
ENHANCED CAPITAL PLAN

The final report in brief

This report outlines the typical process other governments have taken to improve the resilience of their infrastructure, areas of expertise that exist within the County, areas where external expertise is needed, potential approaches to developing an enhanced capital plan, and finally, a recommended approach.

A typical planning process

Miami-Dade County can leverage the experience of other cities that have already initiated similar work in developing their enhanced capital plans to respond to climate change. Many planning processes have followed a generalizable pattern summarized in the report.

Expertise and information needed to proceed

The County and regional partners already have significant expertise and data on local climate risks, including localized sea level rise projections, expected changes in groundwater levels, potential storm surge heights (including sea level rise), as well as temperature and precipitation scenarios. While additional research can always be done, existing information is sufficient to begin planning. The County also has partial information on the vulnerability of its infrastructure to climate impacts. While certain departments such as the Water and Sewer Department and Parks, Recreation and Open Spaces have completed comprehensive assessments, many departments do not have the tools and expertise in-house to thoroughly assess the impact of climate change on the functionality of their systems and therefore have not yet begun this process.

External expertise could be most useful in evaluating the technical and cost-effectiveness of different adaptation strategies. Evaluating the technical effectiveness would involve comparing alternative adaptation measures (e.g. a new bulkhead or new drainage well) to determine which investment is most effective at a given location. This evaluation requires expertise in disciplines such as coastal, geotechnical, and hydraulic engineering. It is important to pair the technical analysis with an economic analysis to develop feasible adaptation measures. For example, nourishing the beach every year and raising the height of dunes to 18 feet may provide the most protection, however, this strategy may not be economically feasible. Completely eliminating risk would likely be prohibitively expensive, therefore, the County needs to systematically determine a reasonable level of risk. This requires expertise in cost benefit analysis, risk management, and economics. The timing of investment is also critical and tools exist to help phase investments, based on flexible adaptation pathways tied to certain physical triggers, such as a given rate of sea level rise or a major hurricane. Experts could also add value by developing communication and visualization tools to help convey information to a wider audience. Tools exist that allow users to move beyond reacting to a pre-defined plan and instead dynamically experiment with different combinations of investments and infrastructure projects. This helps decision makers and the community to understand physical and economic impacts, test alternative outcomes, and identify tradeoffs.

Potential approaches to developing an enhanced capital plan

- Top down: replicating the Dutch approach
- Bottom up: replicating WASD's approach
- Hybrid: replicating Boston and New York's approach

Recommended approach to developing an enhanced capital plan

Given the value of holistic planning, but recognizing the relevance of pre-existing efforts, the County would be best served by adopting a hybrid approach similar to Boston or New York. A hybrid approach would incorporate both the best elements of the Dutch approach, while moving more quickly by leveraging the work done by other departments. This could be done by simultaneously developing [an enhanced capital plan](#) and a [rapid action team](#).

Rapid Action Team

This portion would focus on identifying the most urgent vulnerabilities to critical infrastructure. A project team, comprised of key staff from selected departments and the consultants, would help identify critical needs, compare all proposed projects, quickly prioritize them, and create a phasing strategy to expedite implementation.

Enhanced Capital Plan

Simultaneously, the County could create an enhanced capital plan that addresses medium and long-term risks. This would evaluate alternative resiliency strategies based on their technical efficacy, economic impacts, and co-benefits to the community. The plan will ultimately influence the County's Capital Improvements Program.

Potential costs of retaining external experts

The cost of retaining external experts to develop an enhanced capital plan depends directly on how detailed and comprehensive the County chooses to make the plan. As demonstrated by the costs of other similar projects detailed in Appendix 2, resources between \$1.5 and \$5 million would likely be needed to fully complete this work. As an example, creating *A Stronger, More Resilient New York* required approximately five months and five million dollars. Total funding needs could be reduced by drawing more on internal County resources. Following Hurricane Sandy, New York City temporarily pulled together more than 40 staff members from different agencies to work cooperatively for five months to develop their resiliency plan. The County could pursue a similar strategy.

Conclusions

Developing an enhanced capital plan with the support of external experts could help integrate risks into capital planning. There are useful precedents to draw upon and following an approach similar to New York's may be an expedient path forward. There are many firms with expertise in the range of disciplines needed and there are opportunities to involve local universities and organizations. Completing an enhanced capital plan has the potential to prioritize and develop consensus around preferred adaptation measures. This could ensure short-term investments are not only reacting to visible, short-term issues, such as nuisance flooding, but are proactively contributing to the community's long-term resilience. The additional funding allocated to the Office of Resilience and allocated to hire consultants to support this work will expedite this process.