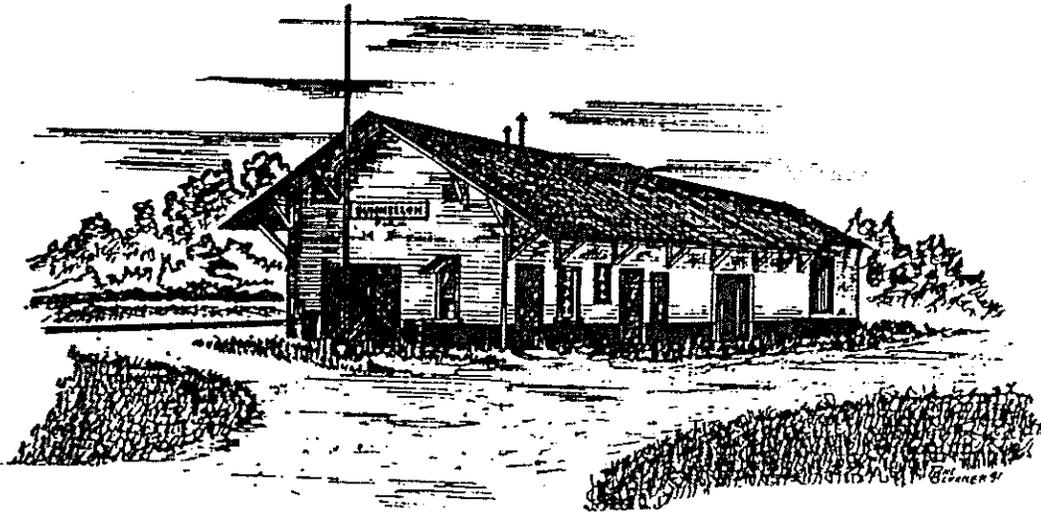


# CITY OF DUNNELLON

## COMPREHENSIVE PLAN



### VOLUME IV

**Infrastructure**  
**Intergovernmental Coordination**  
**Recreation and Open Space**  
**Traffic Circulation**



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**DUNNELLON COMPREHENSIVE PLAN:**

**INFRASTRUCTURE ELEMENT**

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## INFRASTRUCTURE ELEMENT

### INTRODUCTION

The purpose of this document is to provide data and analysis for Dunnellon regarding the following public facilities and services: solid waste, sanitary sewer, drainage, potable water and aquifer recharge areas. The information has been compiled to meet the requirements of 9J-5.011, F.A.C., and to lay the groundwork for the update of Dunnellon's comprehensive plan. This update assesses the deficiencies and surpluses of the existing infrastructure serving Dunnellon's residents so that the City can plan for the needs of the projected population and future land use needs.

#### Sanitary Sewer: Existing Conditions

The City of Dunnellon owns and operates one wastewater treatment plant. The physical treatment plant capacity is 250,000 gallons per day (gpd). Current disposal methods for the chlorinated effluent is through discharge into rapid infiltration basins. The City has a lease contract with the Florida Barge Canal Authority for the use of 23.87 acres of Barge Canal property upon which the basins are located. The most recent operating permit was issued for operation of a 0.25 MGD Type II trickling filter with gravity sand filters (Permit #D042-126082).

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### Service Area

The Dunnellon Wastewater Treatment Plant does not provide service to all land within the City limits, nor does it provide service outside the corporate limits. Figure 1 shows the areas of the City where service is available. This figure also shows the lines, lift stations and manholes, as well as the location of the plant. There is currently no service provided for the Birkett's subdivision or the area south along Palmetto Way. There is no service provided east of the Rainbow River, which includes the Dunnellon Heights, Indian Cove Farms, and Hendrix Avenue subdivisions. Nor is service provided in Vogt Springs or parts of Hillsdale. Predominant land use for the City of Dunnellon sanitary sewer service areas is residential; commercial and limited industrial use are located along Pennsylvania Avenue and US 41.

According to the plant operator for the City of Dunnellon, the City sewage treatment plant currently serves an average of 558 accounts. (Due to variation in seasonal population, the number of accounts ranged from 547 to 561 monthly between August 1989 to August of 1990.) The average daily flow was determined was reported between August 1989 and August 1990, and then averaged to calculate the average daily flow for the year. Because the system does not serve the entire City, the current level of service was estimated based upon the total number of accounts, rather than the total City population. Furthermore, although data were available indicating the number of residential accounts versus nonresidential accounts,

no data were available differentiating gallons of flow from residential versus nonresidential uses. In order to obtain the level of service for the existing population and nonresidential uses, and determine the needs of the projected population, the following methodology was used. Current level of service per capita is existing demand divided by the total population. (140,538 divided by 2,238 equals 63 gallons per capita per day. It is noted that this level of service includes the nonresidential flows within the City that serve residents, tourists and transients.

In order to provide an estimate of the portion of the demand that is residential, the following information is provided. However, because of the complexity of predicting future nonresidential flows, this information will not be used for calculating future demand. There were an average of 389 residential accounts using 4900 gallons per account monthly in 1990, according to the clerk's office. This calculates to 163 gallons per account per day (4900 divided by 30 days). Residential use accounts for only 63,407 gallons per day, or 45 percent of the total use. Nonresidential uses account for the remaining 77,131 gallons per day. The plant is currently at 56 percent of its total treatment design capacity.

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TABLE 1

MONTHLY TOTAL WASTEWATER FLOW

	<u>NO. CONNECTIONS</u>	<u>AVERAGE DAILY FLOW</u>
August 1989	561	124,000
September 1989	567	141,000
October 1989	559	159,000
November 1989	559	149,000
December 1989	560	159,000
January 1990	560	165,000
February 1990	560	189,000
March 1990	558	142,000
April 1990	559	132,000
May 1990	551	101,000
June 1990	554	104,000
July 1990	547	120,000
August 1990	548	142,000

Source: City of Dunnellon Public Works Department, and Henigar & Ray, Revised September 1991.

### Collection System

The existing wastewater collection system consists of gravity sewer laterals and mains, trunk gravity sewers, wastewater pump stations, lift stations, pressurization units and pressure sewer and force mains. Around 1908, Dunnellon's first collection sewer lines were installed. These sewers were vitrified clay conduits with brick and mortar manholes. As time passed, better materials were employed. The new sewer construction systems are designed for a better flow of the sewage, as well as for the prevention of infiltration and exfiltration. Infiltration is known as the inward flow of groundwater into the sewers through cracks, joints, manhole walls and connections. Exfiltration is the seepage of the sewage through cracks, joints, manhole walls and connections into the surrounding soil and water table. Inflow is known as the rainfall, runoff and drainage water entering the sewer system through manhole covers, illegal municipal storm sewer connections and illegal drainage connections.

The City of Dunnellon installed a new wastewater flow meter in the treatment plant. A combined plotting of the daily rainfall and the flow meter's reading was plotted by the City's treatment plant personnel. This analysis was affected when lightning struck near the instrument and it lost its calibration. The data provided before the accident provided a small correlation between rainfall and sewage flow. This short analysis did show, however, that during heavy rainfall periods no great incoming flow changes occurred at the wastewater treatment plant.

It was reported that the City of Dunnellon did not have a severe infiltration and inflow problem in its collection system. (Smith & Gillespie, 1985). That determination was based on a total system analysis and observations. The reported observations are still valid and are as follows:

1. The City's sanitary sewer system is a completely separate system with no known cross connections to the storm sewer system.
2. All manhole covers are located well above the flood range of streams in the area, and are not subject to surface runoff on any of the streets.
3. All customers connected to the system are required to remove all roof leaders, foundation drains, etc., from the service lateral.
4. There are no known reports of any of the lift stations overflowing or backing up during extensive or heavy rainfall.
5. The total sewered area of the City is approximately 240 acres.

A preliminary engineering report prepared as part of a Farmer's Home Administration application in 1990 indicated no excessive infiltration/inflow into the wastewater collection system of Dunnellon; no threat is posed by these services to the capacity of the wastewater treatment facility. Therefore, no recommendations are made at this time for corrective measures.

## Treatment Plants Located and Servicing Outside City Limits

There are no private treatment plants within the City. Areas not served by the Dunnellon plant are on septic tanks. Although connection to the sewer system is mandatory where service is available, areas without available service are still able to install septic tanks.

The State Legislature recently approved a bill requiring that the Marion County Board of Commissioners fix and assess a schedule of rates, fees and charges to finance the cost of providing water and services within the Rainbow River Watershed by 1998. This legislation should provide increased protection against water quality degradation on the Rainbow River resulting from septic tanks.

An inventory of plants located outside City limits is included in the data collection and analysis portion of the plan in order to evaluate availability and capability to provide service within the City limits, particularly waterfront lots on the Rainbow River. Rio Vista is located just north of the Dunnellon City limits on County Road 320. A permit has been issued to operate Rio Vista; the expiration date is September 1, 1988. It is a small plant, approved as a 0.025 MGD capacity extended aeration sewage treatment facility. Disinfected effluent is discharged to groundwater via a percolation pond; there is no discharge to surface waters. During the preparation of the Rainbow River Watershed Study and Management Plan, the following information was collected.

The Rio Vista Wastewater Treatment site has been cited for operational problems. An interview with Marion County Environmental Health Department personnel, on June 9, 1987, indicated that the percolation ponds are undersized. There has been at least one incident of a berm breach and escape of effluent associated with possible hydraulic overloading. The plant operator indicated, in June, 1987, that infractions have been corrected. A telephone interview with DER on February 10, 1988, confirmed that DER's inspection on June 12, 1987, found the plant to be satisfactory.

A third wastewater treatment plant located north of Dunnellon's City limits serves Dunnellon High School. The Marion County School Board has operating responsibility for this plant. According to the Marion County Environmental Health Department, the plant has a design capacity of 24,000 gpd; current demand is 3,000 gpd.

Information on the Dunnellon, Rio Vista, and Marion County School Board plants is shown in Table 2.

TABLE 2

WASTEWATER TREATMENT FACILITIES

Plant/Location	Operating Respon- sibility	Design Capacity gal/day	Demand gal/day	Number Hookups
City of Dunnellon Edgar Avenue & San Jose Blvd.	City of Dunnellon	250,000	125,381	416 Res. 149 Com.
Rio Vista* CR320, NE of Dunnellon	Astor West Incorporated	25,000	15,000	120 Res.
Dunnellon High* School SW 180th Ave.	Marion County School Board	24,000	3,000	N/A

Source: City of Dunnellon.

\*Marion County Environmental Health Department, December 1987.

Soil Suitability Analysis

Data obtained from the USDA Soil Conservation Service (SCS) Soil Survey for Marion County indicates certain portions of Dunnellon's developed and undeveloped lands have soils with moderate or severe limitations for septic tank absorption fields. Figures 2 and 3 depict the areas characterized by these ratings. Soils rated as severe predominately occur adjacent to the Rainbow and Withlacoochee Rivers. Soils with this rating have severe limitations that are so unfavorable or difficult to overcome that special design, significant increases in construction costs and increased maintenance are required. These ratings are based upon

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soil properties, site features, and observed performance of the soil. According to the SCS, flooding, permeability, and a high water table can contribute to unsatisfactory performance of septic tanks absorption fields, which in turn can contribute to groundwater pollution and danger to public health. In order to protect the water quality of the Rainbow River and Withlacoochee River, it is recommended that density restrictions and minimum setbacks from the water be established along the Rivers. For areas of severe soil suitability ratings, it is recommended that central sewer service be required. For existing lots of record along the river, the City has scheduled service to these areas by 1992. Within 90 days of availability, these developments shall be required to hook up to sewer. For new development, central sewer shall be required at the developer's expense.

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