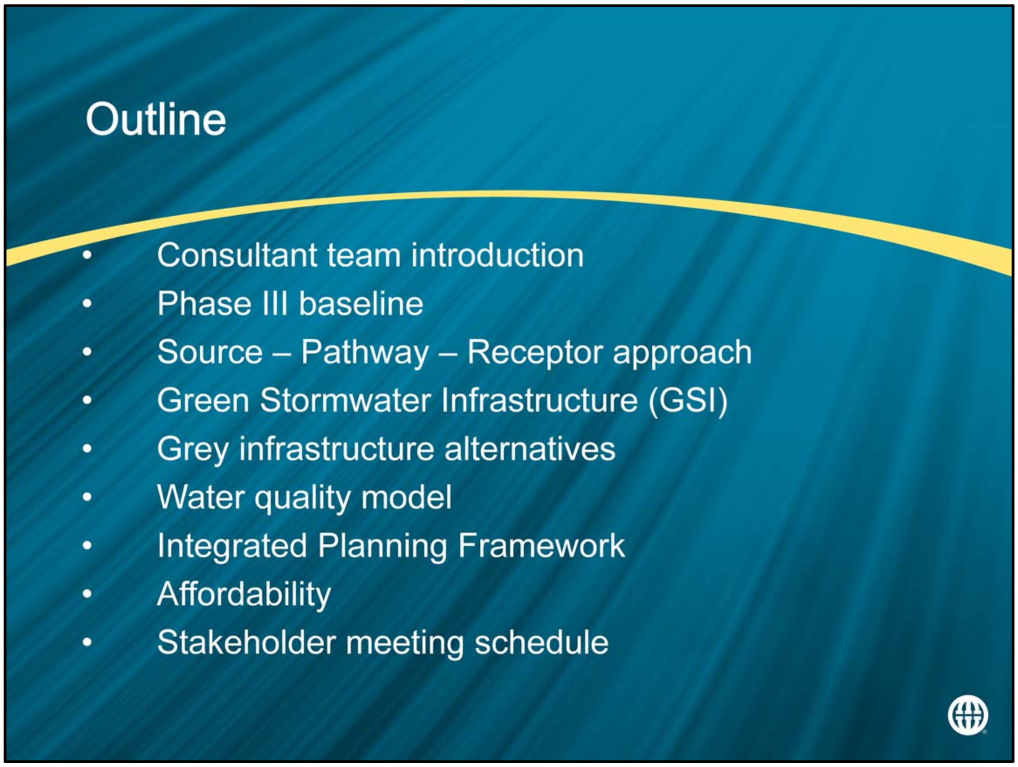
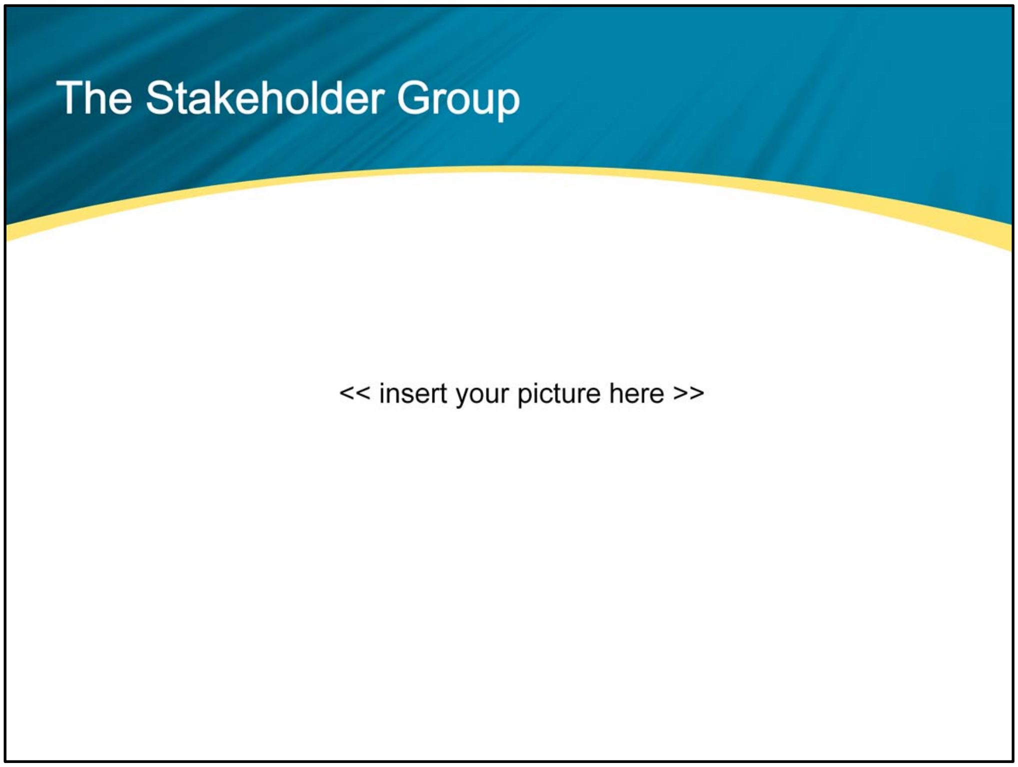

Prepared for
Narragansett Bay Commission
CSO Control Facilities
Phase III Reevaluation
Stakeholder Group Kickoff
12 March2014
Providence
Rumford
East Providence
Edgewood Lake
Edgewood Yacht Club
MWH
BUILDING A BETTER WORLD



We will start with an introduction to the consultant team, then provide a brief overview of the currently defined Phase III CSO program, and discuss our approach to evaluating alternatives. We will talk a little bit about what those alternatives will be in terms of both “hard-pipe” or “grey infrastructure” and “green and sustainable infrastructure”, as well as the water quality model we see as important for evaluating those alternatives. We will spend time discussing the Integrated Planning Framework, or IPF, which is process we use based on EPA guidance that allows us to evaluate and sequence Phase III recommendations along with other regional wastewater and stormwater improvements. That IPF process goes hand-in-hand with an affordability analysis which we will discuss before wrapping up the presentation with an outline of our stakeholder meetings.

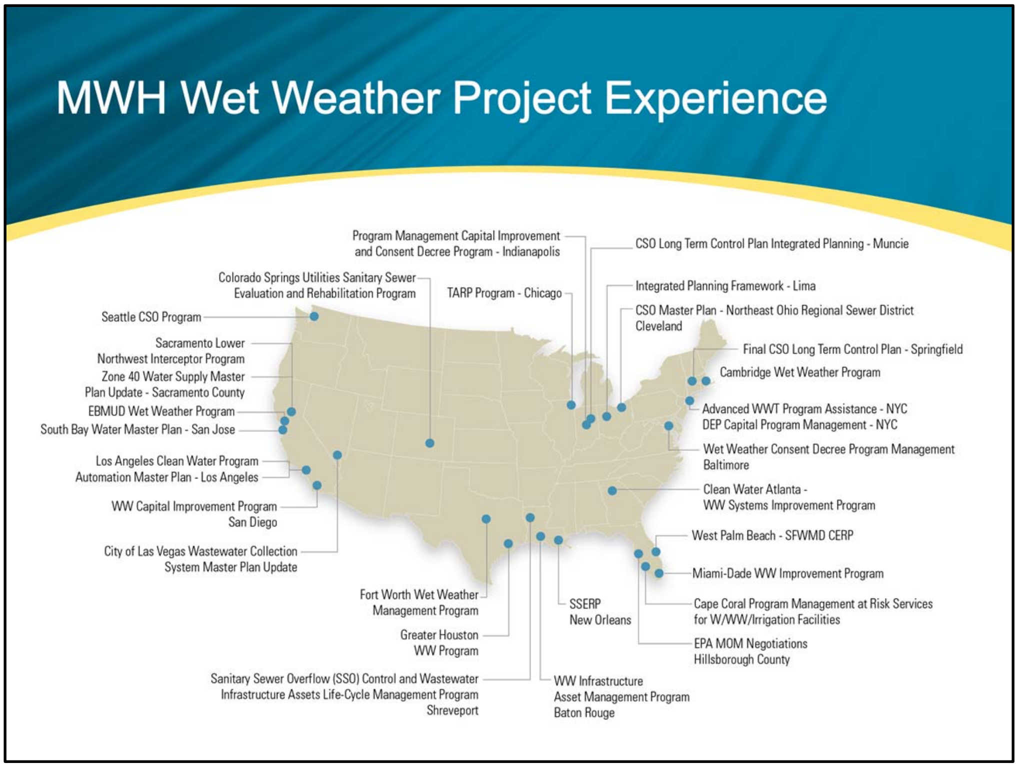


But before we get into any of that, it is important to acknowledge that the success of the Reevaluation project depends heavily on you, the stakeholder group. Everyone in this group possesses knowledge, data, expertise, opinions and understanding that is critical to developing and analyzing the alternative Phase III components and other projects that can improve water quality in the Bay or impact the area rate payers. At the very beginning, and on behalf of the consultant team and the Commission, we would like to thank you for participation and attention over the next several months as we define the projects that will benefit Rhode Island for years to come.

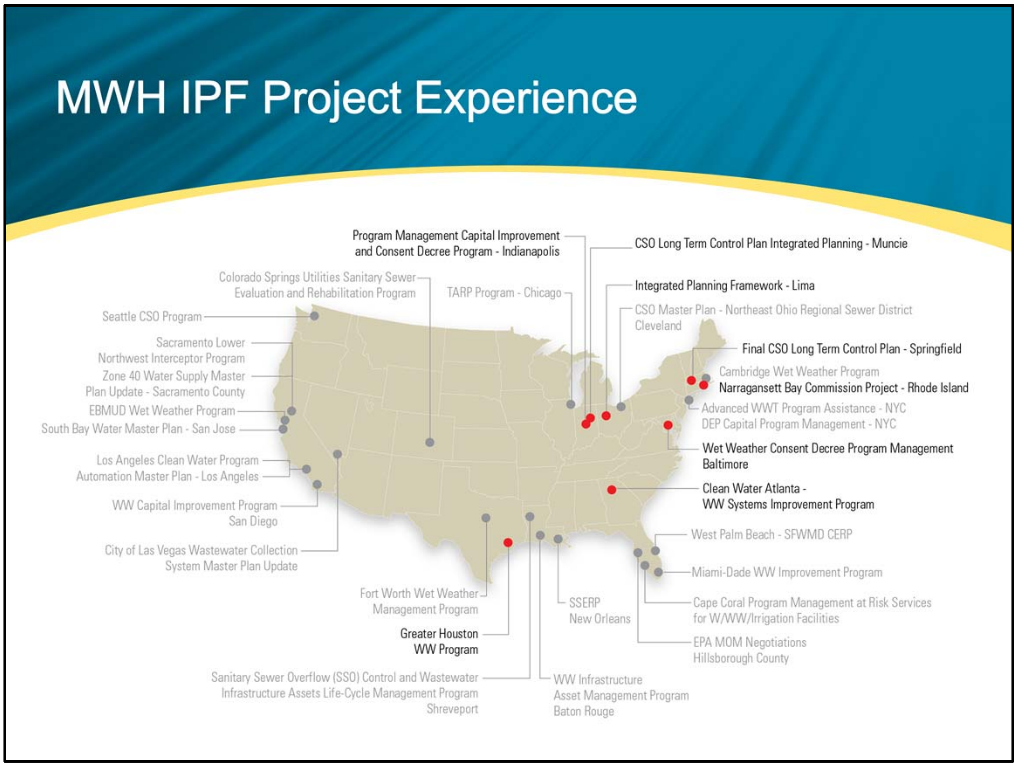
MWH is the team leader and involved in virtually all aspects of the project. MWH is a strategic consulting, technical engineering, and construction services firm with a singular focus on wet infrastructure—and is widely recognized as a leader in the analysis, development and implementation of solutions for wastewater and stormwater management issues in large urban areas. Our nearly 8,000 employees in 35 countries spanning six continents are dedicated to fulfilling our purpose of Building a Better World, which reflects our commitment to sustainable development.

Pare is our partner. Pare Corporation, a multi-disciplinary firm comprised of planners, scientists, and engineers specializing in areas of civil, environmental, geotechnical, waterfront, and municipal projects with offices in Lincoln, Rhode Island and Foxboro, Massachusetts.

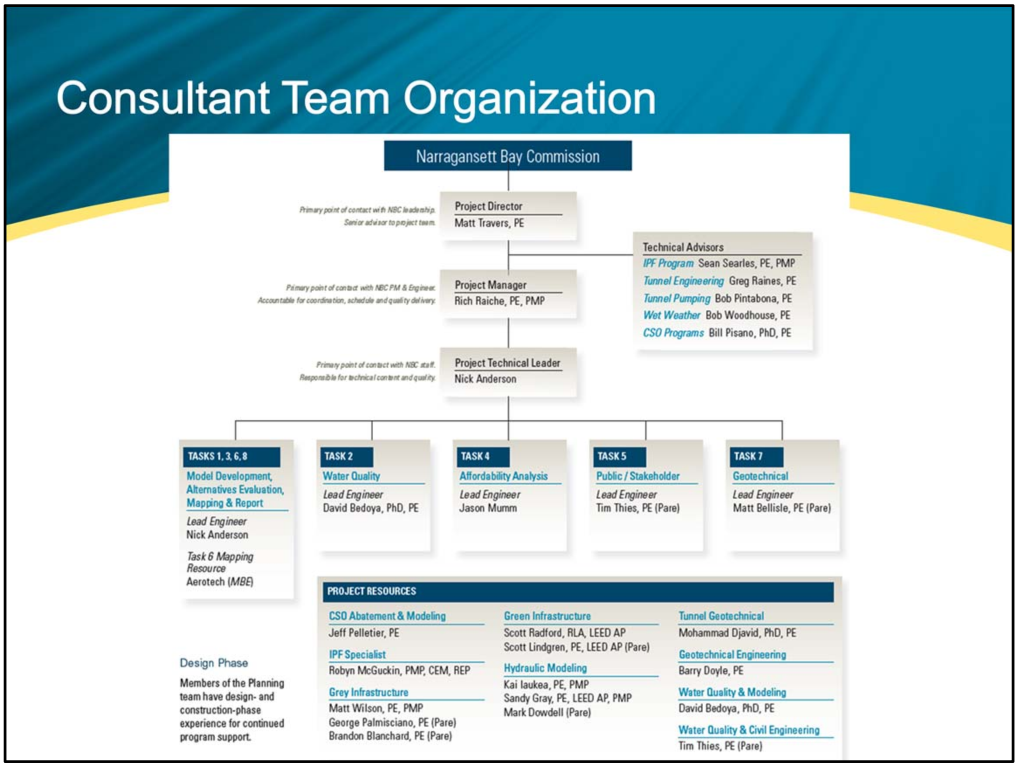
RPS/ASA, who worked on the previous plan development, will perform the receiving water quality modeling.



A large component of our experience is with CSO, or Wet Weather, projects. MWH achieves sustainable, cost-effective CSO management through integrated watershed solutions that mirror the hydrologic cycle; first seeking to hold and infiltrate water at its source on properties and in roadways, then intelligently regulating flow in conveyance systems, and finally storing and treating remaining flow at the end of those pipes.



With our specialization in wet infrastructure and evolution of wet weather strategies, it is not surprising that MWH has emerged at the forefront of applying the EPA's new Integrated Planning Framework (IPF) for clients ranging from Lima, Ohio and Baltimore, Maryland, to the Springfield Water and Sewer Commission in Massachusetts.



Our team is drawing from various national technical experts and area staff with deep local knowledge. Some key staff you will see at these meetings and perhaps outside of these meetings during our data-gathering efforts include:

Matt Travers, the Project Director, and George Palmisciano of Senior Vice President Pare.
Rich Raiche, the Project Manager and the primary point of contact with NBC staff.
Tim Thies, Pare's Project Manager and the lead for these stakeholder meetings.
Nick Anderson, the Project Technical Lead and head modeler, also a point of contact with NBC staff.
David Bedoya, the Lead Engineer the Water Quality task.
Keith Gardner, the lead engineer for the alternatives analysis.
Scott Lindgren, Pare's green infrastructure expert.
Greg Baird, the lead for the affordability analysis.
Simon McGrath, Pare's geotechnical engineer.
Sean Searles, the expert on the Integrated Planning Framework process and large program implementation.

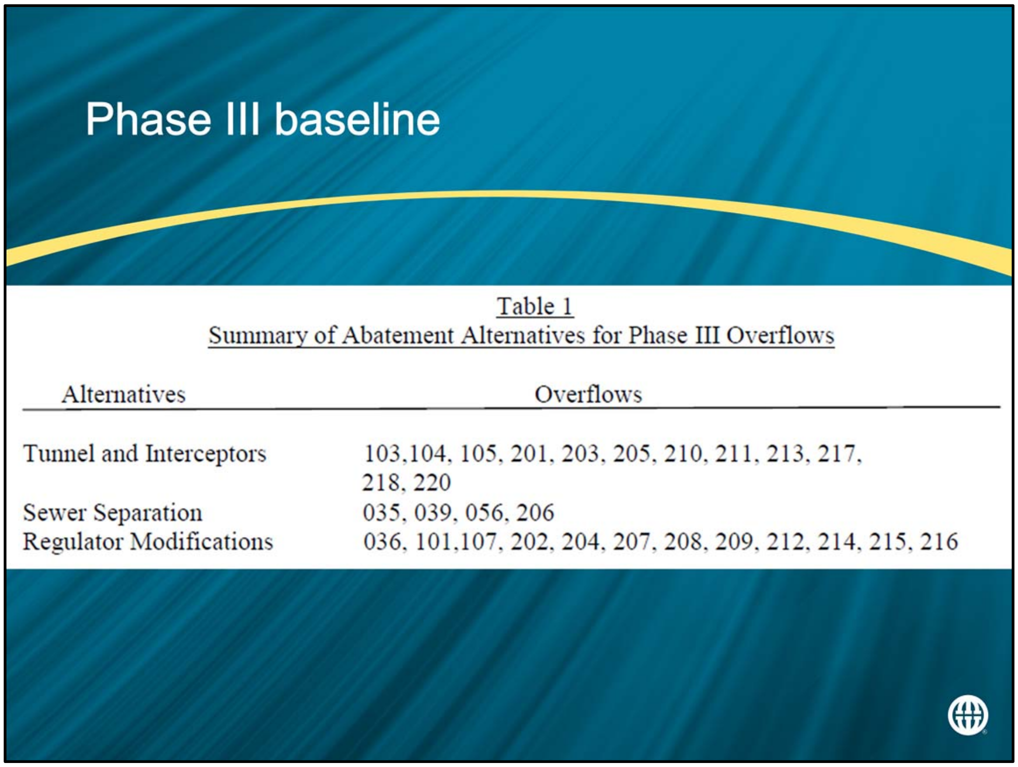
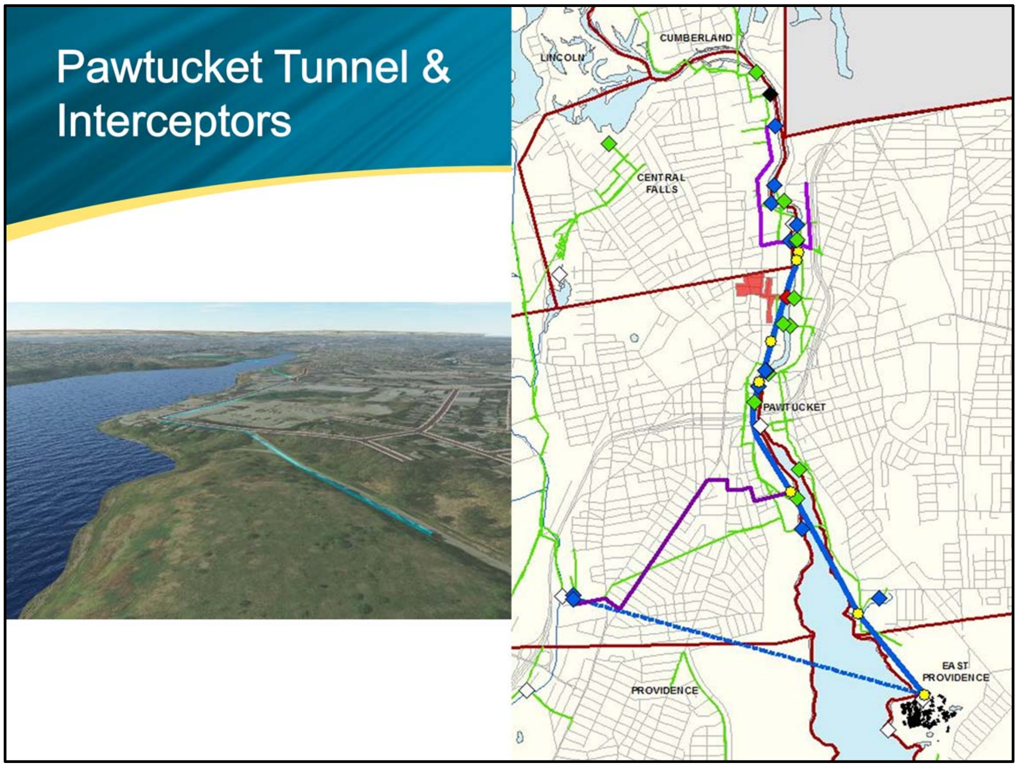


Table 1
Summary of Abatement Alternatives for Phase III Overflows

Alternatives	Overflows
Tunnel and Interceptors	103,104, 105, 201, 203, 205, 210, 211, 213, 217, 218, 220
Sewer Separation	035, 039, 056, 206
Regulator Modifications	036, 101,107, 202, 204, 207, 208, 209, 212, 214, 215, 216

In December 2010, NBC submitted a second reaffirmation of the CDRA and included slightly updated costs, although those costs do not reflect lessons learned from the Phase II program.

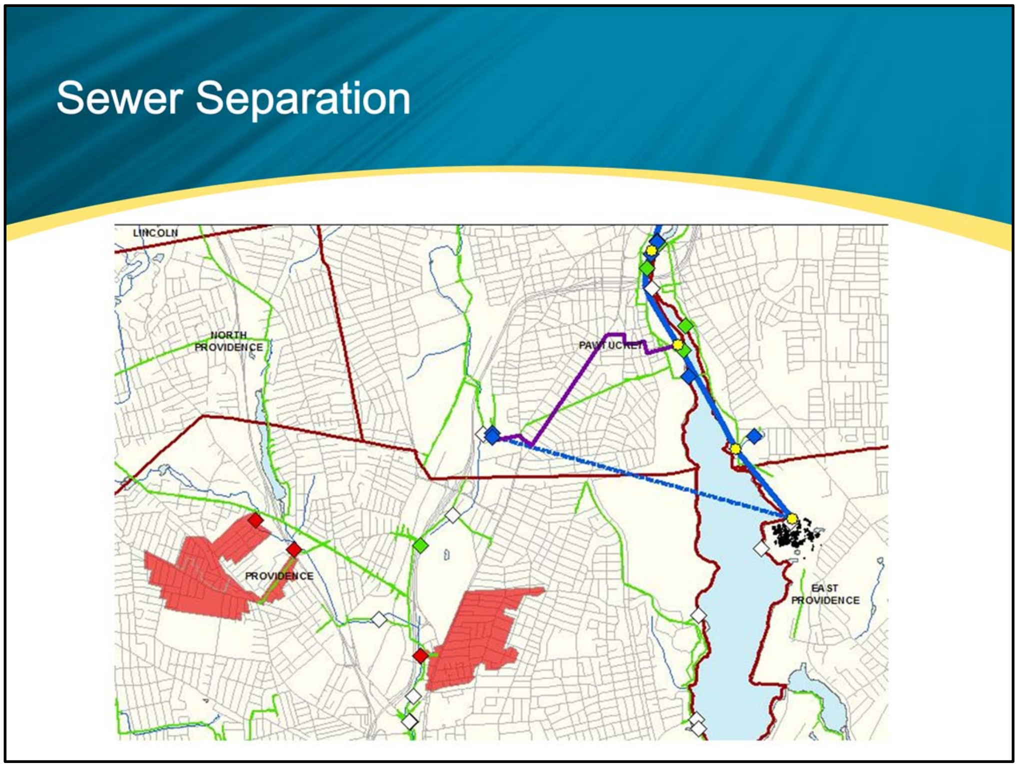
As it stands now, Phase III consists of the construction of the deep Pawtucket Tunnel for storage and interceptors to connect 12 CSO structures to it, and sewer separation in 4 CSO catchments plus regulator modifications at an additional 12 CSOs.



Much like the Main Spine tunnel was a key component of the Phase I plan, the Pawtucket Tunnel is marque component of the Phase III plan. The tunnel was planned to store 51 MG, be 26 feet in diameter, have 5 dropshafts and extend 13,000 lf from just north of the Bucklin Point Treatment Facility in East Providence to the Central Falls / Pawtucket border near the Blackstone River.

From the northern end of the tunnel, two interceptors would convey flows from the more northerly CSOs: A 30 to 66-inch diamter, 2,060 lf interceptor along Middle Street in Pawtucket, and a 42 to 48-inch diameter, 4,240 lf interceptor along High and Cross Streets into Central Falls.

For the recently combined OF219/220 in western Pawtucket, an interceptor consisting of a pump station, 48-inch diamter 4,745 lf force main and 54-inch diameter 3,425 lf gravity main would be required for connection to the tunnel. The CDRA did identify an alternative to the interceptor being a 10-foot diameter, 9,100 lf stub tunnel cutting across Pawtucket and allowing for a change in the configuration of the Pawtucket Tunnel.

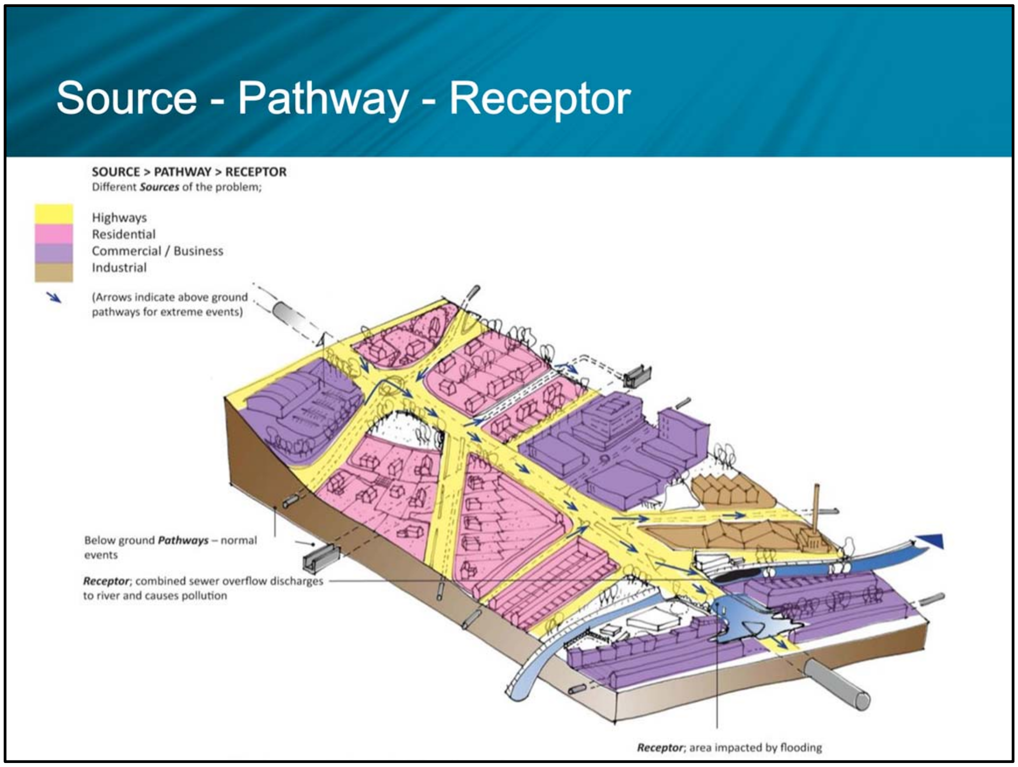


Sewer separation is targeted for one small area in northern Pawtucket to mitigate one CSO on the Blackstone River.

Sewer separation is designated for three areas in northern Providence to mitigate discharges to the West and Moshassuck Rivers. It should be noted that Phase II included sewer separation in similar areas, and construction proved rather difficult. Therefore a focus of the reevaluation will be to develop alternatives to these Phase III sewer separations and evaluate them based on the Phase II experience.

In the decades that have passed since the last planning effort, several conditions have changed. Phase I and II solutions have improved water quality in Narragansett Bay. The real costs and compilations of project construction, particularly sewer separation and interceptor sewers, have escalated. Technological advancements have improved the effectiveness of grey and green infrastructure. The EPA has introduced new affordability parameters and Integrated Planning guidance to better prioritize projects and capital expenditures.

But how do we evaluate alternatives to develop a better plan? It starts with our Source – Pathway – Receptor approach.



The easiest way to think about the S-P-R approach is to pretend that you are a drop of rain encountering different conditions and controls on and in the ground.

When the rain drop first hits the ground, what happens to it depends on the land use: residential, commercial, industrial, etc. So our evaluation starts with understanding how that drop reacts when it hits those different land uses. Source control approaches deal with runoff close to where it occurs, local smaller scale solutions especially green infrastructure and best management practices fall into this category. These controls may be small in individual scale, but they are spread out over a large area.

Once the raindrop runs off of private property, into streets and into the pipe network, it encounters the second group of controls: pathway solutions. These include the interventions along conveyance routes: more traditional sewer system upgrades, sewer separation, and hydraulic controls.

The final classification is the receptors or 'end of pipe' type solutions; typically treatment, tunnels and storage facilities.

The S-P-R approach is intended to support understanding the relationships between systems and promotes the ability to choose the most appropriate solutions to meet the overall needs of the catchment.

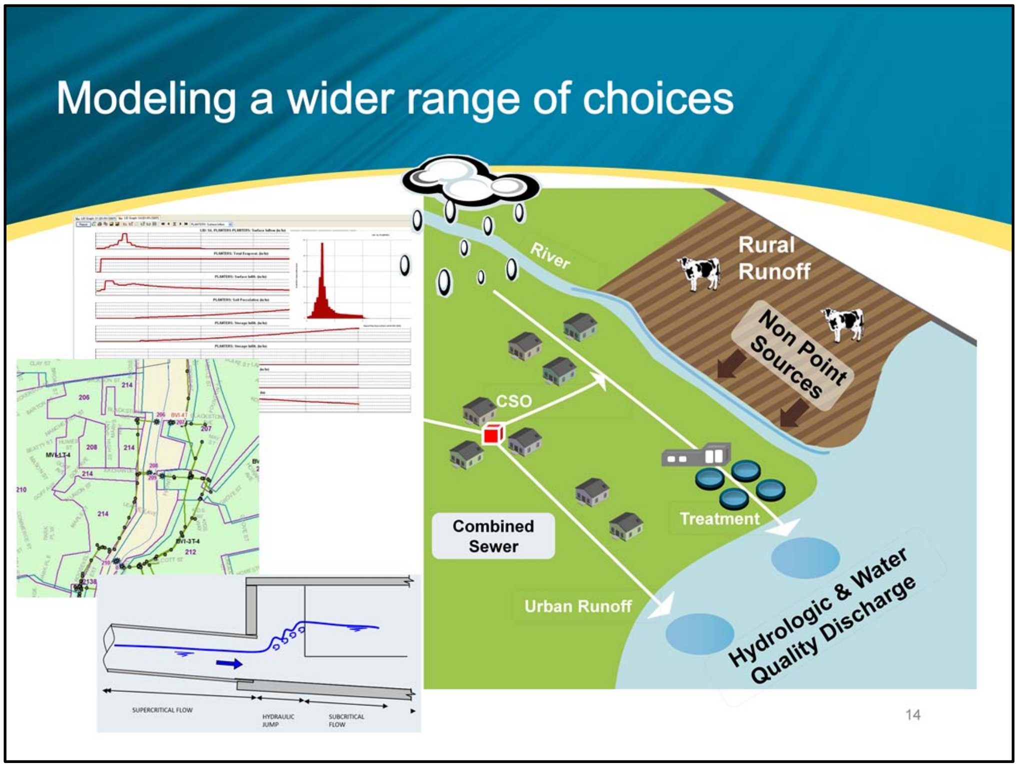
Optimizing Choices

Location / Event	Source	Pathway	Receptor
CSO performance	✓	✓✓	✓✓✓
Levels of service	✓✓	✓	✗
Extreme events	✓	✓	✓✓

Traditionally, CSO programs were designed around Receptor and Pathway solutions and focused only on the moderate rainfall events that cause CSOs to activate.

The S-P-R approach expands the view to include controls outside of the large pipe network. It also allows us to consider how the systems work under other conditions, including higher intensity storms that can affect the Level of Service (for example, sewer backups or localized flooding), and extreme events that can cause flooding damage.

If an improvement in one category has a detrimental effect in another, this does not constitute a successful solution. So while the project focus in this instance is improving water quality of the receiving rivers through CSO abatement, safeguarding and where possible improving, existing the levels of service and ensuring the introduction of any solutions do not have a negative impact in the management of extreme rainfall have a part to play in selecting the most appropriate solutions for the Narragansett Bay Commission.



The application of the S-P-R approach requires an in depth understanding of the sewer system and how and why the CSOs operate. A hydrologic and hydraulic model will support the understanding and once calibrated against flow meter data will provide the necessary confidence in predicting dry and wet weather flow components. That model already exists for the Fields Point Service Area, and we are currently building one for the Bucklin Point Service Area.

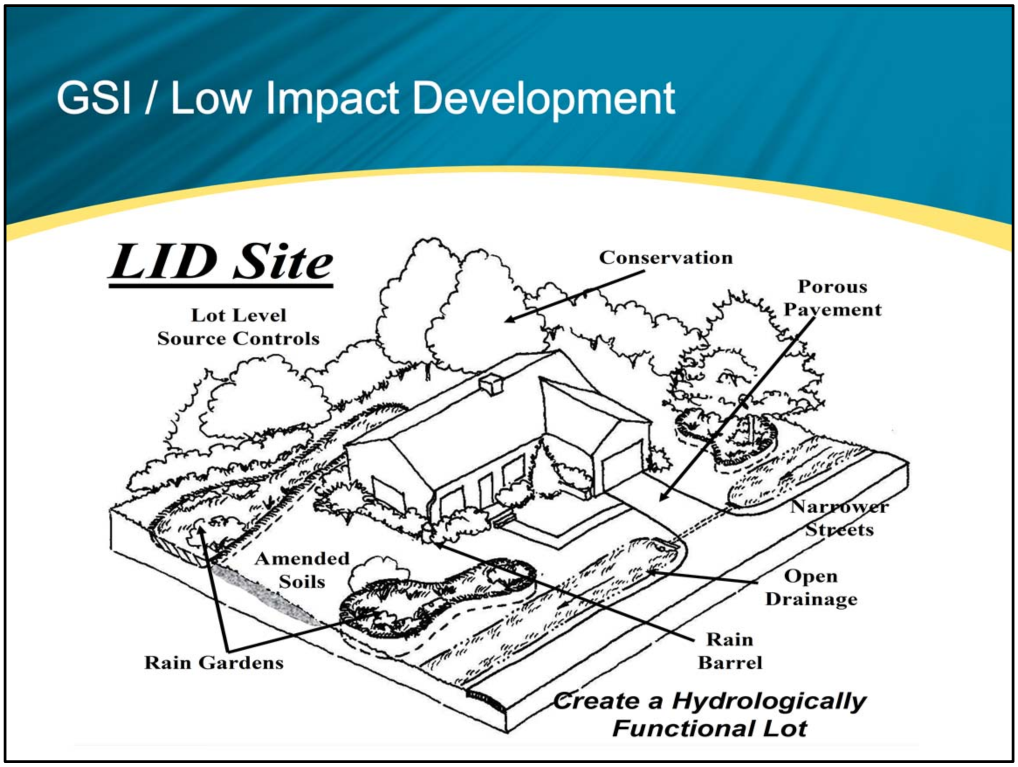
The predicted results from the model will inform the water quality analyses and permit the testing, sizing and optimizing of the S-P-R solutions. The development of the model that meets the need of the Phase III area is the core of the current planning phase and the as the designs developing the future compliance testing and risk understanding will be provided by the model.

Our team includes both hydraulic modelers and civil engineers, both of whom are well versed in the S-P-R methodology and range of alternatives, and who work together collaboratively to define the inputs and analyze the outputs of the model to develop technically feasible alternatives.

One of the biggest changes since the last planning effort has been the maturing of green and sustainable infrastructure. GSI is largely a source control that seeks to approximate the natural water balance and intercept stormwater before it enters the combined sewer system.

In highly urbanized like the NBC's service areas, the construction of separate closed storm and sanitary systems to replace combined sewers is extremely expensive. However, it is often overlooked that any measure that keeps stormwater out of the combined system amounts to de facto sewer separation.

Green Stormwater Infrastructure (GSI), while often difficult to implement in such urban environments, can prove to be a cost-effective alternative to traditional hard-pipe sewer separation. GSI can be incorporated into CSO abatement construction projects to augment or replace grey infrastructure and produce measurable targeted, near-term benefits as part of the Phase III costs. GSI philosophies can also be incorporated into the member communities' stormwater ordinances to produce system-wide, future benefits that reduce the required design capacity of Phase III infrastructure.



GSI is often integrated into new developments and called Low Impact Development or LID. The goal is to reduce or eliminate water pollution by:

- reducing impervious cover,
- increasing on-site infiltration,
- eliminating sources of contaminants, and
- removing pollutants from stormwater runoff.

Some portion of any development will include impervious surfaces whether it be a roof or paved area that cannot be made of permeable pavement. The runoff from those surfaces should be diverted to some system for reuse, uptake or infiltration, such as a rain barrel, rain garden, vegetated swale, or infiltration gallery.

Rain garden, bioswale, permeable pavement and other such elements can also be incorporated into the public areas by proper design of medians and streetscapes. Rather than acting simply as traffic control, these elements can treat and infiltrate stormwater.

Adoption of GSI solutions throughout the entire NBC service area could significantly reduce the wet weather flows in the NBC system and improve water quality in all of the area's receiving water bodies. GSI starts as close to the location where the rain falls as possible, therefore, locations on private property are important to GSI implementation. Application of those solutions are beyond the control of NBC and the scope of the Phase III projects, and depend on each of the communities adopting stormwater regulations, zoning ordinances and building codes that require LID elements into new developments and redevelopment projects. GSI could also be adopted as design standards by each of the communities for public works projects, both in terms of streetscape and building projects.

In the coming months, the consultant team will be working with the stakeholder group to gain an understanding of the technical feasibility, community acceptance, costs and benefits of those area-wide strategies. The realization of the benefits may take several years to occur and will depend on the actions of the member communities

Beyond the generation of area-wide GSI alternatives that can reduce stress on the NBC system, the project approach will focus to a greater level of detail on catchments where sewer separation or interceptor construction is proposed in the Phase III baseline plan, so Central Falls, Pawtucket and northern Providence. The intent of that focus is to develop specific GSI alternatives to those grey options that would be included in the NBC Phase III project portfolio.

Parking, roof tops and street paving typical of the urban landscape predominate the area surrounding these CSO facilities. Existing green space parks, boulevard strips, and play grounds also exist, the concept is to incorporate GSI into these spaces to reduce peak flows by removing the stormwater which currently finds its way into the system.

The green alternatives focus on Source controls. The grey alternatives comprise Pathway and Receptor controls.

Particularly for the sewer separation areas, some targeted use of GSI can reduce the extent of actual sewer separation that needs to be done in those sewersheds. So that is one of the first places we will be looking, essentially swapping green for grey where it's feasible.

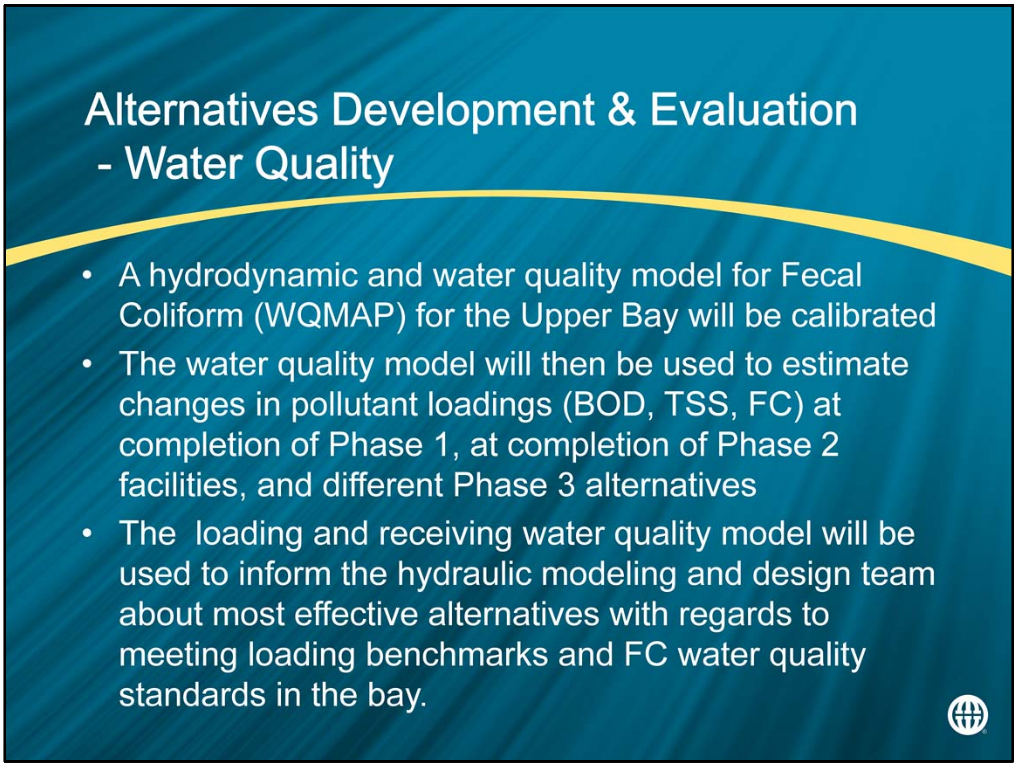
GSI elsewhere in the system can relieve the stress on the interceptor system. That paired with our hydraulic modeling efforts, and our understanding of how the Phase I and II CSO program have changed conditions in terms of both water quality and system dynamics will inform how we modify other components of the plan including the Pawtucket Tunnel size and configuration.

Hydraulic Controls

An area where grey technology has advanced in the States in the past two decades is in hydraulic controls. Passive controls such as vortex throttles, hydroslides and bending weirs can route flows to different parts of the pipe network depending on flow depths. This is particularly useful in combined systems evaluated with the S-P-R approach so that we can control flows under the 3 scenarios (CSO, Level of Service, Extreme).

In the collection and interceptor system, a CSO event is a matter of timing. It occurs then the inflows into the system exceed the capacity of the conveyance pipes or pumps. If we can temporarily store volumes of stormwater or combined flow for release into the system after the system pressures subside, the CSO can be avoided. Therefore, we will be looking at places in the system were we can build near-surface storage or screening and disinfection facilities.

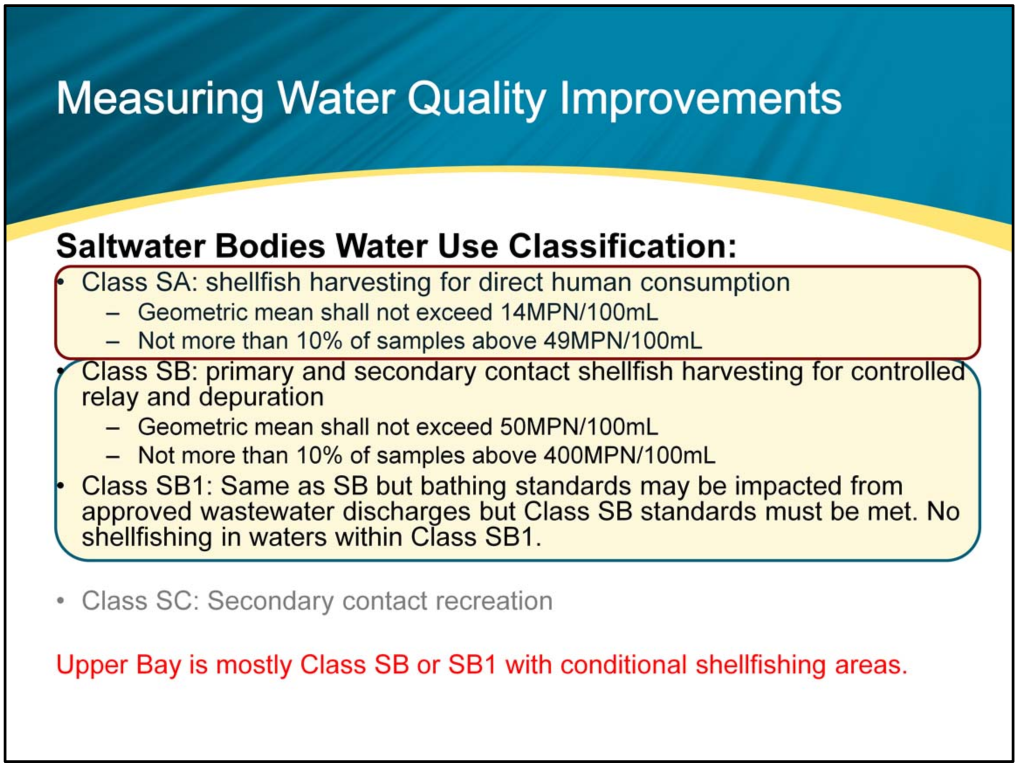
A key to using those facilities is the incorporation of the hydraulic controls like the bending weir that keep flow in the mainlines during normal conditions, but flop over under the weight of water when levels in the pipe get deep to divert flow to off-line storage tanks.



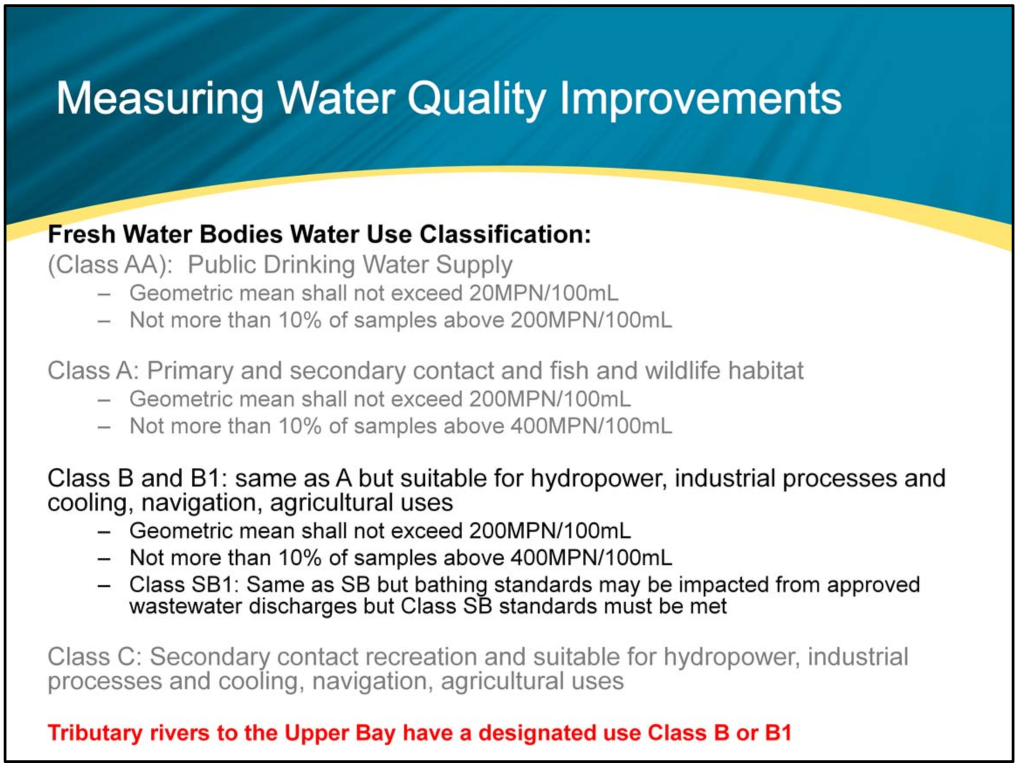
The S-P-R approach with its combination of hydraulic modeling and engineering lead us to technically feasible alternatives, but the goal of the CSO program is improving water quality in the Bay.

The original 1994 Conceptual Design Report (CDR) outlined a number of benchmarks that the CSO abatement project should achieve to meet the water quality criteria.

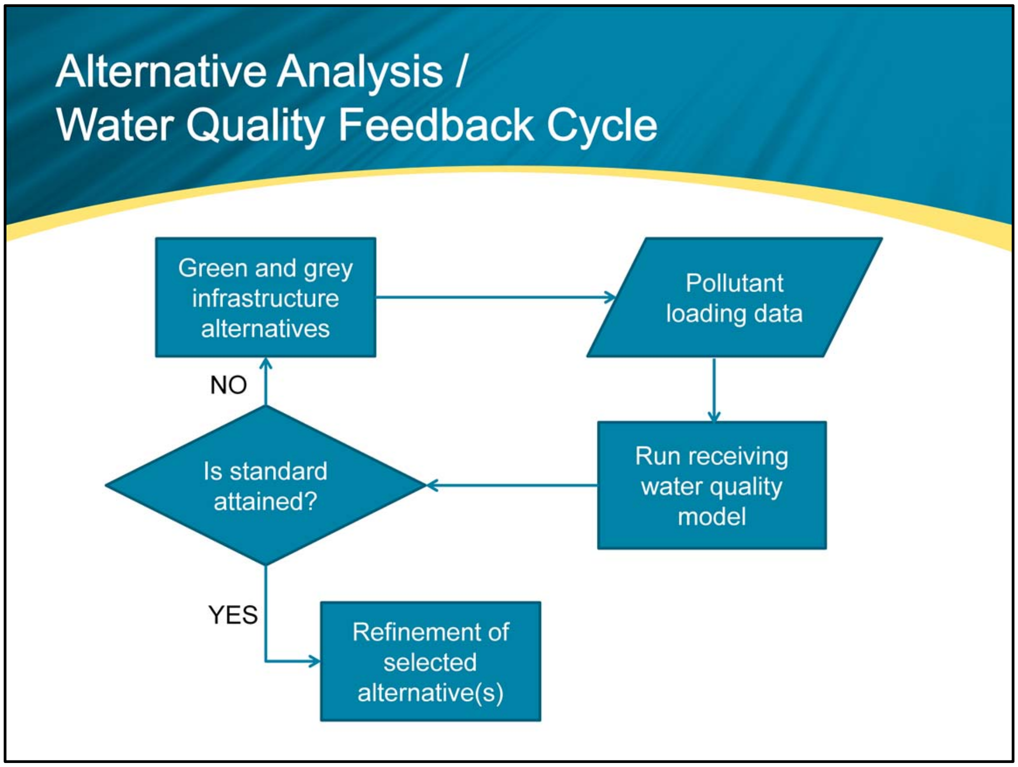
We will be recalibrating the water quality model used during the previous planning effort to reflect current water quality conditions, and use it to evaluate the various alternatives.



The primary measures of water quality impacts are: 1) shellfish closures, and 2) beach closures.

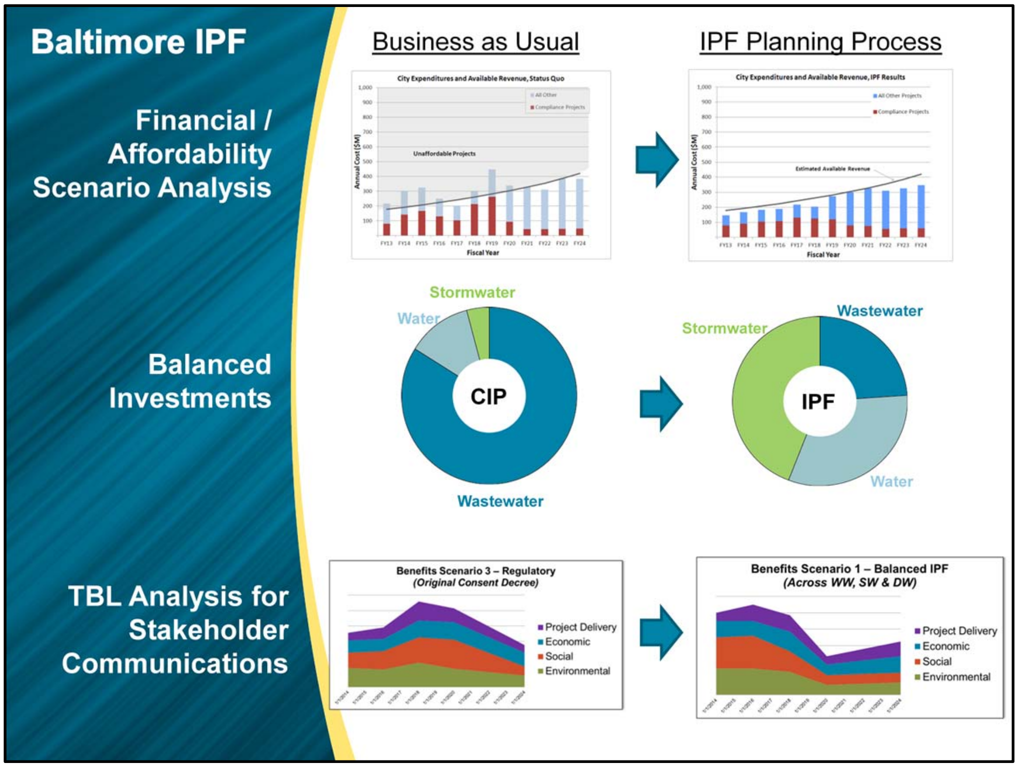


It is also worthy to note that there are standards for the fresh water rivers tributary to the saltwater bay. In general, those waters have been designated Class B or B1.



The water quality model will be used in a feedback cycle to evaluate the alternatives. Each alternative has a certain pollutant loading associated with it. Based on that, we can run the model to determine if collections of alternatives, or scenarios, will achieve the water quality standards.

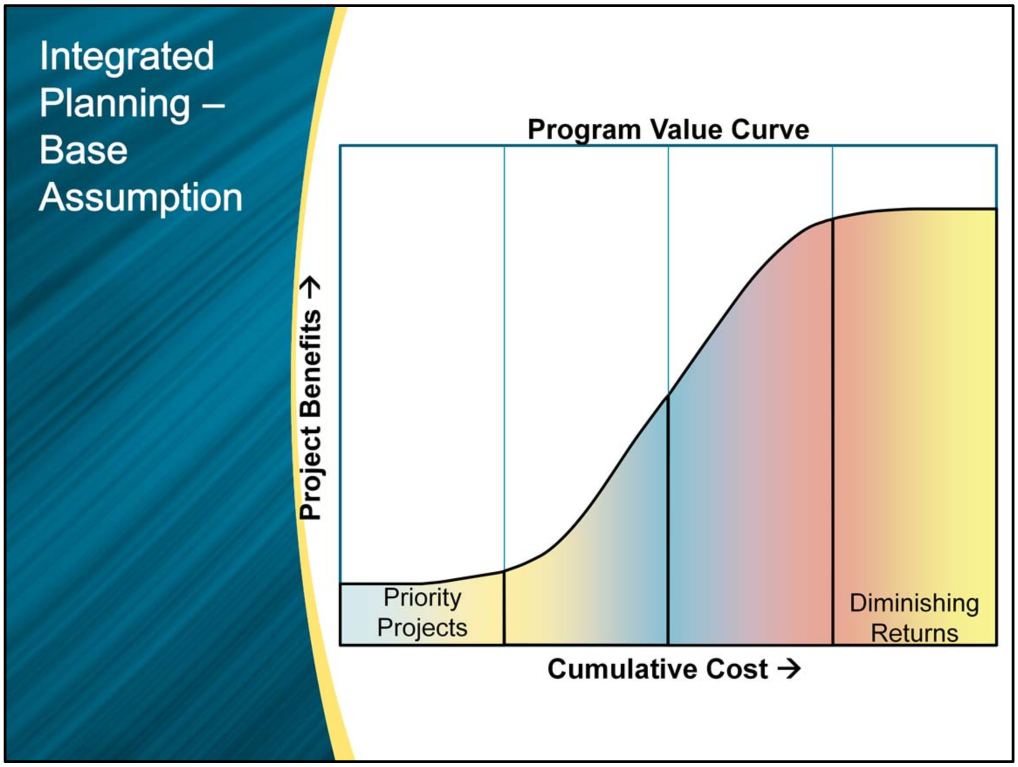
Recognizing that there has been little coordination between CSO, stormwater management and sanitary system improvement programs, on both the regulatory and municipal sides, the federal EPA has issued guidance for an Integrated Planning Framework that does just that.



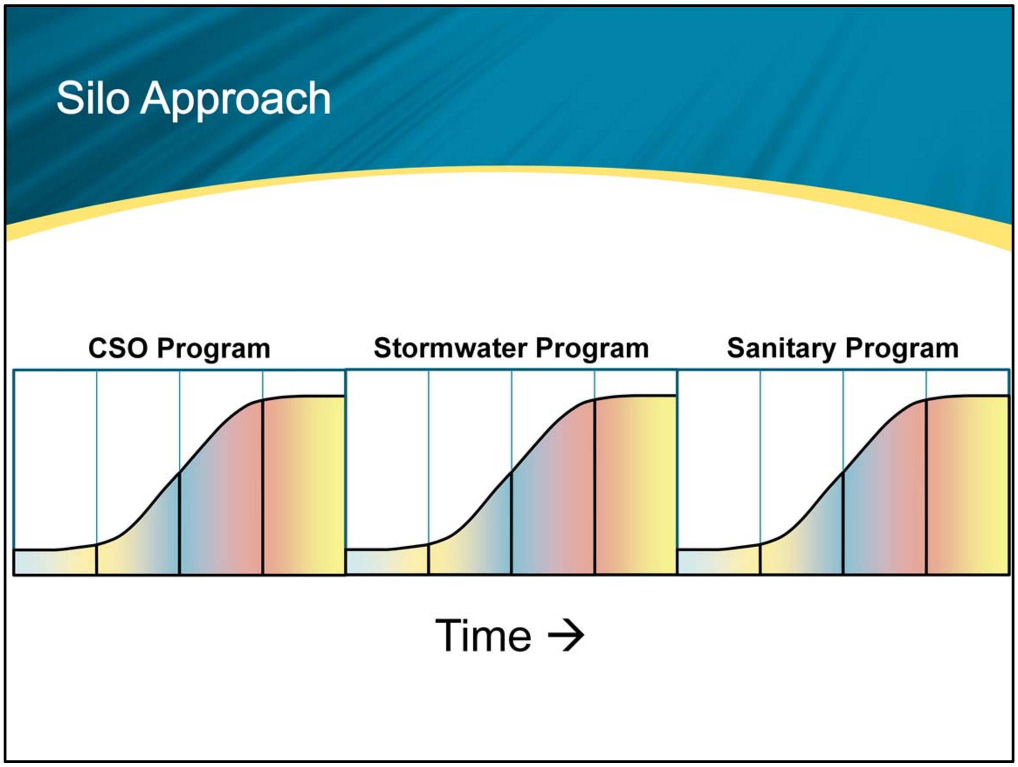
Our Baltimore project, while different from the application here for NBC, serves as a good case study of how IPF can be applied.
Following the process, Baltimore achieved more balanced CIP investments and an extended Consent Decree timing that results in more affordable rate payer impacts. This success came from our ability to use a scientific argument that focused on measurable benefits to change the regulatory position that had been inflexible and seemingly focused on the total cost of the program.

These graphs illustrate how the process resulted in an extension of the compliance deadline to keep expenses below the affordability threshold, a more balanced set of capital investments across infrastructure types, and a sequencing of projects that realized benefits across several criteria earlier in the schedule.

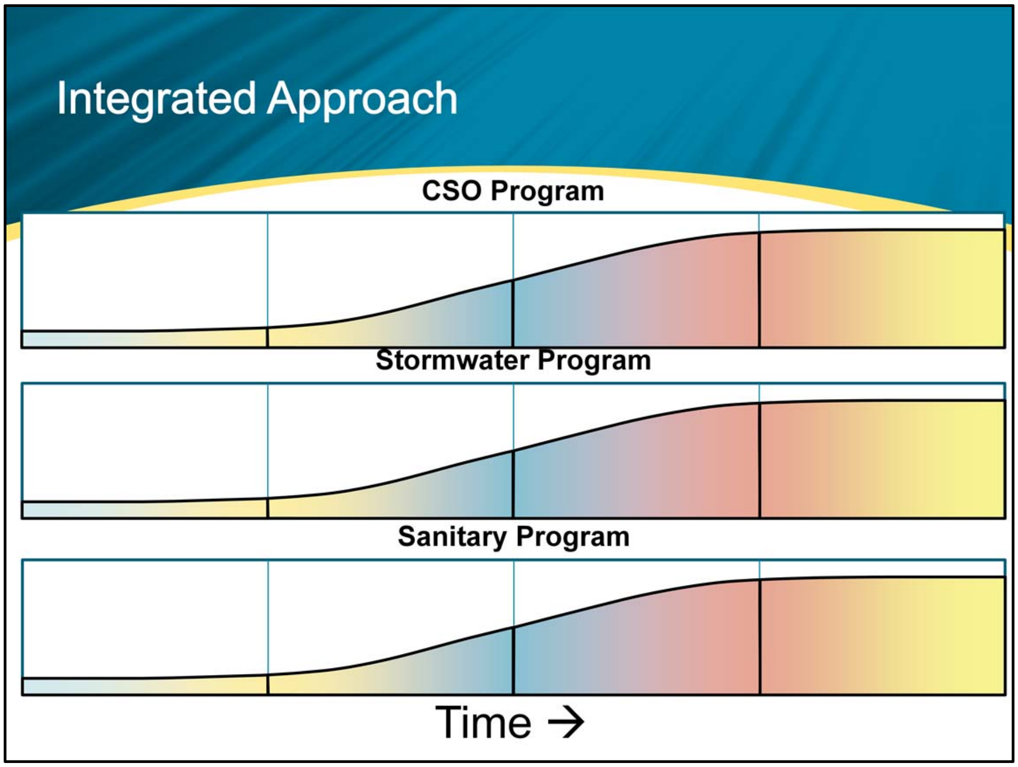
We have a similar set of goals here for NBC. We need to redefine the content of the Phase III program, and sequence those components (to the logistical extent possible) to realize benefits as early as possible. We also need to place those projects in context with other sewer and stromwater improvement projects that will be undertaken by the member communities in terms of both cost to rate payers and benefits across the range of criteria (e.g. water quality, social, economic, environmental, quality of life, etc.) to develop a truly Integrated plan for the region.



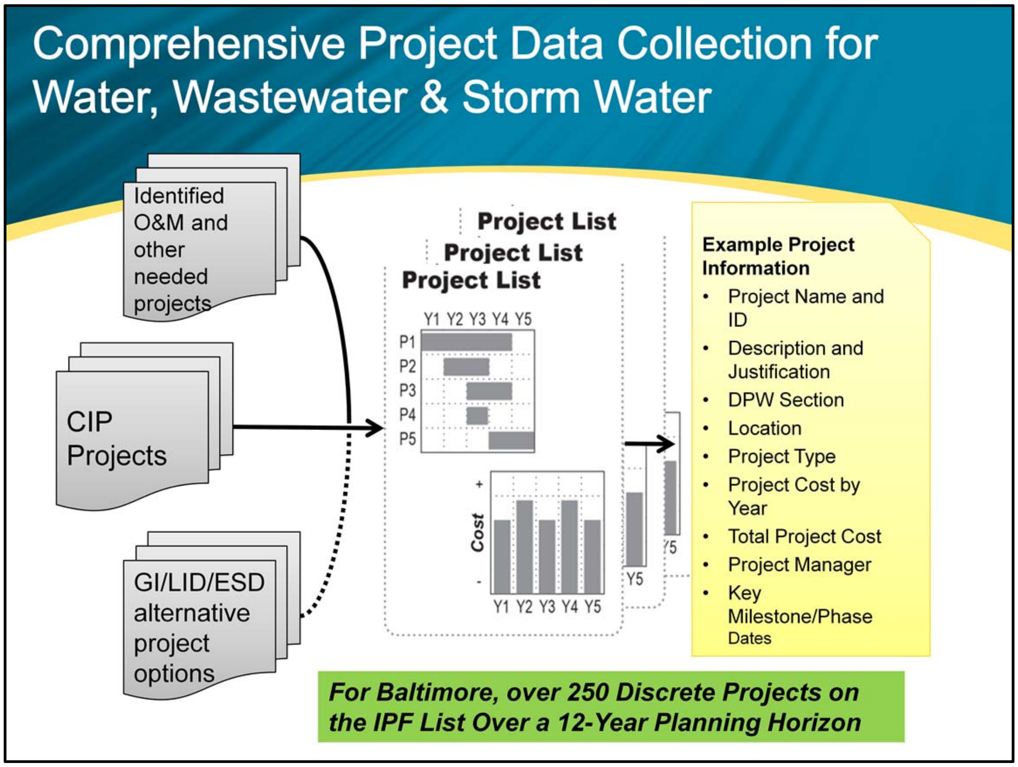
A base theory behind Integrated Planning is that the costs and benefits of projects within an overall program follow a value curve. There will be a group of projects that yield high benefits at relatively low cost. Those are your priority projects, commonly referred to as "low hanging fruit", that you sequence first. On the other end of the spectrum, there are projects with very high costs that yield relatively little benefit. So with any program, you reach that tangent where additional spending produces diminishing returns.



Historically, external drivers have influenced project and program sequencing. A CSO program may be given priority because of a Consent Order. A Stormwater program could be given secondary priority because of a TMDL or NPDES MS4 permit focused on receiving water quality. This results in delaying maintenance on the sanitary collection system due to lack of funds even though doing so can cause impacts, but the lack of driver forces that to happen.

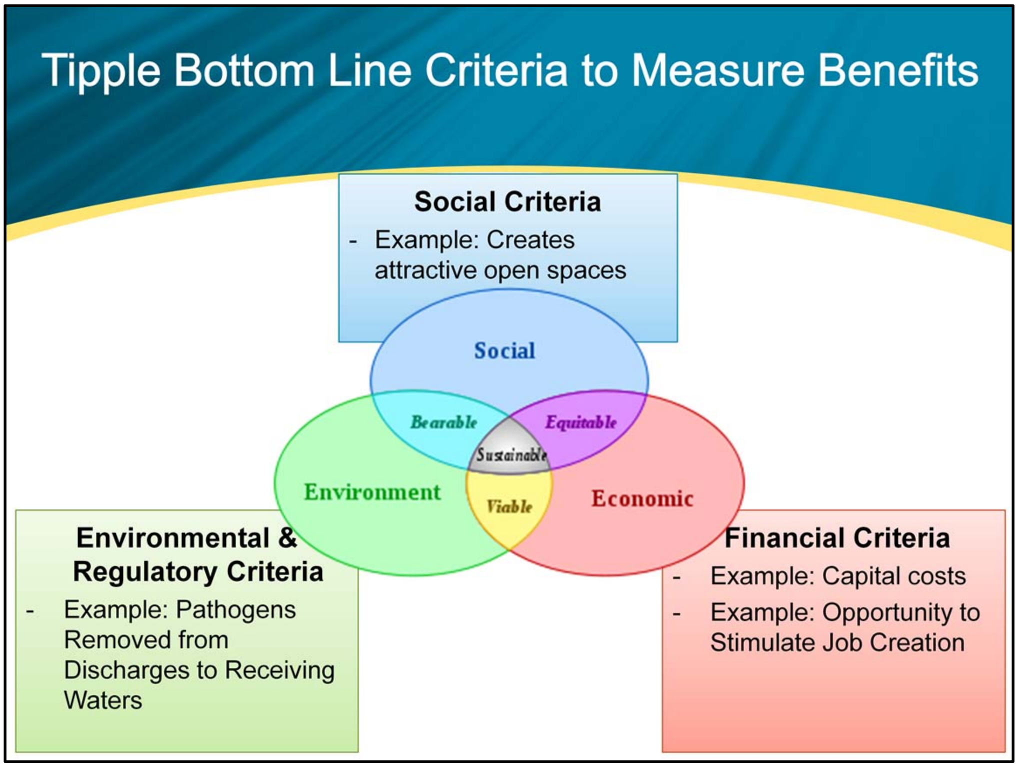


The idea with Integrated Planning is to look beyond program boundaries to optimize spending. Prioritize the “low hanging fruit” projects, regardless of which category they fall in, to create a master program that yields the greatest benefits first. This philosophy also recognizes that the benefits of each of the separate programs obtains the same underlying goals. In this case, improvement of water quality in Narragansett Bay.



The process started with existing Baltimore City CIP, which included Consent Decree projects, and added “wish list” projects beyond existing budgetary constraints.

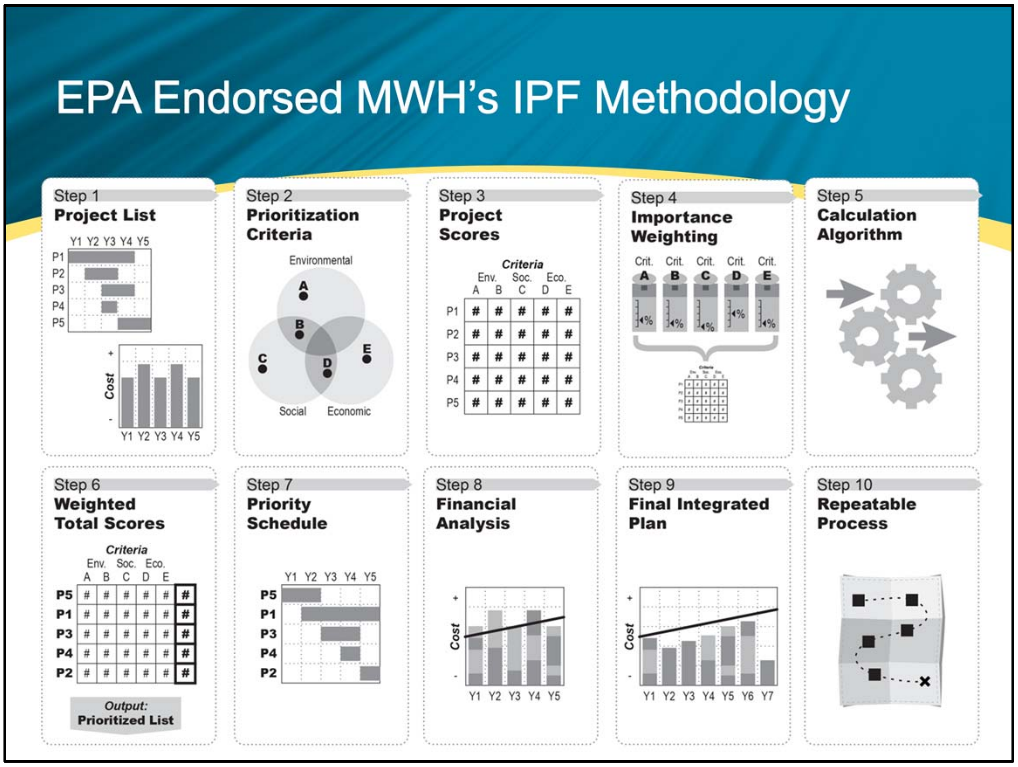
For our NBC project, this is where many members of this stakeholder group become invaluable. We need to put into the mix here any and all projects that are associated with stormwater or sewer, or that will have water quality benefits, or that will financially impact the same rate payer base. Only you can help us fill the funnel with applicable Capital Improvements.



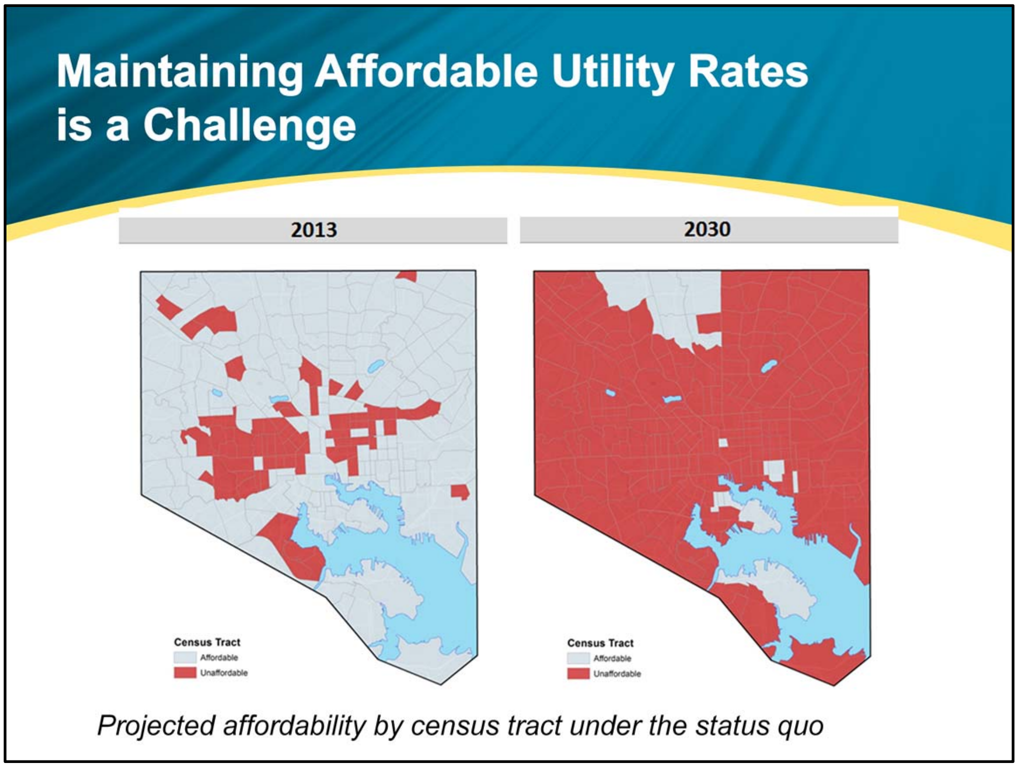
When evaluating alternatives, historically that assessment has been done in terms of costs and benefits. For CSO projects in simplest terms, benefits are quantified as water quality improvements, and costs are the sum of capital and O&M present worth equating to a "bottom line".

Proponents of sustainability have championed expanding the range of those criteria and adding a third criterion that evaluate social impacts. This approach includes using specific measures like pathogen removal, job creation and improvement to services to arrive at a "triple bottom line" that scores alternatives against regulatory, economic and social impacts. The concept is that using only economic and environmental factors, you may arrive at viable solutions, but by adding social measures, you find solutions that are bearable, equitable or even sustainable.

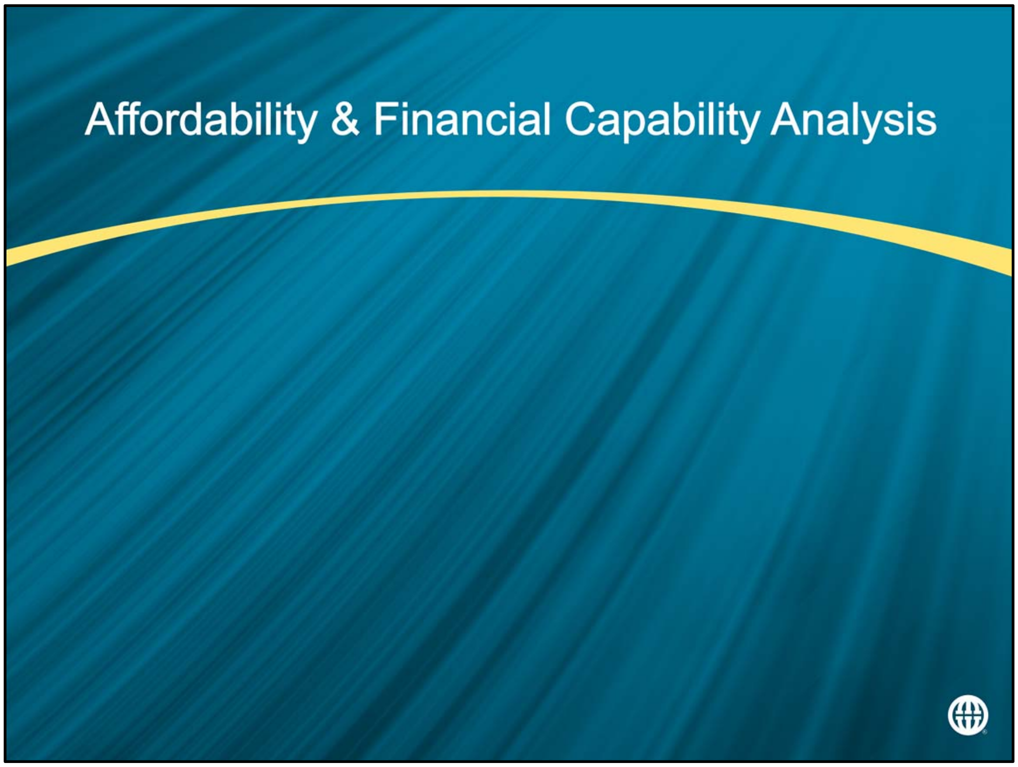
This is another area in which this Stakeholder group is valuable: determining other criteria by which to rate the various projects to help prioritize them. Baltimore ultimately used 21 criteria. This group will help us define the right number and relative weight of criteria to use for NBC's Phase III.



The lessons learned in Baltimore, Lima, Springfield and elsewhere have led to MWH's methodology for development of an Integrated Planning Framework that consists of repeatable processes. It is designed to be adaptable to the unique needs of any utility. It is also designed to produce outputs consistent with the requirements for IPF as specified in EPA's June 5, 2012 Memorandum, Integrated Municipal Stormwater and Wastewater Planning Approach Framework.



A crucial component of the IPF is determining the affordability of the plan. For Baltimore, the traditional approach that was driven by the Consent Order with other project needs layered on top was simply unaffordable. But there is another important layer to understand is how affordability is determined. Simply using median household income over an entire service area does not really reflect the burden on poorer neighborhoods. By building a more refined financial model that looks at census tracts, the picture becomes more clear.



As Tom indicated earlier, in basic terms, EPA currently deems a plan affordable if rates remain below 2% of median income. However, the reality is more complicated, and the US Conference of Mayors is working with EPA to redefine affordability. Our financial capability assessment (FCA) both anticipates those changes, and also provides the documents to support the IPF process and produce an affordable approach.

EPA Methodology (1997)

PHASE 2: Economic Indicators	PHASE 1 : Residential Indicator		
	Low (below 1.0 %)	Mid-Range (between 1.0 and 2.0 %)	High (greater than 2.0 %)
Weak (Below 1.5)	Medium Burden	High Burden	High Burden
Mid-Range (Between 1.5 and 2.5)	Low Burden	Medium Burden	High Burden
Strong (Above 2.5)	Low Burden	Low Burden	Medium Burden

Indicator	*Strong*	*Mid-Range*	*Weak*
Bond Rating	AAA-A (S&P) or Aaa-A (MIS)	BBB (S&P) or Baa (MIS)	BB-D (S&P) or Ba-C (MIS)
Net Debt/Property Value	Below 2%	2% - 5%	Above 5%
Unemployment Rate	>1% below National Ave.	±1% of National Ave.	>1% above National Ave.
Median Household Income	>25% above adj. Nat'l MHI	±25% of adj. Nat'l MHI	>25% below adj. Nat'l MHI
Prop. Tax/Property Value	Below 2%	2% - 4%	Above 4%
Prop. Tax Collection Rate	Above 98%	94% - 98%	Below 94%

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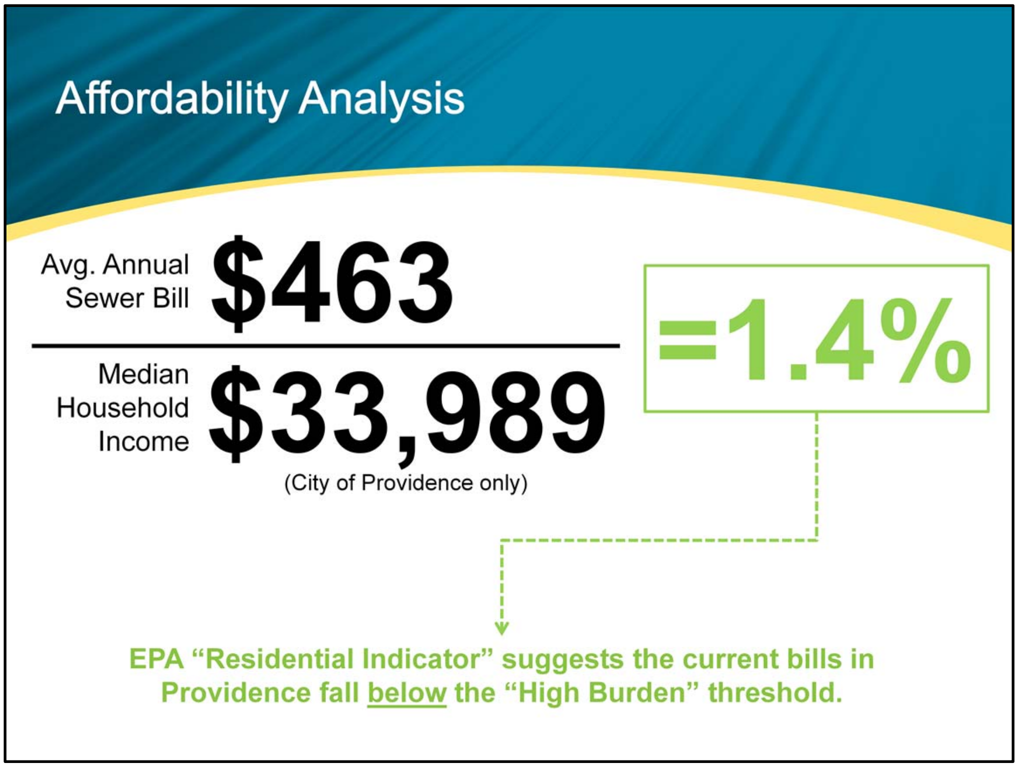
EPA's *CSO Guidance for Financial Capability Assessment and Schedule Development* published in 1997 sets out a two phase methodology which measure residential shares of program costs and the community's underlying financial capacity.

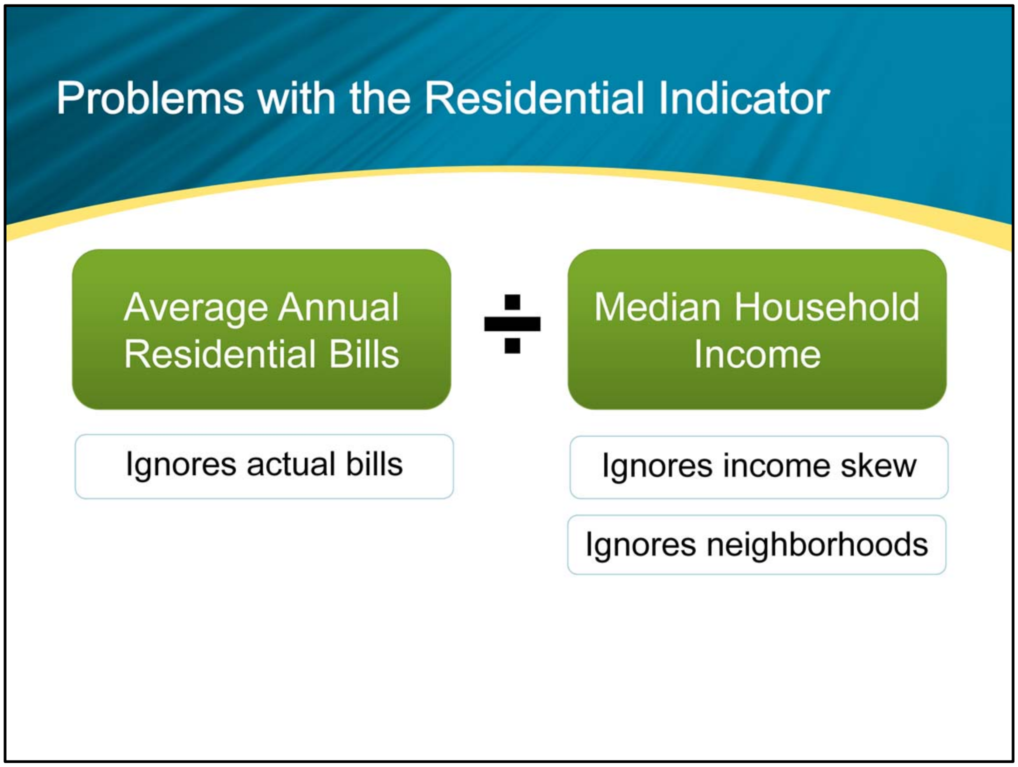
The Residential Indicator is intended to represent prospective financial burden.

The Permittee Financial Capability Indicators are intended to represent existing financial capacity to accommodate additional financial burden.

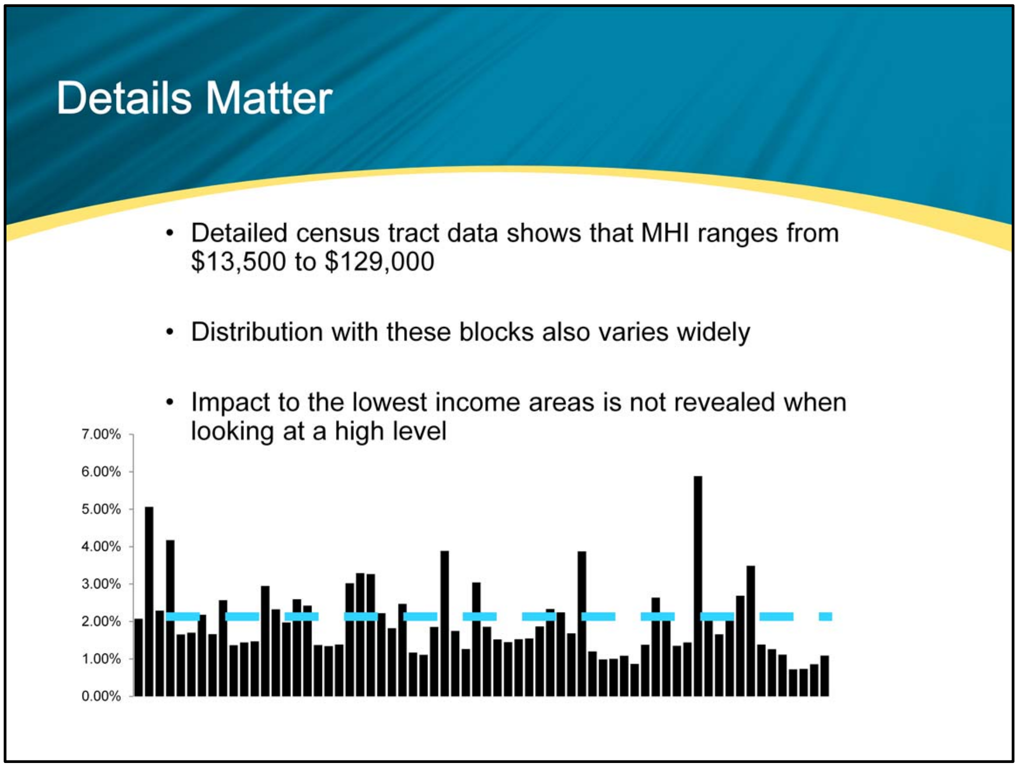


Under this simple approach the City of Providence, for example, could show as a 1.4% burden which is below the EPA's 2% threshold.

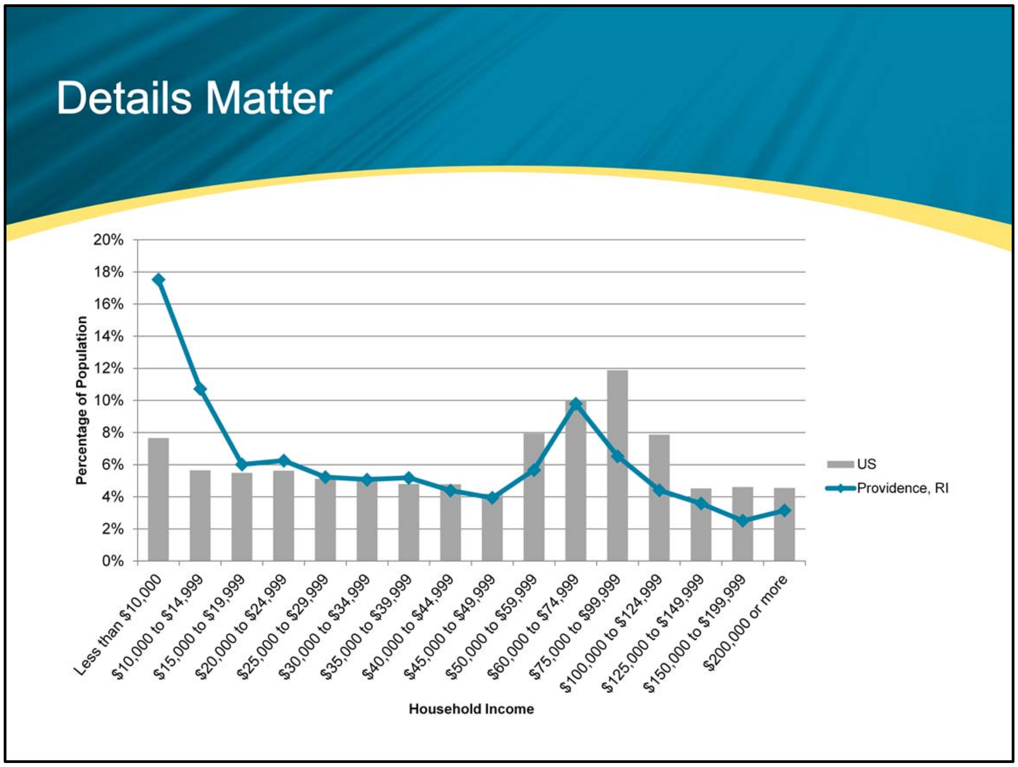
MWH, The US Conference of Mayors and others have pointed out that the simple approach to calculating the residential factor does not fairly represent the true fiscal impact to local communities and individual rate payers.



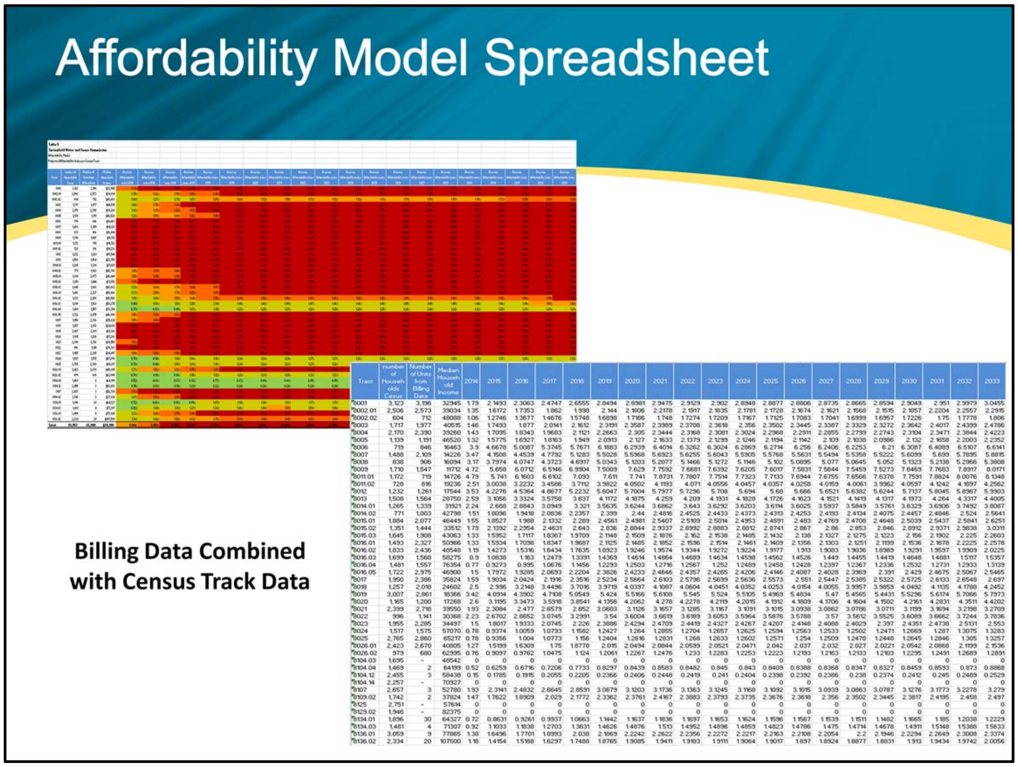
The EPA Methodology ignores actual bills and does not take into consideration the distribution of income in neighborhoods.



The difference in income distribution alone is a huge factor which impacts neighborhoods very differently. A 2% burden for a utility district as a whole as suggested by the EPA does not take this into account.



The percentage of the population spread across the income distribution also influences the fiscal impact to residents.

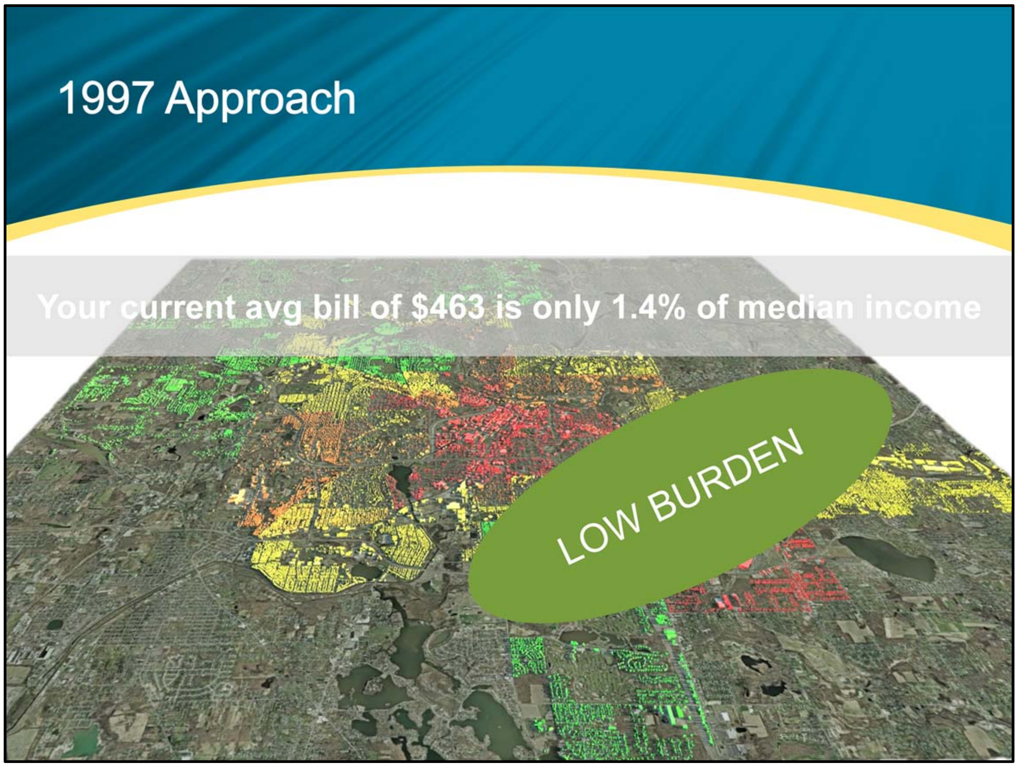


The heart of the affordability approach is development of financial models that adopt the EPA approach, but apply it on a finite scale. This effort includes the development of:

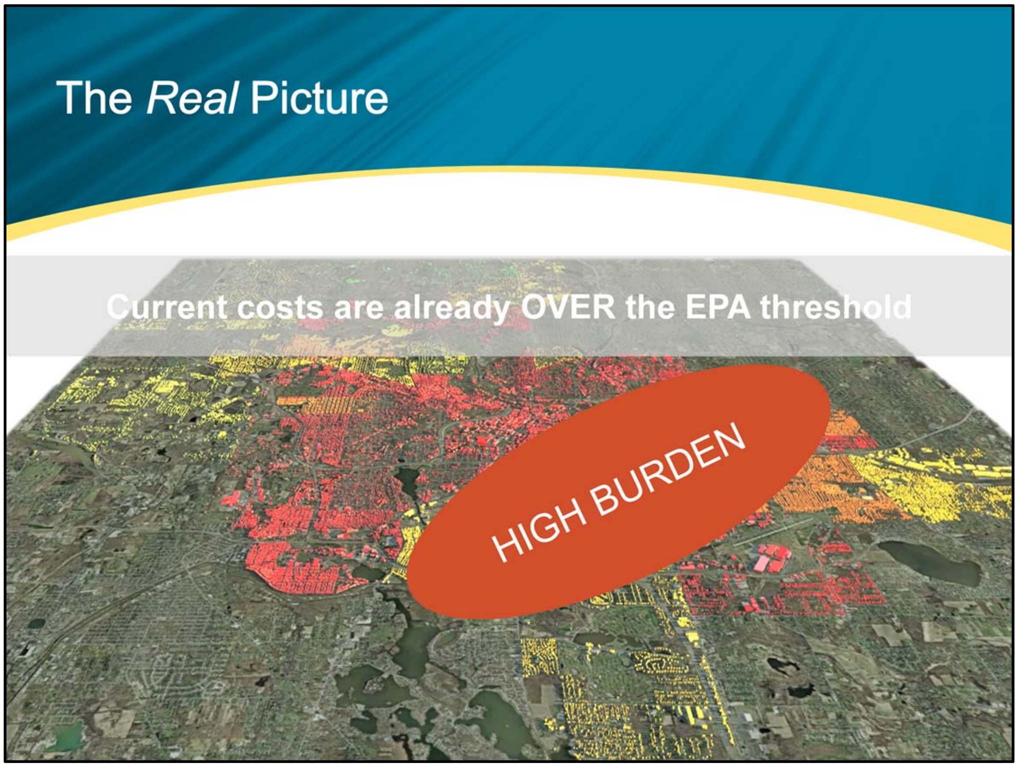
- a sewer fund financial model,
- an affordability model by census tract,
- a GIS engine by census tract and
- a financial capability assessment model.

These models together provide the analysis and input to an enhanced Financial Capability Assessment deliverable, reporting and illustrating the short term and long-term financial and economic impacts of a long-term control plan providing the foundation to request additional time or concessions from the EPA.

The model can demonstrate that there is an affordability issue to lower income rate payers in almost every census tract. This burden increases and spreads as additional rate increases are needed projected into the future.



With the unrefined approach, a plan may look affordable on average over the entire service area.



The MWH approach identifies the granularity of impacts to NBC, by using utility billing data combined with census tract data and projecting the rate increases required to meet the capital plans over the selected period of time. The results demonstrate the level of impacts by census tract and is displayed as a GIS 3D time series picture of the affordability impacts.

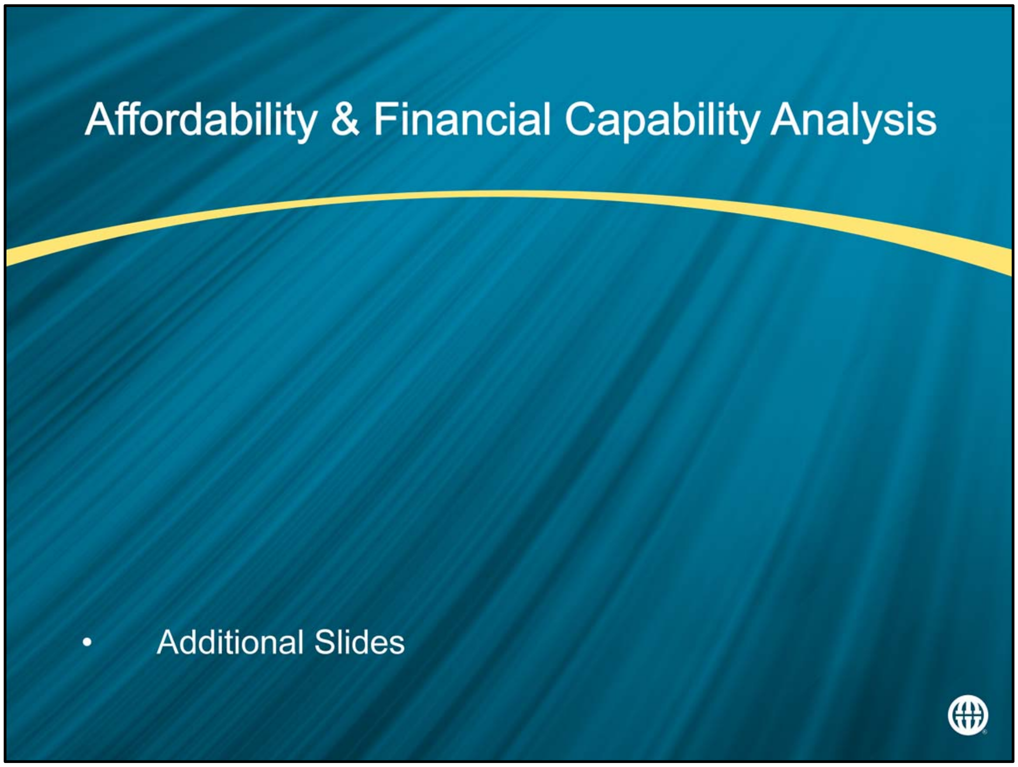
Meeting 2 – Baseline and Grey Infrastructure Focus – 10 April 2014 1:00 PM
For this meeting, the engineering team will provide a description of the recommended Phase III “baseline” systems defined by the CDRA as well as the “grey infrastructure” alternatives defined by Subtasks 3A and 3D. Alternatives will include different interceptor routes, locations for near-surface storage, tunnel configurations and potential sewer separation project boundary modifications based upon Subtask 3C evaluations. At this point, the alternatives will be conceptual, and we will not have cost estimates or modeled benefits; however, it is understood that the stakeholders will want to know ranges of costs and benefits for the proposed alternatives. The purpose of presenting the alternatives to the stakeholder group is to gain input from the stakeholders for refinement of the conceptual designs and to gather data that will inform the cost estimates and benefit definitions to be performed under Subtask 3F.

Meeting 3 – Green Infrastructure Focus – 22 May 2014 9:00 AM
For this meeting, the engineering team will brief the stakeholders on the findings of Subtasks 3B (area-wide GSI) and 3C (specific GSI alternatives). The area-wide presentation will describe the upper boundary of GSI implementation in the region based on mapping data to determine technical feasibility and aggressive adoption of GSI in the member communities through stormwater regulations and building ordinances. The purpose of this discussion is the gain input from the stakeholders on the tolerance from the member communities for adopting such regulations and to help define assumptions for the timing of benefits as those occur during redevelopment. The specific-alternatives presentation will similarly describe conceptual designs of those alternatives without cost or hydraulic benefits. As with Meeting 2, the purpose is to gain information from the stakeholders to refine the conceptual designs and inform the cost estimates and benefits definitions to be performed under Subtask 3F.

Meeting 4 – Evaluation Criteria Focus – 19 June 2014 9:00 AM
The alternatives analysis and the Integrated Planning Framework allow for alternatives to be evaluated on a number of criteria including: cost, hydraulic benefits, water quality impacts, community enhancements, reliability, O&M requirements, abutter impacts, etc. The goal of this meeting is to establish consensus among the stakeholder group on the definition and relative weight of the criteria by which various technically feasible alternatives will be evaluated and ranked. This effort will allow the engineering team to provisionally score alternatives in Subtask 3F, and then complete the IPF process at Meeting 5 and Subtask 3G.

Meeting 5 – IPF Workshop – 4 September 2014 9:00 AM
For this meeting, the engineering team will present the technically feasible alternatives (baseline, grey and green) for each overflow, including provisional rankings, and how those alternatives could be combined and sequenced to achieve the goals of the program. The benefits and cost impacts of other non-NBC projects including collection system maintenance will be presented. The purpose of this meeting is to obtain feedback and input on the application of the evaluation criteria and inform the final IPF development in Subtask 3G.

Meeting 6 – Plan Review and Finalization – 23 October 2014 9:00 AM
The engineering team will present the draft revised Phase III plan. This meeting will provide the stakeholder group a final opportunity to influence and refine the recommendations prior to submission to RIDEM for approval.



The purpose of the financial capability assessment (FCA) is:

(i) to meet the requirements of USEPA and the RIDEM regarding calculation of financial metrics within the Integrated Planning Framework (IPF);
(ii) to provide NBC with expanded financial metrics related to affordability that will enhance the development of the IPF in a way that is responsive to the full spectrum of affordability needs within the service area;
(iii) support development of the IPF documents and submittals to the State of Rhode Island and USEPA as required.

EPA Methodology (1997)

PHASE 2: Economic Indicators	PHASE 1 : Residential Indicator		
	Low (below 1.0 %)	Mid-Range (between 1.0 and 2.0 %)	High (greater than 2.0 %)
Weak (Below 1.5)	Medium Burden	High Burden	High Burden
Mid-Range (Between 1.5 and 2.5)	Low Burden	Medium Burden	High Burden
Strong (Above 2.5)	Low Burden	Low Burden	Medium Burden

USEPA has published the *CSO Guidance for Financial Capability Assessment and Schedule Development* in 1997. The USEPA Guidance indicates that financial capability should be assessed using two methodologies, which USEPA calls “phases.” One method, Phase 1, is to estimate the present value of proposed capital and operational costs of CSO control and wastewater management, coupled with costs of existing wastewater management facilities and procedures, and to measure the residential share of that cost against household income. This computation determines the “Residential Indicator.” USEPA, Office of Water, EPA 832-B-97-004, March 1997.

EPA Financial Capability Assessment

Indicator	Strong	Mid-Range	Weak
Bond Rating	AAA-A (S&P) or Aaa-A (MIS)	BBB (S&P) or Baa (MIS)	BB-D (S&P) or Ba-C (MIS)
Net Debt/Property Value	Below 2%	2% - 5%	Above 5%
Unemployment Rate	>1% below National Ave.	±1% of National Ave.	>1% above National Ave.
Median Household Income	>25% above adj. Nat'l MHI	±25% of adj. Nat'l MHI	>25% below adj. Nat'l MHI
Prop. Tax/Property Value	Below 2%	2% - 4%	Above 4%
Prop. Tax Collection Rate	Above 98%	94% - 98%	Below 94%

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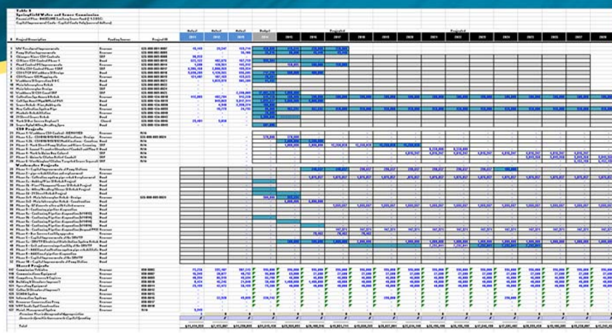
The other method, Phase 2, examines six parameters intended to measure background or underlying financial capacity of the community, collectively called the "Permittee Financial Capability Indicators." Two financial capability indicators address existing debt, two concern socio-economic conditions, and two concern property tax data. These six parameters are compared with benchmark figures (nationwide data, for example) or against specific criteria provided by USEPA. Thus, the Residential Indicator is intended to represent prospective financial burden, and the Permittee Financial Capability Indicators are intended to represent existing financial capacity to accommodate additional financial burden.

Due to the importance of financial capability in determining a municipality's wherewithal to construct CSO Control assets, and to undertake an affordable schedule within which construction of those assets can occur.

Capital Plan



- The Capital Plan drives debt issues and rate increases.
- Capital Plan meets Regulatory Requirement with the projects needed by NBC and Stakeholders.
- All projects reviewed

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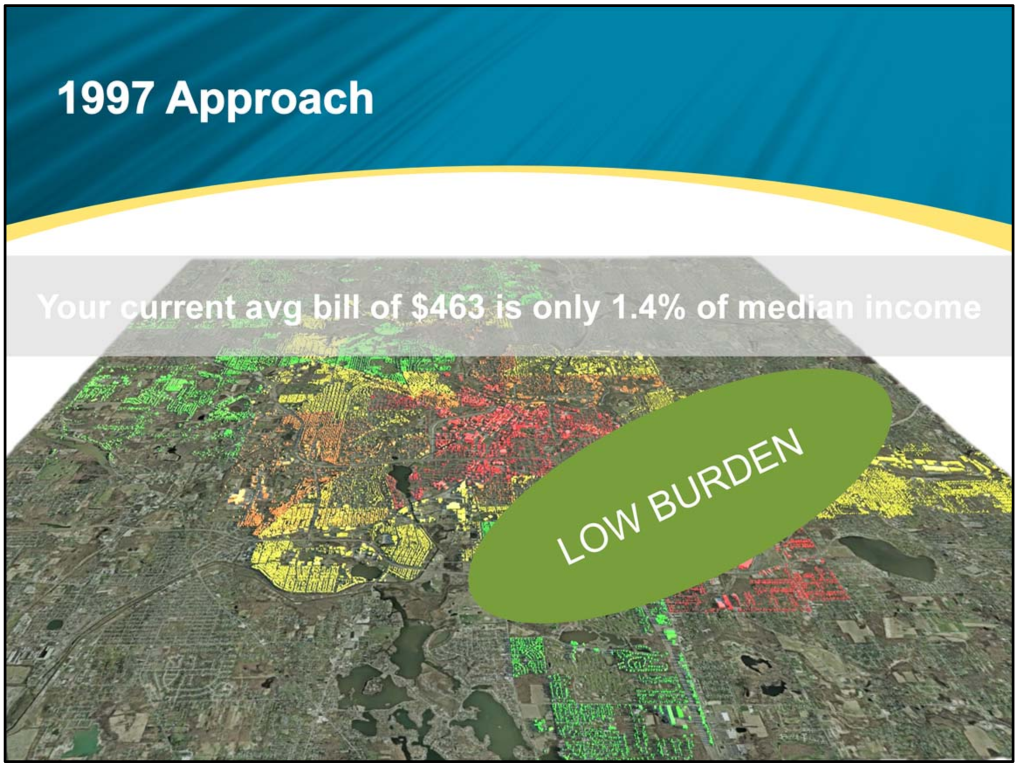
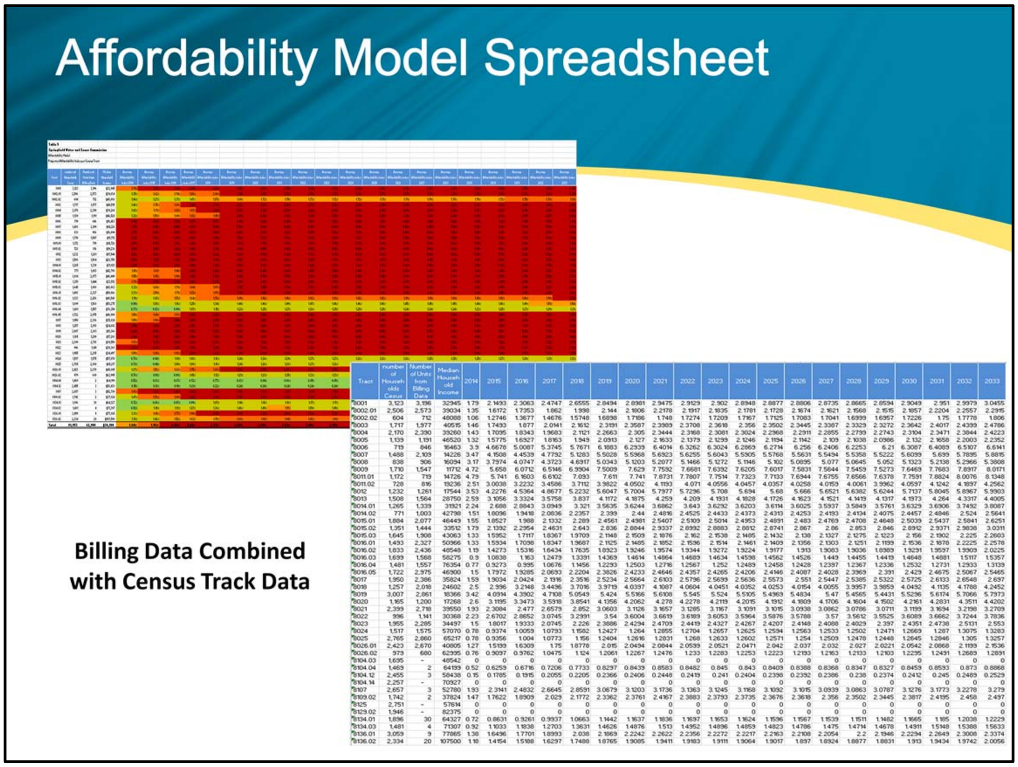
A Long Term Control Plan creates a large capital program which drives rate increases and new debt burdens. Various capital plan scenarios are developed and optimized forecasted in order to understand the short and long term implications of affordability on rate payers.



The EPA Methodology is calculated using existing and future CSO and WWT costs attributable to the residential sector. The cost value is divided by the number of contributing households to determine Cost per Household ("CPH"). Once this figure is determined, the CPH is divided by MHI to determine the Residential Indicator (CPH as a percentage of MHI).

USEPA's Residential Indicator criteria. If CPH is less than one percent of MHI then this cost related factor is assigned a *low* Financial Impact value. If CPH is between one and two percent of MHI then this factor is assigned a *mid-range* Financial Impact value. If CPH is more than two percent of MHI then this factor is assigned a *high* Financial Impact value.



MWH Phase 1 includes establishing the modeling framework including a detailed long-range financial plan with customized output ranges necessary for measuring affordability by the USEPA standards, and with expanded data outputs to show affordability measures at the income distribution levels for individual census blocks in the service area. It will also include development of a baseline analysis demonstrating the current state of affordability in the service area based on the existing service area and the existing financial projections.

MWH Phase 2 is scenario analysis of various capital improvement plans generated by the project team as part of analyzing alternative approaches under the IPF; each scenario represents a new capital improvements plan (differing by projects, cost levels, and/or scheduling of the same) and each scenario will include developing a full output of long-range cost projections and affordability measures as developed in Phase 1.

This effort includes the development of a sewer fund financial model, an affordability model by census tract, a GIS engine by census tract and a financial capability assessment model. These models together provide the analysis and input to an enhanced Financial Capability Assessment deliverable, reporting and illustrating the short term and long-term financial and economic impacts of a long-term control plan providing the foundation to request additional time or concessions from the EPA.

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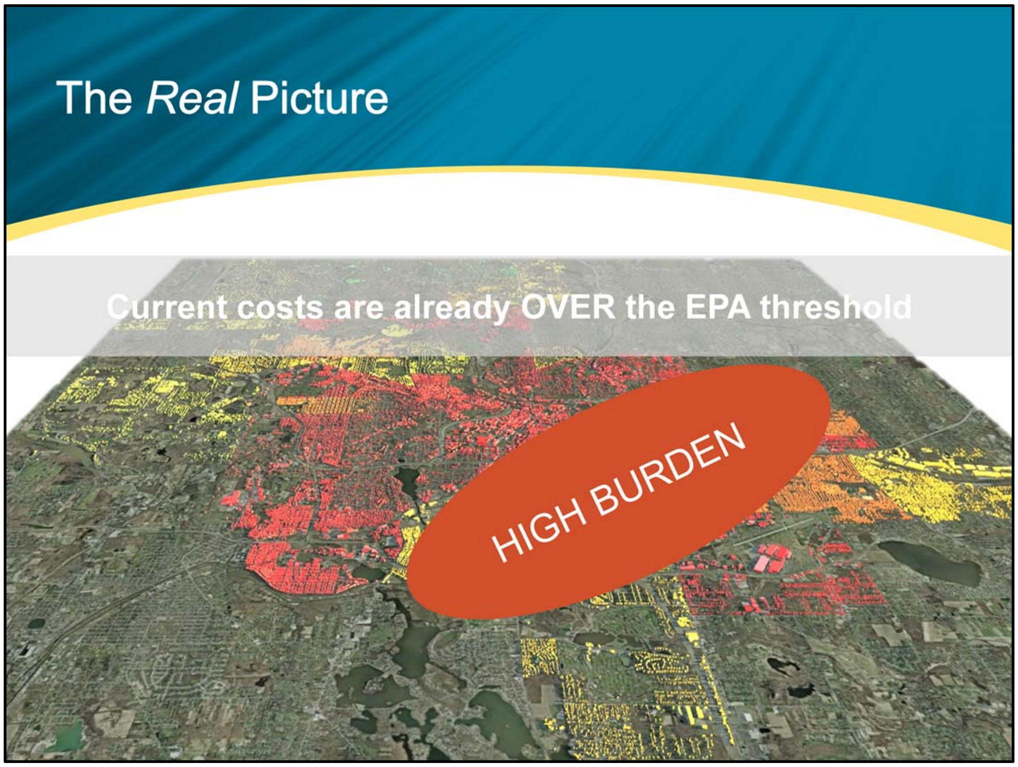

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