Increasing Interagency Collaboration at the Capital Budget Planning Stage

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THE NEW SCHOOL MILANO

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Executive Summary

Background

New York City governmental agencies face significant collaboration challenges during the Capital Budget Planning Period (CBPP) before annual capital budget adoption. Related to this problem are two closely connected issues:

- Planners experiencing issues with finding subsurface infrastructure vulnerabilities and new locations for utilidors
- City agencies are not adequately addressing community district needs

Central Policy Issue

How can interagency collaboration be increased during the Capital Budget Planning Period?

Nature of the Problem

The Central Policy Issue stems from several critical factors, including short OMB CBPP windows for capital budget planning, collaborative capital budget planning not embedded into the annual budgeting process, operational incompatibilities between agencies' planning methodologies, and the lack of effective community input during these crucial planning stages. Many of these factors stem from New York City's unique policy environment, defined by stringent deadlines and requirements for capital project planning. Agencies must consult with Community Boards (CBs) that may be affected by a project, and budget allocation can be contentious. City planners are responsible for conducting outreach to all relevant stakeholders during the CBPP. However, a current staff shortage crisis is causing planning teams to be stretched thin between multiple projects, leading to planners dedicating less time to individual projects. Furthermore, existing tools are insufficient to increase capital budget planning collaboration significantly.

Criteria

In evaluating possible solutions, this report uses a point and weighting system to prioritize criteria more pertinent to solving the Central Policy Issue and fulfilling the

mission of this report than others. Based on the research conducted, the alternatives devised, and the Town+Gown Working Groups' priorities, five criteria were used to evaluate possible options.

A. **Adaptability & Versatility:** How effectively can an alternative be adopted by different agencies?
B. **Better Show Where Utilidors Could Be:** How well an alternative locates possible utilidors and subsurface infrastructure improvement opportunities?
C. **Optimize Capital Planning:** How likely is an alternative able to optimize planners' capital projects at the same or lower overall sequential scope costs?
D. **Better Incorporate Community Input:** What is the likelihood an alternative can better incorporate community needs into the CBPP?
E. **Feasibility:** How feasible would it be for an alternative to be developed, executed, and hosted?

Alternatives

This report developed and considered five alternatives to address insufficient interagency collaboration during the CBPP:

A. **Create a Variant of the NYC Capital Planning Explorer for the CBPP:** Utilize the Capital Planning Explorer's existing codebase to build a separate, internal version specifically for agency projects that they surface during the CBPP.
B. **Geographic Information System (GIS) Collaborative Planning Hub:** Building a new collaborative planning hub from the ground up to better suit the needs of stakeholders engaged in capital budget planning.
C. **Centralized Agency-Community Board Customer Relationship Management (CRM):** City agencies gaining access to or integrating Community Board CRM systems to heighten community needs during the CBPP.

Evaluation

	CRITERIA									
	Adaptability & Versatility		Optimize Capital Planning		Community Input		Better Support Utilidors		Feasibility	
	Weight:	0.25	Weight:	0.3	Weight:	0.15	Weight:	0.1	Weight:	0.2
	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
ALTERNATIVES										
Alt 1: Copy of NYC Capital Planning Explorer	2	**0.5**	2	**0.6**	1	**0.15**	2	**0.2**	3	**0.6**
Alt 2: GIS Collaborative Planning Hub	3	**0.75**	3	**0.9**	2	**0.3**	3	**0.3**	1	**0.2**
Alt 3: Agency + Community CRM	3	**0.75**	1	**0.3**	3	**0.45**	1	**0.1**	2	**0.4**

Recommendation

This report recommends that a GIS Collaborative Planning Hub be created for the CBPP, with the ability to integrate Community Boards' Community District Needs Statements via Customer Relationship Management connections, due to it scoring highest in the Adaptability & Versatility and Optimizing Capital Planning criteria, both of which are the most important criteria as they relate to the Central Policy Issue. This recommendation represents a two-pronged approach of combining best practices in data analysis/collection and putting the Neighborhood Activation Study methodology in the foreground. The GIS hub can consolidate many different data sources relating to various agencies' capital budget plans, including locating utilidors and identifying subsurface infrastructure vulnerabilities.

Introduction

New York City (NYC) is one of the world's largest, most diverse, and most comprehensive municipalities. If NYC were a nation, its economy would be the 9th largest in the world.[1] Yet despite its vast resources and prosperous economy, NYC's governmental agencies have contended with budgeting, planning, and scoping issues for decades. These issues arise from inefficiencies stemming from a multitude of factors, such as the complex jurisdictional relationships between City and State agencies, Community Boards (CB), the City Council, public-benefit corporations, private utility companies, and other significant stakeholders. Optimizing stakeholder collaboration among certain parties would require major amendments to administrative codes and City and State policy. However, even operational optimizations requiring no changes to existing laws or policy have yet to have been realized. One central area of collaboration that has not been probed for optimization is interagency capital budget planning at the City level.

This report aims to research, develop, and evaluate possible alternatives that can mitigate these inefficiencies related to the Capital Budget Planning Period (CBPP), including closing knowledge transfer gaps and helping to facilitate interagency collaboration without making drastic changes to City policy. This report represents a complementary piece to a Multidisciplinary Urban Capstone Project (MUCP) done by students from the University of Toronto's (U/T) School of Cities, titled *Improving Infrastructural and Community Resiliency by Optimizing Projects in Neighborhoods.*[2] Both this report and the U/T MUCP work were conducted under the umbrella of the Town+Gown: NYC citywide research program (Town+Gown) at the NYC Department of Design and Construction (DDC) for the Resilient People, Places and Projects (RP3) Working Group. In addition, these projects relate to a series of NYU/Tandon - Management of Technology capstone projects for the Toward a “Smarter” City: Utilidors Working Group, called Location, Analysis, Measurement, and Prioritize (LAMP) 3.[3]

Central Policy Issue

How can interagency collaboration be increased during the capital planning phase?

The current status quo is defined by a lack of coordination between city agencies at the capital budget planning and ideation stages, especially regarding projects involving utilidor (transitable subsurface structure) implementation. These factors lead to an inability for agencies with closely co-located projects to optimize them before budget adoption, which, post-adoption, could lead to delays and scope creep caused by conflicting projects within overlapping scope areas. Additionally, community representatives are frustrated that their community district needs are not being properly addressed during these critical stages of capital planning, and are left in-the-dark about planned developments in their neighborhoods until they have been adopted in the capital budget.

Background

Primary Stakeholders

The primary stakeholders that intersect with the Central Policy Issue regularly are City agencies that engage in capital budget planning and construction in some capacity. These include but are not limited to, NYC DDC, the Department of Transportation (DOT), the Department of Environmental Protection (DEP), the Department of City Planning (DCP), and the Office of Management and Budget (OMB). In addition to City agencies, the 59 District Community Boards (CBs) are a key part of this conversation due to their role in the City Charter as the City's primary community consultants.[4]

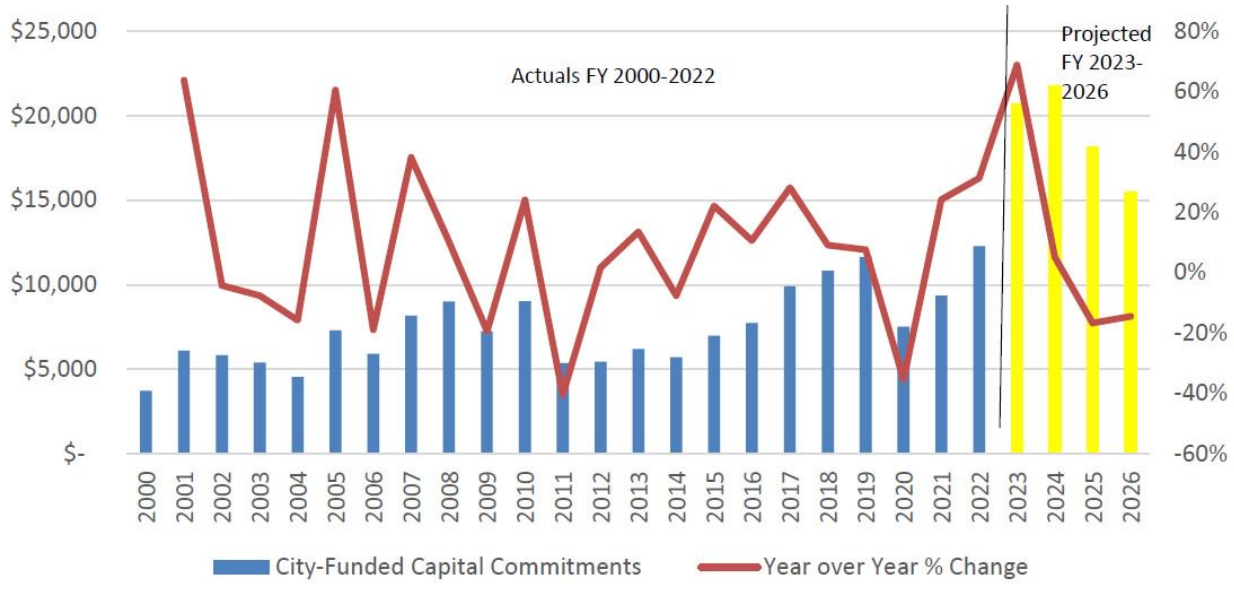
While this report will primarily focus on these two groups of stakeholders, other notable parties related to the issue of utilidors include public utility companies such as Con

Edison, public-benefit corporations that don't fall under the City's jurisdiction (such as the Metropolitan Transportation Authority and Port Authority), and New York State and Federal agencies. These stakeholders mostly inform the boundaries of this report's scope. This report will not discuss the Central Policy Issue as it pertains to stakeholders not enumerated in the City Charter or Capital Commitment Plan (such as the NYC Economic Development Corporation).

The Capital Budget Planning Period (CBPP)

The New York City Independent Budget Office's definition of a capital project is one that "involves the construction, reconstruction, acquisition, or installation of a physical public improvement with a value of $35,000 or more and a 'useful life' of at least five years."[5] As of May 2, 2023, there are 43,848 of these capital projects outlined in the Capital Commitment Plan across 25 departments.[6] Each of these thousands of capital projects must go through several phases: generally planning, ideation, budget adoption, and execution.

Figure 1. City-Funded Capital Commitments ($ in millions)



Source: NYC Office of Management and Budget, FY 2023 Adopted Capital Commitment Plan, September 2022

One of these phases is the Capital Budget Planning Period (CBPP), which starts in September when each District's CBs identify their capital needs. By October, they submit Community District Needs Statements (CDNS) to the Office of Management and Budget (OMB). During this period, construction and operational agencies work on their capital projects with OMB in silos. This phase begins in September and ends in January, with the release of the preliminary budget. The second phase begins after the preliminary budget is released and before the executive budget is published in April. Public hearings are held after both the preliminary and executive budgets are released.[7]

Figure 2. Simplified Capital Budget Timeline

Capital Budget Timeline	
September – October	Community Boards hold hearings on the capital needs of their district
October	Community Boards submit Capital District Needs Statements to the OMB
November	Each government agency submits a detailed estimate of its need for capital funds to OMB.
January	OMB issues the Preliminary Budget for the ensuing fiscal year
February – March	Community Boards hold hearings to determine the responsiveness of the proposed budget to their capital needs.
March	Borough Presidents issue a set of

	recommendations to OMB for modifying the capital proposals.
April	OMB issues a proposed Executive Capital Budget
May	Borough Presidents submit a response to the proposed Executive Capital Budget.
May	City Council holds public hearings on the proposed Executive Capital Budget.
June	The final Executive Capital Budget is adopted

Source: U/T MUCP Report - Improving Infrastructural and Community Resiliency by Optimizing Projects in Neighborhoods

Town+Gown Working Groups

Town+Gown created its Resilient People, Places and Projects Working Group (RP3 WG) in 2018 and its Toward a “Smarter” City: Utilidors Working Group (Utilidor WG) in 2019 to research and develop solutions to outstanding issues in capital planning within the City's agency and policy milieu.

The RP3 WG developed a research project aimed at identifying potential project synergies in pre-selected neighborhoods using the City's Neighborhood Activation Study methodology and lifecycle cost-benefit analyses. The study was developed by the Mayor's Office of Criminal Justice (MOCJ) to "strategically posit community leaders and residents as vocal thought leaders and partners at the table."[8] This methodology aims to create increased infrastructural and community resiliency while also looking for avenues to make existing community-based processes more effective during capital project planning and design phases.

The Utilidor WG was organized to research and analyze infrastructure beneath roadways (subsurface infrastructure) and the potential of constructing multi-utility tunnels, commonly referred to as utilidors. To achieve this goal, the Utilidor WG sponsored two Columbia/SIPA capstone projects to conduct a lifecycle cost-benefit analysis involving modeling and identifying opportunities for innovative subsurface design. Nestled within this Working Group are the LAMP projects, which are surface data-driven analyses and tools to identify aging subsurface infrastructure vulnerabilities, related disruptions from subsurface infrastructure failures, and the impact of failures on communities, which also could identify locations for utilidor implementation. The most current iteration is LAMP 3, which has been developed by New York University (NYU) Tandon Management of Technology MS capstone students.

Nature of the Problem

New York's Policy Milieu

New York City has a unique policy milieu compared to other major municipalities. Since the 1975 financial crisis that brought the City to the edge of bankruptcy,[9] significant changes were made to administrative codes, such as the City Charter granting more power to CBs and agencies and the Bureau of the Budget being rechristened as the Office of Management and Budget (OMB).[10] These changes, and State laws creating external budget oversight and other budget restrictions, made capital project planning a more judicious process, with more requirements agencies must meet before a project can be executed.

For example, the City Charter requires agencies to consult all Community Boards that may be affected by a capital project. This process can take a few days to several months, depending on the project's scope. And the nature of the City's GAAP-based balanced budget requirement, puts continual pressure on the allocation of funds among various City agencies.[11]

When an agency looks to execute a capital project, the project usually goes through planning, ideation, budget adoption, and execution/construction stages. During the CBPP, the onus is on individual City agency planners to conduct outreach to all relevant stakeholders, including, but not limited to, other City agencies, State and Federal agencies, public-benefit corporations, and Community Boards. This has been made more difficult now when City agencies face an unprecedented staff shortage crisis, leading to most planning teams being stretched thin between multiple high-profile capital projects, causing a negative feedback loop of more tasks being assigned to smaller planning teams, leading to planners dedicating less time to work on individual projects.

An Unoptimized CBPP

Interagency collaboration on co-located projects during the CBPP is currently not embedded in the City's annual budgeting process. Based on interviews and correspondence with city planners and senior staff members at City agencies, a pattern emerges in how operational agencies prioritize their optimization efforts to better align their processes with overall City policy objectives, but not with other capital agencies or Community Boards. In an interview with Charles Ukegbu, Assistant Commissioner for Strategic Planning at NYC DOT, he stressed the importance of the stages of capital planning that involve budgeting and commitments planning, stating, "[The] capital planning process is a function of the color of money... In terms of collaboration, if we miss that stakeholder involvement [during] ideation, we will have other problems down the road; we need to plan with people."[12]

Chris Hamby, the Capital Planning Unit Director at NYC DOT, also shared similar sentiments in an interview where he stated, "Stronger, more developed scopes have more buy-in." However, despite the importance of capital budgeting, Mr. Hamby explains, "budgeting and identification of projects is an area not probed for optimization." While shared tools such as NYStreets Pavementworks help identify/track needs and other elements key to capital planning, capital *budget* planning coordination is mainly internal

and "old school," based primarily on Excel and meetings. A comprehensive system that optimizes interagency coordination and collaboration during this phase does not exist.[13] The shared sentiment among planners and project managers interviewed is that a feasible solution could exist by combining existing data, tools, and systems in a shared ecosystem.

Data Conflicts & Issues

One prevalent issue between and across all operational agencies that engage in capital budget planning takes the form of conflicts and incompatibilities in data methodologies. These include database management, how datasets are tabulated, tools, and sources used. Some of these roadblocks may appear minor, but lead to precious planning resources being wasted unnecessarily.

For example, City agencies use Boro-Block-Lot (BBL) codes to denote specific tax lots in New York without the need for address or geometric attributes. However, there is no universal format for BBLs; some datasets, such as DCP's Primary Land Use Tax Lot Output Tax (PLUTO, or MapPLUTO),[14] use 10-digit integer codes, while some separate them by underscores and hyphens, and others delineate all three values separately. In one dataset, the BBL notation was backward (LBB). This is not to say that data issues such as these are impossible to solve; in this select case, it would be relatively easy to fix these issues manually using Excel or a programming language such as R or Python to automate these data transformations. But these minor hiccups are compounded by factors such as historically low City staffing rates and relatively short CBPP timeframes for OMB to accomplish capital budget planning with all agencies before budget adoption.[15]

Subsurface Infrastructure & Utilidors

It’s an open secret that New York’s underground infrastructure is labyrinthian, and the Utilidor WG and RP3 WG have sponsored research projects to support coordination of modern infrastructure designs such as utilidors. Subsurface infrastructure is one of the

most crucial yet most uncharted (literally) sectors of New York's infrastructure network. Water main breaks are a leading cause of flash flooding across the City, especially in historically disadvantaged areas. However, repairing, maintaining, and upgrading these systems is an increasingly difficult and expensive venture. New York's subsurface space is borderline illegible and has been described as "patchwork" and "spaghetti-like" by planners.[16] The mission of LAMP as a Utilidor WG project is to use data analysis models to identify vulnerabilities in underground infrastructure and assess the impact of failures in communities. The RP3 WG research aims at identifying and optimizing synergies between planned capital projects to increase infrastructure resiliency.

Community Boards & 311 Calls

The City Charter requires all agencies engaging in capital projects to consult with Community Boards as part of its stakeholder outreach. While City agencies must consult Community Boards, the Boards do not have veto power. Any agency can elect to ignore a Community Board's suggestions and move forward with executing the project. Perceived NIMBYism, in particular, has caused agencies to be more cautious about incorporating Community Board complaints into their planning, with representatives citing equity issues in Community Boards dominated by NIMBYist attitudes, thus causing data-driven divisions to rely more on 311 calls due in part to their large volumes (although the practice still isn't holistically equitable).[17] According to Shawn Campbell, District Manager of Brooklyn CB14, “One of the frustrations district managers express frequently... the work we put into District needs budget priorities is not matched by the quality of agency responses.”[18]

Methodology

Analytical Process

Due to the Central Policy Issue being mainly relegated to internal politics within the City policy sphere, literature about this specific topic consists mostly of the Neighborhood Activation Study, prior and current Town+Gown capstone project work products, and other Town+Gown materials. Thus, the literature review fed more into constructing the background of this report and identifying the status quo. At the same time, interviews with key stakeholders were conducted to see what policy alternatives or best practice models are available to help increase interagency collaboration.

Interviews

Because the Central Policy Issue is centered on street and underground infrastructure, operational agencies in charge of building and maintaining these facilities were identified first. These included DDC, the Department of Transportation (DOT), and the Department of City Planning (DCP).[19] OMB was also immediately identified due to its crucial role in capital budget planning. It was essential to see how these operational agencies conducted their coordination and collaboration efforts with each other, OMB, and other relevant stakeholders and what issues they have experienced doing so. Thus, this report focused on interviews with key staff members, including unit directors, assistant commissioners, and senior capital planners, involved in executing capital planning or interagency/intergovernmental coordination.

Additionally, interviews were conducted with Community Board representatives because of their importance within the City Charter and the Neighborhood Activation Study methodology as utilized by RP3 WG, including Brooklyn CB04 and Brooklyn CB14.

Literature Review & Quantitative Data Sources

Most literature was sourced from the Town+Gown program materials. These include top-level reports and slide decks, as well as the sources they used to formulate their findings and conclusions. For example, this report pulls from RP3 WG documents which cite MOCJ's Neighborhood Activation Study, DDC's Strategic Blueprint,[20] the Capital Commitment Plan, etc. Literature was also sourced from non-City studies, including the Transit Costs Project by NYU's Marron Institute,[21] which quantifies transit infrastructure project costs using a proprietary spatial model, as well as AREA Research's lifecycle cost-benefit analysis model.[22]

Other internal literature was provided by stakeholders via direct correspondence, some of which is confidential and cannot be listed in this report. These primarily relate to in-development software demos showing that certain types of spatial modeling and information management models previously thought to be untenable are feasible. They also include in-progress City initiatives in the planning and ideation stages as of the publication of this report; these illustrate agencies are also developing their own solutions to problems similar to the Central Policy Issue.

Limitations and Assumptions

In executing this report's analytical process, several limitations were encountered, which necessitated certain assumptions to be made based on those limitations.

Limitations

1. Whatever criteria, alternatives, and final recommendations this report develops, changing any aspects of the City Charter is out of the scope. This means the status quo as it relates to the budgeting process and formal relationship between Community Boards and City agencies must remain.
    a. Collaborative interagency capital budget planning is not practiced during the CBPP; although the City Charter process does not prohibit it so practice-based solutions are available, but limited.

2. The question of which agency or stakeholder would implement this report's recommendation is up-in-the-air. Some combination of OMB and DCP implementation is feasible but would require justification to move them to forward this, based, in part, on this report.

Assumptions

1. This report and its proposed alternatives and recommendations assume agencies and relevant stakeholders are willing to accept solutions in the form of best-practice recommendations rather than City policy alternatives. These can include internal policies, best practices, and other changes to operational methodologies that wouldn't necessarily be codified in administrative codes or other public-facing documents.
2. This report will assume the DCP, OMB, the Office of Technology and Innovation (OTI), or a combination of some or all three will prepare and execute the final policy recommendation.

Figure 3. Analytical Process

Literature	
City Initiatives & Studies	**Available Software & Tools**
What does the policy environment look like?	**What tools can be used to help solve the issue?**
■ MOCJ Neighborhood Activation Study ■ Capital Commitment Plan FY22 ■ Community District Needs Statements - QN02, QN04, BK04, BK14 ■ NYC Administrative Code ○ City Charter ■ Transit Costs Project ■ Town+Gown Working Groups ○ Toward a "Smarter" City: Utilidors (Utilidor) ■ LAMP 1, 2 (QUIETeD), 3 (Current, ongoing)	■ Business Intelligence & Data Visualization ○ PowerBI ○ Tableau ■ GIS Applications ○ ArcGIS Pro ○ QGIS ○ Carto ■ Customer Relationship Management ○ Airtable ○ Dynamics 365

- Lifecycle Cost Benefit Analysis (LCCBA) to Support the Creation of the Smart City Infrastructure Authority/New York City
  - Construction Culture+Data (CC+D)
    - AIMS Plus
  - Resilient People, Places, and Projects (RP3)
    - ClickUp
- GIS Collaborative Planning
  - Remix.com
  - DCP Capital Planning Explorer
- Data Sources
  - NYC OpenData
  - DCP BYTES of the BIG APPLE
  - Asset Information Management System (AIMS)
  - Street Information Management System (SIMS)
  - Many internal datasets

Interviews & Correspondence

Operational Agency Representatives	Non-Agency Experts & Community Boards
What are they experiencing and what can be done?	

- NYC DDC
  - Terri Matthews - Director of Town+Gown
- NYC DOT
  - Charles C. Ukegbu, Ed.D - Assistant Commissioner for Strategic Planning
  - Chris Hamby - Director of Capital Planning
  - Members of the Special Projects Unit
- NYC DCP
  - Danielle J. DeCerbo - Director of Intergovernmental
  - Amanda Doyle - Director of Enterprise Data Management
- OMB
  - Stephen Malmberg - Assistant Director of the Environmental Protection & Transit Taskforce
- Partnership for Parks
  - Ted Enoch - Senior Program Director
- Brooklyn Community Board 14
  - Shawn Campbell - District Manager
- ESRI
  - Information services
- NYU Tandon MOT Students
  - LAMP 3 Study
- U/T MUCP Students

Criteria

This report uses five qualitative criteria to evaluate the different alternatives:

A. **Adaptability & Versatility**
B. **Optimize Capital Planning**
C. **Better Incorporate Community Input**
D. **Better Support Utilidor Implementation**
E. **Feasibility**

The criteria indicate the strengths and weaknesses of each potential solution, aiding in determining the final recommendation. Other criteria, such as cost and timeliness, were considered but dropped due to their peripheral nature to the final alternatives (all alternatives can be deemed low-cost and relatively timely).

Criteria will be scored from "low" to "high," or 1 to 3 in numerical values. Because the criteria vary in importance, they are all weighted differently. Criteria scoring weights are based on several factors, such as the priorities of LAMP, the missions of the relevant Working Groups, and if a criterion is more extensively covered by the U/T MUCP than the other criteria. For example, this report focuses primarily on interagency information costs related to infrastructure planning, while the U/T MUCP report focuses more on the community needs' role in improving cross-agency collaboration in the capital budgeting process. Thus, a criterion pertaining to community input is weighted lower than one relating to strictly interagency affairs.

For more information on weights affecting evaluation, refer to the Evaluation Matrix in the Evaluation section.

A. Adaptability & Versatility

Description: How effectively can an alternative be used by agencies of very different functions, missions, and jurisdictions to improve cross-agency collaboration during the CBPP?

1) Low: Cannot be easily used by planning teams, and their respective internal planning methodologies will most likely be incompatible with one another.

2) Medium: Requires some effort to be used by planning teams, most likely requiring changes to their respective internal methodologies and policies.
3) High: Can be easily used by planning teams without disrupting their different planning methodologies.

Weight & Reasoning: This has a weight of **25%** due to its immediate pertinence to the Central Policy Issue. It will be used to evaluate how well an alternative can be adopted by the agencies that would utilize it, without placing more burden on them. An alternative that scores high in this category is one that can be easily picked up by very different agencies that play very different roles during the CBPP and will work around their different methodologies, instead of having them work around the alternative.

B. Optimize Capital Planning

Description: How likely can an alternative optimize planners' capital projects, and close knowledge transfer gaps, at the same or lower overall sequential scope costs? Namely, if the current costs of engaging in capital planning were held constant, to what extent can planners improve collaboration, integration, and coordination with those of other agencies while ruling out options that lead to higher costs?

1) Low: Does not help planners and agencies optimize projects.
2) Medium: Somewhat helps planners and agencies optimize projects, likely at the same costs as the status quo.
3) High: Greatly helps planners and agencies optimize projects and lower costs.

Weight & Reasoning: This criterion has the highest weight of all five, **30%**, due to its immediate pertinence to improving cross-agency collaboration in the capital budgeting process. It will be used to evaluate how well an alternative can close the interagency knowledge transfer gap and catalyze more collaborative budget planning. This criterion is based on AREA Research's lifecycle cost-benefit analysis (LCCBA) model, previously used in RP3 and Utilidor Working Group reports.[23] Applying the LCCBA to clustered projects can determine “the extent to which it is possible to collectively enhance clusters of closely co-located projects within neighborhoods to provide the highest level of return

from an infrastructural and community resiliency."[24] That is to say, LCCBA is a unique kind of cost-benefit analysis best suited for infrastructure projects due to its ability to "optimize the level of total return on City capital investments within a neighborhood and quantify potential capital budget savings opportunities."[25] This criterion is *not* using this model to evaluate alternatives, but it is about how an alternative can predictably help yield a better net present value (NPV) and/or benefit-cost ratio for capital projects using the LCCBA model.

C. Better Incorporate Community Input

Description: What is the likelihood an alternative can better incorporate community input during the CBPP?

1) Low: Status quo, community district needs aren't taken as seriously as District Managers believe they should be.
2) Medium: Community district needs are considered somewhat more by agencies during the CBPP as compared to the status quo.
3) High: Community district needs are considered more seriously by agencies during the CBPP.

Weight & Reasoning: This criterion has a weight of **15%.** Although this report is primarily interested in interagency collaboration, interviews with CB District Managers have helped identify avenues to better incorporate documents such as Community District Needs Statements into the CBPP at the subordinate level. These avenues will be further expounded upon in the alternatives section

D. Better Support Utilidor Implementation

Description: How well an alternative supports utilidor implementation based on subsurface infrastructure improvement opportunities.

(1) Low: Provides little to no information as to where subsurface infrastructure improvements can be made.
(2) Medium: Gives a general overview of where subsurface infrastructure improvements can be made.

(3) High: Clearly and precisely shows city planners where subsurface infrastructure improvements can be made.

Weight & Reasoning: This criterion has the lowest weight of all five, **10%**. Although subsurface infrastructure is a key component of LAMP and the Utilidor Working Group and should be considered in an alternative's evaluation, unaddressed utilidor vulnerabilities are ultimately symptoms of more significant collaboration problems that affect a variety of capital construction and reconstruction projects. Furthermore, the issue of water main breaks and other subsurface infrastructure failures factors less into the Central Policy Issue, as emergency repairs do not fall under the purview of capital planning.

F. Feasibility

This criterion measures how feasible it would be for an alternative to be developed, executed, and hosted by relevant agencies. In essence, how much work will it take for an agency or several agencies to create an alternative? This is not a cost estimate but rather an estimate of the amount of agency bandwidth and resources an alternative will need to come to fruition.

1) Low: Requires a lot of resources from agencies, likely requiring many several stakeholders to execute.
2) Medium: Requires a moderate amount of resources from agencies, likely requiring several stakeholders to execute.
3) High: Requires few resources from agencies, requiring only one stakeholder to execute an alternative.

Weight & Reasoning: This criterion has a weight of **20%.** All alternatives were developed with feasibility in mind. However, feasibility can vary significantly depending on the alternative. City agencies are already stretched thin, the IT teams even more so, with multiple projects in their pipelines. This is further compounded if multiple agencies are required to carry out an alternative.

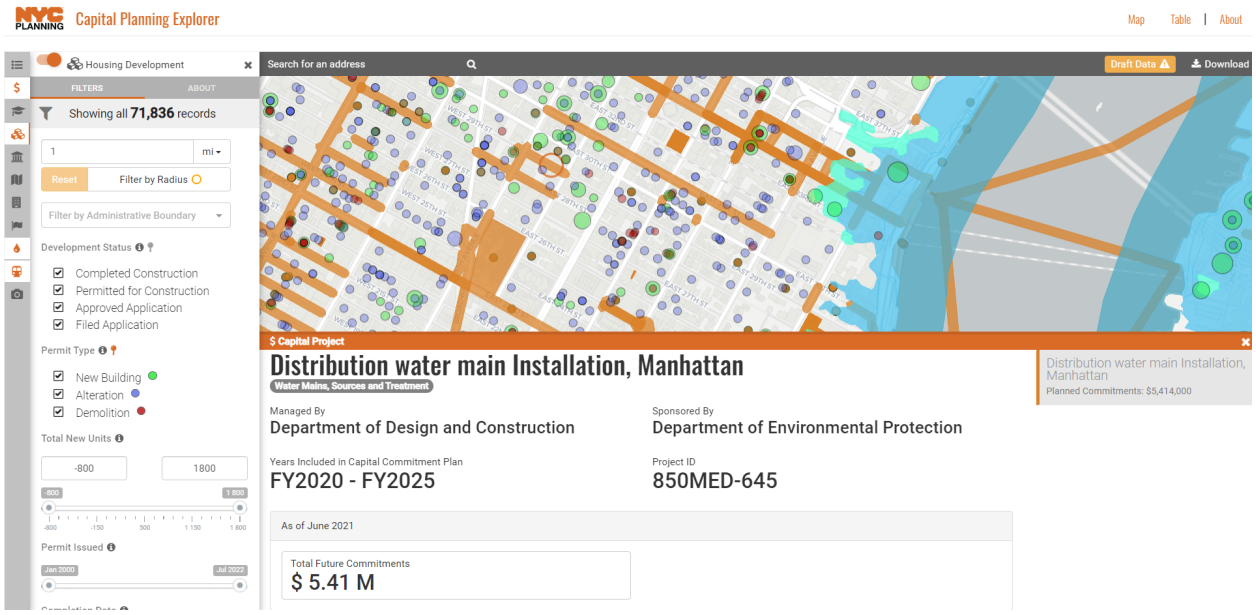
Alternatives

The following alternatives represent tools and toolsets that can catalyze interagency collaboration during capital budget planning in some capacity. The mission of each alternative is to connect information that already exists between agencies and help optimize coordination during the CBPP. Each alternative was conceptualized by examining gaps in budget planning and ideation processes, identifying shared needs between several City agencies and other stakeholders, and analyzing best practices in collaboration methodologies in planning stages that have already been probed for optimization. The agency responsible for carrying out and hosting each alternative differs based on each alternative's characteristics, but generally, DCP and OMB are the primary candidates.

A) Create a Variant of the NYC Capital Planning Explorer for Agencies and OMB to Use During the CBPP

Currently, the closest apparatus to a consolidated tool that visualizes capital projects is the NYC DCP's Capital Planning Explorer. It is a multilayered, GIS-based research tool that allows a user to search through all capital projects and view their details, including development status, budget, the agencies managing and/or sponsoring each of them, and other metrics. The Explorer is a resource that combines data published by DCP and other City agencies and is intended to act as a jumping-off point for users to research capital projects in both a geospatial and tabular format. As presently used, it maps projects that are authorized in the capital budget. This alternative would permit agencies and OMB to create and use a variant of the Explorer to see planned capital projects under consideration during a CBPP for optimization of closely colocated projects before adoption.

Figure 4. The Current Capital Planning Explorer



Source: NYC DCP Capital Planning Explorer

In the map view, a user can browse through a variety of projects represented as geometric features (point, line, polygon); selecting a feature will expand that project's details, including scope area, a brief description of the project, the relevant agencies and parties involved, Project ID, total and planned monetary commitments, and which fiscal years it is included in the Capital Commitment Plan. If multiple projects have overlapping scope areas, the Explorer will queue both features as tabs that the user can switch between. This allows a user to quickly compare different projects that occupy the same areas and gauge the synchronicity of their goals, agencies, timelines, and commitments. They can then download this data in several different formats for further research in their preferred data analysis suites. On top of this, a user can also overlay other helpful information such as flood hazards, multiple transportation layers, and administrative boundaries.

However, in its current beta form, this Explorer only features post-adoption capital projects that have already been included in the Capital Commitment Plan and is intended to be a public-facing tool. While it marries multiple datasets together, it is primarily based on DCP's Capital Projects Database, which reflects the latest Capital Commitment Plan.

And unlike other City resources like OpenData, it is not an automated tool, with some of the spatial data being input and transformed manually, including a QA process DCP runs for each of these datasets. Furthermore, not all projects on the Explorer are represented on the map; of 11,984 capital projects the Explorer lists in its data download section, only 4,479 have geometric attributes and can be mapped. Lastly, DCP itself states that the Explorer is not a project management system and is a data visualization tool first and foremost, and reformatting the tool as a management system would likely require major changes to the backend codebase.

Despite these shortcomings, the Capital Planning Explorer offers a comprehensive framework for showing capital projects at different planning stages. Should DCP utilize Explorer's existing codebase to build a separate, internal version specifically for projects that are in the CBPP, it could assist city planners in carrying out scoping and stakeholder outreach and mitigate the high information costs they are currently facing.

Evaluation:

A. **Adaptability & Versatility**

   MEDIUM (2) - As it exists currently, the Capital Planning Explorer is a highly accessible and flexible tool that provides a suite of useful information and metrics on capital projects. Users who interface with it are able to quickly find what other agencies and stakeholders are planning and discern a lot of data easily due to its well-laid-out UX. That said, one of its acknowledged limitations is that it is not built for project management, and manually-inputted information may be incorrect.[26] Thus if this alternative were carried out to fruition, it would require major changes to the backend codebase to more closely resemble a project management tool. As of this report's completion, the Capital Planning Explorer is still in beta, meaning it is a work-in-progress product.

B. **Optimize Capital Planning**

   MEDIUM (2) - For operational agencies, the ability to quickly and simply identify clusters of projects would considerably optimize the return on

capital investment and better help them find capital budget savings opportunities via the quality-of-life features Explorer provides. However, since it is not intended to be a project management system, it would still likely put the onus on other operational agencies to manually input their capital budget plans in a way that fits the tool, not the other way around.

C. **Better Incorporate Community Input**

LOW (1) - As this alternative would be an internal tool, it would have fewer opportunities for community input than the current public-facing web map. And although geometry attributes can be added to Community District Needs Statements (CDNSs) to represent them as features on a map, the entire UI and features of Explorer are focused solely on providing information on Capital Projects, with all other layers being supplemental.

D. **Better Support Utilidor Implementation**

MEDIUM (2) - Since Capital Planning Explorer uses shapefiles from DCP's BYTES of the BIG APPLE database and uses OpenMapLayers as its web map engine, it would be possible to represent any kind of 2D spatial data, including a layer for subsurface infrastructure (or surface indicators) and quickly identify nearby project scope areas. The current map already has polygons showing in-progress water main projects managed by DDC. Still, in terms of finding where future utilidors could be, this alternative would not alleviate any of the core issues planners face when dealing with NYC's patchwork utilidor systems, due to its lack of project management features. Since the Explorer is focused on providing data for Capital Projects, projected subsurface infrastructure layers would likely be supplemental features.

E. **Feasibility**

HIGH (3) - This alternative would not require much buy-in as the platform has already been developed and shipped. Most of the backend systems will be duplicated or changed in small ways, and it’s highly unlikely that

other agencies or teams will need to step in to assist with development and configuration.

B) GIS Collaborative Planning Hub

This is the most comprehensive and involved alternative in this report. Unlike the previous alternative, this would entail building a new collaborative planning hub from the ground up to better suit the needs of stakeholders engaged in capital budget planning. The ideal platform would be built around the "Four V's of Big Data"—volume, velocity, variety, and veracity; all four can help to mitigate the primary factors contributing to the Central Policy Issue.

Volume refers to the large amount of data generated and stored by City stakeholders and individual planners. These can include datasets from various sources such as NYC OpenData, the US Census Bureau, BYTES of the BIG APPLE, and custom, specialized data frames from smaller units. Traditional, offline data tabulation and analysis tools used by many city planners, such as Excel, QGIS, and RStudio, are under-equipped to handle even lodestar datasets that all agencies operate on a frequent basis due to software and hardware limitations. Even the simple act of sharing data via an interagency Sharepoint is nigh impossible in select cases. Thus, an ideal platform would leverage cloud storage and application program interfaces (APIs) to host and pull the large volume of data shared between stakeholders during the CBPP.

Velocity is the speed at which data is generated and processed. Again, most of the tools planners currently have at their disposal are not equipped to perform more than basic-to-intermediate data manipulation tasks and coordination methodologies without slowing to a crawl, resulting in crucial time being wasted during the CBPP. The ideal collaborative hub can process, analyze, and share data in real-time to help planners extract insights and make informed decisions.

Variety refers to the different types and formats of data, both structured and unstructured. For example, two datasets from two different agencies may both relate to the same topic of capital budget planning with similar scope areas and timeframes; yet they are formatted and tabulated differently enough that planners from each agency would need to meet just to coordinate on how to cross-reference the datasets. An intelligent hub would be able to connect, clean, and integrate these datasets into a shared model with little intervention by planners. It would be able to add geometric attributes to datasets just based on descriptive address columns and highlight commonalities between extremely different forms of data.

Veracity is the accuracy, completeness, and consistency of data. A key factor contributing to interagency knowledge transfer gaps is that the onus of updating capital project dashboards, datasets, and other critical materials is solely on the agency planners, whose bandwidths are likely worn thin by juggling multiple projects at once. This leads to inaccurate and outdated data and information at a phase in the planning process when that information needs to be accurate and consistent. This alternative would ideally mitigate such issues by leveraging APIs to automatically pull and update data files at a constant rate so they are the most accurate and complete versions of themselves at all times.

Until recently, achieving these tasks just for a (relatively) short phase of the capital planning process would have been impossible and untenable. However, the City has recently purchased contracts for tools that, combined in a modular fashion, are capable of creating a hub that can accomplish all four of these pillars. The key word in this case is *modular*, the ability for this platform to integrate multiple kinds of software suites and applications and swap them out easily to best fit the diverse needs of multiple City agencies engaged in the CBPP. Although this report cannot predict what advancements

will be made in the realm of data science and collaborative software development in the near future, it can posit several options that the City currently has at its disposal:

Collaborative GIS:

ArcGIS Pro
Developed by ESRI, ArcGIS Pro is a powerful GIS software suite that almost all operational City agencies utilize. A key capability of ArcGIS Pro is its ability to bring together various datasets and data sources from multiple stakeholders, allowing city planners to gain a more comprehensive and accurate understanding of the City's infrastructure, environment, and social dynamics. It includes robust yet low-code visualization and analysis tools that enable planners and non-planners to explore and identify patterns, trends, and relationships in the data, which can inform capital budget planning decisions. Additionally, ArcGIS includes various collaboration and communication features, such as web mapping and the ability to create narrative-driven reports (ArcGIS StoryMaps), allowing multiple stakeholders to access, edit, and share data and maps in real-time. While its Software-as-a-Service (Saas) approach may turn some planners off, most City agencies have been migrating to ArcGIS Pro as their treadstone GIS suite.
Remix.com
Developed by Via, Remix.com is a collaborative transportation infrastructure planning platform focusing on collaboration and communication features. It enables transportation planners and professionals to design, analyze, and optimize transit networks with ease. Remix.com provides a user-friendly interface that enables the creation of multiple interactive maps and visualizations of numerous types of data represented as browser tab-like "scenarios." This allows users to quickly understand and analyze the impact of different plans, which can inform important decisions related to capital budget planning. City planners, 3rd party stakeholders, and even members of the public all have the ability to share data and insights. Different agencies and outside parties can submit comments and suggestions directly on the map itself using a commenting function not too different from Google Workspace apps. Planners can

then make real-time adjustments to their capital plans, streamlining the planning process and ensuring that all relevant stakeholders are informed and engaged.

Figure 5. Two Graphics Illustrating Remix.com's Collaboration Features

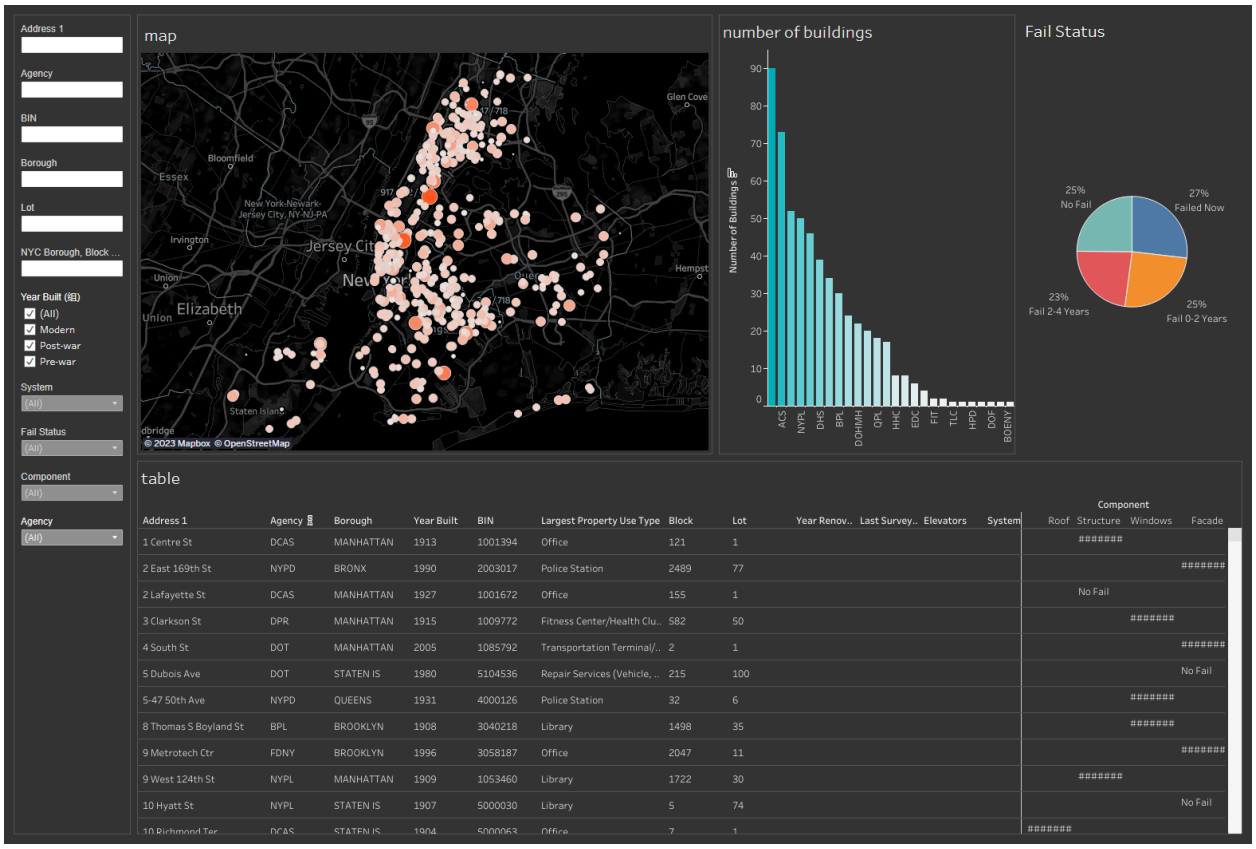
Source: Remix.com

Business Intelligence + Dashboard-based Interfacing:

AIMS Plus
Developed by NYU students as part of the Construction Culture+Data Town+Gown Working Group, AIMS Plus is a proposed modernization of the Asset Information Management System (AIMS), with a focus on expediting and optimizing search and filter functions. Currently, there are thousands of different datasets relating to the conditions of New York's public buildings and infrastructure, all of which are sourced from various organizations that publish them in different formats. The goals of AIMS Plus are to consolidate these datasets via a sustainable interagency database, a dashboard interface with GIS integration, and a quick search engine to ultimately result in capital cost savings for City agencies and relevant stakeholders. The 2022 demonstration model of AIMS Plus is built on Tableau.

PowerBI
Developed by Microsoft as part of the Microsoft Power Platform, PowerBI is a business intelligence and analytics service that engenders collaborative planning through its ability to quickly create and share dashboards, reports, and large datasets with other users, with the capability to pull from a wide variety of data sources. Multiple planners can work on a report or dashboard simultaneously and track changes made by other users. PowerBI also natively supports the integration of ESRI apps, making it an excellent complement to ArcGIS Pro. Perhaps its two most significant benefits with regard to the Central Policy Issue are its ease of use and easy adoption for those intimately familiar with Excel and its Azure Cognitive Services capabilities. Azure is Microsoft's proprietary AI suite, with an eye toward intelligent data analysis and tidying. PowerBI can come with several pre-built artificial intelligence models that can be integrated into reports and dashboards to interpret and extract information from unstructured data. However, Azure requires an additional subscription separate from Power Platform. As of the publication of this report, PowerBI is being adopted as the premier data modeling platform for DOT.
Tableau
Tableau is a counterpart to PowerBI, a comprehensive business intelligence and analytics suite used by Town+Gown Working Groups, DCP, and many data science organizations around the globe. Both Tableau and PowerBI allow multiple users to work on reports and dashboards simultaneously and track changes made by other users. Their differences lie mainly with their parent companies. Tableau, being owned by Salesforce, has more robust integration with customer-relationship management (CRM) software such as Salesforce, while PowerBI integrates better with the Microsoft family of products such as Office 365. Although City agencies are trending more towards adopting more Microsoft products, Tableau is still a viable option for this alternative.

Figure 6. AIMS Plus Dashboard



Source: NYC DDC Town+Gown Construction Culture+Data WG | AIMS Plus

Supplemental Tools:

- **Cyclopedia StreetSmart:** LiDAR-based street-level imagery and 3D mapping tool for transportation, infrastructure, and City planning applications. Essentially a more data-focused approach to Google's StreetView.
- **Jacobs StreetLight Insight:** Analytics platform that uses big data to help transportation planners, engineers, and analysts make data-driven decisions about infrastructure, policies, and projects.
- **New York City Information Management Systems (SIMS, TIMS, AIMS, etc.)**: Disparate systems operated by different city agencies that exhibit intersectional qualities and whose data can be better unified by a centralized platform.

A notional end product stemming from this alternative could use the PowerBI Cloud Service with an Azure subscription as a base to build the rest of the hub around. ArcGIS Pro will be the primary GIS tool and visualizer. Supplemental data such as administrative areas, transit routes, utilidor corridors, natural disaster risks, primary land use tax lots, etc, can act as context base layers to help planners define how they want their capital projects to be represented geospatially.

Once the base hub is populated, the main burden that will be placed on operational agencies and their planning teams is providing a means for the platform to pull from their respective servers automatically. This is typically done via APIs. However, depending on the agency and how their intranets / shared drives are systematized, it may require intervention from that agency's IT team or the NYC Office of Technology and Innovation (OTI). From there, the hub will be able to integrate different agencies' preferred capital budget planning apparatuses without the need for standardized data templates, whether they be via spreadsheets, shapefiles, CRM software, Word documents, or even images, and Zoom meeting recordings using Azure. Data can range from estimated commitments, scope areas, project-unique specifics, correspondence, and more. This is just one example of what a specialized, modular collaborative planning platform could look like. As mentioned above, there are many avenues this alternative could take. It is likely DCP would host this alternative with support from OTI and agency-specific IT teams.

Evaluation:

A. **Adaptability & Versatility**

   HIGH (3) - The modular aspect of this system would ensure that its interface can be as accessible and flexible as possible to suit the needs of planners and planning teams. With ongoing City government-wide rollouts of new business intelligence, data visualization, and GIS suites, it's likely planners will be intimately familiar with many of the tools this platform would comprise.

B. Optimize Capital Planning

HIGH (3) - This alternative is based on best practices already in place in other aspects of capital planning and city planning in general. Having a centralized, shared ecosystem where different can collaborate and plan capital budgets together in the same space is a tried and tested way to optimize planning, keeping costs constant.

C. Better Incorporate Community Input

MEDIUM (2) - This alternative is primarily concerned with increasing collaboration between agencies; however, that is not to say that increasing community input would be impossible. Community DMs have expressed a desire for their CDNSs to be elevated during the CBPP, and there is no reason why a modular collaborative hub can't accommodate that. There are multiple ways CDNSs and other community inputs could be represented on the platform without providing additional infrastructural observations to agencies during the CBPP, such as via Customer Relationship Management (CRM) integration or a limited interface for CBs to interact with.

D. Better Support Utilidor Implementation

HIGH (3) - There exist several systems that can quantify subsurface infrastructure vulnerabilities, including internal civic management tools, 3rd party software, and Town+Gown student minimum viable products (MVPs). As long as these tools provide APIs or other methods to integrate with another system, the ability for this collaborative hub to highlight possible below-the-street failures and new utilidor corridors will not be diminished.

E. Feasibility

LOW (1) - Because of this alternative's scale and comprehensiveness, it will likely require a lot of manpower from multiple teams and agencies to achieve its ideal form. There would likely be extended discussions between different IT teams about how server routing will be set up, as well as conversations with the contracted companies involved, assuming the hub

will utilize multiple 3rd party tools and APIs. That is not to say that this alternative is totally unfeasible, but it will consume much more bandwidth (literally and figuratively) than the other two alternatives.

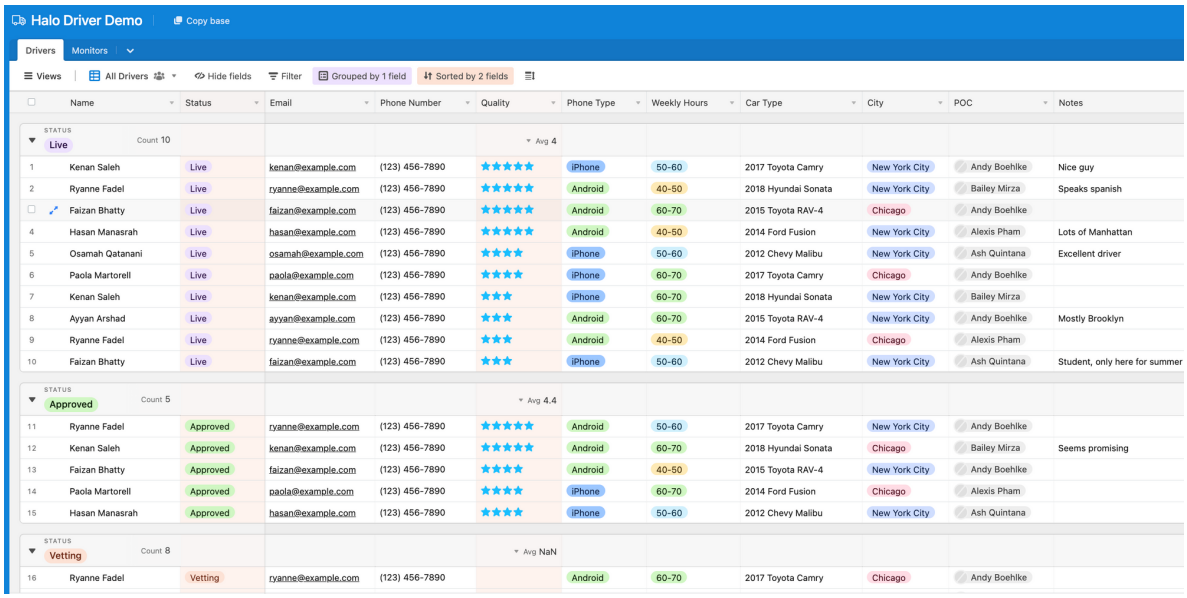
C) Centralized Agency-Community Board Customer Relationship Management (CRM)

This alternative addresses the concerns raised by Community Board members regarding their CDNSs not being high enough of a priority for city planners during the CBPP. This is a unique alternative as it is not meant to be a comprehensive solution to the Central Policy Issue, which is focused on interagency collaboration. However, it can complement one of the two previous alternatives or act as a standalone solution for the closely related issue of increasing community input during the CBPP.

Customer Relationship Management (CRM) systems are software tools designed to manage and analyze interactions with existing and potential customers. CRM systems are typically used for sales, marketing, and customer service operations but have found use in both City agencies and Community Boards. For instance, Brooklyn CB14 uses Airtable as a lightweight CRM to manage its community needs, allowing the Board to create databases that track community new needs and customer information and increase coordination within the CB.

Thus, this alternative would involve City agencies gaining access to CB CRM systems, either by integrating those CRMs into a shared ecosystem similar to Alternative 2, or by gaining direct permissions to interact with these systems as "customers" of the CBs. The ideal CRM infrastructure in this scenario would marry data from 311 calls and CDNSs and elicit more high-quality responses from agencies.

Figure 7. Airtable Interface - Used by Community Boards Currently



Source: Airtable

Evaluation:

1. **Adaptability & Versatility**

   MEDIUM (2) - Since the greatest strength of CRM systems is how they improve the customer experience, this alternative rates high in this criterion as CRM interfaces such as Airtable can be quickly picked up by stakeholders without deep knowledge of how CRM functions. However, different CBs have different approaches to what CRM software they use and how they are configured, if they have a system at all. This could lead to accessibility challenges if all 59 CBs take very different avenues and all have disparate systems.

2. **Optimize Capital Planning**

   LOW (1) - Again, this alternative on its own doesn't solve the Central Policy Issue of the lack of interagency collaboration and focuses more on the related topic of agency-CB collaboration.

3. **Better Incorporate Community Input**

   HIGH (3) - Having CBs and agencies interact within the same CRM systems means there is a more direct line of communication between the two

buckets of stakeholders. Community members would be able to elevate not just their CDNSs, but virtually any other form of input acceptable by their CRM, whether that be text-based suggestions and requests, images and videos outlining problem areas, community-created datasets, and more.

4. **Better Support Utilidor Implementation**

   LOW (1) - By itself, this alternative does not address any aspect of subsurface infrastructure planning unless utilidors and below-the-ground infrastructure were specifically outlined in CDNSs.

5. **Feasibility**

   MEDIUM (2) - The feasibility of this alternative hinges on the existing CRM infrastructure of each of the 59 CBs. By definition CRM systems can connect with a wide variety of customers, but should each CB's system differ significantly from one another, intervention by OTI or several agency IT teams may be required.

Evaluation of Alternatives

This section discusses the evaluation of each alternative by the criteria, comparing the strengths and weaknesses of each and informing this report's final recommendation.

Figure 8. Evaluation Matrix

	CRITERIA									
	Adaptability & Versatility		Optimize Capital Planning		Community Input		Better Support Utilidors		Feasibility	
	Weight:	0.25	Weight:	0.3	Weight:	0.15	Weight:	0.1	Weight:	0.2
	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
ALTERNATIVES										
Alt 1: Copy of NYC Capital Planning Explorer	2	0.5	2	0.6	1	0.15	2	0.2	3	0.6
Alt 2: GIS Collaborative Planning Hub	3	0.75	3	0.9	2	0.3	3	0.3	1	0.2
Alt 3: Agency + Community CRM	3	0.75	1	0.3	3	0.45	1	0.1	2	0.4

Evaluation of Alternatives

Creating a **Variant of the NYC Capital Planning Explorer** specifically for the CBPP represents the most expeditious and feasible way to create a tool to mitigate the Central Policy Issue. However, like the current Explorer it is based on, it will be more of a catalyst for increasing collaboration rather than a system that can sustain it long-term. In essence, it is a web map that is packaged with useful features such as an intuitive UI and multiple contextual data layers, but it is not a project management tool that can engender a collaborative ecosystem all on its own. Still, its high feasibility ease-of-use makes it attractive as an alternative that can be done "tomorrow."

Creating a **GIS Collaborative Planning Hub** from the ground up is a monumental task when compared to the other two alternatives, yet only because it would be the most

comprehensive and ideal alternative for tackling the Central Policy Issue. Planners would have an ecosystem that can evolve to fit the ever-changing needs of units involved in capital budgeting planning. Depending on the main codebase chosen, virtually any kind of structured or unstructured data can be represented on the platform's dashboard at the planners' will. This allows users to communicate a wide range of data for an even wider range of capital projects, such as the complex issue of utilidor planning, without jumping off the platform.

Allowing City agencies to tap into **Community Board CRMs** is not a great answer to the Central Policy Issue on its own, but it would serve to complement one of the other two alternatives, and kill two birds with one stone: increasing both interagency and agency-CB collaboration at the capital budget planning stage. This alternative, however, is unable to gauge the CRM methodologies of all 59 CBs without requiring more resources from agencies.

Recommendations

Final Policy Recommendation

It is recommended that a **GIS Collaborative Planning Hub** be created specifically for the Capital Budget Planning Period, with the ability to integrate **Community Boards' Community District Needs Statements via Customer Relationship Management connections**. This recommendation represents a two-pronged approach of combining best practices in data analysis/collection and putting the Neighborhood Activation Study methodology in the foreground. The GIS hub can be used to consolidate many different data sources relating to different agencies' capital budget plans, including locating utilidors and identifying subsurface infrastructure vulnerabilities.

Next Steps

This report recommends a conversation with OTI regarding the best way to develop and host the planning hub and discuss any challenges this report has not foreseen. It is likely that the IT teams of City agencies involved in capital budget planning, such as DOT, DCP, DEP, DDC and OMB, would also need to be consulted. Units and teams within these agencies will also need to be informed of the new planning hub, and it would be fruitful if the tool was alpha and beta tested before being fully operational to test for any incompatibilities or errors. DCP will likely host the hub based on the precedence of them hosting many similar data hubs.

Appendix I

Operational Suggestions

These suggestions are out of the scope of this report and are not counted as alternatives but can act as subordinate complements to the final policy recommendation. Evaluation of these suggestions uses all criteria except for Feasibility, as they are all infeasible within the parameters of this report.

Interagency On-Street Observation Unit

Interagency field observation units are already utilized by different agencies, such as the Street Conditions Observation Unit (SCOUT), and the Building and Land Use Approval Streamlining Taskforce (BLAST), yet these groups are either antiquities from the 1970s and/or don't pertain to capital planning at all. Refactoring these units or creating a new unit entirely to identify subsurface infrastructure vulnerabilities and potential failures, and gain community input could go a long way in alleviating the Central Policy Issue and help multiple agencies strategize their planning to focus on the issues impacting communities the most.

Evaluation:

A. **Adaptability & Versatility**

   MEDIUM - Street units are not a comprehensive solution to improving interagency infrastructure planning, as they are, in essence, a data source whose data needs to be processed, transformed, and analyzed. However, the quality of such data is likely to be much higher than that of 3rd party sources like 311 calls. Street units will be trained in identifying planning opportunities and can do so straight from the street itself.

B. **Optimize Capital Planning**

   LOW - Street units by themselves would have little to no effect on capital budgeting, only providing more data for planners to budget around.

C. **Better Incorporate Community Input**

HIGH - Street units would be able to see with their own eyes how current infrastructure conditions are affecting local communities and can directly interview members of the community about their ideas for possible improvements, either by inviting members of Community Boards, vox populi-style conversations, or both.

D. **Better Support Utilidor Implementation**

HIGH - Because street units will be trained in locating and identifying surface features that act as surrogates for subsurface vulnerabilities, they can provide high-quality, fast, and reliable information on where utilidor opportunities lie.

Formalize “Regional Megamodel” Coordination Meetings

Regional coordination meetings, or "megamodels," are informal meetings where capital planners from NYC, New Jersey, State, and Federal agencies coordinate with each other to combine their efforts and optimize projects that affect multiple different stakeholders. Formalizing and normalizing these meetings can help to better plug the ideas and plans of multiple agencies into capital planning.

Evaluation:

A. **Adaptability & Versatility**

HIGH - Regional megamodels already engender great collaboration between City, State, and Federal agencies and public-benefit corporations. Yet currently, these meetings only exist on Outlook calendars and email correspondence. Formalizing these meetings would only help planning stakeholders organize their projects around each other's plans.

B. **Optimize Capital Planning**

HIGH - Planners can incorporate formal regional megamodel meetings into their budget planning, better informing them of what work other stakeholders are planning to do.

C. **Better Incorporate Community Input**

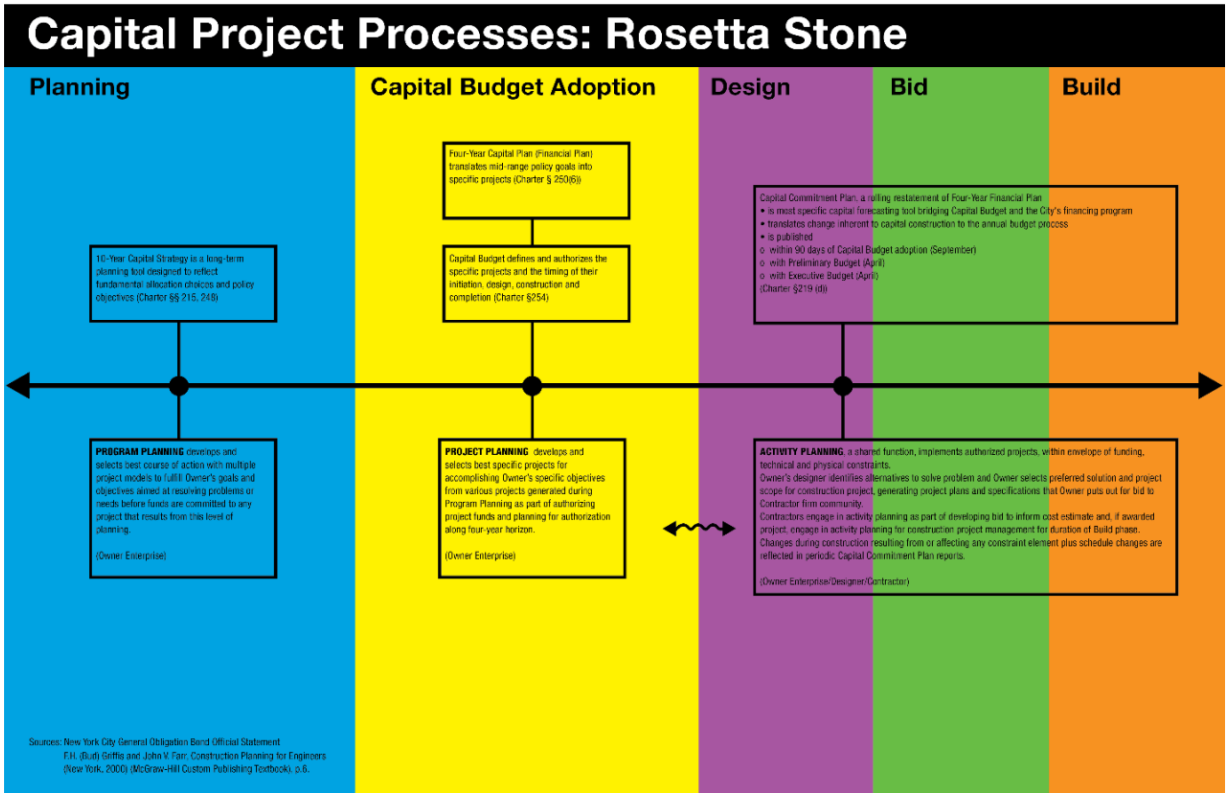
LOW - Regional metamodels do not feature community representatives and likely will not in the future due to the confidential nature of some of the projects discussed.

D. Better Support Utilidor Implementation

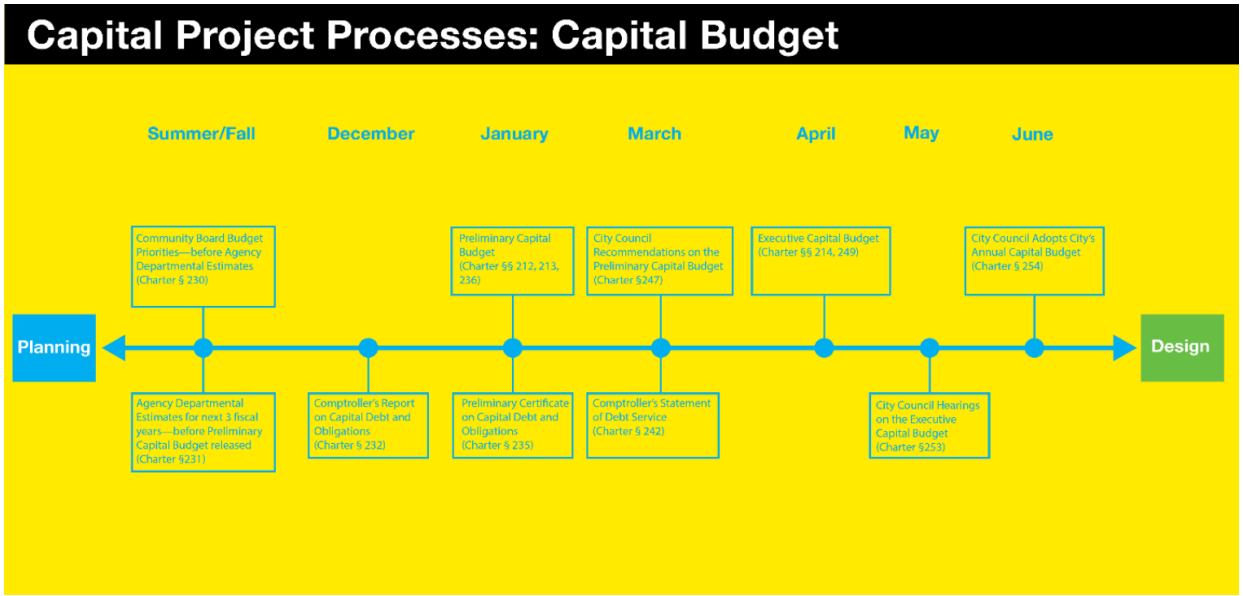
MEDIUM - Due to the large scopes of these meetings, formalizing these meetings would help with showing where utilidor improvements can be made in general areas, but conversations about specific intersections/blockfaces would likely be omitted in the interest of solving “big picture” problems.

Appendix II

Overview of the Typical Capital Project Process



Capital Budget Planning Process



Source: DDC Town+Gown | Resilient People, Places and Projects (RP3) Working Group Research Project

Appendix III

Bibliography

[1] “Why NYC.” NYCEDC, edc.nyc/why-nyc.

[2] Ebsary, C. M., Khan, A., Li, B., Thompson, S., Vaina, C., (2023). Improving infrastructural and community resiliency by optimizing projects in neighborhoods: A critical analysis of the structural knowledge transfer gaps during New York City's capital budget planning processes. School of Cities, University of Toronto.

[3] Ye, Bryson, et al. "LAMP - Urban Infrastructure Disruption Analysis." *nyc.gov*, New York City Department of Design and Construction, January 13 2022, www.nyc.gov/assets/ddc/downloads/town-and-gown/LAMPUrbanInfrastructureDisruptionAnalysisNYU-MOT.pdf.

[4] New York City Charter; Chapter 70 §§ 2800

[5] Understanding New York City's Budget - a Guide to the Capital Budget. New York City Independent Budget Office, June 2013.

[6] Capital Commitment Plan. Mayor's Office of Management and Budget (OMB), 2023, data.cityofnewyork.us/City-Government/Capital-Commitment-Plan/2cmn-uidm/data.

[7] Ebsary, C. M., Khan, A., Li, B., Thompson, S., Vaina, C., (2023). Improving infrastructural and community resiliency by optimizing projects in neighborhoods: A critical analysis of the structural knowledge transfer gaps during New York City's capital budget planning processes. School of Cities, University of Toronto.

[8] Neighborhood Activation Study – NYC – Mayor's Office of Criminal Justice. criminaljustice.cityofnewyork.us/reports/neighborhood-activation-study.

[9] Gramlich, Edward M. "The New York City Fiscal Crisis: What Happened and What Is to Be Done?" The American Economic Review, vol. 66, no. 2, 1976, JSTOR, http://www.jstor.org/stable/1817255.

[10] “New York (N.Y.). Bureau of the Budget.” The New York City Municipal Archives Collections Guide, a860-collectionguides.nyc.gov/agents/corporate_entities/706. "Existence: 1933-1976"

[11] New York City Charter; Chapter 70 §§ 2800

[12] (C. Ukegbu, personal communication, March 21, 2023)

[13] (C. Hamby, personal communication, March 30, 2023)

[14] PLUTO and MapPLUTO. Department of Design and Construction. NYCwww.nyc.gov/site/planning/data-maps/open-data/dwn-pluto-mappluto.page.

[15] Barkan, Ross. “Working for the City When Everyone Else Is Leaving.” Curbed, 23 Jan. 2023, www.curbed.com/2023/01/vacancy-crisis-new-york-city-agencies-eric-adams.html.

[16] City Journal. "Untangling NYC's Underground Utility Infrastructure | City Journal." City Journal, March 23 2023, www.city-journal.org/article/new-yorks-subsurface-spaghetti-problem.

[17] (C. Ukegbu, personal communication, March 21, 2023)

[18] (S. Campbell, personal communication, May 1, 2023)

[19] Note: This report did not interview DEP

[20] Strategic Plan. Department of Design and Construction. www.nyc.gov/site/ddc/about/ddc-strategic-plan.page.

[21] "New York Case." Transit Costs Project, transitcosts.com/city/new-york.

[22] Heyermann, Boris, et al. "Life Cycle Cost Benefit Analysis to Support the Creation of the Smart City Infrastructure Authority/New York City." nyc.gov, New York City Department of Design and Construction, www.nyc.gov/assets/ddc/downloads/town-and-gown/LifeCycleCostBenefitAnalysisSupportCreationSmartCityInfrastructureAuthority.pdf.

[23] Heyermann, Boris, et al. "Life Cycle Cost Benefit Analysis to Support the Creation of the Smart City Infrastructure Authority/New York City." nyc.gov, New York City Department of Design and Construction, www.nyc.gov/assets/ddc/downloads/town-and-gown/LifeCycleCostBenefitAnalysisSupportCreationSmartCityInfrastructureAuthority.pdf.

[24] Green, David. "Resilient People, Places and Projects." nyc.gov, New York City Department of Design and Construction, November 3 2022, www.nyc.gov/assets/ddc/downloads/town-and-gown/DavidGreenRP3Presentation.pdf.

[25] Green, David. "Resilient People, Places and Projects."

[26] “What Is the Capital Planning Explorer?” *NYC Capital Planning Explorer*, capitalplanning.nyc.gov/about/capitalprojects.