON STREET SYSTEM

ALTERNATIVE TRANSPORTATION MEASURES

CIRCULATION

Goal

To implement a circulation system which will preserve the atmosphere and unity of the area and which will assure adequate traffic capacity on major thoroughfares but will minimize through traffic in residential neighborhoods.

Objective 1

To reduce truck traffic through residential areas.

Policies

1a Designate truck routes in concert with Concord and Contra Costa County.

1b Develop truck routes with adequate setback and buffer.

Objective 2

To coordinate the increased use of Concord Boulevard with Concord to reduce traffic passing through the City of Clayton to Kirker Pass.

Policies

2a Direct through traffic onto arterials with appropriate street and intersection design. Such appropriate street and intersection design may include but not be limited to: street widths; traffic control devices; street surface modifications (pavement scoring, surface markers or bumps, speed humps or undulations); traffic diverters or barriers.

2b Direct local traffic onto Marsh Creek Road, Center Street, Clayton Road and Concord Boulevard.

2c Discourage through traffic conflicts with Mt. Diablo Elementary School.

Objective 3

To continue the development of Concord Boulevard based on existing alignment but respecting geological hazards and limitations.

Policies

3a Investigate and remedy slide problem prior to extension of Concord Boulevard

Objective 4

To plan an efficient network of streets and trails which will link all neighborhoods of the community and allow safety and economy of movement.

(Revised 2/21/95)

Policies

4a Establish connections between Clayton Road and Concord Boulevard via El Camino if study warrants.

4b Establish connection between Regency Drive and Mountaire Parkway if study warrants it.

- 4c Provide greenbelt connections creating node linkages between trails.
- 4d Identify acceptable traffic service levels at key interchanges as a base for development analysis.

Objective 5

To provide mitigation for noise on arterials and truck routes with support for use of sound attenuation measures.

Policies

- 5a Permit sound walls on Mitchell Canyon Road subject to City approval for safety.
- 5b Review sound attenuation measures for development along Clayton Road, Concord Boulevard and Marsh Creek Road.
- 5c Require sound attenuation as part of Clayton Road expansion when warranted.

Objective 6

To provide alternative routes of circulation through the Town Center

Policies

- 6a Review route alternatives.
- 6b Seek separation of local and through traffic.
- 6c Prepare cost and benefit analyses of alternative routes.

Objective 7

To enhance the City's system of pedestrian, equestrian and bicycling paths and trails.

Policies

- 7a Determine areas where greenbelt paths may need to be designed to separate equestrian, bicycle and pedestrian use.
- 7b Identify pedestrian routes to school from different neighborhoods to make sure a safe route exists.
- 7c Provide information concerning the greenbelt system and safe route system in the form of maps and street signs.
- 7d Coordinate trails with other jurisdictions such as EBRPD, the State Department of Parks and Recreation, Contra Costa County and Concord.

Objective 8

To cooperate with Concord and Contra Costa County in design of the Regional Traffic System.

Policies

- 8a Support the request of Concord to split Clayton traffic between Concord Boulevard and Clayton Road to the extent feasible upon completion of Concord Boulevard.
- 8b Communicate with Contra Costa County regarding any action that will affect traffic on Marsh Creek Road in Clayton.

Objective 9

Establish a priority system to upgrade existing City streets to a City standard.

Policies

- 9a Require developers to construct all streets within a development and to contribute an equitable share of the improvements of other streets serving the development.
- 9b Seek State and County support for development and improvement of through-traffic arterials.
- 9c Provide systematic upgrade of streets and roads to applicable standards.

Objective 10

To support the establishment and expansion of public transit and carpools.

Policies

- 10a Participate in County-wide and area carpool/van pool programs.
- 10b Assist in location of permanent and temporary park and ride locations.
- 10c Provide free City application processing for park and ride lots on vacant parcels.

Implementation Measures

1. Prepare cost and benefit analysis of Town Center route alternatives.
2. Prepare a safe route to school map which is integrated into the circulation plan.
3. Establish a sign program for the greenbelt trail system.
4. Provide an analysis of roads in Clayton and establish a continuing infrastructure improvement program.
5. Identify potential park and ride lots
6. Determine roadway constructions standards.
7. Develop street standards for grade and section.
8. Encourage development of bus pullouts, shelters and benches.

9. Review off-site circulation needs and fee structure to adequately mitigate the effect of new developments.
10. Support discussions with Concord regarding off-site mitigation, fees and standards in Concord.

11. Identify emergency crossing and pedestrian access crossings to the Silver Creek II area.
12. Install appropriate street and intersection design methods to protect non-arterial streets from through traffic.
13. Use where appropriate the authority given the City by various vehicle code sections to prohibit use of certain commercial vehicles exceeding specific maximum gross weights or oversized or excessively noisy vehicles from using designated residential streets.

(Revised 2/21/95)

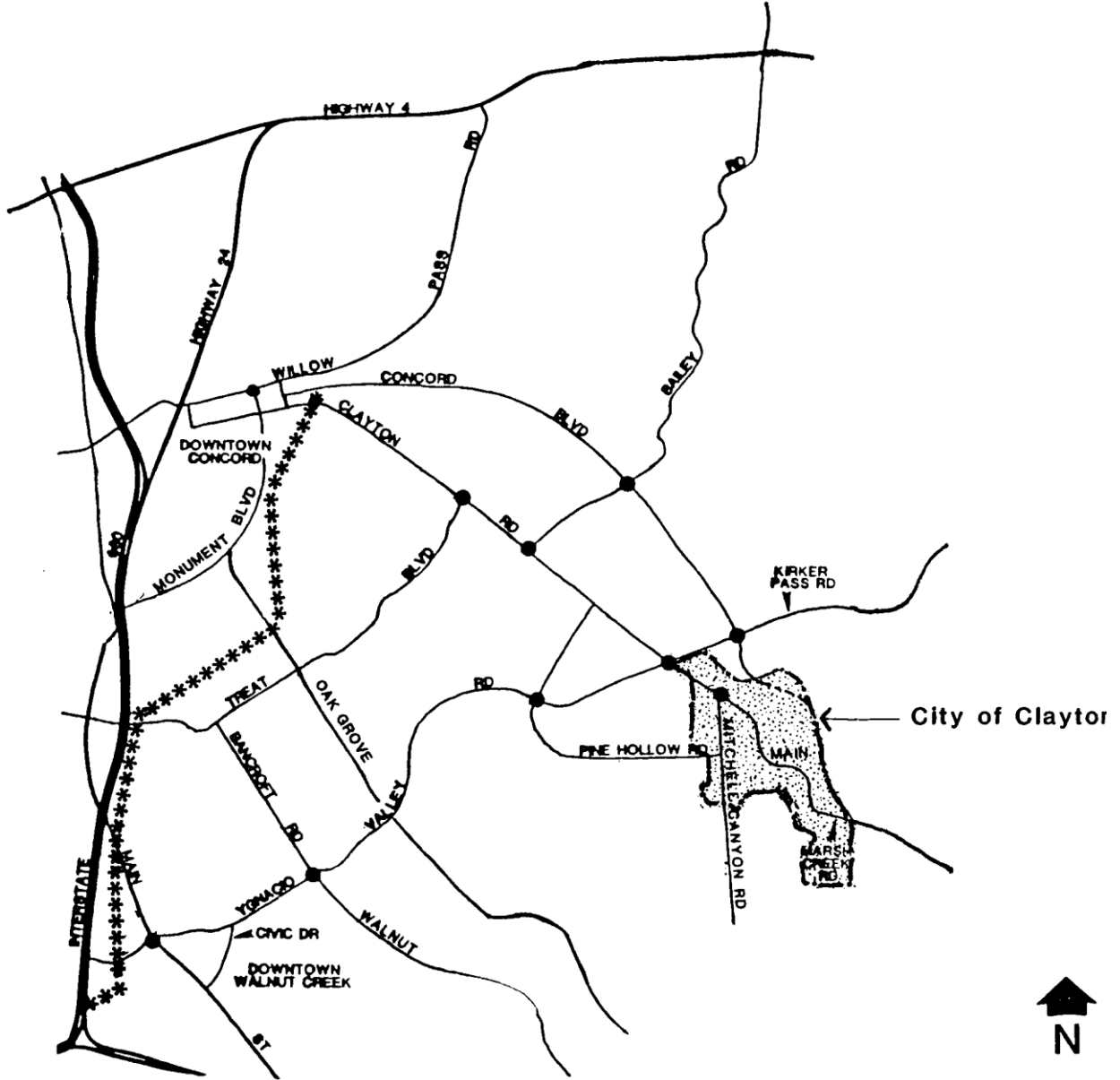
CIRCULATION SETTING

The City of Clayton is situated in a regional circulation system indicated in Exhibit III-1. In the regional context the arterials in the Clayton area are Ygnacio Valley – Kirker Pass Road and Clayton Road. These roads carry most of the commute traffic from east Concord and the Clayton area to Interstate Route 680 and State Route 24 for destinations in downtown Concord, Walnut Creek, Martinez, Pittsburg, Antioch, Alameda County and San Francisco. Concord Boulevard also serves to carry commute traffic, but does so for lower volumes. At present, Concord Boulevard south of Kirker Pass Road changes its name to Oakhurst Drive at Clayton’s City limits. This road connects with Clayton Road.

Clayton Road carries traffic to downtown Clayton from State Route 24 in Concord. Marsh Creek Road carries traffic to Clayton from residential developments and ranches to the east between Clayton and Brentwood. Marsh Creek Road is primarily a rural facility. Clayton and Marsh Creek Roads meet both in the Town Center (where Marsh Creek Road ends) and adjacent to the Diablo view Middle School (where Clayton Road ends and Marsh Creek Road turns to the Town Center).

Other important roads in Clayton are Pine Hollow and Mitchell Canyon. Pine Hollow Road is a two-lane residential street that has been widened to four lanes to serve new subdivisions. It often serves as a bypass to the Ygnacio Valley – Clayton Road intersection, a use the City of Clayton would prefer to discourage because the road is not designed for such use and because heavy bypass traffic would adversely affect a large number of residents whose properties front directly onto the road. Mitchell Canyon Road carries heavy truck traffic to and from the local quarries at times. The number of tandem gravel trucks traveling on Mitchell Canyon Road and Clayton and Pine Hollow Roads depends upon the amount and location of construction activities in the surrounding areas and time of year. Truck travel is greatest during the dry season.

Exhibit III - 1
Areawide Circulation Patterns



Capacity Terms

Discussion of traffic capacity is an indication of how well the circulation system serves area land use. The four common measures of traffic efficiency are as follows:

- a. **Average Daily Trips** – This measures either the vehicle trips generated per residence (10-15 depending on the size of unit) or the number of cars passing over a stretch of roadway during a certain period of time.

- b. **Peak-Hour Trips** - This measures the number of cars passing per hour and normally representing the worst case on a roadway. Afternoon peak hour (4:00 – 6:00) appears to be the heaviest usage of the area’s circulation system. Morning peak hours (6:30 – 8:30) is approaching the same level of volume. The peak hour normally carries 10% of daily volume. If the Clayton peak hours proportion is extended to the entire commute hours of 6:30 to 9:00 AM and 4:00 to 6:30 PM, over 30% of the daily usage will be accounted for leaving 70% of the traffic dispersed over 19 hours. The capacity of system is judged by peak response. In transportation planning the expansion of the peak period or dispersal of peak traffic is sought to improve system function at capacity. Reduction of peak commute hours through work staggering and flex-time will allow more efficient use of the road systems. Otherwise, costly methods of road expansion and improvement of flow become necessary.

The non-system alternatives are to tolerate increased commute periods and delays or prevent additional development.

- c. **Intersection level of service** measure is identified in the table below:

<u>Level of Service</u>	<u>Average Delay Seconds per Vehicle</u>
A	0.0 – 16.0
B	16.1 – 22.0
C	22.1 – 28.0
D	28.1 – 35.0
E	35.1 – 40.0
F	40.1 or greater

Level of service is based on amount of delay experienced by vehicles that pass through an intersection. The number is determined by calculating the average delay experienced by all the vehicles in a 24 hour period.

As the average delay increases, it is easy to envision delay of several minutes at each intersection during peak commute hours.

(Revised 6/28/95)

- d. **Street Capacity** measure can be described in two ways. The first is the physical capacity of a street, which means the ability of a street to carry a certain number of vehicles per hour. A standard two – lane road for instance is considered to have the capacity of 1,000 vehicles per hour. Such a capacity is limited by driveways, left turns, stop signs and cross traffic. Capacities are identified for the following roads:

Street	Size	Vehicles Maximum Cars per Hour
Concord Boulevard	2 lanes	1000 – 1200
Concord Boulevard	4 lanes	2500 – 3000
Clayton Road	2 lanes	1100 – 1300
Pine Hollow Road	2 lanes	1000 – 1200

In contrast to the physical capacity of the street, a capacity index is used as a relative index tied to the level of service. The level of highest acceptable delay is considered to be 100% of capacity. This is not the physical capacity but acceptable capacity. Levels of service higher than 100% indicate street usage at levels in excess of acceptable capacity. In larger metropolitan areas gradual acceptance of longer delays by commuters has been a documented phenomena.

EXISTING AND PROJECTED TRAFFIC LEVELS

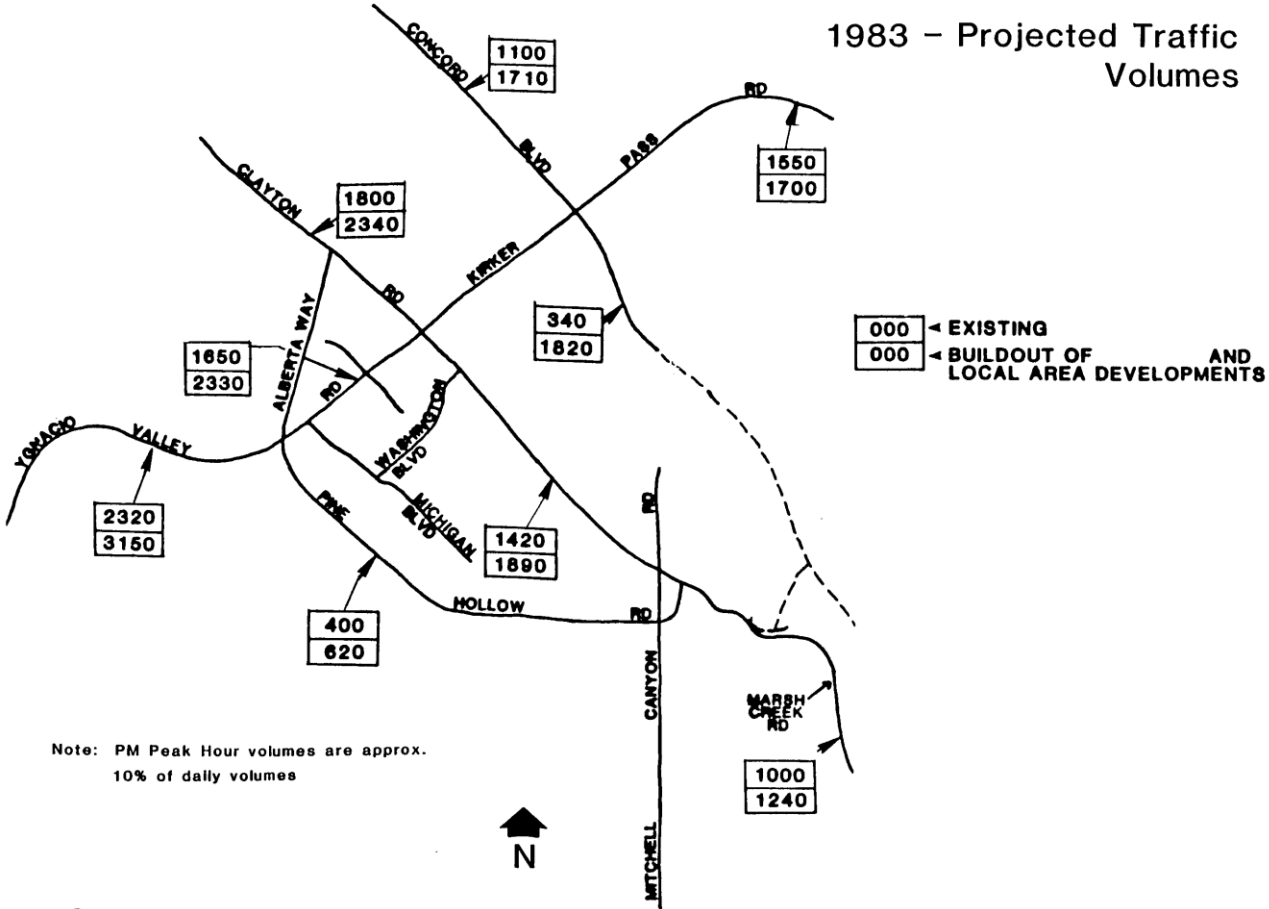
Traffic data used in this plan is based on data generated for the Keller EIR's and other sources as noted. Keller data was prepared by D. K. Goodrich and included information supplied by the cities of Walnut Creek and Concord. The data reflects existing traffic conditions (9/19/83) and projections for new development. Primary anticipated development will be on Keller Ranch, however, smaller projects such as Regency Meadows and infill sites are also included in the tabulation. The data in Exhibit III-2A assumes that Keller will develop 1,825 units with a total of 190,000 square feet of commercial development, 60,000 square feet of office space and 500 infill units. A previous set of projections indicated in Exhibit III-2B assumed 2,016 units to be developed on Keller Ranch with 728,000 square feet of commercial space, 120,000 square feet of office space and 712 infill units.

Exhibit III-2A indicates the most recent peak traffic levels based on projected growth while Exhibit III-2B identifies peak traffic levels based on high growth assumptions. The General Plan numbers adopted 7/85 for Keller Ranch and Clayton fall below those identified in Figure III-2A as the table below indicates:

Keller Ranch Residential	744 to 1486 units
Commercial Retail Development.	190,000 Square Feet
Office Development	60,000 Square Feet
Residential Infill	100 to 645 Units

Since circulation is a primary concern related to development in Clayton, additional traffic studies will be required to update previous information and facilitate determination of mitigation.

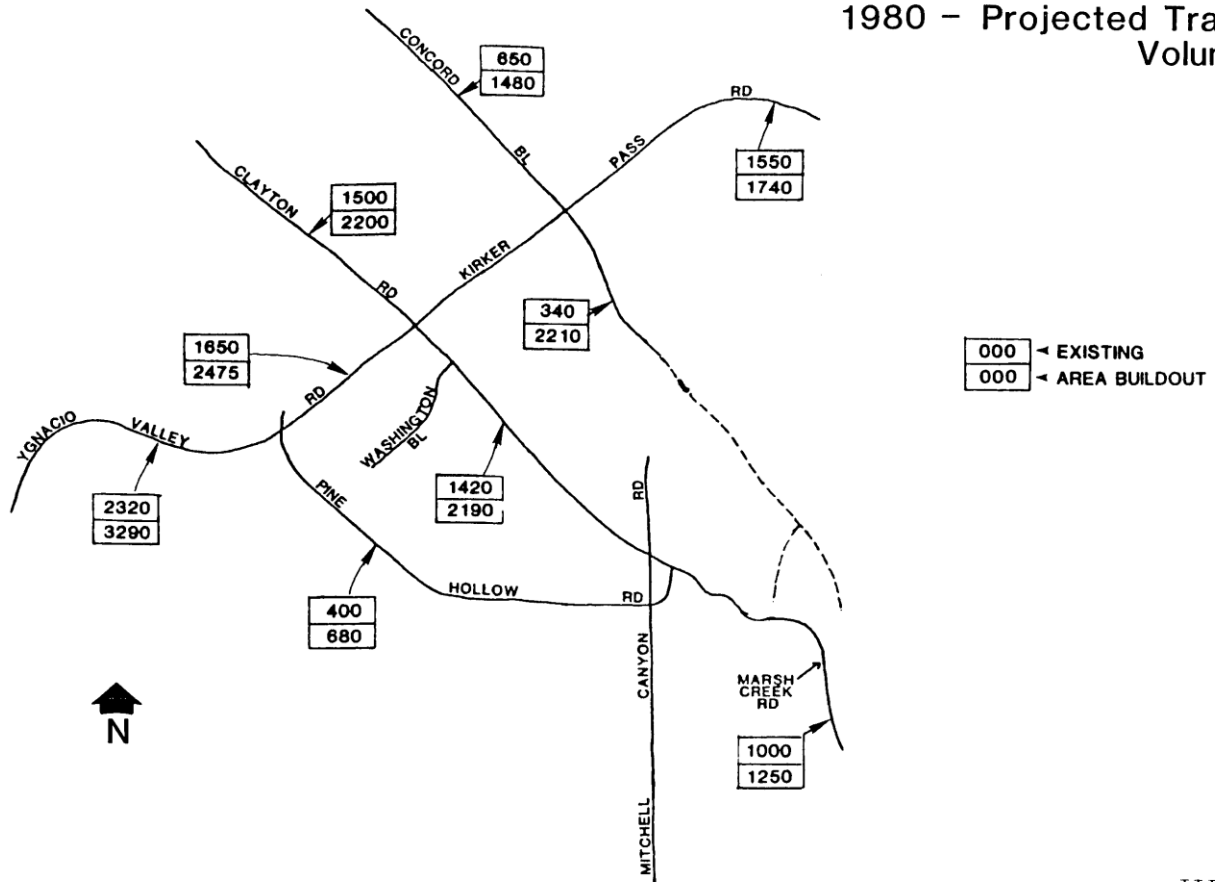
1983 - Projected Traffic Volumes



Note: PM Peak Hour volumes are approx. 10% of daily volumes

SOURCE: D.K. Goodrich, 1983.
City of Concord.
City of Walnut Creek.

1980 - Projected Traffic Volumes



P.M. PEAK HOUR VOLUMES ARE APPROXIMATELY 10% OF DAILY VOLUMES

III-10

SOURCE: D.K. Goodrich, 1980.

AREA GROWTH

Clayton's development is minor when taken in the context of subregional development. Since January 1983, a total of 153 new homes have been built in Clayton (1/83 - 12/84), about 6 homes per month. This represents an 11% increase in the number of homes in Clayton and consequently an 11% increase in the number of current vehicle trips in Clayton. Clayton has cut back on projected growth several times since incorporation, due to circulation and other issues. Presently Clayton's employment-generating development and commercial development is very low. The residential development identified represents 20-year total build-out. It should be noted that the ABAG needs assessment indicates 710 units are needed by 1990, and it is not possible to meet this goal within the present City limits without severe environmental shortcomings.

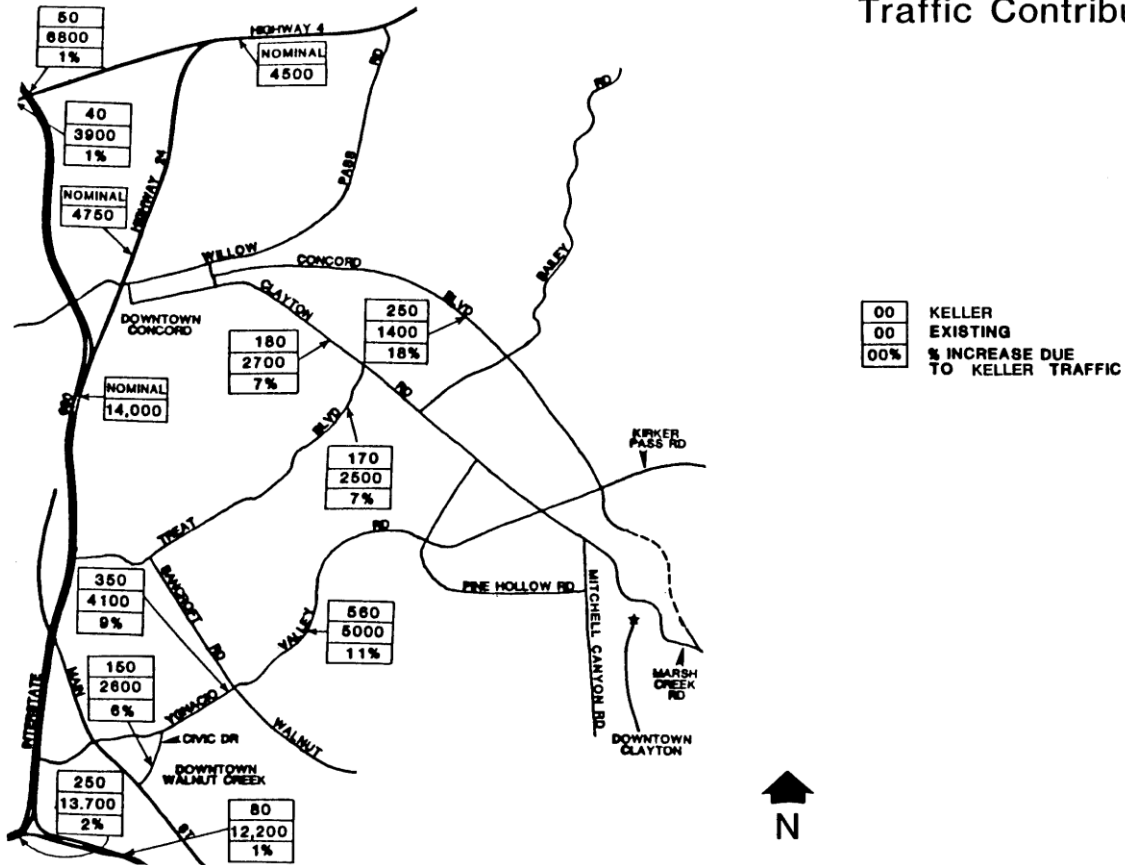
In contrast the initial findings of the Interstate 680 and Interstate 580 Corridor Study (10/84) include the following points:

1. By the year 2000 45,000 new households are anticipated in East County.
2. Employment in the Central Contra Costa County is expected to increase by 63,000 new jobs.
3. The largest projected increase in commute trips will be out of the east Contra Costa County area traveling southbound through Central Contra Costa County. Commuters from Pittsburg – Antioch area are likely to use arterials such as Kirker Pass Road.
4. A monitoring system should be developed to track study area development proposals and their status.
5. Cities and counties should require major developments to provide for short-term transportation mitigation measures to decrease the immediate need for additional improvements.
6. The separation of job location in Central County and residential development in East County will promote long distance commuting, increase highway travel and increase facility improvement needs.

Based on these points it appears Clayton is caught between major employment development in Central County and major residential development in East County. The residents of Clayton are extremely concerned over the changes that have occurred in area traffic. Exhibit III – 3 indicates the projected addition of Clayton traffic upon existing area roadways. It does not include additional traffic due to actions in other jurisdictions.

Clayton is willing to participate in regional solutions that include analysis of factors such as employment generation, land cost, transportation system improvement, encouragement of alternatives to the single-vehicle-occupant commuter, land use, and the respective roles of area communities in the problem.

Exhibit III-3
Traffic Contributions



SOURCE: D.K. Goodrich, 1989.
City of Concord,
City of Walnut Creek.

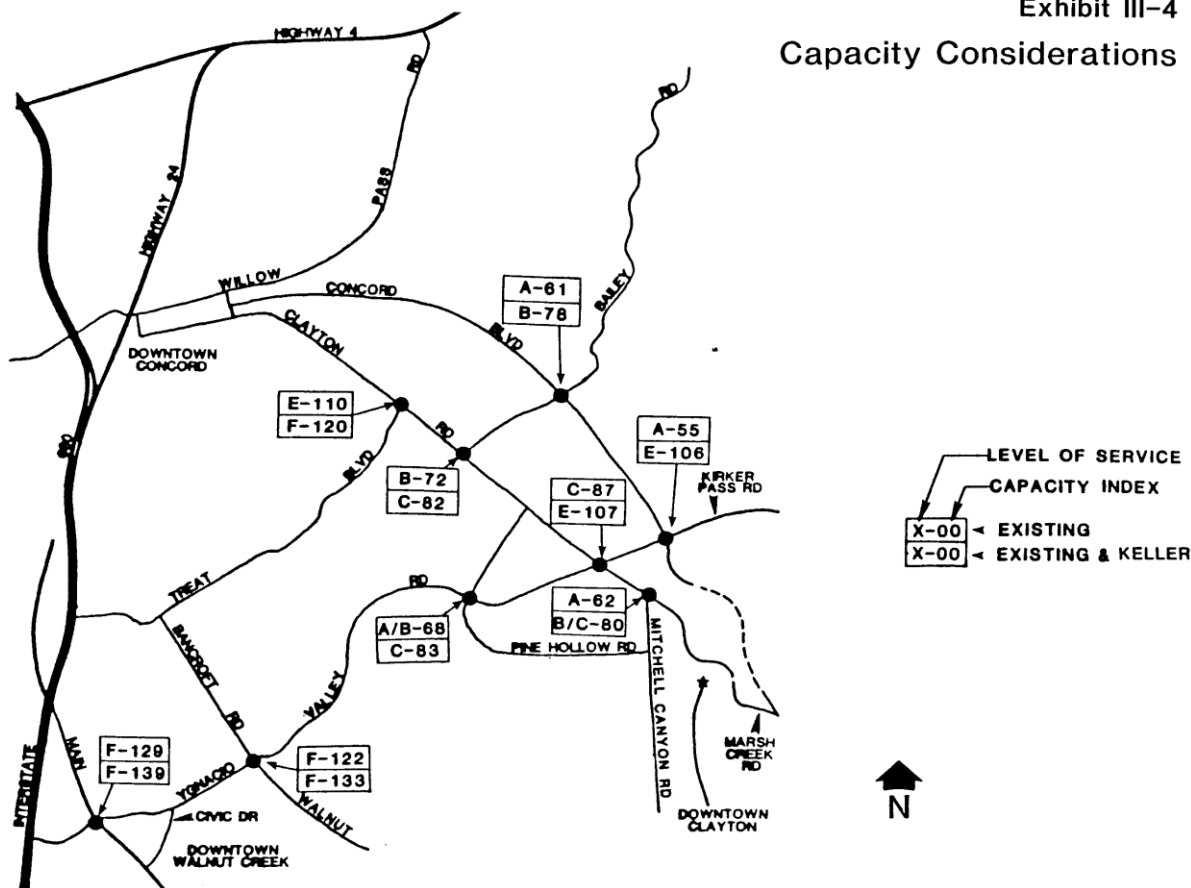
III-1

ROAD IMPROVEMENTS NECESSARY UPON DEVELOPMENT

The greatest impact of new development is the effect of traffic upon service levels would be during the PM peak – hour traffic flow between 4:00 and 6:00 PM daily. Congestion would increase between 6:00 and 8:30 AM but to a lesser peak.

Exhibit III-4 indicates the level of service and capacity index for area intersections under existing conditions and upon buildout. This does not include new developments within other jurisdictions. Without adequate mitigation it appears that unacceptable intersection deterioration can be anticipated at area intersections. In 1981 the City of Clayton adopted a resolution which established a city policy for the collection of off-site arterials/street improvement fees from new residential development.

Exhibit III-4
Capacity Considerations



Design Improvements

Intersection details and EIR mitigation measures are not normally considered in the text of the General Plan. However, the importance of circulation and design in consideration of city buildout prompts inclusion. Resolution of design details will occur at the project level.

The following improvement measures are included in the Keller Ranch EIR (1983) in order to improve area traffic flow. The measures are intended to maintain a level of service of D or better at all signalized intersection and mid-block roadway segments.

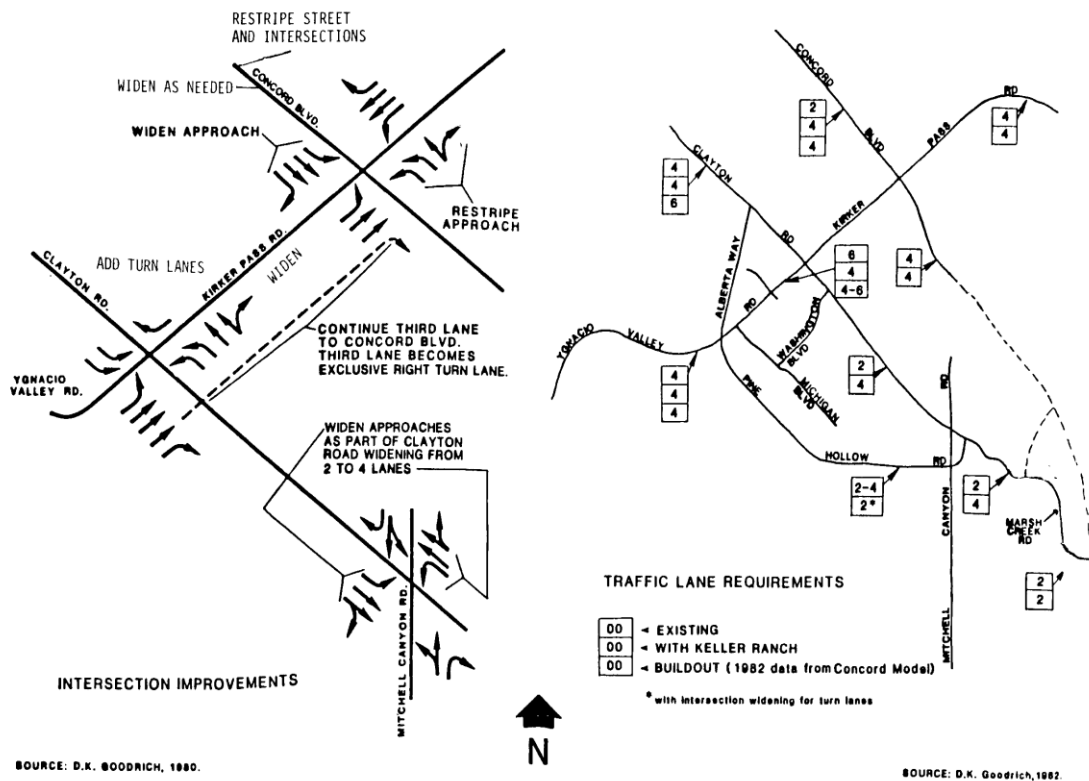
- a. Improve Clayton Road between Kirker Pass Road and Oak Street. This will require realigning and straightening, widening in some locations, providing turn lanes at all intersections, and providing signals where necessary. Sufficient right-of-way for lanes with turn pockets, should it ultimately be necessary, should also be acquired.
- b. Widen Concord Boulevard to four lanes between Kirker Pass Road and Bailey Roads. Figure 20 shows how lane requirements would change on local roadways, including Clayton Road and Concord Boulevard, in response to traffic produced following Keller Ranch development. This would require use of some existing frontage of homes lining Concord Boulevard. An alternative would be to provide an optional two-way left turn lane plus the two existing through lanes. This

would separate the many turning vehicles from the through traffic flow.

- c. Widen intersection approaches on Marsh Creed Road south of the Keller development and on Pine Hollow Road to provide room for turning lanes. This may require removal of minor amounts of landscaping on these approaches
- d. Widen and restripe intersection approaches (Exhibit III – 5) to the intersection of Kirker Pass Road with Clayton Road and with Concord Boulevard, and of Clayton Road with Mitchell Canyon Road.

The City of Concord has found that in addition to these improvements the intersection of Kirker Pass Road/Clayton Road will require a second, or dual, left turn lane to accommodate Clayton buildout traffic (Franzen).

**Exhibit III-5
Keller Ranch Traffic Mitigations**



- e. Extend Concord Boulevard through the Keller Ranch site as a four-lane arterial with turning lanes at all points to its intersection with the Marsh Creek Road extension. Separate the intersections along Concord Boulevard by at least 800 feet, and use four-leg intersections rather than “Tee” intersections wherever possible. The site plan reflects this type of planning and would help divert traffic from Concord Boulevard and downtown Clayton.

- f. South of the Marsh Creek Road extension, Concord Boulevard should be a two-lane road. Reserve sufficient right-of-way for a four-lane road in case additional lanes are required in the future.
- g. Make the Marsh Creek Road extension south of Main Street four lanes and provide turning lanes at each intersection in order to provide adequate traffic flow.
- h. Place traffic signal hardware at the Marsh Creek Road-Concord Boulevard intersection. A signal will probably be necessary when Keller Ranch is fully developed.
- i. Increase the curvature of residential roads to produce a more serpentine alignment with curve design speeds not over 25 miles per hour. This would promote lower speeds and preserve the residential character of the streets.
- j. Design all roads to have grades of 15% or less. Exceptions to this standard in hillside areas should be evaluated on an individual basis and should be for the shortest length possible.
- k. Black Diamond Way should be included on the Preliminary Development Plan as a hiking, riding and bicycling trail. This roadway would need to be removed from the Contra Costa County Major Roads Plan in order to be in conformance with the adopted County General Plan amendment for the Keller Ranch area.
- l. Implementation of all mitigation measures listed in this section would be necessary at buildout of Keller Ranch. However, many would be needed during the course of development, depending on project phasing. The City should require the developer to submit a proposed phasing schedule for improvements that is consistent with the phasing schedule for project development.
- m. The northern Contra Costa County area, including the cities of Concord, Walnut Creek, Martinez, Pittsburg, Antioch and Clayton is in need of an area-wide traffic, transportation and land use study. All of these cities are growing, and the traffic impacts from one city are usually felt by the others. Improvements that may be in the best interest of one city may not facilitate the best overall area traffic system. Many of the transportation related issues that will affect some or all of the cities are beyond the capacity of a single – project EIR to answer. It is therefore recommended that an area-wide study be conducted to coordinate future traffic plans among all responsible government bodies. The following issues should be looked at in the study:
 - Alternative transportation corridors to Ygnacio Valley Road. It will be impossible to keep mitigating traffic problems along this one roadway.
 - Development of new employment centers east of Concord to shift present area-wide travel patterns. This may be the only method to reduce or maintain existing peak hour, peak direction traffic flows on the local roads.

- Funding currently does not exist, nor will it probably exist in the future, to provide enough transit service to reduce auto volumes to any measurable extent.
- Improved signalization coordination and intersection improvements based on a cooperative area-wide traffic flow strategy rather than on a separate city-by-city basis.

Change to the previous comments were recommended by the City of Concord:

1. West of Kirker Pass Road, Clayton Road has been expanded to 6 lanes while Concord Boulevard is only 2 lanes. Traffic should be directed away from Concord Boulevard and onto Clayton Road.
2. Crossings of Mt. Diablo Creek at El Camino, Lydia Land and Mitchell Canyon Road should be considered or at least emergency crossing of emergency vehicles, pedestrians and bicycle paths.
3. Additional left-turn lanes are necessary at the intersection of Clayton Road and Ygnacio – Kirker Pass Roads.

An updated traffic analysis will be necessary to supplement peak traffic analysis in order to include one-way volumes for both AM and PM peak hours.

4. Revised recommendation is made for improvements between Kirker Pass Road and Ayers Road.
5. Recommend use of Concord fee structure for use in Clayton to mitigate downstream traffic.
6. Consideration by Keller Ranch development of effect on Concord Boulevard and Denkinger Road intersection.

Prior to decision on circulation improvement and mitigation of costs due to any new project, the cities of Concord and Clayton will need to meet and resolve the issues raised. This process should begin prior to approval of any significant traffic-generating development.

Clayton Street System

Clayton street and pathway system is indicated in Exhibit III – 6. The system consists of arterial collector streets, local streets, private streets, cul-de-sacs and greenbelts. There is 20.6 miles of roadway. They are described as follows:

Arterial streets such as Clayton Road, Kirker Pass Road, Marsh Creek Road, and Oakhurst Drive are designed to carry traffic through a city or from one major area to another within a city. Specific provisions, such as striping or grade separated lanes are required for non-motorized vehicles.

Collector streets such as Washington Boulevard, Mitchell Canyon Road and El Molino Drive provide a direct connection between arterials and local streets and also provide access to activity centers such as schools, parks, and shopping centers. Specific provisions may be required for non-motorized vehicles.

Local streets such as Tiffin Drive, Lydia Lane and Weatherly Drive are typically two-lane streets which provide direct access to individual residential lots. These types of streets are not shown on the circulation plan. Local streets may be through or may dead end. Streets that will eventually go through should be posted with signs to prevent confusion.

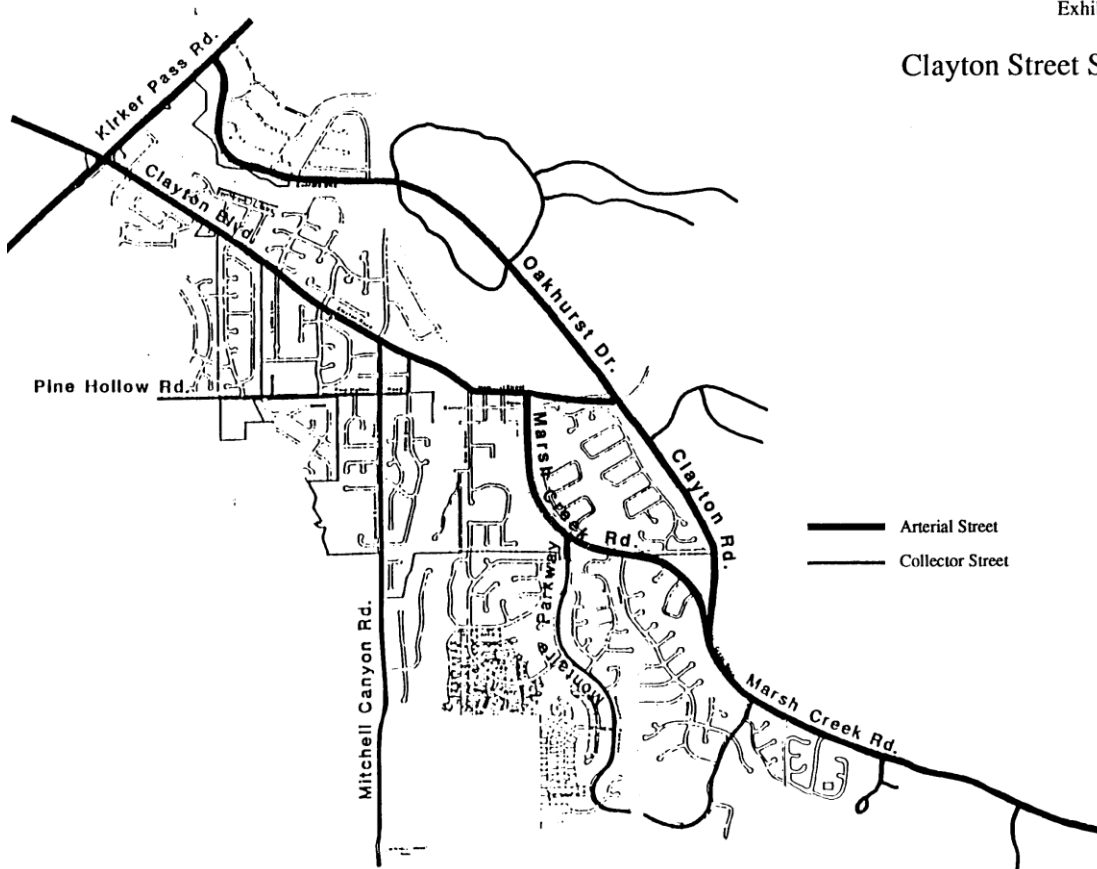
Private streets such as Clark Creek Circle, have been developed as part of a private residential development. The streets are not built to City standard and must be maintained by the homeowners.

Cul-de-sacs such as Marquette court, Nottingham Place and Malibu Court are not intended to go through; however, they must provide adequate turn-around.

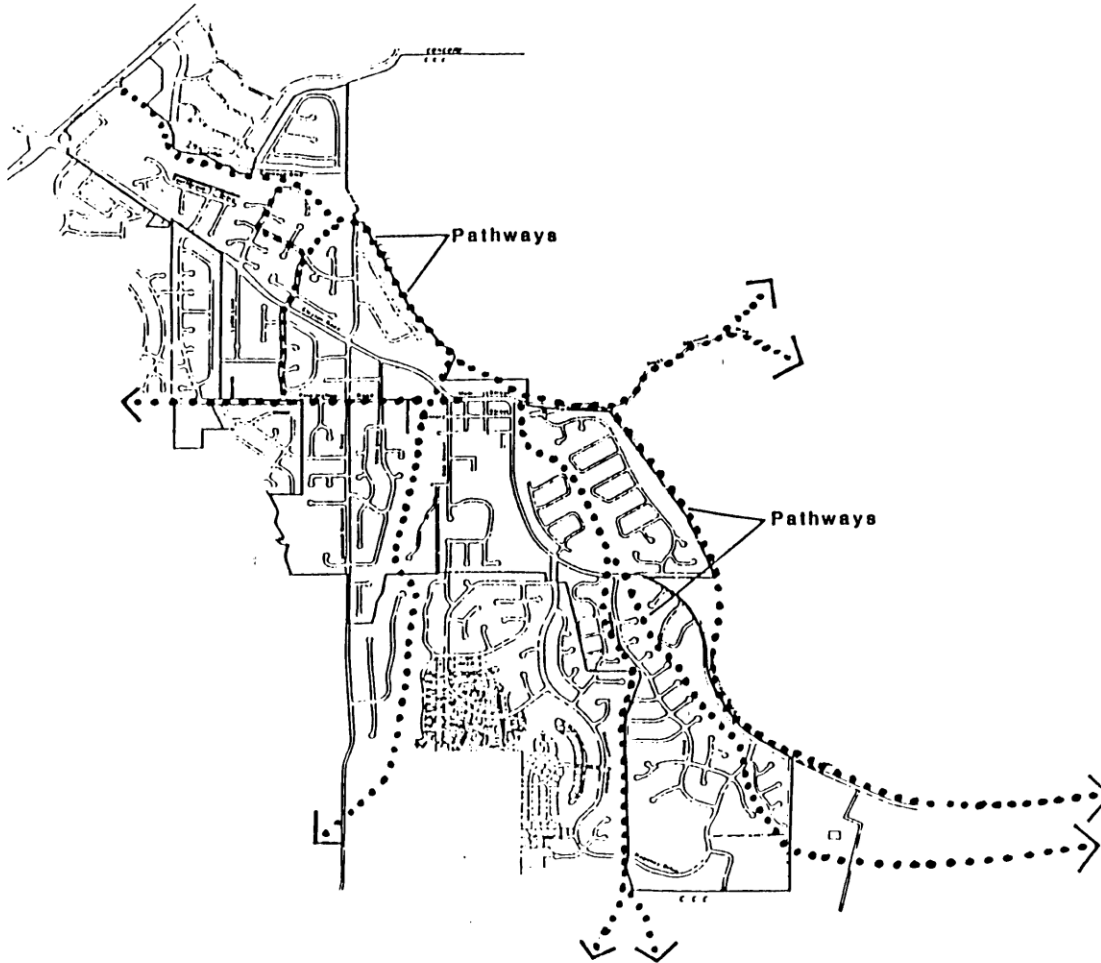
Greenbelts found along Mt. Diablo, Peacock, Donner and Mitchell Creeks provide circulation through the community for pedestrians, horseback riders and bicycle riders.

Exhibit 111-6a

Clayton Street System



(Revised 6/28/95) Page III-18A



(Revised 6/28/95) Page III-18B

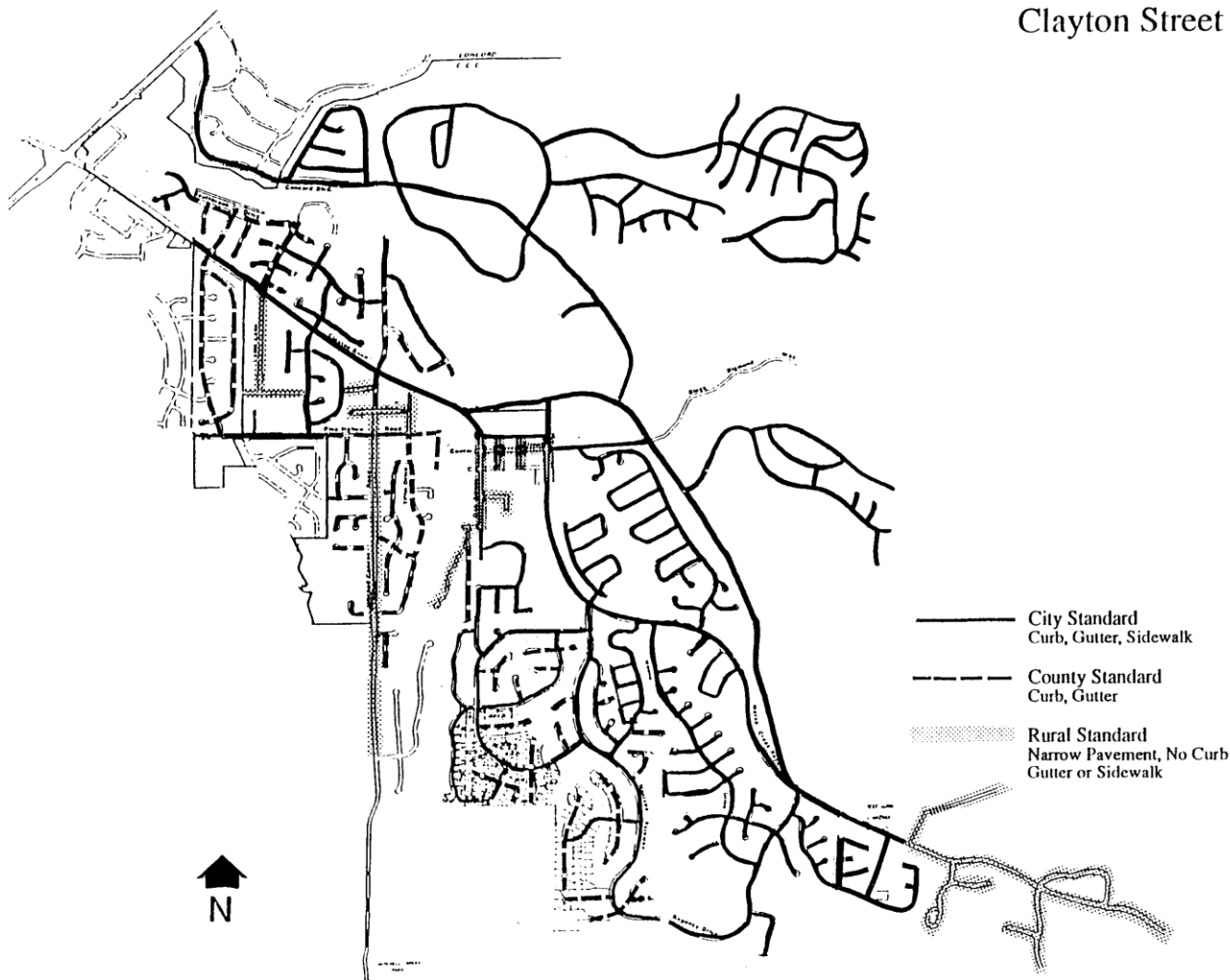
Standards of Construction

Exhibit III – 7 indicates standards under which Clayton streets should be developed. These streets were developed at various times and some lack curb, gutter and sidewalk improvements. The City intends to upgrade all city streets for full city standards depending on available funding. However, within areas that provide a transition from suburban to agricultural uses, street standards may vary to reflect the rural conditions. Specific Plans, conditions of approval and similar documents will define street standards within these transitional areas.

Financing Improvements

The most likely sources of financing for circulation system improvements, proportionate to effect, consist of project contributions from the development of Keller Ranch, Kirker Corridor and smaller projects proposed within the Sphere of Influence. In addition, establishment of a redevelopment agency can help fund needed circulation improvements not covered by fees.

Clayton Street Standards



ALTERNATIVE TRANSPORTATION MEANS

Transit

The City of Clayton is serviced by the Central Contra Costa Transit Authority (CCCTA). The current bus route is indicated in Exhibit III – 8. Bus stop and shelter locations are also indicated.

A recommendation for the service improvement in the future would be a Bart shuttle from various points of Clayton at peak hour as demand warranted.

Park and Ride Lots

There are no park and ride lots in Clayton at present. However, it will be worthwhile to contact churches and other institutions and facilities with large minimally used parking lots for park and ride locations.

Van Pools and Car Pools

There are van pools and car pools currently operating in Clayton. It will be beneficial to assist in providing coordination of carpool formation and matching for local residents.

Exhibit III-8
Transit Routes

