

Appendix Q

Community Infrastructure & Services Technical Report

**Community Infrastructure & Services
Technical Report**

July 2008

**Prepared for:
County of Humboldt
Community Development Services Department
3015 M Street
Eureka, CA 95501-4484**

Prepared by:
 **WINZLER & KELLY**
CONSULTING ENGINEERS
**633 Third Street
Eureka, CA 95501
(707) 443-8326**



Community Infrastructure & Services Technical Report

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LIST OF ACRONYMS

- AB – assembly bill
- AC – asbestos cement
- ACLC – administrative civil liability complaint
- ACLO – administrative civil liability order
- ADWF – average dry weather flow
- ARDWP – Annual Report to the Drinking Water Program
- ASBS – Area of Special Biological Significance
- ASCE – American Society of Civil Engineers
- BOD – biological oxygen demand
- CAO – cleanup abatement order
- CCC – California Coastal Commission
- CDBG – Community Development Block Grant
- CDO – cease and desist order
- CEQA – California Environmental Quality Act
- CFC – California Fire Code
- CI – cast iron
- CIP – capital improvements plan
- CPA – Community Planning Area
- CPL – competitive project list
- CPUC – California Public Utilities Commission
- CSD – community services district
- CWD – County water district
- DHS – Department of Health Services
- DI – ductile iron
- DOF – Department of Finance
- DOT – Department of Transportation
- DWR – Department of Water Resources
- EDU – equivalent dwelling unit
- FEMA – Federal Emergency Management Agency
- gpd – gallons per day
- gpm – gallons per minute
- HBMWD – Humboldt Bay Municipal Water District

HP – horsepower
I&I – inflow and infiltration
ISRF – Infrastructure State Revolving Fund
LAFCo – Local Agency Formation Commission
LCP – Local Coastal Plan
LF – lineal feet
LLC – Limited Liability Corporation
MDD – maximum day demand
MG – million gallons
MGD – million gallons per day
MS4 – Municipal Separate Storm Sewer System
NPDES – National Pollutant Discharge Elimination System
NPS – nonpoint source
PALCO – Pacific Lumber Company
PHD – peak hourly demand
POTW – publicly owned treatment works
PVC – polyvinyl chloride
PWWF – peak wet weather flow
RID – resort improvement district
RUS – Rural Utilities Service
RWQCB – Regional Water Quality Control Board
SCWG – Small Community Wastewater Grant
SOI – sphere of influence
SRF – State Revolving Fund
STEP – septic tank effluent pumping
SWMP – Storm Water Management Plan
SWRCB – State Water Resources Control Board
SWTR – Surface Water Treatment Rule
TSS – total suspended solids
USA – urban study area
USDA – U.S. Department of Agriculture
USEPA – U.S. Environmental Protection Agency
WDR – waste discharge requirements
WSA – water study area
WWTF – wastewater treatment facility
WWTP – wastewater treatment plant

Executive Summary

The purpose of this report is to serve as a basis for the development of the General Plan Update and the Community Infrastructure and Services Element in particular. This new General Plan Element will present policies and implementation measures for providing the infrastructure needs to accommodate development within the County through the year 2025. The information contained in this report was developed during the first half of 2007 and represents a "snapshot" in time. Any recommendations herein are based on a realistic analysis of the conditions that existed at that time, including capacity, future demand, and financing options for water and wastewater, police, fire, road, stormwater, street lights, parks and recreation, schools, and public utilities infrastructure and services. This technical report contains planning level estimates for the future facilities and improvements, acceptable levels of service, funding methods and priorities, and the timing of facility and service availability.

Background

There are three significant factors that contribute to the constant need for infrastructure improvements and upgrades within our communities. The first contributing factor is the fact that much of the County's infrastructure is quite old, deteriorating, and in need of improvement. Quite simply, infrastructure ages and needs maintenance and/or replacement over time. Secondly, the County has seen some population growth over time and will continue to grow, thereby requiring additional infrastructure. Lastly, infrastructure improvements are often required to maintain compliance with increasingly complex and changing regulations. This is especially true in the areas of water and wastewater treatment and disposal. It should be noted that these problems and the associated issues are not unique to Humboldt County. An analysis of the state of the San Francisco Bay Area's infrastructure was performed in 2005 by the American Society of Civil Engineers (ASCE). That analysis gave an overall report card grade for the condition of the infrastructure in the Bay area a "C-", using a rating system from "A" to "F". More recently the 2006-2007 Sonoma County Grand Jury issued a report that identified similar problems and issues with the wastewater issues in their County (see http://www.sonomasuperiorcourt.com/index.php?v=gjury_info).

Many areas within the County are currently in need of infrastructure improvements related to the first contributing factor mentioned above – aging infrastructure. The County and all of the service providers will also need to invest in infrastructure improvements to address the other two forces that effect infrastructure – population growth and increasingly stringent regulatory requirements.

The County has defined specific Urban Study Areas (USAs), areas where water and/or sewer systems exist or may be appropriate to consider, for the purpose of evaluating development potential and infrastructure capacity within the County. One of the goals of this analysis was to develop unit costs for providing the required infrastructure to meet development potential within the USAs. These unit costs would then identify areas where development could occur and be the most cost effectively within the County. This approach was used where sufficient data is available. Unfortunately, significant unknowns exist that prevented exact quantification of these unit costs for development in a number of key locations. In many cases, order of magnitude costs have been presented where improvements are needed and there is insufficient information to accurately define the improvements.

Findings

The intent of this report is to provide the technical basis for the County to develop and implement policy changes, which will be described in the Community Infrastructure and Services and the Circulation Element. This report contains numerous findings regarding current service capacities and the condition of the infrastructure in the communities. The following is a summary of current development capacity in the County and a discussion of areas within the County that can most efficiently accommodate growth in the future.

Current Development Capacity

Development capacity is defined by the allowable density and the physical constraints affecting a parcel, as well as the capacity of service providers. This report contains an evaluation of development potential based on the midpoint density of the current General Plan land use designations. The development potential analysis is described in Sections 1.3.1 and 1.4 of this report. The remainder of the report is an analysis of the current capacity of service providers and the improvements required to service current and future development.

Although the capacity of all service providers should be considered when evaluating development potential, federal and state water and wastewater regulatory requirements clearly establish levels of service that must be adhered to. In addition, levels of service for most of the other services have not been definitively established so they cannot be used as a basis for service thresholds.

Current water and wastewater capacity, which ever of the two is more limiting, has been used to identify the maximum number of available connections within each urban study area. For a detailed discussion of the methodology used to determine capacity see Chapter 6, Water Systems, or Chapter 7, Wastewater Systems. As indicated above, other services such as fire protection and law enforcement are very important, but quantifiable levels of service have not been established.

Roadway capacity is a development limitation and, to a certain extent, can be quantified through Level of Service standards as described in Section 2.4.2, Roadway Capacity and Level of Service (LOS), and Section 2.4.3, Volume to Capacity (V/C) Ratio. However, unlike water quality standards for water and wastewater systems that are regulated pursuant to the federal Clean Water and Safe Drinking Water Acts, which involve local, state, and federal agencies, roadway capacity is regulated by the policies of the local land use agency. As a roadway level of service standard is reached or exceeded, traffic delays will necessarily increase but the system continues to function. Whereas, for water or wastewater systems that reach or exceed capacity a moratorium can be imposed by regulators, there is no mandatory regulatory response to congested roadways. In addition, unlike water and wastewater systems, roadway capacity in one community can be affected by development in other communities.

The following table summarizes development potential within urban study areas based on current General Plan land use designations, known physical constraints, and an analysis of water and wastewater capacity. The column labeled "Low Unit Development Estimate" is the net development potential (based on mid-point density of the current General Plan, not maximum density) of residential land after known physical constraints are subtracted (see Section 1.3.1 and 1.4 for a more detailed discussion). The column labeled "Available Capacity" is either the number of available water or sewer connections (which ever is more limiting) or the Low Development Estimate, which ever is lower. The column labeled "Description of Limitation" is a

brief description of the nature of the service limitation (see Chapters 6 and 7 for detailed discussions of each system).

As described above, water and wastewater standards contained in federal and state laws and regulations have been used to establish the available capacity of local service providers. The California Department of Health Services and Regional Water Quality Control Board, and the authorized local agency providers or public utilities, are together responsible for enforcing these laws and regulations. This report has endeavored to consistently apply these water and wastewater standards. Where this report has identified communities with available capacity at or near zero, the governing boards of the local service providers and the appropriate regulators would ultimately make the decision, on a case by case basis, whether or not to approve applications for new service connections. The County Planning and Building Divisions would stop processing applications for new development within a district upon notice by the appropriate governing board that new service connections would not be authorized.

Table ES-1. Summary of infrastructure capacity limitations within the County.

Urban Study Area	Service Provider	Low Unit Development Estimate	Available Capacity	Capacity Limitation*	Description of Limitation
Alderpoint WS	Alderpoint County Water District	44	0	W	The water system is out of compliance with Surface Water Treatment Rule due to lack of treatment.
Benbow WS	Benbow Water Company	55	0	W	The number of available connections in the Benbow WSA was set at zero because treatment capacity is currently exceeded.
Big Lagoon WS	Big Lagoon Community Services District	10	10	LUD	The water system has further capacity, but land use densities limit development.
Briceland WS	Briceland Community Services District	13	0	W	The number of available connections in the Briceland WSA was set at zero because source capacity is currently exceeded.
Arcata USA	City of Arcata	2	2	LUD	The water and wastewater systems have further capacity, although future limitations may occur as Arcata is not meeting discharge requirements. Land use densities currently limit development.
Blue Lake USA	City of Blue Lake	46	46	LUD	The water and wastewater systems have further capacity, although Blue Lake summertime disposal method may come under scrutiny in the future. Land use densities currently limit development.
Blue Lake WS	City of Blue Lake	6	6	LUD	
Fortuna USA	City of Fortuna	294	0	WW	WWTP currently operates at 100% of peak wet weather design capacity.
Rio Dell USA	City of Rio Dell	2	0	WW	The number of available connections was estimated at zero based on the fact that the City is currently under a Cease and Desist Order.
Rio Dell WS	City of Rio Dell	7	7	LUD	The water system has further capacity. Land use densities currently limit development.
Glendale USA	Fieldbrook Community Services District	20	20	LUD	The wastewater system has capacity for an estimated 80 to 100 remaining connections, and the water system has further capacity. Land use densities currently limit development.
Fieldbrook WS	Fieldbrook Community Services District	138	138	LUD	The water system has further capacity. Barring limitations due to site specific suitability for onsite wastewater, land use densities currently limit development.
Glendale WS	Fieldbrook Community Services District	1	1	LUD	
Garberville USA	Garberville Sanitary District	63	0	WW	The WWTP currently operates in excess of both average dry weather flow and peak wet weather flow design capacity.

Urban Study Area	Service Provider	Low Unit Development Estimate	Available Capacity	Capacity Limitation*	Description of Limitation
Garberville WS	Garberville Sanitary District	61	25	W	The number of available connections in the Garberville study areas was estimated based on the District currently being at 94% of its water treatment capacity.
Freshwater WS	Humboldt Community Services District	130	130	LUD	The water system has further capacity. Barring limitations due to site specific suitability for onsite wastewater, land use densities currently limit development.
South Eureka WS	Humboldt Community Services District	13	13	LUD	
Indianola WS	None	99	99	LUD	Capacity is dependent on locating suitable water supply. Barring limitations due to site specific suitability for onsite wastewater, land use densities currently limit development.
Myrtle town WS	Humboldt Community Services District	55	55	LUD	The water system has further capacity. Land use densities currently limit development.
Humboldt Hill USA, South Eureka USA, Myrtle town USA	Humboldt Community Services District	4,116	4,116	LUD	The water system has further capacity, and HCSD has 4,980 available sewer connections based on its contract with the City of Eureka. Certain areas within the HCSD service area may be limited by the City's wastewater collection system capacity. Land use densities currently limit development.
Hydesville USA/WS	Hydesville County Water District	166	166	LUD	The water system has further capacity. Barring limitations due to site specific suitability for onsite wastewater, land use densities currently limit development.
Jacoby Creek WS	Jacoby Creek County Water District	28	28	LUD	The water system has further capacity. Barring limitations due to site specific suitability for onsite wastewater, land use densities currently limit development.
Loleta USA	Loleta Community Services District	87	0	WW	The WWTP is currently out of compliance with its existing discharge requirements.
Manila USA	Manila Community Services District	142	142	LUD	The water and wastewater systems have further capacity. Land use densities currently limit development.
McKinleyville USA	McKinleyville Community Services District	2,224	1,453	WW	The number of available connections was estimated based on the District's current ADWF (0.9 MGD) being 76% of capacity as set forth in their waste discharge requirements (1.18 MGD).
McKinleyville WS	McKinleyville Community Services District	123	123	LUD	The water system has further capacity. Land use densities currently limit development.

Urban Study Area	Service Provider	Low Unit Development Estimate	Available Capacity	Capacity Limitation*	Description of Limitation
Miranda USA	Miranda Community Services District	48	48	LUD	The water system has an estimated capacity of 77 connections, while the wastewater system has an estimated capacity of 59 connections. Land use densities currently limit development.
Myers Flat WS	Myers Flat Mutual Water Company	4	0	W	The number of available connections in the Myers Flat WSA was set at zero due to undersized source capacity and lack of treatment capacity.
Orick USA	Orick Community Services District	19	19	LUD	The water system has further capacity. Barring limitations due to site specific suitability for onsite wastewater, land use densities currently limit development.
Orick WS	Orick Community Services District	36	18	W	The number of available connections in the Orick study areas was estimated based on the District currently being at 79% of its source capacity (37 available connections minus 19 connections in USA). The primary limitation will be based upon site specific suitability for on site wastewater.
Orleans WS	Orleans Community Services District	50	0	W	The number of available connections in the Orleans study area was estimated based on the District currently being at 104% of its treatment capacity. Source capacity is not an issue.
Scotia USA	Pacific Lumber Company	0	0	WW	The number of available connections was estimated at zero until waste discharge requirements are established for the facility.
Phillipsville WS	Phillipsville Community Services District	11	0	W	The number of available connections in the Phillipsville study area was set at zero due to problems with water supply sources and non-compliance with Surface Water Treatment Rule.
Redcrest WS	Redcrest Water Association	12	0	W	The number of available connections in the Redcrest study area was set at zero due to the system being in noncompliance with the Surface Water Treatment Rule.
Redway USA	Redway Community Services District	298	0	WW	The number of available connections in the Redway study area was set at zero due to treatment capacity (0.46 MGD) being unable to meet peak day demands (0.475 MGD).
Shelter Cove USA	Resort Improvement District No. 1	1,088	288	WW	The number of available connections was estimated based on the District's current ADWF being at 59% of capacity as set forth in their NPDES permit.

Urban Study Area	Service Provider	Low Unit Development Estimate	Available Capacity	Capacity Limitation*	Description of Limitation
Shelter Cove WS	Resort Improvement District No. 1	108	108	LUD	The water system has further capacity (535 available water connections in USA/WSA). Land use densities currently limit development.
Riverside WS	Riverside Community Services District	5	5	LUD	The water system has further capacity. Barring limitations due to site specific suitability for onsite wastewater, land use densities currently limit development.
Samoa USA	Samoa Pacific Group	0	0	WW	Existing wastewater treatment plants must be replaced.
Weott USA	Weott Community Services District	34	0	W	The number of available connections in the Weott USA was set at zero due to source and treatment capacity being currently exceeded.
Westhaven WS	Westhaven Community Services District	79	0	W	The number of available connections in the Westhaven study area was set at zero due to inadequate source capacity.
Willow Creek USA/WSA	Willow Creek Community Services District	227	227	LUD	The water system has further capacity. Barring limitations due to site specific suitability for onsite wastewater, land use densities currently limit development.
TOTALS		9,964	7,293		

* W = water; WW = wastewater; LUD = land use densities

Future Growth Areas

After analyzing development potential, infrastructure availability, and the feasibility of improving and expanding infrastructure systems throughout the County, three major development areas have been identified within the County:

- areas served by Humboldt Community Services District (HCSD), i.e. Humboldt Hill, Ridgewood, Cutten and Myrtle town;
- areas served by McKinleyville Community Services District (MCSD);
- the area served by the Fieldbrook Glendale Community Services District (FGCSD) that has both community water and sewer (Glendale).

Roadway Infrastructure

Humboldt County's roadway system has approximately 1,400 miles of county roads and city streets, 378 miles of state highways, including U.S. Highway 101, and roadways on federal lands. These roadways provide for the inter-regional and intra-regional movement of goods and people on California's north coast. Critical issues for the County road system are safety, functionality and road rehabilitation. Roadway maintenance is a challenge for rural areas such as Humboldt County: lower population densities and long travel distances mean fewer funds are available on a per-mile basis. Roadway capacity is generally less of an issue for rural areas due to the lower population densities, but even so there are existing and projected areas of congestion constraints that must be addressed. Roadway capacity is also affected by competition for space in the right-of-way among vehicular traffic and complementary modes of transportation, including transit service, bicycles, pedestrians, and equestrians.

As the County's population grows over the next 20 years, the projected vehicle-volume growth will have varying impacts on roadways in the County roadway system, and particularly in the Urban Study Areas (USAs); in several cases, roadways in the USAs are already experiencing capacity constraints as observed at a.m. and p.m. peak hours. In other cases, roadways currently able to accommodate existing traffic volumes are likely to develop areas of increased congestion as traffic volumes increase.

The County in conjunction with the City of Eureka, Caltrans, and the Humboldt County Association of Governments (HCAOG) has developed a Greater Eureka Area Travel Model (GEATM) to assess impacts of land use and transportation changes in the county over time and to determine the effectiveness of potential improvements to the roadway system. The GEATM identifies roadway segments with both existing and projected capacity constraints. The model used 2005 data and projected 2030 traffic volume estimates based on the General Plan Update Sketch Plan 3, full entitlement build-out,¹ assumptions for the spatial and temporal patterns of new development.

The roadways with the most significant capacity constraints are located primarily in Eureka (Humboldt Hill, Myrtle town, and South Eureka) and McKinleyville. Both areas have been experiencing increased development pressures that have added and are likely to continue to add vehicle volume to the County's roadways. Future development-related growth in the South Eureka USA will add significant vehicle volume to roadways, some of which are already experiencing capacity constraints. Several roadways within the USA already had segments at Level of Service (LOS) E or F in 2005. The McKinleyville USA is also expected to have capacity

¹ Sketch Plan alternatives were developed in 2005 by Humboldt County (Sketch Plan Alternatives Report, Dyett & Bhatia, 2004) as generalized depictions of proposed planned land uses to illustrate various General Plan options. Sketch Plan 3 was the "Focused Urban Communities/Resource Production Protection" alternative.

constraints along Central Avenue north of the Northbound Highway 101 exit. These sections are currently at LOS D. Other USAs expected to experience capacity constraints include Briceland and Freshwater.

The 2003 Humboldt County Road and Bridge Capital Improvement Plan (CIP) report notes that, overall, the County's roads are in "poor" condition, with the County's Overall Condition Index (OCI) rated at 40 on a scale of 1-100 (County of Humboldt, 2003). The report notes that, in 2000, there was approximately \$100 million in deferred maintenance on the County's roadways (not including maintenance costs for local streets). The report also notes that if Humboldt County continues to fund road maintenance at a level of around \$1 million a year on road surfaces—the approximate budget for resurfacing County roads for the previous 20 years—the OCI would continue to decline, and absent other maintenance activities, would drop in another 20 years to an overall level of 15 (at which point the average road in Humboldt County would require reconstruction).

Humboldt County Public Works' adopted 2006-07 budget was \$26.2 million. Road Maintenance and Construction received \$8.9 million out of a total Road Fund budget of \$14.8 million. Of this \$8.9 million, roughly \$6.5 million goes to personnel and equipment. This leaves approximately \$2.5 million for roadway maintenance materials—about 12 percent of what is needed to keep the roads from degrading further.

Current levels of investment in roadways are not adequate and will lead to continued degradation. Significant investment in the County's road infrastructure will be required over the planning period to reverse this trend and to provide adequate levels of service. Please refer to Chapter 2 for more detailed descriptions of study areas and discussion of recommended infrastructure improvements needed to correct current deficiencies, meet current and near term future regulations and to provide adequate capacity for future growth.

Law Enforcement

The Humboldt County Sheriff's Office provides a variety of public safety services Countywide (court services, corrections, emergency operations) and law enforcement services for the unincorporated areas of the County. The Sheriff's Office Operations Bureau is made up of seven units under the command of the Undersheriff. The most visible of these units is Patrol. These deputies are responsible for responding to emergency calls for service, criminal investigations, and crime prevention through neighborhood and beat patrols. Patrol has one Main Station in Eureka, substations in Garberville, Hoopa and McKinleyville, and six resident deputy posts. Most of the urban study areas (USAs) receive law enforcement services solely from the Humboldt County Sheriff's Office (HCSO). Arcata, Blue Lake, Eureka, Ferndale, Fortuna, Rio Dell and Trinidad each have their own police departments that provide mutual aid to the County. The HCSO also has a mutual aid agreement with the California State Highway Patrol.

Revenue sources used by the County to fund Sheriff's Office operations have not kept pace with service costs. As can be expected, budgetary restrictions impact the Sheriff Department's ability to properly allocate the resources needed to deliver services efficiently and equitably. One of these basic resources is personnel. The Humboldt County Sheriff has received many public complaints regarding its ability to respond to calls for service in a timely manner, and its community involvement. Department accessibility by the community for walk-in services is also a concern. All of these functions are limited by staff availability.

The officer-to-population ratio, the number of officers to calls for service ratio and officer response times are standard measures of the level of service for law enforcement operations. Humboldt County Sheriff staff provided anecdotal information on response times, generally

concluding that they are acceptable in McKinleyville and Eureka but inadequate elsewhere (particularly in outlying areas). The current number of sworn officers is considered inadequate to respond to the demand for service.

Accepted standards for officer-to-population ratios (OPR) for adequate service range from 1.5-2:1000. OPRs below this level can impair the ability of patrol officers to respond to calls for service in a timely manner. The recommended OPR figures are based on an International Association of Chiefs of Police Research Center (IACPRC) directive that sets OPR guidelines for different service population estimates; for an area with a population between 100,000 and 200,000, such as Humboldt County, the IACPRC recommends an OPR of 1.9. In 2007 the Humboldt County Sheriff's Office budgeted for 90 sworn officers, as shown in Table 3.2. Applying 90 sworn officers to Humboldt County's population of approximately 130,000 produces an officer-to-population ratio of 0.7:1,000, well below the 1.9:1,000 recommended benchmark.

Funding sources for the Sheriff's Office include Humboldt County General Fund monies offset by various sources of revenues, including fees and grants. Questions remain about the sufficiency of the tax base to support the Sheriff's Office, and the potential need for new sources of revenue to support the Sheriff's Office's efforts to provide adequate service. Sources of revenue could include: increased operational fees (booking fees, etc.), development fees (however, development fees can only be used new for expanded facilities and equipment), and new taxes (special taxes or sales tax).

Given the general inadequacy of the existing facilities and the anticipated increase in need for personnel and equipment, future costs for upgrades and expansions should be considered as significant. Funding these law enforcement needs will be critical to maintaining adequate levels of law enforcement services within the County.

Additional information on Law enforcement is presented in Chapter 3.

Storm Drainage and Flood Control

The County is responsible for storm drainage within all unincorporated areas of the County and is responsible for the maintenance of flood control levees along the Eel River at Sandy Prairie, the Mad River at Blue Lake, and Redwood Creek at Orick. The majority of the County does not have stormwater conveyance systems, and stormwater therefore follows more in a natural drainage pattern before either infiltrating or entering a waterway. However, portions of the McKinleyville USA, South Eureka USA, Humboldt Hill USA, Myrtle town USA, and Garberville USA do contain stormwater conveyance systems that collect stormwater from roadways and discharge to waterways with minimal or no filtration.

The County also maintains a significant number (estimated in the thousands) of culverts under County roadways. These culverts are located throughout the County's many drainage swales, creeks and streams, and often present a barrier to migrating salmon and other fish passage. The County is part of the Five Counties Salmonid Restoration Program, established in 1997 to prioritize culvert replacement projects and evaluate options for improving County plans, policies, and practices to provide or improve salmonid habitat.

The County's stormwater system varies in condition. Much of the infrastructure is very old and is reaching the end of its design life. The County does not have sufficient funding to make improvements to this system. The County needs a systematic replacement program to begin upgrading and expanding stormwater infrastructure as needed, but lacks the proper funding to do so. In fact, the majority of capital improvement projects outlined in the 1982 McKinleyville master drainage plan have yet to be completed. Funding for maintenance of levees is also

typically in short supply. It will be important for the County to identify problem areas, carryout the proper studies, and implement projects to ensure areas within the County are properly served by stormwater infrastructure and to prevent future drainage problems. Storm drainage infrastructure will be essential to serving future development within the County. New master drainage plans should be developed by the County to reflect changes in the County's roadways and new standards for development and runoff.

There also exists a lack of cohesive development ordinances with respect to stormwater system design. The County does not have comprehensive stormwater ordinance for new development, and current guidelines for return period storms to be used in sizing of stormwater facilities lack a specified duration for the design storm. New stormwater ordinances for development should be prepared, and drainage fees for new developments should be developed. The County should develop a stormwater fund supported by developer fees and also develop mechanisms to fund ongoing maintenance such as special assessments and taxes (such as Mello Roos Community Facilities Districts).

The County should also update the flood hazard regulations to restrict development in the floodway and the flood fringe, consistent with federal guidelines and current practice in comparable jurisdictions. Construction standards and review procedures also should be updated to minimize risk. While the County does impose FEMA's restrictions at the building permit stage, integrating these restrictions into zoning will avoid misunderstanding. They should also update the flood hazard regulations to address the water quality impact of manure storage areas (ponds), and apply for participation in the NFIP's Community Rating System in order to secure lower flood insurance premiums. This may require the implementation of new flood-related programs.

A new law, Assembly Bill No. 162, also requires specific flood control assessment be contained in the Land Use, Housing, and Safety Elements of the General Plan. These updates need to be included in the next revision to the Housing Element after January 1, 2009.

Refer to Chapter 4 for more information on storm drainage and flood control infrastructure.

Fire Protection

Fire protection and emergency medical response services in Humboldt County are provided by a combination of agencies, districts and organizations. They range from federal agencies such as the U.S. Forest Service (USFS) and the Bureau of Land Management (BLM), a state agency—California Department of Forestry and Fire Protection (CAL FIRE)—and local organizations such as community services districts, cities and fire districts and departments not associated with local agencies. With very few exceptions, fire departments in Humboldt County are comprised of all-volunteer firefighters and officers. The County Urban Study Areas (USAs) are primarily served by all-volunteer fire departments.

The Board of Supervisors is the governing board of one fire related district and Humboldt County plays a role in fire planning and protection. The County has taken a significant step in supporting fire protection services, with the formation of a County Fire Safe Council and preparation of a County Master Fire Protection Plan. With the preparation of the Fire Plan, the County has broadened its role in fire planning. The Fire Plan focuses on the County's coordination and oversight role, and incorporates new policies that the County will implement through the General Plan Update.

Fire protection service providers in Humboldt County operate with limited resources and demonstrate a strong need for additional funding. Expenses for essential budget items such as

the maintenance of aging apparatus, worker's compensation, and liability insurance outstrip department revenue. Although local fire organizations are very resourceful—carrying out direct fund raising, using volunteers, surplus and donated equipment, and by working cooperatively to deliver services—most fire departments report that they do not have sufficient funding to support the desired minimum level of service. As a result, fiscal stability is one of the most critical issue facing local fire related organizations.

The capacity of local fire organizations vary widely. Some have dependable revenue sources, paid staff, and up to date equipment that allow them to provide adequate services within their districts. Others have equipment in fair to poor working order, few volunteers, and no source of dependable revenue, other than the donations from the communities they serve. In discussions with local fire personnel, administrative capacity has been identified as the greatest need facing local fire organizations, especially those that are all volunteer. Other deficiencies experienced by local organizations include lack of training and lack of adequate equipment in good working order. These deficiencies prevent local organizations from providing adequate fire protection services.

The boundaries of fire related districts of the local organizations cover most of the USAs within the County. The district boundaries should be expanded to cover all of the USAs, as well as the remaining developed and developable portions of the County, and the provision of services within those areas should be expanded to meet future demand. Upgrading fire services and facilities could be accomplished through the establishment of development impact fees, increases in existing or the establishment of new special assessments and special taxes, and the expansion of existing fire related districts or the formation of a County Service Area (CSA) to fund fire protection services in areas of the county that are experiencing growth. Another service that should be considered by the County is establishing and funding a full time fire services coordinator. This position could be instrumental in assisting local organizations with building their administrative capacity, pooling resources for group equipment, identification of grant funding opportunities, volunteer recruitment and retention, and coordinating training and education programs.

Refer to Chapter 5 for additional information on Fire Protection.

Water and Wastewater

Water and wastewater service providers in Humboldt County include cities, multipurpose special districts, publicly regulated utilities, and private companies. Without exception, all water and wastewater service providers face the need to invest in the maintenance and upgrades required to keep their systems in compliance with state standards. Almost all service providers lack the funding to make the necessary improvements. Further, many of these service providers have limited managerial, financial or technical resources to draw from to solve these problems.

The Humboldt Bay Municipal Water District (HBMWD) was created to provide a reliable supply of water for both domestic and industrial purposes to customers surrounding the greater Humboldt Bay area. The HBMWD provides treated drinking water on a wholesale basis to: the City of Arcata: the City of Eureka: the City of Blue Lake: the Fieldbrook-Glendale CSD: Humboldt CSD: Manila CSD: and McKinleyville CSD, serving water to a population of approximately 80,000 people, or 60% of the Humboldt County population. The District also retails water to approximately 180 customers located in the West End Road and Fairhaven areas. HBMWD has a water right for 75 MGD and currently uses about 40 MGD on a peak day.

It is anticipated that the demands for domestic water will exceed the currently available capacity within the planning time frame of this document, based on County housing and

corresponding population projections. While the HBMWD has sufficient excess water available in its industrial system to meet the shortfall in supply in the domestic system, they will require either expansion of or upgrades to the existing Ranney collectors and treatment facilities to increase the capacity of their domestic water system. In addition, improvements to their transmission system, including replacement of the 15-inch and 18-inch Techite pipelines on the Samoa peninsula, will need to be completed to fully serve future development. The District is also currently exploring options to increase the life of the District's infrastructure and to potentially add capacity to continue to provide a reliable, safe source of drinking water to its customers. It is anticipated that the costs for these improvements will be significant and will be better defined over the next year.

The following is a listing of some of the major infrastructure improvements and issues facing the other water and wastewater service providers. The service providers are listed alphabetically and the list of improvements are not presented in any particular order of importance. This report also includes information on the systems owned and operated by incorporated cities within the County. Several USAs within the county are located just outside of City limits, and in most cases these unincorporated areas can not develop to urban densities unless they annex to the city, there is an existing services district that has a contract for services with the city, or they are able to form a community services district and make use of the existing City system.

Alderpoint County Water District

- **Water** – Provided by an infiltration gallery on the Middle Fork Eel River.
 - System needs additional storage capacity.
 - Currently not in compliance with Surface Water Treatment Rule (SWTR). System needs a treatment plant.
 - Some residents are on boil water advisory due to lack of chlorine contact time.
 - Approximately 1 mile of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
 - System needs a Grade 2 water treatment operator and a Grade 1 water distribution operator.
- **Current Improvement Plans** – The District has not developed a Capital Improvement Plan (CIP) to date for its water system. However, the District is working with the Department of Health Services to develop plans and is exploring funding options for a new water treatment plant.

Benbow Water Company

- **Water** – Provided by an infiltration gallery on the East Branch South Fork Eel River. Privately owned system.
 - System needs considerable storage capacity.
 - Currently overloading treatment filters. System needs additional treatment capacity.
 - Approximately 1.5 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water system. However, the company wants to increase their water rights and expand source capacity at their infiltration gallery, and have estimated costs for expansion of their treatment facility.

Big Lagoon Community Services District

- **Water** – Provided by District wells with good water quality.
 - System needs additional storage capacity for fire flows.
 - Approximately 0.6 miles of distribution system piping will need to be replaced due to coastal bluff erosion.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water system. However, the District is planning to replace some distribution piping due to coastal bluff erosion.

Briceland Community Services District

- **Water** – Provided by a spring on private property.
 - System needs additional source capacity – currently unable to meet maximum day demands.
 - System needs additional storage capacity – barely able to meet one day of maximum demands.
 - Unable to meet turbidity requirements of SWTR with existing treatment system.
 - Approximately 0.5 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Current Improvement Plans** – The District has no other source options, and carefully watches summertime storage tank levels, is planning treatment related improvements, but has not developed a CIP to date.

City of Arcata

- **Water** - Provided by HBMWD regional system and private wells with good water quality.
 - System meets one day of storage capacity but should consider more.
 - Approximately 15 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Wastewater** – Integrated wetland wastewater treatment facility and disposal to Humboldt Bay.
 - Collection system has peaking factor of ten and needs major renovations to reduce inflow and infiltration (I&I).
 - Treatment system unable to meet existing effluent limits for their permitted discharge, as shown by an Administrative Civil Liability Order and Complaint in the past two years.
- **Current Improvement Plans** – The City is in the process of developing a long-term CIP for both its water and wastewater systems. Plans are underway for increased storage in the water system, as well as improvements to the wetland wastewater treatment system.

City of Blue Lake

- **Water** – Provided by HBMWD regional system.
 - System meets one day of storage capacity but should consider more.
- **Wastewater** – Collection, treatment, and disposal to percolation ponds on Mad River bar.
 - Collection system has peaking factor of six to seven and needs renovation to reduce I&I.
 - Treatment system appears to be exceeding permitted organic loading rates since the Casino came online (allowed 300 lbs/day, currently processing 400 lbs/day on average). Additional upgrades will also likely be needed to address current and near term future regulations.
 - Summertime disposal method will come under increasing scrutiny and will likely not be allowed in the near future.
- **Current Improvement Plans** – The City is in the process of developing a CIP for its wastewater system which identifies \$11 million in improvements over the next 10 years.

City of Eureka

- **Water** – Provided by HBMWD regional system.
 - System meets one day of storage capacity (has about four days).
- **Wastewater** – Collection, treatment, and disposal thru an outfall to the Ocean.
 - Collection system has peaking factor of between 3.3 and ten and needs renovation to reduce I&I.
 - Treatment system is currently being evaluated to meet current and future needs and the results of this evaluation are anticipated to be completed in 2008.

- The City and HCSD have a contract to convey wastewater through the City's collection system and share capacity at the Elk River WWTP.

City of Ferndale

- **Water** – Provided by wells that are owned by a private water company.
- **Wastewater** – Collection, treatment, and disposal to Francis Creek or irrigation on nearby agricultural lands.
 - Collection system has peaking factor of approximately seven to ten and needs renovation to reduce I&I.
 - Treatment and disposal system will need upgrades to address current and near term future regulations. City is currently evaluating alternatives and the results of this evaluation are anticipated to be completed in 2008.

City of Fortuna

- **Water** – Provided by City wells with good water quality.
 - Water demand is approximately 94 % of permit capacity, City of Fortuna may need to seek permits from DWR for additional source capacity
 - No major water system deficiencies found. However, several reservoirs need rehabilitation.
- **Wastewater** – Collection, treatment, and disposal to Strong's Creek or percolation ponds on Eel River bar.
 - Collection system has peaking factor of approximately seven and needs renovation to reduce I&I.
 - Treatment system will need upgrades to address current and near term future regulations.
 - Summertime disposal method will come under increasing scrutiny and will likely not be allowed in the near future.
 - California Toxics Rule (CTR) issues surrounding copper, dichlorobromomethane, and chlorodibromomethane
- **Current Improvement Plans** – The District recently completed a hydraulic study of its water system and developed a CIP that addresses necessary improvements to distribution and storage within its water system. A CIP was also recently completed for the wastewater system that identifies necessary improvements to the collection and treatment systems.

City of Rio Dell

- **Water** – Provided from an infiltration gallery on the Eel River.
 - No major deficiencies found. However, some distribution piping needs replacement.
- **Wastewater** – Collection, treatment, and disposal to the South Fork Eel River or percolation ponds on the South Fork Eel River bar.

- City is currently under a Cease and Desist Order for summertime disposal method and an Administrative Civil Liability Order for effluent limit violations.
- Alternative summertime disposal methods are currently being explored.
- Collection system has peaking factor of six to seven and needs renovations to reduce I&I.
- CTR issues surrounding copper, cyanide, dichlorobromomethane, and MTBE
- **Current Improvement Plans** – The City recently completed a series of improvement projects to the water system and has recently changed focus to necessary improvements within the wastewater system. The City has not yet developed a CIP for either the water or wastewater systems.

Garberville Sanitary District

- **Water** – Recently purchased private water system. Water provided by an infiltration gallery on the South Fork Eel River.
 - System needs additional storage capacity.
 - Approximately 5 miles of distribution system piping is undersized for adequate fire flows or in need of replacement (original system from 1930s).
 - Need emergency backup power at raw water intake and treatment plant.
- **Wastewater** – Collection, treatment, and year-round disposal to percolation ponds on the South Fork Eel River bar.
 - Wastewater system is currently under a Cease and Desist Order for exceeding permitted flows by over 233% and chronic effluent limit violations. The system is under a moratorium for new connections.
 - Collection system has peaking factor of approximately four and needs renovations to reduce I&I.
 - Summertime disposal method will come under increasing scrutiny and will likely not be allowed in the near future.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water system. However, the District has identified a Water System Improvements Project, and is exploring funding for a necessary wastewater system expansion and improvements.

Fieldbrook Glendale Community Services District

- **Water** – Provided by HBMWD regional system.
 - System needs stand by generator at booster pump station.
 - System needs additional storage capacity.
 - System needs booster pump station at Korplex due to low system pressures under full buildout.
- **Wastewater** – Collection by FGCSO and contract with City of Arcata for treatment and disposal.

- Collection system has low peaking factor of approximately two.
- Future development limited by contract with City of Arcata. Alternative treatment and disposal options must be found.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water or wastewater system. However, the District does have plans for water system improvements and is exploring options for wastewater treatment and disposal.

Humboldt Community Services District

- **Water** – Provided by HBMWD regional system and District wells with good water quality.
 - System needs additional storage capacity.
 - Approximately 10 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Wastewater** – Collection by HCSO and contract with City of Eureka to convey, treat, and dispose of wastewater.
 - Collection system has peaking factor of approximately six and needs renovation to reduce I&I.
 - The District is currently operating at approximately 60% of contracted flows.
 - The City of Eureka's collection, treatment and disposal system will need upgrades to serve full build out of the District.
- **Current Improvement Plans** – The District recently completed a hydraulic study of its water system and has developed a CIP for both its water and wastewater systems.

Hydesville County Water District

- **Water** – Provided by District wells with good water quality.
 - Approximately 3 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
 - System needs a Grade 2 water distribution operator.
- **Wastewater** – Residents are not interested in developing a community wastewater system.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water system but has identified some improvements needed in its water system.

Indianola

- **Water** – Most drinking water provided by private, individual wells with poor water quality, some portions of WSA receive water from the City of Eureka system.
 - In need of service provider to extend water service to study area. (There are Local Agency Formation Commission issues with respect to extension of service in this area.)

- **Current Improvement Plans** – Residents have requested service from both HCSD and the City of Eureka. No plans for extension of service have been developed, but HCSD has expressed interest in extending service to this area.

Jacoby Creek County Water District

- **Water** – HBMWD water provided through contract with City of Arcata.
 - System needs additional storage capacity – unable to meet one day of maximum day demands.
 - Approximately 1 mile of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Current Improvement Plans** – System operated by City of Arcata under contract. The District has not developed a CIP to date for its water system.

Loleta Community Services District

- **Water** – Provided by District wells with poor quantity and quality (high levels of iron and manganese).
 - System needs additional sources of supply and potentially upgrades to its treatment system.
 - System needs additional storage capacity.
 - Approximately 1 mile of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Wastewater** – Collection, treatment, and year-round disposal to percolation ponds near a slough associated with the Eel River.
 - Has received a Cease and Desist Order, a Cleanup and Abatement Order, and an Administrative Civil Liability Order within the past three years.
 - Does not have qualified personnel and currently contracts to a licensed operator for supervision.
 - Collection system has peaking factor of approximately ten and needs renovations to reduce I&I.
 - Treatment system will need upgrades to address current and near term future regulations.
 - Summertime disposal method will come under increasing scrutiny and will likely not be allowed in the near future.
 - CTR issues awaiting Reasonable Potential Analysis
- **Current Improvement Plans** – The District has not developed a CIP to date for its water or wastewater systems, but has identified some necessary improvement projects for its water system.

Manila Community Services District

- **Water** – Provided by HBMWD regional system.
 - System needs additional storage capacity.
 - Approximately 1 mile of distribution system piping is undersized for adequate fire flows
- **Wastewater** – Collection, treatment, and year-round disposal to percolation ponds on the North Spit of Humboldt Bay.
 - Collection system has peaking factor of approximately three, indicative of low I&I.
 - Treatment facilities operating well and at about half of design capacity.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water or wastewater systems.

McKinleyville Community Services District

- **Water** – Provided by HBMWD regional system.
 - System has more than one day of storage and is planning to develop additional capacity.
 - System needs upgrade to booster station at North Bank Rd. to improve system pressures and pump performance when HBMWD water levels are low.
- **Wastewater** – Collection, treatment, and disposal to Mad River or percolation ponds or irrigation.
 - Collection system has lowest peaking factor in the County, of approximately two.
 - District is currently under an Administrative Civil Liability Order to improve performance of newly installed wetland to meet effluent limits.
 - Summertime disposal method to percolation ponds will likely come under increasing scrutiny and may not be allowed in the near future.
- **Current Improvement Plans** – The District has developed a CIP that addresses necessary improvements to both its water and wastewater systems.

Miranda Community Services District

- **Water** – Provided by District wells with good water quality but low pH.
 - System needs additional storage capacity.
 - Approximately 0.5 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.

- **Wastewater** – Collection, treatment, and disposal to percolation ponds on the South Fork Eel River bar.
 - Collection system has a low peaking factor of approximately three.
 - Summertime disposal method to percolation ponds will come under increasing scrutiny and will likely not be allowed in the near future.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water or wastewater systems.

Myers Flat Mutual Water Company

- **Water** – Provided by private landowner well and surface water source on Pete's Creek.
 - Surface water source not in compliance with SWTR due to lack of treatment.
 - Well source is barely capable of meeting maximum day demands, and its use by the Water Board has been the source of much litigation in the recent past.
 - Approximately 1 mile of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
 - System needs a Grade 1 water distribution operator and will need a Grade 2 water treatment operator if a treatment system is installed.
- **Current Improvement Plans** – The Myers Flat Mutual Water Company has not developed a CIP to date for its water system but has recently completed a study to identify necessary water system improvement projects. The Water Company is also looking into the formation of a CSD.

Orick Community Services District

- **Water** – Provided by District wells with good water quality.
 - System needs additional storage capacity.
 - Approximately 0.5 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Wastewater** – Collection, treatment, and disposal facilities are currently being planned.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water system but has received funding and is in the process of developing plans for a community wastewater system.

Orleans Community Services District

- **Water** – Provided by an infiltration gallery in Peach Creek.
 - System needs considerable storage capacity.
 - Approximately 1 mile of distribution system piping is undersized for adequate fire flows and/or in need of replacement.

- **Current Improvement Plans** – The District has recently completed a CIP for its water system and has plans for improvements to expand source, storage, and treatment capacity.

Phillipsville Community Services District

- **Water** – Provided by surface water spring source and District well with poor water quality.
 - Existing spring source is not in compliance with SWTR, and unable to meet current maximum day demands.
 - Existing well source is high in iron and manganese and has low pH which contributes to corrosion within the water system.
 - System needs additional storage capacity – unable to meet one day of maximum day demands.
 - Approximately 0.5 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water system but is seeking funding for necessary improvements to the water system.

Redcrest Water Works

- **Water** – Provided by infiltration gallery in Chadd Creek.
 - System needs additional storage capacity – unable to meet one day of maximum day demands.
 - Approximately 0.5 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
 - Unable to meet turbidity requirements of SWTR with existing treatment system.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water system but has plans to improve its treatment system and expand storage capacity.

Redway Community Services District

- **Water** – Provided from an infiltration gallery on the South Fork Eel River and an unnamed spring source.
 - System needs additional storage capacity.
 - Existing capacity of water treatment plant insufficient to meet current maximum day demands.
 - Approximately 0.5 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Wastewater** – Collection, treatment, and disposal to upland percolation ponds and direct discharge to the South Fork Eel River.
 - Treatment system is exceeding BOD and TSS effluent limits for their permitted discharge, as outlined in recent Administrative Civil Liability Order. Upgrades will be needed to correct current deficiencies and to meet near term future regulations.
 - Collection system has a peaking factor of approximately three to four.
 - CTR issues surrounding dichlorobromomethane
- **Current Improvement Plans** – The District is in the process of developing a CIP for both its water and wastewater systems. No plans are underway for the water system, but the District is currently making improvements to its wastewater treatment system as part of a compliance project and has plans for collection system improvements.

Riverside Community Services District

- **Water** – Provided by District wells with good water quality.
 - System needs additional storage capacity.
 - Approximately 1 mile of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water system and has no need for any major improvements at this time.

Town of Samoa

- **Water** – Will be provided by HBMWD regional system.
 - System needs storage capacity.
 - System needs new distribution system
- **Wastewater** – Collection, treatment, and disposal facilities are being planned.
 - System needs new collection, treatment and disposal facilities. Treatment will likely consist of sequencing batch reactor or equivalent technology with disposal to leaky wetlands.
- **Current Improvement Plans** – All necessary infrastructure improvements are being incorporated as part of the Samoa Town Master Plan development.

Shelter Cove Resort Improvement District #1

- **Water** – Provided from surface water sources on Rick Spring and Telegraph Creek.
 - Approximately 1 mile of old coal tar coated steel pipe in distribution system is in need of replacement.
- **Wastewater** – Collection, treatment, and disposal to ocean outfall and reuse for irrigation.
 - The District is currently under an Administrative Civil Liability Order for BOD and TSS effluent limit violations, primarily related to excessive I&I during winter storms.
 - Collection system has a peaking factor of approximately five and needs renovations to reduce I&I.
- **Current Improvement Plans** – The District has recently completed a CIP for both its water and wastewater systems. The District has identified necessary improvements to its water system, including a treatment plant upgrade, main replacements, and source capacity expansion. Efforts are also underway to reduce I&I within the collection system.

Town of Scotia

- **Water** – Provided from an infiltration gallery on the Eel River. The owner of this private system is looking to form a public service provider.
 - Approximately 3 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement. New fire hydrants and water meters/ service connections are needed.
 - System needs to be upgraded to meet public system standards.
- **Wastewater** – Collection, treatment, and disposal to the South Fork Eel River or percolation ponds on the South Fork Eel River bar.
 - Town is currently under a Cease and Desist Order for BOD and TSS effluent limit violations.
 - Treatment facility is located within the 100-year floodplain, which makes funding more difficult.
 - Collection system has peaking factor of seven to eight and needs renovations to reduce I&I.
 - Summertime disposal method to percolation ponds will come under increasing scrutiny and will likely not be allowed in the near future.
- **Current Improvement Plans** – A CIP has not been developed to date for Scotia's water or wastewater systems. Necessary improvements were identified in recent studies but will likely not be completed until the fate of the town is identified.

Weott Community Services District

- **Water** – Currently provided by surface water sources on Mill Creek, Corner Creek, and Deck Creek. A new well of poor water quality has been recently developed.
 - Existing sources of water are in newly designated wilderness area, and the new well that has been developed has poor water quality. Needs additional water source.
 - System needs additional storage capacity.
 - Existing capacity of water treatment plant insufficient to meet current maximum day demands.
 - Iron and manganese removal will need to be incorporated into treatment system if new well is to be brought online.
 - Approximately 2.5 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Wastewater** – Collection, treatment, and disposal to a community leach field.
 - Collection system has a low peaking factor of approximately two.
 - Treatment and disposal systems are operating well within their hydraulic and treatment capacity.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water or wastewater systems but has identified improvements needed for the water system.

Westhaven Community Services District

- **Water** – Provided by surface water spring sources on Two Creek and a District well.
 - System needs source capacity –barely able to meet maximum day demands.
 - Approximately 1 mile of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Current Improvement Plans** – The District has not developed a CIP to date for its water system but has plans for necessary improvements to storage and distribution.

Willow Creek Community Services District

- **Water** – Provided by surface water sources on Willow Creek.
 - System needs additional storage capacity.
 - Approximately 2.5 miles of distribution system piping is undersized for adequate fire flows and/or in need of replacement.
- **Wastewater** – Collection, treatment, and disposal facilities are currently being planned.
- **Current Improvement Plans** – The District recently completed a new water treatment facility. A CIP has also been developed for the water system, and plans are underway to develop a community wastewater system.

Please refer to Chapters 6 and 7 for more detailed descriptions of study areas and discussion of recommended infrastructure improvements needed to correct current deficiencies, meet current and near term future regulations and to provide adequate capacity for future growth.

Street Lights

There is evidence that in urban and suburban areas, where there are intersections and concentrations of pedestrians, street lights tend to reduce crashes. In addition to its traffic safety benefits, lighting may serve as a crime deterrent, may aid law enforcement agencies, and contribute to user comfort and community pride. Street lights can be provided by counties, cities, or by special districts. Lighting services can be funded through a portion of the one-percent property tax revenue; through a special assessment, or special tax levied by districts, cities, or a county; as service charges through utility billing; or through other general fund revenue. In Humboldt County, street lighting is provided by each of the seven cities; the Humboldt, McKinleyville, and Willow Creek community services districts; and eight street lighting districts formed by Humboldt County and governed by the Board of Supervisors.

Street lights are available throughout only 21 percent of the USAs/WSAs, partially available within approximately 29 percent of the USAs/WSAs, and not available in 50 percent. The Humboldt County General Plan does not contain policies or standards regarding street lighting, nor does the Humboldt Department of Public Works Roadway Design Standards Manual. The General Plan Update should include policies and standards regarding the provision of street lights serving urbanized areas and well as policies encouraging existing special districts to seek authorization to provide street light services.

Please refer to Chapter 8 for additional information on Street Lights.

Parks and Recreation

Parks and open space areas are important elements of the urban environment. As a rural county, Humboldt County has a wealth of outdoor recreational opportunities. More than twenty percent of the county's 2.3 million acres are protected open space, forests, and recreation areas. Within the county boundaries, there are federal and state parks, 16 county parks and beaches, recreational areas and reserves, city parks, and parks operated by special districts and non-profit organizations. These areas contribute to the quality of life in Humboldt County and provide needed recreation opportunities for residents of neighboring counties and visitors from all over the world. However, most parks in Humboldt County are regional in scope. Outside the seven Humboldt County cities, there are few local community or neighborhood parks.

The National Recreation and Park Association (NRPA) maintains standards and classifications for recreational facilities that are utilized by local agencies across the nation. The state Quimby Act was enacted to preserve open space and parkland in urban areas and allows cities and counties to establish requirements for new development to dedicate land for parks, pay an in-lieu fee, or perform a combination of the two. Aside from Quimby Act related regulations in the Zoning Code, Humboldt County policies and standards relating to community and neighborhood parks and recreation are found in only in a few community plans.

Aside from three community services districts, school grounds, and a few non-profit park facilities, community and neighborhood parks are available only within cities. The General Plan Update should include policies and standards regarding the provision of community and neighborhood parks and recreation facilities serving urbanized areas and well as policies encouraging existing special districts to seek authorization to provide such services.

Please refer to Chapter 9 for additional information on Parks and Recreation.

Schools

Humboldt County communities are served by 32 public school districts, private schools, and schools operated by the Humboldt County Office of Education. Although some schools have experienced growth, public school enrollment in the County has declined at an average annual rate of approximately 0.5 percent per year since 1990. The decline in Humboldt County school enrollment is expected to continue.

Although Humboldt County does not regulate or operate schools, there is a connection between Humboldt County General Plan and school planning and operations. Humboldt County land use planning can lead to changes in school enrollment. As a result, land use decisions should be closely coordinated with school districts to ensure that school capacity is available when student enrollment increases. In addition, school facilities are often utilized as community neighborhood park facilities. As such, school districts should be included in local park and recreation related planning.

Please refer to Chapter 10 for additional information on Schools.

Public Utilities

For the purposes of this analysis public utilities include electricity, natural gas, and telecommunications. Electricity, natural gas, and telephone providers are regulated by the California Public Utilities Commission, which establishes rules relating to service delivery and rates and charges associated with providing and extending service. The County's interaction with public utilities is confined to franchise agreements, referrals regarding development applications, and activities within the County rights of way and land use approvals. Public Utilities are reasonably adequate in Humboldt County with the following exceptions: lack of telecommunications in certain rural Humboldt County communities; and lack of redundancy in Humboldt County's connection to the fiber network. Humboldt County should closely coordinate with public utility providers to ensure that services are available to all areas where development is occurring and where additional utility needs affect existing development

Please refer to Chapter 10 for additional information on Public Utilities.

Infrastructure Cost Summary

A summary of estimated unit costs for low and high build out conditions in the individual study areas is included below. It is important to understand that these are estimated costs and that a portion of the costs shown are due to improvements needed to address existing deficiencies and changes in the regulations. The costs shown below should be considered a "first cut" to show the order of magnitude of the infrastructure needs for each USA/WSA and should be refined through subsequent detailed studies. As a general rule, the unit costs should be lower under the high build out scenario due to economies of scale. The situations where the low build out costs are less than the high build out costs is usually due to a condition where there is some existing infrastructure that can accommodate the low build out and additional infrastructure is needed in the high build out case.

Table ES-2. Estimated Unit Cost Summary by USA for Water and Wastewater Infrastructure

USA/WSA	Water Unit Costs		Wastewater Unit Costs	
	Low Build-Out	High Build-Out	Low Build-Out	High Build-Out
Alderpoint WS	\$19,034	\$17,193	N/A	N/A
Arcata USA	\$2,551	\$2,468	\$2,881	\$2,973
Benbow WS	\$27,976	\$27,935	N/A	N/A
Big Lagoon WS	\$11,932	\$11,000	N/A	N/A
Blue Lake USA	\$0	\$0	\$19,608	\$16,717
Blue Lake WS	\$0	\$0	N/A	N/A
Briceland WS	\$26,462	\$22,538	N/A	N/A
Fieldbrook WS	\$978	\$1,325	N/A	N/A
Fortuna USA	\$ Unknown	\$ Unknown	\$2,643	\$2,572
Freshwater WS	\$1,257	\$1,257	N/A	N/A
Garberville USA	\$12,182	\$10,655	\$31,056	\$28,409
Garberville WS	\$12,182	\$10,655	N/A	N/A
Glendale USA	\$978	\$1,325	\$27,027	\$3,693
Glendale WS	\$978	\$1,325	N/A	N/A
Humboldt Hill USA	\$1,257	\$1,257	\$ Unknown	\$ Unknown
Hydesville USA	\$2,143	\$1,613	\$	\$
Hydesville WS	\$2,143	\$1,613	N/A	N/A
Indianola WS	\$4,221	\$3,947	N/A	N/A
Jacoby Creek WS	\$2,051	\$2,072	N/A	N/A
Loleta USA	\$4,352	\$4,509	\$30,581	\$28,090
Manila USA	\$1,475	\$1,388	\$0	\$0
McKinleyville USA	\$145	\$419	\$1,465	\$1,148
McKinleyville WS	\$145	\$419	N/A	N/A
Miranda USA	\$7,770	\$7,207	\$25,317	\$21,739
Myers Flat WS	\$10,738	\$10,336	N/A	N/A
Myrtle town USA	\$1,257	\$1,257	\$ Unknown	\$ Unknown
Myrtle town WS	\$1,257	\$1,257	N/A	N/A
Orick USA	\$2,523	\$2,553	\$31,250	\$31,250
Orick WS	\$2,523	\$2,553	N/A	N/A
Orleans WS	\$11,859	\$17,493	N/A	N/A
Phillipsville WS	\$17,250	\$17,250	N/A	N/A
Redcrest WS	\$23,267	\$22,224	N/A	N/A
Redway USA	\$3,673	\$4,300	\$6,083	\$4,492
Rio Dell USA	\$2,222	\$2,211	\$15,244	\$15,174
Rio Dell WS	\$2,222	\$2,211	N/A	N/A
Riverside WS	\$22,495	\$22,495	N/A	N/A
Samoa USA	\$0	\$1,830	\$ Unknown	\$ Unknown
Scotia USA	N/A	N/A	\$ 54,237	\$ 54,237
Shelter Cove USA	\$2,618	\$2,768	\$ Unknown	\$ Unknown
Shelter Cove WS	\$2,618	\$2,768	N/A	N/A
South Eureka USA	\$1,257	\$1,257	\$ Unknown	\$ Unknown
South Eureka WS	\$1,257	\$1,257	N/A	N/A
Weott USA	\$20,310	\$19,786	\$0	\$0
Westhaven WS	\$7,622	\$3,918	N/A	N/A
Willow Creek USA	\$3,686	\$5,818	\$ Unknown	\$ Unknown
Willow Creek WS	\$3,686	\$5,818	N/A	N/A

NOTE: Unknown wastewater unit costs for Humboldt Hill USA, Myrtle town USA, and South Eureka USA are due to ongoing negotiations and uncertainties associated with the future of the Elk River WWTP and the Martin Slough Interceptor.

A summary of estimated infrastructure costs for the unincorporated area of the County are summarized below.

Table ES-3. Estimated Infrastructure Costs for Humboldt County

Infrastructure Category	Estimated Cost for Countywide Improvements (\$)
Roadway Infrastructure ¹	\$28.7 million
Law Enforcement	\$8.5 million
Storm Drainage & Flood Control	Unknown
Fire Protection	Unknown
Water ²	\$110.6 million
Wastewater ²	\$137 million

NOTES: ¹ The roadway infrastructure costs do not include approximately \$44 million in improvements needed for the City of Eureka. Further analyses will be required to determine cost allocation between the City and County.

² Water and wastewater costs shown are representative of high build-out conditions. These values also do not contain infrastructure costs for many systems where infrastructure costs were unknown.

Some of the costs shown in Table ES-2 are labeled as unknown due to lack of available information. For storm drainage and flood control, the County does not currently have a capital improvements plan in effect. A comprehensive evaluation of the infrastructure and a CIP should be developed to estimate these costs. Fire protection costs are also shown as unknown due to funding irregularities for fire protection districts, including district size, location, budget, personnel types of training and equipment. Although capital costs for districts can be identified, costs to operate facilities in the most efficient manner vary by district.

Key Issues

Many key issues were identified during the preparation of the Community Infrastructure and Facilities Technical Report. Key issues are addressed through development of policy options. Several policy proposals and key issues for policy development include the following:

Administration: Many of the service providers represent communities with less than 1,000 service connections. The governing boards of these agencies are volunteers and the small size of their Districts makes it very difficult for them to generate the financial resources to properly operate, maintain and upgrade their services and infrastructure and maintain compliance with generally accepted levels of service and state and federal regulations. These agencies often do not have the sufficient ongoing revenue to attract or retain qualified technical and managerial staff. In some cases, the Districts struggle to find members of the community that are interested in taking on the thankless job of serving on the board of directors. It should also be noted that providers share resources and work cooperatively in an ad hoc manner to provide service.

Ongoing Revenue: Water and sewer service providers set rates that are intended to cover their costs. Historically, these rates were adjusted infrequently and often times only covered their cash needs, without accumulating sufficient funds to cover replacement of the system. In addition to the monthly service charges, these systems have connection charges which represent a payment to the service provider for use of the capacity in the existing system by a new user. The purpose of this charge is to enable the service providers to develop the necessary reserves to expand the system when needed. Many of the service providers are recognizing this shortfall and have been adjusting the monthly rates they charge annually. Costs for all services have been rising ahead of inflation in an effort to address the regulatory, replacement and operational issues outlined herein. While rates for water and sewer service have historically been low and have generally not been adequate to cover the whole cost of providing the service, the increases that will be needed to fund operation and maintenance, capital replacement, and regulatory changes will potentially send "rate shock" through these Districts. Working

collaboratively could provide opportunities to reduce the costs for providing these essential services.

Funding of Infrastructure: The most significant obstacle facing communities with respect to both rehabilitation and construction of new infrastructure is funding. Almost all of the providers serve small communities with limited resources. Assistance from the County would likely help the agencies secure the needed funding. Even large developments, in some cases, may have difficulty utilizing traditional land-based financing mechanisms (such as assessment districts or community facilities special tax districts, to be discussed later in this report) because of the small size, and slow rate of build-out, of the project relative to the cost of improvements.

Historically, nearly all infrastructures in the County and the United States have been built with grant funds paying for a significant portion of the project's costs. In rural America, grant funding for between 75% and 95% of the project's costs were typically needed to make the project affordable. While some grant funding is still available today, many programs have changed to revolving loan or a combination of grant and loan with greater emphasis on the loan program. The result is that the grant programs are more competitive, and local agencies need to submit the most competitive application possible to be successful. The County has secured over \$10 million in grants through Proposition 50 for watershed restoration and water and wastewater projects. For instance, \$2.5 million has been programmed for the Martin Slough Interceptor project and will help address current and future wastewater collection problems in the City of Eureka. The County is working with service providers to secure a similar or greater amount of funding from Proposition 84 funds.

Grant availability for roadway infrastructure has declined in recent years. One key issue for rural roadway expansion or construction is the lack of an adequate infrastructure financing mechanism to ensure that users pay their "fair-share" of off-site impacts in road infrastructure. A challenge for the County will be to strike a balance between funding maintenance (and preservation) of Humboldt County's existing transportation systems and creating roadway (multi-modal) capacity in areas where population growth and travel increases are projected to occur.

For County law enforcement services provided by the Sheriff's Office, a critical, detailed review and assessment of long-term facility needs and associated costs will likely indicate the need for a substantial increase in ongoing or one-time funds. Possible sources in addition to General Fund monies include impact fees, special taxes, or utility user or sales taxes.

Key fire protection issues that have been identified during the preparation of the Capital Facilities Technical report tend to be related to insufficient funding. Some of the major issues include:

- Lack of stable revenues
- Insufficient staffing levels
- Lack of needed and required training
- Lack of administrative capacity
- Lack of Level of Service standards for local fire agencies
- Lack of fire prevention and public safety education
- Outdated or poorly maintained equipment and facilities
- Fire services are being extended beyond adopted service boundaries
- Gaps in services between fire protection districts
- Poor communications
- High cost purchasing and insurance

Interagency Cooperation: Efforts should be made to further develop the County's role in fostering development and supporting infrastructure. The County should work to foster coordination between service providers. The County could facilitate the development of resources such as an "experience exchange;" equipment lending library; providing direct support to special districts (including small districts in the workman's comp insurance pool similar to what the County has offered fire protection districts); and seeking funding for qualified operators to serve multiple small districts, similar to a "circuit rider."

Roadway infrastructure maintenance and improvement activities would benefit from greater County-wide consistency on design standards (functional classifications) and more cooperation and coordination among County departments (particularly Community Development Services (Planning) and Public Works) on transportation system (roadway infrastructure, circulation) management. The Greater Eureka Area Travel Model (GEATM) is a powerful (though currently underutilized) tool that can be utilized for planning roadway maintenance and improvement projects as well as for circulation planning.

The Sheriff's Office efforts to keep Humboldt County citizens safe and secure may be furthered by coordination with the County Community Development Services Department on design standards for new development, particularly on approaches to community design that have been shown in other locations to facilitate a reduction in crime rates.

Influencing State Regulations: The County could proactively support the water and sewer service providers in affecting legislation and state agencies. In particular, issues related to wastewater disposal could have a profound effect on the county's infrastructure needs.

Next Steps

At the request of the service providers, the County could take a leading role in expanding the capacity for infrastructure maintenance and development, especially in more rural areas. The County has already begun this effort with its Master Fire Protection Plan and the Proposition 50 coordinating role. Currently, the County provides planning and some infrastructure, such as roads, storm drainage and law enforcement, and governs one Fire District. For other services such as water, sewer, and fire protection, communities rely on a multitude of individual special districts to provide these services. Historically, the County has provided water and sewer services through several County Service Areas. Many communities would benefit greatly from the County taking a more active role in these services.

Many, if not most of the special Districts within the County are operating on minimal budgets, oftentimes without licensed operators, and have aging and deteriorating infrastructure without the financial ability to make necessary capital improvement projects. Infrastructure is the life blood of the County, enabling its residents to live, work and play. The County could expand its leadership role, beyond the coordinating efforts of the Proposition 50 program and the Humboldt Fire Safe Council, to address some of the deficiencies noted herein. To increase the chances of success, the County could act in a supportive and cooperative manner that brings value to service providers through a partnership. The Community Infrastructure and Services Element will further describe policies that the County could adopt to help solve these problems. The following are some possible roles that the County could take:

If the service providers requested, the County could participate in a range of strategies from the formation of a county wide association of service providers to a memorandum of understanding or some other type of agreement that would allow the County to facilitate various programs.

Additional information is provided in the last chapter of this report which discusses Implementation.

The information contained in this technical report has been used as a basis for the development of the goals, policies, standards and recommended implementations contained in the accompanying Community Infrastructure and Services Element and the Circulation Element. These documents should be reviewed and refined by the public, the Planning Commission and the Board of Supervisors so that they may serve to guide infrastructure development in the County over the next twenty years.

1. Introduction

1.1. Purpose

The purpose of this technical report is to serve as the basis for the Community Infrastructure and Services Element of Humboldt County's General Plan Update. This element is responsible for identifying policies and implementation measures to provide the necessary infrastructure to support existing capacity and future growth within the County. Infrastructure and services considered herein includes water, wastewater, law enforcement, fire protection, roads, and stormwater control. Available financing options for funding infrastructure improvements are also evaluated. Additional roadway related policies and programs are intended to be incorporated into the draft Circulation Element.

1.2. Organization of report

This Report is organized by chapters, each dedicated to a separate infrastructure and public facilities type. Chapters include road infrastructure, law enforcement, storm drainage and flood control, fire protection, water, wastewater, streetlights, parks and recreation, schools, and public utilities. A section dedicated to discussion on funding infrastructure is also included, as well as a section summarizing an implementation plan.

1.3. Methodology

In 2005 the County defined specific Urban Study Areas (USAs), areas where water and/or sewer systems exist or may be appropriate to consider, for the purpose of evaluating development potential and infrastructure capacity within the County. Study areas are further broken down into two main sub-categories: Urban Service Study Areas (USAs) and Water Service Study Areas (WSAs). Urban Service Study Areas are areas where sewer and water service exist or may be feasible to provide, and development densities greater than one unit per acre are appropriate to consider. Water Service Study Areas are areas where only water service exists or may be feasible to provide, and development densities less than one unit per acre are appropriate to consider.

1.3.1. Development Projections

The County has made development projections for residential land within Urban Study Areas to identify the likely number of residential units at buildout, where all developable residential land is occupied by housing units. The County used its extensive GIS database to identify vacant and underdeveloped residential parcels within unincorporated areas of the County. Total acreages and the developable portion of each of these vacant or underdeveloped parcels were determined. The net developable acreage (total minus constrained parcel acres) takes environmental and site constraints, such as wetland and slope constraints, into consideration to determine the actual acreage of land available for development. net developable acreage for each parcel was multiplied by two different residential densities (the number of dwelling units permitted per net acre of land as measured in terms of acres per dwelling unit) to develop "low" and "high" estimates of development potential. The low estimate is based upon the mid point of development potential of the current General Plan land use designations and the high estimate

reflects potential changes in density (such as increasing the allowable density range of the RL designation from 1 to 7 dwelling units per acre to 3 to 8 dwelling units per acre or adding additional multifamily residential land.) The actual development that can (legally) occur on these parcels using the maximum density allowable under the current zoning is higher than the high estimate. The development projections are summarized in Table 1-6.

The County utilized the following data sets to identify constrained areas in identifying developable land:

- National Wetland Inventory, Humboldt County Local Coastal Program Wetlands, and McKinleyville Community Plan wetlands data;
- Humboldt County Streamside Management Area data;
- Federal Emergency Management Agency "Q3" flood map data;
- Freshwater and Elk River Light Detecting and Raging data (LIDAR), as applicable;
- Prime agricultural soil maps;
- Alquist-Priolo Fault Zoning Act maps as established by the California Geological Survey;
- California Division of Mines and Geology Watershed Mapping Historic Landslide Areas;
- U.S. Department of Agriculture National Agricultural Inventory Program imagery; and
- United States Geologic Survey 10-meter digital elevation model data.

In developing this report, the service providers were asked to review the development projections that have been made. Input from the service providers has been valuable and has resulted in revisions to the development estimates.

Like all data bases, the development projections should be subject to regular refinement and updating. There has been some controversy surrounding the accuracy of the development potential as determined using the County's GIS data base. Some of the main issues we heard in our review of this information can be summarized into the following categories:

1. *"In many instances the current infrastructure will not support this level of development."* While this statement may be correct, it fails to recognize that the proper sequence is to define the development potential and then to plan and develop the necessary infrastructure. Otherwise, the long range plan would only be based upon what infrastructure is currently in place without making any improvements.
2. *"Parcels that are currently underdeveloped, based upon current zoning do not have a potential for additional development."* The redevelopment of these parcels will likely not occur until economic conditions make this an attractive alternative. Whether the economic conditions change to make this attractive within the planning period is unknown. However, to remove this ability (for redevelopment) will require the County to "downzone" these parcels, which is not something that we recommend.
3. *"Current owners of parcels do not want to develop them or do not wish to develop them to the density desired by the County."* We believe that the subjective nature of this argument makes it impossible to quantify. Further, we believe it would be a mistake to take these development rights away from the property owners by down zoning their parcels. It should also be noted that the minimum development numbers are based upon the densities required by the state as an average that must be obtained throughout the County. So while individual parcels may be developed at higher or lower densities, the use of this average for planning purposes is appropriate.

The development potential identified by the County GIS database and as updated in this effort served as the basis for determining and planning major infrastructure upgrades and improvements that will be required to accommodate this growth. It is important to note that, based on current general plan and zoning regulations, parcels could be developed with more units than is shown in the high estimate and this needs to be taken into account before building any actual improvements. It is also important to note that the County's "high" and "low" projections reflect what the *land can bare* based on the allowable use of the land and the physical constraints that affect the land. These development projections are not related to a specific planning period or a projected growth rate.

1.3.2. Humboldt County Population and Housing Growth

The County has identified the past rates of growth for each individual USA and WSA based on recent population and housing development. The county building permit database in conjunction with 1990 and 2000 census data were used to identify the housing and population growth that has occurred over the past ten years within Humboldt County.

Past Growth Rates. Based on the development that occurred between Census 1990 and 2000, Humboldt County housing units grew at an annual average growth rate (AAGR) of 0.9 percent. Population during this period grew at an AAGR of 0.6 percent. This same overall growth rate has continued, according to the California Department of Finance (DOF) data (Table E-5 – City/County Population and Housing Estimates): the AAGR for housing units was 0.91 percent from 1995 to 2007 and the rate of growth for population was 0.60 during the same period. Based on DOF data, the average household size in Humboldt County has declined from 2.49 in 1990 to 2.39 in 2000, and is now 2.34 in 2007 (U.S. Census and DOF Table E-5).

The continued decline in average household size is likely the most significant contributor to the difference between the growth rate in housing and the growth rate in population. However, the difference between the rate of housing and population growth did vary during this period. According to DOF Table E-5 the housing and population growth rates were nearly equal between 2000 and 2003. In contrast, between 2005 and 2006 the population growth rate declined to 33 percent while the housing growth rate increased to almost 1.60 percent.

Table 1-1. Humboldt County Population and Household Demographics

Humboldt County										
1980	1990			2000			1990-2000			
Pop	Total Pop	Total H/U	Avg HH Size	Total Pop	Total H/U	Avg HH Size	Pop AAGR	H/U AAGR	Total Δ in Pop	Total Δ in H/U
108,812	119,118	51,134	2.49	126,518	55,912	2.39	0.60%	0.90%	6.21%	9.34%

Source: Census 1990 and 2000.

Table 1-2. Humboldt County Population Growth Statistics

Humboldt County					
Total Housing Units			Average Annual Growth Rate		
1995	2000	2005	1995-2000	2000-2005	1995-2005
54,509	55,912	58,015	0.51%	0.74%	0.63%
New Housing Units			Average New Units Per Year		
1995-2000	2000-2005	1995-2000	2000-2005	1995-2005	1995-2005
1,403	2,103	281	421	351	

Source: DOF Table E-5, State of California, Department of Finance, E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2007, with 2000 Benchmark. Sacramento, California, May 2007.

Growth Projections. The DOF released population projections for California counties in July, 2007 (State of California, Department of Finance, Population Projections for California and Its Counties 2000-2050, or Table P-1). These new projections show a higher growth rate between 2005 and 2025 than previously expected and a higher total 2025 population, 145,004 (143,100 was previously projected by DOF and is shown in the Building Communities Report and a previously revised Table P-1 showed a year 2025 population of 141,300). The California Department of Housing and Community Development (HCD) prepares housing projections based on DOF demographic projections.

Table 1-3. Humboldt County Population Growth Forecasts

Humboldt County Population Projections			
Year	Projected Population	Projected AAGR	Between Years
2000	126,839		
2005	131,410	0.71%	2000 to 2005
2010	134,785	0.51%	2005 to 2010
2015	138,681	0.57%	2010 to 2015
2020	142,167	0.50%	2015 to 2020
2025	145,004	0.40%	2020 to 2025
Overall Growth Rate		0.54%	2000 to 2025

Source: DOF Table P-1, State of California, Department of Finance, Population Projections for California and Its Counties 2000-2050, Sacramento, California, July 2007.

Ideally, final housing growth projections by HCD would be available for this report. However, this is not the case. For the purposes of this report, a ratio share method based on the projected population growth rate, has been used to project future housing units. This method assumes that the ratio of housing units to population will be the same in the future as it is today. Because this method may over estimate or under estimate future housing units (depending upon shifts in demographics or local economics), this report will present a range that, at the low end is somewhat lower, and, at the high end, considerably higher than past growth in housing units. In addition, the range of housing growth rates was developed to accommodate the unincorporated area's share of the regional housing need at the low end (slightly more than 0.5 percent AAGR) and three times the regional housing need at the high end (slightly less than 2.5 percent AAGR).

Table 1-4. Growth Projections from State and County

Humboldt County Population Projections		
Year	Population AAGR Based on DOF Projections	Housing AAGR Based on Current Population to Housing Ratio
2000-2005	0.71%	1.07%
2005-2010	0.51%	0.76%
2010-2015	0.57%	0.86%
2015-2020	0.50%	0.75%
2020-2025	0.40%	0.59%
2000-2025	0.54%	0.81%

Source: DOF Table P-1; Humboldt County Community Development Services, 2007.

1.3.3. Coordination with Service Providers

The information on the individual service providers was developed in consultation with the service providers, regulators and the authors' knowledge of these issues. Some of these issues,

particularly those related to pending regulations are not finalized and the requirements necessary to meet them may change from those assumed herein. Additional, detailed studies beyond the scope of this study should be completed to refine the improvements noted herein.

These improvements should be designed to reflect potential future development. Typically this information is developed as a part of a master or facilities planning effort that is completed by the service providers. With this update to the County's general plan, the service providers should evaluate their needs to update past planning efforts. In many instances, the most recent master plans were completed 20 or 30 years ago and need to be updated.

1.4. Service Provider Background Data and Information

1.4.1. Current Development and Future Development Potential by USA/WSA

The following tables serve as a reference for future development potential within USAs and WSAs. Table 1-5 summarizes recent development and growth, as well as current demographic conditions within the USAs and WSAs identified by the County. The number of residential units constructed over the past 10 years is shown, along with the corresponding average annual growth rates that have occurred over this period, as well as existing number of dwelling units and existing densities. Table 1-6 serves as a reference for development potential, outlining vacant/underdeveloped acreage, constrained acreage, and net developable acreage for the various USAs and WSAs. Two density ranges were used to estimate a low (based on the Current General Plan) and high estimate (based on a higher density alternative that focuses development in the urbanized areas) of the development potential that could occur on the net developable acreage, also shown in Table 1-6. It should be noted that existing residential density (expressed as dwelling units/acre) shown in Table 1-5 and future residential density (based on Low and High build-out projections) shown in Table 1-6 are based on gross urban study acres. Estimates of resulting densities as shown in the final two columns of Table 1-6 represent a build-out density and include either the project Low or High unit build-out plus dwelling units (2000) and new residential units constructed between 2000 and 2005 (from Table 1-5).

All infrastructure assessments in the following chapters draw from these tables.

1.4.2. Water and Wastewater Rates

Water and wastewater rates are established by each water and wastewater provider pursuant to state law and local policy. Rates are updated periodically according to the requirements of the provider. Table 1-7, Water and Wastewater Rates by Service Provider, displays monthly water and wastewater user rates and connection fees for each service provider USA/WSA. Information is not provided for the towns of Samoa and Scotia because these areas are currently operated as privately owned campuses. Information is also not provided for the Myers Flat and Redcrest mutual water companies. Mutual water companies are member owned non-profit corporations where members share in equity and expenses. Mutual water company shares are appurtenant to the property owned and cannot be sold separately.

Table 1-7 is provided for informational purposes only. Rate and connection fee information was gathered in March and April 2008 and represents only a snap shot in time. Because of the varied methods of calculating user fees utilized by local service providers, Table 1-7 contains estimates, and is not intended to represent the full and complete rate comparison for all users at all levels of consumption. The methodologies used to calculate rates for water and wastewater by each agency can be different (e.g. flat rates vs. consumptive based) and rates can also include taxes and fees that may not be captured in Table 1-7.

Table 1-5. Background information related to growth in Humboldt County

USA/WSA	# of New Residential Units		Average Annual Growth		Existing Development		
	1995 – 2000	2000 - 2005	1995 – 2000	2000 - 2005	Total Acres	Dwelling Units (2000)	Density (Units/Acre)
Alderpoint WS	5	2	1.64%	0.62%	370	64	0.2
Arcata USA	0	2	0.00%	0.21%	178	188	1.1
Benbow WS	5	13	1.02%	2.45%	415	101	0.2
Big Lagoon WS	2	5	0.24%	0.60%	159	165	1.0
Blue Lake USA	0	1	0.00%	0.26%	94	77	0.8
Blue Lake WS	1	4	0.19%	0.76%	238	104	0.4
Briceland WS	2	1	1.18%	0.57%	82	35	0.4
Fieldbrook WS	37	41	1.51%	1.55%	6,879	512	0.1
Fortuna USA	23	39	0.78%	1.27%	3,587	601	0.2
Freshwater WS	35	30	0.93%	0.76%	3,568	773	0.2
Garberville USA	17	19	1.27%	1.33%	740	278	0.4
Garberville WS	3	8	0.44%	1.13%	1,571	139	0.1
Glendale USA	18	19	2.67%	2.48%	456	146	0.3
Glendale WS	8	3	1.76%	0.62%	400	96	0.2
Humboldt Hill USA	57	102	0.69%	1.18%	3,967	1,689	0.4
Hydesville USA	9	9	0.96%	0.92%	579	192	0.3
Hydesville WS	34	26	2.13%	1.48%	2,398	340	0.1
Indianola WS	26	21	1.08%	0.83%	1,916	495	0.3
Jacoby Creek WS	15	11	1.01%	0.71%	899	305	0.3
Loleta USA	11	13	0.85%	0.96%	119	265	2.2
Manila USA	18	25	1.02%	1.34%	1,455	364	0.3
McKinleyville USA	539	778	2.23%	2.85%	5,521	5,162	0.9
McKinleyville WS	28	28	1.45%	1.35%	2,740	403	0.1
Miranda USA	12	6	1.26%	0.60%	315	197	0.6
Myers Flat WS	1	1	0.24%	0.24%	165	84	0.5
Myrtle town USA	61	46	0.73%	0.53%	830	1,714	2.1
Myrtle town WS	0	0	0.00%	0.00%	61	4	0.1
Orick USA	4	3	0.81%	0.59%	268	101	0.4
Orick WS	3	2	0.68%	0.44%	1,509	90	0.1
Orleans WS	3	12	0.33%	1.27%	1,057	184	0.2
Phillipsville WS	0	0	0.00%	0.00%	326	97	0.3
Redcrest WS	2	1	1.30%	0.62%	280	32	0.1
Redway USA	8	46	0.25%	1.39%	1,288	642	0.5
Rio Dell USA	0	0	0.00%	0.00%	87	5	0.1
Rio Dell WS	1	3	0.73%	2.06%	166	28	0.2
Riverside WS	2	2	0.35%	0.35%	1,977	114	0.1
Samoa USA	0	0	0.00%	0.00%	301	104	0.3
Scotia USA	0	0	0.00%	0.00%	464	270	0.6
Shelter Cove USA	54	196	5.11%	12.47%	873	245	0.3
Shelter Cove WS	19	52	5.49%	10.43%	1,899	81	0.0
South Eureka USA	242	291	1.27%	1.43%	6,030	3,963	0.7
South Eureka WS	3	0	0.58%	0.00%	1,199	106	0.1
Weott USA	2	4	0.27%	0.53%	340	148	0.4
Westhaven WS	52	40	1.91%	1.35%	2,072	577	0.3
Willow Creek USA	0	0	0.00%	0.00%	88	20	0.2
Willow Creek WS	50	78	1.12%	1.64%	3,865	922	0.2

Table 1-6. Development Potential in Humboldt County's USAs and WSAs

USA/WSA	Development Potential			Estimate of Potential Dwelling Units				Estimates of Resulting Densities ¹ (Units/Acre)	
	Vacant /Under-developed Acres	Constrained Acres	Net Develop-able Acres	Low		High		Low	High
				New	Total	New	Total		
Alderpoint WS	210	79	130	44	110	66	132	0.3	0.4
Arcata USA	22	10	12	2	192	205	395	1.1	2.2
Benbow WS	103	52	51	55	169	56	170	0.4	0.4
Big Lagoon WS	63	11	53	10	180	14	184	1.1	1.1
Blue Lake USA	73	23	50	46	124	143	221	1.3	2.3
Blue Lake WS	91	6	85	6	114	18	126	0.5	0.5
Briceland WS	53	0	53	13	49	26	62	0.6	0.7
Fieldbrook WS	5,138	1,383	3,755	138	691	575	1,128	0.1	0.2
Fortuna USA	1,414	527	888	294	934	450	1,090	0.2	0.3
Freshwater WS	1,637	613	1,024	130	933	335	1,138	0.3	0.3
Garberville USA	129	51	79	63	360	108	405	0.5	0.5
Garberville WS	1,099	616	483	61	208	103	250	0.1	0.2
Glendale USA	284	66	218	20	185	1,189	1,354	0.4	2.9
Glendale WS	59	12	47	1	100	1	100	0.2	0.2
Humboldt Hill USA	1,937	713	1,224	963	2,754	2,070	3,861	0.7	0.9
Hydesville USA	243	65	178	96	297	554	755	0.5	1.3
Hydesville WS	1,044	456	588	70	436	246	612	0.2	0.2
Indianola WS	1,269	434	835	99	615	162	678	0.3	0.3
Jacoby Creek WS	338	53	286	28	344	101	417	0.4	0.5
Loleta USA	34	3	31	87	365	116	394	3.0	3.2
Manila USA	172	41	131	142	531	233	622	0.3	0.4
McKinleyville USA	2,038	356	1,683	2,224	8,164	4,112	10,052	1.3	1.7
McKinleyville WS	836	166	670	123	554	137	568	0.2	0.2
Miranda USA	113	27	86	48	251	74	277	0.8	0.9
Myers Flat WS	13	5	8	4	89	4	89	0.5	0.5
Myrtle town USA	278	29	249	466	2,226	1,021	2,781	2.6	3.3
Myrtle town WS	18	2	16	55	59	81	85	1.0	1.4
Orick USA	47	28	18	19	123	30	134	0.4	0.5
Orick WS	660	482	178	36	128	36	128	0.1	0.1
Orleans WS	428	155	273	50	246	220	416	0.2	0.4
Phillipsville WS	114	80	34	11	108	11	108	0.3	0.3
Redcrest WS	23	3	20	12	45	16	49	0.2	0.2
Redway USA	850	381	469	298	986	589	1,277	0.7	1.0
Rio Dell USA	6	2	4	2	7	8	13	0.1	0.1
Rio Dell WS	46	6	40	7	38	7	38	0.2	0.2
Riverside WS	56	22	34	5	121	5	121	0.1	0.1
Samoa USA	69	0	68	0	104	318	422	0	1.4
Scotia USA	0	0	0	0	270	0	270	0	0
Shelter Cove USA	160	5	155	1,088	1,529	1,214	1,655	1.5	1.7
Shelter Cove WS	230	143	87	108	241	267	400	0.1	0.2
South Eureka USA	3,207	929	2,279	2,687	6,941	8,048	12,302	1.1	2.0
South Eureka WS	651	477	175	13	119	47	153	0.1	0.1
Weott USA	31	5	26	34	186	61	213	0.5	0.6
Westhaven WS	668	128	541	79	696	424	1,041	0.3	0.5
Willow Creek USA	24	9	15	12	32	76	96	0.4	1.1
Willow Creek WS	1,482	757	726	215	1,215	504	1,504	0.3	0.4

¹Estimates of resulting densities as shown in the final two columns of Table 1-6 represent a build-out density, are based on gross urban study acres and include either the project Low or High unit build-out plus dwelling units (2000) and new residential units constructed between 2000 and 2005 (from Table 1-5).

Table 1-7. Water and Wastewater Rates by Service Provider

USA/WSA	Water Rates				Wastewater Rates			
	Base Rate ¹	Cubic Feet in Base ²	Rate per hcf ³	Connection Fee	Base Rate	Cubic Feet in Base	Rate per hcf	Connection Fee
Alderpoint CWD	\$40.00	1,000	⁴	none	No sewer service provided			
City of Arcata	\$5.20		\$1.44 to \$2.80	\$1,500	\$22.50	450	\$3.15	\$4,320
Benbow WC	\$66.50		\$0.95	\$2,000	No sewer service provided			
Big Lagoon CSD	\$39.08		\$0.03	\$500	No sewer service provided			
City of Blue Lake	\$16.53		\$0.64 to \$1.32	\$2,676.68	\$38.67		flat rate	\$5,395.58
Briceland CSD	\$20.00		flat rate	none	No sewer service			
City of Eureka	\$12.24		\$2.81	\$2,000	\$20.30		flat rate	\$2,130
Fieldbrook-Glendale CSD	\$24.12	1,000	\$1.49	\$5,162	\$56.19		flat rate	\$5,162
City of Fortuna	\$16.49	250	\$1.53	\$2,003	\$33.14	450	\$7.36	\$5,500
Garberville SD	\$28.00	1,000	\$2.20	\$1,000	\$24.19		flat rate	\$1,000
Humboldt CSD	\$10.45		\$1.50	\$1,030	\$23.75		flat rate	\$1,000
Hydesville CWD	\$30.00	750	\$3.00		No sewer service provided			
Jacoby Creek CWD	\$16.50		\$1.60 to \$3.84	\$1,500	\$22.50	450	\$3.15	\$4,320
Loleta CSD	\$24.77		\$2.71	\$2,500	\$30.83		flat rate	\$2,500
Manila CSD	\$23.37		\$0.73	\$5,350	\$38.33		flat rate	\$7,480
McKinleyville CSD	\$6.35		\$0.94 to \$1.40	\$736	\$15.05		\$0.20	\$3,500
Miranda CSD	\$12.00	1,200	\$0.90	\$1,000	\$23.00		flat rate	\$1,000
Orick CSD	\$21.60	300	\$2.76	\$2,500	No sewer service provided			
Orleans CSD	\$35.00		\$1.13	\$2,705	No sewer service provided			
Palmer Creek CSD	\$36.62	800	\$0.85	\$5,300	\$60.00		flat rate	\$3,000
Phillipsville CSD	\$30.00	1,500	\$0.03	\$1,000				
Redway CSD	\$17.70	1,000	\$2.20	\$1,600	\$26.00		flat rate	\$1,840
City of Rio Dell	\$22.00	100	\$2.00	\$2,700	\$48.00		flat rate	\$1,150
Riverside CSD	\$25.00		\$3.37	\$600	No sewer service provided			
Resort Improvement Dist. #1	\$17.50	500	\$5.00 to \$7.50	\$17,500	\$32.50		flat rate	\$7,200
Weott USA	\$35.00		flat rate	\$500	\$42.00		flat rate	\$500
Westhaven CSD	\$32.80	300	\$2.30	\$4,500	No sewer service provided			
Willow Creek CSD	\$37.27		\$4.85	\$8,700	No sewer service provided			

¹“Base Rate” = the rate that users are required to pay regardless of the volume of water consumed

²“Cubic Feet in Base” = volume of water in cubic foot included in base rate

“hcf” = hundred cubic feet (approximately 748 gallons or 7.48 gallons/cubic foot)

³“Rate per hcf” = the consumption rate for the volume of water consumed in addition to the base volume.

⁴ 2% of volume x \$1.00 for volume in excess of 1000 cu ft

1.5. LAFCo and Service Provider Boundaries

Most local service providers are government agencies, either cities or special districts. Special districts are either single purpose, such as fire protection districts, or multi-purpose local government agencies, such as community services districts. For the purposes of this section the term local agency refers cities and special districts. Each local agency is authorized to provide a specific set of services within a definite service boundary. The set of services and initial boundaries are established, and can change over time, by approval of the affected residents and the Humboldt Local Agency Formation Commission (LAFCo).

This report evaluates services and infrastructure in the Urban Study Areas and identifies issues relating to system condition, capacity, and service boundaries. Many of these issues are also of concern to the Humboldt LAFCo and this report will likely serve as an information source in future LAFCo deliberations. In certain instances, this report recommends that districts expand their Spheres of Influence, annex adjacent land, seek authorization to provide additional services, or that a new special district be formed to provide municipal services within an Urban Study Area. All of these actions would require action by the Humboldt LAFCo.

1.5.1. Local Agency Formation Commission (LAFCo)

LAFCos are independent county-level regulatory commissions created by the California Legislature to act on proposals concerning the formation of cities and special districts and on other changes in jurisdiction or organization of local agencies. LAFCo is also given authority to make studies of existing governmental agencies in an effort to improve the efficiency of urban services.

LAFCo plays an important role in the delivery of services in the County. The State Legislature defined the following objectives for LAFCo: to encourage the orderly formation of local governmental agencies; to preserve agricultural land resources; to discourage urban sprawl. LAFCo carries out these objectives through the planning authorities described below.

Sphere of Influence Studies

Ideally, a local agency provides service within its LAFCo adopted boundaries and plans for the provision of future service outside its boundaries through its LAFCo adopted Sphere of Influence (SOI) study. An SOI is a planning boundary, usually outside of an agency's district boundary, that is defined in Section 56076 of the Government Code as "a plan for the probable physical boundaries and service area of a local agency, as determined by the commission." LAFCo is required to adopt a sphere of influence for each local governmental agency in the county within LAFCo jurisdiction and enact policies designed to promote the logical and orderly development of areas within the SOI. An adopted sphere of influence is primarily a planning tool to guide the review of proposals submitted to LAFCo. Inclusion within an agency's SOI does not indicate that an annexation proposal will be approved. However, annexations will not be approved unless the annexation area is within a local agencies adopted SOI.

Municipal Service Reviews

Municipal Service Reviews (MSR) were added to LAFCo's mandate with the passage of the Cortese-Knox-Hertzberg Act in 2000. An MSR is a comprehensive study designed to better inform LAFCo, local agencies, and the community about the provision of municipal services. MSRs attempt to capture and analyze information about the governance structure and efficiencies of

service providers, and to identify opportunities for greater coordination and cooperation between providers. A completed MSR is a prerequisite to LAFCo's SOI determination and may also lead a LAFCo to take other actions under its authority.

Initiation of Special District Consolidations

LAFCos have the authority to initiate proposals that include the dissolution or consolidation of special districts, or the merging of an existing subsidiary district. Prior to initiating such an action, LAFCo must determine, through an SOI study or other special study that the district's customers would benefit from the proposal.

1.5.2. Service District Boundaries

As indicated in Section 1.3, Urban Study Areas were defined in areas where water and sewer service are currently provided or may be appropriate to consider in the future. Urban Study Areas follow service district boundaries and SOIs, and the SOIs of cities within the County. In certain instances, Urban Study Areas follow the boundaries of private or mutual water companies (Benbow, Myers Flat, and Redcrest WSAs) or include areas beyond district boundaries and SOIs that are currently served by a local agency or that may appropriately be served by a local agency in the future (portions of the Big Lagoon WSA, Orleans WSA, Westhaven WSA, Blue Lake WSA, Fieldbrook WSA, Glendale USA, Indianola WSA, Freshwater WSA, Myrtle town WSA, South Eureka USA and WSA, Humboldt Hill USA, Hydesville USA and WSA, Weott USA, Redway USA, and the Garberville USA and WSA, and all of the Samoa USA and Scotia USA).

In most instances it will be appropriate for an existing city or district to expand its boundaries to include those portions of USAs that already receive its service or areas appropriate for urbanization. In addition, there are areas such as Samoa or Scotia where major redevelopment projects are underway and it may be appropriate for a new district to be formed or for an existing city or district to annex the area. In either case, applications (in the form of landowner petitions or local agency resolutions) would be prepared and LAFCo would consider municipal service reviews, revised SOI reports, and the revised policies and maps contained in the General Plan Update prior to taking any action.

Provision of Service Outside District Boundaries

As described above and detailed in following chapters, there are instances where local agencies of all types are providing services outside of their district boundaries. Pursuant to Government Code Section 56133, local agencies may provide new or extended services by contract or agreement outside jurisdictional boundaries only if the local agency first requests and receives written approval from LAFCo. Services outside district boundaries that were provided prior to January 1, 2001 are exempt from this requirement.

LAFCo may authorize a city or district to provide services outside its jurisdictional boundaries and outside its SOI to respond to an existing or impending threat to the public health or safety of the residents of the affected territory if both of the following requirements are met: (1) the entity applying for the contract approval has provided the commission with documentation of a threat to the health and safety of the public or the affected residents; and (2) The LAFCo has notified any alternate service provider that has filed a map and a statement of its service capabilities with the commission (Government Code Section 56133(c)). The policies of the Humboldt LAFCo contained in the Humboldt County LAFCo Procedures Guide (<http://www.humboldtlaico.org/documents/PROCED03.pdf>) section on "Provision of Services by Contract" apply in addition to Government Code Section 56133.

1.6. Acknowledgements

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2. Road Infrastructure

2.1. Description

Humboldt County's roadway system has approximately 1,400 miles of county roads and city streets, 378 miles of state highways, including U.S. Highway 101, and roadways on federal lands. These roadways provide for the inter-regional and intra-regional movement of goods and people on California's north coast. Humboldt County roadways traverse varying degrees of flat, rolling, and mountainous terrain and provide for limited passing opportunities in many areas.

The County-maintained roadways are integrated with an overall countywide circulation system maintained by local cities, the California Department of Transportation (Caltrans); the U.S. Forest Service, Bureau of Land Management and the Bureau of Indian Affairs; cities; and private property owners. This roadway network contributes to the economic vitality of Humboldt County, providing safe access and travel routes for Humboldt County citizens and visitors, from low-density rural areas to higher-density urban areas.

The purpose of this technical report is to provide information about the current status of the County roadway system and potential future changes, with a focus on the Urban Study Areas being considered as a part of the Humboldt County General Plan Update. This technical report describes the roadway functional classification system and other criteria used by the County to assess and maintain roadways, presents vehicle trip data derived from the Greater Eureka Area Traffic Model developed for the joint use of the County, City of Eureka, and Caltrans, and provides a basis for the roadway improvement goals, policies and programs that will be in the Humboldt County General Plan Community Infrastructure and Services Element. The roadway component of the Community Infrastructure and Services Element will be coordinated with the Circulation Element.

While this portion of the technical report focuses primarily on roadways, it is important to note that County's long term circulation system must include provisions for vehicle as well as truck, bicycle, pedestrian, equestrian, and transit facilities. The General Plan Update will develop policies to ensure that County roadway rights of way better accommodate increased volumes of both vehicular and nonvehicular transportation modes.

Estimates of existing and future roadway capacities and condition help to identify roadways where upgrades, expansions and/or maintenance may be needed. Critical issues for the County road system are safety, functionality and road rehabilitation. Roadway maintenance is a challenge for rural areas such as Humboldt County: lower population densities and long travel distances mean fewer funds are available on a per-mile basis. Roadway capacity is generally less of an issue for rural areas due to the lower population densities, but even so there are existing and projected areas of congestion that must be addressed. Roadway capacity is also affected by competition for space in the right-of-way among vehicular traffic and complementary modes of transportation, including transit service, bicycles and pedestrians.

2.2. Roadway Budget

Funding for roadway maintenance, upgrades and expansions is a critical concern and is often the limiting factor for the determination of project eligibility and the prioritization of projects. Roadway projects typically go through six costly and (often) time-consuming steps: planning, environmental review, design, right-of-way acquisition, permitting, and construction. The environmental and permitting phases are particularly time-consuming due to the increased demands from agencies such as the Corps of Engineers, National Fisheries Marine Service, Fish and Wildlife Service, Department of Fish and Game, Coastal Commission and California Water Quality Control Board, and an ongoing challenge for the County is to find and keep engineers and other technical staff to design, survey, and inspect roadways, and to acquire permits, provide environmental documents, acquire rights-of-way and plan roadway improvements (2003 CIP). The Humboldt County Public Works Roads Fund 2004-2008 budget is shown below.

Table 2-1. Humboldt County Public Works Roads Fund Budget, 2004-2008

1200 - Roads Fund	2004-05 Actual	2005-06 Actual	2006-07 Actual	2007-08 Request	2007-08 Adopted	Increase/ (Decrease)
Revenues						
Taxes	\$2,662,555	\$2,800,912	\$3,427,462	\$3,259,352	\$3,259,352	(\$168,110)
Licenses & Permits	0	0	80,533	0	0	(80,533)
Use of Money & Property	0	11,164	23,580	0	0	(23,580)
Other Gov't Agencies	9,076,558	10,759,727	11,823,508	20,826,688	20,826,688	9,003,180
Charges for Services	745,692	643,939	805,272	688,500	688,500	(116,772)
Other Revenues	40,360	166,586	81,797	621,350	21,350	(60,447)
(To)/From Non-GF Fund Balance	(792,926)	2,625,163	(3,915,600)	2,306,340	2,306,340	6,221,940
Total Revenues	\$11,732,239	\$17,007,492	\$12,326,551	\$27,702,230	\$27,102,230	\$14,775,679
Expenditures						
Contracts	\$2,627,330	\$3,125,935	\$481,376	\$0	\$0	(\$481,376)
Salaries & Benefits	4,408,274	4,858,204	5,776,967	6,669,553	6,669,553	892,586
Supplies & Services	4,442,325	8,758,492	5,452,958	20,738,342	20,138,342	14,685,384
Other Charges	234,605	211,301	575,362	195,505	195,505	(379,857)
Fixed Assets	19,705	53,561	39,887	98,830	98,830	58,943
Total Expenditures	\$11,732,239	\$17,007,492	\$12,326,551	\$27,702,230	\$27,102,230	\$14,775,679
Allocated Positions	111.00	111.00	111.00	112.00	112.00	1.00
Temporary (FTE)	3.35	2.92	3.69	4.75	4.75	1.06
Total Staffing	114.35	113.92	114.69	116.75	116.75	2.06

Source: Humboldt County Adopted Budget Fiscal Year 2007-2008, Page L-33.

The major roadway revenue sources include: State Gas Taxes, Property Taxes, Proposition 42 funds, Transportation Development Act (TDA) Funds, Regional Surface Transportation Program (RSTP) Exchange Funds, Timber Yield Funds, Vehicle-in-Lieu Funds, and Other Revenue. A portion of the Business License fees collected is distributed to roadways. Other revenue includes the sale of surplus equipment, plans and specs, maps and other unanticipated reimbursements or refunds.

Despite healthy revenue growth from FY 2005-06 to FY 2006-07, the roadway budget is facing revenue uncertainties. FY 2005-06 was the final year of a five-year program providing approximately \$900,000 annually from the Forest Service. Grant availability through the State has been reduced. State Transportation Improvement Program (STIP) funds are not guaranteed, are restricted in what they can be used for and are limited in amount; in addition, other entities (e.g., Caltrans) also rely on STIP funding and their funding requests often supersede the County's. Much of the County's non-STIP roadway improvement funding comes from grant programs (e.g., Safe Routes to Schools, Transportation Enhancement Activities), with matching funds from the County's road maintenance program.

The County is developing a five-year Capital Improvement Program (CIP) for the years 2008-2012 to help guide the use of the County's transportation dollars over the next several years. The County is also developing a priority list of road projects from its pavement management system that determines the order of need for roadways in terms of maintenance and rehabilitation. One issue for rural roadway expansion or construction is the lack of an adequate infrastructure financing mechanism that requires users to pay for their "fair-share" of off-site impacts in road infrastructure. This will be further addressed in the Community Infrastructure and Services Element.

Because of the ongoing budget limitations, the County has developed other methods for providing funds for roadway maintenance and improvements. In McKinleyville, the County funds roadway maintenance for new subdivisions through Permanent Road Divisions (PRD). A PRD is a type of special assessment district formed pursuant to California Streets and Highways Code to provide funding for roadway maintenance and improvements. PRDs require the preparation of an engineer's report that calculates and apportions the special benefit to each property within the division. Owners of properties that benefit would vote whether to approve the establishment of a division.

Humboldt County's Regional Transportation Plan (RTP) is a long-range planning document developed by the Humboldt County Association of Governments (HCAOG). The RTP provides guidance on the development of the regional transportation system and assists in the prioritization of projects for funding. The Financial Element of the RTP includes updated funding program information and a funding strategy for financing future transportation improvements. The RTP reflects the importance of creating a balance between maintaining (preserving) Humboldt County's existing transportation systems and creating capacity in areas where population growth and travel increases are projected to occur. The RTP also reflects the importance of bicycle and pedestrian modes as being integral to the multimodal aspects of the regional transportation system. The relationship between County roadway infrastructure and the RTP will be further addressed in the Circulation Element.

2.3. System Standards (Roadway Hierarchy)

2.3.1. Roadway Functional Classifications

Functional classification is the criteria used to group streets and roadways into classes, or systems, according to the character of service they are intended to provide. Basic to this process is the recognition that individual roads and streets do not serve travel independently in any major way. Rather, most travel involves movement through a network of roads. It becomes necessary to determine how this travel can be channelized within the network in a logical and efficient manner.

Functional classification defines the nature of this channelization process by defining the part that any particular road or street should play in serving the flow of trips through a roadway network. The classification identifies the function that a roadway served and the level to which it should be designed. In Humboldt County, many roadways are designed well below the function they have come to serve, and over time, vehicle volumes have increased.

Humboldt County Public Works constructs and maintains roads pursuant to its "Roadway Design Standards Manual" (County of Humboldt, 1971).² The Manual defines the following primary roadway functional classifications:

- *Arterial Road.* An arterial provides service between major traffic generators such as cities or large towns, and normally provides the most direct route to the state system. It usually provides the highest level of service to the County as measured by mobility and traffic volume. An arterial will have some access and traffic control and may be located in either an urban or a rural area. An example of a County arterial road is Central Avenue in McKinleyville.
- *Collector Road.* A collector road moves local traffic from or to arterial roads. A collector can also link arterials or provide access to an arterial. A collector also provides service between minor traffic generators. An example of a County collector is Elk River Road.
- *Local, or Access, Road.* A local road provides access or entrance to residences, businesses or other abutting property. It generally provides the least mobility within the County system and is usually the origin and destination route for a "trip" within the County.

Humboldt County Public Works uses Department of Transportation (DOT) functional classifications for county-maintained roadways. These classifications include: Urban Arterial, Urban Collector, Rural Arterial, Rural Minor Collector, Rural Major Collector, and Local Roads. The following figure illustrates the functional relationship between roadways:

² Other standards that may be applied to projects within USAs include Federal Highway Standards and Caltrans construction standards. Each city within Humboldt County may have its own adopted roadway construction standard as well.

Figure 2-1. Schematic Illustration of a Functionally Classified Rural Roadway Network

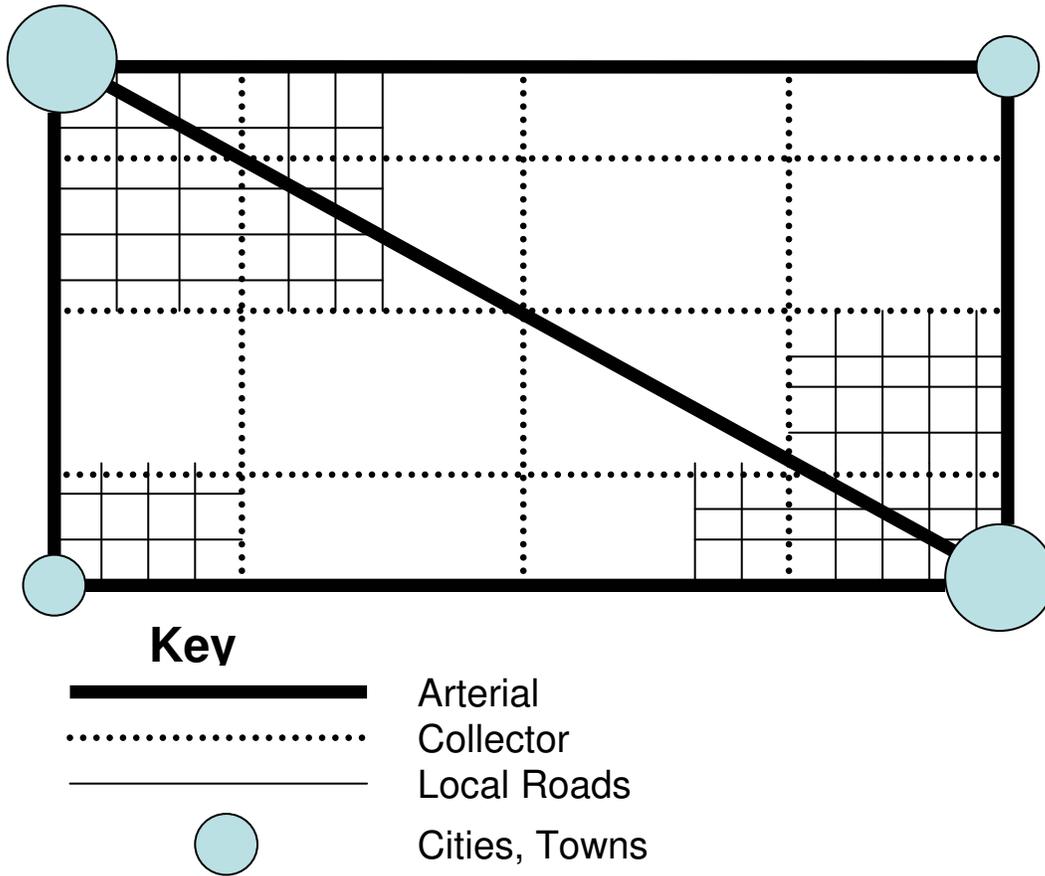
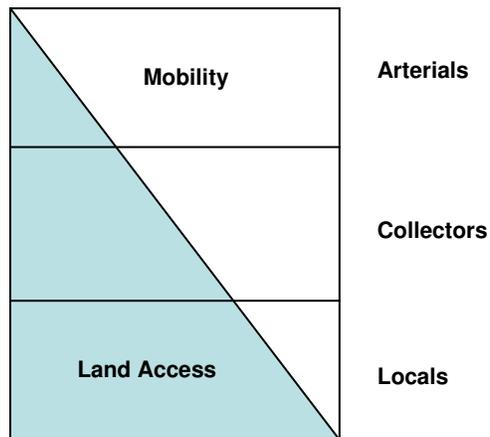


Figure 2-2. Relationship of Mobility and Access to Functional Classification



Allied to the idea of traffic channelization is the dual role the roadway network plays in providing access to property, and travel mobility. Access is a fixed requirement, necessary at both ends of any trip. Mobility, along the path of such trips, can be provided at varying levels, usually referred to as "level of service." It can incorporate a wide range of elements (e.g., riding comfort and freedom from speed changes) but the most basic is operating speed or trip travel time (USDOT, 1989).

The concept of traffic channelization leads logically not only to a functional hierarchy of systems, but also to a parallel hierarchy of relative travel distances served by those systems. This hierarchy of travel distances can be related logically to a desirable functional specialization in meeting the access and mobility requirements. Local facilities emphasize the land access function. Arterials emphasize a high level of mobility for through movement. Collectors offer a compromise between both functions. This is illustrated in Figure 2-2.

2.4. Road System Capacity and Traffic Volumes

2.4.1. Roadway capacity estimates from the GEATM

As the County's population grows over the next 20 years, the projected vehicle-volume growth will have varying impacts on roadways in the County roadway system, and particularly in the Urban Study Areas (USAs); in several cases, roadways in the USAs are already experiencing capacity constraints as observed at a.m. and p.m. peak hours. In other cases, roadways currently able to accommodate existing traffic volumes are likely to develop areas of congestion as traffic volumes increase.

Any effective circulation solution to moving goods and people in, around and through Eureka and the rest of Humboldt County is dependent on the functionality and connectivity of the local and County roadway systems in addition to Highway 101. The analysis here focuses primarily on addressing capacity concerns by accommodating or managing increased volumes, but capacity expansion can also be achieved through the expansion of transit, bicycle and pedestrian facilities and increased use of those modes, as they can offset vehicle volume growth and congestion from planned development. Recommendations for a balanced approach to addressing capacity concerns will be included in the Community Infrastructure and Services Element.

In November 2004, the Greater Eureka Area Corridor Study was initiated, with the development of a region-wide travel demand forecasting model. The model—the Greater Eureka Area Travel Model (GEATM)³—is a planning and decision making tool that can assess impacts of land use and transportation changes along the corridor over time, and help with determining the effectiveness of potential improvements to the local/county/state roadway system. This more comprehensive approach has required close coordination and a cooperative partnership between all affected agencies, including HCAOG, City of Eureka, Caltrans, and the County of Humboldt. Data contained in the traffic model for all roadway segments includes (but is not limited to):

- Location of roadway segment,
- Length of segment,
- Number of lanes,

³"Greater Eureka Area Travel Model County Wide Transportation Network joined to Peak Hour and Average Daily Output Tables for 2005, 2020 & 2030."

- Lane capacity for vehicles (vehicles per hour), and
- Volume-to-capacity (V/C) ratio.

The GEATM simulates traffic levels and patterns for specific geographic areas through the use of input files summarizing land uses, the street network, travel characteristics, and other transportation factors. The model determines the amount of trips generated, where trips begin and end, and the route taken by each trip.

The GEATM is an emerging traffic modeling tool. For this analysis, the model was used primarily as a source of roadway segment-specific information on volume and capacity.⁴ Caltrans traffic modeling staff have pointed out that the model is a very effective tool for projecting future conditions, traffic flows, and areas of congestion based on different land use scenarios. Other tools and methods are then used for determining specific needed improvements. This model has recently been developed and it is anticipated that the ability to use the model will improve over the next year or so as local agency staff become proficient at running the model.

This model is currently being used to evaluate traffic impacts related to two proposed projects (Marina Center and Forster-Gill). While the results from these analyses were not available at the time this report was prepared, we believe that this information will be very useful in refining the needed improvements described below. At a minimum, the results of the existing analyses can be expanded upon to analyze all of the potential development included in this General Plan update. Additional information regarding the scope of the Forster-Gill analysis is described in Section 2.7.2, Capacity-Related Roadway Recommended and Planned Improvements.

2.4.2. Roadway capacity and Level of Service (LOS)

There is a limit to the amount of traffic volume that a given roadway can accommodate. The maximum amount of flow is commonly referred to as the capacity of the roadway. Roadway capacity is affected by a number of factors that influence a driver's ability to maintain a desired operating speed, including:

- The number of lanes
- Lane width
- Average vehicle speed
- The sharpness and steepness of curves
- The amount of heavy vehicles in the traffic stream
- The quality of the signal coordination, and
- The location of lateral obstructions (driveways, intersections)

One of the fundamental aspects of roadway design is the determination of how many lanes will be required to service the anticipated traffic demand. The majority of roadways in Humboldt County adequately meet current and projected demand with two lanes. Certain collectors and arterials may require four lanes to adequately accommodate current and projected vehicle volumes. Other congestion relief measures, such as alternative (bypass) routes, signalization, roundabouts, and left-turn lanes (among others) can be implemented in lieu of more costly capacity expansion.

⁴ Model roadway volume data was derived by taking traffic counts on selected roadway segments, then applying functional classifications and future land use information.

Traffic operations are assessed using the Level of Service (LOS) concept, a qualitative measure of traffic operating conditions. A letter grade, A through F, representing progressively worsening traffic conditions, is assigned to a roadway segment or an intersection. In areas such as Humboldt County, LOS C or better has generally been considered an acceptable traffic operating condition. LOS C provides for stable flows of traffic during peak conditions, and allows drivers at signalized intersections to (typically) proceed in one signal cycle.

There are several factors associated with determining appropriate LOS levels, including whether the roadway is urban or rural, the characteristics of the terrain, and the costs associated with constructing the desired facility. In rural areas, roadway design usually aims to provide LOS C or better as an appropriate balance between more desirable levels of service and cost-effectiveness in providing transportation facilities. Many transportation planners (especially proponents of public transit) recommend aiming for a "C" level of service (particularly in urban areas), one that would slow cars down and make roads safer for pedestrians. LOS D and worse are not generally appropriate design criteria in rural areas; this provides no room for future growth, and can easily lead to substantial deterioration in traffic operations which can decrease safety conditions.

Even so, LOSs lower than designed can be acceptable in some instances, such as during peak travel times, when rights of way must accommodate multiple travel modes, or when existing developments or budgetary restrictions reduce the ability of service providers to remediate congestion problems through costly capacity-expansion projects.

2.4.3. Volume to Capacity (V/C) Ratio

One measure of roadway effectiveness and level of service is the volume-to-capacity (V/C) ratio. The V/C ratio compares roadway demand (vehicle volumes) with roadway supply (carrying capacity). Other measures of roadway effectiveness, such as movement delay, can also be used to assess roadway LOS if data is available. The V/C ratio is used here as it is the primary performance measure available from the GEATM for assessing critical roadway segments.

The V/C ratio can alert transportation providers to areas where traffic mitigation measures such as congestion relief and/or capacity expansion should be considered. In the past, exceeding a V/C ratio of 0.5 was considered a capacity deficiency. A V/C ratio of 0.9 can be considered a more appropriate threshold for the identification of deficiencies due to limited financial resources and because systems operations begin to deteriorate more significantly at this level. The table below lists descriptions of how a roadway section would typically perform with associated V/C ratios (for complete information see the 1994 Highway Capacity Manual, produced by the Transportation Research Board). Levels of Service (LOS) are indicated for different V/C ratio ranges.

Table 2-2. Volume-to-Capacity Ratio (V/C) and Level of Service (LOS) Classifications

V/C ratio (percent)	LOS	Description
< 30	A	Free-flow operations.
30-50	B	Reasonably free-flow operations; ability to maneuver within the traffic stream is only slightly restricted.
50-75	C	Travel speeds still at or near free-flow, but ability to maneuver within the traffic stream is noticeably restricted.
75-90	D	Travel speeds begin to decline with increasing flows; ability to maneuver is more noticeably limited; minor incidents can be expected to create queuing.

V/C ratio (percent)	LOS	Description
90-100	E	Operation at or near capacity and therefore volatile because there are virtually no useable gaps in the traffic stream; maneuverability is extremely limited; any disruption to the traffic stream, such as vehicles entering from ramps or changing lanes, can cause disruptions.
> 100	F	Breakdown in vehicular flow with queues forming behind major breakdown points, such as traffic incidents or recurring points of congestion.

Although the V/C ratio is the most basic measure of roadway demand and supply, factors other than volume and capacity are often critical in determining roadway performance. At higher V/C ratios, roadways can become so congested that the vehicle throughput (volume) will actually decrease. This results in a V/C that is deceptively low because the volume does not adequately represent the demand. An example of this in Humboldt County would be vehicles bypassing congestion on northbound Highway 101 by exiting onto Herrick Avenue and traveling on City of Eureka roadways to reach their destination.

2.4.4. Existing and Projected Capacity Constraints

The GEATM identifies roadway segments that have either existing or projected capacity constraints. The model used 2005 data and projected traffic volume estimates based on the General Plan Update Sketch Plan 3 2030, full entitlement build-out scenario, assumptions for the spatial and temporal patterns of new development. Sketch Plan 3, or the “Focused Growth” scenario, assumed that development would occur primarily in existing developed areas, with limited lower-density development in outlying areas and only a modest extension of existing water service areas. The Sketch Plan-3 2030, full entitlement build-out, scenario projections used to estimate future capacity constraints are thus illustrative of a potential, if not likely, future development pattern. However, the proposed land use alternatives developed through the General Plan Update process should be applied to the GEATM to identify differences in future roadway congestion and capacity.

The projections point to roadway segments where roadway capacity may very likely be inadequate for future traffic volumes. Typically, these segments are at or near junctions with cross-streets, or at points where traffic naturally funnels from connecting streets (for example, a road with a lower classification (local road, collector) to a road with a higher classification (collector, arterial)).

2.4.4.1. Roadways with Capacity Constraints

The roadways with the most significant capacity constraints are located primarily in Eureka (Humboldt Hill, Myrtle town, and South Eureka) and McKinleyville. Both areas have been experiencing increased development pressures that have added and are likely to add vehicle volume to the County's roadways. Future development-related growth in the South Eureka USA will add significant vehicle volume to roadways, some of which are already experiencing capacity constraints. For the USAs in the Eureka area (Humboldt Hill, Myrtle town, South Eureka), the GEATM projects that, at build-out, 12 roadways will have V/C ratios of greater than 90 percent, or LOS E and F, along certain segments; some segments are projected to be over 200 percent of capacity. Several roadways had segments at LOS E or F in 2005.

The circulation network for the South Eureka and Myrtle town USAs are inter-connected with the City of Eureka. The South Eureka USA and the remainder of the Eureka Community Plan area are largely dominated by residential land uses, with residents traveling into the City of Eureka for work, shopping, and other purposes. The development around the City of Eureka and the presence of the Bayshore Mall have contributed to increases in congestion and delays along

Broadway, leading to trips diverting to new routes as they travel through the City. The regional approach to transportation planning embodied in the GEATM and the close coordination and cooperative partnership between HCAOG, City of Eureka, Caltrans, and the County of Humboldt should be used to address current and future traffic congestion within and outside the City of Eureka. Affects of the proposed land use alternatives on County, city, and state roads should be evaluated as part of the General Plan Update environmental impact report.

For the McKinleyville USA, capacity constraints are projected to develop along Central Avenue north of the Northbound 101 exit; these sections are at LOS D (V/C ratio between 75 and 90 percent) as of 2005.

The following tables show 2005 and Sketch Plan-3 2030, full entitlement build-out, scenario GEATM data for Average Daily Traffic (ADT) and Volume-to-Capacity Ratios (V/C)⁵ for specific roadway segments within USA boundaries. Table 2-3A lists roadway segments for which the GEATM predicted an ADT increase of greater than 50 percent, from 2005 to build-out. Table 2-3B lists roadway segments for which the GEATM predicted greater than 90 percent V/C ratio in 2005 and/or build-out (LOS E; calculated by dividing the peak hour volume for roadway segments indicated in the GEATM by the listed capacity for the roadway). This data has been separated into two tables because they display different types of data for impacted roadways. The tables are primarily for illustrative purposes; only the *most* impacted segment is shown for a given roadway. As can be expected, the majority of roadways with significantly increasing volumes or capacity constraints are in the McKinleyville and South Eureka USAs. Additional analysis using the GEATM should be prepared as part of the General Plan Update EIR.

Often, the segment with the maximum ADT or V/C ratio is only a few blocks long. The numbers in the tables do *not* apply to the entire roadway (the GEATM provides roadway segment-specific data), but, again, are presented as illustrative of the type and value of information obtainable through use of the GEATM. The table data represents some of the initial GEATM data runs. GEATM will become even more valuable as local expertise in modeling inputs and outputs increases. Humboldt County, the City of Eureka, Caltrans, and HCAOG will continue their collaboration to develop this local expertise.

The GEATM-derived numbers presented here, and similar numbers contained in the model, are useful in that they direct planners and traffic engineers to roadways that now have, or are likely to develop, capacity constraints. As the GEATM is relatively untested (yet powerful) tool, additional modeling—which was beyond the scope of this analysis—is necessary to confirm and corroborate preliminary numbers such as those contained in the tables below. Further data acquisition and analysis through both field- and computer-based methods are necessary to identify, in greater detail, the specifics of capacity-constrained roadway segments identified by the GEATM. This will allow planners and engineers to draw more meaningful conclusions regarding existing and predicted capacity concerns, and create and test alternative congestion relief solutions.

Maps of roadways that identify specific areas of existing and projected volumes and capacity based on the GEATM are included in Appendix A. The maps display 2005 and 2030 (Sketch Plan

⁵ ADT and V/C are related to each other but are not developed from each other, nor do they necessarily lead to the same conclusion regarding roadway capacity. For example, a roadway may have a relatively low ADT, but could have a high V/C ratio in certain segments owing to high peak-hour traffic volumes or, alternatively, roadway design issues that constrain traffic flow and lead to congestion. Conversely, a roadway could have high ADT (relative to similarly-classified roadways), but have no significant concern over its V/C ratio because peak-hour conditions may permit freer traffic flow with fewer delays.

3 full entitlement) maximum peak hour volume to capacity ratios for selected streets. It should be noted that the GEATM is still being refined by Caltrans, the City of Eureka, and Humboldt County. The figures in Appendix A are provided for illustrative purposes. The GEATM will be updated to reflect the proposed General Plan land use alternatives and refined to ensure greater accuracy.

Table 2-3. Roadway Capacity by Urban Study Area

Table 2-3A, Example USA Roadway Segments from the GEATM Showing 2005- Sketch Plan-3 2030 (Build-Out) ADT Increase of Greater than 50%

GEATM Segment ID	Roadway	USA	Segment Length (feet)	2005 ADT	2030 (Build-out) ADT	ADT increase (%)
6408	Azalea Avenue	McKinleyville	158	577	875	52%
6370	Central Avenue	McKinleyville	634	501	1,263	152%
6345	Murray Road	McKinleyville	370	255	843	231%
6392	Sutter Road	McKinleyville	53	577	875	52%
6346	Redway Drive	Redway	1,109	1,071	1,803	68%
6390	Shelter Cove Road	Shelter Cove	1,742	1,412	2,306	63%
6371	Elk River Road	South Eureka	686	374	1,138	204%
6379	Hemlock Street	South Eureka	422	47	1,019	2,068%
6380	Madison Street	South Eureka	317	433	748	73%
6343	Meyers Avenue	South Eureka	211	516	839	63%
6348	Ridgewood Drive	South Eureka	3,432	3,195	5,780	81%
1295	Walnut Drive	South Eureka	370	3,649	6,081	67%
2777	Westhaven Drive	Westhaven	264	434	959	121%

Table 2-3B, Example USA Roadway Segments from the GEATM Showing 2005, Sketch Plan-3 2030 (Build-Out), scenario V/C Ratios of Greater than 90%

GEATM Segment ID	Roadway	USA	Segment Length (feet)	Roadway Capacity	2005 Peak Hour Volume	2030 (Build-out) Peak Hour Volume	2005 Peak Hour V/C Ratio	2030 (Build-out) V/C Ratio
6344	Harrison Avenue	Myrtle town	370	1,000	1,139	1,194	114%	119%
6014	Myrtle Avenue	Myrtle town	211	1,500	1,342	1,425	89%	95%
6408	F Street	South Eureka	317	1,000	1,319	1,484	132%	148%
6357	Harris Street	Myrtle town	158	1,000	1,180	1,268	118%	127%
2772	Herrick Avenue	South Eureka	950	1,000	1,131	1,306	113%	131%
2769	Humboldt Hill Road	Humboldt Hill	264	700	734	859	105%	123%

GEATM Segment ID	Roadway	USA	Segment Length (feet)	Roadway Capacity	2005 Peak Hour Volume	2030 (Build-out) Peak Hour Volume	2005 Peak Hour V/C Ratio	2030 (Build-out) V/C Ratio
7723	Herrick Road at US 101	South Eureka	264	1,000	1,268	1,528	127%	153%
275	Walnut Drive	South Eureka	528	1,000	923	1,148	92%	115%

2.4.5. Maps of Roadways with Capacity Constraints

The maps included in Appendix A highlight the capacity-constrained roadways from the table above. The maps show both existing (2005; red line) and projected (2030; blue highlight) capacity constraints (where V/C >90 percent, or LOS > D).

2.5. Condition Assessment

Roadway condition and maintenance are critical infrastructure issues for Humboldt County. Maintenance programs must be properly funded and managed to have a lasting beneficial effect on roadway condition and public safety. Maintenance benefits can only be achieved if substantial improvements are made to assure the long-term performance of the County's roadways. The long-term performance of roadway facilities can be judged in terms of the following considerations for roadway maintenance (NCRHP, Highway Maintenance Quality Assurance: Final Report, 1998):

- Safety
- Functionality
- Comfort and Aesthetics
- Preservation of Investment

Whether a roadway maintenance program effectively and economically preserves the investment is not easy to determine, as many factors confound the long-term performance of roadways. Perhaps the most significant factor is the allocation of funds for roadway infrastructure maintenance and construction. Other issues, such as design (types of materials, thicknesses), construction (quality of materials, workmanship, conditions during construction), maintenance and rehabilitation all affect the rate of deterioration for a roadway and thus the amount of funding needed to keep pace with that deterioration.

2.5.1. Pavement Management

Assessing pavement performance and the effects of pavement maintenance programs on performance is challenging for all roadway management agencies. A common practice is to define a critical pavement threshold that is used to identify when maintenance is needed, with roadways below the threshold representing the maintenance backlog. A goal of any pavement maintenance program is to define the maintenance threshold and then to reduce or eliminate the backlog. To facilitate this, it is necessary to track the percentage of pavements in the backlog and the pavement deterioration rate, from one condition range to the next lower range. An increase in the overall condition of the County's roadways would thus be

accompanied by a decrease in the backlog, or the deferred maintenance. A roadway deterioration rate reduction would also reduce the backlog.

In 2000, Humboldt County's arterial and collector roadways were inspected and rated as part of the County's new Pavement Management System (PMS). This system relies on assessments of roadway condition and helps roadway maintenance managers identify thresholds for maintenance measures. The PMS generates pavement distress data for a representative sample of arterial and collector roadways in Humboldt County. This data forms the basis for the creation of an "Overall Condition Index" (OCI), which rates roadway surfaces on a scale from 0-100 as shown in the following table:

Table 2-4. Roadway OCI Estimates, Maintenance Requirements, and Costs

OCI	Condition	Maintenance Typically Required at this Condition Level	Average Cost (\$/ft ²) *
70-100	Very Good	Minor (OCI 70-85)—Variable maintenance.	< \$0.4
50-69	Good	Chip Seal—Pavement sprayed with asphalt, covered with aggregate and rolled.	\$0.4
25-29	Poor	Overlay—An increase in the pavement load carrying capacity by adding additional pavement layers.	\$4.0
< 25	Very Poor	Reconstruction—Complete removal and replacement of the existing pavement structure.	\$10.0

* Cost estimates are based on 2003 CIP estimates escalated to better reflect current material costs.

The OCI can be used to plan for maintenance and to identify priorities for reducing the County's backlog of rehabilitation projects. Deterioration curves, where the OCI is reduced annually as the maintenance requirements for that road segment increase over time, allow for scheduling of maintenance based on the anticipated degradation of roadway surface quality.

2.6. Condition of Humboldt County's Roadways

The 2003 Humboldt County Road and Bridge Capital Improvement Plan (CIP) report notes that, overall, the County's roads are in "poor" condition, with the County's Overall Condition Index (OCI) rated at 40 on a scale of 1-100 (County of Humboldt, 2003). The report notes that, in 2000, there was approximately \$100 million in deferred maintenance on the County's roadways (not including maintenance costs for local streets). The report also notes that if Humboldt County continues to limit spending to around \$1 million a year on road surfaces—the approximate budget for resurfacing County roads for the previous 20 years—the OCI would continue to decline, and absent other maintenance activities, would drop in another 20 years to an overall level of 15 (at which point the average road in Humboldt County would require reconstruction).

In 2003, the CIP stated that it would cost approximately \$7.5 million per year to maintain the County's roadways (i.e., keep them at the same overall OCI) if the OCI was in the "very good" range (OCI 70-100). This number is based on the fact that most roads would only require chip seals at 20 cents per square foot (2003 costs) every 5-7 years, and overlays approximately every 30 years at \$2 per square foot (2003 costs). Information contained in the 2003 CIP suggests that close to \$11 million for annual maintenance expenditures was necessary merely to maintain the roads at OCI 40 (County of Humboldt, 2003). Since 2003, materials costs for roadway maintenance and construction have almost doubled, which suggests that costs merely to maintain County Roads in their current condition could be upwards of \$20 million per year (Whitworth, 2007).

Humboldt County Public Works' adopted 2006-07 budget was \$26.2 million. Road Maintenance and Construction received \$8.9 million out of a total Road Fund budget of \$14.8 million. Of this \$8.9 million, roughly \$6.5 million goes to personnel and equipment. This leaves approximately \$2.5 million for roadway maintenance materials—about 12 percent of what is needed to keep the roads from degrading further.

2.6.1. Modified Overall Condition Index

The Pavement Management System's OCI assessment was conducted for only a sample of Humboldt County arterial and collector roadways. For the analysis conducted for this technical report, a modified OCI (MOCI) rating was developed and applied to the USA roadways. The MOCI is based on OCI quintiles as shown in Table 2.5.

Table 2-5. Modified Overall Condition Index

Modified OCI	Comparable (Average) OCI	Condition Description	Recommended Maintenance	Maintenance Costs (\$/ft ²)
5	90	Very Good	None	< \$0.4
4	70	Good	Chip Seal	\$0.4
3	50	Fair	Chip Seal/Overlay	\$2.0
2	30	Poor	Overlay/Reconstruct	\$6.0
1	10	Failed	Reconstruct	\$10.0

Based on the MOCI assessment conducted for this study, average roadway condition for the USAs is slightly higher than for the county as a whole, with an average MOCI of 3 (corresponding to an OCI of approximately 50, compared to 40 for the County as a whole). This may be explained in part by the larger percentage of roadways in the USAs with higher volumes, higher functional classification, and more frequent maintenance. When roads are allowed to deteriorate below a MOCI of 3, as currently exists in Humboldt County, maintenance costs can escalate significantly.

Calculation of total maintenance requirements and costs is not straightforward. [Precise estimates may not be straight forward, but using the unit costs and in the table above and the MOCI would be easy]. Maintenance is typically prioritized for more heavily traveled roadways, and even then is subject to funding limitations. Costs tend to be roadway- and even segment-specific and subject to the volatile prices of raw material (asphalt, concrete, metals). Often, only first-hand assessment of a roadway can indicate the specific segments that require maintenance.

Because roadway maintenance is ongoing and typically a catch-up process (meeting most urgent maintenance needs first), maintenance expenditures for a given roadway will likely be spread out over time (in addition to being subject to available funds) and applied only to the most-deficient and/or highly-used roadway segments. Traffic engineers use deterioration curves to estimate the time it will take a section of roadway to deteriorate from one condition level to the next and to plan for future maintenance. Very generally, these curves can be summarized as:

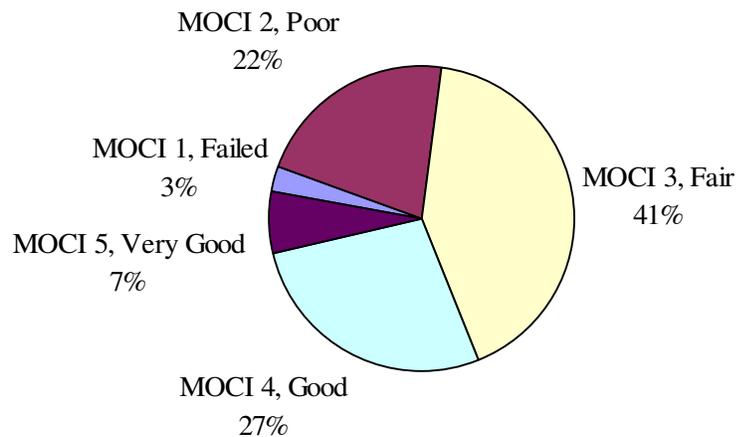
- MOCI 5 to 4: 10 years
- MOCI 4 to 3: 5 years

- MOCI 3 to 2: 5 years
- MOCI 2 to 1: 5 years

For example, a roadway in very good condition (MOCI 5) in 2007 would be expected to deteriorate without maintenance to MOCI 4 in by about 2017 and to MOCI 3 by 2022. Roadways in the USAs are no different from the rest of Humboldt County's roadways in their deterioration rates, and may be subject to more rapid deterioration to the extent that the higher traffic volumes projected for the USAs and the presence of larger vehicles (owing to higher functional classifications) result in more roadway degradation than experienced by other roadways. In general, roadways in poorer condition (< MOCI 3) deteriorate faster than roadways maintained at a higher level (MOCI 4 and 5).

The figure below shows the relative percentages of MOCI for Humboldt County maintained roadways in USAs. As can be seen, two-thirds (66 %) of the County's roadways are at MOCI 3 or below. Only one-third (34 %) are in the good to very good category (MOCI 4 and 5).

Figure 2-19. Percentages of MOCI for USA Roadways



The following tables note the MOCI for specific roadways in Humboldt County's USAs.

Table 2-6. Roadway Condition Estimates by USA

Urban Study Area	Roadway Name	Condition Description	Total Length	USA Length*	Percentage of Roadway within USA
Alderpoint & Garberville	Alderpoint Road	Poor	47.1	2.7	6%
Blue Lake	Blue Lake Boulevard	Very Good	3.3	0.9	28%
	Maple Cr. Road	Poor	28.9	0.2	1%
	Railroad Avenue	Fair	0.2	0.2	100%
	West End Road	Poor	5.7	0.5	9%

Urban Study Area	Roadway Name	Condition Description	Total Length	USA Length*	Percentage of Roadway within USA
Briceland & Redway	Briceland-Thorne Road	Poor	18.1	0.9	5%
Fieldbrook	Fieldbrook Road	Poor	4.9	4.9	100%
Fortuna	Drake Hill Road	Good	1.6	1.3	79%
	Mill Street	Fair	1.1	0.7	65%
	Rohnerville Road	Good	2.0	2.0	100%
Freshwater	Cummings Road	Fair	1.6	0.8	48%
	Freshwater-Kneeland Road	Good	3.1	3.1	100%
	Greenwood Heights Drive	Fair	7.2	2.6	36%
	Westhaven Drive	Poor	3.3	3.3	98%
Garberville	Sprowel Cr. Road	Fair	2.1	0.1	4%
Glendale	Glendale Drive	Fair	3.0	2.3	76%
Humboldt Hill	Humboldt Hill Road	Fair	2.1	1.9	94%
	King Salmon Avenue	Good	0.6	0.6	95%
	Loma Avenue	Poor	0.5	0.5	92%
	Orchard Avenue	Poor	0.1	0.1	92%
	Spring Street	Fair	0.1	0.0	30%
	Tompkins Hill Road (north of Stockton)	Good	8.1	3.4	42%
Indianola	Indianola Cutoff	Poor	0.3	0.3	100%
	Old Arcata Road	Good	2.3	1.6	69%
Jacoby Creek	Jacoby Creek Road	Good	3.3	1.6	48%
Loleta	Summer Street	Fair	0.2	0.2	100%
McKinleyville	Airport Road	Fair	1.0	1.0	100%
	Azalea Avenue	Fair	1.4	1.3	94%
	Central Avenue	Fair	5.1	5.1	100%
	Clam Beach Road	Failed	0.7	0.7	100%
	Dows Prairie Road	Poor	3.8	3.7	98%
	Fischer Avenue	Fair	0.9	0.0	3%
	Gassaway Road	Poor	0.2	0.2	100%

Urban Study Area	Roadway Name	Condition Description	Total Length	USA Length*	Percentage of Roadway within USA
McKinleyville (cont.)	Halfway Avenue	Fair	0.9	0.8	81%
	Hewitt Road	Good	0.2	0.1	33%
	Hiller Road	Fair	1.4	1.4	99%
	McKinleyville Avenue	Good	1.6	1.5	97%
	Murray Road	Fair	5.6	5.1	91%
	Norton Road	Good	0.5	0.3	50%
	Ocean Drive	Poor	0.6	0.6	93%
	Pickett Road	Good	0.4	0.4	90%
	School Road	Good	1.4	1.4	94%
	Sutter Road	Fair	1.2	1.0	85%
	Washington Avenue	Fair	0.4	0.2	41%
Myrtle town	Hall Avenue	Good	0.2	0.2	95%
	Harrison Avenue	Very Good	1.4	1.4	100%
	Lucas Street	Fair	0.3	0.3	100%
	Myrtle Avenue	Very Good	5.7	5.2	92%
	Park Street	Good	0.8	0.5	65%
	Quaker Street	Very Good	0.6	0.6	100%
Orick	Bald Hills Road	Failed	32.2	0.4	1%
Redway	Redway Drive	Very Good	0.8	0.8	100%
Riverside	Port Kenyon Road	Poor	3.2	0.4	12%
Samoa	New Navy Base Road	Good	4.6	1.2	26%
Scotia	Main Street	Fair	1.6	1.6	99%
Shelter Cove	Shelter Cove Road	Fair	9.4	4.0	43%
South Eureka	Allard Avenue	Poor	0.2	0.2	100%
	B Street	Fair	0.5	0.1	16%
	California Street	Fair	0.4	0.4	100%
	Elk River Road	Fair	5.6	4.0	71%
	Eureka Street	Good	0.2	0.2	100%
	F Street	Good	1.0	1.0	100%
	Harris Street	Good	1.7	1.7	100%
	Hemlock Street	Good	0.1	0.1	100%

Urban Study Area	Roadway Name	Condition Description	Total Length	USA Length*	Percentage of Roadway within USA
South Eureka (cont.)	Herrick Avenue	Good	0.9	0.8	91%
	Madison Street	Fair	0.1	0.1	100%
	Meyers Avenue	Fair	0.7	0.7	99%
	Mitchell Road	Fair	1.3	0.7	52%
	Ridgewood Drive	Good	1.8	1.4	79%
	Trinity Street	Fair	0.5	0.3	66%
	Union Street	Poor	0.9	0.8	91%
	Walnut Drive	Good	2.4	2.4	100%
Westhaven	Patrick's Point Drive	Good	5.5	0.5	9%
	Westhaven Drive	Poor	3.3	3.3	98%

* USA Length estimated from Humboldt County Community Development Services GIS data.

2.7. Proposed Improvements

This section briefly discusses both condition- and capacity-related improvements planned by Humboldt County for impaired USA roadways, as well as a list of potential improvements to roadways within the City of Eureka and Caltrans rights of way⁶. This list includes projects that will be further refined based upon additional analysis performed by using the GEATM, and other appropriate traffic analysis methods and tools.

2.7.1. Planned or Completed Roadway Condition Maintenance

The table below notes roadways that have recently or are soon to receive maintenance.

⁶ While this section does not detail Humboldt County Public Works Department's work on pedestrian and bicycle facilities, many County roadway improvement projects include pedestrian and bicycle components. A (partial) list of the bicycle improvements achieved within the last few years includes shoulders with lanes on: Elk River Road, Freshwater Road, Murray Road, Myrtle Avenue (Harrison to Hall), Redwood Drive, Sutter Road, and Walnut Drive. The County is currently designing shoulder lanes for: Central Avenue, Fieldbrook Road, Myrtle Avenue (Hall to Mitchell) and Old Arcata Road. The County has developed pedestrian facilities (sidewalks) on: Blue Lake Boulevard, Briceland-Thorne Road (Redway), McKinleyville Avenue, and Railroad Drive (McKinleyville). The County builds shoulders onto existing roads for pedestrian and bicycle use because these facilities can be maintained by County road crews. At present, the roadway maintenance budget contains insufficient funds for new bicycle/pedestrian projects. The projects listed above are funded through Safe Routes to Schools, Coastal Conservancy, State Transportation Improvement Program (STIP), Transportation Enhancement Act (TEA) and Bicycle Transportation Account funds (among other sources).

Table 2-7. Planned or Completed Roadway Maintenance by USA

Urban Study Area	Roadway Name	Condition Description	Total Length	USA length	Percentage of Roadway within USA	Maintenance
Fortuna	Rohnerville Road	Good	2.0	2.0	100%	Reconstructed recently.
Humboldt Hill	Tompkins Hill Road (north of Stockton)	Good	8.1	3.4	42%	Recently reconstructed
Indianola	Indianola Cutoff	Poor	0.3	0.3	100%	2008 STIP Project
	Old Arcata Road	Good	2.3	1.6	69%	To be reconstructed within two years.
McKinleyville	Azalea Avenue	Fair	1.4	1.3	94%	In Design phase
	McKinleyville Avenue	Good	1.6	1.5	97%	Reconstructed (2007)
	Murray Road	Fair	5.6	5.1	91%	Reconstructed or to be reconstructed within two years.
	Pickett Road	Good	0.4	0.4	90%	Reconstructed (2007)
South Eureka	Elk River Road	Fair	5.6	4.0	71%	Reconstructed Recently
	Herrick Avenue	Good	0.9	0.8	91%	Reconstructed recently.
	Union Street	Poor	0.9	0.8	91%	2009 STIP Project
	Walnut Drive	Good	2.4	2.4	100%	Recently reconstructed

2.7.2. Capacity-Related Roadway Improvements

As indicated in Section 2.4.4 above, most of the roadway segments with capacity constraints are located in the Eureka area (Humboldt Hill, Myrtle town, and South Eureka USAs) and the McKinleyville USA. The community plans for McKinleyville and the Eureka area were completed in 2005 and 1995, respectively. The environmental review for both community plans contained detailed traffic studies and in the case of the Eureka Community Plan, subsequent projects are adding to the analysis and have highlighted requirements for specific Plan related improvements. This section describes the transportation analyses for the McKinleyville and Eureka Community Plans, proposed improvements, and traffic studies associated with subsequent projects.

McKinleyville Community Plan.

The McKinleyville Community Plan EIR traffic analysis identified 20 intersections where operation could diminish over the life of the plan. The McKinleyville Community Plan EIR noted that as of 1999, all of the study intersections identified in the analysis were operating at LOS A or B. At the time of plan area build-out, six of the 20 intersections are expected to experience significant deterioration in operations. Mitigations were adopted as part of the EIR and upon implementation all the six intersections are expected to operate acceptably. As these improvements are not warranted until buildout nears, none of the six projects have been constructed to date. Table 2.8 is a listing of mitigation measures necessary to maintain adequate LOS, based on the McKinleyville Community Plan.

Table 2-8. McKinleyville Community Plan Intersection LOS with Mitigation

Intersection / Mitigation Measure	Delay	LOS
Airport Road/US101 SB Ramps		
All-way Stop-controlled *	35.2	E
Signalized	3.3	A
Murray Road/McKinleyville Avenue		
Signalized (Permissive Left-turns)	7.4	B
Signalized (Protected Left-turns)	9.8	B
Murray Road/Central Avenue		
Signalized (Permissive Left-turns)	8.3	B
Signalized (Protected Left-turns)	13.9	B
Hiller Road/McKinleyville Avenue		
Left-turn Pockets on McKinleyville Avenue	18.4	C
Left-turn Pockets on Hiller Road	17.4	C
School Road/Washington Avenue		
All-way Stop Controls (current lanes) *	20.6	D
All-way stop controls, two lanes on Washington	13.6	C
Central Avenue-US101 North/CA 200		
All-way stop controls *	46.4	F
Signalized	6.0	B

Source: Table 4.7-2: Year 2020 Intersection Levels of Service with Mitigation, Draft Program Environmental Impact Report for the 1999 Revisions to the McKinleyville Community Plan, June 1, 1999.

1995 Eureka Community Plan

A study of existing and future traffic conditions was prepared as part of the 1995 Eureka Community Plan (ECP). The Transportation Chapter of the EIR and the Circulation policies of the ECP made improvement recommendations for roadways in the Myrtle town, South Eureka, and Humboldt Hill USAs based on projected buildout. As of the writing of this report, the recommended improvements, listed in Table 2.9 below, have not yet been completed. Most (if not all) of these projects would require the preparation of a traffic analyses, engineering studies to design the improvement, the identification of appropriate funding sources, and the likely establishment of impact fees to apportion project costs to beneficiaries. Implementation

Measure 4250.2 called for the adoption and periodic review of a traffic impact fee ordinance, or the use of other funds or mechanisms such as assessment districts, to fund proposed improvements. A comprehensive program to fund ECP related improvements has not been established.

Table 2-9 Eureka Community Plan Roadway Improvements

Location	Improvement Description
F Street	Widen to four lanes (through restriping and/or removal of on-street parking, or acquisition of additional rights-of-way)
Herrick Road	Signalize intersection with Elk River Road and provide exclusive left turn pockets and right-turn lane
Walnut Drive	1) provide left-turn pockets at major future intersections, two-way left-turn lanes along sections with numerous driveways (Such as from Campton to Cypress); 2) reroute traffic along Cypress Street, north through the McKay Tract to the end of Harrison Avenue
Union Street	Improve portion from City Limits to Madison Avenue to allow for access from Pine Hill to the City of Eureka; improvements should include a minimum of two driving lanes, pedestrian/bicycle corridor, and improvement of the intersection of Sea Avenue.
Robinson/Dunn Property (Forster-Gill development) [located south of the City of Eureka Lundbar Hills subdivision and north of Ridgewood Drive]	Require a road from Ridgewood to Fairway Drive at least to the North End of the property (planned for ultimate connection to Fairway Drive) Development should have multiple access points onto Walnut Drive and Ridgewood Drive (when feasible should coincide with existing streets, to make four-way intersection)
McKay Tract [Located generally south of Redwood Acres Fairground and north of Home Drive, east of Walnut Drive and west of Ryan Creek]	North McKay: 1) develop a primary through road from Cypress Street to the end of Harrison Avenue; 2) provide at least three access points onto Walnut Drive (incorporating extensions of Redwood, Fern and Arbutus Streets). South McKay: 1) design with a primary access other than Northridge Road (designed to intersect Walnut when possible), with Northridge used as a secondary access; 2) access points should coincide with existing street systems where possible. Mid McKay: A specific circulation system was not recommended for Mid McKay at this time, as it was felt to be more appropriate at the time a development application is filed.

Source: Section 4200, Circulation, Eureka Community Plan, 1995.

Figure 2-4a on page 2-23, Circulation in South Eureka, is a representation of Figure 17, the Circulation Map for the ECP, and identifies future circulation routes that will provide new linkages, congestion relief for existing roadways, and access for areas identified for major future residential development. The Circulation Map shows four routes trending north of Ridgewood Drive/Walnut Drive, two of which connect to Fairway Drive in the City of Eureka. These proposed new routes indicated on Figure 17 interconnect with an east-west trending route that connects to Elk River Road between Westgate Drive and Pine Hill Road. The Circulation Map also shows two new linkages along the eastern edge of the Eureka area, one providing access to new development in the mid-McKay area (near North Ridge Road) and the second connecting Cypress Avenue to Harrison Avenue. These linkages are critical to several planned and proposed projects including the Ridgewood Village project, which is further described below.

Figure 17 contains a notation that the alignments depicted are for graphical purposes only and that the actual location of the routes will be determined at public hearings as development occurs.

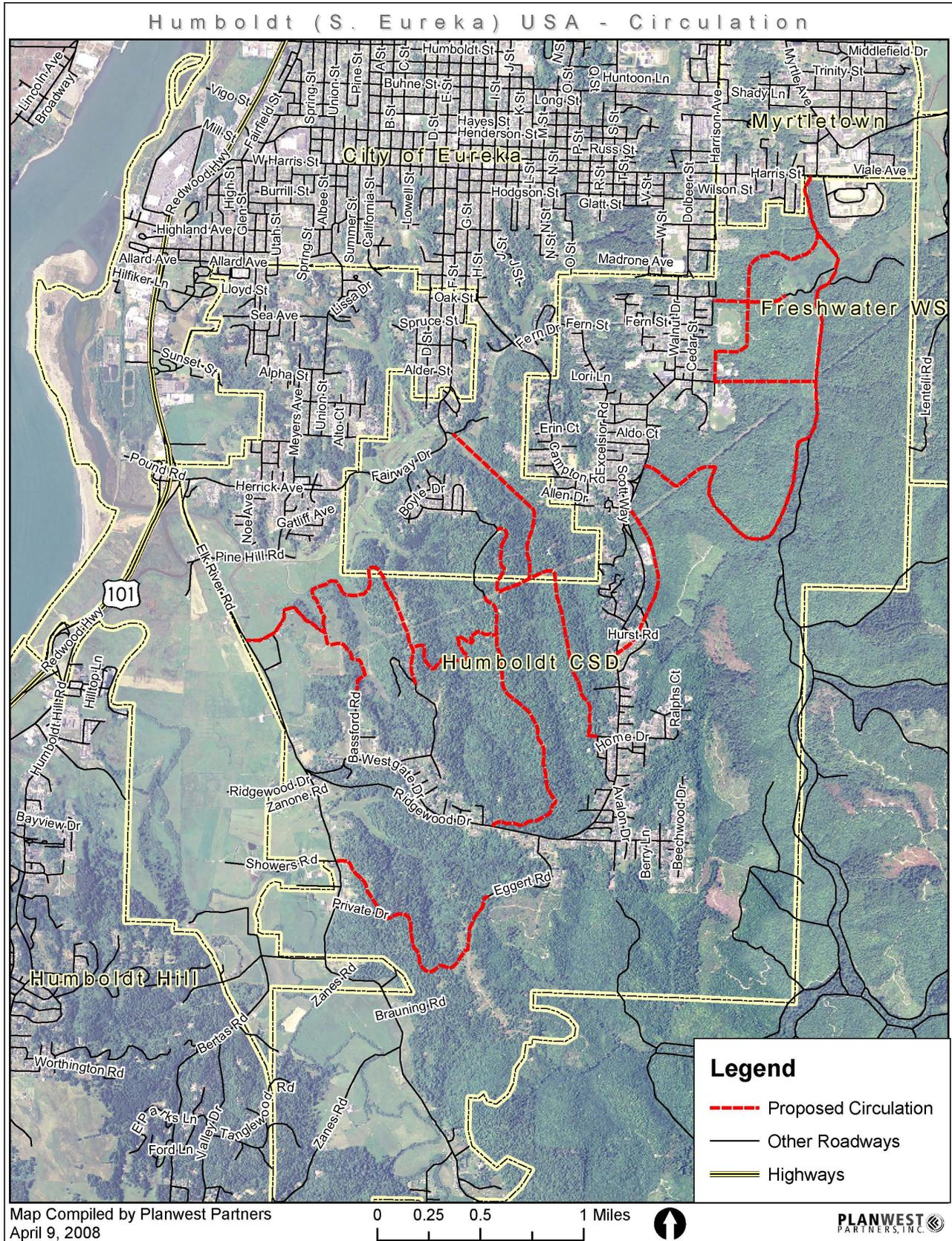
The ECP EIR analyzed traffic impacts at four levels of build-out: 25 percent; 50 percent; 75 percent; and 100 percent of total buildout. The EIR states that the increases in traffic volumes can generally be accommodated by the existing roadway network, with the exception of a few locations (see Table 2-9 above for proposed mitigations). The new roadway linkages are required to be constructed as specific new developments occur. Findings of fact were made as part of the ECP EIR concluding that after the incorporation of mitigation measures, impacts resulting from additional vehicle traffic on two roadways, F Street and Walnut Drive south of Hemlock Street would remain significant after mitigation. The Board of Supervisors adopted a statement of overriding consideration prior to approval of the ECP.

Most of the projects that are listed in Table 2-9, above, are included as candidate long-term roadway projects in the Humboldt Regional Transportation Plan 2006. Long-term projects are defined as those projects that are necessary to maintain service levels and accommodate projected traffic growth over the next twenty years. All of these listed projects are planned for construction between 2016 and 2025. The complete list of long term projects is found in RTP Table IV-2, Long Term Roadway Project Roadway Projects (2006, pages IV-17).

It should be noted that Figure 17, the Circulation Map for the ECP, differs from Figure 3-1, the City of Eureka General Plan Circulation Plan Diagram. The Eureka General Plan Circulation Plan Diagram shows only one north-trending route connecting Ridgewood Drive to Fairway Drive in the City of Eureka. In addition, the functional classification of the north-south connecting route is specified as a minor arterial in the City of Eureka General Plan, whereas it is not specified in the Eureka Community Plan. Humboldt County and the City of Eureka should work together to develop a common circulation plan for the greater Eureka area that contains unified right of way and roadway cross-section standards.

Martin Slough Interceptor Project. The Martin Slough Interceptor (MSI) project is a major wastewater facility that would improve wastewater collection within the Martin Slough basin, which includes portions of the City of Eureka and the ECP area. The intent of the project is to reduce demands on portions of the City's system that are overloaded and from time to time experience sanitary sewer overflows (see Section 7.3 for additional information regarding this project). The MSI project EIR indicated that the current traffic counts (as of May 2004) are not consistent with the levels projected for the current level of buildout in the ECP. For instance, the MSI EIR reports that traffic on Walnut Drive south of Hemlock has already reached levels projected by the ECP EIR to occur after 75 percent of buildout. County staff stated in the January 4th, 2007 staff report regarding the Dunn-Robinson-Forster-Gill General Plan Amendment petition that "staff would concur that...traffic impacts as analyzed in the ECP may not address full congestion in the Highway 101 corridor, in particular that portion within the City of Eureka, and changes in traffic patterns that have and may occur over time."

Figure 2-4a, Circulation in South Eureka



The MSI EIR concluded that the interceptor project would facilitate development allowed by the Eureka Community Plan, indirectly leading to significant traffic effects in the County and the City. The MSI project included mitigation measure 11-3.1, which was designed to limit connections to the MSI pending the development of a memorandum of understanding (MOU) to identify mitigation for cumulative traffic impacts and the implementation of a circulation improvement fund program. The aim of the MOU is to formally identify indirect or cumulative traffic and circulation impacts and the required improvements necessary to offset the impacts, within the areas of the City of Eureka and the unincorporated area served by the MSI project.

Forster-Gill/Ridgewood Village Project. On January 23rd, 2007, the Board of Supervisors accepted a petition from the landowner to submit an application to amend the ECP to remove the density cap of 700 units on the northern portion of the property formerly known as the Robinson-Dunn tract. This project is located in the undeveloped area south of the Lundbar Hills subdivision in the City of Eureka and north of Ridgewood Drive. This project, as submitted, would result in approximately 1,400 dwelling units and 327,000 square feet of commercial development. Pursuant to the ECP, a traffic study that documents the traffic service impacts of removal of density limitations must be prepared (Section 2620, Item 20).

Preparation of an EIR for this project, now referred to as the Ridgewood Village project, has been initiated. The EIR includes a comprehensive traffic analysis. The traffic analysis will determine the operational characteristics of the greater Eureka area circulation system, the circulation system needs associated with future traffic demand, and the probable circulation impacts associated with the development. The consultant preparing the analysis will use the GEATM, described in detail above, for this study. Six scenarios will be used to project future traffic impacts:

1. existing conditions;
2. existing conditions plus the Ridgewood Village project;
3. near term future (horizon year for Phase 1 occupancy) without Ridgewood Village project;
4. near term future (horizon year for Phase 1 occupancy) with Ridgewood Village project;
5. Cumulative traffic without Ridgewood Village project;
6. Cumulative traffic with Ridgewood Village project;

The Ridgewood Village project traffic analysis is being prepared at this time and will not be available for incorporation into this report. However, its results, especially the analysis of cumulative traffic impacts will likely be valuable in the review of General Plan Update land use alternatives.

Marina Project. The proposed Balloon Track mixed-use development, to be named Marina Center, is to be located north of Washington Street and west of Broadway (US Route 101) in the City of Eureka. Waterfront Drive is the north and west boundary of the project site, which is adjacent to Humboldt Bay. The project sponsor proposes to construct approximately 511,200 square feet of commercial/retail mixed use plus 54 dwelling units.

This traffic study evaluated the potential traffic impacts resulting from the development of the proposed project, identified potential roadway and circulation needs and determined potential mitigation measures to offset significant traffic impacts due to the project. The study focused on evaluating conditions at twenty-seven existing intersections and one future study intersection

that may potentially be impacted by the proposed project. The following study intersections were selected for analysis in coordination with City and Caltrans staff:

- | | |
|--|---|
| 1. Broadway and Fourth Street | 15. Wabash and Koster |
| 2. Broadway and Fifth Street | 16. Broadway and Bayshore Mall (north) - Harris |
| 3. Broadway and Sixth Street | 17. Commercial and Fourth Street |
| 4. Waterfront Drive and Fourth Street (project access, does not exist now) | 18. Fourth Street and 'C' Street |
| 5. Broadway and Washington | 19. Fourth Street and 'E' Street |
| 6. Broadway and 14th Street | 20. Fourth Street and 'F' Street |
| 7. Broadway and Wabash-Fairfield | 21. Fourth Street and 'H' Street |
| 8. Broadway and Del Norte | 22. Fourth Street and 'I' Street |
| 9. Broadway and Hawthorne | 23. Fifth Street and 'C' Street |
| 10. Broadway and Henderson | 24. Fifth Street and 'E' Street |
| 11. Washington and Waterfront | 25. Fifth Street and 'F' Street |
| 12. Washington and Koster | 26. Fifth Street and 'H' Street |
| 13. Waterfront and Commercial | 27. Fifth Street and 'I' Street |
| 14. Koster and 14th Street | 28. Broadway and Seventh Street |

The intersection operating conditions were evaluated under the following four scenarios:

1. Existing Conditions in 2006
2. Baseline 2010 (Existing volumes factored by 1.06 traffic growth)
3. Baseline 2010 + Project
4. Cumulative + Project 2025 Conditions

All scenarios were simulated using SimTraffic 6.0 to better assess the potential adverse interaction of traffic queues between closely spaced signalized intersections. Therefore, average speeds, queues, and use of special lane storage lengths were also addressed. While there are no minimum performance criteria for these additional factors, the output of the simulation models allows a good comparison of no project with project conditions scenarios.

The GETAM was made available for use in estimating project traffic distribution and assignment to study intersections. An origin-destination study was made of Costco customers prior to the availability of the model, so that estimates of project trip distribution could be made for impact analysis. The Countywide model was calibrated so that it closely estimates the existing turning volumes at the 27 existing study intersections of the study, and it also fairly estimated the trip distribution for customers leaving Costco. The adjustments to enhance and refine the model for the Marina Center Traffic Report resulted in a powerful tool for analyzing project impact. The Model was only used for project trips in 2010, because there was no general agreement on the land uses in the model for cumulative conditions in 2025.

Currently Planned or Proposed Improvements

Currently there is close to \$30 million, in 2007 dollars, in planned or proposed improvements to roadways in Humboldt County USAs (Source: County Public Works). The proposed system upgrades in the unincorporated area were identified primarily based on field work, historic traffic counts, and constituent input. It should be noted that the unincorporated area improvements

listed below are not all inclusive. There are important roadway improvement projects that are high priority for Humboldt County that area located outside Urban Study Areas.

Table 2-10. Cost of Planned or Proposed Improvements by USA

Urban Study Area	Cost of Planned /Proposed Improvements
Briceland & Redway	\$900,000
Freshwater	\$1,800,000
Humboldt Hill	\$4,500,000
McKinleyville	\$1,900,000
Myrtle town	\$7,000,000
South Eureka	\$12,600,000
TOTAL	\$28,700,000

In addition the City of Eureka has developed a list of potential improvements within its jurisdiction that represent potential mitigation for traffic impacts related to Sketch Plan 3. This list, which totals approximately \$44 million dollars, could be refined through additional analysis using the GEATM, as well as other appropriate traffic analysis methods and tools. A portion of the need for these improvements is related to existing populations and some is related to future populations. Some of these are also more regional in nature, particularly the improvements along Broadway, 4th, and 5th Streets. These proposed improvements are presented in Table 2-11 as well.

Cooperation between the City, County, Caltrans and the HCAOG will help prioritize the roadway improvements and planned for the greater Eureka area listed in Table 2-11. Considerable analysis will be required to determine project need, effectiveness, and feasibility. Additional analysis will be required to allocate the share of improvement costs between existing and future development, development within the City of Eureka and outside the City, and between residential and commercial development. Implementation of these projects and the construction schedule will be determined, among other things, by the Martin Slough Interceptor traffic mitigation MOA described above. Implementation of these projects will be largely determined through the use of the GEATM and other appropriate traffic analysis methods.

Table 2-11 below notes the currently proposed and/or scheduled measures to reduce congestion for critical USA roadways and within the City of Eureka. It should be noted that the information contained in Table 2-11 is derived from preliminary planning level analysis and traffic modeling for the EIR may result in changes, revisions, or deletion of the projects on this list. A detailed traffic engineering report will be prepared as part of the general plan update EIR. The traffic engineering report will need to specify:

1. the location of new circulation routes;
2. the type of facility being built (arterial, collector, local) based upon AASHTO standards;
3. the recommended roadway cross section to accommodate all road users;
4. the width of right of way needed; and
5. enhancements to existing facilities (add travel lanes, traffic signals, etc).

Table 2-11. Planned or Proposed System Upgrades by USA and within the City of Eureka

Roadway	Measures to Reduce Congestion	Estimated Cost of Improvements (\$)	Schedule
Humboldt County Projects			
Briceland WSA and Redway USA—\$900,000			
Briceland-Thorne Road	Curve corrections and improvements to the intersection of Ettersburg Road. Shoulders need to be widened for bikes & pedestrians between Briceland and Redway.	The County has a \$900,000 grant for fixing hazardous roads between Ettersburg Junction and Shelter Cove. No plans currently for improvements to roadway from Redway to Briceland.	2009
Freshwater WSA—\$1,800,000			
Freshwater-Kneeland Road	Install roundabout at intersection with Old Arcata Road.	\$1,000,000	2011
	Phase I - Shoulders widened for bikes and pedestrians (Phase I – 2002). Phase II - Stripe and sign roadway from Old Arcata to Henry Lane. Localized widening as necessary.	\$800,000	2010
Humboldt Hill USA—\$4,500,000 +			
Humboldt Hill Road	Roundabout at intersection of Humboldt Hill Road and South Broadway.	TBD	TBD
	Extend Humboldt Hill Road to Tompkins Hill Road.	\$2,000,000	2014
	Create bypass by extending London Drive to Broadway.	\$2,500,000	2011
McKinleyville USA—\$1,900,000			
Central Avenue (Relief)	Create McKinleyville Avenue-School Road connection.	\$600,000	2009

Roadway	Measures to Reduce Congestion	Estimated Cost of Improvements (\$)	Schedule
	Center left turn lane and bicycle and pedestrian improvements to School Road.	\$900,000	2010
Central Avenue	Safe Routes to School improvements are being installed from Bates to Murray.	\$400,000	2007
Myrtle town USA—\$7,000,000			
Harrison Avenue	Volume/Capacity is acceptable, but shoulders should be widened for bikes and pedestrians if possible.	TBD	TBD
Myrtle Avenue	Install shoulders from Hall to Mitchell.	\$1,000,000	2007
	Install 6' shoulders from Indianola to Stephens Lane.	\$6,000,000	2008
South Eureka USA—\$12,600,000			
Elk River Road	Traffic Signal or round about at intersection with Herrick.	\$400,000	2010
	Construction of Reardon Ranch (Reliever Road)	\$2,800,000	TBD
F Street	Remove parking. Center left turn lane and bike lane enhancement.	\$600,000	2010
Harris Street	McKay Tract connector to Harris Street	\$2,900,000	TBD
	Fern Street Connector from V Street to Excelsior Street.	\$1,200,000	TBD
Herrick	Construction of Lunblade Hills Reliever Road.	\$2,800,000	TBD
Walnut	Construction of a roundabout at Walnut and Hemlock.	\$1,500,000	TBD

Roadway	Measures to Reduce Congestion	Estimated Cost of Improvements (\$)	Schedule
	Installation of traffic signal at Fern Street.	\$400,000	2010
City of Eureka Projects			
Route 101, Broadway Corridor, \$25,500,000			
Waterfront Drive	Extend from Del Norte Street to Hilfiker Lane with new signal on Broadway at Hilfiker Lane	\$20,000,000	2009-10*
Highland Ave & Truesdale Ave Intersections	Combine with a new signal at Truesdale Ave	\$1,000,000	TBD
Harris Street and Henderson Street Intersections	Combine with a new signal at Bayshore Way	\$3,000,000	TBD
Wabash Ave to Truesdale St	Remove parking and restripe to add one southbound lane	\$500,000	TBD
Modify the Wabash and Fairfield Intersections	Elimination of northbound Fairfield St access	\$100,000	TBD
	Install new signal at Broadway and Hawthorne St	\$300,00	TBD
	Widen Hawthorne to provide two westbound right turn lanes and one westbound through/left lane	\$300,000	TBD
4th St to McCullens Ave	Install signal interconnect and implement optimized signal coordination timing along the corridor so that all signals are in one system	\$300,000	TBD
Route 101, 4th, and 5th Streets, \$5,600,000			
4 th St at Broadway	Install new signal	\$200,000	TBD
4 th St at Commercial	Install new signal	\$1,000,000	TBD
4 th St at C St	Install new signal	\$3,000,000	TBD
5 th St at C St	Install new signal	\$200,000	TBD
4 th St at L St	Install new signal	\$200,000	TBD
4 th St at N St	Install new signal	\$200,000	TBD

Roadway	Measures to Reduce Congestion	Estimated Cost of Improvements (\$)	Schedule
5 th St at N St	Install new signal	\$200,000	TBD
4 th St at T St	Install new signal	\$200,000	TBD
5 th St at T St	Install new signal	\$200,000	TBD
Waterfront Dr	Connect from G to J Streets	\$3,200,000	2008-09*
4 th and 5 th St from V St to Broadway	Install signal interconnect and implement optimized signal coordination timing along 4 th and 5 th Streets so that all signals are in one system, from V St to Broadway	\$600,000	TBD
North-East Eureka, \$7,000,000			
Route 101 at Airport Road	Install new signal	\$6,000,000	TBD
Waterfront Drive	Extend from T to V Streets	\$1,000,000	TBD
South-East Eureka, \$3,300,000			
Harris Street and Harrison Street	Expand intersection to provide full 8-phase, protected left turns	\$500,000	TBD
Dolbeer Street, Hemlock Street to Harris Street	Traffic Calming for speed only	\$50,000	TBD
W Street, Hemlock Street to Harris Street	Traffic Calming for speed only	\$50,000	TBD
Harrison Street, Harris Street to Myrtle Avenue	Remove parking and restripe with center left-turn and bike lanes	\$1,400,000	TBD
South-Central Eureka, \$1,200,000			
Harris Street at E and F Streets	Provide protected left turns	\$200,000	TBD
Harris Street at H and I Streets	Signal and intersection improvements	\$500,000	TBD
Harrison Avenue, south of Harris Street	Traffic Calming for speed only	\$200,000	TBD
South-West Eureka, \$900,000			
Harris at Central	Install new signal	\$300,000	TBD
Harris at California	Install new signal	\$300,000	TBD
Henderson at Central	Install new signal	\$300,000	TBD
Citywide, \$900,000			

Roadway	Measures to Reduce Congestion	Estimated Cost of Improvements (\$)	Schedule
Traffic Signal Standardization and Coordination	Replace all city signal equipment and interconnect and implement optimized signal coordination timing	\$400,000	TBD
Emergency Vehicle Preempt	Install City and Caltrans signals	\$200,000	TBD

*Dates listed are from the Humboldt County 2006 Regional Transportation Plan, Table IV-1, Shorter Term Roadway Projects, and Table IV-2, Long Term Projects.

2.8. Issues to be Addressed in the General Plan Update

The technical report presents a basis for classifying and assessing the County roadway system. As documented in this report, the County roadway system needs to be significantly upgraded just to carry current volumes efficiently and safely. It will need additional upgrades to carry the vehicle volumes projected in the County General Plan through the year 2030.

The General Plan Update will include goals, policies and programs for the following issues;

Roadway Classifications. There are currently some inconsistencies in certain classifications being used in the County. The General Plan Update will recommend a set of classifications for arterials, collectors and local roads that will be applicable for new development, planned improvements of existing roadways, maintenance, and modeling.

Distinction between Urban and Rural Standards. Travel and roadway criteria, such as that contained in the Transportation Research Board Highway Capacity Manual, distinguish between urban and rural standards. Applying these standards appropriately can result in more urban standards for the USAs, while maintaining more cost-effective rural standards in outlying areas.

Revenue Sources. The report documents a significant backlog in roadway maintenance. There are also more than \$40 million in planned or proposed improvements to roadways in Humboldt County USAs. The Community Infrastructure and Services Element will propose revenue sources including impact fees, development standards, and special assessments and taxes to cover the range of costs to provide a roadway system.

Multimodal Use of County Road Rights of Way. As stated in this report, the County roadways must be able to carry vehicle, truck, bicycle, pedestrian, equestrian, and transit traffic. The General Plan Update will include policy for maximizing the capacity of county rights of way for multimodal travel.

Greater Eureka Area Traffic Model Maintenance and Operation. The GEATM can become an important tool for projecting future travel demand, and coordinating efforts by the County, City of Eureka, and Caltrans, to respond to that demand.

Community Infrastructure and Services Element and Circulation Element Coordination. These two elements must be internally consistent. The Community Infrastructure and Services Element will identify appropriate roadway system funding mechanisms for construction and maintenance. The Circulation Element will set direction for how that system develops to correspond with planned development.

3. Law Enforcement

3.1. Description and Map

3.1.1. Map

A map of the Sheriff's Office Operations, including locations of the main station, substations, and resident deputy posts, is included as Figure 3-1.

3.1.2. Description

The Humboldt County Sheriff's Office provides a variety of public safety services countywide (court services, corrections, emergency operations) and law enforcement services for the unincorporated areas of the County. Law enforcement on unincorporated public lands is provided by the land management agencies (i.e., Forest Service, Bureau of Land Management, National and State parks); on tribal lands law enforcement services are provided by the tribes (i.e., Hoopa, Yurok). The California Highway Patrol is responsible for enforcing traffic laws on state highways and Roadways within the unincorporated area.

The Sheriff's Office Operations Bureau is made up of seven units under the command of the Undersheriff. The most visible of these units is Patrol. These deputies are responsible for responding to emergency calls for service, criminal investigations, and crime prevention through neighborhood and beat patrols. Patrol has one Main Station in Eureka, substations in Garberville, Hoopa and McKinleyville, and six resident deputy posts. Most of the urban study areas (USAs) receive law enforcement services solely from the Humboldt County Sheriff's Office (HCSO). Arcata, Blue Lake, Eureka, Ferndale, Fortuna, Rio Dell and Trinidad each have their own police departments that provide mutual aid to the County.

The Sheriff's Office has mutual aid agreements with cities and the California State Highway Patrol. Mutual aid is an agreement between agencies where the agency of jurisdiction can request manpower or resources from allied agencies or agencies within larger operational areas (such as regional or multi-jurisdictional entities). These agencies could be local or state agencies. The length of the commitment and scope of the request is based upon the resources and availability of contributing agencies.

The sources of revenue for the Sheriff's Office include the County General fund, grant funding and fees. The 2006 Sheriff Department budget is broken out in Table 3-1.

Table 3-1. 2006 Humboldt County Sheriff's Office Budget

Division	Budget (\$ millions)	Percent of Total
Operations	10.90	49.3
Custody Services	8.90	40.3
Animal Control	1.10	5.0
Cal-MMET (Multijurisdictional Methamphetamine Enforcement Team)	.42	1.9
Marijuana Suppression	.29	1.3
Homeland Security	.28	1.3
Boating Safety	.17	.8
Office of Emergency Services (OES)	.14	.6
TOTAL	22.10	

Figure 3-1. Sheriff Office Operations – Main Station, Substations, and Resident Deputy Posts



3.1.3. Sheriff's Office Operations

Main Station Patrol: Eureka. The Main Station Patrol unit currently (as of June 2007) has one Lieutenant, six Sergeants, 18 Deputy Sheriffs and one Community Services Officer (CSO) that provide law enforcement services to the unincorporated areas of Humboldt County from Arcata south to Redcrest. There are two main beats: central and south. The central beat covers the unincorporated areas of Arcata (Bayside, Fickle Hill) and Eureka (Myrtle town, Cutten, Pine Hill, Samoa, Fairhaven) along with the areas of Kneeland and Elk River. The south beat covers the unincorporated areas surrounding the cities of Fortuna, Ferndale and Rio Dell. Additionally the south beat covers the areas of Humboldt Hill, the South Spit/Table Bluff area, Loleta, Hydesville, Scotia and the Redcrest area. USAs covered by the Main Station include Arcata, South Eureka, Myrtle town, Fortuna, Freshwater, Hydesville-Carlotta, Indianola, Jacoby Creek, Loleta, Manila, Rio Dell, Riverside, Samoa, and Scotia.

The Deputy Sheriffs assigned to these beats are responsible for patrolling approximately 800 square miles and providing law enforcement services to the residents and visitors to those regions. Many of the neighborhoods in the beat areas have strong formal neighborhood watch programs in place, while those areas that are rural or isolated, such as Kneeland, Hydesville and Bridgeville, rely on the less formal but equally effective method of "neighbors watching out for neighbors" (Sheriff's Office website).

Northern Substation: McKinleyville. The Humboldt County Sheriff's Northern Substation in McKinleyville provides law enforcement services to the residents of Blue Lake, Fieldbrook, McKinleyville, Orick, Redwood Valley, Westhaven, and to all other unincorporated areas North of Arcata. The Northern Substation includes one Lieutenant, one Sergeant, eight Deputies, one legal office assistant, and one resident Deputy in Orick. All Law Enforcement services for these areas originate in this station. The Northern Substation responds to about 35 percent of the calls for service in Humboldt County. USAs covered by the Northern Substation include Big Lagoon, Blue Lake, Fieldbrook, Glendale, McKinleyville, Orick, Trinidad and Westhaven.

Garberville Substation. The Humboldt County Sheriff's Garberville Substation is located at the southern end of Humboldt County. The Garberville Substation serves the communities of Garberville, Redway, Shelter Cove, Miranda, Phillipsville, Weott, Myers Flat, and Alderpoint. Deputies patrol from the Stafford area south to the Humboldt county line. The correctional officer works at the station processing arrests made in the southern Humboldt area and transports those in custody to the Humboldt County Correctional Facility when necessary. The station is staffed with one Sergeant, five Deputies, one Resident Deputy assigned to Shelter Cove, one Correctional Officer and a Senior Legal Office Assistant. USAs covered by the Garberville Substation would include Alderpoint, Benbow, Briceland, Garberville, Miranda, Myers Flat, Phillipsville, Redway, Shelter Cove, and Weott.

Hoopla Substation. The Hoopa Sheriff's Station is located 55 miles east of Eureka on the Hoopa Valley Indian Reservation (the largest Indian reservation in California). The sub station is currently staffed with one sergeant, five deputies, a correctional officer, a resident deputy in Orleans, and a Legal Office Assistant. Deputies assigned to the Hoopa station provide law enforcement services to the northeastern part of Humboldt County including Willow Creek, Hoopa, Weitchpec, Orleans, Redwood Valley and other surrounding communities and work in cooperation with the Hoopa Valley and Yurok Tribal Police Departments and California Highway Patrol. The Hoopa Stations area of responsibility borders Trinity and Siskiyou Counties. The correctional officer works at the station processing arrests made in the Hoopa and Willow Creek

areas and transports those in custody to the Humboldt County Correctional Facility when necessary. USAs covered by the Hoopa Substation include Orleans and Willow Creek.

Resident Deputy Posts: Bridgeville, Orick, Orleans, Petrolia and Shelter Cove. Deputies live with and patrol residents in these communities. USAs with resident deputy posts include Orick, Orleans and Shelter Cove.

Boating: Eureka Marina. The Boating Program is made up of two full-time deputies, Marine Posse members and Sheriff Citizens on Patrol (SCOP) members. The Boating Program's most common activities include boating and Enforcement Patrol on all waterways in the County and the Pacific Ocean out to three miles, boating safety displays at places like the Bayshore Mall, and with other local organizations.

Other Sheriff's Office Programs/Functions

- The Criminal Investigations Division (CID) is responsible for the investigation of complex criminal investigations and the collection and processing of evidence.
- The Civil/Courts Division is responsible for the process of all civil proceedings and service of the civil documents.
- Court Services is responsible for courtroom security; they are officers of the court maintaining a presence during all criminal and civil court proceedings.
- Special Services is comprised of all the specialty units within the sheriff's office, this including marine patrol, beach patrol, livestock, and drug enforcement; they are responsible for search and rescue operations.
- Dispatch provides 24-hour 911 radio communication for all Sheriff services.
- Office of Emergency Services (OES) provides training, and logistics, and is the county operational component during all declared emergencies.
- Property/Evidence provides secure storage of property.
- Business/Records performs administrative functions necessary for Sheriff operations.
- Storage Yard (Eureka).

3.2. Existing Level of Service

3.2.1. Personnel Recruitment and Retention

Revenue sources used by the County to fund Sheriff's Office operations have not kept pace with service costs. As can be expected, budgetary restrictions limit the resources needed to deliver services efficiently and equitably. One of these basic resources is personnel. The Humboldt County Sheriff has received many public complaints regarding its ability to respond to calls for service in a timely manner, and its community involvement. Department accessibility by the community for walk-in services is also a concern. All of these functions are limited by staff availability.

Wages, work conditions and a full year of academy training all factor in to the difficulty the Sheriff's Office faces in recruitment and retention of qualified personnel. Staff at substations is inadequate. Training (particularly biohazard/biological training) is considered adequate, but could be enhanced (Downey, 2007). Continued advanced officer training is provided by the

State of California's Commission on Peace Officer Standards and Training (POST), and most training is reimbursed by POST.⁷

A 2004 study by the U.S. Department of Justice noted that fiscal and/or recruitment problems have made it difficult for law enforcement agencies to recruit and retain adequate numbers of officers. Recruitment in rural areas is made more difficult because of the higher wages in urban areas and the more limited pool of qualified applicants. Several possible reasons for this trend were noted, many of which are applicable to Humboldt County:

- The screening and training of new officers can take almost one year to complete.
- Economic factors may have lured good candidates and experienced officers into better paying jobs in professions outside of law enforcement.
- Increasing educational requirements for applicants may have restricted the number of recruits, which may be compounded by more alternatives for prospective applicants who have a college education.
- Some departments may be facing unusually high attrition as baby boomers retire.
- Negative publicity over such matters as racial profiling and the excessive use of force may have discouraged some people from wanting to join the profession.
- Increased hiring during the late 1990s may have contributed to recruit shortages by draining the pool of potential police applicants and intensifying competition among police agencies.

3.2.2. Level of Service Measures

The officer-to-population ratio, the number of officers to calls for service ratio and officer response times are standard measures of the level of service for law enforcement operations. Humboldt County Sheriff staff provided anecdotal information on response times, generally concluding that they are acceptable in McKinleyville and Eureka but inadequate elsewhere (particularly in outlying areas). The current number of sworn officers is considered inadequate to respond to the demand for service, and in addition to adequate staffing, the ability to respond effectively to calls for service depends on the call time and type (e.g., early or late, minor or major incident) (Downey, 2007).

Table 3-2. Humboldt County Sheriff's Office Sworn Officers

Sworn Officer	Budgeted Staff
Sheriff	1
Undersheriff	1
Lieutenant	5
Sergeant	12
Detective	4
Field Training Officer	8
Deputy I&II	60
TOTAL	90

Source: Humboldt County Facilities Master Plan (2007); communications with Sheriff's Office.

⁷ The POST program is voluntary and incentive-based. Participating agencies agree to abide by the standards established by POST. The more than 600 agencies in the POST program are eligible to receive the Commission's services and benefits, such as job-related assessment tools, research into improved officer selection standards, management counseling services, the development of new training courses, reimbursement for training, and quality leadership training programs. POST also awards professional certificates to recognize peace officer achievement and proficiency.

3.2.2.1. Officer to Population Ratios

Accepted standards for officer-to-population ratios (OPR) for adequate service range from 1.5-2:1,000. OPRs below this level can impair the ability of patrol officers to respond to calls for service in a timely manner. These recommended OPR figures are based on an International Association of Chiefs of Police Research Center (IACPRC) directive that sets OPR guidelines for different service population estimates; for an area with a population between 100,000 and 200,000, such as Humboldt County, the IACPRC recommends an OPR of 1.9 (IACP, 2007).

In 2007 the Humboldt County Sheriff's Office budgeted for 90 sworn officers, as shown in Table 3.2. Applying 90 sworn officers to Humboldt County's total population of approximately 131,000 produces an officer-to-population ratio of 0.69:1,000⁸; applying 90 sworn officers to Humboldt County's unincorporated population of approximately 70,000 produces an officer-to-population ratio of 1.29:1,000. In both cases, the OPR is below IACPRC recommended levels.

3.2.2.2. Calls for Service to Population and Staff to Calls for Service Ratios

Law enforcement services demand appears to be increasing faster than population; the ratio of calls for service (CFS) to population increased by 38% from 2003 to 2007, from 0.46 in 2003 to 0.64 in 2007. This can be explained in part by advances in record-keeping in addition to added Departmental responsibilities (such as animal control) and increased calls for service (a rise in criminal activity)⁹.

The staff to calls-for-service ratio has dropped from 2.1 in 2003 to 1.5 in 2007—a 29 percent decline and further indication that service standards may be more difficult to achieve as staff are increasingly required to take on more tasks. The table below lists County population estimates, Sheriff's Office staffing numbers and calls for service totals for the Main Station and Northern and Hoopa substations.

Table 3-3. Calls for Service (CFS), Staff to Population and CFS to Population Ratios

	2003	2004	2005	2006	2007
Population	130,021	131,414	132,273	132,602	132,574
Main Station CFS	47,679	57,410	59,111	60,933	65,000
Northern Substation CFS	10,950	14,350	15,960	17,890	18,000
Hoopa CFS	950	1,148	1,182	1,193	1,200
TOTAL CFS	59,579	72,908	76,253	80,016	84,200
CFS to Population Ratio	.46	.55	.58	.60	.64

Source: Humboldt County Facilities Master Plan (2007)

Other law enforcement service providers have indicated similar issues with the level of service. Arcata Police Chief Randy Mendoza has stated that his department is understaffed due to budgetary constraints. An analysis conducted for a proposed development in Arcata pointed to a need for an increase in police staffing to meet the anticipated increase in calls for service (Creekside Homes Fiscal Impact Analysis).

⁸ The responsibilities of the Sheriff's Office include search and rescue, civil procedure and other types of response that include the entire county population, thus the total county population was used to determine the OPR.

⁹ Types of calls the Sheriff's Office responds to include: physical altercations, weapons violations, burglary/theft/grand theft, suspicious deaths, verbal and physical domestic calls, missing persons, runaway juveniles, elder and child abuse cases, animal control issues, livestock calls, controlled substance-related calls, trespass, shots fired, suspicious vehicles and persons, agency assist requests. The Sheriff's Office may not respond to: no suspect/low solvability/misdemeanor calls, abandoned vehicle calls, garbage dump calls, vehicle accidents (CHP responsibility).

Response Times

While specific data on response times can be difficult to determine for a rural or semi-rural county, the Sheriff's Office did provide estimates of response times for service calls originating in USAs. Industry standards recommend 5- to 10-minute response times. The cities of Eureka and Arcata have set a standard of a five-minute response to calls for service. As can be seen in the table below, the Sheriff's Office is capable of responding to calls for service in less than 10 minutes in over half (19/37) of the USAs. In the more rural areas of the County, maximum response times may reach 50 minutes because of longer travel distances, varied topography, available resources, and the location of the Sheriff Deputy on patrol in relation to the incident. A table summarizing sheriff's response times to the various USAs is shown below.

Table 3-4. Sheriff's Office USA Response Times

Station <i>Maximum Response Times</i>	Communities/Area Patrolled	USA Response Times 10 Minutes or Less	USA Response Times Greater than 10 Minutes
Main Station <i>30 Minutes Maximum Response Time</i>	Arcata south to Redcrest	Arcata South Eureka Myrtle town Indianola Jacoby Creek Loleta Manila Samoa	Fortuna Freshwater Hydesville-Carlotta Rio Dell Riverside Scotia
Northern Substation <i>40 Minutes Maximum Response Time</i>	Blue Lake, Fieldbrook, McKinleyville, Orick, Redwood Valley, Westhaven, and all other unincorporated areas North of Arcata	Blue Lake Fieldbrook Glendale McKinleyville Trinidad Westhaven	Big Lagoon Orick
Garberville Substation <i>50 Minutes Maximum Response Time</i>	Garberville, Redway, Shelter Cove, Miranda, Phillipsville, Weott, Myers Flat, and Alderpoint, from the Stafford area south to the Humboldt county line	Garberville Redway	Alderpoint Benbow Briceland Miranda Myers Flat Phillipsville Shelter Cove Weott
Hoopa Substation <i>45 Minutes Maximum Response Time</i>	Northeastern part of Humboldt County including Willow Creek, Hoopa, Orleans, Redwood Valley and other surrounding communities		Orleans Willow Creek
Resident Deputy Posts <i>45 Minutes Maximum Response Time</i>	Bridgeville, Orick, Orleans, Petrolia and Shelter Cove	Orick Orleans Shelter Cove	