Capital Program, Planning and Real Estate Committee

Item III - A

December 1, 2016

Capital Needs Inventory (CNI) Phase I Key Findings

Washington Metropolitan Area Transit Authority

Board Action/Information Summary

◉ Action ○ Information	MEAD Number: 201813	Resolution: ○ Yes ◉ No

TITLE:

2016 Capital Needs Inventory Phase I Key Findings

PRESENTATION SUMMARY:

The Capital Needs Inventory (CNI) identifies and quantifies Metro's unconstrained capital needs over a 10-year period to advance or maintain a State of Good Repair (SGR), meet regulatory compliance, and invest in safety enhancements. This presentation summarizes key findings from the current phase of the CNI.

PURPOSE:

Present summary of Metro's Ten-Year Capital Needs Inventory (CNI).

DESCRIPTION:

The CNI provides an unconstrained, prioritized list of investment needs over ten years. The list of needs advances or sustains a State of Good Repair (SGR), satisfies regulatory compliance, and includes limited but critical system enhancements.

Key Highlights:

• Metro's CNI, based on the asset evaluation framework of the Federal Transit Administration's (FTA) Transit Economic Requirements Model (TERM), is the first time the Authority has used a complete inventory of its assets to quantify rehabilitation and reinvestment needs.
• The CNI identifies more than $25 billion in capital needs in the next 10 years to achieve a SGR, meet regulatory compliance, modernize technology, and address critically needed system growth.
• When Metro completes its asset conditions inventory at the end of 2018, the CNI will be updated to reflect more detailed intelligence.

Background and History:

Metro last produced a 10-year CNI in 2010, through a joint process of a call for needs and a prioritization process that aligned those needs with Metro's strategic goals. This effort was incorporated into the subsequent Capital Funding Agreement (CFA), which funded about half of the total estimated investment need, totaled approximately $6B over five years, and included the addition of Passenger Rail Investment and Improvement Act of 2008 (PRIIA) funding and jurisdictional matching funds.

In the past few years, Metro has made significant progress on transit asset management. In During 2012 and 2015, Metro developed a draft asset inventory based on a variety of asset databases and financial records. In 2016, Metro undertook the initial phase of formalizing this effort, now called a Transit Asset Inventory and Condition Assessment (TAICA) to establish counts, classifications, and benchmark inventory data for its asset base. This provided the opportunity to develop an analytically-based CNI to project the Authority's 10-year investment needs at a higher asset level and address critical safety and compliance-related investments in a timely manner.

Phase I of the current CNI began in May 2016, and was built using asset quantities and age information from TAICA augmented by useful life benchmarks from the FTA's asset database.

In the past seven months, the GM/CEO, Executive Oversight Committee (EOC), Capital Program Advisory Committee (CPAC), and asset managers across all functions contributed to or participated in the 2016 Phase I CNI development.

This involved:

- Developing a risk-based prioritization approach, consistent with FTA guidance, for asset needs ranking;
- Building existing asset data and integrated asset data from various sources into the TERM database; and
- Identifying new needs from across the Authority that address compliance or regulatory requirements, obsolete technology, and other critical system enhancements anticipated in the near-term horizon.

Discussion:

Metro's CNI currently estimates approximately $25 billion in capital investment needs over the next 10 years to achieve a State of Good Repair (SGR), meet regulatory compliance, modernize technology, and address longstanding and emerging safety needs.

It is important to note that the CNI is entirely unconstrained in terms of both time and budget.

Phase I of the CNI provides Metro and its funding jurisdictions with an order of magnitude estimate of the costs associated with asset replacement and/or rehabilitation necessary to advance the Authority to a state of good repair over the next ten years. It is not intended to be used as a substitute for asset-based design and engineering for detailed project development and costing, as the Phase I work is based on age-based asset conditions. Future phases of the CNI will deliver greater levels of precision and detail.

The ten-year SGR needs total $17B. The following provides a high-level summary based on investment programs categorized under Metro's Capital Improvement Program (CIP).

• Railcar Replacement and Rehabilitation Program of $5B over the next ten years, which is about 28% of the total SGR needs.
• Track and Structure Rehabilitation Program and Rail Systems Program of $3B each to reach and sustain SGR. The combined $6B investment for these two programs will cover fixed rail, guideway structures, track maintenance equipment, electrification, communications, signals, and other related assets.
• Bus and Paratransit Program of $2.3B for fleet, facilities, and maintenance equipment.
• Stations and Passenger Facilities Program of $2.4B to improve or upgrade platforms, station structures, vertical circulation, fare collection and parking facilities.
• Business Support Program of $1.7B to maintain and upgrade software and hardware, supporting equipment and services, as well as the Metro Transit Police Department's (MTPD) assets.

Included in the $17B SGR estimate is approximately $6.5B in rehabilitation or replacement for assets that as of 2016 have already exceeded their useful life. These deferred asset needs are spread across all major asset categories and operating modes, including Metrorail, Metrobus, MetroAccess, and business support.

The SGR assets that need to be in compliance with National Transportation Safety Board (NTSB), FTA, and other safety and security directives are among the highest-priority investments. These compliance based SGR investments total approximately $2B, as shown below:

• Railcars;
• Track circuits);
• Intrusion detection system;
• Central train control;
• Power cable;
• Train control cable;
• Water intrusion project;
• Subway lighting;
• Tunnel ventilation; and
• Radio system upgrades.

In addition to investments necessary to advance and/or achieve a SGR, the CNI catalogs new investment needs required to comply with safety, regulatory, environmental, audit, or other directives. Among the new compliance needs are:

• NTSB and FTA directives;
• Fire Life Safety requirements;
• local and state environmental regulations;
• system safety improvements; and
• Security improvements and crime reduction.

Examples of the types of investments included in the above are:

• Tunnel ventilation improvements;
• Tunnel smoke detection systems;
• Worker wayside detection systems; and
• Heating, Ventilation, Air Conditioning (HVAC) upgrades to the 2000 and 3000 series rail cars as mandated by the Environmental Protection Agency (EPA);

Additionally, staff identified approximately $5.4B in additional non-compliance but necessary investments over the 10-year forecast period, all of which serve a safety, reliability, or service need; for example, safety handrails in rail yards, enhanced fire suppression systems, and completion of the CCTV installation in the 6000-series railcars are among the investments identified as impactful enough on the system that they warrant inclusion in the Phase I CNI.

Besides SGR needs and new investments, Metro also needs $80 million a year to keep up with the current capital spending on minor repairs and maintenance, as well as Information Technology (IT), engineering, and environmental services. The ten year total is $800M.

Next Steps:

Because much if not all of the FY18 budget is already programmed and in fact oversubscribed, the CNI will have limited if any impact on that proposal; however, because some elements from the CNI are compliance or safety critical, staff will identify the highest-ranked elements from the Phase I CNI and will conduct in-depth analyses to determine the work that is required. Meanwhile, highly-ranked needs that require project development will utilize project development funding in the FY 18 budget

Concurrently, the entire prioritized list of CNI investment needs will be evaluated to verify the basis for entering each need into the project development phase. The resulting list will be migrated into the project development phase wherein a definitive scope, cost, designs/specifications, and construction parameters will be created. From this project development phase, staff will ensure that projects can meet a set of project readiness criteria such that they can be appropriately built into a Capital Investment Plan (CIP) with confidence that implementation can take place promptly and accurately.

In spring 2017, staff will test the CNI against various funding level scenarios to determine the impact that greater or lesser funding levels would have on safety and the SGR over the next ten years. This will provide the groundwork for the Transit Asset Management Program (TAMP), which is to be submitted to the FTA in 2018.

Phase I of the CNI relies on the FTA's database of typical asset conditions – determined by their empirical evaluation of assets nationwide – to inform the model's estimate of remaining useful life. By 2018, Metro aims to complete its asset conditions assessment and use that information going forward to update the CNI in Phase II, and thereafter produce annual updates.

FUNDING IMPACT:

None. For information only.	
Project Manager:	Wendy Jia
Project Department/Office:	ENG/PLAN

TIMELINE:

Previous Actions	2009 Capital Needs Inventory
Anticipated actions after presentation	Capital Needs Inventory to be delivered to the Board in December of 2016

RECOMMENDATION:

None. For information only.

Washington Metropolitan Area Transit Authority

Capital Needs Inventory (CNI) Phase I Key Findings

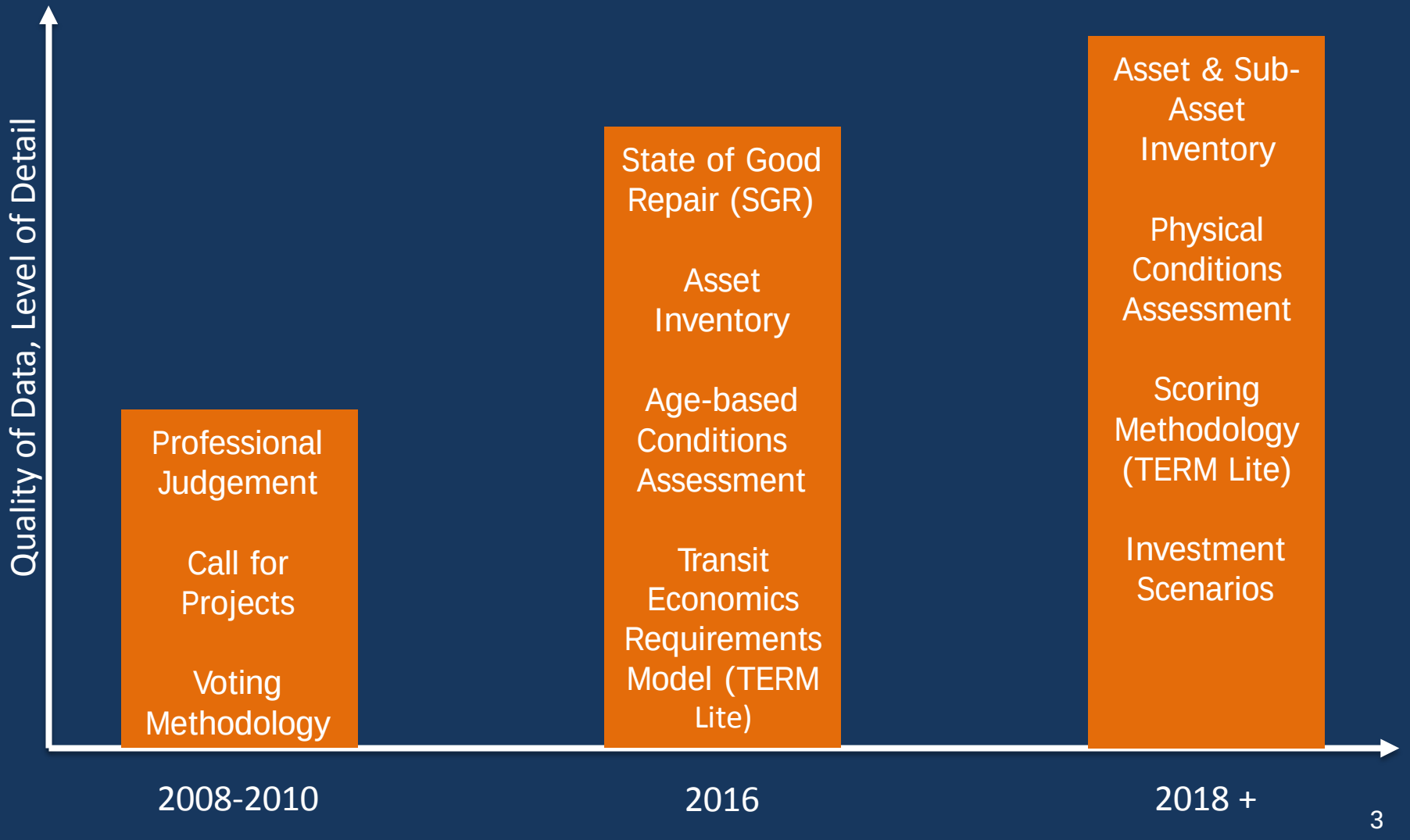
Capital Program, Planning and Real Estate Committee

December 1, 2016

Purpose

Present the Capital Needs Inventory (CNI) Phase I key findings

Capital Needs Inventory Evolution and Improvements



Capital Needs Inventory Evolution and Improvements

The Phase I CNI will Produce:

- Data-driven capital investment needs
- Prioritization of these needs
- Unconstrained order of magnitude investment need estimates ($YOE) for backlogs, age-based asset condition estimates, and program-level reinvestment and replacement needs

The Phase I CNI will NOT Produce:

- Physical conditions assessments for each asset
- “Project ready” list of actual capital projects to be funded
- Specific project-level costs and scopes
- Major changes to the FY 18 capital budget, whose development is well underway

State of Good Repair Needs Unconstrained 10-Year Estimate

- WMATA's SGR needs over the 10 year period total to $17.4 billion
  - Needs are unconstrained by budget, time and execution capacity
  - Needs shown in familiar Metro budget categories for clarity

Category	Current Deferred Needs	SGR Needs 2017 - 2026	Sum of SGR & Deferred Needs
Bus and Paratransit	$843	$1,505	$2,348
Rail Systems	$2,180	$862	$3,042
Railcars	$682	$4,784	$4,902
Track and Structures	$1,542	$1,337	$2,879
Stations and Passenger Facilities	$1,100	$1,347	$2,447
Business Support	$127	$1,619	$1,746
Total	**$6,473**	**$10,891**	**$17,364**

Capital Enhancements/Additions Compliance and Safety Investments

Approximately $7B, including the compliance needs noted below

NTSB	FTA/Safety Oversight	Fire/Life Safety	Potential Safety Hazard	Crime	Environ-ment
Wayside warning system to alert workers of trains	Tunnel ventilation to comply with NFPA-130	Rehab fare gates and correct "fall-safe closed" problem	Safety-Related Station Capacity (Union, Gallery Pl, Farragut N & W, Foggy Bottom)	Transit station area bus safety program	2/3K railcar series HVAC (EPA)

Ten-Year Total Combined Needs

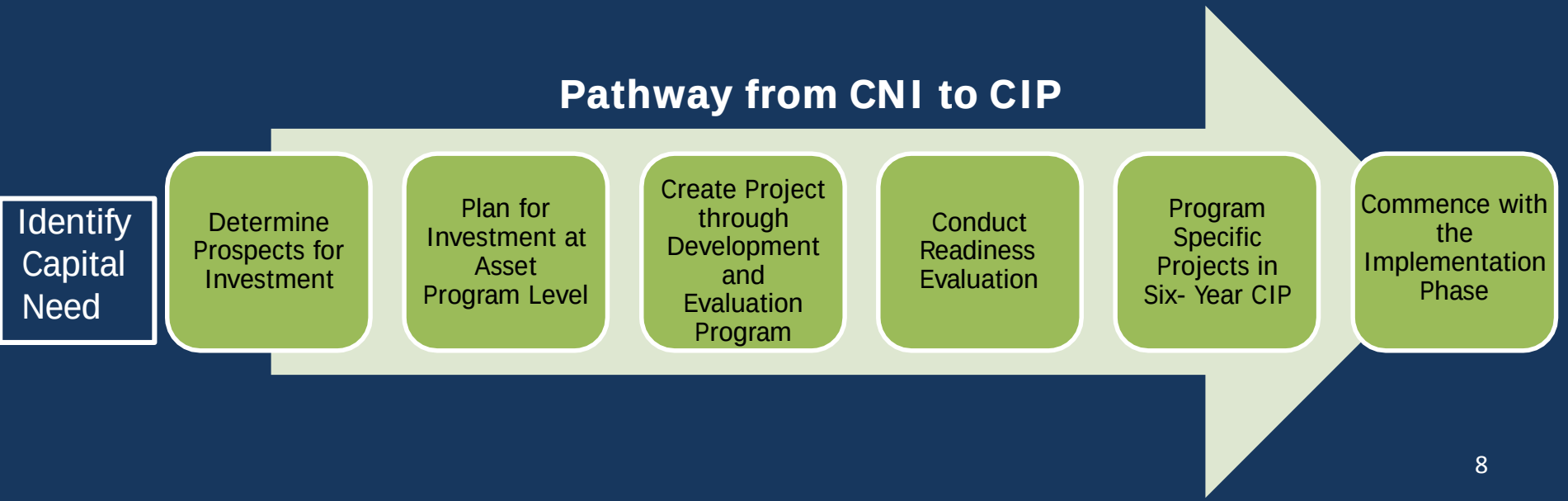
- Total Capital Needs: $25.2 billion
  - SGR, $17.4B
  - New Needs, $7.0B
  - Preventive Maint. Expenses, $800M
    - Minor repairs and maintenance
    - IT, engineering, environmental services

Considerations:

1. Needs are not projects – *yet*. They inform decisions about project development resources.
2. Once project development and evaluation are complete, *projects* may advance into the construction acquisition phases.
3. Needs estimate will become more refined as TAICA process matures.

CNI Relationship to CIP and CFA

- Current CIP contains items that are not in the CNI because they have not “aged” out
- Current CIP contains capitalized parts for maintenance
- Next CFA will differentiate between items carried-over from the current CIP and those that arise from the CNI initiative
- Approximately 85% of FY’18 budget is spoken for by in-progress investments
- CFA for FY’19 and beyond will include proposed investment levels by budget category with updates to those numbers as the CNI matures over the next 12 – 24 months



Next Steps

Immediately and Ongoing	Identify current needs that may warrant inclusion in the current CIP. Other needs to be subject to development and evaluation. Proposed FY2018-2023 CIP and advance renewal of CFA informed by program-level capital investment needs estimate.
Spring 2017	Commence inspections of assets to obtain conditions to inform the CNI
December 2018	Complete TAICA and provide physically-inspected asset condition scores. Prepare and submit to FTA the Transit Asset Management Plan.
2019	Implement routine condition assessments as sole basis of investments in assets (will become annual process/product)