CHAPTER 4: PUBLIC FACILITIES ELEMENT
~~(Reference §9J-5.011(2), F.A.C.)~~

§4.1: PUBLIC FACILITY GOALS, OBJECTIVES, AND IMPLEMENTING POLICIES. This section stipulates goals, objectives, and implementing policies for the Public Facilities Element pursuant to ¶163.3177 ~~(6) (c),~~ F.S., ~~and §9J-5.011(2) (a-c),~~ F.A.C.

GOAL 4-1: NEEDED PUBLIC FACILITIES. Ensure availability of needed public facilities in a manner which protects investments in existing facilities and promotes orderly, compact growth.

OBJECTIVE 4-1.1: ENSURE THAT INFRASTRUCTURE IMPROVEMENT NEEDS SHALL BE MET AND THAT AVAILABLE PUBLIC FACILITIES MAXIMIZE USE OF EXISTING PUBLIC FACILITIES~~, AND PREVENT URBAN SPRAWL.~~ ~~Upon plan adoption, the~~ The City of Key West shall ~~adopt amended land development regulations which include~~ continue to enforce performance standards requiring that requisite public facilities be provided concurrent with the impacts of new development.

~~A concurrency management program shall also be adopted as part of the land development regulations and shall ensure that existing and planned public facilities shall be used to their maximum feasible extent in order to:~~

- ~~achieve economy of scale;~~
- ~~promote compact growth; and~~
- ~~prevent urban sprawl.~~

~~The City of Key West shall adopt procedures to ensure that at the time a development permit is issued, adequate facility capacity is available or will be available concurrent with the impacts of proposed development~~.

The City of Key West shall continue to analyze the capital facilities and infrastructure implications of land use and development permits with attention to the following:

- Safety improvements and hazard mitigation
- Elimination of sub-standard conditions
- Balance between supporting new development or redevelopment
- Financial feasibility, including long term operating costs
- Coordination among agencies of capital programs
- Contractual and/or mandatory obligations

Policy 4-1.1.1: Level of Service Standards. The following ~~level of service standards are hereby adopted, and upon plan adoption these standards shall be included in amended land development regulations which shall be used as the basis for determining the availability of facility capacity and the demand generated by a development~~ are the minimum acceptable Level of Service standards to be utilized in planning for capital improvement needs:

Sanitary Sewerage System Level of Service:

Residential Uses: 100 gallons per capita per day for permanent residents based on 90 gallons per capita per day for seasonal residents

Non-Residential Uses: 660 gallons per acre per day

Treatment Standard:

The effluent concentrations for the City's ~~Fleming Key Wastewater treatment facility~~ Richard Heyman Environmental Protection Facility shall comply with Florida Administrative Code Rule ~~17-6.180(1) (b) 1~~62.600.420(1)(a)~~, as follows:~~.

~~1. The arithmetic mean of the BOD or TSS values for the effluent samples collected (whether grab or composite technique is used) during an annual period shall not exceed 20 mg/l.~~

~~2. The arithmetic mean of BOD or TSS values for a minimum of four effluent samples each collected (whether grab or composite technique is used) on a separate day during a period of 30 consecutive days (monthly) shall not exceed 30 mg/l.~~

~~3. The arithmetic mean of the BOD or TSS values for a minimum of two effluent samples each collected (whether grab or composite technique is used) on a separate day during a period of 7 consecutive days (weekly) shall not exceed 45 mg/l.~~

~~4. Maximum permissible concentrations of BOD or TSS values in any effluent grab sample at any time shall not exceed 60 mg/l.~~

~~For the basic disinfection levels, Code Rule 17-6.180(1) (b) 4., the operational criteria shall comply with Florida Administrative Code Rule 17-6.180(1) (b) 4, using either MF or equivalent MPN methods as follows:~~ Effluent shall meet high level disinfectant requirements as per Florida Administrative Code Rule 62.600.540.

~~1. The arithmetic mean of the monthly fecal coliform values (computed as per b., below) collected during an annual period, shall not exceed 200 per 100 ml of effluent sample.~~

~~2. The geometric mean of the fecal coliform values for a minimum of ten effluent samples each collected on a separate day during a period of 30 consecutive days (monthly) shall not exceed 200 per 100 ml of sample.~~

~~3. No more than ten percent of the samples collected during a period of 30 consecutive days shall exceed 400 fecal coliform values per 100 ml of sample.~~

~~4. Any one sample shall not exceed 800 fecal coliform values per 100 ml of sample.~~

The City's ~~Fleming Key wastewater treatment facility~~ Richard Heyman Environmental Protection Facility shall meet all water quality requirements of Chapter 17-3, Florida Administrative Code, including the chlorine residual standard. Dechlorination may be necessary should the chlorine residual in the effluent exceed the maximum limits at the end of the discharge pipe which would cause a violation of 17-3 standards. The wastewater treatment facility contains dechlorination facilities.

Level of Service for Wastewater Treatment Plant Effluent. To help minimize the eutrophication of ocean waters by ocean outfall which contain nutrients, the wastewater treatment plant effluent shall not exceed the following nutrient levels on an average annual basis:

Total Nitrogen Concentration:	6 mg/l; and
Total Phosphorus Concentration:	4 mg/l.

Private sewage treatment facilities shall provide no less than tertiary level of treatment defined as nutrient stripping meeting a standard of no more than 1.5 parts per million of total phosphorus as the average over two (2) consecutive quarters and no more than five parts per million (5 ppm) of total nitrogen content. The permit-holder shall monitor and test effluent and submit reports to the City Commission documenting that these nutrient stripping standards are being met. If these treatment standards are not met for two (2) consecutive

quarters, the subject permit shall come before the City Commission for review and possible revocation. Monitoring and testing standards shall be conducted as required by Chapter 17-601.100 through 17-601.900, F.A.C.

Potable Water Level of Service:

	~~Residential~~	~~Non-Residential~~
~~1990 - 1995~~	~~95 gal/capita/day~~	~~660 gal/acre/day~~
~~1996 - 2010~~	~~93~~ 100 gal/capita/day	~~650 gal/acre/day~~

Solid Waste Disposal Level of Service:

~~1991-1993 Level of Service (lb/capita/day)~~

~~Land Use~~	~~Total Waste Generation~~	~~WTE Facility Capacity~~
~~Residential~~	~~3.8~~	~~2.93~~
~~Non-Residential~~	~~9.1~~	~~7.00~~

~~1994-2010~~ Level of Service (lb/capita/day)

Land Use	Total Waste Generation	~~WTE Facility Capacity~~	Recyclable Waste Generation
Residential	2.66	~~2.05~~	0.5
Non-Residential	6.37	~~4.90~~	0.25

~~The City shall not approve development applications unless the City demonstrates that sufficient capacity is available to accommodate projected solid waste disposal needs for all existing and approved development for a period of three (3) years. As part of the remedial plan amendment the City shall include an executed copy of the contract for accommodating haul out and landfill needs covering a five year period with an option to renew for five additional years. The City's contract with Chambers shall provide a reserve capacity for 50,000 tons per year or 299.40 cubic yards of landfill at the Berman Road Landfill in Okeechobee County. The landfill is comprised of 345 acres with an adjacent 2,000 acres under ownership by Chambers for landfill expansion~~.

Drainage: The Drainage level of service standard below will be applicable to all types of development. Where two or more standards impact a specific development, the most restrictive standard shall apply:

a. Post development runoff shall not exceed the pre-development runoff rate for a 25-year storm event, up to and including an event with a 24 hour duration.

b. Stormwater treatment and disposal facilities shall be designed to meet the design and performance standards established in Chapter ~~17-25~~, 62-25 Section 25.025, FAC, with treatment of the runoff from the first one inch of rainfall on-site to meet the water quality standards required by Chapter ~~17-302, Section 17-302.500~~, 62-302, 862-302.500 FAC. Stormwater facilities which directly discharge into "Outstanding Florida Waters" (OFW) shall provide an additional treatment pursuant to Section ~~17-25.025~~ 62-25.025 (9), FAC.

c. Stormwater facilities must be designed so as to not degrade the receiving water body below the minimum conditions necessary to assure the suitability of water for the designated use of its classification as established in Chapter ~~17-302~~, 62-302 FAC."

~~In order to ensure that these levels of service standards are maintained, upon plan adoption the City of Key West shall develop a concurrency management implementation system pursuant to 9J-5.0055, F.A.C. which shall prescribe methodologies for determining available capacity and demand, including appropriate peak demand co-efficient for each facility and for the type of development proposed.~~

Policy 4-1.1.2: Compliance with Level of Service Standards. As a condition of the issuance of development orders and permits, all public improvements including new facilities or replacements, expansions, or other alterations to public facilities shall be compatible with the adopted level of service standards for the facilities. Issuance of development orders or permits shall be conditioned upon demonstrated compliance with applicable federal, state, and local permit requirements for potable water, wastewater, drainage, and solid waste facilities.

Policy 4-1.1.3: Demand and Supply Information System. The City of Key West shall develop procedures for updating facility demand and capacity information and shall prepare annual summaries of capacity and demand information for respective facilities and/or service areas.

Policy 4-1.1.4: Coordination Between Future Land Use and Potable Water/ Wastewater System Needs. The City's adopted land development code shall be enforced to ensure that incremental decisions by the City concerning potable water and wastewater system needs, plans and the location and timing of improvements shall be consistent with land use and conservation resource management policies stipulated in the Comprehensive Plan.

Policy 4-1.1.5: Areawide Planning for Potable Water and Wastewater Systems and Solid/Hazardous Waste Disposal. The City shall meet no less frequently than annually with the Florida Keys Aqueduct Authority to review and refine areawide management strategies for delivery of potable water and wastewater services. ~~In addition, the City shall by 1992 evaluate management strategies for meeting the solid waste, hazardous waste and recycling initiatives, including the planned thirty (30) percent reduction in solid waste through recycling pursuant to Ch. 403.706 F.S. The City shall commence curbside recycling by 1990-91.~~ Finally, the City ~~amended~~ shall continue to enforce land development regulations which shall not permit proliferation of small fragmented water or wastewater systems except in unique cases where the City Commission determines that the public health and safety is served by such a system and areawide service systems are not available. Furthermore, the applicant shall provide an environmental assessment which ensures that water quality shall not be adversely impacted. Where a package plant is permitted, the City shall provide for mandatory connection to the central system as the system becomes available.

Objective 4-1.2: Adoption of the Key West Water Supply Facilities Work Plan. The City of Key West shall comply with its Water Supply Facilities Work Plan 2012-2025 (Work Plan) adopted XXX XX, 2012, as required by section 163.3177(6)(c), F.S. within 18 months after the governing board of the South Florida Water Management District approved its Lower East Coast Water Supply Plan Update on February 15, 2007. The Work Plan will be updated, at a minimum, every 5 years. The City's Work Plan is designed to: assess current and projected potable water demands; evaluate the sources and capacities of available water supplies; and identify those water supply projects, using all available technologies, necessary to meet the City's water demands for the planning period.

Policy 4-1.2.1: Compliance with the Adopted Water Supply Facilities Work Plan. The City of Key West shall comply with its Water Supply Facilities Work Plan (2012–2025) which is incorporated by reference into the Comprehensive Plan.

Policy 4-1.2.2 Intergovernmental Coordination with Water Supply Planning. Coordinate appropriate aspects of its Comprehensive Plan with the South Florida Water Management District's regional Water Supply Plan adopted February 15, 2007, with the Florida Keys Aqueduct Authority (FKAA) 20-Year Water System Capital Improvement Master Plan adopted December 2006 and with the Monroe County Water Supply Plan adopted

November 25, 2008 (as necessary). The City shall amend its Comprehensive Plan and Work Plan as required to provide consistency with the District, County and FKAA plans.

Monitoring Measure:

The Work Plan shall remain consistent with the Florida Keys Aqueduct Authority 20-Year Water System Capital Improvement Master Plan, which is compatible with the FKAA Water Use Permit renewals and with the projects listed in the South Florida Water Management District's Lower East Coast Regional Water Supply Plan. The Work Plan will be updated, at a minimum, every 5 years and within 18 months after the South Florida Water Management District's approval of an updated Lower East Coast Regional Water Supply Plan.

~~**OBJECTIVE 4-1.2: MAINTAINING A SCHEDULE OF PUBLIC FACILITY CAPITAL IMPROVEMENT NEEDS TO ENSURE THAT CITY INFRASTRUCTURE RESPONSIBILITIES ARE MET.** The City shall develop and maintain a five-year schedule of capital improvement needs for public facilities and shall annually update the schedule as stipulated in the Capital Improvements Element. During the process of programming and budgeting for capital outlays, the City shall investigate new ways to finance public facilities and services, including impact fees.~~

~~**Policy 4-1.2.1: Capital Improvement Schedule.** The City Commission, after considering the recommendations of the Planning and Zoning Board, shall annually evaluate and rank capital improvement projects proposed for inclusion in the five-year schedule of capital improvement needs.~~

~~**Policy 4-1.2.2: Public Facility Evaluation Criteria.** Proposed capital improvement projects shall be evaluated and ranked according to the following priority level guidelines:~~

~~**"Level 1":** Whether the project is needed to:~~

- ~~Protect public health and safety.~~
- ~~Fulfill the City's legal commitment to provide facilities and services.~~
- ~~Preserve or achieve full use of existing facilities.~~

~~**"Level 2":** Whether the project accomplishes the following:~~

- ~~Increases efficiency of existing facilities.~~
- ~~Prevents or redu ces future improvement costs.~~
- ~~Provides service to developed areas lacking full service or promotes in-fill development.~~

~~**"Level 3":** Whether the project:~~

- ~~Represents a logical extension of facilities and services in a manner consistent with future Land Use Element goals, objectives and policies, including the Future Land Use Map.~~

OBJECTIVE 4-1.3: PROCEDURES AND STANDARDS FOR ON-SITE WASTEWATER TREATMENT SYSTEMS. The City shall assist in ensuring implementation of State regulations imposing mandated standards for inspections, operation, and maintenance of on-site wastewater treatment systems.

Policy 4-1.3.1: Limitations on the Use of On-Site Wastewater Treatment Systems. Use of on-site wastewater treatment systems shall be limited to the following conditions:

1. Existing septic tank and package treatment plants may remain in service until such time as centralized service is made available.

2. Use of septic tank systems for new development shall be prohibited within the service area of the City system west of the Cow Key Channel Bridge. The potential for water quality problems emerging in the City of Key

West is increased by the high water table and the likelihood of tile fields beginning to submerge during high tides. Under such conditions the pollutants cannot be absorbed and the pollutants enter the groundwater system and are eventually discharged to the waters surrounding Key West.

3. Use of package treatment plants shall comply with applicable laws governing the location, use, and design of the facility. Package treatment plants shall be designed in a manner which facilitates integration into the City-wide system in the future.

4. All development located within areas where central sewerage facilities are not currently available shall be required to connect into the central sewerage system when the system has been extended within 100 feet of the subject parcel.

Policy 4-1.3.2: Conditions Governing Development Orders or Permits. ~~Upon plan adoption the~~ The City shall ~~adopt amended~~ continue to enforce land development regulations which include performance criteria stipulating that prior to the issuance of development orders or permits all development shall be found consistent with regulations of all federal, State, and local on-site wastewater treatment systems.

The City's performance criteria shall also regulate the location, timing, and scale of development in order to ensure that new development is effectively served by wastewater services. The performance criteria shall discourage the proliferation of permanent package treatment plants. System reviews shall be coordinated with the State ~~Department of Environmental Regulation (DER)~~ in order to promote best management practices and compliance with relevant State permitting procedures. Similarly, the City shall prohibit use of septic tanks as elaborated in Policy 4-1.3.1(b) within the service area of the City system west of the Cow Key Channel Bridge.

Policy 4-1.3.3: Compliance with On-Site Wastewater Treatment and Water Quality Regulations. ~~Upon plan adoption the~~ The City shall ~~adopt amended~~ continue to enforce land development regulations which require that performance criteria be incorporated in order to regulate on-site wastewater package treatment plants, including their impacts on water quality. The performance criteria shall stipulate that all new or altered on-site wastewater treatment improvements shall be compliant with regulations of federal, State, and County agencies having jurisdiction. Furthermore, no new septic tanks shall be permitted. The City shall not approve any on-site package plant unless the plant complies with all, federal, State and County regulations.

All development located within areas where central sewerage facilities are not currently available shall be required to connect into the central sewerage system when the system has been extended within 100 feet of the subject parcel.

GOAL 4-2: PROVIDING FACILITIES TO MEET EXISTING AND PROJECTED DEMANDS. Ensure that wastewater systems, solid waste disposal, drainage and potable water facilities and services are available to meet existing and projected demands identified in the comprehensive plan.

OBJECTIVE 4-2.1~~a~~: ~~RECONCILE EXISTING~~ WASTEWATER SYSTEM ~~DEFICIENCIES.~~ ~~The City hereby adopts Table IV-1 as the City's capital improvement program for requisite improvements to the City's wastewater system. Table IV-1 incorporates specific wastewater system improvements, including committed funding and programmed timing for each project. This objective shall be further implemented through the following policies.~~ The City will continue to meet its Level of Service Standard to Wastewater through the inclusion of necessary projects in its Capital Improvements Schedule.

Policy 4-2.1~~a~~.1: Improvements to Key West Wastewater System. For the Key West system, there are continuing ongoing improvements of the collection and conveyance system taking place. ~~These are summarized in Table IV-1, Wastewater Enterprise Fund Capital Improvements Program Estimated Annual Outlay. This information is included in the CH2M Hill August, 1989 Wastewater System Rate Recommendations Report to the City of Key West.~~ Based on the wastewater demand projections presented in the 2012 Updated Data Inventory and Analysis of the Solid Waste Sub element, the City does not anticipate a deficit in the capacity of the waste-to-energy facility throughout the planning period.

The City's improvements include three major types of improvements including rehabilitation of the ocean outfall, design and permitting for deep well injection, and programmed improvements within sewer improvement district in order to reduce infiltration/inflow (I/I). The City has committed funds to each of these projects. Table IV-1 in the Public Facilities Goals, Objectives, and Policies indicates all wastewater system improvements, anticipated costs and proposed scheduling indicated on the Public Facilities Data Inventory and Analysis wherein each improvement cited within IV-1 is described. The scheduled impacts of these programs, including the anticipated amount of infiltration/inflow (I/I) to be corrected, are cited in the Public Facilities Data Inventory and Analysis. The estimated I/I to be eliminated is as follows:

ESTIMATED WASTEWATER INFILTRATION/INFLOW (I/I) TO BE ELIMINATED (MGD) BY PROGRAMMED SEWER DISTRICT IMPROVEMENTS

Sewer District	Average Annual I/I	Maximum Month Average Daily I/I	Peak I/I
A	0.3	0.5	0.2
B	0.1	0.2	0.1
C	0.1	0.2	0.1
D	0.1	0.2	0.1
DA	0.1	0.2	0.0
E	0.3	0.5	0.3
F	0.2	0.5	0.2
G	0.1	0.2	0.0
Total	**1.3**	**2.5**	**1.0**

PREPARED BY: CH2M HILL, Key West Office, 1991.

The sewer system rehabilitation contemplated will consist of:

- Replacement of old deteriorated manholes with new precast manholes.
- Replacement of complete runs of sewer lines (manhole) with new pipe where there are a number of broken pipes, protruding service laterals, deteriorating pipe material, etc.
- Point repairs where only one or two localized problems in a sewer run exist.
- Replacement of deteriorated service laterals to the right of way line. The service lateral is often one of the major sources of I/I.
- Raising of manhole covers where the manholes are in a low spot where they can take in a large amount of surface runoff.
- After all the other work is completed, sealing of leaky pipe joints with a chemical gel like grout will be accomplished for the remaining pipes.

Policy 4-2.1a.2: Other Investigation of Wastewater System. Upon plan adoption the City shall investigate water quality issues at the locations below identified and develop a program of improvements to address the water quality impacts.

1. Water quality within the Riviera Canal has become a target of concern among numerous interest groups. Pollution has been attributed to leakage from the sewage collection system which enters the stormwater drainage system and finds its way into the Riviera Canal.
2. The City shall investigate removal of the sewer main behind Key West By The Sea as soon as the new S. Roosevelt sewer main is installed.

3. Sewage Outfall South of Fort Zachary Taylor. Nitrate and phosphates are potentially contributing to eutrophication. The City shall immediately replace the landward side of the existing sewer outfall as scheduled for FY 1992-93 in the capital improvements program. Also, pursuant to the National Pollutant Discharge Elimination System (NPDES) monitoring program, the City shall collect data and evaluate environmental impacts of the outfall. The City will continue to collect data to evaluate the impacts of the outfall discharge on the environment and to annually monitor the condition of the outfall in order to assess the remaining useful life of the existing seaward outfall line consistent with EPA directives. Table IV-1 in the Public Facilities Goals, Objectives, and Policies and Table IX-1 in the Capital Improvements Element present the City's committed funds to programmed capital improvements. Both tables include specific allocations for initiating design and permitting for deep well injection and a separate allocation for repair of the landward portion of the ocean outfall. (Note: Table IV-1 will be available prior to the June 13th meeting.)

4. Deep Well Injection. The City has approved funding for the design and permitting of deep well injection and has allocated $180,000 for FY 1992-93 as presented in Table IV-1.

5. The City is committed to extending sewerage service to North Stock Island. The cost of the proposed capital outlay is anticipated to be $4,000,000 and is scheduled for construction by 1992. In addition, at Monroe County's request the City will participate in determining the most cost effective measures for providing long term sewerage services to the unincorporated South Stock Island.

Policy 4-2.1a.3: Use of Graywater for Irrigation. By the end of 1992, the City shall develop a program for investigating the feasibility of providing reclaimed water to the City and its residents for irrigation purposes. The City will monitor innovative concepts in wastewater collection and disposal, including wastewater reuse through such programs as use of "graywater" for spray irrigation and use of cisterns for collecting rainwater for use in spray irrigation or other related purposes. However, the high salt content of such water currently indicates that the high salt content of Key West "graywater" may render it useless in spray irrigation since much of Key West's vegetation may not be sufficiently salt tolerant to withstand the graywater. System improvements shall integrate proven technology in order to enhance cost effectiveness, conserve natural resources, and promote multiple uses of water resources.

TABLE IV-1, page 1 of 3
PUBLIC FACILITIES CAPITAL IMPROVEMENTS PROGRAM
Projected Annual Outlay

Project	Programmed City Funding Sources (a)	Other Programmed Funding Sources	Total Project Cost	FY 1992-93	FY 1993-94	FY 1994-95	FY 1995-96	FY 1996-97	FY 1997-98 and beyond
I. PUBLIC FACILITIES									
A. Wastewater System Capital Improvements (a)									
1. Ocean Outfall Rehab			$1,000,000	$1,000,000					
		Navy (23%)	<$230,000>	<$230,000>					
City Obligation			$770,000	$770,000					
2. Deep Injection Well			$180,000	$180,000					
Permitting & Design		Navy (23%)	<$42,000>	<$42,000>					
City Obligation			$138,000	$138,000					
3. Effluent Disposal			$5,000,000			$1,000,000	$4,000,000		
Alternatives (b)		Navy (23%)	<$1,150,000>			<$230,000>	<$920,000>		
City Obligation			$3,850,000			$770,000	$3,080,000		
4. Sigsbee Park			$500,000	$500,000					
		Navy (100%)	<$500,000>	<$500,000>					
City Obligation			$0	$0					
5. Phase I, Districts E and F Sewer System Rehabilitation			$2,900,000	$2,900,000					
6. Sewer System Evaluation of Districts A and D			$200,000	$200,000					
7. Phase II (Districts A and D and Remaining Districts (E, F, and G) Sewer System Rehabilitation			$8,000,000	$500,000	$1,500,000	$1,000,000	$1,200,000	$3,800,000	$0

TABLE IV-1, page 2 of 3
PUBLIC FACILITIES CAPITAL IMPROVEMENTS PROGRAM
Projected Annual Outlay

Project	Programmed City Funding Sources (a)	Other Programmed Funding Sources	Total Project Cost	FY 1992-93	FY 1993-94	FY 1994-95	FY 1995-96	FY 1996-97	FY 1997-98 and beyond
8. Miscellaneous Sewer System Repairs			$500,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000
9. Pump Station "E" Expansion			$115,000	$115,000					
10. Pump station D Rehab.			$720,000	$720,000					
11. Pump Station B Rehab			$320,000	$320,000					
12. Pump Station Impvmts for C, F, D, A			$170,000	$170,000					
13. South Roosevelt Boulevard Airport Area			$850,000	$850,000					
14. Maintenance Building			$150,000	$150,000					
15. South Roosevelt Boulevard Western Portion			$640,000	$640,000					
16. Upsize Pumps			$650,000		$650,000				
		Navy <23%>	<$149,000>		<$149,000>				
City Obligation			$501,000		$501,000				
17. Hilton Haven			$500,000	$500,000					
18. North Stock Island			$4,000,000						
TOTAL CITY SHARE			$20,324,000	$8,073,000	$2,101,000	$1,870,000	$4,380,000	$3,900,000	$4,100,000
TOTAL GRANTS			$0	$0	$0	$0	$0	$0	$0
TOTAL NAVY SHARE			$2,071,000	$772,000	$149,000	$230,000	$920,000	$0	$0
TOTAL WASTEWATER SYSTEM CAPITAL IMPROVEMENTS			$22,395,000	$8,845,000	$2,250,000	$2,100,000	$5,300,000	$3,900,000	$4,100,000

Notes: (a) All projects funded by the City are funded through the Wastewater Enterprise Fund.
(b) Cost based on deep injection well.

TABLE IV-1, page 3 of 3
PUBLIC FACILITIES CAPITAL IMPROVEMENTS PROGRAM
Projected Annual Outlay

Project	Programmed City Funding Sources (a)	Other Programmed Funding Sources	Total Project Cost	FY 1992-93	FY 1993-94	FY 1994-95	FY 1995-96	FY 1996-97	FY 1997-98 and beyond
B. Potable Water System Capital Improvements		**No potable water system capital improvements have been scheduled.**							
C. Solid Waste System Capital Improvements (a)									
1. Haul out Ash (b)			$1,041,000	$1,041,000					
Transfer Station									
2. Annual Haul out Cost (b)			$5,593,000	$493,000	$1,200,000	$1,200,000	$1,300,000	$1,400,000	$1,500,000
3. Recycling Transfer Station			$67,000	$67,000					
4. Stock Island Closure,									
Phase II Closure			$3,600,000	$3,600,000					
5. Air Emission Control,			$2,500,000	$1,000,000	$1,500,000				
Incinerator Plan									
TOTAL SOLID WASTE SYSTEM CAPITAL IMPROVEMENTS			$12,801,000	$6,201,000	$2,700,000	$1,200,000	$1,300,000	$1,400,000	`$1,500,000
NOTES:	(a) All programmed projects are funded through the Solid Waste Enterprise Fund								
	(b) The haul out costs represent operating costs together with possible capital costs								
D. Drainage System Capital Improvements									
1. Master Drainage Plan		Gas Tax	$250,000	$250,000					
			$250,000	$250,000					
TOTAL DRAINAGE SYSTEM CAPITAL IMPROVEMENTS									

OBJECTIVE 4-2.~~1b~~2: ~~RECONCILE EXISTING AND PROJECTED FUTURE SOLID WASTE DEFICIENCIES AND~~ COORDINATE RELATED ISSUES NECESSARY TO MEET EXISTING AND FUTURE SOLID WASTE NEEDS. ~~As stated in the Solid Waste Element Data Inventory and Analysis the City maintains a solid waste recycling program, a waste to energy plant, a landfill, and a hazardous waste program directed toward recycling motor oil. The City has entered into a Consent Order with the Department of Environmental Regulation in order to achieve closure of the Stock Island Landfill and to implement effective measures for hauling out ash and non recyclable waste. Policy 4-2.1(b).1 incorporates the City's commitment to this Consent Order and cites dates and a committed budget for carrying out State mandated actions.~~

~~The City has included in Policy 4-2.1(b).1 specific actions required to resolve projected system deficiencies identified in the Data Inventory and Analysis. As stated above, this policy incorporates a specific schedule and committed funds. Pursuant to DCA's request, the City shall provide DCA with a signed contract for ash haul out within ninety (90) days prior to the commencement of ash haul out (i.e., February 1993).~~

~~The City shall continue to participate on a Joint Task Force organized by Monroe County in order to analyze and coordinate new solid waste management directives stipulated in State legislation as cited in the below stated policy. Furthermore, the City shall continue the curbside recycling program which is already in place. The joint City County coordination activities shall also demonstrate the methods to be employed in coordinating with the County in meeting future solid waste and recycling improvement needs.~~

~~Upon plan adoption the~~ The City shall ~~develop~~ continue to enforce an effective system for monitoring solid waste collection capabilities of private companies having a franchise agreement with the City. This process shall continue to be a subcomponent of the concurrency management process. The procedures shall include working with the private companies to ensure that solid waste collection needs and evolving private market conditions are effectively coordinated so that the City's future population is adequately served by solid waste collection.

Policy 4-2.~~1b~~2.1: Solid Waste Projects. Based on the solid waste demand projections presented in the 2012 Updated Data Inventory and Analysis of the Solid Waste Sub element, the City does not anticipate a deficit in the capacity of the waste-to-energy facility throughout the planning period.

~~In July 1989 the City entered into a Consent Order with DER to take steps to close the Stock Island landfill and to select a method or methods to replace the function of the Stock Island landfill. Within the framework of the Consent Order, the City shall maximize use of existing solid waste facilities. Accordingly, the following schedule is set forth in this Consent Order:~~

~~Task~~	~~Date~~
~~- Phase I Closure of Stock Island Landfill~~	~~January 1991~~
~~- Method Selection to Replace Stock Island Landfill Function~~	~~July 1991~~
~~- Phase 2 Closure of Stock Island Landfill~~	~~November 1993~~

~~-SOURCE: Recommended Solid Waste Disposal Rate for FY 1990 and Projected Rate for FY 1991, CH2M HILL, August 1989, updated, 1991.~~

~~The Consent Order provides for extensions of these dates where circumstances beyond the control of the City prohibit the City from meeting these dates, such as extended review times by DER on permit applications and litigation associated with purchasing property required for the replacement method.~~

~~Costs of system improvements recommended prior to the July 1989 Consent Order are contained in the November 1988 Phase 2 Report. The Consent Order modified cost and scheduling estimates and added mandated improvements. Below stated are cost estimates and cost estimates for additional facilities by CH2MHill. Cost estimates for additional facilities are presented in Table IV-1 Public Facilities Capital Improvements Program.~~

~~Estimated Costs of Solid Waste System Capital Improvements~~

~~Cost Item~~	~~Estimated Cost in Millions of Nominal Dollars~~
~~Haul out Ash Transfer Station: 1992-1993~~	~~$1,041,000~~
~~Est. Annual Haul out Cost: 1993-1998~~	~~$1,200,000-1,500,000~~
~~Recycling Transfer Station: 1992-1993~~	~~$67,000~~
~~Stock Island Closure Phase II Closure - 1993~~	~~$3,600,000~~
~~Air Emission Control Incinerator Plan: 1992-1994~~	~~$3,000,000~~

~~NOTE: All programmed projects are funded through the Solid Waste Enterprise Fund.~~

~~SOURCE: City of Key West Finance Department, 1993.~~

~~Based on DCA request for a demonstrated commitment by the City to ash haul out, the City had committed funds for annual ash haul out in the capital improvement program. In addition, the City shall provide the DCA with a signed contract for ash haul out at least ninety (90) days prior to the commencement of ash haul out (i.e., February 1993).~~

Policy 4-2.2.2: Solid Waste Projects. The City of Key West will continue provide for future solid waste demands and facility needs with the following level of service standards ~~calculated by CH2M Hill, solid waste system engineers for the City of Key West~~:

~~1991-1993 Level of Service (lb/capita/day)~~

	~~Total Waste Generation~~	**~~WTE Facility Capacity~~**
~~Land Use~~		
~~Residential~~	~~3.8~~	~~2.93~~
~~Non-Residential~~	~~9.1~~	~~7.00~~

~~1994-2010~~ Level of Service (lb/capita/day)

Land Use	**Total Waste Generation**	**~~WTE Facility Capacity~~**	**Recyclable Waste Generation**
Residential	2.66	~~2.05~~	0.5
Non-Residential	6.37	~~4.90~~	0.25

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The City shall enact a Solid Waste Master Plan to meet the City's goals of 75% waste diversion.

~~The City shall not approve development applications unless the City demonstrates that sufficient capacity is available to accommodate projected solid waste disposal needs for all existing and approved development for a period of three (3) years.~~

~~As part of the remedial plan amendment the City shall include an executed copy of the contract for accommodating haul out and landfill needs covering a five year period with an option to renew for five additional years. The City's contract with Chambers shall provide a reserve capacity for 50,000 tons per year or 299.40 cubic yards of landfill at the Berman Road Landfill in Okeechobee County. The landfill is comprised of 345 acres with an adjacent 2,000 acres under ownership by Chambers for landfill expansion.~~

Policy 4-2.~~1b~~2.23: Solid Waste Coordination and Management Activities. The City shall continue to coordinate with Monroe County's solid waste management program to achieve improvements in hazardous waste collection and disposal. ~~In addition, the City shall coordinate with Monroe County in developing a local response, including recycling of solid waste which is compliant with State legislation establishing new mandates for achieving a thirty (30) percent reduction in solid waste volumes deposited at the landfill by 1994. The City shall cooperate with county officials and technicians on the Joint Committee in order to address countywide approaches for achieving access to resource recovery facilities or other alternatives to conventional landfill operations. Other specific issues which shall be addressed include:~~

- ~~Enhancing solid waste collection and transfer operations;~~
- ~~Management strategies for implementing recycling efforts;~~
- ~~Curbing illegal dumping of solid waste as well as disposal activities which adversely impact natural systems;~~
- ~~Preparing a strategy compliant with 1988 State Solid Waste Management legislation establishing new mandates for achieving a thirty (30) percent reduction in solid waste volumes by 1994;~~
- ~~Developing improved information dissemination regarding hazardous waste generators;~~
- ~~Determining feasibility of hazardous waste storage/transfer facilities;~~
- ~~Improving management of the collection and disposal of hazardous waste;~~
- ~~Drafting policy for appropriate regulatory measures governing solid waste and hazardous waste including identification of long term operating costs and capital improvement needs associated with various policy options.~~

~~The following existing methods of solid waste disposal will continue to be provided:~~

- ~~Mandatory collection of solid waste from all residences and commercial businesses within the City limits by a franchised hauler.~~
- ~~Transport of trash and construction debris by self haulers who are licensed by the City.~~
- ~~Transport of street sweepings, beach pickups, etc. by City trucks.~~
- ~~Transport of residential, commercial, and institutional waste generated on the Naval bases by U.S. Navy owned and operated trucks.~~
- ~~A full residential curbside recycling program by the City's franchised recyclable collector which was implementing February 1991~~.
- ~~Incineration at the City of Key West resource recovery facility, located on Stock Island. The City of Key West requires all waste generated from within the City limits to be transported and processed at the facility.~~
- ~~Disposal of unburnable waste that cannot be recycled and ash from the resource recovery facility is at the Stock Island landfill.~~

~~The City of Key West has two basic waste transport and disposal alternatives available for final disposal of the City's post recycling waste stream:~~

- ~~Haul out and disposal of residual ash; or~~
- ~~Discontinuing use of the Stock Island Resource Recovery Plant and haul out and disposal of raw municipal solid waste~~

~~By July 27, 1991, the City Commission must select the preferred disposal method. The City will then have until the initiation of final landfill closure (about May 1993) to implement the preferred disposal alternative so that there will be no disruption in disposal service.~~

~~Since the City's Waste to Energy plant has sufficient capacity to continue operations through the year 2010, the City shall enter into a contract for ash haul out. The capital improvement program includes an allocation of $1.7 million (nominal $) for annual ash haul out. The City shall provide the DCA with a signed contract for ash haul out at~~ least ~~ninety (90) days prior to the commencement of ash haul out (i.e., February 1993).~~

OBJECTIVE 4-2.3~~.1c~~: RECONCILE EXISTING FUTURE POTABLE WATER DEFICIENCIES. The Florida Keys Aqueduct Authority has not identified any existing future system deficiencies. However, the future system includes regular use of the Aqueducts Reverse Osmosis plant, which is very energy and fiscally intensive. The more water efficiencies the City can create, the less expensive our future water will be.~~—~~The City shall investigate potential water supply and water quality issues and coordinate at least annually in a formal meeting with the Board of the Florida Keys Aqueduct Authority for purposes of identifying problems, issues and opportunities associated with water quality, water supply, and water distribution. ~~The service areas for 1995 and 2010 include the entire city limits.~~

~~**Policy 4-2.1c.1: Potable Water System Projects.** The City shall coordinate technical issues surrounding short- and long-range decisions concerning management of water quality, water supply, and distribution on a continuing basis. Upon plan adoption, the City shall prepare amended land development provisions mandating that all new development demonstrate a source of available water supply, including management and coordination of related issues with the Florida Keys Aqueduct Authority.~~

~~In addition, upon plan adoption the City shall investigate water quality and water supply issues impacting City residents who may be using water obtained from the freshwater lens.~~

OBJECTIVE 4-2.1~~d~~4: PLAN AND COORDINATE SURFACE WATER MANAGEMENT SERVICES TO MEET EXISTING AND FUTURE SURFACE WATER MANAGEMENT NEEDS~~, INCLUDING PREPARATION OF AN ENGINEERED STORMWATER MANAGEMENT PLAN AND ENSURE PLAN IMPLEMENTATION.~~ ~~In order to maximize the use of existing surface water management facilities and reconcile existing problems identified in the Drainage Sub-element Data Inventory and Analysis, during FY 1992-93 the City shall commence an engineered stormwater management plan which shall identify existing and projected short term (1995) and long term (2010) stormwater management needs.~~

~~The master plan shall include an inventory of existing natural and structural features included in the City's drainage system. In addition, the plan shall assess related problems and issues building on the analysis contained in the comprehensive plan. The plan shall address criteria in policy 4-2.1d.1 and shall document findings and recommendations associated with this criteria. The plan is scheduled as a capital project in the capital improvement element during FY-92-93 and FY-93-94.~~

~~By the end of 1994 the~~ The City shall ~~incorporate recommended capital improvements into~~ an continue to annually amend~~ed~~ its capital improvements schedule and ~~shall amend~~ implement ~~land development~~ regulations to include recommended regulatory measures directed toward meeting level of service criteria as well as managing impacts of stormwater runoff on water quality in a manner consistent with goals, objectives and policies of the comprehensive plan.

~~**Policy 4-2.1d.1: Stormwater Management Plan.** By FY 1992-93 the City shall commence an engineered stormwater management plan which shall be completed by 1993-94. By the end of fiscal year 1993-94 the City shall adopt a capital improvement program which includes funding for the construction of drainage improvements recommended in the adopted~~

master drainage plan. The study shall build on preliminary studies by CH2M HILL and any other available drainage plans. The analysis shall address major drainage improvement needs and shall:

1. Assess sub-drainage basins, identify stormwater management resources, direction of flow, condition of major channelized waterways, implications of flood conditions during high tide when waters back up through drainage system and overflow in urban areas;

2. Evaluate water quality issues associated with sewer line leakage and flow of sewage into the drainage system, especially in the Riviera Canal;

3. Evaluate existing stormwater management system, including projected stormwater runoff versus actual stormwater runoff conditions and existing levels of services by sub-basin;

4. Determine impacts of existing and anticipated development and calculate short term (1995) and long term (2010) impacts on the drainage system in terms of storage capacity and water quality impacts;

5. Stipulate priorities for drainage facility replacement, correcting existing facility deficiencies, and providing for future needs;

6. Identify major problems and issues anticipated in providing the designated minimum level of service for existing and future development;

7. Recommend a program of improvements (i.e., needed replacements, retrofitting, or new facility sittings) for the short (1995) and long term (2010) time frames for resolving stormwater management issues including establishing a schedule for correcting existing system deficiencies and providing for future facility needs. Meeting existing system deficiencies shall receive first priority in the expenditure of public funds.

8. Recommend a framework for funding needed sub-basin system improvements such as a stormwater utility, and for monitoring the performance of the system. The City shall amend the capital improvements schedule by the end of 1994 to incorporate programs and funding allocations to implement the stormwater management plan.

9. Recommend measures for protecting and maintaining natural drainage corridors and other natural drainage features, including acquiring necessary drainage easements;

10. Address the impacts of existing and projected future runoff into the Ocean and the Gulf and related impacts on water quality and marine life.

11. Investigate 1) the impacts of surface water runoff including non-point source pollutants on water quality in the Riviera Canal, and 2) the circulation of tidal waters within the Salt Ponds with a view toward enhancing tidal flushing especially in remote areas of the Salt Ponds. These actions shall be part of the stormwater management study.

12. Specify management frameworks, such as a stormwater utility, which may be used to fund necessary improvements. Recommend a regulatory framework for alleviating and/or preventing increased surface water management problems and issues generated by development and/or redevelopment activity.

Policy 4-2.1d.2: Improvement of Flow at Riviera Canal and the Salt Run. The mangroves along the Riviera Canal and the banks of the Salt Run are overgrown and cause substantial trappings of building materials and other waste products and pollutants. The City shall seek permits required to ensure that these mangroves are systematically on a continuing basis trimmed consistent to best management principles and practices of mangrove trimming. In addition, illegal dumping and siltation currently obstruct normal flushing action within the Riviera Canal and Salt Run. The City shall also seek appropriate permits for implementing maintenance dredging activity necessary to enhance flow of waters through the Riviera Canal and the Salt Run.

~~Based on recent meetings with the Department of Environmental Regulation, the City has committed to carryout a three fold program of drainage improvements directed toward improving water quality at the Riviera Canal. As explained in the Public Facilities Data Inventory and Analysis, the City has committed to concurrently undertake the following activities:~~

~~1. The scheduled Master Drainage Plan shall include a study of all streets which direct run off into the Riviera Canal. This study shall recommend specific drainage improvements, such as inlets and under drains to be constructed at the streets ends nearest to the Riviera Canal. This improvement is intended to reduce non point source pollutants impacting the Riviera Canal. This study is included in the capital improvements program and is scheduled to commence in 1991.~~

~~2. The City is also committed to funding a sanitary sewerage rehabilitation program which is directed toward reducing septic leakage. Water quality within the Salt Pond and Riviera Canal may be adversely impacted by leakage from the sewer line behind Key West By the Sea. The City shall investigate removal of the sewer line behind Key West By the Sea as soon as the new South Roosevelt sewer line is installed.~~

~~3. Finally, the Department of Environmental Regulation has acknowledged that the proposed dredging of the Riviera Canal explained in the Public Facilities Data Inventory and Analysis is acceptable in order to improve flushing. The City shall undertake the proposed dredging; however, the City shall only discharge dredged spoil to upland areas.~~

Policy 4-2.~~1~~4.1: Compliance with Capital Improvements Element. All major public facility projects shall be undertaken in accordance with the schedule provided in the Capital Improvements Element of this plan, as may be hereinafter amended.

Policy 4-2.~~1~~4.2: Priority for Correcting Existing Deficiencies. In developing the annual schedule of capital improvement projects, the City shall assign highest priority to those projects required for purposes of correcting existing deficiencies.

Policy 4-2.~~1~~4.3: Existing Deficiencies Shall Not Be Increased by New Development. The City shall issue no development order for new development which would result in an increase in demand on deficient facilities prior to completion of improvements needed to bring the respective facility up to standard. ~~Upon plan adoption the City shall include an adequate facilities requirement as part of the updated Land Development Code. The adequate facilities ordinance shall mandate that future applications for development shall include a written evaluation of the impact of the anticipated development on the levels of services for the water and wastewater systems, solid waste system, drainage, recreation, and the traffic circulation system.~~ Prior to issuing a site plan or building permit (whichever is first applicable), the City shall render a finding that the applicant has provided written assurance that the proposed development shall be served with each of the above cited facilities with a level of service at least equal to that level of service stipulated in Policy 4.1.1.1. The developers application shall include written assurances that any required improvements shall be in place concurrent with the impacts of the development (i.e., by the time a certificate of occupancy is granted by the City).

Policy 4-2.~~1~~4.4: Coordinate with Monroe County Hazardous Waste Planning Efforts. The City shall offer assistance to Monroe County as the County assesses and plans for hazardous waste management in a manner consistent with ~~the provisions of §403.7265,~~ Florida Statutes.

OBJECTIVE 4-2.~~2~~5: MEETING PROJECTED PUBLIC FACILITY DEMANDS TO 1995. The City shall plan for projected public facility demands through ~~the year 1995 by undertaking the following projects:~~ its Capital Improvements Schedule.

~~1. **Wastewater System Projects.** The programmed wastewater system projects are identified in Table IV-1 of this element. The City shall replace the landward side of the existing sewer outfall in accordance with the required National Pollutant Discharge Elimination System (NPDES) monitoring program. Sometime within FY '90-91, the City will initiate the design and permitting process for one or two deep injection wells while continuing to collect data to evaluate the impacts of the outfall discharge on the environment and to annually monitor the condition of the outfall in order to assess the remaining useful life of the existing seaward outfall line.~~

2. **Solid Waste Projects.** Improvements scheduled after 1990 are included under Policy 4-2.1b.1.

3. **Drainage Projects.**

Stormwater Management Plan: $250,000

Aerial mapping should consist of 1" = 200' scale photo plan sheets with topographic mapping at a one foot contour interval with spot elevations at all high points, depressions, and other areas needed to clearly depict the ground topography. The estimated cost for this aerial mapping is:

Aerial Mapping	$73,000
Horizontal and Vertical Ground Control	$22,000
Total	$95,000

Drainage survey efforts should consist of a structure by structure survey of all the drainage facilities in each drainage system. It will serve to identify:

- Structure size and type
- Top of grate elevations
- Throat elevations
- Invert elevations
- Sizes of pipes entering and exiting the structures.

The estimated cost to survey all drainage systems is $70,000. This figure assumes the horizontal and vertical ground control for the aerial mapping efforts either would be done simultaneously with these survey efforts or would be done prior to these efforts.

The aerial mapping efforts are an absolute prerequisite to proceeding further with master drainage planning efforts and must be done as soon as funding will permit.

However, once aerial mapping is completed, the structure by structure survey efforts could proceed on a drainage area basis, followed by drainage area and system study, design, and permitting. This process would allow the City to first obtain the necessary drainage system permits for those areas where problems are the greatest as funding became available. In addition, regulatory agencies may support experimental and more economical methods of satisfying the permitting requirements when a single drainage area, rather than the entire City of Key West study area, is involved.

Additional information must be developed as part the comprehensive drainage plan. It is estimated Phase II of the master drainage plan will cost approximately $85,000. Thus, the comprehensive drainage master plan has been recommended as a capital outlay of $250,000.

Upon the completion of the stormwater management plan being undertaken in FY 1992-1993, the City shall amend the capital improvements program to include construction of required infrastructure improvements approved by the City Commission.

4. **Potable Water System.** Additional water distribution system improvements of approximately $3.0 million anticipated in fiscal year 1992. No potable water system capital improvements have been scheduled.

Policy 4-2.25.1: Coordinate with Capital Improvements Element. All public facility projects shall be undertaken in accordance with the schedule provided in the Capital Improvements Element of this Plan.

Policy 4-2.25.2: Public Facility Planning and Management Efficiency. In scheduling the location, timing and staging of public facility improvements, the City Commission shall use the following criteria:

- Minimize disruption of services;
- Prevent duplication of labor; and
- Maintain service levels for all respective facilities.

Policy 4-2.2~~5~~5.3: Additions of Public Facility Project Approvals. All required federal, State, and County permits shall be obtained before the City undertakes or authorizes contractors to undertake construction and/or operation of facilities.

~~**OBJECTIVE 4-2.3: MEETING PROJECTED DEMANDS FOR THE YR 1996 THROUGH YR 2010.** The City shall meet projected public facility demands between 1996 and 2010 by undertaking the following projects:~~

~~1. **Wastewater System Projects.** Table IV-1 presents the schedule of wastewater improvements for the period 1995-2010.~~

~~2. **Solid Waste Projects.**~~

~~Estimated Annual Haul out Cost: 1997-2010 $1,500,000~~

~~Upon the completion of the stormwater management plan being undertaken in FY 1992-1993, the City shall amend the capital improvements program to include construction of required infrastructure improvements approved by the City Commission.~~

~~3. **Drainage Projects.** A schedule of engineered improvement needs will be included in the capital master drainage plan.~~

~~Upon the completion of the stormwater management plan being undertaken in FY 1992-1993, the City shall amend the capital improvements program to include construction of required infrastructure improvements approved by the City Commission.~~

~~4. **Potable Water System.** No projects are anticipated for the period 1995-2010.~~

Policy 4-2.2~~.1~~5.4: Scheduling Needed Capital Improvements. The City Commission shall ensure that projects required to meet projected demands through the year ~~1996~~ 2016 shall be in the Capital Improvements Element of this plan in accordance with the requirements of ~~§163.3177(3),~~ Florida Statutes.

OBJECTIVE 4-2.6: ENACT EFFICIENCY EFFORTS TO REDUCE PROJECTED DEMANDS. The City shall utilize best management practices in efficiencies and conservation as a mandatory step in meeting projected demands in wastewater, solid waste disposal, drainage, potable water facilities and energy facilities and services. Within two years of plan adoption, the City shall set energy, water, transportation and solid waste efficiency standards.

GOAL 4-3: PROVIDE ADEQUATE DRAINAGE. Provide adequate stormwater drainage in order to protect against flood conditions and prevent degradation of quality of receiving waters.

OBJECTIVE 4-3.1: PROTECT NATURAL DRAINAGE FEATURES. ~~The City shall undertake a master drainage plan which shall investigate and recommend measures to protect natural drainage features, including the Riviera Canal and the Salt Pond area. The drainage sub-element Data Inventory and Analysis identifies issues related to these natural resources which shall be addressed in the master drainage plan.~~

~~Upon the effective date of the comprehensive plan adoption, t~~The City shall ~~amend~~ maintain its land development regulations ~~and incorporate amended~~ and implement performance criteria for floodplain management and stormwater management ~~regulations~~, including level of service standards. ~~These amended regulations shall be directed toward protecting natural drainage features and ensuring that future development utilizes stormwater management systems consistent with the City's performance criteria as well as criteria of FDER and SFWMD. Upon completion of the stormwater management plan, the City shall reevaluate the performance standards criteria. The City shall amend development regulations to incorporate the following factors:~~

1. The City shall coordinate with the South Florida Regional Planning Council, the Florida Department of Environmental Regulation, and (FL DER) and the South Florida Water Management District (SFWMD) in identifying any urban drainage systems which are not compliant with Chapter 17-25, FAC. Where such non-compliant systems are found to contribute significantly to the degradation of surface waters, the City shall coordinate with the FL DER, SFWMD, and Monroe County in order to achieve a regional approach to improved drainage and retrofitting as may be appropriate;

2. Existing stormwater engineering, design and construction standards for on site systems should be evaluated and amended as needed;

3. Existing standards for erosion and sediment controls should be evaluated and amended, if necessary;

4. Periodic inspection of on site systems shall be required to ensure continuance of system design and maintenance.

Policy 4-3.1.1: Ensure that Urban Lands Provide Adequate Drainage and Protection from Flooding and Manage the Retention of Ground and Surface Water at Levels that Enhance Natural Storage Capacity of Watersheds and Promote Aquifer Recharge. Promote the ecological, biological, and hydrological role that surface waters play in sustaining recharge to aquifers and supporting surface vegetation. Manage the location design and intensity of urban development in order to foster continuance of natural hydrological processes, including preserving recharge areas, promoting on-site retention of surface waters and natural return of surface water into the soil, and channeling excess stormwater volume primarily via natural grassy swales. Require the integration of natural storage areas and natural drainage courses into water management plans for new development.

Policy 4-3.1.2: Provide Adequate On-Site Retention and Ground Water Recharge while Directing the Surplus Run-off to Receiving Waterways in a Manner which Prevents Imbalance to their Ecosystems. Upon adoption of the Comprehensive Plan, the City shall continue to enforce the level of service standards identified for retention/detention in Policy 4-1.1.1. Upon plan adoption the City of Key West shall adopt amended land development regulations which shall include land use controls, such as subdivision regulations, zoning, including site plan review and performance criteria as well as special erosion controls, water quality control, landscaping and flood management ordinances which shall assist in implementing stormwater management and water quality controls. The programs shall be continually updated based on improved knowledge of problems, issues, and best management practices.

In FY 1992-93 the City shall commence the engineered stormwater management plan which shall provide recommended regulatory measures designed to protect and preserve water quality, retard runoff, and enhance percolation.

By the end of 1994, the Stormwater Management Plan shall be implemented by adopting regulatory ordinances for implementing the Plan. In addition, by the end of 1994 the City shall amend the capital improvement schedule by incorporating capital improvement items recommended in the Stormwater Management Plan.

Policy 4-3.1.3~~1~~1: Pursue the Development of Adequate Off-Site Surface Water Management Facilities. The City shall monitor at regular intervals the performance of existing off-site drainage facilities, evaluate existing and potential future problems or issues, and pursue the funding of necessary structural and non-structural system improvements for effective surface water management. All new developments shall provide an equitable contribution for off-site drainage improvements necessitated by the development. No new development shall be allowed which fails to meet adopted level of service standards for drainage.

Policy 4-3.1.4~~2~~2: Coordinate Watershed Management Plans and Policies with Appropriate Public Agencies. Ensure coordination of watershed management plans and policies, with appropriate local, regional, state and federal agencies~~, including Monroe County, the South Florida Water Management District, South Florida Regional Planning Council, the State Department of Environmental Regulation, the Agricultural Extension Service, the United States Army Corps of Engineers, the U.S. Fish and Wildlife Service, and other appropriate agencies~~.

Policy 4-3.1.53: Buffer Zone Requirements. ~~Upon plan adoption the~~ The City shall ~~amend~~ continue to enforce its land development regulations to include performance criteria which shall require that new development provide buffer zones adjacent to natural drainage ways and retention areas.

~~Such regulations shall be approved by the City Engineer prior to adoption by the City Commission. The proposed stormwater management plan scheduled for FY 1992-94 shall reevaluate the City's stormwater management regulatory program, including the buffer zone requirements, and recommend needed improvements~~.

Policy 4-3.1.64: Managing Land Use in the Floodplain. ~~Upon plan adoption the~~ The City shall ~~amend~~ continue to enforce its land development regulations to include performance criteria regulating development within floodplain areas. ~~The criteria shall include refinements to the existing stormwater management and floodplain protection ordinance. By 1994 these regulations shall be reevaluated to include regulatory measures recommended in the Stormwater Management Plan scheduled for completion in FY 93-94. These regulations shall address necessary restrictions on encroachment, alteration, and compatible use of the floodplain and major drainage corridors.~~

~~**Policy 4-3.1.7: Implementing Stormwater Management Plan.** The Stormwater Management Plan shall commence in FY 1992-93 and shall be completed by FY 1993-94. The City has included a program and funding mechanism in the capital improvement schedule in order to ensure plan implementation.~~

Policy 4-3.1.85: Inspection and Maintenance of Drainage Systems. ~~Upon plan adoption the~~ The City shall ~~develop~~ continue to maintain a program and schedule for the inspection and maintenance of drainage components. As part of the Stormwater Management Plan implementation program the City shall ensure that drainage system components are monitored pursuant to best management practices. ~~The plan shall specify criteria for frequency of inspections and shall develop procedures for perpetual maintenance~~.

~~**GOAL 4-4: PROTECT FUNCTIONS OF GROUNDWATER AQUIFER RECHARGE AREAS. The functions of natural groundwater aquifer recharge areas within the city shall be protected and maintained.**~~

~~**OBJECTIVE 4-4.1: COORDINATE ISSUES SURROUNDING AQUIFER RECHARGE.** The City shall coordinate with Monroe County and the South Florida Water Management District in providing for maintenance of aquifer recharge area functions. Upon plan adoption the City shall adopt amended land development regulations. These regulations shall include performance standards that reinforce natural hydrologic relationships that optimize erosion control, percolation and recharge of groundwater in order to enhance water quality. The City shall assist management of recharge areas and recharge of groundwater in order to promote continuance of natural hydrological processes to the maximum reasonable extent.~~

~~**Policy 4-4.1.1: Protect Surficial Aquifer Recharge Areas.** The City has no prime aquifer recharge areas which have been identified by the South Florida Water Management District. The City has a shallow freshwater lens that some residents use for domestic purposes. Upon plan adoption the City shall adopt amended land development regulations which regulate the use of the freshwater lens for domestic purposes.~~

~~On a continuing basis the City shall further protect groundwater from point and nonpoint pollution sources by assisting the State and South Florida Water Management District in managing water quality by preventing the discharge of inadequately treated wastewater and poor quality stormwater into public water bodies. The scheduled stormwater management plan shall recommend specific capital improvements and regulatory measures required to enhance water quality management.~~

~~**Policy 4-4.1.2: Deep Aquifer Water Conservation.** No deep water aquifer exists in the City of Key West.~~

~~**Policy 4-4.1.3: Retain Run-off to Maximize Recharge.** Upon plan adoption the City shall amend its land development regulations to reflect the recommended level of service standard in Policy 4-1.1.1.~~

~~**Policy 4-4.1.4: Coordinate with Other Recharge Protection Programs.** The City will coordinate with local, State, and federal agencies to achieve regional aquifer recharge protection objectives.~~

Policy 4-4.1.5: Regulate Private Wells. The City shall assist the FKAA and SFWMD to determine the impacts of private wells deemed detrimental and adverse to the water quality of the underlying freshwater lens. Within one year of plan adoption, the City shall propose an interagency agreement with FKAA and SFWMD in order to complete a study of the freshwater lens by 1995. The agreement shall specify the parameters of the study including at a minimum:

- Identification of all private wells.
- Determination of well impacts on water quality.
- Identification of legal issues related to phase out of wells.
- Agency responsibilities for project tasks.
- Schedule for implementation of recommendations.

OBJECTIVE 4-4.2: CONSERVING POTABLE WATER RESOURCES. The City shall develop measures as cited herein for achieving conservation of potable water. By 1996 the City's potable water conservation program shall reduce the volume of water consumption by two gallons per capita for residential uses and shall reduce the volume of water consumption by 10 gallons per acre per day for nonresidential uses (Cross reference potable water level of service standards in Policy 4-1.1.1). Upon plan adoption the City shall amend its land development regulations and incorporate adopted level of service criteria for potable water consumption.

Upon plan adoption, in order to meet this standard the City shall develop a technical committee on potable water and wastewater. Membership in the technical committee shall also include Monroe County, the Florida Keys Aqueduct Authority, as well as representatives from each private wastewater system operating in the City. The responsibility of the joint committee shall be to establish procedures for monitoring the existing and projected future supply of and demand for potable water. The committee shall also be charged with advancing the use of reclaimed (i.e., nonpotable treated effluent) water for irrigation purposes, including investigating how to avoid the adverse impacts of excessive amounts of chlorides and of salinity on vegetation. The effluent within the Key West area has extraordinary amounts of chloride and salinity.

The City shall upon plan adoption establish a program for implementing concurrency management, including but not limited to, monitoring and evaluation of potable water consumption, including available supply and demand now and for 1995 and 2010.

By 1994, as the monitoring and evaluation system yields data for improved planning of potable water resources, the City shall in coordination with Monroe County, reassess the potable water consumption level of service and amend level of service standards in order to reflect reduced consumption rates based on effective plan implementation, including greater usage of reclaimed water for irrigation.

Policy 4-4.2.1: Conservation of Potable Water Supply. In order to comply with potable water conservation policies of the South Florida Regional Planning Council, and achieve a reduction in the current rates of water consumption, land development regulations shall incorporate the following performance standards:

1. Where nonpotable alternative sources of irrigation water are available, potable water supplies may not be used to meet irrigation needs.

2. Require the use of water saving plumbing fixtures on all new development.

3. In order to reduce demand for irrigation water (which in turn often places greater demand upon potable water sources), at least thirty (30%) percent of all landscaping material obtained from off site sources for use on any site should be native plant material adapted to soil and climatic conditions existing on the subject site. Further, at least fifty (50%) percent of all trees used in landscaping shall be native species adapted to soil and climatic conditions existing on site in order to lessen water demand.

4. The level of service standards herein adopted is predicated on engineered analysis by CH2M HILL, the City's engineering consultant. As stated in Objective 4-4.2, by 1994, as the monitoring and evaluation system yields necessary data, the City shall amend adopted level of service standards in order to reflect reduced consumption rates based on effective plan implementation, including greater usage of reclaimed water for irrigation.

~~**Policy 4-4.2.2: Emergency Conservation of Water Sources.** By 1992 the City shall develop and implement a water conservation program that coordinates water conservation issues with SFWMD policies and program resources. By the end of 1992, the City shall develop a program for investigating the feasibility of providing reclaimed water to the City and its residents for irrigation purposes. The City will monitor proven technology in wastewater collection and disposal, including wastewater reuse through such programs as use of "graywater" for spray irrigation and use of cisterns for collecting rainwater for use in spray irrigation or other related purposes. However, the high salt content of such water currently indicates that the high salt content of Key West "graywater" may render it useless in spray irrigation since much of Key West's vegetation may not be sufficiently salt tolerant to withstand the graywater. System improvements shall integrate proven technology in order to enhance cost effectiveness, conserve natural resources, and promote multiple uses of water resources.~~