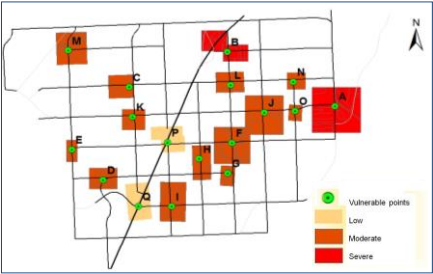




**Project Information Form**

Project Title	<b>Reducing Interactive Service Interruptions in Linear Infrastructure Systems (Transportation, Water/Sewer, Power) by Synchronizing Schedules for Appropriate Maintenance Activities</b>
University	Florida International University
Principal Investigator	Prof. Berrin Tansel
PI Contact Information	Florida International University (FIU) Civil and Environmental Engineering Department, Engineering Center Miami, FL 33174 Tel:305 348 2928 Fax: 305 348 2802 e-mail: <a href="mailto:tanselb@fiu.edu">tanselb@fiu.edu</a>
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	<p>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.</p> <p>Objectives of this research are to:</p> <ol style="list-style-type: none"> <li>1. Characterize service interruption profiles in ILIS;</li> <li>2. Provide an dynamic analysis of interactions in ILIS;</li> <li>3. Identify interactively the major events increasing the stress and service bottlenecks;</li> <li>4. Develop an interactive tool to establish checkpoints for service</li> </ol>

	<p>quality.</p> <p>The following tasks will be conducted during the study.</p> <p><i>Task 1.</i> Preliminary analyses</p> <p><i>Task 2.</i> Identification of service interruption hazard modes</p> <p><i>Task 3.</i> Profiling, classification and rating of hazard modes</p> <p><i>Task 4.</i> Service quality and priority assessment</p>
<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>(Attach Any Photos)</p>	<ol style="list-style-type: none"> <li>1. A comprehensive integrated network methodology was developed to evaluate and quantify the interactions between different infrastructure networks which included transportation and pipeline systems for water and sewer services.</li> <li>2. A paper was submitted for Presentation at the 2014 Annual Meeting of the Transportation Research Board and for Publication in the <i>Transportation Research Record</i>.</li> <li>3. An abstract was submitted for presentation at the 2014 ASCE EWRI conference in Portland, Seattle.</li> <li>4. Integrated infrastructure management case studies were incorporated into course projects and case studies in the environmental engineering program (e.g., senior design; wastewater collection systems).</li> </ol> 
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	<p><u><i>Task 1.</i></u> Preliminary analyses: Preliminary analysis work plan was developed.</p> <p><u><i>Task 2.</i></u> 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.</p> <p><u><i>Task 3.</i></u> 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.</p> <p><u><i>Task 4.</i></u> Service quality and priority assessment: This task has not been initiated yet.</p>



<p>Web Links</p> <ul style="list-style-type: none"><li>• Reports</li><li>• Project website</li></ul>	<p>None yet.</p>
<p>Names of students who are financially supported by this grant</p>	<p>Bahareh Inanloo</p>
<p>Names of students who are participating (but not financially supported) by this project</p>	<p>NA</p>