SOUTH JERSEY TRANSPORTATION PLANNING ORGANIZATION

ITEM 1709-32: Approving the Selection of Michael Baker International, Inc. as the Consultant for the Ocean Drive (CR 621) Upgrades and Bridge Improvements Local Concept Development Study

PROPOSAL

At its September 11, 2017 meeting, the Technical Advisory Committee recommended that the Policy Board approve the selection of Michael Baker International, Inc. in association with WSP, Churchill Consulting Engineers (DBE), and Richard Grubb & Associates (DBE) for the Ocean Drive (CR 621) Upgrades and Bridge Improvements Local Concept Development Study.

BACKGROUND

The Request for Proposal (RFP) for the technical study was issued on Thursday, July 6, 2017. With the request, SJTPO was seeking qualified firm(s) to conduct Local Concept Development (LCD) services for Ocean Drive (County Road Number 621) from NJ Route 109 to Madison Avenue in Lower Township, Cape May County. The main objective of the LCD Phase is to identify and compare reasonable alternatives and strategies that address the requirements of the initial stages of the project delivery process, and to select a Preliminary Preferred Alternative. The Notice of Availability of Requests was sent to 197 firms.

A total of four (4) proposals were received on Wednesday, August 2nd. Proposals were reviewed and scored by the TAC-designated Consultant Selection Committee with representatives from Cape May County, SJTA, and SJTPO. Proposals were evaluated cost-blind, based on the technical approach, firm and staff qualifications, and DBE participation. Scores for each reviewer were converted to a rank, which was then averaged amongst all reviewers with **Michael Baker International, Inc.** emerging as the top-ranked firm. For this technical study, Michael Baker International, Inc. is partnering with WSP, Churchill Consulting Engineers (DBE), and Richard Grubb & Associates (DBE).

The scope of work and associated project cost was reviewed and there was no need for negotiations. Therefore, the proposed cost is **$1,250,000.00**, with 12.6% DBE participation. This technical study is a two-year effort with a contract end date of June 28, 2019.

If this contract is awarded, the SJTPO DBE/ESBE participation rate for FY 2018 would be 12.9% (including other previously approved consultant efforts in July). The attached resolution authorizes the Executive Director to negotiate minor revisions to the scope of work and fee to best advance the goals and intent of the project.

This study is to be funded through Task 18/409 with $1,400,000 in available budget. The task was amended into SJTPO's UPWP for FY 2018 earlier this year.

INTRODUCTION

Michael Baker International, Inc. (Michael Baker) has assembled a strong team with distinctly unique expertise, background, and capability to successfully deliver this high profile and important Local Concept Development (LCD) Study. The Michael Baker Team was assembled to leverage several key advantages to provide the South Jersey Transportation Planning Organization (SJTPO) and Cape May County with a quality project completed on an accelerated schedule. We will meet these goals by relying extensively on our strong project management team, our well documented LCD Study experience including our unique knowledge of NJDOT's LCD process, our successful completion of nearly all of the coastal bridge projects in New Jersey (predominately in the immediate vicinity of Ocean Drive), and with great relevancy, from the work completed by our major subconsultant WSP USA (WSP, formerly Parsons Brinkerhoff) as part of the previously completed study.

Project Management - Michael Baker's Mike Sidani will be the Project Manager with assistance from Jim Yeager serving as Deputy Project Manager. Mike and Jim bring unparalleled experience from their recent management of the Oceanic Bridge LCD Study for the North Jersey Transportation Planning Authority (NJTPA) and Monmouth County. They are currently in the final stages of completing the Monmouth County Oceanic Bridge (S-31) LCD Study where they have refined a project approach that will help to streamline project delivery on Ocean Drive. Their recent experience and collaborative efforts on the Oceanic Bridge project will enable greater efficiency and more robust management of the scope of work for the Ocean Drive project. In addition, Mike Sidani has successfully delivered the largest coastal bridge project in the history of New Jersey, the $400M Route 52 Causeway. These examples are just a few advantages that Mike offers on this project.

The LCD Process - In addition to the Oceanic Bridge LCD Study, the Michael Baker Team has documented success completing a number of LCD studies over the past 20+ years. Our practical experience is reinforced by Michael Baker's staff experience working with the NJDOT Project Management Office in the development of their current project delivery process. Over a period of six years, Michael Baker had staff on-site at NJDOT developing the current Capital Project Delivery Process and continues to work with the Department as they identify additional opportunities to streamline the process. Michael Baker additionally worked closely with the NJDOT Local Aid office in the development of the Local Public Agency Manual which directs the process for advancing projects through Concept Development, Preliminary Engineering, and Final Design, and ultimately through the construction administration process. Coordination with environmental agencies is an integral part of the LCD process and the Michael Baker Team has intimate familiarity and a trusting relationship with key leaders from these agencies.

Relevant Experience - The Michael Baker Team has unmatched experience with advancing the replacement of coastal bridges and water crossing bridges in New Jersey, including the following;

- Ocean Drive (CR 621) Upgrade and Bridge Replacements – Alternatives Analysis Report
- Route 52 Causeway Replacement – Final Scoping, Preliminary and Final Design
- Monmouth County Oceanic Bridge (S-31) – Local Concept Development Study
- Garden State Parkway Great Egg Harbor Bridges – Concept Development, Preliminary Design, and Environmental Permitting
- I-95 Scudder Falls Bridge over the Delaware River Replacement – Preliminary Engineering and Final Design
- Avalon Boulevard Bridge Rehabilitation and Widening – Final Design
- Nacote Creek Bridge – Feasibility Assessment and Design
- Route 50 Tuckahoe River Bridge – Final Design
- Ohio Avenue Bridge over the Penrose Canal
- Route 4 Bridge over the Passaic River – Concept Development
- Emergency Repairs to the Townsends Inlet Bridge
- Route 72 Bridge over the Manahawkin Bay – Concept Development/Feasibility Assessment, and Final Design
- Garden State Parkway over Mullica River

- Rehabilitation of CR 619 Bridge over Great Channel
- Ocean City Longport Bridge Replacement – Preliminary and Final Design
- Rehabilitation of the Route 35 Bridge over the Manasquan River - Preliminary and Final Design
- Rehabilitation of Roosevelt Boulevard Bridge

The Michael Baker Team brings this extensive experience and know how developed through the successful completion of studies and design on coastal bridges in New Jersey with issues directly aligned with the issues which will be addressed on the Ocean Drive Project.

The Team - The Michael Baker Team includes WSP USA (WSP, formerly Parsons Brinckerhoff), that provides intimate familiarity of the area, as well as specific knowledge of the previous work performed on the Ocean Drive project. As part of the previous study, WSP staff addressed technical elements including; the Identification of Substandard Conditions, Environmental Studies, Geotechnical Investigation, Alignment Development, and Public Outreach. All of these elements were documented in an Alternatives Analysis Report completed in January 2004. WSP staff who completed the document will provide the benefits of their knowledge of the Ocean Drive (CR 621) project to assist the Michael Baker Team in advancing the LCD Study efficiently and aggressively starting on Day One.

Michael Baker and WSP also enjoy a strong collaborative working relationship and have worked together successfully on numerous projects previously. Starting with the Route 21 Viaduct Replacement project in Newark, NJ many years ago, and continuing currently with the advancement of the Pulaski Skyway project, Michael Baker and WSP have an established working relationship and procedures for efficient project delivery including office locations that are a 5-minute drive from each other in Hamilton and Lawrenceville and in adjacent buildings in Newark, NJ. The Team of Michael Baker and WSP is currently advancing the Marine Transportation System Planning Agreement for the NJDOT Office of Maritime Resources.

Overall - This Team has the technical and project management skills, direct project related experience, strong understanding of the LCD Study process, coastal bridge experience, and intimate knowledge of the previous Ocean Drive project. The Michael Baker Team has extensive Cape May County expertise and working relationships which will enable us to hit the ground running on day one with the goal of delivering a well-established Project Purpose and Need, a full range of prudent and feasible alternatives, an alternatives comparison process which provides the appropriate focus on the important issues, and delivers an appropriate, supportable, permittable, and buildable Preliminary Preferred Alternative within fifteen months of Notice to Proceed.

PROJECT UNDERSTANDING

Michael Baker understands that on behalf of Cape May County, the SJTPO is seeking to engage the services of a consulting engineering firm to perform a LCD Study for Ocean Drive (CR 621) Upgrades and Bridge Improvements from NJ Route 109 to Madison Avenue in Lower Township, Cape May County as part of the SJTPO FY 2018 Unified Planning Work Program. The major objectives of the LCD Phase are to develop a well-defined and justified Purpose and Need Statement focused on the primary transportation needs to be addressed and to identify and compare prudent and feasible alternatives, which will include bridge replacements, rehabilitation, and 'no-build' alternatives. Following a rigorous alternatives development and evaluation, and public outreach process, the effort will culminate in the recommendation of a Preliminary Preferred Alternative (PPA) and advancement of the project to the Local Preliminary Engineering (LPE) phase.

The Ocean Drive causeway has linked the communities of Cape May and the Wildwoods (the Cities of Wildwood and North Wildwood, Wildwood Crest and West Wildwood Boroughs, and Diamond Beach, Lower Township) since 1941. The project limits consist of a 2.7-mile stretch of roadway between NJ Route 109 and Madison Avenue. This route provides a critical link and coastal evacuation route that connects NJ Route 109 and access to the mainland and Garden State Parkway with the barrier island containing the Wildwoods, a popular summer attraction and economic center. This length of roadway includes three bridges over Mill Creek (300' concrete T-beam bridge), Upper Thorofare (350' concrete T-beam bridge), and Middle Thorofare (1,039' that includes a movable bascule span). The Middle Thorofare Bridge serves as the 'southern gateway' to the Intracoastal Waterway in New Jersey.

KEY ISSUES

Currently, portions of Ocean Drive are below the 100-year flood zone elevation, and prone to occasional flooding. As it exists today, the roadway could become impassible in a hurricane or significant storm event. Much of the roadbed was constructed at an elevation of 7.5' on fill in 1940 and has settled to an approximate elevation of 6', well below the 100-year flood elevation (11' per the current FEMA Flood Insurance Rate Maps). This presents a major concern as Ocean Drive is a designated emergency coastal evacuation route for the southern end of the Wildwoods. According to a US Army Corps of Engineers report, Cape May County is one of the ten most difficult areas in the United States to evacuate during a hurricane landfall. Ocean Drive is also an important linkage which provides access to the commercial fishing facilities on the mainland side, one of which is considered to be the third largest fishing seafood processing facility on the entire eastern seaboard.

Each of the three bridges within the project limits are structurally deficient and functionally obsolete due to low sufficiency ratings and narrow widths, respectively. Due to its poor condition, the Middle Thorofare Bridge has been downposted, restricting loads to 15 tons, prohibiting bus and truck traffic.

Additionally, the width of the bascule bridge opening is 50', limiting larger vessels from entering the Intracoastal Waterway. These deficiencies restrict the growth of the nearby commercial fishing industry due to vehicle and vessel size restrictions. The narrow bridge opening has also contributed to three to four large vessels per year colliding with the bridge as they attempt to navigate the channel. The collisions have resulted in the bridge being closed for costly and inconvenient emergency repairs.

Since the Middle Thorofare Bridge is movable, it experiences 20 to 40 openings per day for the passage of maritime traffic including Cape May's commercial fishing fleet. These openings, which last about 10 minutes each, cause between 200 and 400 minutes of roadway closures each day, causing significant negative impacts to the capacity of this critical travel link. During the summer months, the vehicle demand during peak periods far exceeds the roadway capacity, resulting in unacceptable levels of service and reduced air quality.

Ocean Drive traverses through a very environmentally sensitive area consisting largely of tidal waterways, coastal wetlands, public lands, and habitat for numerous state and federally listed species and is also considered a major migratory bird pathway. Additionally, numerous cultural resources are also present in the study area. The NJ State Historic Preservation Office has identified the Middle Thorofare Bridge as eligible for listing on the National Register of Historic Places.

These and additional key issues are shown on Figure 1: Key Issues (included at the end of this Narrative) and discussed in detail throughout our technical approach.

PREVIOUS EFFORTS

The Ocean Drive Upgrade and Bridge Replacement effort was the subject of an earlier comprehensive scoping endeavor. In 1999, Michael Baker Team member, WSP USA (WSP, formerly Parsons Brinckerhoff) was selected to perform a scoping study for the Mill Creek and Upper Thorofare portion of Ocean Drive. The intent of the project was to raise the roadway elevation above the 100-year storm elevation, at the time, to a flood elevation of 9 feet. In 2002, the study was extended to include the Middle Thorofare Bridge and to rehabilitate/replace the functionally obsolete bridges. The study developed a range of horizontal alignments and considered both a low-level movable bridge over Middle Thorofare as well as high-level, long-span alternatives. Based on the Alternatives Matrix, the recommended PPA would not only satisfy the project needs but does so while minimizing various impacts including those to the sensitive environmental, cultural, and socio-economic aspects of the area.

The effort culminated in a 2004 *Alternatives Analysis Report, Ocean Drive Upgrade and Bridge Replacements, County Road 621, Lower Township, Cape May County, NJ*, prepared by WSP and the selection of a PPA. The PPA selected was a high-level, long-span alternative with an alignment that was to the south of the existing Middle Thorofare Bridge. Before the project was able to advance, the US Fish & Wildlife purchased a parcel of land where the PPA was proposed. As a result, the selected PPA is no longer a viable option and Cape May County has requested a new LCD Study be completed.

The invaluable experience and lessons learned from WSP's past project will be leveraged during this effort, making the Michael Baker Team well-positioned to assist SJTPO to complete this LCD Study efficiently and expeditiously and advance the project through the Local Concept Development Process.

OUR STUDY APPROACH

The SJTPO's Local Project Delivery Process is intended to advance the goals of the SJTPO Regional Transportation Plan 2040. This process advances projects in a process similar to the Capital Project Delivery Process recently adopted by the NJDOT. Adhering to the prescribed process is vitally important for the project to be considered for Federal funding opportunities.

Michael Baker is uniquely familiar with NJDOT's Capital Project Delivery Process and has provided on-site engineering consulting services to assist in developing a more efficient, logical and comprehensive Project Delivery Process. As a result of this experience, Michael Baker is intimately familiar with the inter-relationships between the activities required to complete a LCD Study, providing the knowledge which will allow the Michael Baker Team to advance appropriate tasks concurrently, identify critical path tasks, and understand the impacts delayed activities will have on the overall schedule.

The LCD process requires a number of critical activities, including the review of existing conditions and needs assessment, the identification of project stakeholders, development of a purpose and need statement, extensive public outreach, inventory of environmental and regulated resources, development and analysis of alternatives, determination of the required National Environmental Policy Act (NEPA) level of review, and the selection of a PPA. Michael Baker, in coordination with SJTPO, Cape May County and NJDOT (the Project Team), will determine the level of NEPA documentation (i.e., Categorical Exclusion(s), Environmental Assessment with FONSI, or Environmental Impact Statement) for the next phase of work.

In addition to our staff's expertise and familiarity with the procedures of the standard project delivery process, the Michael Baker Team recognizes that each project comes with a set of unique design challenges and constraints. The Michael Baker Team's technical staff is aptly qualified and well-suited to tackle the complexity and sensitivity of these challenges. Collectively, Michael Baker and WSP have successfully designed the majority of the coastal bridges in New Jersey, including the Route 52 Causeway Bridge in Ocean City and Somers Point, Great Egg Harbor Bridge, NJ Route 50/Tuckahoe River Bridge, Route 72 over Manahawkin Bay, the Garden State Parkway over Mullica River, and Route 35 Bridge over the Manasquan River. Michael Baker has successfully completed over 50 Concept Development Studies/Feasibility Assessment Studies over the past 25 years which follow the New Jersey Department of Transportation (NJDOT) and Federal Highway Administration (FHWA) capital project delivery process. Together, this team has developed a technical approach that is cost efficient, streamlined and consistent with federal requirements. Throughout this proposal, we will identify strategic opportunities to reduce task durations and in turn, person-hour estimates.

The following concerns specific to the scope of the Ocean Drive LCD Study were identified and considered in the development of Michael Baker's technical approach to the project:

- Addressing functional and structural deficiencies of existing structures and roadways including substandard roadway design elements, bridge load rating, and the existing narrow (50 foot wide) channel opening width
- Considering the benefits and drawbacks of replacing the existing movable Middle Thoroughfare Bridge with a fixed structure
- Right-of-way and access impacts to adjacent property owners
- Accommodating the seasonal travel demands of the region including vehicular, non-motorized, and maritime traffic
- Environmental constraints due to the proximity of the project to protected habitats and cultural resources
- Hydrological constraints including accommodating a major coastal evacuation route and designing to an elevation above the 100-year floodplain
- Achieving public consensus by addressing the needs of and considering the impacts to the adjacent community and stakeholders affected by the project, including relevant public agencies, local businesses and property owners, the US Coast Guard, and the US Fish and Wildlife Service.
- Obtaining federal funding by advancing the LCD Study in compliance with FHWA, NJDOT, AASHTO and MUTCD guidance and standards
- Addressing SHPO concerns related to Historic Bridges and/or view impacts for Historic Districts
- Maintaining access to existing commercial fishing industry facilities during and post construction

- Preparing an updated Navigational Impact Report
- Establishing navigable channel vertical clearance requirements of fixed bridge alternatives

The Michael Baker Team also recognizes that many of the critical activities required for the LCD Study were completed as part of the 2004 Alternatives Analysis Study. Where possible, data, analysis, and conceptual alternatives will be reevaluated from the 2004 Study and used for this LCD Study; however, as over a decade has passed since the completion of the 2004 study, there have been a number of changes which could impact the selection of a PPA including:

- Updated Design Manuals and standards
- New construction techniques and materials
- Changes in property ownership, specifically regarding United States Fish and Wildlife protected lands
- Changes in Base Flood Elevation levels
- New and updated and new state environmental regulations including the Flood Hazard Area Control Act Rules (N.J.A.C. 7:13) and Stormwater Management Rules (N.J.A.C. 7:8);
- Additions to the threatened or endangered species list (Atlantic Sturgeon)
- Updated guidance for developing a Navigation Impact Report
- Changes to the needs of the local businesses, industries, and residents
- Changes to regulatory agencies' focus, interpretations, and staff

As will be demonstrated in this proposal, the members of the Michael Baker Team, Michael Baker, WSP USA (WSP), Churchill Consulting Engineers (Churchill), and RGA, Inc. (RGA), each have significant experience leading or contributing to the successful completion and advancement of LCD studies in New Jersey for NJDOT, MPOs, and Counties. Based on our experience with other coastal bridges, our team fully understands the unique challenges and constraints. As demonstrated through our Team's relevant experience, Michael Baker has employed creative structural design techniques, focused on right-sizing project elements, minimized structural footprint, and developed innovative construction staging to deliver projects ahead of schedule, under budget, and limiting community, commercial, and environmental impacts. Given the complexities identified above and other challenges, the Michael Baker Team presents a technical approach that leverages expertise, experience and lessons learned from previous coastal bridge concept development, preliminary engineering, and final design projects to achieve the study goal of selecting and advancing a PPA that addresses the primary transportation and environmental needs, is supported by the public and local officials, and is in compliance with the required standards and guidance to obtain federal funding.

TECHNICAL APPROACH

The Michael Baker Team's Technical Approach complies with the NJDOT Local Concept Development Process. The required activities are presented in five major tasks that reflect broad categories of work, some of which will occur throughout the duration of the LCD process. The five major tasks are:

1. Public Outreach
2. Data Collection
3. Alternatives Analysis
4. Documentation
5. Project Management

TASK 1: PUBLIC OUTREACH

Public outreach and community involvement is an important part of LCD, particularly for bridge replacement projects that can impact access, viewsheds and/or require a detour during construction. The Michael Baker Team understands the importance of identifying and coordinating with local officials, community stakeholders, and the general public to develop a context sensitive design, and avoid project delays. Michael Baker has extensive experience facilitating public outreach efforts and community

involvement events starting in Concept Development and continuing through construction. Michael Baker is currently facilitating robust public outreach efforts for the Oceanic Bridge LCD Study and for the PE/FD phases of the entire Pulaski Skyway Rehabilitation Program, Contracts 5-9.

A. Public Involvement Action Plan

Michael Baker is committed to an open Concept Development process which allows ample opportunity for the community, stakeholders and the Project Team to share information and voice concerns. The first step to achieve this goal is to develop a comprehensive Public Involvement Action Plan (PIAP). The PIAP will include traditional and innovative techniques and strategies for communicating information and soliciting feedback from project stakeholders and the public during the concept development process through construction. Where possible, public involvement efforts completed under the earlier Alternatives Analysis Study will be incorporated and updated. Michael Baker will work to build off of the established stakeholder list and public outreach process findings, incorporating knowledge and expertise that have already been gained so that the study may move forward with the involvement of all affected parties.

The content of the PIAP will include a database of known stakeholders and an outline of anticipated meetings with elected officials, stakeholders and/or the general public. It will also detail public outreach techniques to solicit community feedback, potentially including social media, paper and online surveys, and a project website, and will identify community concerns and strategies to address those concerns. A community profile will also be developed and included as a supplement to the PIAP. The PIAP will be reviewed periodically throughout the concept development process and be updated or revised as needed to maintain open lines of communication with stakeholders and the communities. A draft PIAP will be submitted to the Project Team for review. The draft document will be revised to address Project Team comments and a final version of the document will be provided and uploaded to the project SharePoint site.

B. Local Officials Meetings

To provide opportunity for input from local officials representing municipalities potentially impacted by the project, the Michael Baker Team will, in coordination with the Project Team, coordinate, schedule, and lead four (4) local officials meetings. Local Officials Meetings (LOMs) are an essential task used to encourage input and support from local officials and secure buy-in of alternatives considered and the PPA. It is anticipated that local officials from Cape May County, Lower Township, the City of Cape May, and the Wildwoods will be invited to participate. Local officials from these municipalities will also be invited to participate in Stakeholder Meetings and Public Information Centers. The following describes the anticipated topics and timing of Local Officials Meetings:

- Meeting 1: Project Kickoff – Introduce project and LCD process to local officials
- Meeting 2: End of Data Collection Task – Review Project Fact Sheet, present the draft Purpose and Need Statement, and solicit feedback that will be incorporated in the final Purpose and Need Statement
- Meeting 3: During Alternatives Analysis – Present range of alternatives and solicit feedback that will be incorporated into the draft PPA
- Meeting 4: End of Alternatives Analysis Task – Present the recommended PPA and solicit feedback that will be incorporated into the selected PPA

C. Stakeholder Coordination and Meetings

The Michael Baker Team will, in coordination with the Project Team, identify and reach out to potential project stakeholders. Stakeholders will include concerned and/or affected community organizations and residents, environmental groups, local business organizations, local bicycle and pedestrian advocacy groups, first responders, and other agencies. The Michael Baker Team will coordinate with project stakeholders to obtain input on the project Purpose and Need and developed alternatives. It is anticipated that three (3) Stakeholder Meetings will be held during the LCD process. The format of these meetings are anticipated to be a formal presentation followed by a question and answer session. The following describes the anticipated topics and timing of Community Stakeholder Meetings (CSMs):

- Meeting 1: End of Data Collection Task – Introduce the project and public involvement in the LCD process, Review

Project Fact Sheet, present the draft Purpose and Need Statement, and solicit feedback that will be incorporated in the final Purpose and Need Statement

- Meeting 2: During Alternatives Analysis – Present range of alternatives and solicit feedback that will be incorporated into the draft PPA
- Meeting 3: End of Alternatives Analysis Task – Present the draft PPA and solicit feedback that will be incorporated into the final PPA

In addition to meetings, stakeholder outreach will occur regularly throughout the LCD Study. A stakeholder survey will be developed and distributed to stakeholders and made available to the general public via the project website and/or social media. Stakeholders and the public will have the opportunity to provide comments, feedback, and opinions and voice concerns through the project website or social media. Results of the survey will be analyzed to obtain input and determine primary concerns of stakeholders. Stakeholders will be given the opportunity to participate in surveys.

The Michael Baker Team has significant experience working with stakeholders throughout the planning and design process. As part of the Hackettstown Mobility Improvements Concept Development Study for NJDOT, improvement concepts were revised to reflect the concerns of local businesses and the Hackettstown Historical Society. For the Route 52 Causeway Replacement Project, Michael Baker established a task force during the final scoping phase to allow community feedback for aesthetic design, mobility, circulation, and the environmental process. The Michael Baker Team understands community involvement and ultimately, community approval, is paramount to a successful project.

D. Public Information Centers

The Michael Baker Team will, in coordination with the Project Team, coordinate, arrange, prepare for, facilitate, and document Public Information Centers (PICs). Public Information Centers will be open to all interested parties, and local officials and stakeholders from affected municipalities will be encouraged to attend. The Public Information Centers will follow the format as specified in the PIAP. The format options could include an informal open house session, formal presentations, or a combination of both. The centers could also be a standalone event or can be facilitated as part of another community event to reach larger percentages of the community. The Michael Baker Team will utilize the stakeholder list compiled in the PIAP as the initial channel for notifying the general public of the Public Information Centers. The Michael Baker Team will also work with impacted municipalities and Cape May County to post meeting notices on their respective websites and in public places. It is anticipated that six (6) Public Information Centers will be held: one on either side of the project limits (in Cape May and the Wildwoods) at three times during the LCD Study. The following describes the topics and timing of anticipated Local Officials Meetings:

- Meeting 1: End of Data Collection Task – Introduce the project and LCD process, Review Project Fact Sheet, present the draft Purpose and Need Statement, and solicit feedback that will be incorporated in the final Purpose and Need Statement
- Meeting 2: During Alternatives Analysis – Present range of alternatives and solicit feedback that will be incorporated into the draft PPA
- Meeting 3: End of Alternatives Analysis Task – Present the draft PPA and solicit feedback that will be incorporated into the final PPA

E. Agency Consultation Meetings

To provide opportunity for timely input from regulatory agencies, the Michael Baker Team will, in coordination with the Project Team, establish a technical work group with outside public agencies. The technical work group will consist of representatives of the following agencies:

- US Army Corps of Engineers Regulatory Program Philadelphia District
- NJ Department of Environmental Protection including Division of Land Use Regulation, Division of Fish and Wildlife Endangered and None-Game Species Program, and State Historic Preservation Office.
- National Oceanic and Atmospheric Administration National Marine Fisheries Service

- US Fish and Wildlife Service NJ Field Office and Cape May Wildlife Refuge
- US Coast Guard Bridge Program District 5
- US Environmental Protection Agency
- Federal Highway Authority

The Michael Baker Team is intimately familiar with the above agencies, and has coordinated extensively with agency leadership throughout the development of design on past projects in the area. It is anticipated that four (4) quarterly meetings will be held with the regulatory agencies. These meetings will be used to encourage agency input and secure buy-in of the PPA. Additional meetings will be held with individual agencies, as needed, to address specific concerns. Prior to scheduling the meeting the Michael Baker Team will meet with the SJTPO and the County to develop agendas and review materials.

The anticipated agenda for the four technical work group meetings will generally be as follows:

- Project Introduction and Review Purpose and Need
- Review and Input on Project Alternatives
- Selection of Preliminary Preferred Alternative and Review Permit Requirements
- Review and Develop Mitigation Strategies and NEPA Classification

F. Resolutions of Support

The ultimate goal of the public outreach effort is to generate support in Cape May County and Lower Township, from the stakeholders and residents, culminating with each municipality adopting a resolution of support for the PPA. The Michael Baker Team will support SJTPO and Cape May County by developing and delivering a presentation (Town Hall Presentation) for use at Township and County board meetings and providing relevant information and materials necessary to obtain the resolutions of support. It is anticipated that the project sponsor (Cape May County) will provide a resolution of support for the PPA as well.

G. Public Outreach Summary

The Michael Baker Team will document all public outreach efforts performed during the concept development study and include them as part of the Concept Development Report. The documentation will include meeting minutes, presentation materials, written and oral comments, community feedback, correspondence and the resolutions of support for the PPA.

H. Project Website and Social Media

To maintain open lines of communication throughout the study, a public facing project website will be developed. The website will provide information about the project status, ongoing work, and upcoming public meetings. The website will also be used to provide community access to project online surveys (developed as part of the Stakeholder Coordination subtask) and survey results, as well as project information, including fact sheets, presentations, and upcoming meeting notices. The Michael Baker Team will also monitor the website's usage and traffic utilizing Google Analytics or a similar program. Google Analytics tracks and reports what website visitors are clicking and how long and how often users visit. The Michael Baker Team will report on website activity monthly. Michael Baker developed public outreach including a website for the Transportation Matters – A Plan for South Jersey, SJTPO's 2040 Regional Transportation Plan Update.

In addition to a project website, the Michael Baker Team will develop a social media plan to leverage the use of social media as another public outreach channel throughout the LCD process. Michael Baker's innovative outreach has included utilization of a Twitter account to notify followers of public meetings, construction updates, and traffic incidents along potential diversion routes on behalf of the NJDOT for the Pulaski Skyway Rehabilitation Program. For this study, social media including Facebook, Instagram, and Twitter can be used to keep stakeholders and community members informed about upcoming meetings and study progress. At the end of the concept development study, the Michael Baker Team will turn over all website and social media account materials and any information needed to access and maintain them, to the Project Sponsor.

Task 1 Deliverables

- Public Action Plan for the project

- Community Profile
- Meeting materials including handouts, surveys, presentations, and display boards for all meetings
- Meeting minutes for all meetings
- Four Local Officials Meetings
- Three Stakeholder Meetings
- Six Public Information Centers
- Four Agency Consultation Meetings
- One Town Hall presentation
- Resolutions of Support from Lower Township and Cape May County
- Public Outreach Summary for the project
- A Project Website and Social Media Plan for the project
- Monthly website statistic reports for the project

TASK 2: DATA COLLECTION

To the extent possible, the Michael Baker Team will use data collected during the previous 2004 WSP study and leverage team member WSP's uniquely intimate knowledge of the project to complete data collection and provide a thorough, efficient existing conditions analysis ahead of schedule. Additionally, in anticipation of being selected for this LCD Study and recognizing that time-sensitive data must be collected during the peak summer travel season, the Michael Baker Team began collecting traffic data in early August 2017 to obtain essential peak data that would otherwise need to have waited until summer 2018 to obtain. Through these previous and preemptive efforts, the Michael Baker Team will be primed and ready to initiate execution task activities immediately following notice to proceed. Efforts include obtaining and reviewing existing documentation, verifying, validating and updating, as needed, previously collected project mapping and survey, review and update the Environmental Screening Report, and evaluate site deficiencies. The information will be summarized in an Existing Conditions Report and serve as a primary resource in developing the project formal Purpose and Need Statement.

A. Obtain and Review Existing Documentation

In addition to reviewing the previously completed report, the Michael Baker Team will collect existing data, plans and studies of the project area from the various project stakeholders. This information may include:

- Tax and Right-of-Way Maps
- Research and obtain Deeds
- Zoning and Flood Maps
- Jurisdictional Agreements and Maps
- As-Built and Site Plans
- State and Local Master Plans and Land Use Studies
- Utility Maps
- Traffic Reports and Studies
- Structural Inspection Reports and Inventory and Appraisal sheets
- Straight Line Diagrams and Other Roadway Inventory Data
- Drainage Maps, Soil Surveys and Geodetic Surveys
- Hydrological and Hydraulic Data Reports
- Environmental Landscape Data, Reports and Studies
- Demographic profiles/Environmental Justice Maps and Data

Michael Baker will meet with project stakeholders to gather information relative to issues or problems that they think should be considered in this assessment. Issues that may be identified through this interview process include areas that flood or have poor drainage, unstable embankments or erosion, reoccurring maintenance requirements, issues relating to emergency evacuation needs, first responder access or circulation concerns, needs for improved directional signage, or other issues that may not be obvious to the Project Team. Michael Baker will also obtain data from State, regional, county, and municipal agencies as appropriate.

B. Project Mapping and Survey

Michael Baker Team member, Churchill Consulting Engineers (Churchill), will lead the efforts to validate, verify, and update the survey data obtained in the previous Alternatives Analysis effort, as needed. A preliminary review of the existing mapping against current aerial photography indicates that all areas remain unchanged, with the exception of the Ocean Drive and Route 109 intersection. By utilizing the existing mapping as a base, a tremendous saving in time, survey field work, and costs is achieved.

Churchill will apply ground based surveying and mapping to reflect current conditions by updating and supplementing the previous Concept Development Phase mapping. Equipment with the latest technologies will be efficiently utilized to perform accurate ground based survey and provide positioning of aerial control on universally held datums. Digital scanning capabilities will offer an opportunity to provide a quick and detailed survey grade point cloud for existing improvements that cannot be surveyed conventionally. Churchill will execute fieldwork to achieve unattained mapping details or verification that can eliminate inefficient drafting. An online FTP site will be established to allow the direct exchange and real time assessment of digital data between our field crews and office personnel. Churchill has the state-of-the-art tools and the experienced personnel to satisfy all anticipated survey requests.

Mapping will meet or exceed National Map Accuracy Standards, comply with the NJDOT Photogrammetry Manual, and conform to NJDOT Article 51.

Field surveyors will perform on-site field edits of the photogrammetric base mapping to identify any missing and/or reconstructed surface features. Churchill's field surveyors will perform supplemental observations, as required, utilizing the control network previously established, a combination of RTK GPS, conventional total station, and high definition laser scanning. The supplemental observations will include identification of existing features (i.e. signs, fences, ground surface types, building types, etc.), surface utilities (i.e. valves, utility poles, hydrants, etc.), and additional ground locations in areas not visible from aerial photography (i.e. top and bottom of curbs, edge of pavements, sidewalks, etc.). Churchill will locate underground utilities by noting the painted markings and flags placed by utility entities. Also, the approximate horizontal locations of overhead wires will be sketched.

All surveying activities along roadways will be performed under an approved NJDOT Access Permit and the necessary Maintenance and Protection of Traffic.

Churchill will obtain record mapping by submitting requests to applicable agencies for information, performing County research, utilizing existing Right-of-Way (ROW) mapping, and reviewing local tax maps. These documents will be evaluated and will assist the field crew in identification of existing monuments. The locations of ROW and parcels will be defined and based on a combination of the recovered monumentation and the deeds/documents received. Adjacent property lines will be depicted by available parcel data from the NJ State Geographic Information Network and cross-checked against municipal tax assessment maps. Parcel lines, ROW lines, and centerline geometry will be overlaid on the topographic mapping. All established baselines will be provided from our documented research. Churchill will provide a table of baseline stations, geometric coordinates (PC, PCC, PT, and PI), equation stations, and ties in DGN format. Tie sketches of all secondary control traverse points set in the field will also be included.

Churchill will map historic Tidelands from NJDEP GIS data. Locations of existing Tidelands instruments (grants, licenses, etc.) will be researched through the Bureau of Tidelands and mapped accordingly. Furthermore, Tidal datums will be surveyed in the project area and provided in table form.

C. Environmental Screening

The Environmental Screening will be led by Steve Bolzano from WSP with support from Becky Traylor of Michael Baker. Steve Bolzano oversaw the original screening and is intimately familiar with the site. Under the direction of NJDOT-BEPR, the team will identify existing environmental and cultural resources within the project limits based on available data, site visits and consultation with stakeholders. It is the intent of this investigation to identify environmentally sensitive areas and State/Federally regulated areas. The culmination of this investigation will be the preparation of an Environmental Screening Report (ESR). Having collaborated with the NJDOT-BEPR on the development of the environmental process for local aid projects, the Baker Team is intimately familiar with the requirements for the ESR and has extensive experience in identifying and documenting regulated resources.

The consultant team will compile and review all prior technical studies, including, where available:

- Cultural Resources Study
- Ecology/Wetlands Report
- Hazardous Materials Report
- Socioeconomic and Land Use

An updated Environmental Screening Report will be prepared. The Screening Report will identify the extent of known environmental constraints and existing land uses within the project area based on review of publicly available data utilizing the data available in the previous technical studies wherever pertinent. The deliverables will include an updated Environmental Screening Form, a brief narrative describing the environmental constraints within the project area and maps illustrating the location of know constraints. This scope does not anticipate that conducting technical investigations or surveys will be warranted at this phase of the project and as such is not included.

1. Cultural Resources (Archaeological and Historic Architecture)

   Cultural resources are a key environmental resource for the project area. The New Jersey Office of Historic Preservation previously concurred with the Area of Potential Effects (APE) for archaeological and architectural resources for this project. Within the APE the most notable historic element is the Middle Thorofare Bridge, completed in 1941, which was previously determined eligible for listing on the National Register. As part of the APE report, the scope of work for the architectural and archaeological surveys was developed for completion during Preliminary Engineering. The scope of work will be reevaluated as part of this effort.

   The County previously evaluated the potential for impacts to these adjoining Districts and properties and found a low potential for adverse effect. It is also unlikely that archaeological deposits of historical significance exist within the APE, and therefore no effects on historic or prehistoric archaeology are anticipated.

   As part of the environmental screening, RGA, Inc. will review and expand, as necessary, on their earlier efforts to provide an updated cultural resources screening. This will include:

RGA performed the cultural resources investigations as part of the original Feasibility Assessment project. In 2013, they prepared a cultural resources investigation for emergeny slope protection measures for the north abutment of the National Register eligible Middle Thoforefare Bridge.

   - A review of National and State Register listings and previous cultural resources investigation reports at the New Jersey Historic Preservation Office (NJHPO). Research gathered during previous Alternatives Analysis effort will be used to the greatest possible extent. A particular focus will be on prior cultural resource survey work in the project area, and work that post-dates 2012.
   - Review of NJHPO review correspondence for the CR 621 project.

- A review of archaeological site files at the New Jersey State Museum. The focus of this effort will be on the project area. Previous research on site records will be updated.
- The preparation of a brief letter report with a graphic showing the location of historic properties (i.e. National and State Register listed or eligible resources).

2. Section 4(f) Properties (Parkland and Historic)

The Department of Transportation Act of 1966 included a special provision - Section 4(f) - which stipulated that the Federal Highway Administration (FHWA) and other DOT agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless there is no feasible and prudent alternative to the use of land and that the action includes all possible planning to minimize harm to the property resulting from use. The previous land use report will be updated to reflect changes in property ownership. Of particular importance, is the recent expansion of USFWS land to the immediate southeast of the existing causeway. As part of the NJDOT Route 72 Manahawkin Bay Bridge and Route 72 East Projects, WSP secured a NEPA Environmental Assessment for USFWS Special Use authorization for use of a portion of a National Wildlife Refuge and facilitated an agreement to allow for encroachment of roadway improvements within a federal wildlife refuge.

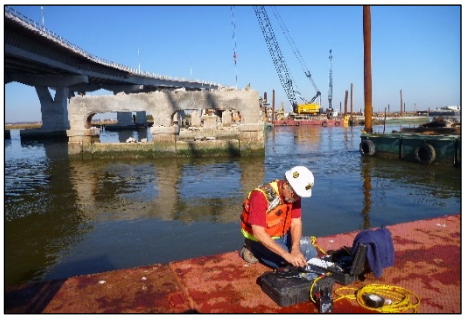
Additionally, the environmental screening will identify historic sites that would be protected under Section 4(f). Protection is also afforded to contributing elements of historic districts.

3. Air/Noise

The Michael Baker Team will perform a site visit to identify sensitive receptors to potential air and noise impacts within 300 feet of the project limits. Additionally, the project will be reviewed for shifts in horizontal and vertical alignment and increases in capacity that may affect sensitive receptors. Recommendations for more detailed air quality and/or noise impacts studies will also be provided if warranted as well as identifying preliminary mitigation opportunities.

4. Wetlands

Wetland delineation was performed for the project in December 1999 and March 2002. The wetland delineation and resource value classification will be verified.



Michael Baker oversaw hydroacoustic studies at the adjacent Route 52 Causeway Replacement Project as part of Section 7 consultation for Atlantic sturgeon on the GSP Str. 28.0S and 28.5S Bridge Replacement projects.

5. Flood Hazard Areas, Riparian Zones, and Surface Waters

The project includes several water crossings including Upper Thorofare, and Middle Thorofare (FW2-NT/SE1). Dickenson Creek (FW2-NTC1/SE1) also occurs within the project area, classified as a Category 1 waters which receives the highest level of water quality protection in NJ. The Michael Baker Team will review the effective Flood Insurance Study (FIS), Flood Insurance Rate Maps, and NJDEP State Study Maps to identify regulated flood hazard areas within the project limits. As discussed previously, the elevation of the flood hazard area has increased since the 2004 study. Additionally, in 2007, the NJDEP established jurisdiction over the riparian zone. Riparian zones are not applicable for barrier islands or in coastal wetlands. However, the study area will be reviewed to confirm that riparian zones are absent.

6. Threatened & Endangered Species and Protected Habitat

The project area is considered a major migratory bird pathway. As many as fifteen (15) state and federally listed threatened and endangered species occur with the project area. They include various species of birds, as well as, sea turtles, plants and fish including the Atlantic sturgeon (*Acipenser oxyrinchus*) which was recently listed as federally endangered species in 2012. Coordination with USFWS, NMFS, and NJDEP Division of Fish and Wildlife was conducted during the initial study regarding Essential Fish Habitat, migratory birds, submerged aquatic vegetation,

shellfish leases, state listed species and known nesting sites, and sea turtles. As part of the screening, the Michael Baker Team will verify that the conclusions of this coordination remains valid.

7. Hazardous Waste

A Hazardous Waste Screening was performed as part of the 2004 study. The Michael Baker Team will review the study and update it to reflect current changes in land use. The screening will be completed utilizing federal and state databases, review of Sanborn Maps, and field reconnaissance. Individual property owners and local officials will not be contacted unless directed to do so by the Project Team. Results of this research will be documented in the ESR and will be submitted for review and a determination on the need for a detailed Site Investigation. A Site Investigation with detailed sampling, PAECE reports, or Contamination Clean-up Plan are not completed during the Concept Development Study. However, based upon finding of this study, recommendations for sampling or additional investigation will be provided and documented in the ESR.

8. Socio-economic, Environmental Justice, Land Use, and Community Impacts

The Michael Baker Team will assess potential socio-economic impacts, environmental justice, land use and community impact concerns that may influence the project decision making. The latest available US Census tract data will be used to identify and evaluate any potential environmental justice concerns in accordance with Executive Order 12898. Summary documentation assessing potential socio-economic, environmental justice, land use and community impact considerations, as a result of project activities, will be included in the ESR. Environmental justice communities will be identified early. If they are present, the PIAP will be updated to provide adequate outreach. Based on a preliminary review of available census data, despite being a tourist destination, the City of Wildwood exhibits economic distress characteristics. Data gathered during the previous study also indicate the heavy pedestrian use of the bridge by seasonal workings.

9. Regulatory Approvals, Consultation, and Permits

The Michael Baker Team will review the range of concepts under consideration and identify the potential Federal and State regulatory reviews, coordination and approvals that may be required. Results of the review will be documented in the ESR. In determining regulatory jurisdiction and permitting requirements, additional studies that may be recommended to further identify relevant information affecting jurisdictional determinations and extent of permitting efforts will be documented. Based upon a preliminary review of the project and its location, it is anticipated that numerous federal review and state permit processes will be required and are listed below.

As a requirement of the above permits and approvals, mitigation will ultimately be required. The primary purpose of mitigation is to offset or compensate for the potential for significant environmental harm resulting from impacts attributed to the project. Mitigation may include conservation measures to minimize impacts such as seasonal restrictions on certain activities, such as in-water construction, or other best management practices such as aquatic noise abatement measures to avoid adverse impacts to listed aquatic species. Compensatory mitigation such as land preservation, habitat restoration or creation, or accommodations for enhanced public waterfront access, may also be required. In the event the selected PPA anticipates in excess of 5 acres of impacts to Waters of the US then review by the US Environmental Protection Agency may also be necessary.

Federal Consultation and Authorization

- National Environmental Policy Act (NEPA) Documentation
- Section 106 of the National Historic Preservation Act Consultation
- Section 4(f) of the USDOT Act Evaluation
- Section 7 of the Endangered Species Act with USFWS and NMFS
- Essential Fish Habitat Consultation Magnuson-Stevens Fishery Conservation and Management Act NMFS
- US Army Corps of Engineers Permit
- US Coast Guard Bridge Permit

State Review and Permits

- NJDEP Freshwater Wetlands Protection Act Permit
- NJDEP Flood Hazard Area Control Act Compliance
- NJDEP Coastal Area Facilities Review Act Permit
- NJDEP Coastal Wetlands Act Permit
- Cape-Atlantic Soil Conservation District Soil Erosion and Sediment Control Plan Certification
- NJPDES Construction Stormwater General Permit, Highway General Permit, and Request for Authorization
- NJDEP Tidelands Conveyance
- NJDEP Waterfront Development Permit
- NJ Register of Historic Places Act
- NJDEP Stormwater Management Rules (Plan Review and Approval)
- NJDEP Water Quality Certificate
- NJDEP Green Acres Program

D. Navigation Impact Report

Michael Baker will perform a navigational study in accordance with 33 CFR Part 116.01. The "USCG Bridge Program Reasonable Needs of Navigation White Paper" will be utilized as guidance for the study.

A navigation study will be performed to develop a Navigation Impact Report (NIR). The purpose of the NIR is to investigate how the construction and operation of bridge alternatives could affect current and future river navigational uses, and to identify how various bridge options could avoid or minimize such impacts. The Navigational Impact Report will describe the existing conditions of navigation within the study area, outline the purpose and need of the project and detail the alternatives. The report will also include the results of a boat height sensitivity analysis and outline how navigation in the study area may be affected.

Ultimately, the NIR will be submitted to United States Coast Guard (USCG), the federal permitting agency which issues vertical clearance requirement permits for bridges. To ensure the needs of navigation are met, the Coast Guard must approve the dimensions and clearances of the PPA to ensure it does not unreasonably obstruct the current or foreseeable future maritime uses in the study area.

Michael Baker performed a navigation study in 2016 for the Monmouth County Oceanic Bridge LCD Study.

Relying on Michael Baker's experience with other moveable bridge replacement projects, early coordination with the USCG will be initiated as part of the LCD Study. Michael Baker has successfully worked the USCG to determine the reasonable needs of navigation for the Route 52 Causeway Bridge Replacement project and is currently working with the Harbor Operators Committee and the USCG to obtain a preliminary determination on the vertical clearance for the Monmouth County Oceanic Bridge LCD Study. The Michael Baker Team will apply that lesson to the Ocean Drive LCD Study reducing the anticipated duration for this task.

The reasonable needs of navigation will be assessed and prior navigation studies for this area will be used to document existing conditions. The design depth and width of the channel at the Middle Thorofare Bridge are -12' (mllw) and 100', respectively. Figure 2 (included at the end of this Narrative) illustrates existing depths of channels and inlets in the vicinity of the project limits. County and metropolitan planning records will be reviewed to assess potential maritime traffic needs in the future. Additionally, the following data will be collected and analyzed:

- The existing conditions of the navigable channel. Figure 2 (included at the end of this Narrative) shows the most recent bathymetric survey of the navigable channel at the Middle Thorofare Bridge, obtained from the U.S. Army Corps of Engineers.

- Navigable channel jurisdiction (U.S. Army Corps of Engineers or the State of New Jersey maintained)
- Vessel population (type, size and use)
- Existing marina locations upstream and downstream of the Middle Thorofare Bridge
- Existing environmental land uses
- Future plans to improve the channel
- Future development/vessel population - upstream/downstream planned developments/ marinas will be researched in proximal municipalities and in waterfront development permit applications at NJDEP. An estimated number and size of boat slips (amount of personal watercraft, commercial vessels, and larger yachts/sportfishing vessels) will be calculated.

E. Evaluate Site Deficiencies

The Michael Baker Team will review the data, both the previous data and newly collected, to assess the existing transportation system to determine the existence of any controlling substandard design elements (CSDE), structural defects, and traffic operational deficiencies, in accordance with current AASHTO, MUTCD, and NJDOT design standards and guidelines.

This task includes a re-evaluation assessment of existing transportation systems and site conditions and will identify roadway deficiencies. The identified deficiencies will serve as the basis in developing the project Purpose and Need.

Michael Baker will coordinate with the Cape May County Division of Engineering to gather information relative to issues or problems that should be considered in this assessment. The coordination can identify concerns that may not be ascertained from the review of existing records or reports, or readily apparent to the Project Team. The Michael Baker Team will perform site visits to review, verify and document roadway information. Digital photos will be taken to document existing conditions and used to create a Project Fact Sheet.

The following investigations and data collection efforts will be required for performing the appropriate analyses for this project:

1. Traffic and Collision Data

   Given the amount of time since the conclusion of the previous study, the Michael Baker Team will develop a traffic data acquisition program that will consist of Automatic Traffic Recorders (ATR) and manual Turning Movement Counts (TMC). Although there are existing 2010, 2014 and 2015 traffic counts within the study area, the time periods of these counts do not accurately reflect the peak and off-peak seasons. However, these previous counts will be reviewed to better understand the overall traffic patterns within the study area. Traffic data will assist in determining existing level of service and delays, forecasting future travel demand, and determining construction detours during alternatives analysis. Data will also assist in identifying potential ITS traffic management strategies to improve operations in the existing and future build conditions. Travel time, speed studies and vehicle-delay data studies will not be performed.

   The Michael Baker Team recognizes that peak-season data must be collected during the peak summer season, between Memorial Day weekend and Labor Day weekend. As the anticipated Notice-to-Proceed date of this study is October 2017, the earliest time new peak-season data can be collected will be June 2018. In anticipation of this challenge, the Michael Baker Team began a preliminary traffic data collection program in early August 2017 using Automatic Traffic Recorders to obtain one week of peak-season traffic data that would otherwise need to have waited until summer 2018 to obtain. The traffic data will be used to document existing traffic operations on Ocean Drive and will be included in the existing conditions report. The data will also be considered during the alternatives analysis phase discussed in Task 3.

   Michael Baker will install ATRs at the following locations:

   1. CR 621 (Ocean Drive) just west of the western Middle Thorofare abutment (MP 1.6)
   2. CR 621 (Ocean Drive) just west of the Upper Thorofare Bridge (MP 1.2)
   3. CR 621 (Ocean Drive) just west of the Mill Creek Bridge (MP 0.7)
   4. Three additional roadways will be counted at locations approved by Cape May County.

Manual Turning Movement Counts will be performed at the following locations:

1. Intersection of CR 621 (Ocean Drive) and NJ 109
2. Two additional intersections will be counted at locations approved by Cape May County.

Michael Baker will perform a total of two 12-hour Bicycle and Pedestrian Counts on the Middle Thorofare Bridge during the peak summer season, one weekday and one weekend.

Crash data for the most recent three years will be obtained from state and municipal sources. A crash analysis and crash diagram will be prepared detailing crash type and, if applicable, an associated sub-standard design element identified in an earlier task. The sub-standard design elements and mitigation measures will be taken into account when developing roadway alternatives.

Locations and travel routes of local emergency services and/or school services will be identified during field visits and through discussions with stakeholders.

2. Structural

This task will involve the review of available structural data and collection of additional field data for the three bridges within the project limits. According to a preliminary review of the 2004 Alternatives Analysis Report, the project includes three structurally deficient bridges: Mill Creek (300'), Upper Thorofare (350'), and Middle Thorofare (1,039'). The Mill Creek and Upper Thorofare Bridges are fixed bridges comprised of four reinforced concrete T-beams, and 12 and 14 spans respectively, each span is 25' in length. The Middle Thorofare Bridge consists of 21 fixed spans and 1 single leaf movable bascule span. According to the 2004 Report, each of the three bridges were deemed functionally obsolete due to narrow widths, structurally deficient due deteriorated structural elements and low sufficiency ratings; 46.8, 47.3, and 4.0 (out of a possible 100 points) for the bridges over Mill Creek, Upper Thorofare, and Middle Thorofare, respectively. The Middle Thorofare Bridge is also posted due to its inability to carry loads greater than 15 tons. Additionally, the existing 50' opening (between fenders) of the movable span restricts larger vessels from navigating past the bridge and has contributed to collisions several times each year.

The Michael Baker Team will perform up to three (3) visits to the project area to document existing structural conditions, and mechanical and electrical conditions of the moveable span of the Middle Thorofare Bridge. Notations of existing physical characteristics of the bridge will be made, and any particular problems/opportunities relative to potential improvements will be identified. The following structural information will be evaluated, observed in the field and/or identified during a thorough review of as-built plans, bridge inspection reports, and other documents:

- Structural inventory & appraisal rating (SI&A)
- Load posting and rating
- Structural defects
- Structural service life and life cycle
- Structural integrity and serviceability
- Vertical Clearances

3. Roadway

This task will involve the review of data provided in the 2004 Alternatives Analysis Report and performing additional investigations, including up to two field visits, to evaluate the current condition of the project area. Notations of existing physical characteristics of the road system will be made, and any particular problems/opportunities relative to potential improvements will be identified. Additionally, intersections and pedestrian facilities, including curb ramps will be inventoried and evaluated for compliance with the Americans with Disabilities Act (ADA).

The project limits consist of a 2.7-mile stretch of roadway between NJ Route 109 and Madison Avenue in the Diamond Beach section of Lower Township, Cape May County. The project includes three structurally deficient bridges includes three bridges over Mill Creek (300'), Upper Thorofare (350'), and Middle Thorofare (1,039'). The surface roadway within the project limits consists of a 40' wide bituminous paved surface consisting of 10' lanes and 10' shoulders in each

direction. Each of the three bridges carry two 10' lanes, no shoulders, and 1'-6" safety walks on each side. A toll booth separates the two travel lanes approximately 35' east of the movable span of the Middle Thorofare Bridge.

A review of the 2004 Alternatives Analysis Report indicates that the existing roadway within the project limits contains several deficiencies, which include insufficient travel lane width, substandard horizontal curves, substandard profile grades, and a roadway surface elevation below the 100-year floodplain. However, this report used design standards and guidance from publications which have since been updated including the 2001 edition of AASHTO's "*A Policy on Geometric Design of Highways and Streets*". Michael Baker will evaluate these deficiencies, as well as additional applicable roadway data provided in the 2004 Report and obtained from site visits and as-built plans to determine compliance with current design standards and identify additional deficiencies. The following roadway design elements will be documented and evaluated:

- Geometrics – Horizontal and Vertical Alignment Issues with focused consideration of the 100 year flood elevation, Right-of-Way (ROW), and Environmental Impacts
- Typical Sections – Cross slopes, superelevations, and grade transitions
- Lane and Shoulder Widths, Tapers, and Transitions
- Safety/Roadside Design Features (Guiderail and End Treatments, Pavement Drop-offs, Clear Zone Issues, Slope Stabilization, etc.)
- Substandard Stopping Sight Distance
- Location of Driveways, Turnarounds, Slip Ramps, and Other Points of Access
- Right-of-Way and Utility Impacts
- Signing, Striping, Delineation, and RPMS
- Toll plaza replacement
- Impacts of structural vertical clearance on roadway geometry

4. Stormwater Management/Drainage

Michael Baker will obtain existing data, plans and studies of the project area from the various project stakeholders to evaluate site deficiencies in drainage and stormwater management design. In addition to conducting field visits during both wet and dry conditions, Michael Baker will describe drainage system defects, drainage areas, and flooding conditions as follows:

Drainage System Defects and Best Management Practices (BMPs)

Michael Baker will evaluate the existing drainage and stormwater management system to locate drainage structures and critical facilities such as the existing pipe culvert west of Fish Dock Road controlling freshwater and saltwater interaction. Due to our knowledge of the project, we know the culvert is a gathering place for recreational fishing and crabbing. This culvert is the only waterway that permits water to flow from the east side of Ocean Drive to the west side during tidal changes. The pipe is undersized and typically has water flowing through it at a high velocity. The County considers it a safety hazard and has identified it for replacement within this project. Michael Baker will also identify discharge locations within the project area.

Drainage Areas

Michael Baker will delineate the drainage areas and identify the land use and soil types for the existing conditions within the project area. Potential changes to drainage area properties, as a result of proposed concepts, will be noted in the alternatives analysis. Based on our preliminary evaluation, the project is located within a tidal Flood Hazard Area.

Flooding

Michael Baker will review information provided by Cape May County, local businesses, and residents to evaluate documented incidents of roadway flooding. Michael Baker will perform a field visit during or shortly following a storm event, if feasible, to identify roadway ponding areas within the project area. It is important to note the new preliminary

base flood elevation of 11' NAVD 88 as it has risen by 2 feet since the previous concept development study was evaluated.

5. Geotechnical/Pavement

Michael Baker will obtain existing data, plans and studies of the project area from the following sources:

- Geotechnical Information in Technical Addendums for Ocean Drive Upgrade & Bridge Replacements
- NJDOT Geotechnical Data Management System online records, (i.e., Cape May Canal Bridge (North Shore Road), Route 47 Bridge (Rio Grande Road))
- Engineering Soil Survey Report (Rutgers)
- New Jersey Geological Survey Publications: Surficial Geology Maps and Bedrock Geology Maps
- As-Built Plans
- Michael Baker Team's projects in the adjacent area

For this LCD Study, Michael Baker will use the existing subsurface information to evaluate the proposed foundation types. After an initial review already performed, Michael Baker has determined that existing soil borings satisfy the subsurface data needed and performing new soil borings will not be required as part of this effort. The scour design previously completed can be re-examined leveraging the Michael Baker Team's knowledge of the project to ascertain a concept level understanding of the scour potential at the project site. This step will also solidify the steps need during preliminary engineering for computing and finalizing the foundation designs.

6. Utilities

Utility information is available from the *Alternatives Analysis Report* (2004) and in the existing utility CAD file (eutil file). Utility companies within the project include Atlantic City Electric distribution (aka Conectiv), Verizon, Comcast, South Jersey Gas, and the Lower Township MUA (sanitary sewer force main but not water). A utility contact letter (NJDOT Utility Letter No.1) will be sent to each of these utility companies in the vicinity of the project and to others as necessary, to request current utility contacts, verification that utilities are in the vicinity of the project limits, and an order of magnitude Preliminary Engineering Utility Engineering cost estimate.

Particular attention will be given to the utility crossings at the three existing bridges, as these represent prime locations where high impact utility relocations may be required. The information obtained from the utility companies will be used to update the utility base map (eutil) file.

F. Existing Conditions Documentation

A summary of the existing conditions will be incorporated into a Project Fact Sheet and will be organized in a manner consistent with the Concept Development report as outlined in the LCD Process. The digital photos taken during the field visits will be used to illustrate the existing conditions. The Project Fact Sheet will be submitted to the Project Team for review and approval. Review comments shall be incorporated into a working version. Once approved, the Project Fact Sheet will be used to introduce community members to the project. It will be available at public meetings, and on the website. Additionally, it will be included as an appendix item in the CD report.

Once the data collection effort is complete, the results will be summarized in the Existing Conditions Report (ECR). The ECR will comprehensively outline the current state of the bridge and its context. It will contain the findings from Structure Inventory & Appraisal (SI&A), reporting on the condition of the structural state of the bridge and information obtained from previous movable bridge inspections. In addition, there will be an inventory of Controlling Substandard Design Elements (CSDE), drainage & stormwater evaluation, an analysis of motorized and non-motorized traffic patterns on the bridge, report of communication with utility companies, geotechnical and new pavement evaluations, crash history report, Environmental Screening Report, Community Profile, and Navigation Evaluation. The ECR will include maps, graphics, and figures to illustrate the existing conditions, as well as appendices of back-up data which support the conclusions. The Existing Conditions Documentation will be used to develop the project Purpose and Need.

G. Purpose and Need Statement

The results of the data collection efforts will culminate in the development of the project Purpose and Need Statement. The Purpose and Need will focus on the transportation needs and address the structural and operational deficiencies of the roadway network.

Purpose and Need document has three components: the "Purpose", the "Need", and the "Goals and Objectives". The "Purpose" will explain the fundamental transportation problem clearly and succinctly. The "Need" will go in further detail, supporting the purpose with important facts and findings from the existing conditions effort, including the bridge's structural, mechanical, and electrical deficiencies, its place in the local and regional transportation network, its importance to maritime traffic, and its value to local businesses and residents. Finally, the "Goals and Objectives" reach beyond the fundamental transportation issue, representing outcomes that the project team wishes to achieve. The "Goals and Objectives" are developed from data collection, public input, environmental concerns, and transportation considerations.

The project Purpose and Need Statement is the foundational document in the LCD process, as it lays the initial groundwork for the development and evaluation of the alternatives. The Michael Baker Team, in collaboration with SJTPO and Cape May County, will formulate a Purpose and Need which is well justified through data collection, existing conditions analyses, project team coordination, and stakeholder and public input.

Successful alternatives *must* meet the Purpose and Need. For this reason, it is essential that the Purpose and Need document be carefully crafted in order to facilitate the development of a prudent range of alternatives and the selection of a fitting and successful Preliminary Preferred Alternative. Michael Baker has significant and recent experience developing Purpose and Need documents for Local Concept Development Studies which balance intersecting transportation, structural, environmental, and community issues. Our experience with the LCD studies for the Oceanic Bridge in Monmouth County, the 6th Avenue Bridge in Passaic County and the Central Avenue Bridge in Newark, will be invaluable in creating a document which can successfully guide the project.

Task 2 Deliverables:

- Project Mapping (1:100 scale, 1' contour)
- Project Fact Sheet/Existing Conditions Documentation
- Concept-level Foundation Study
- Navigational Impact Report
- Environmental Screening
- Existing Condition Report
- Draft and Final Purpose and Need Statement

TASK 3: ALTERNATIVES ANALYSIS

Following the data collection phase, a number of possible alternatives will be developed. The goal of the alternative analysis phase is to identify and compare a reasonable number of prudent and feasible alternatives to satisfy the project Purpose and Need. At a minimum, the Federal process requires that a No-Build and a Rehabilitation Alternative be considered. Similarly, as the Middle Thorofare Bridge is eligible for designation on the National Register, a Modified Rehabilitation Alternative and a New Bridge constructed in a New Location Alternative must also be considered. As part of the "New Bridge in a New Location" Alternative, the existing Middle Thorofare Bridge would also need to be maintained to a level which preserves the cultural resource, but that may not accommodate vehicular traffic. In addition to these regulatory requirements, a number of build alternatives will be developed. At the conclusion of the Alternatives Analysis process, each of these alternatives will be evaluated within the Alternatives Comparison Matrix, concluding in the selection of the PPA.

In addition to the use of data collected during the previous 2004 WSP study, the Michael Baker Team will leverage team member WSP's knowledge of previously conceived alternatives to begin the alternatives analysis task ahead of schedule. Alternative

development in this coastal environment has a steep learning curve that the Michael Baker Team has already reached. WSP's history of the project coupled with the Team's extensive experience in the area and with Cape May County will lead to a narrow and focused list of feasible build alternatives and a detailed alternatives comparison matrix.

A. Development of Engineering Alternatives

Alternatives will be developed to address the Purpose and Need Statement while minimizing impacts to the surrounding environment and community, as per SJTPO, Cape May County and NJDOT goals, while meeting Cape May County, NJDOT and Federal Highway Administration standards. Each alternative will be developed conceptually and to a detail such that impacts to surrounding resources can be determined for comparison purposes. The Michael Baker Team will develop the following alternatives as outlined above:

1. No Build

   The No Build Alternative will require that the existing bridge be kept in its current state of repair, requiring on-going maintenance and potential closures. The No-Build Alternative also establishes the baseline condition for comparison and analysis during the evaluation process and in support of the environmental review documentation. Due to a number of substandard features and the location within a 100-year floodplain, this alternative is not expected to meet the needs of this project, but it is required as a necessary basis of comparison.

2. Rehabilitation

   As part of our due diligence we will investigate the feasibility of a major rehabilitation of the existing bridge as required by NEPA environmental review for Section 106 & Section 4f compliance. Based on the severity of the deteriorated condition of the bridge deck, superstructure, and substructure, and the age of the bridge, it is unlikely that this alternative will meet the needs of this project. For purposes of a complete comparison, the rehabilitation alternative will be documented and included in the alternatives evaluation.

   A cursory inspection of the existing bridge will be performed to determine the general extent of repair and rehabilitation that will be necessary to make this alterative comparable to the build alternatives. Existing inspection reports, maintenance records, prior repair and rehabilitation records, as well as previous studies will be examined. This field view will also allow us to determine if any short-term repairs are needed in order to continue providing safe and reliable operations until more permanent repairs to the bridge can be made.

   NJDOT requires that rehabilitated structures be capable of carrying the current national minimum standard load specified by AASHTO. Michael Baker anticipates that due to the bridge's age, a rehabilitation to current standards would be elaborate and costly. Additionally, it is anticipated that fatigue damage, which has already accumulated, will make rehabilitation a non-viable option, as strengthening a member does not negate the already accumulated stress cycle damages. With the information gathered during the field view and the existing document review, such accumulated fatigue damage will be accessed along with the other repairs needed to extend the bridge's useful service life.

   The Michael Baker Team has extensive experience in the rehabilitation of bascule highway bridges, and will use this knowledge to determine the feasibility of this option. A moveable bridge may lessen access impacts to businesses located on the roadway. However, Michael Baker understands the fundamental trade-off between movable and fixed bridges. According to a previous Navigation Report, the bridge opens about 7,500 times annually, or up to 40 times per day in the summer season. As bridge openings can disrupt traffic between Cape May and the Wildwoods, fixed bridge alternatives will also be investigated.

   Michael Baker Team member WSP has extensive experience in conducting feasibility assessments, alternatives analysis, preliminary and final design, and construction engineering services for movable bridges locally and across the country.

   Such requisite experience is essential to the SJTPO and Cape May County in properly assessing the rehabilitation alternative, as construction access, operation, alignment, highway and river traffic demands, all become critical considerations before selecting an alternative involving reconstruction with confidence.

3. Modified Rehabilitation

The Modified Rehabilitation Alternative would include major rehabilitation of the existing bridge but in a manner which would retain those elements that contribute to the bridge's historic significance, in accordance with the Secretary of the Interior Standards. These elements could include railing, bascule, and operator's house, among others. Similar to the Rehabilitation Alternative, the Modified Rehabilitation Alternative is unlikely to meet the needs of this project but will be reevaluated and documented to meet FHWA and LCD study requirements.

4. New Location

The New Bridge in a New Location Alternative will consider constructing a new bridge to accommodate the transportation needs of the area while maintaining the existing bridge as a cultural resource. It is likely this alternative would not advance as it incurs the impacts of a new bridge as well as some of the impacts of the rehabilitation options. However, this alternative will be evaluated and documented to meet FHWA and LCD study requirements.

In addition to the required alternatives, the Michael Baker Team will review the alternatives evaluated as part of the previous study and will investigate the feasibility of new alternatives given the constraints or changes that may have occurred since that project was completed. These changes include the U.S. Fish and Wildlife Service purchase of the property adjacent to the U.S. Coast Guard training facility, and the increased 100-year flood elevation for the area, from 9' to 11'.

5. Other Alternative Options

Michael Baker will develop additional build alternatives that incorporate a wide range of bridge type and alignment options. Alternatives will include moveable and long-span fixed bridges of various types, both on-alignment and off-alignment. Michael Baker will revisit the previously developed alignments, which include bascule movable bridges, and high-level fixed span bridges.

Due to the Michael Baker Team's familiarity with the project, including knowledge of environmental constraints, a number of new alternative alignments have already been identified that utilize and improve upon previously proposed alignments by minimizing impacts to federal and state wetlands. The resulting horizontal geometry will be evaluated to provide an acceptable and consistent design speed. Figure 3 (included at the end of this Narrative) depicts the previously evaluated alignments as well as possible new alignments to be evaluated.

The Michael Baker Team will also investigate additional movable bridge types, including vertical lift bridges and table bridges. Movable bridges may be able to accommodate the needs of navigation while limiting the amount of space needed for approach spans while maintaining access to local businesses located along the roadway.

The Ocean Drive causeway contains multiple segments that each serve different needs. The possibility of "branch" and "trunk" 2-stepped alignments, which span the Upper Thoroughfare, Middle Thoroughfare, and Lower Thoroughfare in a range of locations, may also be investigated. This practice allows different portions of the bridge to be evaluated separately, and for the PPA to be formed from the best choice for each particular location.

Alignments may also be developed to represent a range of construction approaches. For example, a staged construction approach can enable the construction of a bridge very close to the current alignment, while minimizing full closures of the existing bridge.

B. Alternatives Evaluation

Consistent with the RFP goal of performing a "planning level effort", the comparison of alternative project concepts will be developed using sound engineering judgment and the Michael Baker Team's recent and unique experience with similar projects.

In close discussion with the Project Team, the advantages and disadvantages of each basic alternative project scheme will be assessed in an Alternatives Comparison Matrix and weighted to the achievement of

Michael Baker has prepared an Alternatives Matrix for nearly all of the CD studies it has completed over the last two decades and has the expertise to quantitatively and qualitatively assess the alternatives based on their surrounding resources.

the project purpose and need. Viable movable and fixed bridge type variations will be included and weighted in the comparison matrix for each of the basic alternatives under consideration by this study: No Build, Reconstruction or Replacement.

The Alternatives Matrix is an independent tool that documents and weighs the social, economic and environmental impact of each alternative against the community, project and funding constraints. Impact categories may include:

- P&N Statement Satisfaction
- Engineering Elements
- Constructability
- Cost
- ROW/Access Impacts
- Traffic
- Socio-Economics

Each alternative will be described in detail with an accompanying plan sketch. The plan sketch will illustrate the proposed cross-section, alignment, and profile. The key document in the Alternatives Analysis process is the Alternatives Comparison Matrix. As a similar comparison matrix was previously developed as part of the 2004 Alternatives Analysis Study, the Michael Baker Team will reevaluate and improve on the evaluation criteria and selection methodology used to develop the earlier matrix and incorporate relevant data into the Alternatives Comparison Matrix. The matrix will evaluate each alternative based on a comprehensive range of criteria developed from the findings of the data collection and public outreach efforts.

The matrix will document the advantages and disadvantages of each alternative. For each alternative, the impacts will be qualitatively and quantitatively assessed and weighted. Michael Baker understands that the selection of a valuable PPA is dependent on an effective and context-sensitive matrix. Michael Baker has developed Alternatives Comparison Matrices that take into account complex infrastructure, transportation, and environmental needs and concerns for a multitude of projects including many in Cape May County. Ultimately, the matrix is a logical and defendable tool that balances the various impacts versus the constraints of an alternative. Michael Baker will solicit input from project stakeholders in accordance with the Public Action Plan, with the intent of obtaining feedback on issues and concerns for each alternative.

The criterion used for the alternatives matrix can be grouped into the following seven categories: engineering, constructability, cost, right-of-way/access, traffic, socio-economics, and environmental. In addition to identifying the previous concerns and constraints, weighting their impact of the project alternatives appropriately is paramount to the process. Right-of-way proved to be a major concern preventing the previous CD from advancing into preliminary engineering. *Revisiting the previously developed alternatives matrix revealed that the weighting of that constraint was comparatively low compared to other constraints.* The team's experience with this issue as well as the vast number of coastal bridges in New Jersey led by the Michael Baker team members constructed close to their original alignments will elevate this process and correctly balance the weighting of constraints.

1. Engineering Elements

   The engineering criteria for the alternatives matrix summarize the multitude of roadway and structural elements that can vary between concepts. Each solution can have different contributing engineered elements that can affect the ultimate product in a variety of ways.

   For the roadway elements, these criteria can include: lane widths, project length, roadway length, design speed, elevation above the floodplain, alignments, tolling facilities, and compliance of intersections and pedestrian facilities to guidance specified in the Americans with Disabilities Act (ADA). The structural criteria may include: length of structures, span length, retaining walls (length and height), structure type, structure material, clearances, number of project bridge openings, and number of piers. These two lists are not intended to be complete and inclusive, but highlight the multitude of elements that contribute to the function and use of the facility into the future.

   Michael Baker will investigate the proposed alternatives for compliance with the most recent AASHTO and NJDOT Design Standards. If it is anticipated that design exceptions cannot be eliminated and it is established that the lesser design value is the best practical alternative, Michael Baker will obtain a reasonable assurance of design exception from NJDOT Quality Management Services. Michael Baker has extensive experience in identifying substandard design elements and obtaining reasonable assurances of design exceptions, and has recently successfully completed these efforts on the Cape May County CD Study Rio Grande Avenue (CR661) Entrance Improvements, NJTPA/Monmouth County Oceanic Bridge LCD Study, and NJDOT's Route 4 over the Hackensack River CD Study.

The risk of utility impacts for each identified alternative will be assessed. High risk utility impacts will be identified and incorporated into the alternatives evaluation processes (matrices, etc.). Utility relocation schemes and impacts will be shown on plans to illustrate potential impacts (risks) associated with each of the alternatives. Relocation cost estimates will also be requested from the utility owners to provide a more accurate construction cost estimate during the alternatives analysis task.

Once the PPA is identified, proposed utility relocations will be shown on the concept plans. The proposed concept plans with utility relocations will be discussed with the respective utility companies. A description of the existing utilities and potential impacts from the PPA will be provided in the LCD Study, including potential utility implications associated with construction staging, temporary facilities, demolition, traffic control, detours, and maintenance of draw bridge operations and lighting. A concept level cost estimate of utility impacts will be provided either as a percentage of construction cost or through considerable experience with utility cost impacts on many similar projects. Utilities will be further evaluated in the Risk Management section.

2. Cost

Cost is one of many criteria that gets evaluated during the alternative selection process; however, cost should not only be limited to the initial construction cost, but should also consider life cycle and operations costs. As such, it is important that the various alternatives be compared using costs that are reflective of the various project elements, from roadways, to bridges, to potential ground improvement needed. Movable bridges are more costly to build and have higher maintenance and operational costs. However, high level fixed bridges come with an added cost as well due to need for deeper foundations and added materials. Constructability considerations reflective of the difficulty of construction anticipated for each of the alternatives, particularly for in-water activities that would require cofferdams, need to be incorporated into the construction costs as appropriate. Costs for construction access, barge access, and construction staging need to be integrated into the overall construction cost as well.

With all the above complexities involved on this Ocean Drive project, we will apply our collective experience as a team from the design and construction of numerous coastal bridges, thus providing the SJTPO and Cape May County with a well vetted and dependable cost accounting to support the alternatives evaluation, and subsequently the PPA.

3. Right-Of-Way / Access

The right-of-way and access components of this project will be a critical driver of the selected PPA. As stated before, right-of-way is a main reason why the project could not advance beyond the original CD. The project area is surrounded by businesses and environmentally sensitive properties. The roadway itself is critical for the area's businesses, including the tourism industry, delivering thousands of people every week to the various destinations along the shore. The route is also an evacuation route for the barrier islands. Roadway access is not the only type of access that will be important to this project. Access to the navigation channel is critical to the various federal agencies as well as the fisheries located at the project site and the pleasure boats leaving some of the area's largest marinas just upstream of the project.

Acquisitions, easements, riparian grants, and business impacts among others will be quantified within the alternatives matrix to clearly define this category for each of the progressing alternatives. Balancing these impacts will lead to a project that meets the project's Purpose and Need as well as the long term needs of the community.

4. Traffic

With the fluctuations of traffic on weekends and during the summer months, consideration should be given to the impacts the project will have during these peak times. The Michael Baker Team's experience in situations like this is robust, with direct and relevant experience at Route 72, Route 52, and Rio Grande Boulevard to name only a few.

The alternatives analysis will consider the design year traffic projections, opening required (if any), queuing due to tolling, in addition to impacts driven by the engineering drivers: lane width, design speed, shoulders, etc.

5. Environmental

Given the environmental constraints of the area (Cape May Coastal Wetlands, Cape May National Wildlife Refuge, Marmora Wildlife Management Area, and the U.S. Fish and Wildlife Service property), obtaining a 55 mph design for a long-span high level fixed bridge may be possible, but perhaps with impacts to sensitive areas and properties. Those impacts need to be weighted appropriately for the project alternatives. This was considered at length in the previous study by Michael Baker Team member WSP providing a significant advantage to this team.

Environmental constraints will be confirmed and re-evaluated in the previous data collection phase. Impacts to the constraints will be summarized in the matrix and will include impacts to: wetlands and open waters; coastal and aquatic resources; Natural Heritage Sites; Fish and Wildlife Resources; Hydraulics and Hydrology; Air and Noise; Hazardous Materials; and Cultural Resources. While these impacts may be significant, they may also be similar from alternative to alternative. Their context in the purpose and need of the project will be an important descriptor when determining the selected alternative.

Additionally, at the time of the previous concept development study, the NJDEP Stormwater Management Rules (N.J.A.C. 7:8) were not in place. It is anticipated that the build alternatives will meet the definition of a major development (1 acre of ground disturbance or 0.25 ac net new impervious surface), requiring compliance with the Rules. The NJDEP Stormwater Management Rules require that all projects classified as a major development meet certain standards for water quality, water quantity, and groundwater recharge. However, since the project is located within a tidal flood hazard area, stormwater quantity regulations will be met by showing that the tidal flooding will exceed any local stormwater flooding. Additionally, since the project ultimately discharges to salt water, groundwater recharge compliance is not warranted. Therefore, the stormwater quality regulations will be the aspect of the rule that will require the Michael Baker Team's attention. BMPs such as basins, swales and water quality manufactured treatment devices will be proposed to meet stormwater quality requirements. Due to the limited Right of Way and anticipated high groundwater, smaller surface BMPs and water quality manufactured treatment devices will likely be proposed to achieve the required TSS removal rate to the maximum extent practicable.

Constructed infiltration basin on Garrets Island for the Route 52 Causeway Replacement Project.

6. Socio-Economics

Socio-economics of the alternatives will consider the impacts to the population of the immediate community as well as the larger surrounding area. Businesses have access that will be impacted by nearly any project selected. Some of these businesses are largely seasonal, while the commercial fishing industry has a year round need of the roadway. In addition to the business aspects, the fabric of the surrounding communities should be considered in a selection of an alternative. Cape May, Wildwood Crest, as well as the Ocean Drive corridor have certain aesthetic elements and a vibrant engaged community that have great interest in the project area. Their interests go beyond the immediate bridge, and include parkland resources, waterfront access, fishing piers, and boating access to name a few. The impacts to the socio-economics will be part of the alternatives matrix.

7. Constructability

It is essential that constructability considerations get frequent attention during the early stages of a project, particularly during the Concept Development phase. The benefit to SJTPO is that the Michael Baker Team has successfully advanced a number of LCD studies all the way through Final Design and Construction, providing a constructability perspective in the earlier phases of the project cycle where it could be a differentiator, by integrating it into the Alternatives Analysis and Evaluation. In many instances, environmental considerations are used as the major evaluation criteria between alternatives to determine the alternative which avoids or minimizes the environmental impacts, to the detriment of constructability and construction cost. This approach frequently results in a PPA that does not get advanced past preliminary engineering without major modifications, which results in impacting the project

schedule. Our team will balance the needs to avoid and minimize the environmental impacts along with the constructability considerations by integrating the following:

a. Environmental Impacts: By gaining knowledge of the existing environmental resources within the project limits, we will be able to not only quantify these environmental impacts, but also determine how they could potentially affect construction from timing restrictions for in-water construction, the need to have construction access trestles, and to determine bridge versus roadway limits to minimize impacts on wetlands.
b. Barge Access and Laydown Areas: While the final footprint for the laydown and barge access areas will be finalized in subsequent phases, their potential locations need to be evaluated during this phase as their location and size would differ between alternatives. Figure 3 (included at the end of this Narrative) illustrates existing depths of channels and inlets in the vicinity of the project limits.
c. Construction over Middle Thorofare Channel: Coordination with the US Coast Guard needs to be initiated during this phase to not only get a preliminary determination of the vertical clearance, but to also discuss allowable window for channel closure during construction.
d. Construction Staging: Depending on the geometry of the alternatives, some may be more suitable for construction staging than others which could facilitate maintenance of traffic and potential contract packaging.
e. Miscellaneous Considerations: Other considerations, such as accelerated bridge construction techniques, pile supported embankments, impacts to major utilities will be evaluated and integrated into the alternatives analysis as appropriate and when the offer to be a differentiator between alternatives.

C. Alternatives Development Documentation

The Michael Baker Team will document the methodology for developing the alternatives and detail the reasons why alternatives were removed from consideration including any fatal flaws. Michael Baker will document the public and agency input for each alternative. For identified design exceptions, Michael Baker will develop alternatives to eliminate exceptions or obtain reasonable assurance of the design exception from NJDOT and Cape May County.

The Michael Baker Team will maintain a continuous open dialog with the Project Team as the project progresses, to obtain an up-to-date understanding of the concerns of the SJTPO, Cape May County and NJDOT. We will consider the impact of each alternative and develop a methodology to weigh and/or rank the impacts for each of the identified critical issues, and, in coordination with the SJTPO, Cape May County and NJDOT, to select a PPA. We will work with the Cape May County engineer to obtain a resolution of support for the selected PPA from impacted municipalities. The PPA will be submitted for review and approval and the selection process will be documented for inclusion in the Concept Development Report.

Michael Baker will summarize the findings of the alternatives development process in the Alternatives Analysis Document, which will include a detailed description of each alternative, conceptual plan of each alternative, the Alternatives Comparison Matrix, a synopsis of the alternatives analysis, stakeholder input, comments and comment resolutions, and the selection of the PPA.

D. Value Engineering Review

Based on federal regulation 23 CFR Part 627.9(d) (1), all Federal-aid bridge projects with an estimated total cost of over $40 million shall have a Value Engineering Technical Report prepared. In accordance with the NJDOT's Capital Project Delivery Process for Concept Development, the Michael Baker Team will provide input to the NJDOT's Value Engineering (VE) Unit to conduct an independent review of the draft Preliminary Preferred Alternative (PPA) in order to identify, evaluate, develop, and recommend alternative designs or methods that will provide an acceptable or improved product. The Michael Baker Team will develop a project overview presentation for select NJDOT subject matter experts with diverse engineering backgrounds and who are independent from the project development team. This objectivity will allow for the identification of alternative solutions that maximize the value of every dollar spent and minimize life cycle costs.

It is well known that the earlier VE is performed during a project's life cycle, the greater the opportunity to achieve cost savings and value. Since the Ocean Drive Upgrades and Bridge Improvements Project will be in the early LCD phase, the VE team will focus on strategic issues, overall scope development, risk mitigation, procurement strategies, constructability issues, etc., to ensure that a project will stay on track to meet its cost and schedule goals. The Michael Baker Team will organize a one day VE workshop after a draft PPA has been developed, at which time pertinent documentation, calculations and drawings will be

provided. At the conclusion of the VE process, the NJDOT VE Unit will provide a VE Technical Report to the design team for review and comment. Comments will be addressed in a Comment Resolution Memorandum and returned to the NJDOT for inclusion in the overall LCD Report.

Additionally, following the Value Engineering Review, a PPA Constructability Review will be performed by NJDOT's Bureau of Construction Management to identify project specific construction risks with associated probability and impact to schedule and cost, allowing the project team to assess changes to staging and construction methods at the appropriate time in design to potentially reduce the construction duration. Previously identified constructability risks will be reviewed (as documented in the Risk Register), and any new risks identified will subsequently be added to an updated Risk Register. Furthermore, the Constructability Review will potentially help in developing a more accurate construction cost estimate. Comments from the Constructability Review will be made in writing along with comment responses from the Michael Baker Team, and included in the overall LCD Report.

E. Risk Management Review and Documentation

A key member of Michael Baker's Concept Development Team, Martin Wade, was deeply involved with the development of NJDOT's overall risk management process and will seamlessly incorporate the process into the overall project to help evaluate deficiencies and identify fatal flaws to assist in selecting the PPA. In accordance with NJDOT's standards, Michael Baker will perform risk identification and quantitative risk analysis, and develop risk response strategies and action plans. A Risk Register will be maintained to document project risks throughout the project life cycle. Due to the anticipated total construction cost being greater than $100 million, a Quantitative Risk Analysis Worksheet will also be developed to numerically estimate the probability that the project will meet its cost and schedule objectives. The results of the Quantitative Risk Analysis will be summarized in the Quantitative Risk Analysis Report.

As the study progresses, one area of particular importance is the potential utility conflicts with the proposed work. These will be identified for each alternative. Impacts will be quantified, evaluated and summarized for each alternative, along with approximate costs related to the relocations required. Potential impacts related to right of way, easement requirements and environmental permits will also be addressed. This information will be provided for inclusion in the Alternative Comparison Matrix.

Per the NJDOT Capital Project Delivery Process, a Utility Risk Assessment Plan will be developed to highlight potential high risk utility impacts, such as the underground gas distribution line at the western project limit and the sanitary force main that runs the project length. Potential utility relocation alternatives considered will be in accordance with the State Utility and Railroad Accommodation Policy.

F. Develop Mitigation Strategies

If a build alternative is selected, impacts to sensitive ecological resources including wetlands, open waters and habitat for state and federal listed species are will be unavoidable. Ultimately, project authorizations will be required from several federal and state resource agencies. Mitigation in coastal areas is often challenging as most land is either already protected or developed. Recognizing these challenges, the Michael Baker Team proposes to evaluate conceptual mitigation options in Concept Development.

The Consultant Team will perform an initial mitigation site search and evaluation to determine potential mitigation strategies for inclusion in the proposed PPA. This will include the identification of potential properties for acquisition and preservation to address potentially needed authorization for a diversion of state or federal wildlife refuge properties. Additionally, opportunities within the general project environs for habitat restoration and/or creation will be identified to address compensatory mitigation requirements for wetland and coastal resource impacts. The mitigation search will include the identification of potential sites within the general project corridor and adjoining areas, a review of ownership status and whether adequate mitigation credit would be available to satisfy regulatory requirements. Additional mitigation measures such as seasonal restrictions and best management practices will also be identified, which may ultimately affect construction.

Task 3 Deliverables:

- Alternatives Comparison Matrix (Electronic/5 Hardcopies)
- Description of the Alternatives (Electronic/5 Hardcopies)

- Risk Register
- Utility Risk Assessment Plan
- Quantitative Risk Analysis Report
- Conceptual Mitigation Report

TASK 4: DOCUMENTATION

A. Concept Development Plans

Michael Baker will prepare concept plans for the selected PPA, including the proposed alignment and bridge type, local roadway improvements, drainage, anticipated impacts to sensitive receptors, right of way, potential ITS needs, and impacts to adjacent properties. This information will be developed using the updated mapping document during the data collection task. The plans will be developed at a scale of 1"=100' with contours generated at a 1-foot interval and in accordance with Cape May County Engineering standards, AASHTO, the NJDOT Roadway Design Manual, Drainage Design Manual, the 2007 Standard Specifications for Roads and Bridge Construction, etc. Michael Baker will also prepare preliminary MPT schemes, detour routes and/or conceptual construction staging plans for review by the Project Team.

B. Prepare Order of Magnitude Cost Estimates

Based on the concept plans, a concept-level construction cost estimate for the PPA will be prepared. The cost estimate will consider major construction activities including mobilization, paving, excavation, removal and demolition of existing, new structures, drainage, SWM facilities, lighting, landscaping, environmental mitigation, MPT, etc. Recent unit bid prices will be made available to the Project Team by Cape May County or NJDOT. Contingencies and escalation will also be included. Right-of-Way impacts to property owners will also be noted.

C. NEPA Classification and Documentation

Although NEPA review and permit authorization are not addressed until Preliminary Engineering and Final Design, respectively, a primary objective during Concept Development (CD) is determining an appropriate NEPA classification. The goal of the CD process is to craft a well-defined and justified purpose and need statement and develop a range of reasonable alternative to address that need. Given the complexity and challenges of this project due to its environmental sensitivity and potential for significant impact, additional efforts to build consensus among regulatory agencies and develop preliminary mitigation strategies to address regulatory requirements can be conducted during CD. By incorporating the input from external stakeholders, including regulatory agencies, into the PPA, the project team is better able to demonstrate efforts to minimize harm, comply with applicable regulatory standards, and minimize potential for significant impacts, and in doing so, help to provide for a more defensible NEPA classification and streamline subsequent environmental approvals.

The County previously determined that the appropriate NEPA classification was an Environmental Assessment. However, given the opportunities for greater collaboration with regulatory agencies and refining mitigation strategies as part of this project, the project may likely qualify for a Categorical Exclusion Document under bridge rehabilitation, reconstruction or replacement (23 CFR 771.117(d)3. Based on the agency input and alternative analysis conducted under Task 1 and 3 above, respectively, the Michael Baker Team, in coordination with the Project Team, will determine the level of NEPA documentation (i.e., Categorical Exclusion(s), Environmental Assessment with FONSI, or Environmental Impact Statement) for the next phase of work. In addition to the environmental document, a determination will be made regarding the need for any additional Section 106 documentation or Section 4(f), Section 6 (f) etc. investigations, evaluation(s) and reporting.

D. Develop Preliminary Engineering Next Steps/Tasks

The Michael Baker Team will coordinate with the Project Team to prepare the next steps, utilizing the NJDOT PE Scope Statement format. The PE scope statement needed to conduct Preliminary Engineering and Final Design, and includes approval of the environmental document and any design exceptions. The PE Scope Statement will be included in the Concept Development Report. An initial Preliminary Engineering, Final Design and Construction schedule will be developed and will

include estimated durations based on Michael Baker's significant construction management experience. The project's critical path and variables affecting that path will be identified.

E. Concept Development Report

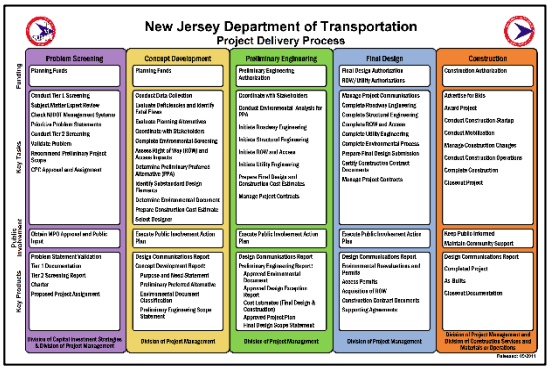
Michael Baker will compile and summarize the tasks completed during this Concept Development study and will organize the report as detailed in the RFP. The Concept Development Report will be sent to the Project Team for review and approval, and all comments will be addressed within two (2) weeks of receiving them.

Task 4 Deliverables:

- Concept Development Plans for the selected PPA (Electronic/4 Hardcopies)
- Cost Estimates (Electronic only)
- NEPA Classification Recommendation (Electronic only)
- Concept Development Report (Electronic/5 Hardcopies)
- Preliminary Engineering Scope of Work Activities (Electronic only)

TASK 5: PROJECT MANAGEMENT

This task includes project management duties and responsibilities, including scope, schedule, and budget, necessary to advance the project. Michael Baker will maintain regular and frequent contact with the SJTPO and Cape May County representatives throughout the project duration. The schedule's critical activities will be managed aggressively to avoid delays.



Michael Baker refined and documented the NJDOT Capital Project Delivery Process during a 5-year on-site assignment.

Michael Baker's primary objectives are to perform cost-effective engineering services and provide quality products that meet the budget, technical, and strategic requirements for the South Jersey Transportation Planning Organization. Project Manager Maher (Mike) Sidani, P.E., PMP, has extensive experience in managing multidisciplinary infrastructure projects. Mr. Sidani will be Michael Baker's point of contact for SJTPO, and will facilitate the scheduling and assignment of the appropriate support staff as needed to complete the Ocean Drive (CR 621) Local Concept Development Study. He will be supported by the firm's senior management throughout the agreement, which will include monthly internal Project Status Review meetings which scrutinize every active project with respect to budget status, schedule, and scope of work progress.

A. Project Controls

Reporting and invoicing procedures will be in accordance with the terms of the agreement. As such, Michael Baker will prepare and submit monthly progress reports to the SJTPO indicating percent of work complete that corresponds to the monthly invoice. The progress reports will include a listing of active and completed tasks, indicating the percent of work complete (total and by task), work and submittals completed in the previous month and to be performed in the next billing period, meetings, actions/decisions required by the SJTPO, Completed Goals, Upcoming Goals, SJTPO Action Items, and the status of the schedule and budget. Michael Baker will develop a detailed schedule for review and approval at the project kick-off meeting. The schedule, which will identify project tasks and milestones, will be reviewed and maintained throughout the study on a quarterly basis.

B. Status Meetings

Michael Baker will coordinate and attend monthly project status meetings with SJTPO, Cape May County, NJDOT-Local Aid, and NJDOT-BEPR (the Project Team), and prepare and distribute meeting agendas, handouts, and meeting summaries in

support of those meetings. Michael Baker will develop a two-week look ahead list of activities and identify action items to be discussed at each status meeting. Michael Baker will document meetings, maintain a list of action items, and maintain a database of design related and decision making actions as a result of attended meetings.

C. Project SharePoint Site

Michael Baker will establish a project SharePoint site. SharePoint is a web-based Microsoft product, and as such, is accessible from mobile devices with an internet connection and integrates seamlessly with Microsoft Office 365 and Microsoft Project. The SharePoint site will be made available to the Project Team and stakeholders, as appropriate. It is anticipated that the site will contain electronic copies of project documents, schedules, meeting agendas, handouts, minutes, presentations, a project calendar with meetings and project milestone dates, and the DCR.

Michael Baker is successfully hosting, maintaining and using a SharePoint site as an electronic document library for the Pulaski Skyway Rehabilitation Program, the Oceanic Bridge LCD Study, and the Sixth & Central Bridges LCD Study. As the Skyway Program consists of five design teams, each with multiple subconsultants, a SharePoint site has proven to be an excellent tool for real-time coordination and collaboration between members of the Project Team.

D. Design Communications Report

Michael Baker will establish a Design Communications Report (DCR) which will provide a record of all relevant communication, decisions, agreements, and approvals that occur between the Project Team and stakeholders. The DCR will be maintained on a project SharePoint Site. The SharePoint site will serve as an electronic document library throughout the course of the study.

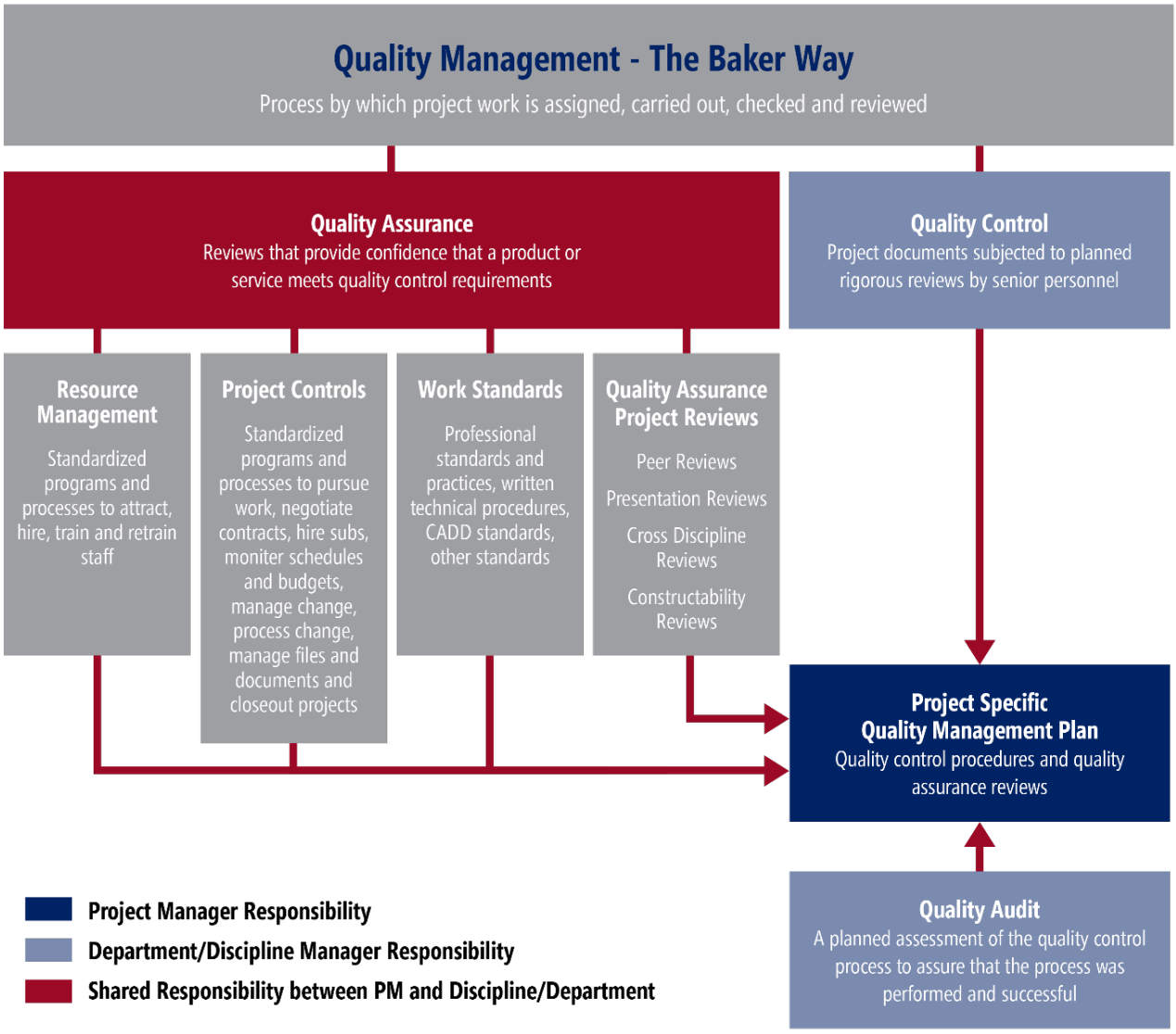
E. Quality Management

Quality control at Michael Baker starts with a solid foundation in project management. Michael Baker has a series of *rigorous processes and checks that result in services and products that meet or exceed client's expectations.* Quality assurance (QA) and quality control (QC) are part of an overall project management system called "The Michael Baker Way" to track and check interim products and to maintain the quality of final products. Michael Baker staff who perform quality control checks have been trained by the Project Management Institute (PMI).

Michael Baker's QA and QC *methods are in place and ready to be implemented and tailored for this project.* They involve separate QA procedures to verify the availability of resources and tools to enforce quality control. Michael Baker's QA/QC Lead, Joe Danyo, will consult with Mr. Sidani to establish a Project Specific Quality Management Plan (PSQMP). The PSQMP details the specific resources and actions necessary to provide the best opportunity for the project deliverables to meet the client's quality expectations and requirements. This PSQMP will be integrated, ongoing and focused throughout the project and not just applied before a submission. The QA/QC procedures will also be applied to the subconsultants' tasks. By integrating QA/QC into the project's production process, Michael Baker will deliver a clear, concise, and accurate deliverables.

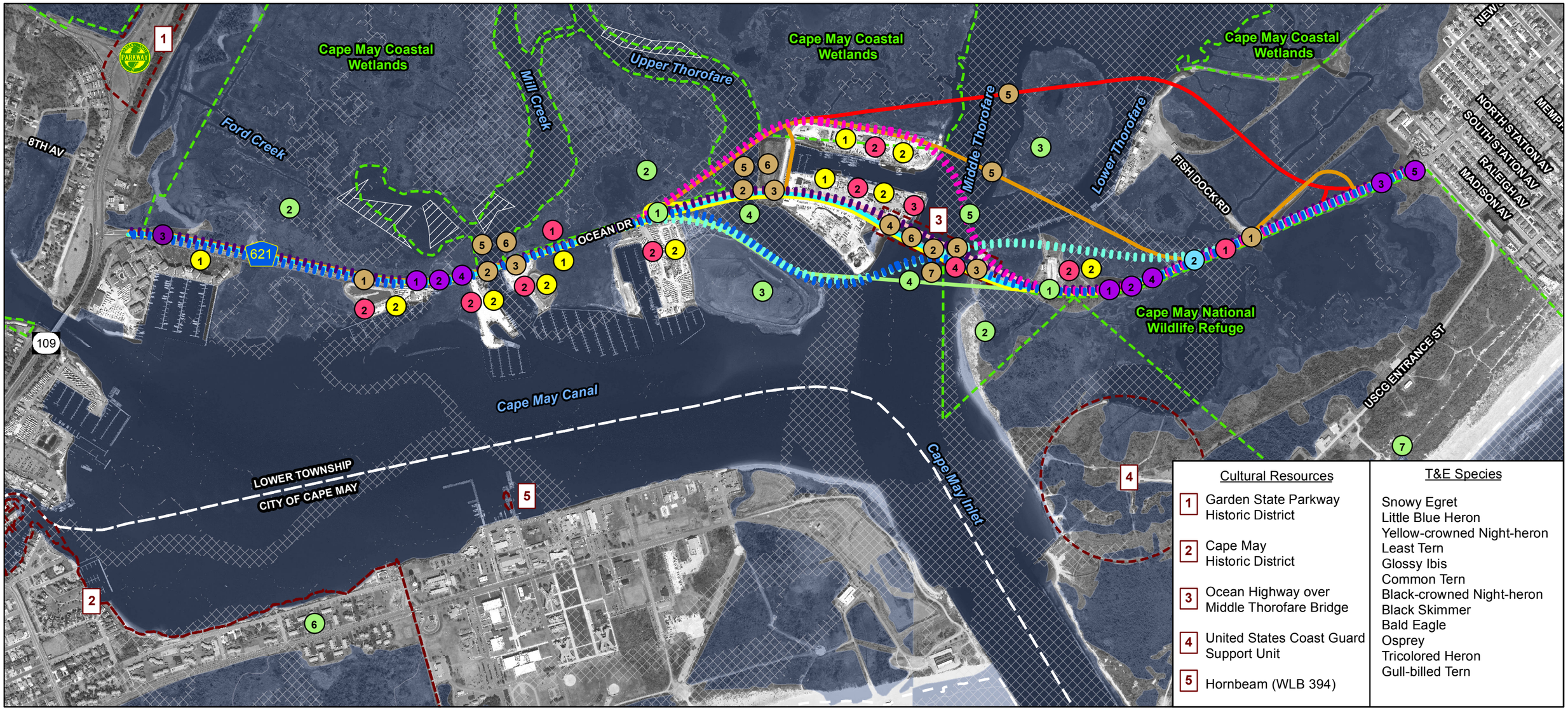
"The Michael Baker Way" is Michael Baker's proven, effective project management process to monitor and control schedules, resources and costs. This process was developed to facilitate communication and understanding between SJTPO, Cape May County and the Project Manager, while streamlining communication within the project disciplines. A Project Management Plan (PMP) will be developed for the project by the Project Manager, approved by the Principal in Charge, and distributed to all team members. The PMP serves as the roadmap to successful performance of the project and includes clear definition of the following project elements:

- Project Purpose
- Scope of Work & Contract
- Critical Assumptions & Constraints
- Project Team & Stakeholders
- Project Budget & Invoicing
- Quality Management Plan
- Risk Management Plan
- Safety & Occupational Health
- Project Schedule
- Communications Plan
- Change Management Plan
- Project Closeout Plan



Task 5 Deliverables:

- An initial detailed project schedule at the Project Kick-off meeting and quarterly schedule updates
- Monthly in-person status meetings with the Project Team
- Regulatory Agency Meetings (up to four)
- Project Team SharePoint Site
- Design Communications Report
- Documentation for the above mentioned meetings, including agendas, handouts, presentations, minutes and written summaries of project meetings
- Monthly progress reports and corresponding invoices



Cultural Resources

1. Garden State Parkway Historic District
2. Cape May Historic District
3. Ocean Highway over Middle Thorofare Bridge
4. United States Coast Guard Support Unit
5. Hornbeam (WLB 394)

T&E Species

Snowy Egret
Little Blue Heron
Yellow-crowned Night-heron
Least Tern
Glossy Ibis
Common Tern
Black-crowned Night-heron
Black Skimmer
Bald Eagle
Osprey
Tricolored Heron
Gull-billed Tern

Environmental

1. Minimize impacts to wetlands and open water.
2. Avoid Green Acres and USFWS land diversions and maintain public access during construction.
3. Evaluate mitigation opportunities early.
4. Timing restrictions on in-water construction. Evaluate need for hydroacustic mitigation such as bubble curtains.
5. Mitigation measures for affects on historic bridge may include recordation, context sensitive design, reuse of salvaged elements, and interpretive displays.
6. Consider visual impact to Cape May Historic District.
7. Coordinate with USFWS and NJDEP Division of Fish and Wildlife regarding effects to migratory birds.

Stormwater

1. 1% Flood plain increased to 11' NAVD88 since previous CD Report.
2. Undersized culvert moderating freshwater & saltwater interaction.
3. Stormwater management needs to consider coastal impacts.

Staging and Constructability

1. Maintain two lanes of traffic at all times.
2. Preserve access to boarding properties during construction.
3. Perform offline bridge construction while exisiting bridge remains inservice. Perform two main stage roadway construction utilizing temporary pavement.
4. Consideration of constructability and cost as independent factors for the feasible construction of middle thorofare bridge.

Structural/Geotechnical

1. Implement soil improvement methods such as wick drain and column embankment to prevent time related settlement on tidal marsh soil.
2. Address deep scour depths present in nearby channels during design.
3. Use pre-augering or water settling to help piles penetrate alternating layers of stiff clay and dense sand.
4. Minimize vibration to adjacent existing structures during foundation installation.
5. Consider potential ABC solution for precast structures in marine environment.
6. Consider access trestle needed where water depths are low (4.5') at low tide.
7. Identify structural solutions that minimize closures to the navigational channel.

Roadway

1. Raise the elevation above the 100-Year flood elevation.
2. Widen travel lane width from 10' to 12' and reduce shoulder width to 8' minimum within existing roadway cross section.
3. Correct deficient horizontal curvature.
4. Correct deficient profile grades for sufficient surface drainage.
5. Address local pedestrian safety concerns.

Utilities/Right-of-Way

1. Minimize impacts to aerial electrical lines, highway luminaries, aerial & underground cable lines, under ground gas distribution lines, and LTUA sanitary force main.
2. Minimize impacts and maintain access to adjacent properties.
3. ROW easements and riparian grants will be required.

Legend

- Municipal Boundary
- Federal and State Open Space
- Historic Resources
- NWI Wetlands
- Submerged Aquatic Vegetation
- Tidelands Claims
- Previous Alignments
- Baker Alignments

1,000 500 0 1,000 Feet

South Jersey Transportation Planning Organization

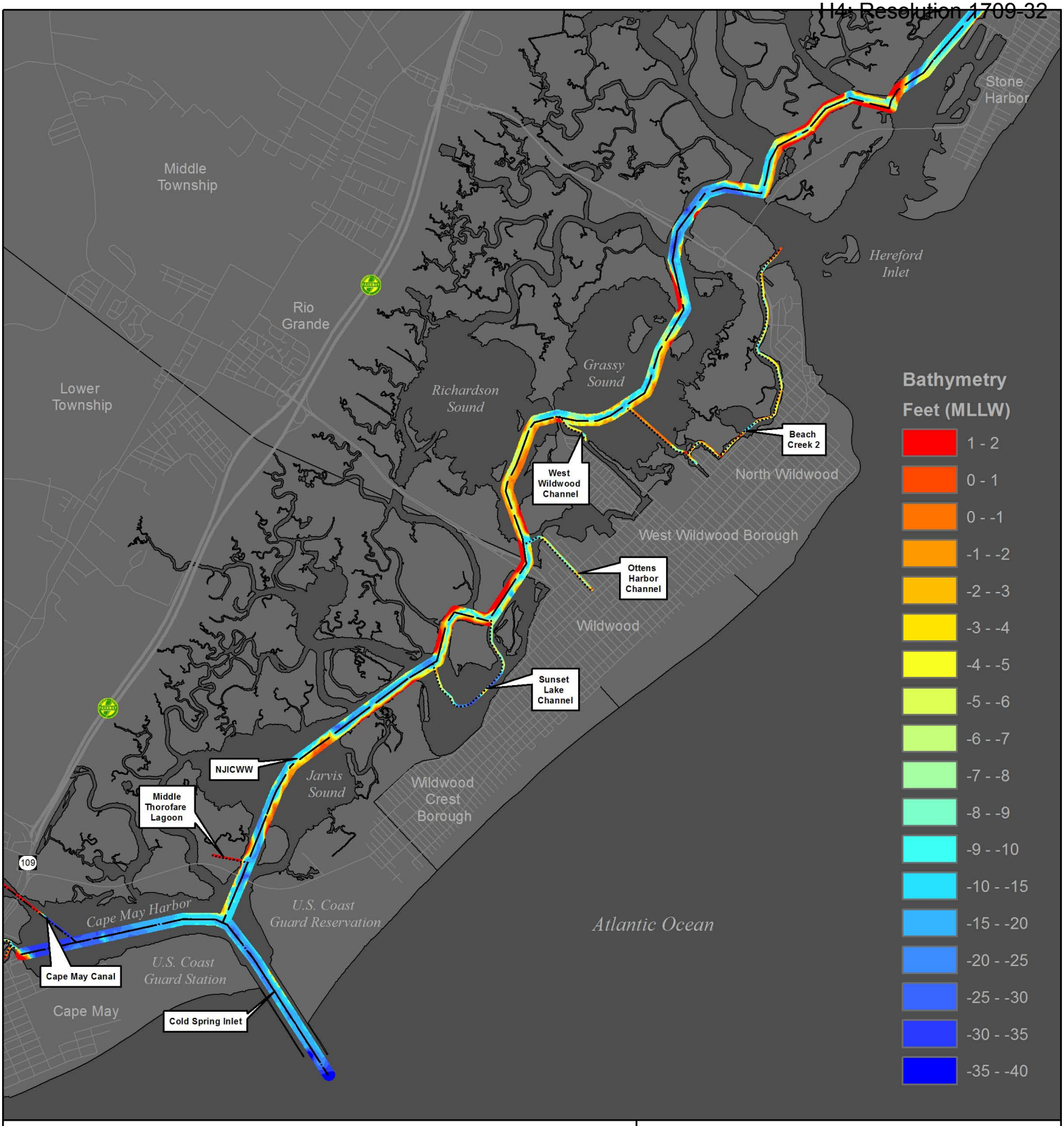
Figure 1
Key Issues

Ocean Drive (CR621) Upgrades and Bridge Improvements
NJ Route 109 to Madison Avenue

Lower Township
Cape May County, New Jersey

Michael Baker INTERNATIONAL

August 2017



Federal Channel (USACE Philadelphia District):
NJICWW

Inlet (USACE Philadelphia District):
Cold Spring Inlet
Cape May Canal

NJ State Channel (NJDOT OMR):
Beach Creek 2
Middle Thorofare Lagoon
Ottens Harbor Channel
Sunset Lake Channel
West Wildwood Channel

Legend

— — Federal Channel (ICWW) (USACE)

The authorized depth of the NJICWW at Middle Thorofare Bridge is -12 mean lower low water and the authorized channel width is 100-feet.

-·-·- Inlet (USACE)

····· State Channel (NJDOT)

Municipalities

0 0.5 1 Miles

Source: 2014 NOAA National Centers for Environmental Information (NCEI) Digital Elevation Model (DEM), 1/9 arc second; USACE; NJ Department of Transportation; NJ Office of Information Technology, Office of Geographic Information Systems.

South Jersey Transportation Planning Organization

Figure 2
Channel Conditions

Ocean Drive (CR621) Upgrades and Bridge Improvements
NJ Route 109 to Madison Avenue

Lower Township
Cape May County, New Jersey

Michael Baker INTERNATIONAL

August 2017

Potential Alignments

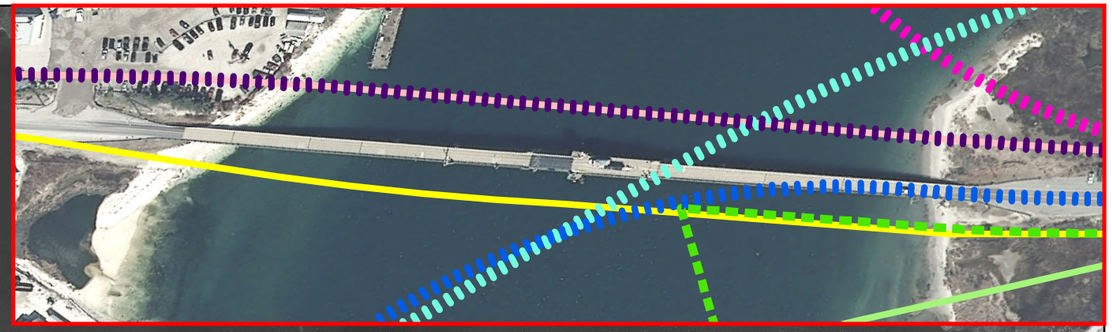
Previous Alignments

- 3A
- 3B
- 3C
- 3D
- 3E
- 3F&G

Baker Alignments

- Baker Alternative 1
- Baker Alternative 2
- Baker Alternative 3
- Baker Alternative 4

USFWS Wildlife Management Area



Lower Township
Mill Creek
Upper Thorofare
Middle Thorofare
Lower Thorofare
Ford Creek
FISH DOCK RD
621
OCEAN DR
109
Cape May Canal
Cape May Inlet
USCG ENTRANCE ST
Cape May City
PARKWAY

1,000 500 0 1,000 Feet

South Jersey Transportation Planning Organization

Figure 3
Alternative Alignments

Ocean Drive (CR621) Upgrades and Bridge Improvements
NJ Route 109 to Madison Avenue

Lower Township
Cape May County, New Jersey

Michael Baker INTERNATIONAL

August 2017

STAFFING PLAN

Michael Baker has provided engineering and design services for some of the largest and most complex bridges recently constructed in the United States. Michael Baker is the 7th largest bridge consultant in the country, as ranked by *Engineering News Record*, and our diverse bridge experience enables us to provide cutting-edge ideas and superior guidance for complex bridge projects of all types. Michael Baker's key personnel have established a legacy of responding to the most complex highway interchange projects and toughest bridge challenges with innovative and sustainable bridge designs, and have demonstrated leadership by promoting advancements in bridge design and construction, such as the use of high-performance materials and Accelerated Bridge Construction techniques.

In New Jersey, Michael Baker's success can be summarized by the completion of the signature Route 52 Bridge for the NJDOT, a project that successfully addressed many of the same issues facing the Ocean Drive and the Middle Thorofare Bridge. Mike Sidani, the Project Manager from the Route 52 Causeway Construction project, has been selected to lead the Ocean Drive (CR 621) project for SJTPO and Cape May County. In addition to demonstrating his acumen with complex bridge Feasibility Assessment, Preliminary Engineering and Final Design in coastal areas, Mike is also the Project Manager for the Oceanic Bridge Local Concept Development (LCD) Study for NJTPA and Monmouth County. Based on the anticipated Notice to Proceed date in the RFP, the Oceanic Bridge LCD Study will be in the final stages of completion by the time the Ocean Drive study gets underway. Mike's time can then be focused on the Ocean Drive study while incorporating all of the lessons learned from the Oceanic Bridge study. Mike will apply that direct and relevant experience to the Ocean Drive LCD Study and is one of the reasons the Michael Baker Team can accelerate the project, in advance of the schedule outlined.

Mike's Deputy Project Manager on the Ocean Drive LCD Study will be Jim Yeager. This is the same leadership team completing the Oceanic Bridge LCD Study and is poised to execute this project at Notice to Proceed. In addition to the Oceanic Bridge LCD Study, Jim was the Project Manager for the Northerly Crossings Feasibility Study for the Delaware Joint River Toll Bridge Commission. That study included the development of alternatives for the four bridges over the Delaware River in Warren and Sussex Counties. In addition to the development of alternatives, that study had significant public outreach and alternatives analysis components. Mike's and Jim's complimentary skills have yielded successful collaboration on a number of projects in the past. In fact, the proposed staff from Michael Baker have worked together extensively in the past, and have developed the strong working relationships of a highly-functioning team. This project will be managed out of Michael Baker's Hamilton, NJ office, located at 300 American Metro Boulevard, Suite 154.

Michael Baker has selected WSP USA (WSP, formerly Parsons Brinckerhoff) as a partner for the Ocean Drive LCD Study. Michael Baker has a history of teaming with WSP on a number of other endeavors including the current Marine Transportation System Planning Agreement for the NJDOT Office of Maritime Resources. WSP brings the unparalleled benefit of completing the Scope Development and Feasibility Study for Improvements to Ocean Drive in 2004. Aside from having ready access to previously collected data and information, WSP has intimate knowledge and insight of the needs, issues, major stakeholders, and methodology that went into the development and evaluation of the previous alternatives and alternatives evaluation matrix. Given that unique experience, the Michael Baker Team believes the project approach developed for the Ocean Drive LCD Study has the ability to reduce schedule durations and reduce costs while still developing, evaluating and recommending an alternative that meets the Purpose and Need of the project.

The Michael Baker Team is comprised of leaders that have delivered successful concept development studies and design projects which allows the Team to remain intact and seamlessly transition to the next phases of a project's life, preliminary engineering and final design. Michael Baker and WSP have the previous experience with the project, LCD study experience, knowledge of bridge design, especially in coastal areas, and the resources available to hit the ground running on this assignment.

INTRODUCTION

Michael Baker International, Inc. (Michael Baker) has assembled a strong team with distinctly unique expertise, background, and capability to successfully deliver this high profile and important Local Concept Development (LCD) Study. The Michael Baker Team was assembled to leverage several key advantages to provide the South Jersey Transportation Planning Organization (SJTPO) and Cape May County with a quality project completed on an accelerated schedule. We will meet these goals by relying extensively on our strong project management team, our well documented LCD Study experience including our unique knowledge of NJDOT's LCD process, our successful completion of nearly all of the coastal bridge projects in New Jersey (predominately in the immediate vicinity of Ocean Drive), and with great relevancy, from the work completed by our major subconsultant WSP USA (WSP, formerly Parsons Brinkerhoff) as part of the previously completed study.

Project Management - Michael Baker's Mike Sidani will be the Project Manager with assistance from Jim Yeager serving as Deputy Project Manager. Mike and Jim bring unparalleled experience from their recent management of the Oceanic Bridge LCD Study for the North Jersey Transportation Planning Authority (NJTPA) and Monmouth County. They are currently in the final stages of completing the Monmouth County Oceanic Bridge (S-31) LCD Study where they have refined a project approach that will help to streamline project delivery on Ocean Drive. Their recent experience and collaborative efforts on the Oceanic Bridge project will enable greater efficiency and more robust management of the scope of work for the Ocean Drive project. In addition, Mike Sidani has successfully delivered the largest coastal bridge project in the history of New Jersey, the $400M Route 52 Causeway. These examples are just a few advantages that Mike offers on this project.

The LCD Process - In addition to the Oceanic Bridge LCD Study, the Michael Baker Team has documented success completing a number of LCD studies over the past 20+ years. Our practical experience is reinforced by Michael Baker's staff experience working with the NJDOT Project Management Office in the development of their current project delivery process. Over a period of six years, Michael Baker had staff on-site at NJDOT developing the current Capital Project Delivery Process and continues to work with the Department as they identify additional opportunities to streamline the process. Michael Baker additionally worked closely with the NJDOT Local Aid office in the development of the Local Public Agency Manual which directs the process for advancing projects through Concept Development, Preliminary Engineering, and Final Design, and ultimately through the construction administration process. Coordination with environmental agencies is an integral part of the LCD process and the Michael Baker Team has intimate familiarity and a trusting relationship with key leaders from these agencies.

Relevant Experience - The Michael Baker Team has unmatched experience with advancing the replacement of coastal bridges and water crossing bridges in New Jersey, including the following;

- Ocean Drive (CR 621) Upgrade and Bridge Replacements – Alternatives Analysis Report
- Route 52 Causeway Replacement – Final Scoping, Preliminary and Final Design
- Monmouth County Oceanic Bridge (S-31) – Local Concept Development Study
- Garden State Parkway Great Egg Harbor Bridges – Concept Development, Preliminary Design, and Environmental Permitting
- I-95 Scudder Falls Bridge over the Delaware River Replacement – Preliminary Engineering and Final Design
- Avalon Boulevard Bridge Rehabilitation and Widening – Final Design
- Nacote Creek Bridge – Feasibility Assessment and Design
- Route 50 Tuckahoe River Bridge – Final Design
- Ohio Avenue Bridge over the Penrose Canal
- Route 4 Bridge over the Passaic River – Concept Development
- Emergency Repairs to the Townsends Inlet Bridge
- Route 72 Bridge over the Manahawkin Bay – Concept Development/Feasibility Assessment, and Final Design
- Garden State Parkway over Mullica River

- Rehabilitation of CR 619 Bridge over Great Channel
- Ocean City Longport Bridge Replacement – Preliminary and Final Design
- Rehabilitation of the Route 35 Bridge over the Manasquan River - Preliminary and Final Design
- Rehabilitation of Roosevelt Boulevard Bridge

The Michael Baker Team brings this extensive experience and know how developed through the successful completion of studies and design on coastal bridges in New Jersey with issues directly aligned with the issues which will be addressed on the Ocean Drive Project.

The Team - The Michael Baker Team includes WSP USA (WSP, formerly Parsons Brinckerhoff), that provides intimate familiarity of the area, as well as specific knowledge of the previous work performed on the Ocean Drive project. As part of the previous study, WSP staff addressed technical elements including; the Identification of Substandard Conditions, Environmental Studies, Geotechnical Investigation, Alignment Development, and Public Outreach. All of these elements were documented in an Alternatives Analysis Report completed in January 2004. WSP staff who completed the document will provide the benefits of their knowledge of the Ocean Drive (CR 621) project to assist the Michael Baker Team in advancing the LCD Study efficiently and aggressively starting on Day One.

Michael Baker and WSP also enjoy a strong collaborative working relationship and have worked together successfully on numerous projects previously. Starting with the Route 21 Viaduct Replacement project in Newark, NJ many years ago, and continuing currently with the advancement of the Pulaski Skyway project, Michael Baker and WSP have an established working relationship and procedures for efficient project delivery including office locations that are a 5-minute drive from each other in Hamilton and Lawrenceville and in adjacent buildings in Newark, NJ. The Team of Michael Baker and WSP is currently advancing the Marine Transportation System Planning Agreement for the NJDOT Office of Maritime Resources.

Overall - This Team has the technical and project management skills, direct project related experience, strong understanding of the LCD Study process, coastal bridge experience, and intimate knowledge of the previous Ocean Drive project. The Michael Baker Team has extensive Cape May County expertise and working relationships which will enable us to hit the ground running on day one with the goal of delivering a well-established Project Purpose and Need, a full range of prudent and feasible alternatives, an alternatives comparison process which provides the appropriate focus on the important issues, and delivers an appropriate, supportable, permittable, and buildable Preliminary Preferred Alternative within fifteen months of Notice to Proceed.

PROJECT UNDERSTANDING

Michael Baker understands that on behalf of Cape May County, the SJTPO is seeking to engage the services of a consulting engineering firm to perform a LCD Study for Ocean Drive (CR 621) Upgrades and Bridge Improvements from NJ Route 109 to Madison Avenue in Lower Township, Cape May County as part of the SJTPO FY 2018 Unified Planning Work Program. The major objectives of the LCD Phase are to develop a well-defined and justified Purpose and Need Statement focused on the primary transportation needs to be addressed and to identify and compare prudent and feasible alternatives, which will include bridge replacements, rehabilitation, and 'no-build' alternatives. Following a rigorous alternatives development and evaluation, and public outreach process, the effort will culminate in the recommendation of a Preliminary Preferred Alternative (PPA) and advancement of the project to the Local Preliminary Engineering (LPE) phase.

The Ocean Drive causeway has linked the communities of Cape May and the Wildwoods (the Cities of Wildwood and North Wildwood, Wildwood Crest and West Wildwood Boroughs, and Diamond Beach, Lower Township) since 1941. The project limits consist of a 2.7-mile stretch of roadway between NJ Route 109 and Madison Avenue. This route provides a critical link and coastal evacuation route that connects NJ Route 109 and access to the mainland and Garden State Parkway with the barrier island containing the Wildwoods, a popular summer attraction and economic center. This length of roadway includes three bridges over Mill Creek (300' concrete T-beam bridge), Upper Thorofare (350' concrete T-beam bridge), and Middle Thorofare (1,039' that includes a movable bascule span). The Middle Thorofare Bridge serves as the 'southern gateway' to the Intracoastal Waterway in New Jersey.

KEY ISSUES

Currently, portions of Ocean Drive are below the 100-year flood zone elevation, and prone to occasional flooding. As it exists today, the roadway could become impassible in a hurricane or significant storm event. Much of the roadbed was constructed at an elevation of 7.5' on fill in 1940 and has settled to an approximate elevation of 6', well below the 100-year flood elevation (11' per the current FEMA Flood Insurance Rate Maps). This presents a major concern as Ocean Drive is a designated emergency coastal evacuation route for the southern end of the Wildwoods. According to a US Army Corps of Engineers report, Cape May County is one of the ten most difficult areas in the United States to evacuate during a hurricane landfall. Ocean Drive is also an important linkage which provides access to the commercial fishing facilities on the mainland side, one of which is considered to be the third largest fishing seafood processing facility on the entire eastern seaboard.

Each of the three bridges within the project limits are structurally deficient and functionally obsolete due to low sufficiency ratings and narrow widths, respectively. Due to its poor condition, the Middle Thorofare Bridge has been downposted, restricting loads to 15 tons, prohibiting bus and truck traffic.

Additionally, the width of the bascule bridge opening is 50', limiting larger vessels from entering the Intracoastal Waterway. These deficiencies restrict the growth of the nearby commercial fishing industry due to vehicle and vessel size restrictions. The narrow bridge opening has also contributed to three to four large vessels per year colliding with the bridge as they attempt to navigate the channel. The collisions have resulted in the bridge being closed for costly and inconvenient emergency repairs.

Since the Middle Thorofare Bridge is movable, it experiences 20 to 40 openings per day for the passage of maritime traffic including Cape May's commercial fishing fleet. These openings, which last about 10 minutes each, cause between 200 and 400 minutes of roadway closures each day, causing significant negative impacts to the capacity of this critical travel link. During the summer months, the vehicle demand during peak periods far exceeds the roadway capacity, resulting in unacceptable levels of service and reduced air quality.

Ocean Drive traverses through a very environmentally sensitive area consisting largely of tidal waterways, coastal wetlands, public lands, and habitat for numerous state and federally listed species and is also considered a major migratory bird pathway. Additionally, numerous cultural resources are also present in the study area. The NJ State Historic Preservation Office has identified the Middle Thorofare Bridge as eligible for listing on the National Register of Historic Places.

These and additional key issues are shown on Figure 1: Key Issues (included at the end of this Narrative) and discussed in detail throughout our technical approach.

PREVIOUS EFFORTS

The Ocean Drive Upgrade and Bridge Replacement effort was the subject of an earlier comprehensive scoping endeavor. In 1999, Michael Baker Team member, WSP USA (WSP, formerly Parsons Brinckerhoff) was selected to perform a scoping study for the Mill Creek and Upper Thorofare portion of Ocean Drive. The intent of the project was to raise the roadway elevation above the 100-year storm elevation, at the time, to a flood elevation of 9 feet. In 2002, the study was extended to include the Middle Thorofare Bridge and to rehabilitate/replace the functionally obsolete bridges. The study developed a range of horizontal alignments and considered both a low-level movable bridge over Middle Thorofare as well as high-level, long-span alternatives. Based on the Alternatives Matrix, the recommended PPA would not only satisfy the project needs but does so while minimizing various impacts including those to the sensitive environmental, cultural, and socio-economic aspects of the area.

The effort culminated in a 2004 *Alternatives Analysis Report, Ocean Drive Upgrade and Bridge Replacements, County Road 621, Lower Township, Cape May County, NJ*, prepared by WSP and the selection of a PPA. The PPA selected was a high-level, long-span alternative with an alignment that was to the south of the existing Middle Thorofare Bridge. Before the project was able to advance, the US Fish & Wildlife purchased a parcel of land where the PPA was proposed. As a result, the selected PPA is no longer a viable option and Cape May County has requested a new LCD Study be completed.

The invaluable experience and lessons learned from WSP's past project will be leveraged during this effort, making the Michael Baker Team well-positioned to assist SJTPO to complete this LCD Study efficiently and expeditiously and advance the project through the Local Concept Development Process.

OUR STUDY APPROACH

The SJTPO's Local Project Delivery Process is intended to advance the goals of the SJTPO Regional Transportation Plan 2040. This process advances projects in a process similar to the Capital Project Delivery Process recently adopted by the NJDOT. Adhering to the prescribed process is vitally important for the project to be considered for Federal funding opportunities.

Michael Baker is uniquely familiar with NJDOT's Capital Project Delivery Process and has provided on-site engineering consulting services to assist in developing a more efficient, logical and comprehensive Project Delivery Process. As a result of this experience, Michael Baker is intimately familiar with the inter-relationships between the activities required to complete a LCD Study, providing the knowledge which will allow the Michael Baker Team to advance appropriate tasks concurrently, identify critical path tasks, and understand the impacts delayed activities will have on the overall schedule.

The LCD process requires a number of critical activities, including the review of existing conditions and needs assessment, the identification of project stakeholders, development of a purpose and need statement, extensive public outreach, inventory of environmental and regulated resources, development and analysis of alternatives, determination of the required National Environmental Policy Act (NEPA) level of review, and the selection of a PPA. Michael Baker, in coordination with SJTPO, Cape May County and NJDOT (the Project Team), will determine the level of NEPA documentation (i.e., Categorical Exclusion(s), Environmental Assessment with FONSI, or Environmental Impact Statement) for the next phase of work.

In addition to our staff's expertise and familiarity with the procedures of the standard project delivery process, the Michael Baker Team recognizes that each project comes with a set of unique design challenges and constraints. The Michael Baker Team's technical staff is aptly qualified and well-suited to tackle the complexity and sensitivity of these challenges. Collectively, Michael Baker and WSP have successfully designed the majority of the coastal bridges in New Jersey, including the Route 52 Causeway Bridge in Ocean City and Somers Point, Great Egg Harbor Bridge, NJ Route 50/Tuckahoe River Bridge, Route 72 over Manahawkin Bay, the Garden State Parkway over Mullica River, and Route 35 Bridge over the Manasquan River. Michael Baker has successfully completed over 50 Concept Development Studies/Feasibility Assessment Studies over the past 25 years which follow the New Jersey Department of Transportation (NJDOT) and Federal Highway Administration (FHWA) capital project delivery process. Together, this team has developed a technical approach that is cost efficient, streamlined and consistent with federal requirements. Throughout this proposal, we will identify strategic opportunities to reduce task durations and in turn, person-hour estimates.

The following concerns specific to the scope of the Ocean Drive LCD Study were identified and considered in the development of Michael Baker's technical approach to the project:

- Addressing functional and structural deficiencies of existing structures and roadways including substandard roadway design elements, bridge load rating, and the existing narrow (50 foot wide) channel opening width
- Considering the benefits and drawbacks of replacing the existing movable Middle Thoroughfare Bridge with a fixed structure
- Right-of-way and access impacts to adjacent property owners
- Accommodating the seasonal travel demands of the region including vehicular, non-motorized, and maritime traffic
- Environmental constraints due to the proximity of the project to protected habitats and cultural resources
- Hydrological constraints including accommodating a major coastal evacuation route and designing to an elevation above the 100-year floodplain
- Achieving public consensus by addressing the needs of and considering the impacts to the adjacent community and stakeholders affected by the project, including relevant public agencies, local businesses and property owners, the US Coast Guard, and the US Fish and Wildlife Service.
- Obtaining federal funding by advancing the LCD Study in compliance with FHWA, NJDOT, AASHTO and MUTCD guidance and standards
- Addressing SHPO concerns related to Historic Bridges and/or view impacts for Historic Districts
- Maintaining access to existing commercial fishing industry facilities during and post construction

- Preparing an updated Navigational Impact Report
- Establishing navigable channel vertical clearance requirements of fixed bridge alternatives

The Michael Baker Team also recognizes that many of the critical activities required for the LCD Study were completed as part of the 2004 Alternatives Analysis Study. Where possible, data, analysis, and conceptual alternatives will be reevaluated from the 2004 Study and used for this LCD Study; however, as over a decade has passed since the completion of the 2004 study, there have been a number of changes which could impact the selection of a PPA including:

- Updated Design Manuals and standards
- New construction techniques and materials
- Changes in property ownership, specifically regarding United States Fish and Wildlife protected lands
- Changes in Base Flood Elevation levels
- New and updated and new state environmental regulations including the Flood Hazard Area Control Act Rules (N.J.A.C. 7:13) and Stormwater Management Rules (N.J.A.C. 7:8);
- Additions to the threatened or endangered species list (Atlantic Sturgeon)
- Updated guidance for developing a Navigation Impact Report
- Changes to the needs of the local businesses, industries, and residents
- Changes to regulatory agencies' focus, interpretations, and staff

As will be demonstrated in this proposal, the members of the Michael Baker Team, Michael Baker, WSP USA (WSP), Churchill Consulting Engineers (Churchill), and RGA, Inc. (RGA), each have significant experience leading or contributing to the successful completion and advancement of LCD studies in New Jersey for NJDOT, MPOs, and Counties. Based on our experience with other coastal bridges, our team fully understands the unique challenges and constraints. As demonstrated through our Team's relevant experience, Michael Baker has employed creative structural design techniques, focused on right-sizing project elements, minimized structural footprint, and developed innovative construction staging to deliver projects ahead of schedule, under budget, and limiting community, commercial, and environmental impacts. Given the complexities identified above and other challenges, the Michael Baker Team presents a technical approach that leverages expertise, experience and lessons learned from previous coastal bridge concept development, preliminary engineering, and final design projects to achieve the study goal of selecting and advancing a PPA that addresses the primary transportation and environmental needs, is supported by the public and local officials, and is in compliance with the required standards and guidance to obtain federal funding.

TECHNICAL APPROACH

The Michael Baker Team's Technical Approach complies with the NJDOT Local Concept Development Process. The required activities are presented in five major tasks that reflect broad categories of work, some of which will occur throughout the duration of the LCD process. The five major tasks are:

1. Public Outreach
2. Data Collection
3. Alternatives Analysis
4. Documentation
5. Project Management

TASK 1: PUBLIC OUTREACH

Public outreach and community involvement is an important part of LCD, particularly for bridge replacement projects that can impact access, viewsheds and/or require a detour during construction. The Michael Baker Team understands the importance of identifying and coordinating with local officials, community stakeholders, and the general public to develop a context sensitive design, and avoid project delays. Michael Baker has extensive experience facilitating public outreach efforts and community

involvement events starting in Concept Development and continuing through construction. Michael Baker is currently facilitating robust public outreach efforts for the Oceanic Bridge LCD Study and for the PE/FD phases of the entire Pulaski Skyway Rehabilitation Program, Contracts 5-9.

A. Public Involvement Action Plan

Michael Baker is committed to an open Concept Development process which allows ample opportunity for the community, stakeholders and the Project Team to share information and voice concerns. The first step to achieve this goal is to develop a comprehensive Public Involvement Action Plan (PIAP). The PIAP will include traditional and innovative techniques and strategies for communicating information and soliciting feedback from project stakeholders and the public during the concept development process through construction. Where possible, public involvement efforts completed under the earlier Alternatives Analysis Study will be incorporated and updated. Michael Baker will work to build off of the established stakeholder list and public outreach process findings, incorporating knowledge and expertise that have already been gained so that the study may move forward with the involvement of all affected parties.

The content of the PIAP will include a database of known stakeholders and an outline of anticipated meetings with elected officials, stakeholders and/or the general public. It will also detail public outreach techniques to solicit community feedback, potentially including social media, paper and online surveys, and a project website, and will identify community concerns and strategies to address those concerns. A community profile will also be developed and included as a supplement to the PIAP. The PIAP will be reviewed periodically throughout the concept development process and be updated or revised as needed to maintain open lines of communication with stakeholders and the communities. A draft PIAP will be submitted to the Project Team for review. The draft document will be revised to address Project Team comments and a final version of the document will be provided and uploaded to the project SharePoint site.

B. Local Officials Meetings

To provide opportunity for input from local officials representing municipalities potentially impacted by the project, the Michael Baker Team will, in coordination with the Project Team, coordinate, schedule, and lead four (4) local officials meetings. Local Officials Meetings (LOMs) are an essential task used to encourage input and support from local officials and secure buy-in of alternatives considered and the PPA. It is anticipated that local officials from Cape May County, Lower Township, the City of Cape May, and the Wildwoods will be invited to participate. Local officials from these municipalities will also be invited to participate in Stakeholder Meetings and Public Information Centers. The following describes the anticipated topics and timing of Local Officials Meetings:

- Meeting 1: Project Kickoff – Introduce project and LCD process to local officials
- Meeting 2: End of Data Collection Task – Review Project Fact Sheet, present the draft Purpose and Need Statement, and solicit feedback that will be incorporated in the final Purpose and Need Statement
- Meeting 3: During Alternatives Analysis – Present range of alternatives and solicit feedback that will be incorporated into the draft PPA
- Meeting 4: End of Alternatives Analysis Task – Present the recommended PPA and solicit feedback that will be incorporated into the selected PPA

C. Stakeholder Coordination and Meetings

The Michael Baker Team will, in coordination with the Project Team, identify and reach out to potential project stakeholders. Stakeholders will include concerned and/or affected community organizations and residents, environmental groups, local business organizations, local bicycle and pedestrian advocacy groups, first responders, and other agencies. The Michael Baker Team will coordinate with project stakeholders to obtain input on the project Purpose and Need and developed alternatives. It is anticipated that three (3) Stakeholder Meetings will be held during the LCD process. The format of these meetings are anticipated to be a formal presentation followed by a question and answer session. The following describes the anticipated topics and timing of Community Stakeholder Meetings (CSMs):

- Meeting 1: End of Data Collection Task – Introduce the project and public involvement in the LCD process, Review

Project Fact Sheet, present the draft Purpose and Need Statement, and solicit feedback that will be incorporated in the final Purpose and Need Statement

- Meeting 2: During Alternatives Analysis – Present range of alternatives and solicit feedback that will be incorporated into the draft PPA
- Meeting 3: End of Alternatives Analysis Task – Present the draft PPA and solicit feedback that will be incorporated into the final PPA

In addition to meetings, stakeholder outreach will occur regularly throughout the LCD Study. A stakeholder survey will be developed and distributed to stakeholders and made available to the general public via the project website and/or social media. Stakeholders and the public will have the opportunity to provide comments, feedback, and opinions and voice concerns through the project website or social media. Results of the survey will be analyzed to obtain input and determine primary concerns of stakeholders. Stakeholders will be given the opportunity to participate in surveys.

The Michael Baker Team has significant experience working with stakeholders throughout the planning and design process. As part of the Hackettstown Mobility Improvements Concept Development Study for NJDOT, improvement concepts were revised to reflect the concerns of local businesses and the Hackettstown Historical Society. For the Route 52 Causeway Replacement Project, Michael Baker established a task force during the final scoping phase to allow community feedback for aesthetic design, mobility, circulation, and the environmental process. The Michael Baker Team understands community involvement and ultimately, community approval, is paramount to a successful project.

D. Public Information Centers

The Michael Baker Team will, in coordination with the Project Team, coordinate, arrange, prepare for, facilitate, and document Public Information Centers (PICs). Public Information Centers will be open to all interested parties, and local officials and stakeholders from affected municipalities will be encouraged to attend. The Public Information Centers will follow the format as specified in the PIAP. The format options could include an informal open house session, formal presentations, or a combination of both. The centers could also be a standalone event or can be facilitated as part of another community event to reach larger percentages of the community. The Michael Baker Team will utilize the stakeholder list compiled in the PIAP as the initial channel for notifying the general public of the Public Information Centers. The Michael Baker Team will also work with impacted municipalities and Cape May County to post meeting notices on their respective websites and in public places. It is anticipated that six (6) Public Information Centers will be held: one on either side of the project limits (in Cape May and the Wildwoods) at three times during the LCD Study. The following describes the topics and timing of anticipated Local Officials Meetings:

- Meeting 1: End of Data Collection Task – Introduce the project and LCD process, Review Project Fact Sheet, present the draft Purpose and Need Statement, and solicit feedback that will be incorporated in the final Purpose and Need Statement
- Meeting 2: During Alternatives Analysis – Present range of alternatives and solicit feedback that will be incorporated into the draft PPA
- Meeting 3: End of Alternatives Analysis Task – Present the draft PPA and solicit feedback that will be incorporated into the final PPA

E. Agency Consultation Meetings

To provide opportunity for timely input from regulatory agencies, the Michael Baker Team will, in coordination with the Project Team, establish a technical work group with outside public agencies. The technical work group will consist of representatives of the following agencies:

- US Army Corps of Engineers Regulatory Program Philadelphia District
- NJ Department of Environmental Protection including Division of Land Use Regulation, Division of Fish and Wildlife Endangered and None-Game Species Program, and State Historic Preservation Office.
- National Oceanic and Atmospheric Administration National Marine Fisheries Service

- US Fish and Wildlife Service NJ Field Office and Cape May Wildlife Refuge
- US Coast Guard Bridge Program District 5
- US Environmental Protection Agency
- Federal Highway Authority

The Michael Baker Team is intimately familiar with the above agencies, and has coordinated extensively with agency leadership throughout the development of design on past projects in the area. It is anticipated that four (4) quarterly meetings will be held with the regulatory agencies. These meetings will be used to encourage agency input and secure buy-in of the PPA. Additional meetings will be held with individual agencies, as needed, to address specific concerns. Prior to scheduling the meeting the Michael Baker Team will meet with the SJTPO and the County to develop agendas and review materials.

The anticipated agenda for the four technical work group meetings will generally be as follows:

- Project Introduction and Review Purpose and Need
- Review and Input on Project Alternatives
- Selection of Preliminary Preferred Alternative and Review Permit Requirements
- Review and Develop Mitigation Strategies and NEPA Classification

F. Resolutions of Support

The ultimate goal of the public outreach effort is to generate support in Cape May County and Lower Township, from the stakeholders and residents, culminating with each municipality adopting a resolution of support for the PPA. The Michael Baker Team will support SJTPO and Cape May County by developing and delivering a presentation (Town Hall Presentation) for use at Township and County board meetings and providing relevant information and materials necessary to obtain the resolutions of support. It is anticipated that the project sponsor (Cape May County) will provide a resolution of support for the PPA as well.

G. Public Outreach Summary

The Michael Baker Team will document all public outreach efforts performed during the concept development study and include them as part of the Concept Development Report. The documentation will include meeting minutes, presentation materials, written and oral comments, community feedback, correspondence and the resolutions of support for the PPA.

H. Project Website and Social Media

To maintain open lines of communication throughout the study, a public facing project website will be developed. The website will provide information about the project status, ongoing work, and upcoming public meetings. The website will also be used to provide community access to project online surveys (developed as part of the Stakeholder Coordination subtask) and survey results, as well as project information, including fact sheets, presentations, and upcoming meeting notices. The Michael Baker Team will also monitor the website's usage and traffic utilizing Google Analytics or a similar program. Google Analytics tracks and reports what website visitors are clicking and how long and how often users visit. The Michael Baker Team will report on website activity monthly. Michael Baker developed public outreach including a website for the Transportation Matters – A Plan for South Jersey, SJTPO's 2040 Regional Transportation Plan Update.

In addition to a project website, the Michael Baker Team will develop a social media plan to leverage the use of social media as another public outreach channel throughout the LCD process. Michael Baker's innovative outreach has included utilization of a Twitter account to notify followers of public meetings, construction updates, and traffic incidents along potential diversion routes on behalf of the NJDOT for the Pulaski Skyway Rehabilitation Program. For this study, social media including Facebook, Instagram, and Twitter can be used to keep stakeholders and community members informed about upcoming meetings and study progress. At the end of the concept development study, the Michael Baker Team will turn over all website and social media account materials and any information needed to access and maintain them, to the Project Sponsor.

Task 1 Deliverables

- Public Action Plan for the project

- Community Profile
- Meeting materials including handouts, surveys, presentations, and display boards for all meetings
- Meeting minutes for all meetings
- Four Local Officials Meetings
- Three Stakeholder Meetings
- Six Public Information Centers
- Four Agency Consultation Meetings
- One Town Hall presentation
- Resolutions of Support from Lower Township and Cape May County
- Public Outreach Summary for the project
- A Project Website and Social Media Plan for the project
- Monthly website statistic reports for the project

TASK 2: DATA COLLECTION

To the extent possible, the Michael Baker Team will use data collected during the previous 2004 WSP study and leverage team member WSP's uniquely intimate knowledge of the project to complete data collection and provide a thorough, efficient existing conditions analysis ahead of schedule. Additionally, in anticipation of being selected for this LCD Study and recognizing that time-sensitive data must be collected during the peak summer travel season, the Michael Baker Team began collecting traffic data in early August 2017 to obtain essential peak data that would otherwise need to have waited until summer 2018 to obtain. Through these previous and preemptive efforts, the Michael Baker Team will be primed and ready to initiate execution task activities immediately following notice to proceed. Efforts include obtaining and reviewing existing documentation, verifying, validating and updating, as needed, previously collected project mapping and survey, review and update the Environmental Screening Report, and evaluate site deficiencies. The information will be summarized in an Existing Conditions Report and serve as a primary resource in developing the project formal Purpose and Need Statement.

A. Obtain and Review Existing Documentation

In addition to reviewing the previously completed report, the Michael Baker Team will collect existing data, plans and studies of the project area from the various project stakeholders. This information may include:

- Tax and Right-of-Way Maps
- Research and obtain Deeds
- Zoning and Flood Maps
- Jurisdictional Agreements and Maps
- As-Built and Site Plans
- State and Local Master Plans and Land Use Studies
- Utility Maps
- Traffic Reports and Studies
- Structural Inspection Reports and Inventory and Appraisal sheets
- Straight Line Diagrams and Other Roadway Inventory Data
- Drainage Maps, Soil Surveys and Geodetic Surveys
- Hydrological and Hydraulic Data Reports
- Environmental Landscape Data, Reports and Studies
- Demographic profiles/Environmental Justice Maps and Data

Michael Baker will meet with project stakeholders to gather information relative to issues or problems that they think should be considered in this assessment. Issues that may be identified through this interview process include areas that flood or have poor drainage, unstable embankments or erosion, reoccurring maintenance requirements, issues relating to emergency evacuation needs, first responder access or circulation concerns, needs for improved directional signage, or other issues that may not be obvious to the Project Team. Michael Baker will also obtain data from State, regional, county, and municipal agencies as appropriate.

B. Project Mapping and Survey

Michael Baker Team member, Churchill Consulting Engineers (Churchill), will lead the efforts to validate, verify, and update the survey data obtained in the previous Alternatives Analysis effort, as needed. A preliminary review of the existing mapping against current aerial photography indicates that all areas remain unchanged, with the exception of the Ocean Drive and Route 109 intersection. By utilizing the existing mapping as a base, a tremendous saving in time, survey field work, and costs is achieved.

Churchill will apply ground based surveying and mapping to reflect current conditions by updating and supplementing the previous Concept Development Phase mapping. Equipment with the latest technologies will be efficiently utilized to perform accurate ground based survey and provide positioning of aerial control on universally held datums. Digital scanning capabilities will offer an opportunity to provide a quick and detailed survey grade point cloud for existing improvements that cannot be surveyed conventionally. Churchill will execute fieldwork to achieve unattained mapping details or verification that can eliminate inefficient drafting. An online FTP site will be established to allow the direct exchange and real time assessment of digital data between our field crews and office personnel. Churchill has the state-of-the-art tools and the experienced personnel to satisfy all anticipated survey requests.

Mapping will meet or exceed National Map Accuracy Standards, comply with the NJDOT Photogrammetry Manual, and conform to NJDOT Article 51.

Field surveyors will perform on-site field edits of the photogrammetric base mapping to identify any missing and/or reconstructed surface features. Churchill's field surveyors will perform supplemental observations, as required, utilizing the control network previously established, a combination of RTK GPS, conventional total station, and high definition laser scanning. The supplemental observations will include identification of existing features (i.e. signs, fences, ground surface types, building types, etc.), surface utilities (i.e. valves, utility poles, hydrants, etc.), and additional ground locations in areas not visible from aerial photography (i.e. top and bottom of curbs, edge of pavements, sidewalks, etc.). Churchill will locate underground utilities by noting the painted markings and flags placed by utility entities. Also, the approximate horizontal locations of overhead wires will be sketched.

All surveying activities along roadways will be performed under an approved NJDOT Access Permit and the necessary Maintenance and Protection of Traffic.

Churchill will obtain record mapping by submitting requests to applicable agencies for information, performing County research, utilizing existing Right-of-Way (ROW) mapping, and reviewing local tax maps. These documents will be evaluated and will assist the field crew in identification of existing monuments. The locations of ROW and parcels will be defined and based on a combination of the recovered monumentation and the deeds/documents received. Adjacent property lines will be depicted by available parcel data from the NJ State Geographic Information Network and cross-checked against municipal tax assessment maps. Parcel lines, ROW lines, and centerline geometry will be overlaid on the topographic mapping. All established baselines will be provided from our documented research. Churchill will provide a table of baseline stations, geometric coordinates (PC, PCC, PT, and PI), equation stations, and ties in DGN format. Tie sketches of all secondary control traverse points set in the field will also be included.

Churchill will map historic Tidelands from NJDEP GIS data. Locations of existing Tidelands instruments (grants, licenses, etc.) will be researched through the Bureau of Tidelands and mapped accordingly. Furthermore, Tidal datums will be surveyed in the project area and provided in table form.

C. Environmental Screening

The Environmental Screening will be led by Steve Bolzano from WSP with support from Becky Traylor of Michael Baker. Steve Bolzano oversaw the original screening and is intimately familiar with the site. Under the direction of NJDOT-BEPR, the team will identify existing environmental and cultural resources within the project limits based on available data, site visits and consultation with stakeholders. It is the intent of this investigation to identify environmentally sensitive areas and State/Federally regulated areas. The culmination of this investigation will be the preparation of an Environmental Screening Report (ESR). Having collaborated with the NJDOT-BEPR on the development of the environmental process for local aid projects, the Baker Team is intimately familiar with the requirements for the ESR and has extensive experience in identifying and documenting regulated resources.

The consultant team will compile and review all prior technical studies, including, where available:

- Cultural Resources Study
- Ecology/Wetlands Report
- Hazardous Materials Report
- Socioeconomic and Land Use

An updated Environmental Screening Report will be prepared. The Screening Report will identify the extent of known environmental constraints and existing land uses within the project area based on review of publicly available data utilizing the data available in the previous technical studies wherever pertinent. The deliverables will include an updated Environmental Screening Form, a brief narrative describing the environmental constraints within the project area and maps illustrating the location of know constraints. This scope does not anticipate that conducting technical investigations or surveys will be warranted at this phase of the project and as such is not included.

1. Cultural Resources (Archaeological and Historic Architecture)

   Cultural resources are a key environmental resource for the project area. The New Jersey Office of Historic Preservation previously concurred with the Area of Potential Effects (APE) for archaeological and architectural resources for this project. Within the APE the most notable historic element is the Middle Thorofare Bridge, completed in 1941, which was previously determined eligible for listing on the National Register. As part of the APE report, the scope of work for the architectural and archaeological surveys was developed for completion during Preliminary Engineering. The scope of work will be reevaluated as part of this effort.

   The County previously evaluated the potential for impacts to these adjoining Districts and properties and found a low potential for adverse effect. It is also unlikely that archaeological deposits of historical significance exist within the APE, and therefore no effects on historic or prehistoric archaeology are anticipated.

   As part of the environmental screening, RGA, Inc. will review and expand, as necessary, on their earlier efforts to provide an updated cultural resources screening. This will include:

RGA performed the cultural resources investigations as part of the original Feasibility Assessment project. In 2013, they prepared a cultural resources investigation for emergeny slope protection measures for the north abutment of the National Register eligible Middle Thoforefare Bridge.

   - A review of National and State Register listings and previous cultural resources investigation reports at the New Jersey Historic Preservation Office (NJHPO). Research gathered during previous Alternatives Analysis effort will be used to the greatest possible extent. A particular focus will be on prior cultural resource survey work in the project area, and work that post-dates 2012.
   - Review of NJHPO review correspondence for the CR 621 project.

- A review of archaeological site files at the New Jersey State Museum. The focus of this effort will be on the project area. Previous research on site records will be updated.
- The preparation of a brief letter report with a graphic showing the location of historic properties (i.e. National and State Register listed or eligible resources).

2. Section 4(f) Properties (Parkland and Historic)

The Department of Transportation Act of 1966 included a special provision - Section 4(f) - which stipulated that the Federal Highway Administration (FHWA) and other DOT agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless there is no feasible and prudent alternative to the use of land and that the action includes all possible planning to minimize harm to the property resulting from use. The previous land use report will be updated to reflect changes in property ownership. Of particular importance, is the recent expansion of USFWS land to the immediate southeast of the existing causeway. As part of the NJDOT Route 72 Manahawkin Bay Bridge and Route 72 East Projects, WSP secured a NEPA Environmental Assessment for USFWS Special Use authorization for use of a portion of a National Wildlife Refuge and facilitated an agreement to allow for encroachment of roadway improvements within a federal wildlife refuge.

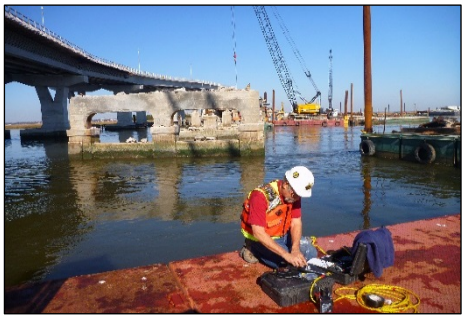
Additionally, the environmental screening will identify historic sites that would be protected under Section 4(f). Protection is also afforded to contributing elements of historic districts.

3. Air/Noise

The Michael Baker Team will perform a site visit to identify sensitive receptors to potential air and noise impacts within 300 feet of the project limits. Additionally, the project will be reviewed for shifts in horizontal and vertical alignment and increases in capacity that may affect sensitive receptors. Recommendations for more detailed air quality and/or noise impacts studies will also be provided if warranted as well as identifying preliminary mitigation opportunities.

4. Wetlands

Wetland delineation was performed for the project in December 1999 and March 2002. The wetland delineation and resource value classification will be verified.



Michael Baker oversaw hydroacoustic studies at the adjacent Route 52 Causeway Replacement Project as part of Section 7 consultation for Atlantic sturgeon on the GSP Str. 28.0S and 28.5S Bridge Replacement projects.

5. Flood Hazard Areas, Riparian Zones, and Surface Waters

The project includes several water crossings including Upper Thorofare, and Middle Thorofare (FW2-NT/SE1). Dickenson Creek (FW2-NTC1/SE1) also occurs within the project area, classified as a Category 1 waters which receives the highest level of water quality protection in NJ. The Michael Baker Team will review the effective Flood Insurance Study (FIS), Flood Insurance Rate Maps, and NJDEP State Study Maps to identify regulated flood hazard areas within the project limits. As discussed previously, the elevation of the flood hazard area has increased since the 2004 study. Additionally, in 2007, the NJDEP established jurisdiction over the riparian zone. Riparian zones are not applicable for barrier islands or in coastal wetlands. However, the study area will be reviewed to confirm that riparian zones are absent.

6. Threatened & Endangered Species and Protected Habitat

The project area is considered a major migratory bird pathway. As many as fifteen (15) state and federally listed threatened and endangered species occur with the project area. They include various species of birds, as well as, sea turtles, plants and fish including the Atlantic sturgeon (*Acipenser oxyrinchus*) which was recently listed as federally endangered species in 2012. Coordination with USFWS, NMFS, and NJDEP Division of Fish and Wildlife was conducted during the initial study regarding Essential Fish Habitat, migratory birds, submerged aquatic vegetation,

shellfish leases, state listed species and known nesting sites, and sea turtles. As part of the screening, the Michael Baker Team will verify that the conclusions of this coordination remains valid.

7. Hazardous Waste

A Hazardous Waste Screening was performed as part of the 2004 study. The Michael Baker Team will review the study and update it to reflect current changes in land use. The screening will be completed utilizing federal and state databases, review of Sanborn Maps, and field reconnaissance. Individual property owners and local officials will not be contacted unless directed to do so by the Project Team. Results of this research will be documented in the ESR and will be submitted for review and a determination on the need for a detailed Site Investigation. A Site Investigation with detailed sampling, PAECE reports, or Contamination Clean-up Plan are not completed during the Concept Development Study. However, based upon finding of this study, recommendations for sampling or additional investigation will be provided and documented in the ESR.

8. Socio-economic, Environmental Justice, Land Use, and Community Impacts

The Michael Baker Team will assess potential socio-economic impacts, environmental justice, land use and community impact concerns that may influence the project decision making. The latest available US Census tract data will be used to identify and evaluate any potential environmental justice concerns in accordance with Executive Order 12898. Summary documentation assessing potential socio-economic, environmental justice, land use and community impact considerations, as a result of project activities, will be included in the ESR. Environmental justice communities will be identified early. If they are present, the PIAP will be updated to provide adequate outreach. Based on a preliminary review of available census data, despite being a tourist destination, the City of Wildwood exhibits economic distress characteristics. Data gathered during the previous study also indicate the heavy pedestrian use of the bridge by seasonal workings.

9. Regulatory Approvals, Consultation, and Permits

The Michael Baker Team will review the range of concepts under consideration and identify the potential Federal and State regulatory reviews, coordination and approvals that may be required. Results of the review will be documented in the ESR. In determining regulatory jurisdiction and permitting requirements, additional studies that may be recommended to further identify relevant information affecting jurisdictional determinations and extent of permitting efforts will be documented. Based upon a preliminary review of the project and its location, it is anticipated that numerous federal review and state permit processes will be required and are listed below.

As a requirement of the above permits and approvals, mitigation will ultimately be required. The primary purpose of mitigation is to offset or compensate for the potential for significant environmental harm resulting from impacts attributed to the project. Mitigation may include conservation measures to minimize impacts such as seasonal restrictions on certain activities, such as in-water construction, or other best management practices such as aquatic noise abatement measures to avoid adverse impacts to listed aquatic species. Compensatory mitigation such as land preservation, habitat restoration or creation, or accommodations for enhanced public waterfront access, may also be required. In the event the selected PPA anticipates in excess of 5 acres of impacts to Waters of the US then review by the US Environmental Protection Agency may also be necessary.

Federal Consultation and Authorization

- National Environmental Policy Act (NEPA) Documentation
- Section 106 of the National Historic Preservation Act Consultation
- Section 4(f) of the USDOT Act Evaluation
- Section 7 of the Endangered Species Act with USFWS and NMFS
- Essential Fish Habitat Consultation Magnuson-Stevens Fishery Conservation and Management Act NMFS
- US Army Corps of Engineers Permit
- US Coast Guard Bridge Permit

State Review and Permits

- NJDEP Freshwater Wetlands Protection Act Permit
- NJDEP Flood Hazard Area Control Act Compliance
- NJDEP Coastal Area Facilities Review Act Permit
- NJDEP Coastal Wetlands Act Permit
- Cape-Atlantic Soil Conservation District Soil Erosion and Sediment Control Plan Certification
- NJPDES Construction Stormwater General Permit, Highway General Permit, and Request for Authorization
- NJDEP Tidelands Conveyance
- NJDEP Waterfront Development Permit
- NJ Register of Historic Places Act
- NJDEP Stormwater Management Rules (Plan Review and Approval)
- NJDEP Water Quality Certificate
- NJDEP Green Acres Program

D. Navigation Impact Report

Michael Baker will perform a navigational study in accordance with 33 CFR Part 116.01. The "USCG Bridge Program Reasonable Needs of Navigation White Paper" will be utilized as guidance for the study.

A navigation study will be performed to develop a Navigation Impact Report (NIR). The purpose of the NIR is to investigate how the construction and operation of bridge alternatives could affect current and future river navigational uses, and to identify how various bridge options could avoid or minimize such impacts. The Navigational Impact Report will describe the existing conditions of navigation within the study area, outline the purpose and need of the project and detail the alternatives. The report will also include the results of a boat height sensitivity analysis and outline how navigation in the study area may be affected.

Ultimately, the NIR will be submitted to United States Coast Guard (USCG), the federal permitting agency which issues vertical clearance requirement permits for bridges. To ensure the needs of navigation are met, the Coast Guard must approve the dimensions and clearances of the PPA to ensure it does not unreasonably obstruct the current or foreseeable future maritime uses in the study area.

Michael Baker performed a navigation study in 2016 for the Monmouth County Oceanic Bridge LCD Study.

Relying on Michael Baker's experience with other moveable bridge replacement projects, early coordination with the USCG will be initiated as part of the LCD Study. Michael Baker has successfully worked the USCG to determine the reasonable needs of navigation for the Route 52 Causeway Bridge Replacement project and is currently working with the Harbor Operators Committee and the USCG to obtain a preliminary determination on the vertical clearance for the Monmouth County Oceanic Bridge LCD Study. The Michael Baker Team will apply that lesson to the Ocean Drive LCD Study reducing the anticipated duration for this task.

The reasonable needs of navigation will be assessed and prior navigation studies for this area will be used to document existing conditions. The design depth and width of the channel at the Middle Thorofare Bridge are -12' (mllw) and 100', respectively. Figure 2 (included at the end of this Narrative) illustrates existing depths of channels and inlets in the vicinity of the project limits. County and metropolitan planning records will be reviewed to assess potential maritime traffic needs in the future. Additionally, the following data will be collected and analyzed:

- The existing conditions of the navigable channel. Figure 2 (included at the end of this Narrative) shows the most recent bathymetric survey of the navigable channel at the Middle Thorofare Bridge, obtained from the U.S. Army Corps of Engineers.

- Navigable channel jurisdiction (U.S. Army Corps of Engineers or the State of New Jersey maintained)
- Vessel population (type, size and use)
- Existing marina locations upstream and downstream of the Middle Thorofare Bridge
- Existing environmental land uses
- Future plans to improve the channel
- Future development/vessel population - upstream/downstream planned developments/ marinas will be researched in proximal municipalities and in waterfront development permit applications at NJDEP. An estimated number and size of boat slips (amount of personal watercraft, commercial vessels, and larger yachts/sportfishing vessels) will be calculated.

E. Evaluate Site Deficiencies

The Michael Baker Team will review the data, both the previous data and newly collected, to assess the existing transportation system to determine the existence of any controlling substandard design elements (CSDE), structural defects, and traffic operational deficiencies, in accordance with current AASHTO, MUTCD, and NJDOT design standards and guidelines.

This task includes a re-evaluation assessment of existing transportation systems and site conditions and will identify roadway deficiencies. The identified deficiencies will serve as the basis in developing the project Purpose and Need.

Michael Baker will coordinate with the Cape May County Division of Engineering to gather information relative to issues or problems that should be considered in this assessment. The coordination can identify concerns that may not be ascertained from the review of existing records or reports, or readily apparent to the Project Team. The Michael Baker Team will perform site visits to review, verify and document roadway information. Digital photos will be taken to document existing conditions and used to create a Project Fact Sheet.

The following investigations and data collection efforts will be required for performing the appropriate analyses for this project:

1. Traffic and Collision Data

   Given the amount of time since the conclusion of the previous study, the Michael Baker Team will develop a traffic data acquisition program that will consist of Automatic Traffic Recorders (ATR) and manual Turning Movement Counts (TMC). Although there are existing 2010, 2014 and 2015 traffic counts within the study area, the time periods of these counts do not accurately reflect the peak and off-peak seasons. However, these previous counts will be reviewed to better understand the overall traffic patterns within the study area. Traffic data will assist in determining existing level of service and delays, forecasting future travel demand, and determining construction detours during alternatives analysis. Data will also assist in identifying potential ITS traffic management strategies to improve operations in the existing and future build conditions. Travel time, speed studies and vehicle-delay data studies will not be performed.

   The Michael Baker Team recognizes that peak-season data must be collected during the peak summer season, between Memorial Day weekend and Labor Day weekend. As the anticipated Notice-to-Proceed date of this study is October 2017, the earliest time new peak-season data can be collected will be June 2018. In anticipation of this challenge, the Michael Baker Team began a preliminary traffic data collection program in early August 2017 using Automatic Traffic Recorders to obtain one week of peak-season traffic data that would otherwise need to have waited until summer 2018 to obtain. The traffic data will be used to document existing traffic operations on Ocean Drive and will be included in the existing conditions report. The data will also be considered during the alternatives analysis phase discussed in Task 3.

   Michael Baker will install ATRs at the following locations:

   1. CR 621 (Ocean Drive) just west of the western Middle Thorofare abutment (MP 1.6)
   2. CR 621 (Ocean Drive) just west of the Upper Thorofare Bridge (MP 1.2)
   3. CR 621 (Ocean Drive) just west of the Mill Creek Bridge (MP 0.7)
   4. Three additional roadways will be counted at locations approved by Cape May County.

Manual Turning Movement Counts will be performed at the following locations:

1. Intersection of CR 621 (Ocean Drive) and NJ 109
2. Two additional intersections will be counted at locations approved by Cape May County.

Michael Baker will perform a total of two 12-hour Bicycle and Pedestrian Counts on the Middle Thorofare Bridge during the peak summer season, one weekday and one weekend.

Crash data for the most recent three years will be obtained from state and municipal sources. A crash analysis and crash diagram will be prepared detailing crash type and, if applicable, an associated sub-standard design element identified in an earlier task. The sub-standard design elements and mitigation measures will be taken into account when developing roadway alternatives.

Locations and travel routes of local emergency services and/or school services will be identified during field visits and through discussions with stakeholders.

2. Structural

This task will involve the review of available structural data and collection of additional field data for the three bridges within the project limits. According to a preliminary review of the 2004 Alternatives Analysis Report, the project includes three structurally deficient bridges: Mill Creek (300'), Upper Thorofare (350'), and Middle Thorofare (1,039'). The Mill Creek and Upper Thorofare Bridges are fixed bridges comprised of four reinforced concrete T-beams, and 12 and 14 spans respectively, each span is 25' in length. The Middle Thorofare Bridge consists of 21 fixed spans and 1 single leaf movable bascule span. According to the 2004 Report, each of the three bridges were deemed functionally obsolete due to narrow widths, structurally deficient due deteriorated structural elements and low sufficiency ratings; 46.8, 47.3, and 4.0 (out of a possible 100 points) for the bridges over Mill Creek, Upper Thorofare, and Middle Thorofare, respectively. The Middle Thorofare Bridge is also posted due to its inability to carry loads greater than 15 tons. Additionally, the existing 50' opening (between fenders) of the movable span restricts larger vessels from navigating past the bridge and has contributed to collisions several times each year.

The Michael Baker Team will perform up to three (3) visits to the project area to document existing structural conditions, and mechanical and electrical conditions of the moveable span of the Middle Thorofare Bridge. Notations of existing physical characteristics of the bridge will be made, and any particular problems/opportunities relative to potential improvements will be identified. The following structural information will be evaluated, observed in the field and/or identified during a thorough review of as-built plans, bridge inspection reports, and other documents:

- Structural inventory & appraisal rating (SI&A)
- Load posting and rating
- Structural defects
- Structural service life and life cycle
- Structural integrity and serviceability
- Vertical Clearances

3. Roadway

This task will involve the review of data provided in the 2004 Alternatives Analysis Report and performing additional investigations, including up to two field visits, to evaluate the current condition of the project area. Notations of existing physical characteristics of the road system will be made, and any particular problems/opportunities relative to potential improvements will be identified. Additionally, intersections and pedestrian facilities, including curb ramps will be inventoried and evaluated for compliance with the Americans with Disabilities Act (ADA).

The project limits consist of a 2.7-mile stretch of roadway between NJ Route 109 and Madison Avenue in the Diamond Beach section of Lower Township, Cape May County. The project includes three structurally deficient bridges includes three bridges over Mill Creek (300'), Upper Thorofare (350'), and Middle Thorofare (1,039'). The surface roadway within the project limits consists of a 40' wide bituminous paved surface consisting of 10' lanes and 10' shoulders in each

direction. Each of the three bridges carry two 10' lanes, no shoulders, and 1'-6" safety walks on each side. A toll booth separates the two travel lanes approximately 35' east of the movable span of the Middle Thorofare Bridge.

A review of the 2004 Alternatives Analysis Report indicates that the existing roadway within the project limits contains several deficiencies, which include insufficient travel lane width, substandard horizontal curves, substandard profile grades, and a roadway surface elevation below the 100-year floodplain. However, this report used design standards and guidance from publications which have since been updated including the 2001 edition of AASHTO's "*A Policy on Geometric Design of Highways and Streets*". Michael Baker will evaluate these deficiencies, as well as additional applicable roadway data provided in the 2004 Report and obtained from site visits and as-built plans to determine compliance with current design standards and identify additional deficiencies. The following roadway design elements will be documented and evaluated:

- Geometrics – Horizontal and Vertical Alignment Issues with focused consideration of the 100 year flood elevation, Right-of-Way (ROW), and Environmental Impacts
- Typical Sections – Cross slopes, superelevations, and grade transitions
- Lane and Shoulder Widths, Tapers, and Transitions
- Safety/Roadside Design Features (Guiderail and End Treatments, Pavement Drop-offs, Clear Zone Issues, Slope Stabilization, etc.)
- Substandard Stopping Sight Distance
- Location of Driveways, Turnarounds, Slip Ramps, and Other Points of Access
- Right-of-Way and Utility Impacts
- Signing, Striping, Delineation, and RPMS
- Toll plaza replacement
- Impacts of structural vertical clearance on roadway geometry

4. Stormwater Management/Drainage

Michael Baker will obtain existing data, plans and studies of the project area from the various project stakeholders to evaluate site deficiencies in drainage and stormwater management design. In addition to conducting field visits during both wet and dry conditions, Michael Baker will describe drainage system defects, drainage areas, and flooding conditions as follows:

Drainage System Defects and Best Management Practices (BMPs)

Michael Baker will evaluate the existing drainage and stormwater management system to locate drainage structures and critical facilities such as the existing pipe culvert west of Fish Dock Road controlling freshwater and saltwater interaction. Due to our knowledge of the project, we know the culvert is a gathering place for recreational fishing and crabbing. This culvert is the only waterway that permits water to flow from the east side of Ocean Drive to the west side during tidal changes. The pipe is undersized and typically has water flowing through it at a high velocity. The County considers it a safety hazard and has identified it for replacement within this project. Michael Baker will also identify discharge locations within the project area.

Drainage Areas

Michael Baker will delineate the drainage areas and identify the land use and soil types for the existing conditions within the project area. Potential changes to drainage area properties, as a result of proposed concepts, will be noted in the alternatives analysis. Based on our preliminary evaluation, the project is located within a tidal Flood Hazard Area.

Flooding

Michael Baker will review information provided by Cape May County, local businesses, and residents to evaluate documented incidents of roadway flooding. Michael Baker will perform a field visit during or shortly following a storm event, if feasible, to identify roadway ponding areas within the project area. It is important to note the new preliminary

base flood elevation of 11' NAVD 88 as it has risen by 2 feet since the previous concept development study was evaluated.

5. Geotechnical/Pavement

Michael Baker will obtain existing data, plans and studies of the project area from the following sources:

- Geotechnical Information in Technical Addendums for Ocean Drive Upgrade & Bridge Replacements
- NJDOT Geotechnical Data Management System online records, (i.e., Cape May Canal Bridge (North Shore Road), Route 47 Bridge (Rio Grande Road))
- Engineering Soil Survey Report (Rutgers)
- New Jersey Geological Survey Publications: Surficial Geology Maps and Bedrock Geology Maps
- As-Built Plans
- Michael Baker Team's projects in the adjacent area

For this LCD Study, Michael Baker will use the existing subsurface information to evaluate the proposed foundation types. After an initial review already performed, Michael Baker has determined that existing soil borings satisfy the subsurface data needed and performing new soil borings will not be required as part of this effort. The scour design previously completed can be re-examined leveraging the Michael Baker Team's knowledge of the project to ascertain a concept level understanding of the scour potential at the project site. This step will also solidify the steps need during preliminary engineering for computing and finalizing the foundation designs.

6. Utilities

Utility information is available from the *Alternatives Analysis Report* (2004) and in the existing utility CAD file (eutil file). Utility companies within the project include Atlantic City Electric distribution (aka Conectiv), Verizon, Comcast, South Jersey Gas, and the Lower Township MUA (sanitary sewer force main but not water). A utility contact letter (NJDOT Utility Letter No.1) will be sent to each of these utility companies in the vicinity of the project and to others as necessary, to request current utility contacts, verification that utilities are in the vicinity of the project limits, and an order of magnitude Preliminary Engineering Utility Engineering cost estimate.

Particular attention will be given to the utility crossings at the three existing bridges, as these represent prime locations where high impact utility relocations may be required. The information obtained from the utility companies will be used to update the utility base map (eutil) file.

F. Existing Conditions Documentation

A summary of the existing conditions will be incorporated into a Project Fact Sheet and will be organized in a manner consistent with the Concept Development report as outlined in the LCD Process. The digital photos taken during the field visits will be used to illustrate the existing conditions. The Project Fact Sheet will be submitted to the Project Team for review and approval. Review comments shall be incorporated into a working version. Once approved, the Project Fact Sheet will be used to introduce community members to the project. It will be available at public meetings, and on the website. Additionally, it will be included as an appendix item in the CD report.

Once the data collection effort is complete, the results will be summarized in the Existing Conditions Report (ECR). The ECR will comprehensively outline the current state of the bridge and its context. It will contain the findings from Structure Inventory & Appraisal (SI&A), reporting on the condition of the structural state of the bridge and information obtained from previous movable bridge inspections. In addition, there will be an inventory of Controlling Substandard Design Elements (CSDE), drainage & stormwater evaluation, an analysis of motorized and non-motorized traffic patterns on the bridge, report of communication with utility companies, geotechnical and new pavement evaluations, crash history report, Environmental Screening Report, Community Profile, and Navigation Evaluation. The ECR will include maps, graphics, and figures to illustrate the existing conditions, as well as appendices of back-up data which support the conclusions. The Existing Conditions Documentation will be used to develop the project Purpose and Need.

G. Purpose and Need Statement

The results of the data collection efforts will culminate in the development of the project Purpose and Need Statement. The Purpose and Need will focus on the transportation needs and address the structural and operational deficiencies of the roadway network.

Purpose and Need document has three components: the "Purpose", the "Need", and the "Goals and Objectives". The "Purpose" will explain the fundamental transportation problem clearly and succinctly. The "Need" will go in further detail, supporting the purpose with important facts and findings from the existing conditions effort, including the bridge's structural, mechanical, and electrical deficiencies, its place in the local and regional transportation network, its importance to maritime traffic, and its value to local businesses and residents. Finally, the "Goals and Objectives" reach beyond the fundamental transportation issue, representing outcomes that the project team wishes to achieve. The "Goals and Objectives" are developed from data collection, public input, environmental concerns, and transportation considerations.

The project Purpose and Need Statement is the foundational document in the LCD process, as it lays the initial groundwork for the development and evaluation of the alternatives. The Michael Baker Team, in collaboration with SJTPO and Cape May County, will formulate a Purpose and Need which is well justified through data collection, existing conditions analyses, project team coordination, and stakeholder and public input.

Successful alternatives *must* meet the Purpose and Need. For this reason, it is essential that the Purpose and Need document be carefully crafted in order to facilitate the development of a prudent range of alternatives and the selection of a fitting and successful Preliminary Preferred Alternative. Michael Baker has significant and recent experience developing Purpose and Need documents for Local Concept Development Studies which balance intersecting transportation, structural, environmental, and community issues. Our experience with the LCD studies for the Oceanic Bridge in Monmouth County, the 6th Avenue Bridge in Passaic County and the Central Avenue Bridge in Newark, will be invaluable in creating a document which can successfully guide the project.

Task 2 Deliverables:

- Project Mapping (1:100 scale, 1' contour)
- Project Fact Sheet/Existing Conditions Documentation
- Concept-level Foundation Study
- Navigational Impact Report
- Environmental Screening
- Existing Condition Report
- Draft and Final Purpose and Need Statement

TASK 3: ALTERNATIVES ANALYSIS

Following the data collection phase, a number of possible alternatives will be developed. The goal of the alternative analysis phase is to identify and compare a reasonable number of prudent and feasible alternatives to satisfy the project Purpose and Need. At a minimum, the Federal process requires that a No-Build and a Rehabilitation Alternative be considered. Similarly, as the Middle Thorofare Bridge is eligible for designation on the National Register, a Modified Rehabilitation Alternative and a New Bridge constructed in a New Location Alternative must also be considered. As part of the "New Bridge in a New Location" Alternative, the existing Middle Thorofare Bridge would also need to be maintained to a level which preserves the cultural resource, but that may not accommodate vehicular traffic. In addition to these regulatory requirements, a number of build alternatives will be developed. At the conclusion of the Alternatives Analysis process, each of these alternatives will be evaluated within the Alternatives Comparison Matrix, concluding in the selection of the PPA.

In addition to the use of data collected during the previous 2004 WSP study, the Michael Baker Team will leverage team member WSP's knowledge of previously conceived alternatives to begin the alternatives analysis task ahead of schedule. Alternative

development in this coastal environment has a steep learning curve that the Michael Baker Team has already reached. WSP's history of the project coupled with the Team's extensive experience in the area and with Cape May County will lead to a narrow and focused list of feasible build alternatives and a detailed alternatives comparison matrix.

A. Development of Engineering Alternatives

Alternatives will be developed to address the Purpose and Need Statement while minimizing impacts to the surrounding environment and community, as per SJTPO, Cape May County and NJDOT goals, while meeting Cape May County, NJDOT and Federal Highway Administration standards. Each alternative will be developed conceptually and to a detail such that impacts to surrounding resources can be determined for comparison purposes. The Michael Baker Team will develop the following alternatives as outlined above:

1. No Build

   The No Build Alternative will require that the existing bridge be kept in its current state of repair, requiring on-going maintenance and potential closures. The No-Build Alternative also establishes the baseline condition for comparison and analysis during the evaluation process and in support of the environmental review documentation. Due to a number of substandard features and the location within a 100-year floodplain, this alternative is not expected to meet the needs of this project, but it is required as a necessary basis of comparison.

2. Rehabilitation

   As part of our due diligence we will investigate the feasibility of a major rehabilitation of the existing bridge as required by NEPA environmental review for Section 106 & Section 4f compliance. Based on the severity of the deteriorated condition of the bridge deck, superstructure, and substructure, and the age of the bridge, it is unlikely that this alternative will meet the needs of this project. For purposes of a complete comparison, the rehabilitation alternative will be documented and included in the alternatives evaluation.

   A cursory inspection of the existing bridge will be performed to determine the general extent of repair and rehabilitation that will be necessary to make this alterative comparable to the build alternatives. Existing inspection reports, maintenance records, prior repair and rehabilitation records, as well as previous studies will be examined. This field view will also allow us to determine if any short-term repairs are needed in order to continue providing safe and reliable operations until more permanent repairs to the bridge can be made.

   NJDOT requires that rehabilitated structures be capable of carrying the current national minimum standard load specified by AASHTO. Michael Baker anticipates that due to the bridge's age, a rehabilitation to current standards would be elaborate and costly. Additionally, it is anticipated that fatigue damage, which has already accumulated, will make rehabilitation a non-viable option, as strengthening a member does not negate the already accumulated stress cycle damages. With the information gathered during the field view and the existing document review, such accumulated fatigue damage will be accessed along with the other repairs needed to extend the bridge's useful service life.

   The Michael Baker Team has extensive experience in the rehabilitation of bascule highway bridges, and will use this knowledge to determine the feasibility of this option. A moveable bridge may lessen access impacts to businesses located on the roadway. However, Michael Baker understands the fundamental trade-off between movable and fixed bridges. According to a previous Navigation Report, the bridge opens about 7,500 times annually, or up to 40 times per day in the summer season. As bridge openings can disrupt traffic between Cape May and the Wildwoods, fixed bridge alternatives will also be investigated.

   Michael Baker Team member WSP has extensive experience in conducting feasibility assessments, alternatives analysis, preliminary and final design, and construction engineering services for movable bridges locally and across the country.

   Such requisite experience is essential to the SJTPO and Cape May County in properly assessing the rehabilitation alternative, as construction access, operation, alignment, highway and river traffic demands, all become critical considerations before selecting an alternative involving reconstruction with confidence.

3. Modified Rehabilitation

The Modified Rehabilitation Alternative would include major rehabilitation of the existing bridge but in a manner which would retain those elements that contribute to the bridge's historic significance, in accordance with the Secretary of the Interior Standards. These elements could include railing, bascule, and operator's house, among others. Similar to the Rehabilitation Alternative, the Modified Rehabilitation Alternative is unlikely to meet the needs of this project but will be reevaluated and documented to meet FHWA and LCD study requirements.

4. New Location

The New Bridge in a New Location Alternative will consider constructing a new bridge to accommodate the transportation needs of the area while maintaining the existing bridge as a cultural resource. It is likely this alternative would not advance as it incurs the impacts of a new bridge as well as some of the impacts of the rehabilitation options. However, this alternative will be evaluated and documented to meet FHWA and LCD study requirements.

In addition to the required alternatives, the Michael Baker Team will review the alternatives evaluated as part of the previous study and will investigate the feasibility of new alternatives given the constraints or changes that may have occurred since that project was completed. These changes include the U.S. Fish and Wildlife Service purchase of the property adjacent to the U.S. Coast Guard training facility, and the increased 100-year flood elevation for the area, from 9' to 11'.

5. Other Alternative Options

Michael Baker will develop additional build alternatives that incorporate a wide range of bridge type and alignment options. Alternatives will include moveable and long-span fixed bridges of various types, both on-alignment and off-alignment. Michael Baker will revisit the previously developed alignments, which include bascule movable bridges, and high-level fixed span bridges.

Due to the Michael Baker Team's familiarity with the project, including knowledge of environmental constraints, a number of new alternative alignments have already been identified that utilize and improve upon previously proposed alignments by minimizing impacts to federal and state wetlands. The resulting horizontal geometry will be evaluated to provide an acceptable and consistent design speed. Figure 3 (included at the end of this Narrative) depicts the previously evaluated alignments as well as possible new alignments to be evaluated.

The Michael Baker Team will also investigate additional movable bridge types, including vertical lift bridges and table bridges. Movable bridges may be able to accommodate the needs of navigation while limiting the amount of space needed for approach spans while maintaining access to local businesses located along the roadway.

The Ocean Drive causeway contains multiple segments that each serve different needs. The possibility of "branch" and "trunk" 2-stepped alignments, which span the Upper Thoroughfare, Middle Thoroughfare, and Lower Thoroughfare in a range of locations, may also be investigated. This practice allows different portions of the bridge to be evaluated separately, and for the PPA to be formed from the best choice for each particular location.

Alignments may also be developed to represent a range of construction approaches. For example, a staged construction approach can enable the construction of a bridge very close to the current alignment, while minimizing full closures of the existing bridge.

B. Alternatives Evaluation

Consistent with the RFP goal of performing a "planning level effort", the comparison of alternative project concepts will be developed using sound engineering judgment and the Michael Baker Team's recent and unique experience with similar projects.

In close discussion with the Project Team, the advantages and disadvantages of each basic alternative project scheme will be assessed in an Alternatives Comparison Matrix and weighted to the achievement of

Michael Baker has prepared an Alternatives Matrix for nearly all of the CD studies it has completed over the last two decades and has the expertise to quantitatively and qualitatively assess the alternatives based on their surrounding resources.

the project purpose and need. Viable movable and fixed bridge type variations will be included and weighted in the comparison matrix for each of the basic alternatives under consideration by this study: No Build, Reconstruction or Replacement.

The Alternatives Matrix is an independent tool that documents and weighs the social, economic and environmental impact of each alternative against the community, project and funding constraints. Impact categories may include:

- P&N Statement Satisfaction
- Engineering Elements
- Constructability
- Cost
- ROW/Access Impacts
- Traffic
- Socio-Economics

Each alternative will be described in detail with an accompanying plan sketch. The plan sketch will illustrate the proposed cross-section, alignment, and profile. The key document in the Alternatives Analysis process is the Alternatives Comparison Matrix. As a similar comparison matrix was previously developed as part of the 2004 Alternatives Analysis Study, the Michael Baker Team will reevaluate and improve on the evaluation criteria and selection methodology used to develop the earlier matrix and incorporate relevant data into the Alternatives Comparison Matrix. The matrix will evaluate each alternative based on a comprehensive range of criteria developed from the findings of the data collection and public outreach efforts.

The matrix will document the advantages and disadvantages of each alternative. For each alternative, the impacts will be qualitatively and quantitatively assessed and weighted. Michael Baker understands that the selection of a valuable PPA is dependent on an effective and context-sensitive matrix. Michael Baker has developed Alternatives Comparison Matrices that take into account complex infrastructure, transportation, and environmental needs and concerns for a multitude of projects including many in Cape May County. Ultimately, the matrix is a logical and defendable tool that balances the various impacts versus the constraints of an alternative. Michael Baker will solicit input from project stakeholders in accordance with the Public Action Plan, with the intent of obtaining feedback on issues and concerns for each alternative.

The criterion used for the alternatives matrix can be grouped into the following seven categories: engineering, constructability, cost, right-of-way/access, traffic, socio-economics, and environmental. In addition to identifying the previous concerns and constraints, weighting their impact of the project alternatives appropriately is paramount to the process. Right-of-way proved to be a major concern preventing the previous CD from advancing into preliminary engineering. *Revisiting the previously developed alternatives matrix revealed that the weighting of that constraint was comparatively low compared to other constraints.* The team's experience with this issue as well as the vast number of coastal bridges in New Jersey led by the Michael Baker team members constructed close to their original alignments will elevate this process and correctly balance the weighting of constraints.

1. Engineering Elements

   The engineering criteria for the alternatives matrix summarize the multitude of roadway and structural elements that can vary between concepts. Each solution can have different contributing engineered elements that can affect the ultimate product in a variety of ways.

   For the roadway elements, these criteria can include: lane widths, project length, roadway length, design speed, elevation above the floodplain, alignments, tolling facilities, and compliance of intersections and pedestrian facilities to guidance specified in the Americans with Disabilities Act (ADA). The structural criteria may include: length of structures, span length, retaining walls (length and height), structure type, structure material, clearances, number of project bridge openings, and number of piers. These two lists are not intended to be complete and inclusive, but highlight the multitude of elements that contribute to the function and use of the facility into the future.

   Michael Baker will investigate the proposed alternatives for compliance with the most recent AASHTO and NJDOT Design Standards. If it is anticipated that design exceptions cannot be eliminated and it is established that the lesser design value is the best practical alternative, Michael Baker will obtain a reasonable assurance of design exception from NJDOT Quality Management Services. Michael Baker has extensive experience in identifying substandard design elements and obtaining reasonable assurances of design exceptions, and has recently successfully completed these efforts on the Cape May County CD Study Rio Grande Avenue (CR661) Entrance Improvements, NJTPA/Monmouth County Oceanic Bridge LCD Study, and NJDOT's Route 4 over the Hackensack River CD Study.

The risk of utility impacts for each identified alternative will be assessed. High risk utility impacts will be identified and incorporated into the alternatives evaluation processes (matrices, etc.). Utility relocation schemes and impacts will be shown on plans to illustrate potential impacts (risks) associated with each of the alternatives. Relocation cost estimates will also be requested from the utility owners to provide a more accurate construction cost estimate during the alternatives analysis task.

Once the PPA is identified, proposed utility relocations will be shown on the concept plans. The proposed concept plans with utility relocations will be discussed with the respective utility companies. A description of the existing utilities and potential impacts from the PPA will be provided in the LCD Study, including potential utility implications associated with construction staging, temporary facilities, demolition, traffic control, detours, and maintenance of draw bridge operations and lighting. A concept level cost estimate of utility impacts will be provided either as a percentage of construction cost or through considerable experience with utility cost impacts on many similar projects. Utilities will be further evaluated in the Risk Management section.

2. Cost

Cost is one of many criteria that gets evaluated during the alternative selection process; however, cost should not only be limited to the initial construction cost, but should also consider life cycle and operations costs. As such, it is important that the various alternatives be compared using costs that are reflective of the various project elements, from roadways, to bridges, to potential ground improvement needed. Movable bridges are more costly to build and have higher maintenance and operational costs. However, high level fixed bridges come with an added cost as well due to need for deeper foundations and added materials. Constructability considerations reflective of the difficulty of construction anticipated for each of the alternatives, particularly for in-water activities that would require cofferdams, need to be incorporated into the construction costs as appropriate. Costs for construction access, barge access, and construction staging need to be integrated into the overall construction cost as well.

With all the above complexities involved on this Ocean Drive project, we will apply our collective experience as a team from the design and construction of numerous coastal bridges, thus providing the SJTPO and Cape May County with a well vetted and dependable cost accounting to support the alternatives evaluation, and subsequently the PPA.

3. Right-Of-Way / Access

The right-of-way and access components of this project will be a critical driver of the selected PPA. As stated before, right-of-way is a main reason why the project could not advance beyond the original CD. The project area is surrounded by businesses and environmentally sensitive properties. The roadway itself is critical for the area's businesses, including the tourism industry, delivering thousands of people every week to the various destinations along the shore. The route is also an evacuation route for the barrier islands. Roadway access is not the only type of access that will be important to this project. Access to the navigation channel is critical to the various federal agencies as well as the fisheries located at the project site and the pleasure boats leaving some of the area's largest marinas just upstream of the project.

Acquisitions, easements, riparian grants, and business impacts among others will be quantified within the alternatives matrix to clearly define this category for each of the progressing alternatives. Balancing these impacts will lead to a project that meets the project's Purpose and Need as well as the long term needs of the community.

4. Traffic

With the fluctuations of traffic on weekends and during the summer months, consideration should be given to the impacts the project will have during these peak times. The Michael Baker Team's experience in situations like this is robust, with direct and relevant experience at Route 72, Route 52, and Rio Grande Boulevard to name only a few.

The alternatives analysis will consider the design year traffic projections, opening required (if any), queuing due to tolling, in addition to impacts driven by the engineering drivers: lane width, design speed, shoulders, etc.

5. Environmental

Given the environmental constraints of the area (Cape May Coastal Wetlands, Cape May National Wildlife Refuge, Marmora Wildlife Management Area, and the U.S. Fish and Wildlife Service property), obtaining a 55 mph design for a long-span high level fixed bridge may be possible, but perhaps with impacts to sensitive areas and properties. Those impacts need to be weighted appropriately for the project alternatives. This was considered at length in the previous study by Michael Baker Team member WSP providing a significant advantage to this team.

Environmental constraints will be confirmed and re-evaluated in the previous data collection phase. Impacts to the constraints will be summarized in the matrix and will include impacts to: wetlands and open waters; coastal and aquatic resources; Natural Heritage Sites; Fish and Wildlife Resources; Hydraulics and Hydrology; Air and Noise; Hazardous Materials; and Cultural Resources. While these impacts may be significant, they may also be similar from alternative to alternative. Their context in the purpose and need of the project will be an important descriptor when determining the selected alternative.

Additionally, at the time of the previous concept development study, the NJDEP Stormwater Management Rules (N.J.A.C. 7:8) were not in place. It is anticipated that the build alternatives will meet the definition of a major development (1 acre of ground disturbance or 0.25 ac net new impervious surface), requiring compliance with the Rules. The NJDEP Stormwater Management Rules require that all projects classified as a major development meet certain standards for water quality, water quantity, and groundwater recharge. However, since the project is located within a tidal flood hazard area, stormwater quantity regulations will be met by showing that the tidal flooding will exceed any local stormwater flooding. Additionally, since the project ultimately discharges to salt water, groundwater recharge compliance is not warranted. Therefore, the stormwater quality regulations will be the aspect of the rule that will require the Michael Baker Team's attention. BMPs such as basins, swales and water quality manufactured treatment devices will be proposed to meet stormwater quality requirements. Due to the limited Right of Way and anticipated high groundwater, smaller surface BMPs and water quality manufactured treatment devices will likely be proposed to achieve the required TSS removal rate to the maximum extent practicable.

Constructed infiltration basin on Garrets Island for the Route 52 Causeway Replacement Project.

6. Socio-Economics

Socio-economics of the alternatives will consider the impacts to the population of the immediate community as well as the larger surrounding area. Businesses have access that will be impacted by nearly any project selected. Some of these businesses are largely seasonal, while the commercial fishing industry has a year round need of the roadway. In addition to the business aspects, the fabric of the surrounding communities should be considered in a selection of an alternative. Cape May, Wildwood Crest, as well as the Ocean Drive corridor have certain aesthetic elements and a vibrant engaged community that have great interest in the project area. Their interests go beyond the immediate bridge, and include parkland resources, waterfront access, fishing piers, and boating access to name a few. The impacts to the socio-economics will be part of the alternatives matrix.

7. Constructability

It is essential that constructability considerations get frequent attention during the early stages of a project, particularly during the Concept Development phase. The benefit to SJTPO is that the Michael Baker Team has successfully advanced a number of LCD studies all the way through Final Design and Construction, providing a constructability perspective in the earlier phases of the project cycle where it could be a differentiator, by integrating it into the Alternatives Analysis and Evaluation. In many instances, environmental considerations are used as the major evaluation criteria between alternatives to determine the alternative which avoids or minimizes the environmental impacts, to the detriment of constructability and construction cost. This approach frequently results in a PPA that does not get advanced past preliminary engineering without major modifications, which results in impacting the project

schedule. Our team will balance the needs to avoid and minimize the environmental impacts along with the constructability considerations by integrating the following:

a. Environmental Impacts: By gaining knowledge of the existing environmental resources within the project limits, we will be able to not only quantify these environmental impacts, but also determine how they could potentially affect construction from timing restrictions for in-water construction, the need to have construction access trestles, and to determine bridge versus roadway limits to minimize impacts on wetlands.
b. Barge Access and Laydown Areas: While the final footprint for the laydown and barge access areas will be finalized in subsequent phases, their potential locations need to be evaluated during this phase as their location and size would differ between alternatives. Figure 3 (included at the end of this Narrative) illustrates existing depths of channels and inlets in the vicinity of the project limits.
c. Construction over Middle Thorofare Channel: Coordination with the US Coast Guard needs to be initiated during this phase to not only get a preliminary determination of the vertical clearance, but to also discuss allowable window for channel closure during construction.
d. Construction Staging: Depending on the geometry of the alternatives, some may be more suitable for construction staging than others which could facilitate maintenance of traffic and potential contract packaging.
e. Miscellaneous Considerations: Other considerations, such as accelerated bridge construction techniques, pile supported embankments, impacts to major utilities will be evaluated and integrated into the alternatives analysis as appropriate and when the offer to be a differentiator between alternatives.

C. Alternatives Development Documentation

The Michael Baker Team will document the methodology for developing the alternatives and detail the reasons why alternatives were removed from consideration including any fatal flaws. Michael Baker will document the public and agency input for each alternative. For identified design exceptions, Michael Baker will develop alternatives to eliminate exceptions or obtain reasonable assurance of the design exception from NJDOT and Cape May County.

The Michael Baker Team will maintain a continuous open dialog with the Project Team as the project progresses, to obtain an up-to-date understanding of the concerns of the SJTPO, Cape May County and NJDOT. We will consider the impact of each alternative and develop a methodology to weigh and/or rank the impacts for each of the identified critical issues, and, in coordination with the SJTPO, Cape May County and NJDOT, to select a PPA. We will work with the Cape May County engineer to obtain a resolution of support for the selected PPA from impacted municipalities. The PPA will be submitted for review and approval and the selection process will be documented for inclusion in the Concept Development Report.

Michael Baker will summarize the findings of the alternatives development process in the Alternatives Analysis Document, which will include a detailed description of each alternative, conceptual plan of each alternative, the Alternatives Comparison Matrix, a synopsis of the alternatives analysis, stakeholder input, comments and comment resolutions, and the selection of the PPA.

D. Value Engineering Review

Based on federal regulation 23 CFR Part 627.9(d) (1), all Federal-aid bridge projects with an estimated total cost of over $40 million shall have a Value Engineering Technical Report prepared. In accordance with the NJDOT's Capital Project Delivery Process for Concept Development, the Michael Baker Team will provide input to the NJDOT's Value Engineering (VE) Unit to conduct an independent review of the draft Preliminary Preferred Alternative (PPA) in order to identify, evaluate, develop, and recommend alternative designs or methods that will provide an acceptable or improved product. The Michael Baker Team will develop a project overview presentation for select NJDOT subject matter experts with diverse engineering backgrounds and who are independent from the project development team. This objectivity will allow for the identification of alternative solutions that maximize the value of every dollar spent and minimize life cycle costs.

It is well known that the earlier VE is performed during a project's life cycle, the greater the opportunity to achieve cost savings and value. Since the Ocean Drive Upgrades and Bridge Improvements Project will be in the early LCD phase, the VE team will focus on strategic issues, overall scope development, risk mitigation, procurement strategies, constructability issues, etc., to ensure that a project will stay on track to meet its cost and schedule goals. The Michael Baker Team will organize a one day VE workshop after a draft PPA has been developed, at which time pertinent documentation, calculations and drawings will be

provided. At the conclusion of the VE process, the NJDOT VE Unit will provide a VE Technical Report to the design team for review and comment. Comments will be addressed in a Comment Resolution Memorandum and returned to the NJDOT for inclusion in the overall LCD Report.

Additionally, following the Value Engineering Review, a PPA Constructability Review will be performed by NJDOT's Bureau of Construction Management to identify project specific construction risks with associated probability and impact to schedule and cost, allowing the project team to assess changes to staging and construction methods at the appropriate time in design to potentially reduce the construction duration. Previously identified constructability risks will be reviewed (as documented in the Risk Register), and any new risks identified will subsequently be added to an updated Risk Register. Furthermore, the Constructability Review will potentially help in developing a more accurate construction cost estimate. Comments from the Constructability Review will be made in writing along with comment responses from the Michael Baker Team, and included in the overall LCD Report.

E. Risk Management Review and Documentation

A key member of Michael Baker's Concept Development Team, Martin Wade, was deeply involved with the development of NJDOT's overall risk management process and will seamlessly incorporate the process into the overall project to help evaluate deficiencies and identify fatal flaws to assist in selecting the PPA. In accordance with NJDOT's standards, Michael Baker will perform risk identification and quantitative risk analysis, and develop risk response strategies and action plans. A Risk Register will be maintained to document project risks throughout the project life cycle. Due to the anticipated total construction cost being greater than $100 million, a Quantitative Risk Analysis Worksheet will also be developed to numerically estimate the probability that the project will meet its cost and schedule objectives. The results of the Quantitative Risk Analysis will be summarized in the Quantitative Risk Analysis Report.

As the study progresses, one area of particular importance is the potential utility conflicts with the proposed work. These will be identified for each alternative. Impacts will be quantified, evaluated and summarized for each alternative, along with approximate costs related to the relocations required. Potential impacts related to right of way, easement requirements and environmental permits will also be addressed. This information will be provided for inclusion in the Alternative Comparison Matrix.

Per the NJDOT Capital Project Delivery Process, a Utility Risk Assessment Plan will be developed to highlight potential high risk utility impacts, such as the underground gas distribution line at the western project limit and the sanitary force main that runs the project length. Potential utility relocation alternatives considered will be in accordance with the State Utility and Railroad Accommodation Policy.

F. Develop Mitigation Strategies

If a build alternative is selected, impacts to sensitive ecological resources including wetlands, open waters and habitat for state and federal listed species are will be unavoidable. Ultimately, project authorizations will be required from several federal and state resource agencies. Mitigation in coastal areas is often challenging as most land is either already protected or developed. Recognizing these challenges, the Michael Baker Team proposes to evaluate conceptual mitigation options in Concept Development.

The Consultant Team will perform an initial mitigation site search and evaluation to determine potential mitigation strategies for inclusion in the proposed PPA. This will include the identification of potential properties for acquisition and preservation to address potentially needed authorization for a diversion of state or federal wildlife refuge properties. Additionally, opportunities within the general project environs for habitat restoration and/or creation will be identified to address compensatory mitigation requirements for wetland and coastal resource impacts. The mitigation search will include the identification of potential sites within the general project corridor and adjoining areas, a review of ownership status and whether adequate mitigation credit would be available to satisfy regulatory requirements. Additional mitigation measures such as seasonal restrictions and best management practices will also be identified, which may ultimately affect construction.

Task 3 Deliverables:

- Alternatives Comparison Matrix (Electronic/5 Hardcopies)
- Description of the Alternatives (Electronic/5 Hardcopies)

- Risk Register
- Utility Risk Assessment Plan
- Quantitative Risk Analysis Report
- Conceptual Mitigation Report

TASK 4: DOCUMENTATION

A. Concept Development Plans

Michael Baker will prepare concept plans for the selected PPA, including the proposed alignment and bridge type, local roadway improvements, drainage, anticipated impacts to sensitive receptors, right of way, potential ITS needs, and impacts to adjacent properties. This information will be developed using the updated mapping document during the data collection task. The plans will be developed at a scale of 1"=100' with contours generated at a 1-foot interval and in accordance with Cape May County Engineering standards, AASHTO, the NJDOT Roadway Design Manual, Drainage Design Manual, the 2007 Standard Specifications for Roads and Bridge Construction, etc. Michael Baker will also prepare preliminary MPT schemes, detour routes and/or conceptual construction staging plans for review by the Project Team.

B. Prepare Order of Magnitude Cost Estimates

Based on the concept plans, a concept-level construction cost estimate for the PPA will be prepared. The cost estimate will consider major construction activities including mobilization, paving, excavation, removal and demolition of existing, new structures, drainage, SWM facilities, lighting, landscaping, environmental mitigation, MPT, etc. Recent unit bid prices will be made available to the Project Team by Cape May County or NJDOT. Contingencies and escalation will also be included. Right-of-Way impacts to property owners will also be noted.

C. NEPA Classification and Documentation

Although NEPA review and permit authorization are not addressed until Preliminary Engineering and Final Design, respectively, a primary objective during Concept Development (CD) is determining an appropriate NEPA classification. The goal of the CD process is to craft a well-defined and justified purpose and need statement and develop a range of reasonable alternative to address that need. Given the complexity and challenges of this project due to its environmental sensitivity and potential for significant impact, additional efforts to build consensus among regulatory agencies and develop preliminary mitigation strategies to address regulatory requirements can be conducted during CD. By incorporating the input from external stakeholders, including regulatory agencies, into the PPA, the project team is better able to demonstrate efforts to minimize harm, comply with applicable regulatory standards, and minimize potential for significant impacts, and in doing so, help to provide for a more defensible NEPA classification and streamline subsequent environmental approvals.

The County previously determined that the appropriate NEPA classification was an Environmental Assessment. However, given the opportunities for greater collaboration with regulatory agencies and refining mitigation strategies as part of this project, the project may likely qualify for a Categorical Exclusion Document under bridge rehabilitation, reconstruction or replacement (23 CFR 771.117(d)3. Based on the agency input and alternative analysis conducted under Task 1 and 3 above, respectively, the Michael Baker Team, in coordination with the Project Team, will determine the level of NEPA documentation (i.e., Categorical Exclusion(s), Environmental Assessment with FONSI, or Environmental Impact Statement) for the next phase of work. In addition to the environmental document, a determination will be made regarding the need for any additional Section 106 documentation or Section 4(f), Section 6 (f) etc. investigations, evaluation(s) and reporting.

D. Develop Preliminary Engineering Next Steps/Tasks

The Michael Baker Team will coordinate with the Project Team to prepare the next steps, utilizing the NJDOT PE Scope Statement format. The PE scope statement needed to conduct Preliminary Engineering and Final Design, and includes approval of the environmental document and any design exceptions. The PE Scope Statement will be included in the Concept Development Report. An initial Preliminary Engineering, Final Design and Construction schedule will be developed and will

include estimated durations based on Michael Baker's significant construction management experience. The project's critical path and variables affecting that path will be identified.

E. Concept Development Report

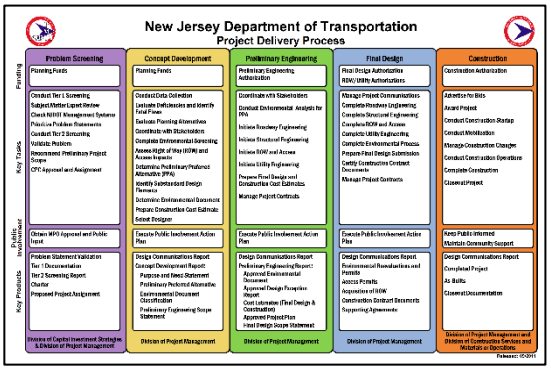
Michael Baker will compile and summarize the tasks completed during this Concept Development study and will organize the report as detailed in the RFP. The Concept Development Report will be sent to the Project Team for review and approval, and all comments will be addressed within two (2) weeks of receiving them.

Task 4 Deliverables:

- Concept Development Plans for the selected PPA (Electronic/4 Hardcopies)
- Cost Estimates (Electronic only)
- NEPA Classification Recommendation (Electronic only)
- Concept Development Report (Electronic/5 Hardcopies)
- Preliminary Engineering Scope of Work Activities (Electronic only)

TASK 5: PROJECT MANAGEMENT

This task includes project management duties and responsibilities, including scope, schedule, and budget, necessary to advance the project. Michael Baker will maintain regular and frequent contact with the SJTPO and Cape May County representatives throughout the project duration. The schedule's critical activities will be managed aggressively to avoid delays.



Michael Baker refined and documented the NJDOT Capital Project Delivery Process during a 5-year on-site assignment.

Michael Baker's primary objectives are to perform cost-effective engineering services and provide quality products that meet the budget, technical, and strategic requirements for the South Jersey Transportation Planning Organization. Project Manager Maher (Mike) Sidani, P.E., PMP, has extensive experience in managing multidisciplinary infrastructure projects. Mr. Sidani will be Michael Baker's point of contact for SJTPO, and will facilitate the scheduling and assignment of the appropriate support staff as needed to complete the Ocean Drive (CR 621) Local Concept Development Study. He will be supported by the firm's senior management throughout the agreement, which will include monthly internal Project Status Review meetings which scrutinize every active project with respect to budget status, schedule, and scope of work progress.

A. Project Controls

Reporting and invoicing procedures will be in accordance with the terms of the agreement. As such, Michael Baker will prepare and submit monthly progress reports to the SJTPO indicating percent of work complete that corresponds to the monthly invoice. The progress reports will include a listing of active and completed tasks, indicating the percent of work complete (total and by task), work and submittals completed in the previous month and to be performed in the next billing period, meetings, actions/decisions required by the SJTPO, Completed Goals, Upcoming Goals, SJTPO Action Items, and the status of the schedule and budget. Michael Baker will develop a detailed schedule for review and approval at the project kick-off meeting. The schedule, which will identify project tasks and milestones, will be reviewed and maintained throughout the study on a quarterly basis.

B. Status Meetings

Michael Baker will coordinate and attend monthly project status meetings with SJTPO, Cape May County, NJDOT-Local Aid, and NJDOT-BEPR (the Project Team), and prepare and distribute meeting agendas, handouts, and meeting summaries in

support of those meetings. Michael Baker will develop a two-week look ahead list of activities and identify action items to be discussed at each status meeting. Michael Baker will document meetings, maintain a list of action items, and maintain a database of design related and decision making actions as a result of attended meetings.

C. Project SharePoint Site

Michael Baker will establish a project SharePoint site. SharePoint is a web-based Microsoft product, and as such, is accessible from mobile devices with an internet connection and integrates seamlessly with Microsoft Office 365 and Microsoft Project. The SharePoint site will be made available to the Project Team and stakeholders, as appropriate. It is anticipated that the site will contain electronic copies of project documents, schedules, meeting agendas, handouts, minutes, presentations, a project calendar with meetings and project milestone dates, and the DCR.

Michael Baker is successfully hosting, maintaining and using a SharePoint site as an electronic document library for the Pulaski Skyway Rehabilitation Program, the Oceanic Bridge LCD Study, and the Sixth & Central Bridges LCD Study. As the Skyway Program consists of five design teams, each with multiple subconsultants, a SharePoint site has proven to be an excellent tool for real-time coordination and collaboration between members of the Project Team.

D. Design Communications Report

Michael Baker will establish a Design Communications Report (DCR) which will provide a record of all relevant communication, decisions, agreements, and approvals that occur between the Project Team and stakeholders. The DCR will be maintained on a project SharePoint Site. The SharePoint site will serve as an electronic document library throughout the course of the study.

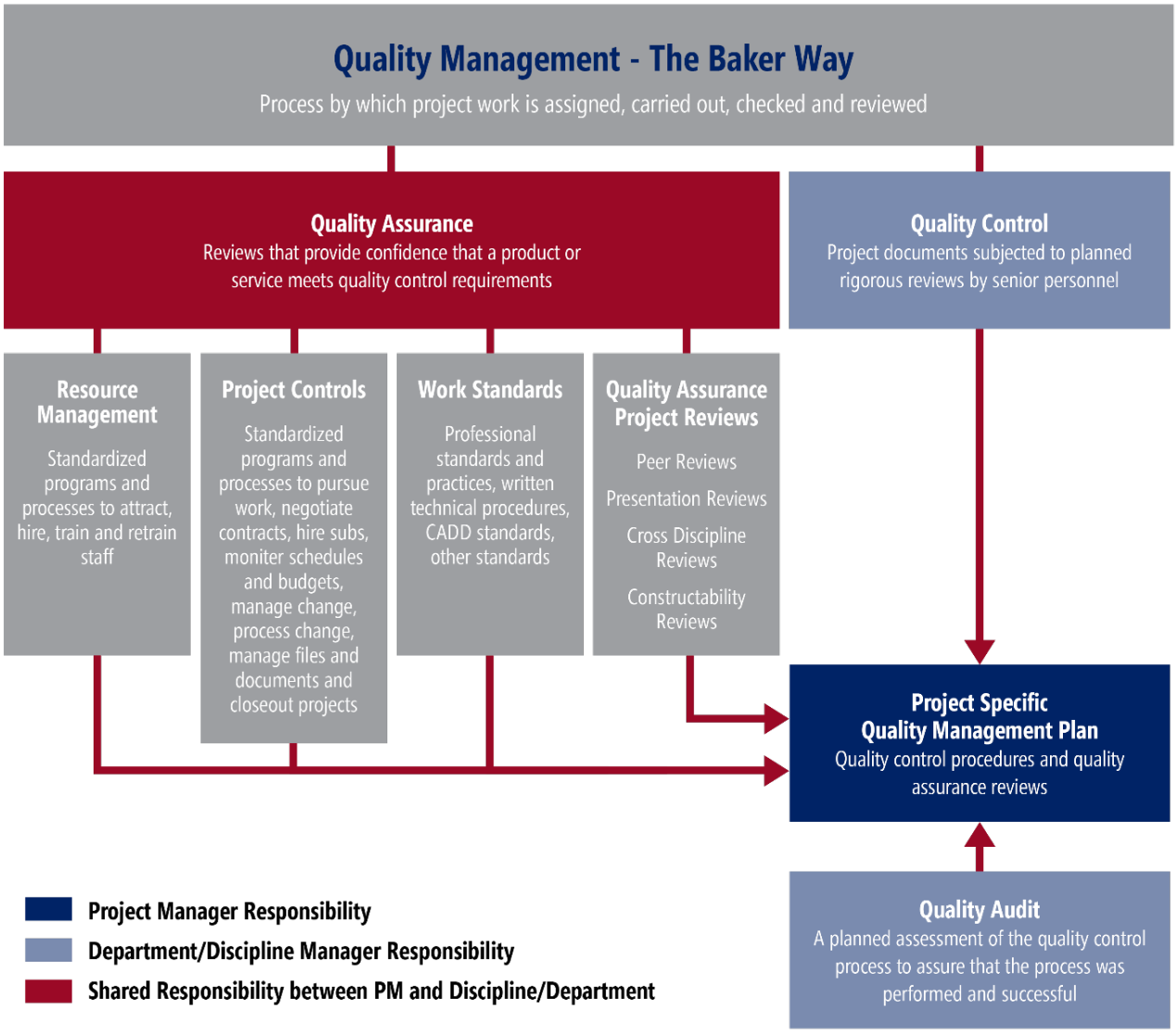
E. Quality Management

Quality control at Michael Baker starts with a solid foundation in project management. Michael Baker has a series of *rigorous processes and checks that result in services and products that meet or exceed client's expectations.* Quality assurance (QA) and quality control (QC) are part of an overall project management system called "The Michael Baker Way" to track and check interim products and to maintain the quality of final products. Michael Baker staff who perform quality control checks have been trained by the Project Management Institute (PMI).

Michael Baker's QA and QC *methods are in place and ready to be implemented and tailored for this project.* They involve separate QA procedures to verify the availability of resources and tools to enforce quality control. Michael Baker's QA/QC Lead, Joe Danyo, will consult with Mr. Sidani to establish a Project Specific Quality Management Plan (PSQMP). The PSQMP details the specific resources and actions necessary to provide the best opportunity for the project deliverables to meet the client's quality expectations and requirements. This PSQMP will be integrated, ongoing and focused throughout the project and not just applied before a submission. The QA/QC procedures will also be applied to the subconsultants' tasks. By integrating QA/QC into the project's production process, Michael Baker will deliver a clear, concise, and accurate deliverables.

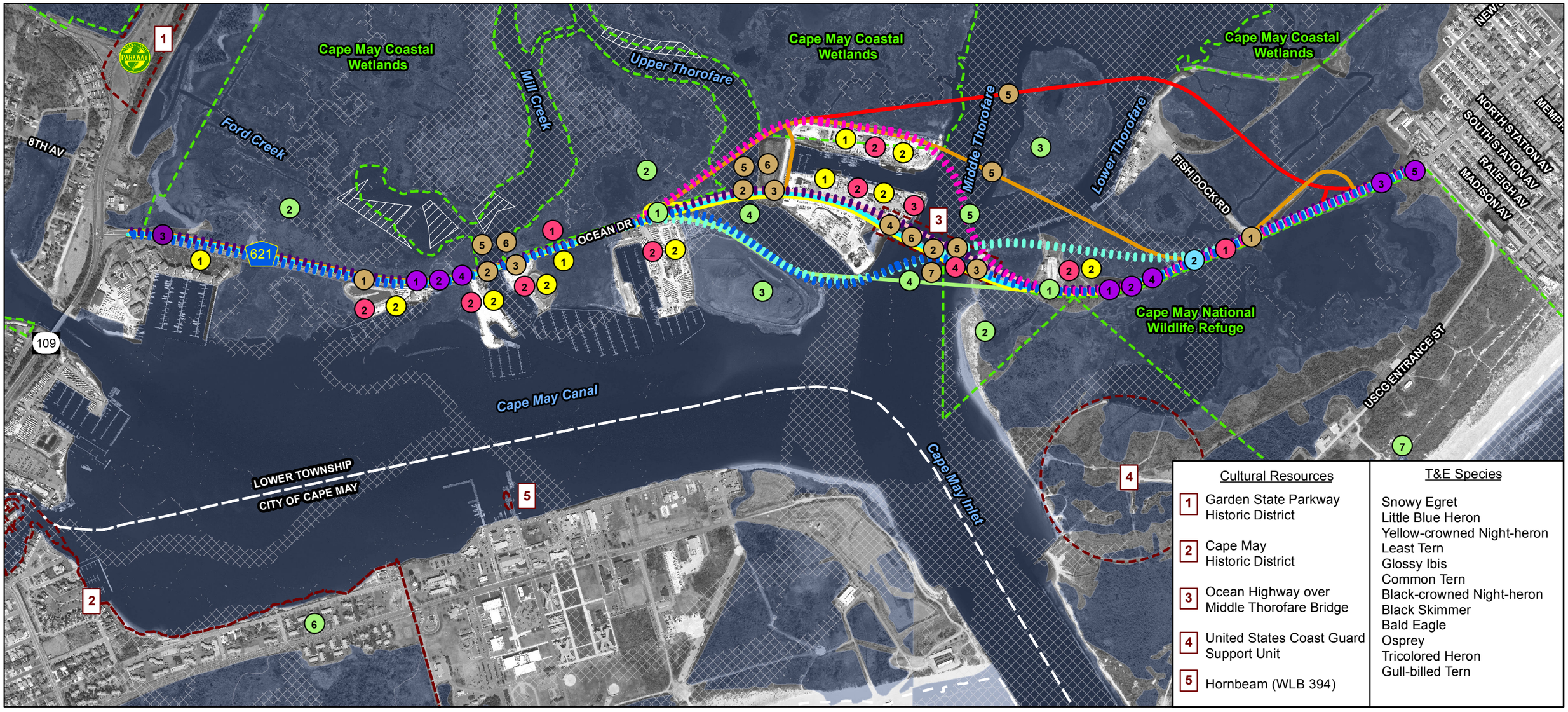
"The Michael Baker Way" is Michael Baker's proven, effective project management process to monitor and control schedules, resources and costs. This process was developed to facilitate communication and understanding between SJTPO, Cape May County and the Project Manager, while streamlining communication within the project disciplines. A Project Management Plan (PMP) will be developed for the project by the Project Manager, approved by the Principal in Charge, and distributed to all team members. The PMP serves as the roadmap to successful performance of the project and includes clear definition of the following project elements:

- Project Purpose
- Scope of Work & Contract
- Critical Assumptions & Constraints
- Project Team & Stakeholders
- Project Budget & Invoicing
- Quality Management Plan
- Risk Management Plan
- Safety & Occupational Health
- Project Schedule
- Communications Plan
- Change Management Plan
- Project Closeout Plan



Task 5 Deliverables:

- An initial detailed project schedule at the Project Kick-off meeting and quarterly schedule updates
- Monthly in-person status meetings with the Project Team
- Regulatory Agency Meetings (up to four)
- Project Team SharePoint Site
- Design Communications Report
- Documentation for the above mentioned meetings, including agendas, handouts, presentations, minutes and written summaries of project meetings
- Monthly progress reports and corresponding invoices



Cultural Resources

1. Garden State Parkway Historic District
2. Cape May Historic District
3. Ocean Highway over Middle Thorofare Bridge
4. United States Coast Guard Support Unit
5. Hornbeam (WLB 394)

T&E Species

Snowy Egret
Little Blue Heron
Yellow-crowned Night-heron
Least Tern
Glossy Ibis
Common Tern
Black-crowned Night-heron
Black Skimmer
Bald Eagle
Osprey
Tricolored Heron
Gull-billed Tern

Environmental

1. Minimize impacts to wetlands and open water.
2. Avoid Green Acres and USFWS land diversions and maintain public access during construction.
3. Evaluate mitigation opportunities early.
4. Timing restrictions on in-water construction. Evaluate need for hydroacustic mitigation such as bubble curtains.
5. Mitigation measures for affects on historic bridge may include recordation, context sensitive design, reuse of salvaged elements, and interpretive displays.
6. Consider visual impact to Cape May Historic District.
7. Coordinate with USFWS and NJDEP Division of Fish and Wildlife regarding effects to migratory birds.

Stormwater

1. 1% Flood plain increased to 11' NAVD88 since previous CD Report.
2. Undersized culvert moderating freshwater & saltwater interaction.
3. Stormwater management needs to consider coastal impacts.

Staging and Constructability

1. Maintain two lanes of traffic at all times.
2. Preserve access to boarding properties during construction.
3. Perform offline bridge construction while exisiting bridge remains inservice. Perform two main stage roadway construction utilizing temporary pavement.
4. Consideration of constructability and cost as independent factors for the feasible construction of middle thorofare bridge.

Structural/Geotechnical

1. Implement soil improvement methods such as wick drain and column embankment to prevent time related settlement on tidal marsh soil.
2. Address deep scour depths present in nearby channels during design.
3. Use pre-augering or water settling to help piles penetrate alternating layers of stiff clay and dense sand.
4. Minimize vibration to adjacent existing structures during foundation installation.
5. Consider potential ABC solution for precast structures in marine environment.
6. Consider access trestle needed where water depths are low (4.5') at low tide.
7. Identify structural solutions that minimize closures to the navigational channel.

Roadway

1. Raise the elevation above the 100-Year flood elevation.
2. Widen travel lane width from 10' to 12' and reduce shoulder width to 8' minimum within existing roadway cross section.
3. Correct deficient horizontal curvature.
4. Correct deficient profile grades for sufficient surface drainage.
5. Address local pedestrian safety concerns.

Utilities/Right-of-Way

1. Minimize impacts to aerial electrical lines, highway luminaries, aerial & underground cable lines, under ground gas distribution lines, and LTUA sanitary force main.
2. Minimize impacts and maintain access to adjacent properties.
3. ROW easements and riparian grants will be required.

Legend

- Municipal Boundary
- Federal and State Open Space
- Historic Resources
- NWI Wetlands
- Submerged Aquatic Vegetation
- Tidelands Claims
- Previous Alignments
- Baker Alignments

1,000 500 0 1,000 Feet

South Jersey Transportation Planning Organization

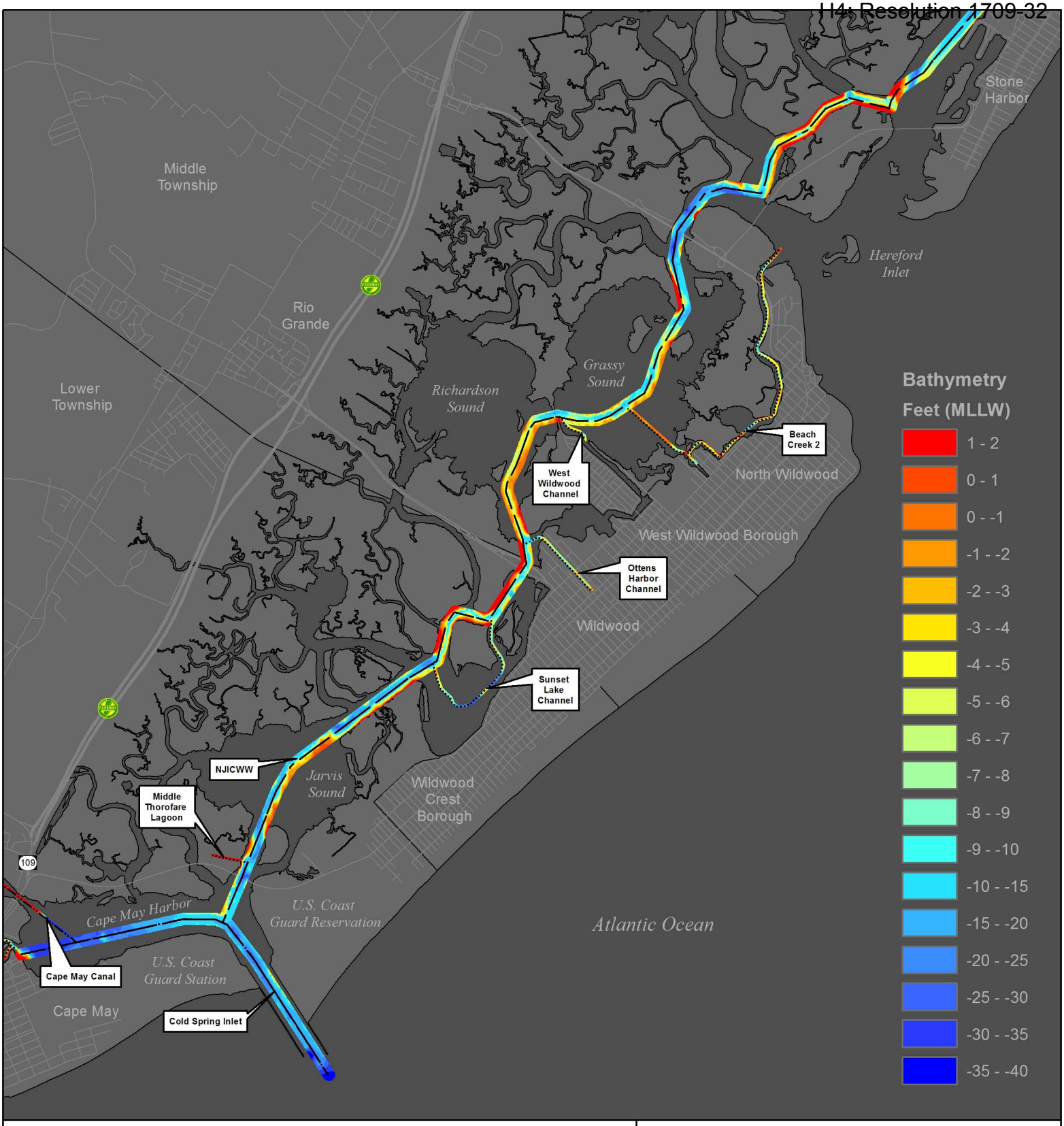
Figure 1
Key Issues

Ocean Drive (CR621) Upgrades and Bridge Improvements
NJ Route 109 to Madison Avenue

Lower Township
Cape May County, New Jersey

Michael Baker INTERNATIONAL

August 2017



Federal Channel (USACE Philadelphia District):
NJICWW

Inlet (USACE Philadelphia District):
Cold Spring Inlet
Cape May Canal

NJ State Channel (NJDOT OMR):
Beach Creek 2
Middle Thorofare Lagoon
Ottens Harbor Channel
Sunset Lake Channel
West Wildwood Channel

Legend

— — Federal Channel (ICWW) (USACE)

The authorized depth of the NJICWW at Middle Thorofare Bridge is -12 mean lower low water and the authorized channel width is 100-feet.

-·-·- Inlet (USACE)

····· State Channel (NJDOT)

Municipalities

0 0.5 1 Miles

Source: 2014 NOAA National Centers for Environmental Information (NCEI) Digital Elevation Model (DEM), 1/9 arc second; USACE; NJ Department of Transportation; NJ Office of Information Technology, Office of Geographic Information Systems.

South Jersey Transportation Planning Organization

Figure 2
Channel Conditions

Ocean Drive (CR621) Upgrades and Bridge Improvements
NJ Route 109 to Madison Avenue

Lower Township
Cape May County, New Jersey

Michael Baker INTERNATIONAL

August 2017

Potential Alignments

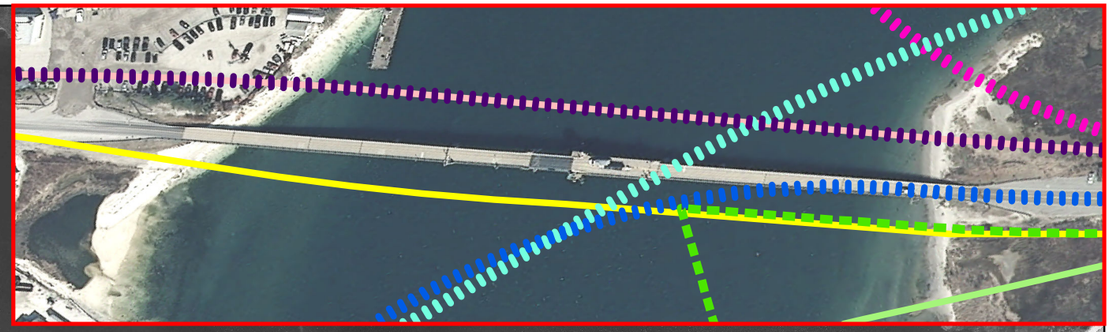
Previous Alignments

- 3A
- 3B
- 3C
- 3D
- 3E
- 3F&G

Baker Alignments

- Baker Alternative 1
- Baker Alternative 2
- Baker Alternative 3
- Baker Alternative 4

USFWS Wildlife Management Area



Lower Township
Mill Creek
Upper Thorofare
Middle Thorofare
Lower Thorofare
Ford Creek
FISH DOCK RD
621
OCEAN DR
109
Cape May Canal
Cape May Inlet
USCG ENTRANCE ST
Cape May City
PARKWAY

1,000 500 0 1,000 Feet

South Jersey Transportation Planning Organization

Figure 3
Alternative Alignments

Ocean Drive (CR621) Upgrades and Bridge Improvements
NJ Route 109 to Madison Avenue

Lower Township
Cape May County, New Jersey

Michael Baker INTERNATIONAL

August 2017

STAFFING PLAN

Michael Baker has provided engineering and design services for some of the largest and most complex bridges recently constructed in the United States. Michael Baker is the 7th largest bridge consultant in the country, as ranked by *Engineering News Record*, and our diverse bridge experience enables us to provide cutting-edge ideas and superior guidance for complex bridge projects of all types. Michael Baker's key personnel have established a legacy of responding to the most complex highway interchange projects and toughest bridge challenges with innovative and sustainable bridge designs, and have demonstrated leadership by promoting advancements in bridge design and construction, such as the use of high-performance materials and Accelerated Bridge Construction techniques.

In New Jersey, Michael Baker's success can be summarized by the completion of the signature Route 52 Bridge for the NJDOT, a project that successfully addressed many of the same issues facing the Ocean Drive and the Middle Thorofare Bridge. Mike Sidani, the Project Manager from the Route 52 Causeway Construction project, has been selected to lead the Ocean Drive (CR 621) project for SJTPO and Cape May County. In addition to demonstrating his acumen with complex bridge Feasibility Assessment, Preliminary Engineering and Final Design in coastal areas, Mike is also the Project Manager for the Oceanic Bridge Local Concept Development (LCD) Study for NJTPA and Monmouth County. Based on the anticipated Notice to Proceed date in the RFP, the Oceanic Bridge LCD Study will be in the final stages of completion by the time the Ocean Drive study gets underway. Mike's time can then be focused on the Ocean Drive study while incorporating all of the lessons learned from the Oceanic Bridge study. Mike will apply that direct and relevant experience to the Ocean Drive LCD Study and is one of the reasons the Michael Baker Team can accelerate the project, in advance of the schedule outlined.

Mike's Deputy Project Manager on the Ocean Drive LCD Study will be Jim Yeager. This is the same leadership team completing the Oceanic Bridge LCD Study and is poised to execute this project at Notice to Proceed. In addition to the Oceanic Bridge LCD Study, Jim was the Project Manager for the Northerly Crossings Feasibility Study for the Delaware Joint River Toll Bridge Commission. That study included the development of alternatives for the four bridges over the Delaware River in Warren and Sussex Counties. In addition to the development of alternatives, that study had significant public outreach and alternatives analysis components. Mike's and Jim's complimentary skills have yielded successful collaboration on a number of projects in the past. In fact, the proposed staff from Michael Baker have worked together extensively in the past, and have developed the strong working relationships of a highly-functioning team. This project will be managed out of Michael Baker's Hamilton, NJ office, located at 300 American Metro Boulevard, Suite 154.

Michael Baker has selected WSP USA (WSP, formerly Parsons Brinckerhoff) as a partner for the Ocean Drive LCD Study. Michael Baker has a history of teaming with WSP on a number of other endeavors including the current Marine Transportation System Planning Agreement for the NJDOT Office of Maritime Resources. WSP brings the unparalleled benefit of completing the Scope Development and Feasibility Study for Improvements to Ocean Drive in 2004. Aside from having ready access to previously collected data and information, WSP has intimate knowledge and insight of the needs, issues, major stakeholders, and methodology that went into the development and evaluation of the previous alternatives and alternatives evaluation matrix. Given that unique experience, the Michael Baker Team believes the project approach developed for the Ocean Drive LCD Study has the ability to reduce schedule durations and reduce costs while still developing, evaluating and recommending an alternative that meets the Purpose and Need of the project.

The Michael Baker Team is comprised of leaders that have delivered successful concept development studies and design projects which allows the Team to remain intact and seamlessly transition to the next phases of a project's life, preliminary engineering and final design. Michael Baker and WSP have the previous experience with the project, LCD study experience, knowledge of bridge design, especially in coastal areas, and the resources available to hit the ground running on this assignment.

PROJECT MANAGER

MAHER (MIKE) SIDANI, P.E., PMP is the proposed Project Manager for this important project because he delivered the largest coastal bridge in New Jersey, the Route 52 Causeway, and is currently managing the Local Concept Development Study for the Monmouth County Oceanic Bridge (S-31). Mr. Sidani is a Vice President/Regional Chief Engineer with over 37 years of extensive experience in the planning, design, and construction of major and complex multi-disciplinary transportation projects including bridges and highway interchanges. In the past, Mr. Sidani served as Director of Project Management and Quality Assurance/Quality Control for Michael Baker, where he oversaw the implementation of the Quality Assurance program throughout the office. Later, Mr. Sidani assumed the role of Regional Chief Engineer, where he worked on enhancing the coordination and production capabilities of the various engineering disciplines in order to meet the rising challenges of multi-disciplinary complex projects. Mr. Sidani is thoroughly conversant with the AASHTO Bridge design manual, and his bridge design experience includes steel and concrete superstructures, continuous multi-span bridges, and curved bridges and approaches.

NJDOT Route 52 Causeway Replacement Project

Mr. Sidani was the Project Manager for the $400M Route 52 Causeway Replacement project, and was directly responsible for providing innovative solutions to the bridge type study, evaluating constructability issues, and minimizing and managing environmental impacts on the surrounding natural resources. The final product included alternative designs that consisted of segmental concrete design and prestressed concrete I-Girders. Mr. Sidani successfully implemented an innovative approach to deliver partial bid documents for the two alternatives, where the selected alternative was completed (post bid). The project involved innovative design elements such the use of Vibrocore Concrete Columns for the embankment at the island to control settlement. The project also included complex scour modeling, intricate in-water construction in accordance with multiple environmental seasonal restrictions, extensive coordination with the NJDEP, US Coast Guard, and US Army Corps of Engineers, and an extensive public outreach program. He implemented continuous electronic vibration monitoring adjacent to the deteriorated existing bridge to verify that the existing bridge was not adversely impacted during construction. Mr. Sidani's duties included coordination and communications with the client and stakeholders, and implementing a rigorous overall management program of scope, schedule and budget controls as well as complying with the Quality Assurance protocols. The Route 52 project received high marks from the NJDOT in exceeding their expectations as the project was delivered under budget, ahead of schedule, with zero claims after construction had been completed, reflecting a high quality design. The project received the American Council of Engineering Companies (ACEC) Honor Awards for both Contracts A and B and the 2013 ASHE Project of the Year for the entire project. The new bridge was opened to traffic during interim stages, then in its entirety in May 2012.

DEPUTY PROJECT MANAGER

JAMES YEAGER, P.E., PTP has 30 years of experience and serves as Michael Baker's Director of Transportation overseeing multiple Departments in New Jersey, including Environmental/Water Resources, GIT, and Transportation Planning. Mr. Yeager has extensive experience in completing concept development projects for various facility types, conducting public outreach meetings, managing community involvement activities, completing community assessments, and context sensitive design. His experience includes the development of travel forecasting models, traffic engineering, deficiency assessment, signalized intersection analyses, operational analyses, bicycle/pedestrian accommodations, context sensitive design and project management. Mr. Yeager has led stakeholder coordination and public

Michael Baker has been one of just a few consultants awarded multiple, consecutive 3-Year Agreements by NJDOT to perform Concept Development Studies on its behalf. We have consistently proven our expertise in performing these types of studies and gained NJDOT's confidence, resulting in being re-selected by the NJDOT for follow-up contracts, year after year.

outreach elements which were integral to the success of his projects. Mr. Yeager will provide project management support to Mr. Sidani as Deputy Project Manager for the Michael Baker Team.

Mr. Yeager was Michael Baker's Project Manager for the NJDOT Statewide Concept Development/Feasibility Assessment Task Order Agreements from 2003 to 2012, and is currently managing Concept Development Studies under Michael Baker's General Engineering Services Agreement. These agreements involve over 200 task orders that address various roadway and bridge improvements, safety, congestion mitigation, bicycle/pedestrian accommodation, and traffic signal improvements. These task orders included the use of management system data, multi-model improvements, corridor studies, land use, and access management. Many also encompassed extensive Community Outreach elements including facilitating meetings to inform various stakeholders and community organizations of project goals, issues, and progress, as well as to solicit feedback regarding difficult locations and the range of potential solutions, ultimately securing resolutions of support.

Another endeavor worth highlighting is Mr. Yeager's responsibility as Project Manager for the completion of a transportation planning congestion mitigation study for four (4) northern Delaware River bridges: Milford Montague Bridge; I-80 Delaware Water Gap Bridge; Portland Columbia Bridge; and the Portland Columbia Pedestrian Bridge. The study reviewed traffic operations of the bridges and approach roadways, identified existing transportation deficiencies, forecasted interim and long-term travel demand, assessed future traffic operations, identified existing and future transportation deficiencies, identified a range of alternative improvement concepts to mitigate existing and future congestion, and assessed construction phasing/MPT issues and solutions. Traffic engineering tasks included the development of peak hour traffic volumes, traffic capacity analyses, analysis of travel characteristics, and development of a travel demand forecasting tool. Highway design tasks included geometric design and analysis of proposed improvement concepts. An environmental screening of the study area was completed to develop conceptual improvements which minimized potential environmental impacts. An extensive public outreach effort was completed which included the establishment of an Interagency Advisory Committee (IAC) which met frequently during the project and gave officials from the FHWA, NJDEP, NJDOT, PennDOT, counties, and others an opportunity to participate/guide the study effort.

PRINCIPAL-IN-CHARGE

MICHAEL BRESCIA, P.E. Mr. Brescia is a Senior Vice President and Michael Baker's Northeast Regional Director. He oversees Michael Baker's New Jersey, New York and New England Operations. He has 33 years of experience in the transportation industry including project management, design, construction inspection and construction management. His past experience includes responsibilities as Project Manager, Construction Manager, Resident Engineer and Project Engineer. His expertise includes constructability reviews, cost estimating, and dispute resolution. Mr. Brescia has performed field inspections on over 200 bridges; prepared written reports; performed design and analysis of steel reinforced concrete, pre-stressed concrete and timber structures; and prepared contract drawings, specifications and cost estimates. Mr. Brescia served as an active Principal In Charge for the Route 52 Causeway Replacement and the Route 21 Section 2N Viaduct Replacement, and currently serves as the Principal-In-Charge for the Scudder Falls Bridge Replacement. Together, Mike Sidani and Mike Brescia have delivered over $1.2B in successfully constructed completed bridge and interchange projects throughout New Jersey.

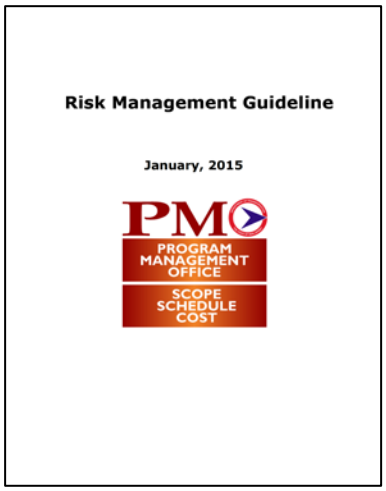
QUALITY MANAGEMENT

JOSEPH DANYO, P.E., P.P. Mr. Danyo is the New Jersey Chief Engineer and Director of Quality and Project Management for Michael Baker's New Jersey Offices. Mr. Danyo brings 38 years of experience in the transportation and construction industry, including numerous projects involving bridge and highway design including several in coastal environments, concept development, complex staging, environmental permitting, and construction management/inspection. Mr. Danyo served as Quality Assurance/Quality Control Manager on the Route 52 Causeway Replacement, and served as Project Manager on the Replacement of GSP Structure Nos. 28.0S & 28.5S over Great Egg Harbor Bay between Atlantic County and Cape May County. As a Project Manager, Mr. Danyo has successfully delivered numerous complex infrastructure projects by applying Michael Baker's company-wide Quality Management System. Michael Baker has established a standard, structured project delivery process for all projects ("The Baker Way"). This process addresses every aspect of a project and is the foundation for delivering a quality product. Mr. Danyo is involved in developing the framework for Project Specific Quality

Improving Project Performance through Product Delivery Excellence

Management Plans (PSQMP) and setting the parameters for a project's Quality Audit. In collaboration with the Project Managers, Mr. Danyo is responsible for scheduling, staffing, and performing QA/QC reviews throughout the life of the projects to confirm that the design of the project is in compliance with contract requirements. Mr. Danyo has experience and understanding of the procedures, guidelines, and protocols required to bring a project of this magnitude from start to finish.

CONSTRUCTABILITY / RISK MANAGEMENT



JOSEPH MUMBER, P.E. Mr. Mumber (WSP) is a WSP-certified Senior Project Manager managing two of the firm's biggest projects with the New Jersey Department of Transportation (NJDOT), the Rehabilitation of the Pulaski Skyway and the Route 72 Manahawkin Bay Bridges projects. Mr. Mumber has dedicated his career to the design of new bridges and the rehabilitation of existing ones and the management of projects. He has performed constructability management, inspections, ratings, and analyses, as well as feasibility, conceptual, preliminary and final designs, for numerous highway and railroad structures and industrial facilities. He has served as a project manager, deputy project manager, and lead design engineer on many key projects. Some of his other notable projects in New Jersey include the Ocean City Longport Bridge Replacement, and the design of Interchange 159 on the Garden State Parkway for NJTA.

RICHARD DUNNE, P.E. Mr. Dunne has managed and directed structural design, bridge inspection, and geotechnical engineering activities on numerous projects throughout New Jersey. Mr. Dunne is also responsible for providing technical expertise for transportation related projects and initiatives, which include risk-based asset management, accelerated bridge construction, constructability reviews and bridge preservation. His experience includes several management positions with the NJDOT, including State Bridge Engineer and State Transportation Engineer. As the State Bridge Engineer, he directed and supervised the activities of the Structural Design, Geotechnical Engineering and Structural Inspection & Rating units. Additionally, he was responsible for developing the Structural Asset Management plan to develop the bridge portion of the Capital Program including formulating alternative delivery recommendations, based on a risk analysis, for various bridge needs from preservation projects to large bridge replacement projects. He also provided technical support to Construction, Operations and Maintenance as required. Mr. Dunne performed initial screening, scope development, project design, constructability reviews and construction engineering services for several bridge and highway projects including accelerated bridge deck and superstructure replacement projects. Recently, Mr. Dunne was the Design Joint Venture Proposal Manager for the New York State Department of Transportation/New York State Thruway Authority Tappan Zee Bridge Replacement Design/Build Project. Mr. Dunne coordinated the collaboration of the entire Design/Build team to develop over 10 alternative technical concepts, which amounted to total project savings in excess of $100M.

TASK LEADERS

GEOTECHNICAL/ PAVEMENT – MICHAEL YANG, PH.D., P.E. Dr. Yang has 29 years of geotechnical experience including complex foundation investigation and design, soil/ground modifications, subsurface investigations, and soil and pile testing involving major transportation projects. Dr. Yang has also managed numerous large geotechnical investigation programs inclusive of multiple concurrent drilling and inspection teams. As Geotechnical Task Lead for the Route 52 Causeway Replacement, Dr. Yang managed the geotechnical investigation program which included 400 test borings with depths from 10 feet to 180 feet on land and over water. On the NJTA Preliminary Design and Permit Preparation for the Replacement of GSP Bridge Nos. 28.0S & 28.5S over Great Egg Harbor Bay, Dr. Yang performed subsurface investigations including all test borings and the cone penetrating test (CPT) program, laboratory testing, and seismic shear wave velocity tests. He assessed the need for soil strengthening on approach embankments over soft tidal marsh soils and also evaluated the marine deep foundation options for the main bridges, specifically pre-stressed concrete square pile versus drilled shaft. Dr. Yang evaluated the drivability of concrete piles in a marine environment by wave equation analysis.

UTILITY ENGINEERING – VINOD (VINNIE) KOTECHA, P.E. Mr. Kotecha has 48 years of experience and has served as Project Manager and Utility Engineering Task Leader for numerous projects in New Jersey involving utility relocation and accommodations on a variety of roadways. Mr. Kotecha has extensive experience in coordination with utility companies,

scheduling/planning for timely utility order execution, developing utility orders in accordance with the NJDOT Procedures Manuals, and performing interdisciplinary coordination necessary for accurate utility relocation. Vinnie has served as the lead utility engineer for numerous projects and is familiar with NJDOT Procedures Manual Chapter 10 and NJDOT Capital Project Delivery Process and Design Manuals, Utility Relocation Procedures, Railroad Accommodation Policy, and the State Utility Accommodation Policy 16:25.

HIGHWAY/CIVIL ENGINEERING – SYLVESTER FRYC, P.E. Mr. Fryc brings 29 years of experience managing multidiscipline transportation projects including various aspects of highway design. He has managed similar tasks applicable to this project which include development of horizontal and vertical alignment, complex staging and Maintenance and Protection of Traffic plans, construction plans, grading, utility relocation, earthwork, cross sections and cost estimates. Sly was the Deputy Project Manager and Roadway Design Team Leader on the NJDOT's $400M Route 52 Causeway Replacement project where he was involved in the development of roadway and bridge alignments, complex construction staging and MPT plans, including intricate staging of construction scheduled around numerous environmental timing restrictions. He also served as the Roadway Design Team Leader for the Rehabilitation and Widening of the Avalon Boulevard Bridge in Cape May County. More recently, Sly has served as the Project Manager for several Concept Development efforts including Rio Grande Avenue Entrance Improvements, Route 4 over Hackensack River, I-80 Eastbound Resurfacing Project (MP 45.6 to 53.0), and I-78 over the Raritan River following the NJDOT Delivery Process.


Rendering of proposed Scudder Falls Bridge

STRUCTURES ENGINEERING – JOSEPH ROMANO, P.E. Mr. Romano has 24 years of experience in structures design and brings a multitude of knowledge from project management to complex bridge design and experience in delivering projects under accelerated schedules. He is experienced in performing the tasks required for concept development and feasibility assessment including existing deficiency assessments, concept plans, and summary reports. He brings a strong familiarity with major comprehensive bridge projects with extensive regulatory agency involvement including movable bridge structural repairs and control system programming, electrical and mechanical repairs, scoping projects, complex bridge live load rating calculations, AASHTO LRFD and long span structures, temporary structures to facilitate construction, bridge replacement and rehabilitation, foundation design, seismic design, complete deck reconstruction, deck joint elimination/replacement, and emergency repairs. Mr. Romano is thoroughly conversant with AASHTO and the NJDOT Bridge Design Manuals. In addition, he has managed projects in sensitive environmental areas and successfully navigated those projects through the NEPA process during preliminary design and environmental permitting during final design all while maintaining close coordination with the regulatory agencies. Mr. Romano was the Structures Design Team Lead (Contract A) and Deputy Project Manager (Contract B) for the final bridge design of the replacement for the Route 52 Causeway, and has served as the Structures Team Lead on a variety of other important projects, including the Preliminary Design for the Replacement of GSP Bridge Nos. 28.0S & 28.5S over Great Egg Harbor Bay, and Scudder Falls Bridge Replacement project. Currently, he is the Lead Structures Engineer for the Oceanic Bridge (S-31) Local Concept Development Study.

BRIDGE CONCEPTS – MIGUEL SANTIAGO, P.E. Miguel Santiago (WSP) is a supervising structural engineer with 22 years of experience in the design and inspection of numerous types of structures, including the widening and rehabilitation of railroad and highway bridges, retaining walls, airport terminals, and sign structures. Mr. Santiago served as the lead structural engineer for the scope development study for the Ocean Drive over Middle Thorofare project in 2004. As the main author of the original alternatives analysis report, he also assisted Cape May County with the Federal Tiger Grant application in 2009.

LIFT BRIDGE DESIGN – RAMA KRISHNAGIRI, P.E. Mr. Krishnagiri (WSP) has extensive experience in the design, analysis, inspection, evaluation, and rehabilitation of existing bridges and design of new bridges. He has worked on numerous bridge projects, including analysis, design, inspection, evaluation and ratings of fixed and movable bridges. He is very familiar with NJDOT and NBIS bridge inspection requirements, scour and priority repair procedures, and movable bridge structural design and its multi-disciplinary efforts.

TRAFFIC ENGINEERING – DAVID LIEBGOLD, P.E., P.P. Mr. Liebgold brings 18 years of experience managing multi-discipline transportation projects. He has managed similar tasks on many transportation projects with experience applicable to this project particularly traffic engineering and operations; traffic signal design, pavement markings, MPT plans, intelligent transportation systems (ITS); highway lighting, systems engineering, field implementation, integration, operation, maintenance, and training; ITS systems and equipment, classroom and field training of owners, engineers, operators, and maintenance personnel; transportation management center (TMC) integration, operation, and training; design-build; advanced vehicle detection implementation; advanced systems communications; fiber-optic design; project planning, scheduling, and management; grant proposals; technical and legal specification preparation; contract procurement and management; construction inspection and management; and transportation planning. Mr. Liebgold is currently involved in the NJDOT's Route 47/347 and Route 49/50 Corridor Enhancements ITS and Operational Improvement Project, which aims to provide alleviate severe traffic congestion in coastal counties during summer months and facilitate emergency management on coastal evacuation routes.

ENVIRONMENTAL DOCUMENTATION – STEVEN P. BALZANO. Mr. Balzano (WSP) has over 32 years of successful program management and public policy experience in natural resource management, environmental regulation and sustainable land use planning at the local, state and federal level. He has successfully managed and coordinated complex projects involving a wide range of technical disciplines and diverse stakeholder interest. He has expert level understanding in the following technical disciplines: environmental impact analysis, environmental program management, endangered species biology, terrestrial ecology, aquatic ecology, wetland ecology, habitat restoration/mitigation, conservation planning, regulatory compliance, water resource management, real estate development, sustainable land use practices and geospatial analysis. Mr. Balzano led the environmental documentation effort during the 2004 Feasibility Assessment and Alternatives Analysis of the Ocean Drive (CR 621) and Mill Creek/Upper Thorofare Bridge Local Concept Development Study. His knowledge of the conditions at the site, the regulated resources present, and the agencies involved is an invaluable resource for the project team.

NEPA CLASSIFICATION – REBECCA TRAYLOR, PWS, CE. Ms. Traylor has 13 years of experience as an environmental permitting specialist and has served as the Environmental Lead for numerous coastal bridge and highway projects. Ms. Traylor has practical experience and training in the implementation of the requirements of the National Environmental Policy Act of 1969 (NEPA), ecological assessments, wetland delineation, environmental studies, and state and federal environmental permitting for the transportation industry. She has successfully completed NEPA documentation, including Section 4(f) evaluations, Section 106 coordination, Section 7 of the Endangered Species Act consultation, among others for numerous projects. Through the environmental review process, Ms. Traylor has developed relationships with the reviewers at the regulatory agencies and has worked with these agencies to identify issues and develop agreeable resolutions efficiently. Additionally, collaborating with the engineers and planners, Ms. Traylor has been heavily involved in evaluating proposed alternatives in regards to regulated resources. Her involvement is essential in developing a permittable solution that minimizes environmental impacts while meeting the project purpose and need. Ms. Traylor was the Environmental Lead on the Route 52 Causeway Replacement, the Preliminary Design & Permit Preparation for the Replacement of GSP Bridge Nos. 28.0S & 28.5S over Great Egg Harbor Bay, the Route 50 Tuckahoe River Bridge, and Scudder Falls Bridge Replacement. Currently, Ms. Traylor is the Lead Environmental Manager for the Oceanic Bridge (S-31) Local Concept Development Study, Replacement of Nacote Creek Bridge (PR-07) Old New York Road Project, and Rio Grande Avenue Entrance Improvements Project.

Bioengineered shoreline stabilization mitigation for NJDOT Route 52 Causeway Replacement Project

STORMWATER MANAGEMENT/DRAINAGE – CRAIG WENGER, P.E., AICP, CFM, LEED GA. Mr. Wenger has nine years of experience in roadway and water resources projects including pavement reconstruction, road widening, grade studies, subwatershed delineation, Federal Emergency Management Agency (FEMA) Flood Insurance Studies, hydrologic studies, stormwater management, scour for coastal environments, pump station design, stream modeling, and flood economics forecasting. Mr. Wenger has extensive experience with Geographic Information Systems (GIS) and the integration of those tools with his engineering tasks, including the Arc Hydro Tool set. He served as the Chair of the New Jersey Association for Floodplain Management for 3 years and has worked closely on the development of the flood hazard area rules with New Jersey Department of Environmental Protection (NJDEP) staff and supported the funding of NJ's stream gages and tide telemetry system. Mr. Wenger is currently assisting Cape May County with the Rio Grande Avenue Entrance Improvements Project.

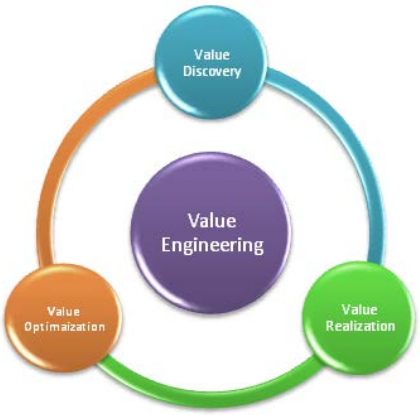
PROJECT MAPPING AND SURVEYING – ANDREW COURSEN, P.E., PLS. Mr. Coursen (Churchill) has over 31 years of experience in civil engineering and land surveying, including 24 years as a professional surveyor and over 20 years as a professional engineer. Mr. Coursen serves as manager of the survey and CADD department with responsibility for procedures, reviewing the accuracy of survey data, managing the work and the production of the required deliverables. Experienced with GSP datum, NJTA Design Manual, Microstation and Inroads, NJTA CADD Standards, large DTMs, design drawings and traffic control for field survey on the GSP. Over the course of the last 4 years, Mr. Coursen has served as the Survey/ROW Team Leader on 8 projects in Cape May County, all but one being roadway design projects. He is extremely familiar with Cape May County in terms of the area, procedures, and expectations.

COMMUNITY INVOLVEMENT

PAM LEBEAUX, PH.D., AICP, P.P. Ms. Lebeaux (WSP) has an extensive background in transportation planning and public involvement. She has designed and carried out collaborative planning processes for corridor studies, master plans, regional and statewide plans, and led public engagement programs for a variety of infrastructure projects. Pam serves on the leadership team of WSP's Communications and Public Involvement practice. Pam recently served as the Research Director for a study of best practices in DOT communications, which included guiding the research process to identify and document proven strategies and tactics for DOT communications units. The findings of this work were published by the American Association of State Highway and Transportation Officials (AASHTO) in February 2017.

VALUE ENGINEERING

GEORGE A. OBARANEC, P.E., C.V.S. Mr. Obaranec has over 30 years of experience in roadway, transportation, and civil engineering. He has designed and managed transportation projects ranging from intersection improvements to major interstate widening. His background includes relevant experience in design, construction and delivery of transportation facilities. He has been active in VE for 15 years and involved in more than 100 VE studies as a coordinator, team member, and facilitator primarily in the transportation field. He has facilitated and participated in studies for transportation agencies in Minnesota, Utah, Alaska, Washington, Mississippi, Georgia, Michigan, and Ohio and has conducted VE training in Georgia, Colorado, Virginia and New Jersey. He has led and managed several state VE program contracts. Under his leadership, the studied projects totaled over $3.5 billion in construction costs with implemented or projected savings of over $300 million. Additionally, he is an experienced QC/QA leader on VE reports for transportation studies.



DBE/ESBE UTILIZATION

Michael Baker has made a corporate commitment to utilize and mentor small and disadvantaged firms, providing them with opportunities for growth and technological advancement. We regularly achieve Disadvantaged Business / Emerging Small Business Enterprise (DBE/ESBE) goals for our clients and are committed to helping SJTPO meet its established participation goals.

PLAN TO MEET SJTPO's DISADVANTAGED BUSINESS AND EMERGING SMALL BUSINESS PARTICIPATION GOALS

While Michael Baker has full in-house multi-disciplined planning and engineering capabilities, we have supplemented our team with a number of specialty subconsultants to provide value added resources that we believe will benefit the project. Michael Baker shares the Organization's commitment to the DBE/ESBE Program and understands that we are bound to and must comply with its requirements. In a good faith effort to award at least 12.44% of this project to registered DBE/ESBEs in NJ, Michael Baker has invited the firms of Churchill Consulting Engineers (ESBE) and Richard Grubb & Associates (DBE), to join our Team. These DBE/ESBE firms have multidisciplinary capabilities and Cape May County experience, which will allow Michael Baker to fully utilize their talents toward delivering a quality project. These firms have provided meaningful value to the Michael

Baker Team on previous projects, and have led major tasks for Michael Baker. Michael Baker will diligently monitor the project's DBE/ESBE percentage and shift resources as required to meet the goals.

Michael Baker is confident, based on our on-going experience working with these firms and on their proven track record for quality and leadership, that each firm chosen will be a reliable partner for Michael Baker and SJTPO in delivering project assignments.

Churchill Consulting Engineers (Churchill) is certified by the NJDOT as an Emerging Small Business Enterprise (ESBE). Churchill will be provide survey/mapping, ROW, and utility engineering, accounting for 11.5% of work towards the project's DBE/ESBE goal

Richard Grubb & Associates, Inc. (RGA) is certified by the NJDOT, NJ Transit and Port Authority of New York & New Jersey as a Disadvantaged Business Enterprise (DBE). RGA will provide cultural resources services, accounting for 1.1% of work towards the project's DBE/ESBE goal.

The overall combined DBE/ESBE utilization for Churchill and RGA is 12.6%, which is above the project's 12.44% goal.

PERSON-HOUR SCHEDULES BY TASK

Michael Baker's proposed staff including their roles and reporting relationships is provided in the Organizational Chart, and resumes for key staff members are provided in the Staff Qualification section of this proposal.

The Michael Baker Team Person-hour Estimates summarize our proposed person-hours for each project by job title and task. Also included are person-hour breakdowns by firm for Michael Baker and our subconsultants: WSP, RGA, Inc., and Churchill Consulting Engineers.

The Michael Baker Team Person-hour Estimates were developed to deliver the project at a cost below the amount budgeted by the SJTPO. This will allow for the inclusion of potential unforeseen items, if they should occur, to be added to the project without exceeding the established budget amount. Based on our collective project history, intimate project knowledge, and familiarity with previous work products, the Michael Baker Team will deliver this study for the SJTPO at a value unmatched by other firms and efficiently advance this study to the next project delivery phase.

PROJECT SCHEDULE

The Michael Baker Team has developed a project schedule that reflects our strong and well documented understanding of the concept development process, the needs, goals, objectives and requirements of coastal bridge design, and intimate past knowledge of the project based on the work from the previous Ocean Drive (CR 621) concept development phase. The Michael Baker Team has the management experience and technical expertise to complete this Local Concept Development Study in 16 months, 3 months ahead of schedule, presenting a PPA by using the same proven team and techniques effectively applied to other similar projects.

The schedule will follow the NJDOT Local Concept Development Study, which is typically an 18 to 24 month process. However, because of the Michael Baker Team's experience, we can reduce task durations to achieve meaningful reductions in the overall project schedule.

The critical path will run through the data collection process, documenting any design deficiencies, and developing a well-defined project Purpose and Need statement to guide the process. During these stages, the experience of completing the previous concept development efforts will provide significant efficiencies. Leveraging WSP's comprehensive familiarity with the previous Ocean Drive Feasibility Study, we can expedite the existing conditions data collection process and confirm the project purpose and need. The data collected from the previous project is readily available and will be used as the basis for current data collection efforts from day one. The main tasks of the data collection effort will be to identify new data requirements and validate and update the previous information as necessary.

We recognize that site conditions and engineering requirements have changed since the original report. Many of these changes are identified in this proposal and obtaining new traffic data that captures peak-season activity is particularly time sensitive. As the anticipated notice-to-proceed date of this study is in October 2017, the earliest time new peak-season data can be collected will be June 2018. This constraint would delay the development of a comprehensive traffic analysis needed for the existing conditions report and consideration of traffic impacts during alternatives analysis. In anticipation of this challenge, the Michael Baker Team began a preliminary traffic data collection program in early August 2017 using Automatic Traffic Recorders to collect one week of peak-season traffic data that otherwise would not have been obtained until summer 2018. Obtaining this critical data will allow traffic analysis of existing conditions, proposed alternatives, and construction staging to occur earlier, saving months of time and accommodating the proposed accelerated 16-month schedule.

Building off of the previously considered alignments, the Michael Baker Team will develop potential alignments given the updated constraints and needs. The Michael Baker Team's extensive collective experience on coastal bridges in New Jersey will expedite the development and evaluation of alternatives. Taking advantage of our team's previous experience and insight with the project, we have reviewed the previous information and have preliminarily developed new potential alignments to avoid/limit impacts to known sensitive land uses as shown in Figure 3. Our intimate knowledge of the previous alternatives and site conditions will enable us to swiftly hone in on improvements to the previously studied alternatives and to efficiently develop new feasible and sensible alternatives.

Utilizing the existing information and leveraging the knowledge of previously developed alternatives will allow the Michael Baker Team to conduct activities concurrently and to overlap tasks. For example, some of the work necessary to develop alternatives and perform alternatives analysis can be performed concurrently with activities in the Data Collection task, utilizing existing data and earlier knowledge to develop and analyze alternatives and subsequently altering alternatives, if necessary, based on updated findings during Data Collection activities.

We understand that project stakeholder coordination can delay projects. Our project outreach plan has been developed to move the project forward by providing ample opportunity for stakeholders to participate and voice concerns. Having collaborated with many of the environmental agencies (NJDEP, USACE, NMFS, USCG, USFWS, and NJSHPO) on previous projects, Michael Baker, WSP, and RGA have built relationships based on trust with the regulators, allowing us to identify concerns and develop amicable solutions together in a streamlined manner.

As indicated in the proposed project schedule, the Michael Baker Team proposes completing the LCD efforts in an accelerated 16-month schedule with 3 months of schedule savings. A more detailed project schedule, including activity start/end dates, activity relationships, identification of the critical path, and milestone dates will be prepared for review by the Project Team prior to the project kickoff meeting and revisited quarterly.

South Jersey Transportation Planning Organization
Ocean Drive (CR 621) Upgrades and Bridge Improvements
Local Concept Development Study

Proposed Project Schedule
August 2, 2017

		2017			2018												2019
Task Description	**Calendar Days**	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUNE**	**JULY**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**JAN**
Notice to Proceed	0 Days																
Task 1 - Public Outreach																	
A - Public Involvement Action Plan	+ 90 Days																
B - Local Officials Meetings																	
1. Meeting 1 - Project Kickoff	+ 30 Days																
2. Meeting 2	+ 115 Days																
3. Meeting 3	+ 250 Days																
4. Meeting 4	+ 310 Days																
C - Stakeholder Coordination & Meetings																	
1. Meeting 1	+ 120 Days																
2. Meeting 2	+ 255 Days																
3. Meeting 3	+ 315 Days																
D - Public Information Centers																	
1. Meeting 1	+ 135 Days																
2. Meeting 2	+ 270 Days																
3. Meeting 3	+ 330 Days																
E - Agency Consultation Meetings																	
1. Meeting 1	+ 90 Days																
2. Meeting 2	+ 215 Days																
3. Meeting 3	+ 275 Days																
4. Meeting 4	+ 310 Days																
F - Resolutions of Support	+ 475 Days																
G - Public Outreach Summary	+ 488 Days																
H - Project Website & Social Media	+ 488 Days																
Task 2 - Data Collection																	
A - Obtain & Review Existing Documentation	+ 90 Days																
1. Vessel Survey	+ 60 Days																
2. Traffic Counts & Analysis*	+ 60 Days																
3. Hydraulic Analysis	+ 60 Days																
B - Project Mapping and Survey	+ 60 Days																
1. Identity Site Resources	+ 90 Days																
C - Environmental Screening	+ 90 Days																
D - Navigation Impact Report	+ 245 Days																
E - Evaluate Site Deficiencies	+ 90 Days																
F - Existing Conditions Documentation	+ 105 Days																
G - Purpose and Need Statement (P&N)	+ 105 Days																
Task 3 - Alternative Analysis																	
A - Develop Engineering Alternatives	+ 245 Days																
B - Alternatives Evaluation	+ 305 Days																
1. Selection of Preliminary Preferred Alternative (PPA)	+ 305 Days																
C - Alternatives Analysis Documentation	+ 305 Days																
D - Value Engineering Review	+ 370 Days																
E - Risk Management Review and Documentation	+ 275 Days																
F - Develop Mitigation Strategies																	
Task 4 - Documentation																	
A - Concept Development Plans	+ 430 Days																
B - Prepare Cost Estimates	+ 460 Days																
C - NEPA Classification and Documentation	+ 435 Days																
D - Develop Preliminary Engineering Next Steps/Tasks	+ 488 Days																
E - Concept Development Report	+ 475 Days																
Task 5 - Project Management																	
A - Project Controls																	
B - Status Meetings																	
C - Project Sharepoint Site																	
D - Design Communication Report																	
E. Quality Management																	

Durations Assume One Week Review By Other Agencies and Committees
*Peak Season Traffic Counts to be Collected August 2017

LEGEND
Key Meetings
Deliverables
Status Meetings

Michael Baker INTERNATIONAL

Michael Baker INTERNATIONAL

ORGANIZATION CHART
Ocean Drive (CR 621) Upgrades and Bridge Improvements Local Concept Development Study

South Jersey Transportation Planning Organization

Principal In Charge
Michael Brescia, P.E.

Project Manager
Maher (Mike) Sidani, P.E., PMP

Deputy Project Manager
James Yeager, P.E., PTP

Quality Management
Joseph Danyo, P.E., P.P.

Constructability / Risk Management
Joseph Mumber, P.E. (WSP)
Richard Dunne, P.E.

Value Engineering
George Obaranec, P.E., C.V.S.

Subconsultants:
WSP USA (WSP)
RGA, Inc. (Richard Grubb & Associates) (RGA)
Churchill Consulting Engineers (CH)

Resumes Provided

Geotechnical / Pavement
Michael Yang, Ph.D., P.E.

Borings / Subsurface Conditions
Kwang Ro, P.E. (WSP)
Gang Shen, P.E.
Paul Stubee, P.E. (CH)

Roadway and Embankment Stability
Hamid Ikram, P.E.
Gang Shen, P.E.

Ground Improvements
Michael Yang, Ph.D., P.E.
Ragui Fahmy, P.E., Ph.D. (WSP)

Settlement Analysis
Kwang Ro, P.E. (WSP)
Don Green, P.E.
Ragui Fahmy, P.E., Ph.D. (WSP)

Pavement Analysis
Vahid Ganji, P.E.

Highway / Civil Engineering
Sylvester Fryc, P.E.

Highway Design / Geometrics
Gilberto Bosque, P.E.
William McBride, Jr., P.E.

Access
Cynthia Coupe, P.E., P.P.

Construction Staging / MPT
Derek Franz, P.E.
Justin Worek, P.E.

Substandard Geometric Design/ Design Exceptions
Jolly Benitez, P.E.
Sara Tesfu, P.E.

Safety / Roadside Design Measures
Joseph Milanese, P.E., AICP, PTOE
Nirav Shah, P.E.

Concept Plans and Estimate
Ronald Meek, P.E.
Jolly Benitez, P.E.

Project Schedule
Julie Liuzzo, P.E.
Juan Uribe

Structures Engineering
Joseph Romano, P.E.

Bridge Concept
Yong Chen, Ph.D., P.E.
Miguel A. Santiago, P.E. (WSP)

Seismic Analysis and Structural/ Vibration Modeling
Hamid Ikram, P.E.
Michael Hnat, P.E.
Ling Zhao, PhD., P.E.

Bridge Architecture
Adam Anzzolin, AIA

Foundation Design
Kelvin Luo, P.E.
Shafiul Azam, P.E.

Bulkhead / Retaining Wall
Bruce Karalius, P.E.
Steven Esposito, P.E. (WSP)

Segmental Design
Yong Chen, Ph.D., P.E.
Joe Tse, P.E. (WSP)

Lift Bridge Design
Rama Krishnagiri, P.E. (WSP)
Jamal Grainawi, P.E. (WSP)
Jude Bonsu, P.E. (WSP) – *Mechanical*
Desmond Raffington, P.E. (WSP) – *Electrical*

Fender / Dolphin System
Ling Zhao, Ph.D., P.E.
Steve Esposito, P.E. (WSP)
Lyly Lau, P.E. (WSP)

Traffic Engineering
David Liebgold, P.E., P.P.

Forecast Travel Projections
Martin Wade, P.E.

Crash Analysis
Joseph Milanese, P.E., AICP, PTOE

Traffic Operations and Level of Service Analysis
Stephen Hodose, P.E., PTOE

Detour Route Evaluation
Martin Wade, P.E.
Matthew Ullestad, P.E., PTOE

ITS / Roadway Lighting
Kellen Sporny, P.E.

Traffic Signage / Striping
Stephen Hodose, P.E., PTOE
Matthew Ullestad, P.E., PTOE

Navigational Study
Daniel Barone, Ph.D., GISP, CFM

Environmental Documentation
Steven Balzano (WSP)

Environmental Screening and Mapping / NEPA
Stephen Forney
Anne Napolitano
Darren Stanker (WSP)
Tara Bencivenga (WSP)

Cultural Resources / Section 106
Paul McEachen, RPA, M.A. (RGA)
Damien Tvaryanas, M.S. (RGA)

NEPA Classification
Rebecca Traylor, PWS, CE

Agency Coordination
Steven Balzano (WSP)

Utility Engineering
Vinod Kotecha, P.E.

Utility Agreement Plans
Joseph Seiler
Anthony Daino
William Fleming, Jr., P.E., P.P. (CH)

Utility Relocation Schemes / Plans
Anthony Daino
William Fleming, Jr., P.E., P.P. (CH)

Utilities Investigation / Verification
William Fleming, Jr., P.E., P.P. (CH)

Community Involvement
Pam Lebeaux, Ph.D., AICP, P.P. (WSP)

Public Involvement Action Plan
Steven Wong, AICP, PTP, PMP
Debbie Hartman, P.E. (WSP)

Stakeholder Coordination
Andrew Lappitt, AICP, P.P.

Socio-economic / Environmental Justice
Pam Lebeaux, Ph.D., AICP, P.P. (WSP)

Public Information Sessions
Debbie Hartman, P.E. (WSP)

Resolutions of Support
Steven Wong, AICP, PTP, PMP

Project Website and Twitter Account Development
Matthew Bodnar, AICP

Project Mapping and Survey
Andrew Coursen, P.E., PLS (CH)

Surveying
Andrew Coursen, P.E., PLS (CH)

ROW Engineering
Les Gregrowski
Michael C. Dorio, PLS (CH)

Jurisdictional Documents
Andrew Coursen, P.E., PLS (CH)

Stormwater Management/ Drainage
Craig Wenger, P.E., AICP, CFM, LEED GA

Drainage System Assessment
Lori Wade, P.E., CPSWQ

Stormwater Management Compliance
Julia Fine, P.E., CPSWQ
Stella Karcnik
James Mellett, P.E. (CH)

Scour
Tom Mihlbachler, P.E., CFM

Hydrologic and Hydraulic Analysis / Floodplain Analysis
Hani Rimawi, P.E., CFM

South Jersey Transportation Planning Organization
Ocean Drive (CR 621) Upgrades and Bridge Improvements
Local Concept Development Study

Consultant Summary Budget Form

August 2, 2017

Labor Costs (Prime Only)		
Direct Labor	$	237,280.90
Overhead at 141.44%	$	335,610.10
Subtotal Labor	$	572,891.00
Non-Salary Direct Expenses (Prime Only)		
EDR and Permit Fee	$	-
Aerial Mapping	$	-
Reproduction	$	6,163.17
Mileage and Tolls	$	6,420.00
Postage	$	300.00
Maps, Plans and Graphics	$	6,000.00
PIC Advertising	$	1,800.00
SharePoint Site Hosting and Maintenance	$	600.00
Project Website Hosting and Maintenance	$	600.00
Subtotal Non-Salary Direct Expenses	$	21,883.17
Sub-consultant Fees		
WSP	$	440,474.43
RGA**	$	14,085.50
Churchill**	$	143,376.80
Sub-consultant Fees	$	597,936.73
Total Non-Salary Direct Expenses + Sub-Consultant Fees	$	619,819.90
Fixed Fee (10% of L + OH) (Prime Only)	$	57,289.10
TOTAL	**$**	**1,250,000.00**

** DBE/ESBE Participant 12.6%

Michael Baker INTERNATIONAL

SOUTH JERSEY TRANSPORTATION PLANNING ORGANIZATION

RESOLUTION 1709-32: Approving the Selection of Michael Baker International, Inc. as the Consultant for the Ocean Drive (CR 621) Upgrades and Bridge Improvements Local Concept Development Study

WHEREAS, the South Jersey Transportation Planning Organization (SJTPO) is the Metropolitan Planning Organization (MPO) designated under Federal law for the southern region of New Jersey including Atlantic, Cape May, Cumberland, and Salem Counties; and

WHEREAS, the Fiscal Year 2018 SJTPO Unified Planning Work Program includes Federal Highway Administration planning funds for this project; and

WHEREAS, the Notice of Availability of Requests was sent to approximately 197 firms on July 6, 2017; and

WHEREAS, the Request for Proposal (RFP) announcement and supplemental materials were also posted on the publicly accessible SJTPO website; and

WHEREAS, four (4) proposals were received; and

WHEREAS, the SJTPO Technical Advisory Committee endorsed the consultant selection committee with representatives from Cape May County, SJTA, and SJTPO, who reviewed and evaluated the proposals in accordance with SJTPO's published criteria; and

WHEREAS, the Consultant Selection Committee recommends Michael Baker International, Inc. in association with WSP, and Churchill Consulting Engineers and Richard Grubb & Associates serving as the Disadvantaged Business Enterprise (DBE) firms; and

WHEREAS, the SJTPO TAC, at their September 11, 2017 meeting, endorsed the recommendation of the Consultant Selection Committee;

NOW THEREFORE BE IT RESOLVED, that the Policy Board of the South Jersey Transportation Planning Organization hereby approves the above selection for the Ocean Drive (CR 621) Upgrades and Bridge Improvements Local Concept Development Study, with a maximum fee of $1,250,000.00 and 12.6% DBE participation; and

BE IT FURTHER RESOLVED, that the Policy Board authorizes the Executive Director to execute scope of work and cost modifications to the original contract amount, provided that funding is available.

BE IT FURTHER RESOLVED, that the Policy Board requests that the South Jersey Transportation Authority execute the appropriate contractual arrangements with the consultant on behalf of the SJTPO.

Certification

I hereby certify that the foregoing is a correct and true copy of a resolution adopted by the Policy Board of the South Jersey Transportation Planning Organization at its meeting of September 25, 2017.

John W. Risley /MB

John W. Risley, Secretary/Treasurer