

VI -5. TRANSPORTATION SYSTEMS MANAGEMENT

Transportation Systems Management is an opportunity to increase the safety and efficiency of Santa Cruz's transportation infrastructure -- without widening streets -- through innovative technologies and effective prioritization of resource use.

This section describes the MTS vision for relieving congestion and improving safety through Transportation Systems Management (TSM). It briefly describes the goals and the strategies commonly used in TSM, identifies location specific applications throughout the city and presents short-term and long-term recommendations.

MTS VISION

The MTS vision for traffic management is:

"Automobile congestion will be managed and reduced while minimizing impacts on surrounding residential neighborhoods. New technologies in transportation will be evaluated and adopted as they are shown to be affordable and implementable."

MTS Goals

The MTS goals related to traffic management are to:

1. Provide multiple transportation modes thereby creating a flexible and adaptive transportation system throughout the City of Santa Cruz
2. Use new technologies to manage traffic and prevent neighborhood cut-through
3. Develop a system that exceeds existing transportation norms and addresses issues with innovative and alternative solutions
4. Develop ways to manage congestion in 10 years
5. Make arterials function safely and efficiently

TSM STRATEGIES

Managing the flow of traffic on Santa Cruz's streets not only relieves automobile congestion, but improves the efficiency and attractiveness of transit, which also relies on streets, and improves the safety of pedestrians and bicyclists, who often share streets with automobiles. Reducing traffic congestion keeps automobiles on streets designated for citywide and regional mobility and minimizes intrusion into residential neighborhoods.

Maximizing the efficiency of the existing transportation system is a leading priority for communities across the nation as the cost of building new roads skyrockets. Most

communities find it undesirable to acquire land and remove land uses to widen streets, and citizens often oppose major street widening because it impacts other modes of travel and encourages more driving and higher speeds.

Transportation Systems Management (TSM) provides tools or methods to find optimum strategies to relieve, lessen or control congestion with minimal roadway widening. These strategies can reduce vehicle travel time and enhance system accessibility with little impact on other modes. Figure 12 shows the location of TSM measures.

Intelligent Transportation Systems (ITS)

Recent technology advances also have considerable transportation benefits without the need to widen streets. Numerous opportunities exist for the application of this new technology in Santa Cruz. A few examples are:

- Adaptive "Real-Time" Traffic Operations using cameras and a centralized traffic management center to control traffic and incidents as they occur. Soquel Avenue and Ocean Street are two candidate corridors.
- Priority Emergency and Transit Vehicle Routing- equipping vehicles with "Opticom-type" devices that give them priority at traffic signals. All traffic signals are candidates.
- Integrated Freeway and Arterial Streets System - installation of Changeable Message Signs along city arterials to advise drivers of road problems and parking conditions. Mission Street, Ocean Street, and Soquel Avenue are candidates for these systems. Careful consideration must be given to aesthetics in the consideration of these systems. These message signs can also advise vehicle operators of the optimum speed for synchronized signals.
- Transit Management- more user-friendly transit through ITS technological applications including automatic vehicle location (AVL) systems linked to a Traffic Management Center allowing adaptive real-time modification to signal timing to improve bus travel time (using Global Positioning System technology and odometer readings, the AVL system can track and locate buses at all times: actual versus scheduled bus location can be automatically compared for schedule-adherence efficiency and signal timing along bus corridors can be automatically adjusted), real time bus stop display of when buses will arrive, automatic data transmission capability; emergency communications systems; computer-aided dispatch; electronic vehicle diagnostics; and automatic passenger counting systems.
- Incident Management- used when extended and/or complete closure of roadways is necessary, written detour plans are prepared with arrangements to provide traffic control devices. In addition, Changeable Message Signs in strategic locations can identify alternative routes and warn drivers of delays

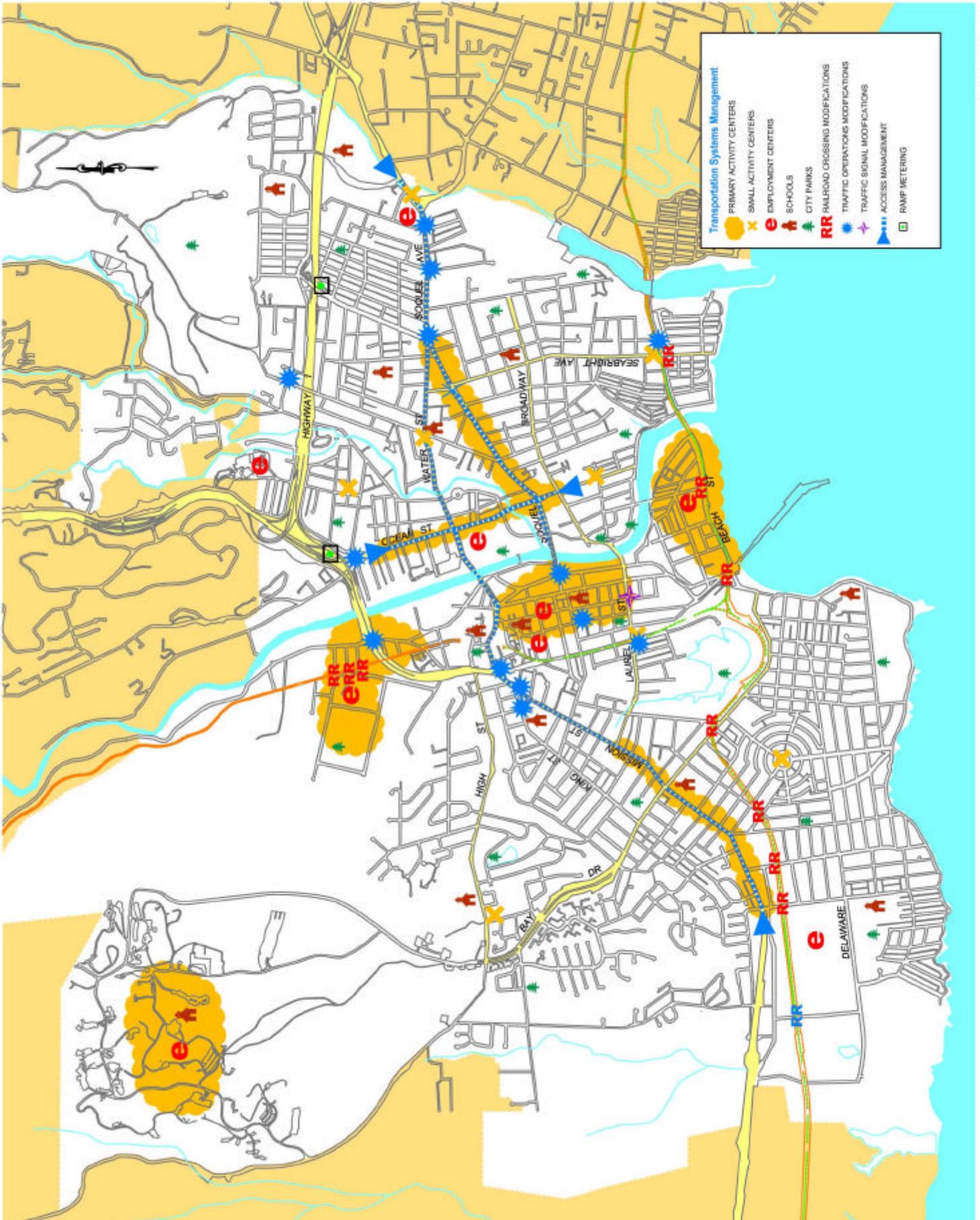


FIGURE 12

- **Multimodal Traveler Information Services-** providing information concerning the transportation system's conditions to the public in a timely manner, using monitoring, communications, and data processing capabilities of a traffic-signal management system and broadcasts of information on cable television, internet, or changeable message signs. Ocean Street is a prime candidate for this type of program.
- **Enforcement using automatic cameras for red light running and/or speeding.** Major target areas would be Mission Street, Soquel Avenue, Water Street and problem neighborhoods.

Intersection Modifications & Innovative Solutions

Intersection modifications include innovative solutions at both signalized and non-signalized intersections. Traffic signal modifications include modernizing existing traffic signals, installing new traffic signals, removing unnecessary traffic signals, interconnecting and synchronizing individual signals into signal systems or networks, optimizing signal timing for traffic flow during both high and low volume hours, and providing for signal flashing during off-peak hours. Solutions include use of video cameras and a centralized control center to make real-time adjustments to signal operations to clear congestion. Posting of synchronized traffic speeds will also be considered.

Traffic operations modifications at non-signalized intersections may include various corridor and intersection changes (approach widening, channelization, addition of turn lanes, and parking removals), re-striping travel lanes, one-way couplets, installing pavement markers, and relocating transit stops. Traffic operations modifications are designed to increase the operational efficiency, safety, and capacity of the existing street system without corridor-wide street widening.

Innovative intersection solutions include implementing modern roundabouts. This form of intersection allows traffic to flow into and out of a circle without the need for traffic signals. Roundabouts create a slower speed, while improving flow because there is less need for traffic to stop. Up to certain traffic volumes, roundabouts have equal or greater vehicle capacity than standard signalized and unsignalized intersections. They are designed to accommodate bicycles and large vehicles, and pedestrians are channeled to narrow locations where conflicts are minimized.

Access Management

Access management is a method of controlling access onto major streets and activity sites to minimize conflicts and friction caused by multiple, closely spaced driveways and intersections. Methods include consolidation of driveways and installation of raised medians. Access management improves vehicular, pedestrian and bicycle safety as well as improving traffic flow. This concept should be sensitive to the division of neighborhoods. Special attention should be given to public/private property access management in the Beach Area.

Railroad Crossing Modifications

Railroad crossing modifications are intended primarily to improve safety. Among the modifications categorized as railroad crossing modifications are: (1) installation of rubber pads to smooth traffic, bicycle, and pedestrian crossings of tracks; (2) road surface modifications; (3) installation or modernization of flashers; and (4) installation or improvement of gates. These measures improve traffic flow, minimize auto/train conflicts at the crossings, improve non-motorized crossing of tracks, and reduce motor vehicle collisions at the approaches to the crossings.

Ramp Metering

Metering freeway entrance ramps optimizes freeway capacity and travel speeds, encouraging through traffic to remain on the freeway and not use city streets to bypass congestion. This should be considered for Route 1. Ramp metering can have negative impacts on City streets. This impact can be mitigated with the use of ramp queue detectors, which increase the metering rates onto the highway when queues reach a point where they interfere with surface street operations.

Preferential Treatment for HOV's

Actions that give transit, carpooling, emergency vehicles and other high-occupancy modes of transportation preferential treatment over single-occupant vehicle travel support a number of TSM objectives. These measures include exclusive HOV lanes, reversible HOV lanes, and peak period elimination of on-street parking for buses, and bus queue jump lanes at intersections. HOV facilities encourage transit use by increasing the competitiveness of transit over driving. Carpooling becomes more attractive as well as travel times increase for cars with multiple occupants. Clearly, the trade-off of this measure is reduced capacity for non-HOV vehicles, which potentially will increase cut-through traffic in the surrounding neighborhoods. The provision of preferential HOV facilities on City streets requires concurrent implementation of neighborhood traffic calming plans.

Signage and Lighting Upgrading

Upgrading signage and lighting enhances driver safety by advising of special regulations or hazards, by directing traffic movement, and by providing directional information. The Ocean Street corridor is a candidate for this type of improvement. Route 1 and Route 17 are state highways that would benefit from additional and or enhanced signage leading to major activity centers in the City of Santa Cruz.

EXISTING POLICIES

The City of Santa Cruz General Plan adopted in 1994 contains the following goals and policies related to Transportation System Management and improving the efficiency of the existing transportation system. The following goals and policies support the MTS goals described above.

Goal C5: Maximize the efficiency and safety of the existing road system while ensuring that it accommodates all modes of travel, operates at an acceptable level of service, and is not expanded unnecessarily.

- Outline alternative transportation improvements, TSM strategies, road improvements and widening/expansion projects that can achieve acceptable level of service and prioritize alternative transportation improvements and TSM strategies over road improvements and widening/expansion projects.
- Limit driveways, mid-block access points, intersections, remove on-street parking, cluster facilities around interconnected parking areas, provide access from side streets and implement other measures having similar effects, to improve the flow, safety and reduce impacts on arterial streets.

Goal C6: Develop a Transportation Systems Management program that reduces automobile use by reducing travel need, encouraging the use of alternative transportation, increasing the average number of persons per automobile, and improving the operation of the existing road system.

- Expand and implement traffic operations improvement programs such as traffic control systems and peak hour parking restriction programs to increase road efficiency, reduce traffic congestion and improve traffic flows during peak periods, including visitor peaks;
- Develop a TSM planning and monitoring program to evaluate, adjust and improve citywide TSM strategies.

IMPLEMENTATION

Short-term implementation actions are strategies, programs, and capital projects that Santa Cruz can implement within the next five to ten years.

TABLE 1: Short-Term Implementation Priorities

Priority	Implementation Action
1	<p>Implement the following modifications at the Mission/King intersection to improve traffic conditions on Storey and High Streets:</p> <ul style="list-style-type: none"> ● Restrict parking on eastbound King Street between Storey and Mission and stripe two approach lanes, providing more storage and channelizing traffic into the appropriate turning lanes ● Implement the Mission Street signal coordination to optimize the cycle length at the Mission/King intersection. Consider implementing "half-cycle" signal timing at this intersection to reduce queue buildup on King Street. If not possible consider signalization at Storey and King intersection.
2	<p>Develop TSM solutions for the following non-signalized intersections:</p> <ul style="list-style-type: none"> Soquel Avenue and Dakota Avenue California Avenue and Bay Street Pacific Avenue at Beach Street Pacific Avenue and Center Street (potential roundabout) Market Street at Goss Avenue
3	<p>Develop TSM solutions for the following signalized intersections with PM Level of Service D - F</p> <ul style="list-style-type: none"> Mission Street and Chestnut Street (potential roundabout) Mission Street and King Street (potential roundabout) Mission Street and Bay Street Ocean Street and Water Street Route 1 at Route 9 San Lorenzo Boulevard and Riverside Avenue San Lorenzo Boulevard and Ocean Street Seabright Avenue and Murray Street Soquel Avenue at Park Avenue Soquel Avenue at Morrissey Boulevard Soquel Avenue and Seabright Avenue Soquel Avenue and Branciforte Avenue Soquel Avenue at Hagemann Avenue

TABLE 1: Short-Term Implementation Priorities

Priority	Implementation Action
4	Identify and install safety improvement plans at the following railroad crossings: Swift Street Encinal Street Almar Avenue Fair Avenue Fern Street Beach Street Swift Street
5	Study the feasibility and potential benefits and impacts of implementing peak-hour HOV or exclusive bus lanes on the following streets: Beach Street, Soquel Avenue, Water Street & Pacific Avenue between Center Street and Beach Street

Long-Term

Long-term implementation actions are capital projects, studies, and programs that Santa Cruz can implement in 10-20 years. These projects are dependent on available funding for implementation.

TABLE 2: Long-Term Implementation Priorities

Priority	Implementation Action
1	Develop access management plans for the following corridors: Beach Street Ocean Street Soquel Avenue Mission Street Water Street
2	Develop a joint study with Caltrans and SCCRTC to determine the feasibility and benefits of implementing ramp metering at the following locations. Ensure analysis of the impact on Santa Cruz streets. Morrissey Avenue at Route 1 Plymouth Street at Route 1 If feasible, work with regional and state agencies to secure funding and implement.
3	Prepare a citywide Intelligent Transportation Systems (ITS) study coordinated with SCCRTC and Caltrans to identify potential ITS tools and priority locations for implementation. Work with regional and state agencies to implement priority improvements.

TABLE 2: Long-Term Implementation Priorities

Priority	Implementation Action
4	Prioritize the non-signalized and signalized improvements identified in the studies from short-term actions #2 and #3 and implement improvements in order of priority
5	Prioritize the railroad crossing improvements identified in the study from short-term action #3 and implement improvements in order of priority
6	Prioritize and implement feasible HOV improvements identified in the studies prepared under short-term action #5

