

3. Public/Private Infrastructure and Facilities

This section of the plan discusses aspects of long-term redevelopment specific to publicly and privately owned community infrastructure and facilities. The Infrastructure and Public Facilities Technical Advisory Committee (TAC), herein referred to as the Infrastructure TAC, is the lead implementing body for this section and it is responsible for working in coordination with relevant local and regional organizations and agencies. The goal of the Infrastructure TAC is to plan for the repair and reconstruction of Hillsborough County's infrastructure and public facilities in the most efficient and rapid manner possible after a disaster while building resiliency into the system. The Infrastructure TAC includes three sub-TACs: Public Infrastructure, Public Facilities, and Private Infrastructure and Facilities.

3.1 OVERVIEW

The need for rapid restoration of infrastructure and critical public facilities after a disaster is an obvious recovery need and one that is addressed in both response plans and short-term recovery plans of local government and private utilities and infrastructure companies. Additionally, there are long-term redevelopment considerations for infrastructure restoration that must be weighed in conjunction with land use, environment, housing, and economic redevelopment issues. Taking advantage of opportunities to upgrade, mitigate, or even relocate infrastructure or public facilities after a disaster are items that can be addressed in a PDRP. Many post-disaster redevelopment strategies included in other sections of the PDRP will also depend on public services and infrastructure being available to the community.

The Infrastructure and Public Facilities TAC identified and prioritized the following list of issues that are discussed in detail in **Section 3.4**:

1. Security of critical infrastructure information;
2. Infrastructure services to priority redevelopment areas and other areas of new service resulting from redevelopment;
3. Infrastructure services to interim redevelopment needs;
4. Infrastructure and public facility repair; and
5. Communication and coordination among agencies, jurisdictions, and stakeholders.

3.2 VULNERABILITY

Due to the sensitive nature of information pertaining to the vulnerability of existing public and private infrastructure and facilities in Hillsborough County, the details of this vulnerability assessment have been summarized for public dissemination. The detailed inventory of information is protected under Section 119.071(1), Florida Statutes, and it is not public domain.

Government and Institutional Structures

The Florida Department of Community Affairs (FDCA) looked at the number of structures used for governmental, medical, educational, or institutional purposes to assess their risk to a number of hazards. **Table 3.1** shows the number of structures in Unincorporated Hillsborough County that are susceptible to property damage and economic impact due to storm surge, flood, wildfire, and sinkholes.

Table 3.1 Estimated Number of Governmental/Institutional Structures Exposed to Selected Hazards

Hazard	Governmental/Institutional Structures
Storm Surge*	507
100-Year Floodplain	2,109
Wildfire	5,670
Sinkhole	2,120
Total	10,406

*Note: Storm surge-related flooding building exposure results are a subset of the flood results.
Source: Florida Department of Community Affairs, 2006.

County-Owned Buildings

The Infrastructure TAC conducted an assessment of county-owned buildings¹ vulnerable to the risk of flooding and estimated the cost of repairing these structures. The TAC looked at 627 buildings in its assessment, including wastewater treatment plants. For the purpose of this analysis, the plants, which consist of many freestanding buildings, are considered one structure as they are functionally interdependent. The County buildings are prioritized using the Critical Facility Index (CFI) which applies to private and public critical facilities and is directly related to business continuity and continuity of government. The TAC identified the County buildings that are located in evacuation zones, as seen in **Table 3.2**. The numbers of county structures that are located in particular FEMA flood zones are included in **Table 3.3**.

¹ There are also city-owned buildings that are vulnerable to flooding; however, an analysis to address the number of city-owned structures at risk of flooding and estimated repair costs has yet to be completed.

Table 3.2 Prioritized County Buildings Located in Evacuation Zones

County Buildings	Evacuation Zone ¹					Total
	A	B	C	D	E	
CFI Priority 1 ²	0	0	0	0	0	0
CFI Priority 2 ³	1	2	3	2	2	10
CFI Priority 3 ⁴	0	0	0	1	0	1
CFI Priority 4 ⁵	0	0	0	1	1	2
CFI Priority 5 ⁶	1	11	10	12	0	34
Total	2	13	13	16	3	47

Table 3.3 County Buildings Located in Flood Zones

Flood Zone	Number of County Buildings
AE – Special Flood Hazard Areas subject to inundation by the 1% annual chance flood (100-year flood). Base Flood Elevations determined.	8
A – Special Flood Hazard Areas subject to inundation by the 1% annual chance flood (100-year flood). No Base Flood Elevations determined.	17
X – Areas outside the 0.2% annual chance flood (500-year flood).	248

According to **Table 3.2**, there are no CFI Priority 1 County buildings located in Evacuation Zones, but there are six CFI Priority 2 County Buildings in Evacuation Zones A, B, and C, meaning that these structures are likely to sustain damage in a Category 3 hurricane or lower storm. There are 34 CFI Priority 5 County Buildings located within an evacuation zone.

Table 3.3 shows that out of the 627 County buildings included in this assessment, 25 are currently located within the 100-year flood plain (Zones AE and A). These buildings could suffer substantial damage in a flood event.

In the second part of this analysis, detailed in **Table 3.4**, the Infrastructure TAC estimated the cost of reconstructing damaged County buildings based on the storm

¹ Evacuation zones are defined by the Hillsborough County Emergency Management Department and are based on estimated storm surge impacts (see **Table 5.14**).

² CFI Priority 1 = Identified as “critical” to public health, safety or the National or Global Economy including hospitals and emergency medical facilities; emergency shelters; main fire stations; occupied main police stations; prisons/jails; occupied fire rescue facilities; master water pumping and wastewater facilities; major communications facilities; major flood control structures; financial institutions with national or global impact; military installations; and critical electric utility facilities.

³ CFI Priority 2 = These facilities provide significant public services but are deemed to be somewhat less critical by government agencies and plan to resume operations within 24 hours. These facilities include some of the same types of facilities described for CFI Priority 1. These include nursing homes; major water and sewer facilities; fire and police stations; minor flood control structures; fuel transfer/loading facilities (ports); airport; American Red Cross; and schools and park facilities used to support other critical government purposes.

⁴ CFI Priority 3 = These types of facilities plan to resume operations within 48 hours and include apartment complexes for the elderly; assisted living facilities; grocery distribution/large cold storage facilities; local water and sewer facilities; local fire and police stations (community policing); medical service facilities (such as dialysis centers); and facilities having critical impact on the environment.

⁵ CFI Priority 4 = These types of facilities plan to resume operations within 72 hours and include supermarkets; banks; gasoline stations; and TECO Customers of 500 KVA or more demand.

⁶ CFI Priority 5 = These types of facilities plan to resume operations after 72 hours and include schools not acting as shelters; other medical facilities (i.e., FI Mental Health); and hog, fish and poultry farms.

surge and flood risk assessment above. The TAC used an estimate of \$300 per square foot for reconstruction which is the estimate for commercial rebuilding and assumed that for major structures over two stories tall only the lower floors would need to be rebuilt. These costs are also based upon a cost to rebuild the entire single story building assuming that damages exceed 50% of the structure. This is a broad estimation of cost based on an estimate of exposure to risk. These costs do not include relocating the structures out of the Evacuation Zones; therefore, this assessment does not include land acquisition costs that could amount to \$350,000 or more an acre. Costs also do not include contents.

It could cost the County over \$222 million to rebuild only the County-owned buildings located in Evacuation Zones. In a major disaster event, it is likely that the County will sustain wind damage in other areas and costs will be even higher.

Table 3.4 Estimated Cost of Rebuilding County-owned Buildings Located in Evacuation Zones

Evacuation Zone	Number of Buildings	Cost of Rebuilding (based on estimate of \$300/ft ²)
A	2	\$3,330,150
B	13	\$45,546,250
C	13	\$46,626,000
D	16	\$117,850,320
E	3	\$9,077,100
Total	47	\$222,429,820

Transportation

Functional Classified Roadways

There are 1,146 miles of “functional classified roadways” within Hillsborough County. Of these, 446 miles are under the jurisdiction of the state and 743 miles are under County jurisdiction and 32% or 306 miles are deficient roadways. To bring the existing roadway network up to adopted standards would cost \$1.8 billion for the county road system and \$500 million for the State road system (Comprehensive Plan for Unincorporated Hillsborough County: Transportation Element, 2008).

Table 3.5 Estimated Cost of Mitigating/Repairing Infrastructure

Mitigation/Repair Project	Estimated Costs (in millions)
Stormwater System	
79 Concrete box culverts (CBC) – bridges excluded	\$37.5
472 Reinforced concrete pipe (RCP) culverts (sites)	\$55.1
Bridges	
Replacement cost for the 117 bridges	\$462
Mitigation costs for the 117 bridges	\$93
Roads	
Replacement cost (1,726 lane miles - 2008 Debris Clearance Routes)	\$701

Source: Hillsborough County Public Works, 2009.

Transit

A population’s dependency on public transportation is likely to increase after a disaster as road closures make automobile travel difficult and gasoline prices rise. In Hillsborough County, Hillsborough Area Regional Transit Authority (HART) must provide all public mass transportation, or by a third party through agreement with HART (Comprehensive Plan for Unincorporated Hillsborough County: Transportation Element, 2008). **Table 3.6** shows the annual HART ridership since 2005, indicating a peak in 2008 when gasoline prices were at their highest in recent years.

Table 3.6 Annual HART Ridership 2005-2009

Year	Bus	Paratransit	Streetcar	Total
2005	10,040,492	49,278	434,498	10,524,268
2006	10,697,621	63,165	389,785	11,150,571
2007	11,147,660	82,439	437,612	11,667,711
2008	12,044,758	101,426	440,738	12,586,922
2009	11,600,000	99,000	460,000	12,159,000

Source: Hillsborough Area Regional Transit Authority, 2009.

Hillsborough County operates Sunshine Line, a program that provides door-to-door transportation and bus passes for elderly, low-income, and disabled persons in need of transportation. The Sunshine Line fleet consists of 67 vehicles and 59 drivers who log more than 1.2 million miles annually. Sunshine Line is available to residents of the Tampa metropolitan area yet the majority of the service area (70%) is considered rural (Wisniewski, 2008).

Cargo Transportation

Activity at the Port of Tampa represents the single most important contributor to the economy of west central Florida’s five-county region. Cargo is transported to and from the port by approximately 11,200 heavy trucks and 850 rail cars per day. This total is expected to grow to over 17,000 trucks and 1,025 rail cars by 2010 (Florida Department of Transportation District 7, 2005).

Utilities

Rapid restoration of utilities such as communications, electric, gas, water, wastewater, and waste disposal is important for a community to return to normalcy post-disaster. Utility Lines in Hillsborough County located underground in flood-prone areas are likely to sustain damage in a major storm event. After Hurricane Katrina, New Orleans experienced significant infrastructure damage from corrosion of underground utility lines (electric, cable, and phone) due to saltwater inundation. Also, the valves on gas lines were corroded and had to be replaced before gas service could be resumed (New Orleans Community Support Foundation, 2007).

Communications

Verizon has facilities in at-risk locations in the county, however, they are maintained annually and expected to be capable of withstanding Category 2 to 3 hurricanes (Verizon Communications, 2008).

Electric and Gas

There are power plants and several substations located within the coastal zone area that are protected up to a moderate storm event but not a severe disaster. Facilities located within the Coastal High Hazard Area (CHHA) are projected for potential service disruption of 15 days for a Category 3 hurricane (Hillsborough County Comprehensive Plan: Coastal Management Element, 2008).

Water and Wastewater

Potable water supplies include wellfields and surface water sources. Within the coastal zone area are three potable water facilities in the Apollo Beach area. The water is treated and distributed through miles of waterlines provided by Tampa Bay Water (TBW) and the County.

Tampa's Howard F. Curren wastewater treatment facility is also within the coastal zone area. It is projected for potential service disruption of 15 days for a Category 3 hurricane (Hillsborough County Comprehensive Plan: Coastal Management Element, 2008).

Waste Management and Disposal

Hillsborough County owns and/or operates several major solid waste facilities for the collection and disposal of solid waste. The cornerstone of the County's Solid Waste System is the 1,200 tons per day Hillsborough County Resource Recovery Facility. Other facilities include transfer stations, landfill disposal, chemical collection centers, and those for managing yard waste (Hillsborough County Comprehensive Plan: Solid Waste Element, 2008).

Port of Tampa

The Port of Tampa is the largest seaport in Florida, handling approximately 50 million tons of cargo annually. About half of the port facilities are owned and operated by the Tampa Port Authority while the other half are various private companies, particularly

operations involving petroleum and phosphate. Forty-five percent of all petroleum products for the state come in through the Port of Tampa, including jet fuel for the MacDill Air Force Base, and Tampa International and Orlando International Airports. The gasoline that is distributed from the Port of Tampa would affect a five-county area if the Port was greatly impacted by a disaster. Short-term supplies of fuel would be all that would be available until the Port’s operations were restored (Tampa Port Authority, 2009).

3.3 INSTITUTIONAL CAPACITY

An institutional capacity assessment was undertaken for each topic area of the PDRP by surveying the members of each technical advisory committee. The purpose of conducting these assessments was to document what is already in place to contribute to disaster recovery, determine the ability of Hillsborough County to implement this plan, and to identify potential opportunities for establishing or enhancing specific redevelopment policies, programs, or projects. The following capacity discussion is specific to private and public infrastructure and facilities in Hillsborough County.

Existing Capacity

Due to the broad and comprehensive nature of post-disaster redevelopment, there are often many disparate resources that may provide a portion of the capacity needed for pre-or post-disaster implementation of the PDRP.

Organizations

The organizations listed in **Table 3.7** are those that would be important to have represented on the Infrastructure TAC after a disaster as they are either critical for rapid post-disaster decision-making or may play a role in implementation. This list however is neither exhaustive nor is the participation of these organizations in the planning/implementation process mandatory. Additional stakeholders not listed in the table below attended TAC meetings during the PDRP planning process and, at the discretion of the TAC Chairs, these and other organizations can be invited to participate in the future.

Table 3.7 Public/Private Infrastructure and Facilities Agencies and Organizations

Organization	Role or Expertise
Alltel	Assistance with long-term communication needs; repair and mitigation of communication infrastructure and facilities
Bright House Networks	Assistance with long-term communication needs for private residences and businesses; repair and mitigation of communication infrastructure and facilities
City of Tampa Public Works Department	Repair and mitigation of infrastructure for the City of Tampa
City of Tampa Transportation Division	Provision of long-term transportation needs and repair and mitigation of transportation facilities for the City of Tampa
City of Temple Terrace Public Works Department	Repair and mitigation of all infrastructure and facilities in the City of Temple Terrace

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Organization	Role or Expertise
County and Municipal Fire Rescue Departments	Coordinate mitigation of fire department facilities
CSX Transportation	Regional and local shipping; Repair and mitigation of rail infrastructure
Environmental Protection Commission of Hillsborough County	Ensure that repair and mitigation of infrastructure does not cause adverse impacts to the environment or habitats
Florida Department of Transportation (FDOT)	Repair and mitigation of roads and infrastructure
Hillsborough Area Regional Transportation (HART)	Responsible for meeting local public transportation needs and repairing and improving transit infrastructure
Hillsborough County Aviation Authority	Represents Tampa International Airport (TPA), a regional transportation hub
Hillsborough County City-County Planning Commission	Provision of guidance in the planning efforts for long-term reconstruction of infrastructure and facilities in Hillsborough County
Hillsborough County Emergency Management Department	Coordination of overall recovery effort
Hillsborough County Facilities Management Division	Repair and mitigation of County-owned facilities
Hillsborough County Metropolitan Planning Organization (MPO)	Responsible for establishing priorities to meet short-term (next 5 years) and long-term multi-modal transportation needs for Tampa, Temple Terrace, Plant City, and Unincorporated Hillsborough County
Hillsborough County Planning and Growth Management Department	Assistance with planning efforts for long-term reconstruction of infrastructure and facilities in Hillsborough County
Hillsborough County Public Works	Repair and mitigation of infrastructure and public facilities for Hillsborough County including transportation and stormwater
Hillsborough County School District	Repair and mitigation of public school facilities
Hillsborough County Solid Waste Department	Repair and mitigation of solid waste facilities for Hillsborough County
Hillsborough County Transportation and Land Development Review Division	Review all proposals for repair and mitigation work for Hillsborough County
Hillsborough County Water Resources Department	Repair and mitigation of water-related infrastructure and facilities for Hillsborough County
MacDill Air Force Base	Responsible for repair and mitigation of infrastructure on Air Force Base
Plant City Public Works	Repair and mitigation of infrastructure for the City of Plant City
Port Heavy Weather Advisory Group	Knowledgeable about issues pertinent to port
TECO Energy (Tampa Electric Company and Peoples Gas)	Responsible for the repair and mitigation of energy and gas infrastructure; Restoration of electric and gas service to residents
Tampa Bay Builders Association	Represents local builders and provides information and continuing education programs to building industry
Tampa Port Authority	Repair and mitigation of all port-related infrastructure and facilities
United States Coast Guard Sector, St. Petersburg Sector	Involved in repair and mitigation of the ports; responsible for shipping channels
United States Geological Survey	Provide technical information
Verizon Communications	Assistance with long-term communication needs; repair and mitigation of communication infrastructure and facilities
Westshore Alliance	Knowledgeable about local business infrastructure needs

Coordination Capacity

In addition to identifying the relevant organizations, identifying existing networks and means of communication between these organizations is an important component of understanding the capacity for implementing the PDRP. The following are existing networks between organizations that could prove useful.

Emergency Support Functions

Hillsborough County has an Emergency Support Function (ESF) structure to align County response and recovery activities with those of the State. The following ESFs are relevant to the Infrastructure TAC during short-term recovery:

ESF 1: Transportation – The role of ESF 1 is to provide coordination of transportation support to the public, County departments, and other government, private agencies, and voluntary organizations requiring transportation to accomplish disaster evacuation, response, and recovery missions. The primary responsibility for transportation planning and operations rests with the County Disaster Transportation Resources Group. The primary members of this group are Emergency Management, County Sunshine Line, HART, and School Board Transportation. There are several other agencies with transportation assets and capabilities that may serve on the Disaster Transportation Resources Group and that will participate in emergency transportation operations, including Hillsborough County Fire Rescue, Tampa Fire Rescue, Public Works/Transportation Maintenance Division, basic life support ambulance companies, Parks Recreation and Conservation, and Solid Waste Management. In addition, there are numerous private sector and private nonprofit organizations that may be utilized to provide trucks, tractor trailers, buses, vans, taxi cabs, etc. (Hillsborough County Comprehensive Emergency Management Plan, 2006).

ESF 2: Communications – ESF 2 coordinates telecommunications support necessary to conduct disaster response and recovery operations, including the restoration of downed communications systems. One of the major elements for any successful disaster response is effective communications. An integrated blend of all communications systems (radio, telephone, and Internet-based systems) is mandatory during a major emergency. The primary responsibility for coordinating communications rests with the County Telecommunications Section under the Information & Technology Services Department. Agencies directly involved in providing and maintaining communications include Verizon, RACES, the Sheriff's Office Communications, and the City of Tampa Radio Communications Section. Public Safety Department sections (i.e., Emergency Management, Emergency Dispatch Center, and 9-1-1 Operations) are supporting elements for this emergency support function (Hillsborough County Comprehensive Emergency Management Plan, 2006).

ESF 3: Public Works and Engineering – The purpose of this ESF is to provide public works and engineering support necessary to restore the community's infrastructure, including the areas of debris clearance and disposal, temporary construction of emergency access routes, restoration of critical public services, restoration of water and waste water systems, construction management and inspection, and emergency demolition or stabilization of damaged structures. The primary responsibility for

coordinating public works and engineering activities rests with the Public Works Department. Supporting agencies include the Environmental Protection Commission, Facilities Management Division, Fleet Management, Health Department, Code Enforcement Department, Parks, Recreation and Conservation, Planning and Growth Management Department, Real Estate Department, Sheriff's Office, Solid Waste Management Department, Tampa Electric Company, Verizon, and Water Resource Services. Florida Department of Transportation (FDOT), District 7 may provide support as resources allow (Hillsborough County Comprehensive Emergency Management Plan, 2006).

ESF 12: Energy – ESF 12 coordinates the restoration of energy systems and availability of petroleum products for response and recovery operations. TECO Energy is the responsible agency for electrical power and gas aspects of this emergency support function. The coordinator of petroleum product aspects under this emergency support function is the Fleet Management Department. For the state, the Florida Electric Power Coordinating Group will coordinate with all electrical power providers concerning power generation activities (Hillsborough County Comprehensive Emergency Management Plan, 2006).

Disaster Recovery Committee and Subcommittees

All of the ESFs are represented on the Disaster Recovery Committee that acts as a coordinating body for emergency management activities in the County. Subcommittees of the Disaster Recovery Committee that are active in issues relevant to infrastructure and public facilities include the Power Committee and other various ad hoc committees and working groups (Hillsborough County Comprehensive Emergency Management Plan, 2006).

Transportation Management Centers

According to the National Transportation Recovery Strategy, Transportation Management Centers (TMCs) may be maintained post-disaster at the state or local level. TMCs are regional information management centers that gather and maintain transportation-related data and are responsible for a variety of functions that improve the safety, efficiency, and traffic conditions on transportation infrastructure. In addition to personnel, TMC functions are supported by Intelligent Transportation Systems (ITS) technologies located at the TMC and embedded in the infrastructure, some serving to support multiple functions. Because each TMC has unique applications, resources, sizes, and functionalities, the scope of a TMC involvement in any recovery operation will vary greatly (U.S. Department of Transportation, 2009).

Tampa Bay Regional Domestic Security Task Force

The goal of the Tampa Bay Regional Domestic Security Task Force (RDSTF) is to provide a regional response to any incident of terrorism that may occur within the State. The Task Force is made up of representatives from Hillsborough, Citrus, Sumter, Hernando, Pasco, Pinellas, Polk, and Hardee Counties. This collaboration gives smaller counties that do not have sufficient resources the opportunity to draw from those that do in order to be adequately prepared for an event. It also cultivates networks allowing for

communities to smoothly and efficiently provide assistance to each other in the case of an event.

Tampa Bay Urban Area Security Initiative

Tampa Bay Urban Area Security Initiative (UASI) is a coalition of agencies, including law enforcement, emergency management, and public health and safety organizations, that joined together to collaborate on enhancing regional preparedness in health and safety initiatives. UASI also coordinates with private critical infrastructure and key resources.

Plans, Programs, and Procedures

Table 3.8 provides a listing of local plans/ordinances, programs, and/or procedures¹ that are relevant to long-term recovery of public and private infrastructure and facilities. This table can serve as an inventory of the relevant plans, programs, and procedures for staff and TAC members to reference post-disaster as potential methods of implementation. Staff and financial capacity may be tied to plans and programs, so these can also be viewed as potential local fiscal resources.²

Table 3.8 Public/Private Infrastructure and Facilities Plans, Programs, and Procedures

Plan/Program/Procedure	Purpose	Lead Entity
City of Tampa Capital Improvement Program (CIP)	Planned improvement projects managed by various divisions within the city government such as Solid Waste, Stormwater, Technology and Innovation, Public Works, Wastewater, and Water	City of Tampa Budget Office
City of Tampa Comprehensive Plan	Provides the City of Tampa's vision and 20-year plan, including improvements to transportation and public facilities	Hillsborough County City-County Planning Commission
City of Temple Terrace CIP	Planned improvement projects dealing with the following categories: streets, storm drainage, resurfacing, and utilities	City of Temple Terrace Engineering Department
City of Temple Terrace Comprehensive Plan	The City of Temple Terrace's long-range vision including its planned capital improvement projects and plans for transportation and public facilities	Hillsborough County City-County Planning Commission
Hillsborough County CIP	A six-year, \$522.3-million plan that includes improvement projects pertaining to the following infrastructure: fire services, government facilities, library services, parks facilities, solid waste, and stormwater	Hillsborough County Management and Budget Department
Hillsborough County Comprehensive Emergency Management Plan (CEMP)	Prioritization of Infrastructure Repairs	Hillsborough County Emergency Management

¹ For private infrastructure and facilities, all information is not in the public domain. Information needed during an emergency will be accessed by the previously designated private industry contact.

² The programs listed were functional at the time that this plan was drafted. Future PDRP updates will include revising these tables to adjust for programmatic changes.

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Plan/Program/Procedure	Purpose	Lead Entity
Recovery		Department
Hillsborough County Comprehensive Plan	Guides and coordinates long-range growth and development in Hillsborough County. Relevant elements that address infrastructure and public facilities include Coastal Management, Future Land Use, Potable Water, Sanitary Sewerage, Solid Waste, Stormwater Management	Hillsborough County City-County Planning Commission
Hillsborough County Disaster Debris Management Plan	Addresses disaster debris removal on essential transportation routes and for coordinating the permanent removal and disposal of all debris from public property and rights-of-way within unincorporated Hillsborough County	Hillsborough County Public Works Department
Hillsborough County Metropolitan Planning Organization (MPO) Transportation Improvement Program (TIP)	Prioritizes and allocates anticipated funding for the transportation improvements	Hillsborough County MPO
Hillsborough County Solid Waste Management Department CEMP	Provides Solid Waste Management Department employees with uniform policies and procedures for the effective coordination of actions necessary to prepare for, and respond to natural disasters	Hillsborough County Solid Waste Management Department
Hillsborough County Truck Route Plan	Limits the movement of thru trucks to designated routes	Hillsborough County Planning and Growth Management, Transportation Division
Local Mitigation Strategy (LMS)	Incorporates mitigation measures addressing stormwater management, stormsewers, drainage, and flood control	Hillsborough County Planning and Growth Management
Long Range Transportation Plan (LRTP)	A multi-modal, 20-year guide for transportation investments. The plan identifies the location, size, and type of improvements in transportation infrastructure and services that can be afforded throughout the County and municipalities	Hillsborough County MPO
Plant City CIP	Identifies needs of Plant City and develops methods for financing the scheduled improvements for deficiencies and new improvements	Plant City Public Works
Plant City Comprehensive Plan	Plan has been updated to address the major issues facing the City of Plant City, including Capital Improvement Projects, public facilities, and transportation	Hillsborough County City-County Planning Commission
Port of Tampa Redevelopment Plan	Includes ideas about changes to existing infrastructure and locating new facilities	Tampa Port Authority

Plan/Program/Procedure	Purpose	Lead Entity
Southwest Florida Water Management District (SWFWMD) CEMP	Outlines operations including addressing pre-disaster preparation, post-disaster response and recovery, and deployment of resources for SWFWMD	SWFWMD
Tampa International Airport Emergency Response Plan	Outlines responsibilities, duties, and procedures to respond to emergencies and restore service	Hillsborough County Aviation Authority
TECO Energy Redevelopment Plan	Outlines policies and procedures to restore electric and gas service	TECO Energy
U.S. Coast Guard West Central Florida Area Contingency Plan	Outlines the plan to deal with pollution including oil and hazardous substances	U.S. Coast Guard, St. Petersburg Sector
Verizon Redevelopment Plan	Outlines existing policies and procedures and includes a prioritization of preparatory needs	Verizon Communications

Recommendations for Expanding Capacity

Knowing where to prioritize spending requires some basic knowledge of what is covered under insurance policies, or what projects will be eligible for federal reimbursement through the Public Assistance Program, and if there are financial reserves that can be targeted. It would be worthwhile for the Infrastructure TAC members to launch an assessment of County and municipal insurance policies to determine what facilities are covered and for what extent of damage. They can use this assessment to make decisions about increasing coverage or for making a plan to pay for damages to any un/under-insured structures. They can also determine whether mitigation enhancements would be covered under current policies and public assistance or whether additional funding would need to be raised. TAC members can develop a procedure to ensure that the assessment is updated annually.

After a disaster, public and private utilities may be receiving reduced fee payments while levels of service are low and populations are displaced. Before a disaster, the utilities can determine if reserve funds are enough to make up for this drop in fees. If not, entities can develop a plan to account for any disparities and ensure continuity of services.

Hillsborough County has more extensive infrastructure networks than some of the smaller counties in the Tampa Bay Region, including several key facilities like the Port of Tampa, Tampa International Airport, and the MacDill Air Force Base. Because of this, the region will be dependent on Hillsborough County’s ability to rapidly restore or replace its infrastructure post-disaster. Also, due to its size and extent of services, Hillsborough County may need to absorb displaced populations from other impacted counties in the region. This can lead to a strain on County infrastructure. In order for the County to properly prepare for an increase in capacity and consider other counties’ needs, the Infrastructure TAC should coordinate regional meetings with key stakeholders that deal with recovery and redevelopment of infrastructure and public facilities.

Regional collaboration is also essential to the redevelopment of transportation systems. As the region's Metropolitan Planning Organizations (MPOs), FDOT, and the Tampa Bay Area Regional Transportation Authority (TBARTA) make transportation plans they should also discuss issues of pre-disaster mitigation and long-term redevelopment. Collaboration could lead to a more sustainable regional transportation plan and coordination of resources to enable a faster recovery.

3.4 ISSUES

The prioritized issues listed below are the most significant post-disaster redevelopment issues relevant to infrastructure and public facilities in Hillsborough County as determined by the Infrastructure TAC. Following each issue is a summary of the recommended strategy for implementation. Specific actions that correspond with each issue strategy are listed in **Appendices D** and **E**, with pertinent information such as timeframe and responsibilities for implementation. Full details on the actions are found on the Infrastructure Action Forms, which can be obtained through the Hillsborough County PDRP website (www.hillsboroughcounty.org/pgm/pdrp).

Issue #1: Security of critical infrastructure information

In planning for and conducting infrastructure restoration and repair, care must be taken to not release information that could endanger the security of our infrastructure and critical facilities. This will require that some data be protected under Section 119.071(1), Florida Statutes, and, when appropriate, planning and implementation meetings of the Infrastructure TAC may need to be closed to the public.

Current Policy and Procedures

PDRP Policies

3-a. All infrastructure information that would be a threat to security if released to the public at large will be protected under Section 119.071(1), Florida Statutes, and available as an attachment to the PDRP for staff and cleared individuals working on infrastructure planning or repair.

3-b. The Hillsborough County PDRP will not cite the name or specific location of private infrastructure facility information but will discuss the need for preparation and coordination of private and public entities placing special importance on the development of individual public and private stakeholder PDRPs.

Strategy

For the County to be completely prepared for a major disaster, its private infrastructure and utility companies should have long-term redevelopment plans; however, it is in the best interest of the County if this information remains secure. The County can reach out to all private infrastructure and utility companies to assist them in preparing plans for long-term recovery from a major disaster. These would be protected under security of information but reviewed by the Infrastructure TAC to ensure that they are complimentary to the County's infrastructure plans as well as feasible.

As the PDRP is updated during implementation, it can be expanded to include strategies to respond to acts of terrorism. Due to the nature of these disasters, it is counter-productive to make these plans available to the general public; however, they should be referenced into the PDRP and coordinated with UASI and the Hillsborough County Emergency Operations Center (EOC). As a solution, when PDRP actions relate to potential disaster impacts from an act of terrorism, any details that could threaten the County's security can be cleared from the action forms and a contact person can be listed for those with security clearance that would need more information for implementation of the actions. The Infrastructure TAC Chair can be responsible for editing the PDRP to ensure that all of the information available to the general public is appropriate.

Issue #2: Infrastructure services to priority redevelopment areas and other areas of new service resulting from redevelopment

In the event of a major disaster, redevelopment and recovery service resource allocation may be focused in priority redevelopment areas (PRAs) as recommended by the Land Use TAC and designated by the County Commission and municipal councils. These PRAs may require new infrastructure service or enhanced capacity if intensity or density is increased as development from more hazardous areas transfers to less impacted community centers. Once studies have been conducted, the County and municipalities may also decide to enhance infrastructure and facilities in PRAs before a disaster occurs as an incentive for sustainable development patterns.

Strategy

One of the main priorities of the Land Use TAC is to determine which areas of the County should serve as PRAs. Part of the criteria for identifying appropriate locations is the existence of infrastructure that can accommodate an increase in development or can be feasibly expanded to meet increased service needs. The Infrastructure TAC can work with the Land Use TAC to perform a capacity analysis for potential PRAs during the identification process. It is likely that the infrastructure in most PRAs will need to be enhanced before they are able to accommodate a significant increase in population; however, these improvements will not happen right away. The Infrastructure TAC can perform additional capacity assessments to determine what level of service standards can be met if the density in PRAs is increased before enhancements can be made. For example, a disaster could hit the County before planned pre-disaster infrastructure projects are completed and the Infrastructure TAC's capacity assessments would give the County an idea of the size of population that can realistically relocate to a specific PRA. An important part of these capacity assessments would involve identifying high-priority infrastructure through Geographic Information Systems (GIS) mapping.

The Land Use TAC is going to designate PRAs into two categories: Sustainable PRAs and Vulnerable PRAs. These categories and the process of defining PRAs is further described in greater detail in **Section 7**. Vulnerable PRAs include those that would be cost prohibitive to relocate or would not be able to function in a different location but are vital for the recovery of the region. As the Land Use TAC begins to identify PRAs, the Infrastructure TAC can be involved in this process and request that any critical location-dependent infrastructure be designated as Vulnerable Location-Dependent

PRAs or Priority Redevelopment Corridors. Examples of critical location-dependent infrastructure include the seaport, airport, and TECO installations.

It is important that the County's existing infrastructure plans are consistent with the PDRP and the development of PRAs. The Infrastructure TAC working with associated groups can assess any existing County or city infrastructure plans and programs to ensure that they are conducive to implementing the PDRP and vice versa. For example, the 2050 Long Range Transportation Plan (LRTP) can be modified to address PRAs and include plans to enhance deficient roads within and connecting recovery areas. Another way to promote coordination among plans would be to give PDRP strategies extra points in the ranking of Capital Improvement Program (CIP) and Transportation Improvement Program (TIP) projects. This would incentivize agencies to include mitigation in their proposed projects and prioritize projects in PRAs. These projects, in turn, can be listed in the Local Mitigation Strategy (LMS) and included in fund allocation.

While the Infrastructure TAC is assessing existing infrastructure plans for inconsistencies, it can use that time as an opportunity to incorporate advancements in technology and "healthy community" principles into existing infrastructure plans, especially in reference to the development of PRAs. For example, the TAC can look for opportunities to make infrastructure systems more energy and water efficient or consider incorporating renewable energy technology into redevelopment plans. The TAC may also work with the MPO to modify the LRTP to include making streets more pedestrian- and alternative-transportation friendly.

The Infrastructure TAC can also consider opportunities for expanding and enhancing the Port of Tampa and related facilities according to their master plans. This may involve decisions about whether to rebuild nearby substantially damaged infrastructure to pre-disaster conditions or to make changes that would allow the Port to meet future needs. More details can be found in the Port of Tampa Redevelopment Report, which can be obtained from the Infrastructure TAC Chair or Hillsborough County Hazard Mitigation Section.

Issue #3: Infrastructure services to interim redevelopment needs

After a disaster, there are many temporary recovery needs that arise, particularly for debris removal, construction staging, housing, and business relocation. Infrastructure and utility services are often needed for these temporary uses, and ideally these interim redevelopment needs should be pre-planned to ensure rapid recovery operations and determine the long-term implications of temporary use locations.

Current Policy and Procedures

Additional policies and procedures may be added during future plan updates.

TECO Policy

- Under regulation, TECO cannot absorb the cost of temporary infrastructure during recovery. For example, TECO cannot fund the installation of power lines to temporary housing sites post-disaster.

Strategy

Investing in infrastructure to meet temporary needs during recovery will be costly. It is in the best interest of the County and cities that any infrastructure intended to be used temporarily be located in areas favorable to future permanent development without contributing to sprawl. Existing infrastructure can incentivize new development to replace temporary housing by cutting construction costs. For example, it would be favorable to a developer to have the opportunity to build permanent housing on sites previously used for temporary housing because the infrastructure would already have been built during recovery and funded by grants. This issue is addressed in greater detail in the temporary housing discussion in **Section 5**.

Transportation issues are going to be significant and immediate during recovery as reconstruction begins and transportation patterns change. Increasing the availability of public transit is a way to provide the public options to move around the County despite frustrating road closures and construction congestion. The Infrastructure TAC can explore developing or updating mutual aid agreements between HART and other bus systems in Florida to borrow buses and drivers that can be spared in other locations and increase the level of service in Hillsborough County. Also, it may be necessary to alter existing bus routes to accommodate temporary housing and recovery hub centers. The Infrastructure TAC can work with the Health and Social Services TAC to expand public transportation options for special needs populations that may be in new locations.

To ensure rapid recovery operations after a disaster, the Infrastructure TAC can begin to address transportation issues before a disaster by designating and mapping recovery routes to designated temporary housing and debris sites. The Disaster Temporary Housing Plan requires that the County review its temporary housing sites annually. The County can consider recovery routes at the same time. The Infrastructure TAC can also develop procedures for designating additional temporary haul routes. The criteria or rating system could include land use sensitivity, engineering considerations for safety, alternative route availability, and need for more routes.

Issue #4: Infrastructure and public facility repair

The repair of transportation, water, sewer, and power infrastructure is essential to establishing normal operations within a community. Post-disaster redevelopment can be used as an opportunity to make modifications, improvements, and additions to existing transportation networks and other infrastructure systems. Incorporating hazard mitigation into the repair and reconstruction of infrastructure and public facilities can ensure that when disaster strikes again, the infrastructure and facilities are better able to withstand the impacts.

Current Policy and Procedures

TECO Policies

- TECO cannot charge undergrounding of infrastructure to customers without public approval.
- TECO cannot underground infrastructure in Coastal High Hazard Areas because brackish water corrodes electrical equipment.

- Restoration of power to underground facilities takes TECO longer than restoration to above ground facilities.

Strategy

Reconstruction is an opportune time to mitigate infrastructure to future damage. Mitigation techniques can be incorporated into repair plans to prevent repetitive damage to structures. Private and public infrastructure agencies can also consider relocating any structures that are severely damaged and not location-dependant to less vulnerable areas. Options about which structures to mitigate and relocate can be discussed pre-disaster and preliminary plans can be drafted. Final decisions will most likely depend upon post-disaster damage assessment reports.

To ensure efficiency in the utilization of resources, the Infrastructure TAC can work closely with the Local Mitigation Strategy Working Group to prioritize mitigation projects. An example of a general sequence could include giving the highest priority mitigation improvements to evacuation and truck routes to infrastructure facilities followed by other roads, electric, water, and sewer. The County can also prioritize mitigation projects to areas like business centers, PRAs, and disaster relief communities. During recovery, the Infrastructure TAC can coordinate with the EOC to prioritize infrastructure repairs based on damage assessments. Severely damaged areas should be a low priority because waiting on a large number of repairs will delay re-entry. The County can consider relocating any infrastructure that is considered low-priority and is substantially damaged to prevent repetitive damage.

To improve business continuity and have infrastructure facilities back up and running post-disaster, the Infrastructure TAC can work with the Housing Recovery TAC to locate work-force temporary housing options located near infrastructure employment sites. The TACs can work with private infrastructure and utility providers to permit on-site employee housing where conditions are applicable. Public and private infrastructure agencies can develop housing options as part of their continuity plan that include group sites for temporary or transient workers that will be recruited during redevelopment in its housing plans. The Infrastructure TAC could also work with the Health and Social Services TAC to make sure childcare options would be available on-site for employees.

The Tampa Port Authority may pursue hazard mitigation and disaster preparation activities and encourage private port companies to do the same by devising a list of a best port practices. Activities can include better sealing of electrical panels and shutting down electrical equipment before a storm, building water front facilities to higher standards, equipping hazard materials facilities with generators and sufficient fuel supplies, elevating generators and equipment, and floodproofing structures where possible. Facilities located at the port that are not dependent upon handling vessel traffic or dealing with cargo should be relocated to less flood-prone locations (i.e., redistribution centers, manufacturing operations, and the U.S. Postal Service). The County can consider relocating the City of Tampa Water Treatment Plant where it would be less susceptible to flooding, which could result in contamination.

As the PDRP is implemented and expanded, the vulnerability of County infrastructure to sea level rise is an important issue that should be analyzed and incorporated into future action plans. The County could look for ways to mitigate its structures and public

facilities against sea level rise and rank these projects as high priority in the LMS, LRTP, and individual facilities' redevelopment plans.

Issue #5: Communication and coordination among agencies, jurisdictions, and stakeholders

There are many agencies, companies, and jurisdictions involved in providing infrastructure, public facilities, and utility services. Before and after a disaster, these private and public entities need to establish communication and coordination procedures to make sure that long-term recovery and redevelopment occurs in an efficient and organized manner. Each agency or company should have their own recovery plan; however, coordination and communication are critical, if any opportunities for directing redevelopment are to be taken. For instance, prioritizing and sequencing recovery efforts in priority redevelopment areas or providing needed temporary services will best be done with all infrastructure stakeholders working together as well as with the other PDRP technical advisory committees.

Strategy

Whenever possible, dialogue and coordination between agencies, jurisdictions, and stakeholders should begin pre-disaster so that recovery can begin with as many parties as possible on the same page. A specific opportunity for pre-disaster coordination is between the Infrastructure TAC and the FDOT to discuss post-disaster coordination and expectations related to state and local roles for transportation recovery. These meetings can serve as a forum to familiarize the FDOT with the details of the County PDRP. The two entities can also consider creating a plan to coordinate post-disaster repairs to infrastructure in the right-of-ways with repairs to the road surfaces to minimize the closing of roads while the transportation system is limited in capacity. This will help to provide holistic restoration to neighborhoods and employment centers so that whole areas can be restored to operational conditions at once rather than having only some of the services needed for reoccupation; however, it will require close coordination and agreement between agencies.

Because of the complexity of coordinating the implementation of many individual public and private entities' plans post-disaster, the Infrastructure TAC can establish a schedule and format for stakeholder coordination meetings immediately following a disaster. The TAC should also determine which communication methods should be utilized to ensure that all stakeholders are present and participating. During recovery, these meetings may need to be coordinated heavily by ESF 1, ESF 3, and ESF 12 before transitioning out of the EOC to the infrastructure TAC as long-term recovery begins. **Table 3.11** shows some of the interdependencies between the different infrastructure entities that the County can be aware of during redevelopment.

Table 3.11 Critical Infrastructure Interdependencies

Type of Inter-dependency	Energy – Electric	Energy - Gas/Oil	Water	Communication	Transportation
Energy - Electric	Highly connected and interdependent infrastructure for business and economic security	Power for control systems, pumping stations, storage, compressors, and facilities	Power for control systems, pumps, lift stations, and facilities	Power for switches and communication facilities	Power for signaling, switches, and public transportation
Energy - Gas/Oil	Fuel for heat, generators and lubricants for electric facilities	Highly connected and interdependent infrastructure for business and economic security	Fuel for treatment, heat, pumps and lift stations, and facilities	Fuel for heat, generators, and facilities	Fuel and lubricants for vehicles and facilities
Water (Potable and Wastewater)	Water for cooling and emissions control	Water for production, cooling and emissions control	Essential and highly dependent infrastructure for health and safety	Water for cooling facilities	Water transport for emergency response and construction
Communication (Landline, Cellular, Cable)	Distribution automation, EMS, and SCADA communication, and customer service and crew repair communication	SCADA communication, and customer service and crew repair communication	Control system and SCADA communication, and customer service and crew repair communication	Highly connected and interdependent infrastructure for business and economic security	Signal and control system communication, and crew repair communication
Transportation (Roads, Rail, Ports/Airports)	Transport of fuel and shipping of goods and materials, and inspection	Transport of fuel and shipping of goods and materials, and inspection	Transport of water and inspection	Transport of goods and materials, and inspection	Highly connected and interdependent infrastructure for business and economic security

Source: Geospatial Information and Technology Association, 2008.

Throughout redevelopment, the Infrastructure TAC must work closely with the other TACs while the County's infrastructure is being restored. This is particularly true in reference to the Housing Recovery TAC. The two TACs will have to manage expectations for transition from disaster relief communities back to permanent housing. Transition cannot be expected to occur faster than infrastructure is projected to be restored to all neighborhoods. This may affect some temporary housing duration requirements.

The Public Outreach TAC will be responsible for creating post-disaster milestones and goals for the purpose of tracking progress and keeping the public informed of the status of recovery and redevelopment. Like all of the other TACs, the Infrastructure TAC will need to work closely with the Public Outreach TAC to manage and communicate recovery expectations related to infrastructure restoration.