Project Information Form

Project Title	**Reducing Interactive Service Interruptions in Linear Infrastructure Systems (Transportation, Water/Sewer, Power) by Synchronizing Schedules for Appropriate Maintenance Activities**
University	Florida International University
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Funding Source(s) and Amounts Provided (by each agency or organization)	NCTSPM - $50,000 Florida International University - $50,000
Total Project Cost	$100,000
Agency ID or Contract Number	DTRT12GUTC12 NCTSPM 2013-004
Start and End Dates	11/1/13 – 05/31/15
Brief Description of Research Project	Linear infrastructure systems (roads, water/sewer/power lines) are often interdependent due to the similarities in their design purposes to provide the necessary services. Hence, they are vulnerable to possible domino effects which can impact both the health and economic well being of communities. The key impacts of bottlenecks in interdependent linear infrastructure systems (ILIS) are reduction of system reliability and oscillations in service delivery capacity. In ILIS events are linked by time and dynamics of the interactions between the systems. This research will demonstrate quantitatively infrastructure limitations (design and operation) for coastal communities, identification of critical bottlenecks for service quality and propagation of domino effects in ILIS. Objectives of this research are to: 1. Characterize service interruption profiles in ILIS; 2. Provide an dynamic analysis of interactions in ILIS; 3. Identify interactively the major events increasing the stress and service bottlenecks; 4. Develop an interactive tool to establish checkpoints for service

	quality. The following tasks will be conducted during the study. *Task 1.* Preliminary analyses *Task 2.* Identification of service interruption hazard modes *Task 3.* Profiling, classification and rating of hazard modes *Task 4.* Service quality and priority assessment
Describe Implementation of Research Outcomes (or why not implemented) (Attach Any Photos)	The integrated methodology developed can be used: 1. To develop strategies to minimize service interruptions in lifeline systems (i.e., identifying areas where agencies can coordinate maintenance schedules to maximize maintenance efficiencies to improve service quality and reduce cost), 2. For asset management for developing effective maintenance programs for infrastructure networks to improve service quality in the areas served by multiple infrastructure networks, 3. For decision-making to improve service quality under dynamic (technical, environmental, social, economic) factors, and 4. For improving service quality by smart maintenance planning for integrated transportation and water/sewer infrastructure network service and maintenance programs. Photo credits: Carline Jean, Sun Sentinel, May 8, 2007 http://www.sun-sentinel.com/news/sfl-sinkholes-photos-20130812-030,0,5153164.photo
Impacts/Benefits of Implementation (actual, not anticipated)	[*Task 1.* Preliminary analyses: Preliminary analysis work plan was developed. *Task 2.* Identification of service interruption hazard modes: This task focuses on: 1.Causes of service quality decline and interruptions, 2. Service quality and system redundancy, 3. Service quality. This task will be initiated in March 2013. *Task 3.* Profiling, classification and rating of hazard modes A rating system (metrics) for different service interruption hazard modes are being developed. A preliminary criteria was developed.

	Task 4. Service quality and priority assessment: This task has not been initiated yet.
Web Links • Reports • Project website	None yet.
Names of students who are financially supported by this grant	Bahareh Inanloo
Names of students who are participating (but not financially supported) by this project	2