

Response to Request for Information: Integrated Master Planning

February 18, 2020



SEWER



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February 18, 2020

Patti Wallace, Purchasing Director,
Sewerage and Water Board of New Orleans,
625 St. Joseph Street, Room 131,
New Orleans, Louisiana 70165

RE: Integrated Master Planning RFI

Dear Ms. Wallace:

Waggoner Engineering, Inc., (Waggoner) is pleased to provide this response to the Sewerage and Water Board of New Orleans for Integrated Master Planning.

The following document will demonstrate the Waggoner Team's perspective on the current and future challenges that the City of New Orleans faces. Waggoner wishes to express interest in participating in this RFI process, as well as any future workshops.

Should you require more information, please feel free to reach out to your Point of Contact listed below.

Waggoner Point of Contact is as follows:

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In Closing, we appreciate this opportunity to present our qualifications and look forward to putting our team to work for the Sewerage and Water Board of New Orleans.

Sincerely,
WAGGONER ENGINEERING, INC.

Emad Al-Turk, PE
President



WHY CHOOSE WAGGONER

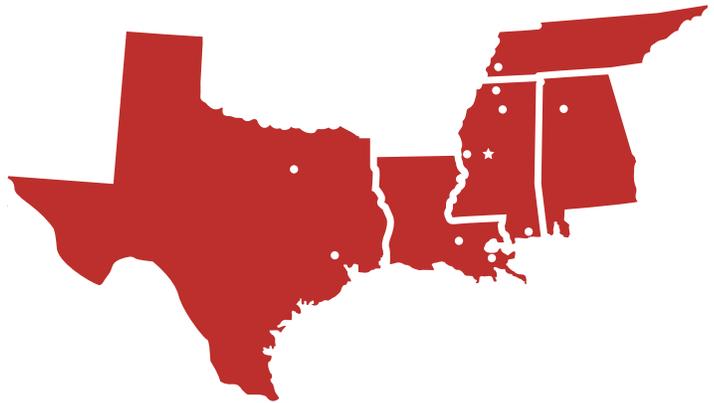
Introduction

Founded in 1976, Waggoner Engineering is one of the largest engineering firms in the Mid-South. From offices in Gulfport, Jackson, Vicksburg, Oxford and Hernando, MS; New Orleans and Baton Rouge, LA; Memphis, TN; Dallas and Houston, TX and Washington DC, our team consists of skilled professionals with decades of unique and specialized experience. Waggoner offers a full complement of engineering services in economic development, cost/benefit analysis, water resources, aviation, transportation infrastructure, coastal resiliency, environmental, civil design and planning, data collection, feasibility studies, and construction inspection and management.

At Waggoner, our services are built on over 40 years of knowledge, experience, and customer service. Our client-focused approach is what makes us one of Mississippi's premiere engineering firms. In fact, Waggoner is far more than a traditional engineering firm. We develop innovative solutions from a broad array of disciplines and strive for excellence in every project and every client engagement.

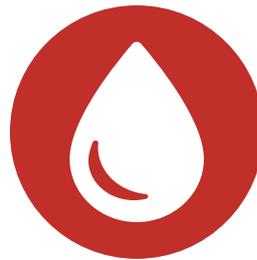
Our Staff

Every project is different, and every client's challenges must be met in unique ways. That's why Waggoner has carefully assembled a staff of seasoned professionals who are passionate about serving our clients, improving quality of life, and making positive impacts to communities. Our team consists of civil, transportation, and environmental engineers, LEED and Envision accredited professionals, planners, surveyors, economic development professionals, GIS technicians, economists, and policy experts. Drawing upon the expertise of our team members, we construct the right task force for each client's needs and work to ensure successful outcomes that exceed expectations.



Capabilities

Waggoner provides clients with a valuable combination of traditional engineering services along with unique approaches to strategic infrastructure planning and implementation. Waggoner is a reliable and innovative partner, with a proven track record assisting clients in navigating sensitive and complex environmental, regulatory, social, and cultural issues. Waggoner is pleased to offer the New Orleans Sewerage and Water Board the following broad array of capabilities and an even broader approach to implementing them.



Water, wastewater, and drainage issues are a constant challenge for communities - large and small - as well as local governments, regional entities, and private industries. Orderly growth and planned economic development now largely depend upon whether water, wastewater, and storm water providers can address these ever-increasing demands and provide cost effective and environmentally sound solutions. Waggoner has a proven track record helping local governments address water resources issues with local, regional, and federal interests.



Storm Water Management Experience

Waggoner has performed studies and designed solutions for stormwater improvements, erosion and sediment control program development, and watershed planning all over the state. More specifically, through our partnership with the state of Mississippi as a Technical Cooperating Partner, we have developed and updated the states' risk maps for over the last 13 years

Watershed and Coastal Services

Cities and counties can find themselves balancing the competing interests of promoting quality of life, economic viability, and environmental responsibility. This challenge is nowhere more pronounced than with the management of stormwater and drainage infrastructure. The complexities and unique attributes of Mississippi's abundant natural environments make solving this challenge even more compelling, given potential impacts of stormwater to human life and property, as well the fragile ecosystems and habitats that exist within our streams and coastline.

That is why Waggoner has a dedicated group of professionals focused on applying the principles of integrated watershed planning and management to the needs of our clients, whether located in the interior areas of our state or in the coastal zone. It really is about more than hard engineered culverts and storm drains. A few examples of some of our success projects are located to the right of this page.

Rankin Countywide Watershed Assessment Management Plan

Since 2017, Waggoner has been engaged in a collaborative and innovative project with Rankin County to develop and implement an integrated countywide watershed-based program to stormwater management. The project scope involved the development of a countywide watershed-based assessment and an implementable Five-Year Action Plan to address multiple water resource and infrastructure priorities. The Project helped establish a unified strategic approach to stormwater management that is innovative and transparent to stakeholders

Mississippi Gulf Region Water and Wastewater Program

As the lead firm in the Mississippi Engineering Group, Inc. (MSEG), Waggoner developed and implemented the Mississippi Gulf Region Water and Wastewater Plan (MGRWP) after Hurricane Katrina. Funded by HUD, MGRWP identified water, sewer and stormwater infrastructure needs totaling \$654 million. The plan included rebuilding and improvements to enhance economic recovery in the five lower counties of Mississippi. A key component of the plan was ensuring compliance with HUD regulations.

Jackson Wastewater Consent Decree

The City of Jackson's wastewater infrastructure is aging and needs repair. The City of Jackson hired Waggoner to help negotiate a manageable settlement with the government, which resulted in a federal Consent Decree (CD). Under the CD, Jackson has committed to make major infrastructure improvements to its sewer system to ensure that sewer overflows are substantially reduced or eliminated. As Program Manager, Waggoner is helping the City achieve these infrastructure improvements through the development and implementation of the Wastewater Infrastructure Redevelopment Program (WIRP). WIRP includes approximately \$940 million in improvements over a 17.5 year schedule.

Waggoner is pleased to submit for the consideration of the Sewerage and Water Board of New Orleans (SWBNO) the following response to the specific questions related to its various water-related business lines. Specifically, SWBNO has posed the following question of its infrastructure systems:

What will be New Orleans' biggest stormwater/drainage, wastewater/sewerage, and drinking water challenges in 50 years and what is the best approach to integrated, long-range planning to address those challenges?

Waggoner acknowledges that while each of the three business lines – stormwater, wastewater and drinking water – addresses particular needs, is subject to different regulatory and compliance measures, and faces unique challenges for the future, they nonetheless share common connections. Further, a long-term, sustainable solution to managing either must consider all three. Hence, the following is offered in the context of an integrated water resources management approach.

The Challenges



The City of New Orleans, like so many cities across the United States, is confronting seemingly insurmountable challenges in meeting its basic infrastructure needs. Decades of deferred

maintenance, combined with loss of jobs and a shrinking tax base have resulted in crumbling streets and deteriorating water, wastewater, and stormwater systems. Additionally, New Orleans has suffered the devastating effects of multiple flooding events over the past 15 years that have exacerbated these conditions. SWBNO and Department of Public Works (DPW) are compelled to spend enormous amounts of limited capital dollars addressing major maintenance issues that provide temporary patches, when these resources should be spent on capital improvements that bring long-term value.

A host of other challenges contributes to the current state of public infrastructure in cities like New Orleans.

- Absence of effective asset management across all infrastructure systems fosters reactionary operation and maintenance practices.

- Loss of jobs and economic investments places an increasing burden on a dwindling tax base to fund public services.
- Lack of systems in place to allow meaningful collection, analysis, and reporting make it virtually impossible to assess infrastructure condition and performance accurately and reliably.
- Historical reluctance to adjust utility rates on a systematic basis has resulted in deferred maintenance and deterioration of assets.
- Inconsistent and incomplete billing practices result in the loss of substantial amounts of revenue owed to operating accounts.
- Imbalance in the current public employee pay scales relative to the job market makes it difficult to attract and retain skilled workers, resulting in significant erosion of qualified staff to manage, operate, and maintain infrastructure systems.

As a result of these and other challenges, operation and maintenance of public water, sewer, and stormwater infrastructure has deteriorated into a process that is necessarily

reactionary and crisis-driven. As SWBNO and the City of New Orleans have acknowledged, many of these issues are relevant to conditions in New Orleans. And, several of these issues will continue to challenge the leadership and citizenry of New Orleans over the next fifty years. The multiple challenges associated with building, operating, and maintaining water, sewer, and drainage systems effectively and efficiently with limited public funds will always be present.

In addition to these ever-present issues, the next fifty years certainly will bring challenges that at this time cannot be completely foreseen.

- The continuing quest to understand the uncertain implications and future impacts of climate change certainly will be at the forefront. Any program whose goals include long-term sustainability must include measures to incorporate resiliency to a changing climate in its approach.
- Additionally, an uncertain regulatory environment surely will affect operation

and maintenance (and planning) of public infrastructure, presenting increasing challenges over the next generation.

- Application of technology to the development of cost-effective treatment solutions has been and will continue to be a challenge in the drinking water and wastewater treatment and disposal fields. For example, as technologies advance for monitoring and detecting constituents in water supplies, regulations commonly increase without full consideration to whether treatment capability has advanced to those same levels.

Thankfully, and to the credit of the SWBNO, the City, and even the Louisiana Legislature (through 2018 House Resolution 193), this state of affairs is beginning to be addressed in a proactive manner. The issuance of this present RFI and the purposeful and deliberate process of preparing a long-range strategic plan that will serve the next generation is a testament to the proactive leadership approach now being undertaken.

Addressing the Challenges – The SWBNO Integrated Infrastructure Program

SWBNO has posed the question, *What is the best approach to integrated, long-range planning to address the challenges of the next fifty years?*

To address these challenges and to put in place a sustainable, long-range solution to challenges both current and as yet unknown, SWBNO has identified the current planning process as described in its RFI. Waggoner commends the leadership of the City and SWBNO for their foresight in initiating this process and believes, respectfully, that an integrated infrastructure program as outlined briefly in the following pages is the only approach that will address the challenges that will confront New Orleans over the next generation. We refer to this approach as the

SWBNO Integrated Infrastructure Program (the Program).

The purpose of the Program is to provide the SWBNO with a deliberate, planned approach for funding, implementing, operating and maintaining its basic public infrastructure in a way that is sustainable for the long-term and that serves to promote and enhance the quality of life and provide appropriate levels of utility services for the residents, businesses, workforce and visitors within the City of New Orleans.

To accomplish this larger purpose the Program is intended to transform the SWBNO business model from one of crisis-driven reactivity to one of data-driven, risk-based proactivity.

The Program proposed in subsequent pages is not another master plan, study, or capital improvements program. As the RFI acknowledges, much significant work has been accomplished over the last generation analyzing systems, writing plans and identifying priorities; and, this work is not lost. A component of the proposed Program is to capture the results of these previous efforts so that as much value as possible can be gleaned from them. However, the several attributes differentiate the proposed Program from past efforts and from typical approaches to capital improvements planning as enumerated hereafter.

The ultimate outcome of the Integrated Infrastructure Program is that it creates deliberate and systematic investment of capital dollars toward improvements that return long-term value to the citizen owners of the public infrastructure.

To accomplish this ultimate outcome, specific components of the Program should:

- Coordinate and integrate allocation of resources and efforts across all systems, or business lines (water, wastewater, stormwater);
- Enable compliance with and anticipation of ever-evolving regulatory requirements that impact each business line in unique ways;
- Allow risk-based determination of capital priorities;
- Budget annual levels of capital and maintenance expenditures that will restore

the City's systems to a condition of stability and provide for a planned level of growth into the future;

- Execute strategies for funding and financing that leverage local, state, private and federal sources to stabilize cash flow demands and implement the Program's priorities;
- Build capacity within the local contracting community, so that they become participants, as prime contractors, through the implementation of this program;
- Build capacity within the City population, via internships, through vocational training and other available training efforts and partnerships, to help boost employment, elevate income levels and consistently attract and retain workers and residents in New Orleans;
- Facilitate periodic Program evaluation and adjustment based on measurable outcomes;
- Provide ongoing, meaningful information sharing with and effective feedback from the public; and
- Promote infrastructure investments that will attract economic development and enhance job creation within the City.

Waggoner respectfully proposes that a truly effective, long-range approach, the SWBNO Integrated Infrastructure Program, should include the basic components outlined hereafter, that can be undertaken individually or concurrently at the discretion of SWBNO.

Component 1 – Immediate Action Plan

This is a plan of action for the City to undertake in the immediate term (year 1 of program development), while the long-term Program is under development, that prioritizes infrastructure improvements of a critical nature and/or those which the City (or SWBNO) has already identified and programmed. SWBNO has already acknowledged and planned for accomplishing several of the following objectives in Phases 1 and 2 of its integrated planning process, described in the RFI. Incorporating and building upon the outcomes of those efforts, the Immediate Action Plan would include such goals as:

- Review of the most recent infrastructure master plans or other planning documents, current fiscal year budgets, current Capital Improvements Program (CIP), and other documents or data related to the SWBNO and the City’s infrastructure priorities.
- Preparation of a situational assessment, in a format that can be presented concisely and effectively for review with SWBNO management, summarizing the current priorities that have been planned or programmed and the status of their completion.
- Collaboration with management to review the situational assessment and to identify other projects or initiatives of immediate priority that may already have been identified or programmed for implementation.
- Development of climate change vulnerability assessment that will be the basis for the development of long range integrated plan
- Preparation of a Three-Year Plan of Consolidated Infrastructure Priorities to guide capital and maintenance spending during the initial years of the Program. This will be a summary plan report, in tabular and graphic form with limited narrative, prioritizing a three-year program of capital projects and maintenance, repair,

and replacement activities across water, wastewater, and stormwater systems.

- Development of a small-construction contractor training/mentoring program for implementation on small maintenance projects.
- Implementation of a public information and engagement strategy to raise awareness of current efforts and imminent results and to build a basis of support within the business community.

Component 2 – GIS-based Asset Management Platform for Risk-Based Assessment

The purpose is to develop and implement an enterprise GIS for SWBNO, expanding upon existing databases, that will fully integrate with the appropriate infrastructure asset management platform (either already in use or to be implemented).

The Integrated Infrastructure Program consists of three major systems, water supply, wastewater, and stormwater. And, while the City’s transportation assets are not under the responsibility of SWBNO, impacts to and from streets and roadways must be considered in a truly integrated approach. Each of these systems includes subsystems comprised of facilities or groups of facilities, which then consist of individual assets or groups of assets.

For purposes of this approach, the following definitions are employed:

Infrastructure systems – the primary systems that comprise SWBNO’s Integrated Infrastructure base, including water, wastewater, and stormwater

Subsystems – the functional sub-systems within the primary infrastructure systems, comprised of assets or groups of assets that work together to perform that subsystem’s function

Assets, or asset groups – the individual assets, or groups of assets, within each subsystem that collectively cause the

subsystem to perform its intended function. Depending, e.g., on the level of detail of a particular assessment exercise, a wastewater lift station might be considered an asset or an asset group.

Following is a preliminary tabulation that illustrates how the systems, subsystems, and assets within the Integrated Infrastructure Program might be organized for assessment and management.

System	Subsystem	Assets
Water Supply	Intake/Treatment/Pumping	Intake structures
		Treatment plants
		Wells
	Distribution	Pump/Booster stations
		Control systems (SCADA)
		Lines
	Storage	Valves
		Hydrants
		Tanks
Wastewater	Collection	Gravity sewer lines
		Manholes
		Force mains
	Transmission	Pump/lift stations
		Control systems (SCADA)
		Gravity interceptors, subinterceptors
Treatment and Disposal	Manholes	Treatment plants
Stormwater	Open Drainage	Ditches, streams
		Ponds (retention & detention)
		Bridges, open culverts
	Closed Drainage	Erosion control structures
		Pipes, closed culverts
		Catch basins, inlets, junction boxes

This task will be accomplished in three phases. Phase 1 will be the Concept Plan development. Phase 2 will be a pilot demonstration of the approved Concept Plan, using GIS data already existing at SWBNO. Phase 3 will consist of initial build out and implementation of the data model to include SWBNO's consolidated infrastructure assets, including water, wastewater, and stormwater facilities. Component 2 can begin concurrently with Component 1.

Phase 1 – Concept Plan Development

Preparation of a detailed plan for accomplishing Phase 3 – build out and implementation – would require a certain amount of initial assessment and scoping, including several tasks.

Situational Assessment – This is initial step would accomplish two things:

- Assess the current asset management platform in use by SWBNO and its applicability for integration with the proposed enterprise GIS database; and
- Accomplish an inventory and conditional assessment of data currently existing at SWBNO or DPW related to water, wastewater, and stormwater assets under SWBNO control. This effort would assess such things as the nature and use of the data; currency of available data; digital or non-digital condition; completeness of coverage for that dataset; its function as critical or non-critical; an identifiable standard of accuracy; identification of attributes and compatibility with the asset management data model; and an opinion of the effort needed to fill the gaps identified in the assessment.

In order to be most effective, this step would require collaboration with the broader community of engineering and surveying consultants (and perhaps construction contractors) who have amassed institutional knowledge and collected essential data regarding infrastructure condition and operation.

Needs Analysis

The needs analysis would involve discussions with SWBNO management to determine the various operational systems and functions and to identify the users of data; the needs and requirements for various types of data; the sources and uses of data, either existing or needed; and potential linkages with other users and functions both within and outside SWBNO's operational structure.

Concept plan

Based on the outcomes of the previous steps, a Concept Plan for the GIS framework would be developed. The Concept Plan would be reviewed with SWBNO management to develop common understanding and expectations; assist in prioritizing data needs and applications; and define more specifically the elements of the program outlined hereafter. The Concept Plan would enable development of a budget and timeline for accomplishment of Phase 2.

Phase 2 – Demonstration Pilot

Upon completion of Phase 1 and approval of the Concept Plan, Phase 2 would consist of a Pilot program to include initial development of the system incorporating GIS data already existing at SWBNO. The data model could be based on ESRI's Local Government Data Model, with the intention of integrating with City Works or other asset management platforms. The demonstration pilot would be fully functional and incorporate a standard suite of map services to allow immediate, beneficial use by staff. The demonstration pilot would also provide the opportunity to test and refine the system prior to investing significant resources in extensive data collection efforts.

Phase 3 – System Build out and Implementation

Based on the Concept Plan developed in Phase 1 and refined through lessons learned in Phase 2, Phase 3 would continue the initial build out and implementation of the GIS data model and platform for the consolidated

infrastructure assets.

Data Collection and Development

Depending on the findings of Phase 1, this element of the program would require an extensive upfront effort, as well as ongoing development, maintenance, and updating. This effort would include collection and validation of data already residing in a digital format, conversion of existing paper or other non-digital data into an acceptable digital format, field collection and generation of data not currently available, and compilation of relevant data from other available open sources.

Configuration of Map Services

As the various components of the data model are completed, relevant map services would be configured within the customized SWBNO framework. These map services could include data sets developed uniquely for SWBNO as well as data sets accessed through linkage to other enterprise or open source users. Customized map service configuration would be an ongoing functional use of the GIS database and can be accomplished by SWBNO as needed.

Custom Applications

Custom applications would allow SWBNO to use its data to fullest advantage. As the need for a particular operation or function is identified by staff, either office- or field-oriented, applications can be acquired or written to pull data from particular map services and accomplish functions for the particular user. Development of functional applications is an ongoing benefit of a properly maintained and updated GIS database and can be accomplished as specific needs arise.

Component 3 – Ten-Year Integrated Infrastructure Plan

This component can begin upon completion of Component 1 and will include preparation of a plan (the Plan) for implementing and managing SWBNO’s consolidated infrastructure assets – water, wastewater, and stormwater – built around a ten-year capital improvements program and integrating the GIS-based asset management platform. The Plan will include, as a minimum, the following components:

- A process of risk-based assessment for setting priorities among the consolidated infrastructure assets;
- A resiliency component that integrates measures in the planning and design process and modifies standards as necessary to implement infrastructure improvements that are more resistant to the impacts of a changing and unstable climate.
- A ‘rolling’ ten-year capital improvements program (CIP), to include:
 - A ten-year capital budget to implement infrastructure priorities;
 - A program of accelerated maintenance, repair, and replacement among the consolidated infrastructure systems;
 - A process for bi-annual assessment, adjustment, and reprioritization, as necessary, based on budgets, funding resources, and performance/outcomes of implemented improvements;
- Robust strategies for financing and funding strategies for implementation of the CIP, that incorporate local, state, federal and private sources;
- A public engagement, information and outreach process that builds support across the community, supports funding efforts, and provides regular feedback

on effectiveness of implemented improvements;

- A workforce training and technical assistance component to build skilled worker capacity, stimulate entrepreneurship, and create job opportunities within the City of New Orleans;
- A program to train and develop small-construction contractors; and a
- Process of establishing metrics, monitoring progress, assessing outcomes, and adjusting priorities.

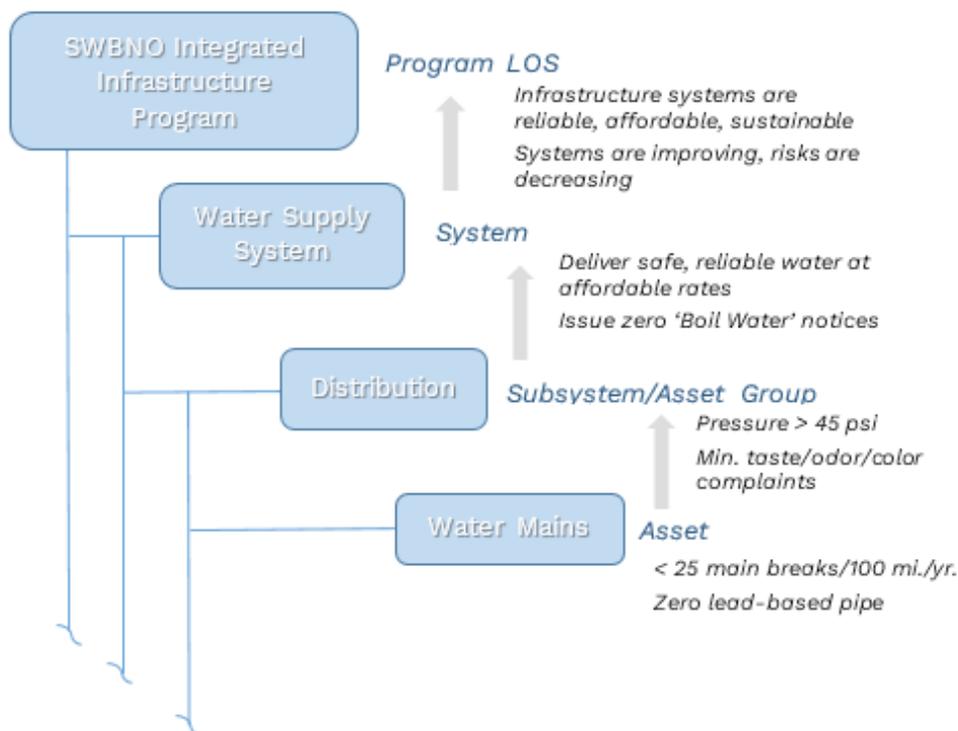
Simply stated, the overarching goal of the Program is continuous improvement of infrastructure systems and continuous reduction of risks. Capital funding is allocated to capital project priorities through an objective, systematic, data-driven process.

A key component of this process is a risk assessment approach that would allow prioritization of capital projects based on evaluation of assets within the water, wastewater, and stormwater infrastructure

systems (i.e., the integrated infrastructure systems), in terms of the risk that the asset will fail to provide a specified level of service.

For each of these systems, performance goals, or levels of service (LOS) would define what is acceptable to the SWBNO, the Department of Public Works, the regulators (both state and Federal), and the public (the citizens/customers of New Orleans). Risk assessment, then, is a measure of the likelihood and consequence(s) of an asset or system failing to meet its acceptable LOS. The level of risk that a project alleviates determines that project's ranking on the priority list.

LOS define the goals of the Integrated Infrastructure Program both qualitatively and quantitatively, from the Program level all the way down to the asset level. To this point, the overall Program can perform at an acceptable LOS only to the extent that each component system or asset performs to its acceptable LOS. The figure at right illustrates the hierarchical relationships between the systems, with examples of how LOS might be expressed for each.



Component 4 – Program Delivery

Once the Ten-Year Integrated Infrastructure Plan has been completed and adopted by the SWBNO, the Program Delivery phase would include the process to undertake the Program and implement the planned improvements. The process could include a number of components, such as those described as follows, and would require a broad collaborative effort among the consultant and contractor community, indeed the larger business community across the New Orleans area.

- **Program Management** – this component might involve the establishment of a Program Management Team to support SWBNO in implementing its Integrated Infrastructure Program.
- **Funding and Finance** – the Program would require key members of the SWBNO Program Management Team to be responsible for:
 - Assistance in identifying, potential sources of state and federal funding for the capital program
 - Preparation of financing plans
 - Preparation of funding requests and applications
 - Implementation of procedures for maintaining compliance with source-specific regulations
- **Procurement Support** – this component would include such tasks as:
 - Outreach to consultant/contractor communities via workshops and meetings to review Program forecasts
 - Maintenance of a web-based library of Program documents, guidelines, and standards
- **Capacity Building through Job Training** – This would include implementation of the capacity-building component developed as part of the Plan, which likely would include tasks such as:
 - Development of procurement documents, including RFQ/RFP
 - Pre-selection/qualification of consultants and contractors
 - Recruitment and outreach to unemployed individuals through area churches, non-profits, news media and social media outlets
 - Assessment to determine aptitude, training/job interest, education, etc. for placement in appropriate training tracks
 - Engagement of MBE, FBE and other certified private sector firms in on-the-job training strategies
 - Collaboration with existing job training programs or organizations to carry out classroom and field-based job skills education and training
 - Facilitation of job search/development/placement in collaboration with local consultants and contractors
- **Public Engagement** – Implementation of the public engagement, information and outreach component developed as part of the Plan, will likely include tasks such as:
 - Development of Program branding
 - Facilitation of community/

neighborhood meetings and listening sessions

- Publishing regular informational and progress updates for public consumption
- Development and maintenance of a web site for disseminating Program information and collecting feedback and public input

- **Project Delivery** – Implementation of the Plan will require project-level attention from DPW and its Program Management Team to accomplish such requirements as:
 - Coordination and/or preparation of design criteria and standards for use across the Program
 - Preparation of conceptual designs
 - Preparation of NEPA compliance documents, if necessary
 - Review and recommendation to DPW for approval of design, contract documents, plans and specifications submitted by engineers
 - Implementation of Project Management Controls to monitor scopes, schedules, and budgets for each project
 - Assistance in project closeout requirements from state and federal agencies

Waggoner looks forward to the opportunity to participate, if invited, in SWBNO's ongoing planning process, including the pre-planning workshops. We believe that the integrated approach identified by SWBNO for achieving its long-range planning goals is indeed the best approach to addressing the challenges to be faced over the next fifty years. And, we believe that the concepts presented in our response can contribute to the success of that approach.