METROPOLITAN
TRANSPORTATION
COMMISSION

Joseph P. Bort MetroCenter
101 Eighth Street
Oakland, CA 94607-4700
TEL 510.817.5700
TDD/TTY 510.817.5769
FAX 510.817.5848
E-MAIL info@mtc.ca.gov
WEB www.mtc.ca.gov

Memorandum

TO: Sustainable Communities Strategy (SCS) Regional Advisory Working Group

DATE: May 3, 2011

FR: Glen Tepke

W. I.

RE: Plan Bay Area: Preliminary Transit Capital Needs Assessment

Projections Summary

Draft preliminary transit capital need projections for Plan Bay Area compared to the projections for T2035 are summarized in Chart 1 below. The figures represent the total cost of replacing and rehabilitating current transit capital assets over the 28-year planning period under three alternative scenarios for the state of good repair (SGR) of the system. This includes major vehicle replacement projects coming up over the next decade, including all of BART's and Caltrain's railcars, and all of SFMTA's trolleys. Capital costs of expansion and enhancement projects are not included. As shown, the total capital need estimate ranges from $35.5 billion to $47.0 billion, as compared to $40.3 billion in Transportation 2035. Attachment "A" details the unconstrained needs by agency and asset type.

The projected needs consist of a one-time backlog of deferred replacement (assets that are already past their useful life at the beginning of the planning period) and rehab needs, plus normal, recurring replacement and rehab needs that come up when assets reach the end of their life or are due for rehabilitation during the planning period. The estimated cost of the backlog is $6.3 billion (2010 $).

Methodology

The projections are based on the Regional Transit Capital Inventory (RTCI), a database of all of the region's transit capital assets, such as buses, railcars, ferries, track, bridges, tunnels, train control and traction power systems, stations, maintenance facilities, and communications systems. The objective of the RTCI is to collect consistent and comparable data on the region's transit capital assets and replacement/rehabilitation costs for each transit operator. The initial RTCI was developed for the transit capital needs projections for Transportation 2035, and was recently updated by the transit operators for use in Plan Bay Area.

In addition to an asset inventory, the RTCI includes replacement and rehabilitation cycles and costs for each type of asset. Asset data for the RTCI was developed by each operator using multiple sources, such as maintenance management systems, fleet plans, condition assessments, and accounting systems. For cases where cost data was not available, industry standard replacement and rehabilitation cycles and costs for each asset type were developed based on a national inventory maintained by the Federal Transit Administration (FTA) and other sources.

Chart 1. Plan Bay Area Preliminary Transit Capital Need Projections 2013-2040
Year-of-Expenditure $ Millions

	Transportation 2035	Plan Bay Area Scenarios		
		Unconstrained	10-Year SGR	Maintain Backlog
Large Operators				
AC Transit	$1,745.8	$3,444.4	$3,367.7	$2,606.9
BART	15,119.0	15,000.2	15,009.8	12,458.4
Caltrain	3,455.6	3,945.3	3,724.1	2,006.2
GGBHTD	1,046.8	1,304.8	1,215.6	892.3
SamTrans	1,018.4	1,496.5	1,477.1	1,126.9
SFMTA	11,388.2	14,495.3	13,641.8	11,286.4
VTA	4,374.4	4,411.2	4,330.8	3,074.6
Subtotal Large Operators	$38,148.2	$44,097.8	$42,766.9	$33,451.8
Small Operators				
ACE	$453.0	$159.9	$153.7	$138.4
CCCTA	272.2	424.7	411.7	348.5
ECCTA	121.1	197.3	197.1	172.7
Fairfield	125.2	179.5	181.5	118.6
LAVTA	127.4	223.8	217.4	181.3
Marin County	N/A	42.8	42.8	41.1
Napa	56.0	145.2	145.3	87.3
Petaluma	13.7	34.2	34.1	28.3
Santa Rosa	116.8	127.2	127.1	109.2
Sonoma County	169.3	266.4	266.3	181.6
Union City	43.8	63.4	63.5	59.9
Vacaville	147.9	69.6	70.1	45.5
Vallejo/Benicia	278.5	614.5	557.7	318.6
Westcat	122.9	165.2	166.0	108.6
WETA (AOF)	98.8	181.2	181.3	144.7
Subtotal Small Operators	$2,146.6	$2,895.0	$2,815.7	$2,084.3
Clipper	Included above	$43.9	$38.7	$28.6
Total	$40,294.8	$47,036.7	$45,621.3	$35,564.7

Alternative SGR Scenarios

For purposes of the projections, State of Good Repair is defined in terms of the size of the backlog of deferred replacements and rehabs. Eliminating the backlog and performing all replacements and rehabs on schedule would result in an ideal SGR. The sizable backlog indicates the system is currently in a less-than-ideal SGR.

The three scenarios represent alternative levels of SGR that can be achieved by reinvestment in the system, i.e., alternative definitions of transit capital need. In terms of mechanics, they differ in how the backlog is addressed.

Unconstrained. The backlog is eliminated in the first year of the projection (2013), and all normal recurring replacements and rehabs are performed on schedule. Under this scenario, the system would attain an ideal SGR in 2013 and would be maintained at that level through 2040. The scenario used to define transit capital needs in T2035 was equivalent to this scenario.

Attain SGR in 10 Years. This scenario is similar to Unconstrained, except that the cost of replacing over-age assets and performing deferred rehabs is spread over the first ten years of the projection period, i.e., a more realistic version of the Unconstrained scenario. Under this scenario, the system would attain an ideal SGR by 2023 and would be maintained at that level through 2040.

Maintain Current Backlog. The rate of replacements and rehabs is constrained so that the dollar value of the backlog in 2040 is approximately the same as it was in 2013 (in constant dollars), i.e., the status quo scenario. Under this scenario, some assets would remain in service beyond their useful lives, and some rehabs would continue to be deferred, so the SGR of the system remains approximately the same throughout the planning period.

We propose to develop projections under a fourth intermediate scenario: Reduce Backlog/Improve SGR. Under this scenario, the backlog would be reduced but not eliminated by 2040, and the SGR would improve but not reach the ideal state. The three scenarios presented here, as well as the proposed Reduce Backlog/Improve SGR scenario, provide the range of transit capital needs as the region begins the funding tradeoff discussions.

Changes from T2035

As in T2035, the transit capital need projections are based on the Regional Transit Capital Inventory (RTCI) originally developed for T2035. Unlike T2035, the projections were produced using FTA's Transit Economics Requirement Model (TERM), a capital planning tool used by FTA for national-level projections, including the 2009 Rail Modernization Report and the 2010 National State of Good Repair Assessment. We used TERM as an intermediate step toward implementation of "TERM Lite," a more user-friendly version of TERM that FTA is developing for use by operators and MPOs.

There are several reasons for the differences between the projected needs for Plan Bay Area compared to the T2035 projections:

- SFMTA's need projections are based on the initial capital asset inventory which was completed in 2010. SFMTA was unable to complete the inventory (for assets other than vehicles) in time for use in T2035, so the T2035 projections were extrapolated from SFMTA's CIP. The asset-based approach used for the Plan Bay Area projections is more comprehensive than the project-based approach used in T2035, resulting in an increase in SFMTA's projected needs.

- Other operators completed an update of the asset inventories they had developed for use in T2035. In many cases, the operators refined replacement and rehab costs, and useful lives, and in some cases corrected errors and omissions in asset counts. BART was unable to complete an update of its inventory data in time for use in the preliminary projections, so, with the exception of the BART car replacement costs noted below, the projections are based on BART's original data for T2035. Staff is working with BART to complete an update of its asset inventory.

- The RTCI consultant team, working with the operators, recommended numerous revisions to asset classifications, replacement and rehab costs, and useful lives which are intended to result in more accurate projections.

- The costs of the BART car replacement project were modeled to match BART's current projected total of $3.2 billion as compared to $2.7 billion in T2035.

- Marin County Transit District's projected capital needs are included for the first time (SMART and Rio Vista will be incorporated in later revisions to the projections).

- The Plan Bay Area projections are for 28 years vs. 25 years for T2035.

- The Plan Bay Area projections assume an inflation rate of 2.2% vs. 3.0% for T2035.

- The first year of the Plan Bay Area projections is 2013 vs. 2009 for T2035, so the costs include an additional four years of inflation.

Taking these variables into account, the Plan Bay Area projections are generally consistent with T2035.

Revisions to Projections

These are preliminary draft projections. After presenting the preliminary projections, we plan to make a second round of revisions over the summer before finalizing the projections for the RTP tradeoff discussions in the fall. The second round of revisions will include:

- Updated asset data for BART, if available.

- Further refinements to capital inventory data for SFMTA and other operators based on analysis of the preliminary projections.

- Addition of SMART and Rio Vista, which were not included in the T2035 capital need projections.

- Transfer of ferry assets and capital needs from Vallejo to WETA.

Performance Measures

The performance measure for the transit capital program in the RTP is the Average Age of Assets as a Percentage of Useful Life, with a target of reducing the average to 50% of the useful life, which represents an ideal state of good repair. In developing the preliminary need projections, we have found that the average age is strongly affected by long-lived, high-cost assets that are rehabilitated but not replaced during the projection period under any scenario, such as the BART tube and elevated guideway. To address this anomaly, staff is evaluating two alternative measures:

- The dollar value of the backlog of assets that are past their useful life or have deferred rehab work; and

- The percentage of assets (weighted by replacement value) over their useful life.

The attached charts (Attachment B) illustrate the results for each of these alternatives under the Attain SGR in 10 Years and Maintain Backlog scenarios, as well as other measures that can be estimated using TERM, including the condition rating of assets (estimated based primarily on age because we do not have actual condition data in the RTCI).

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Attachment A.

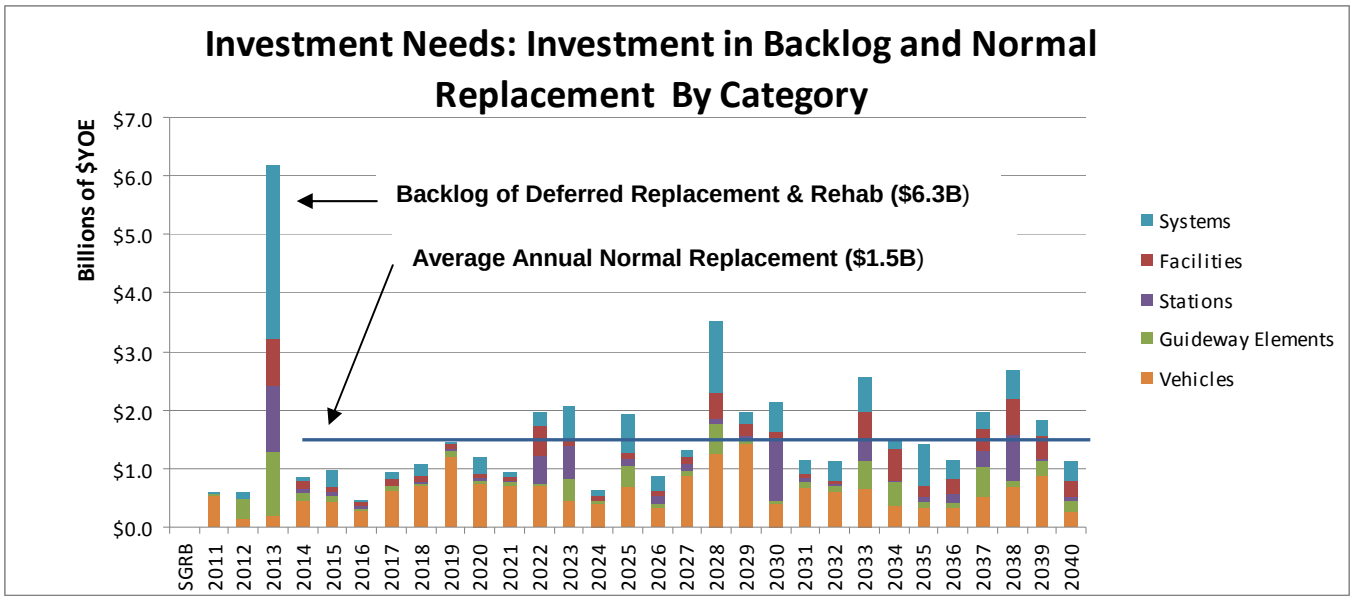
Plan Bay Area Preliminary Transit Capital Need Projections, 2013 - 2040, Unconstrained Scenario

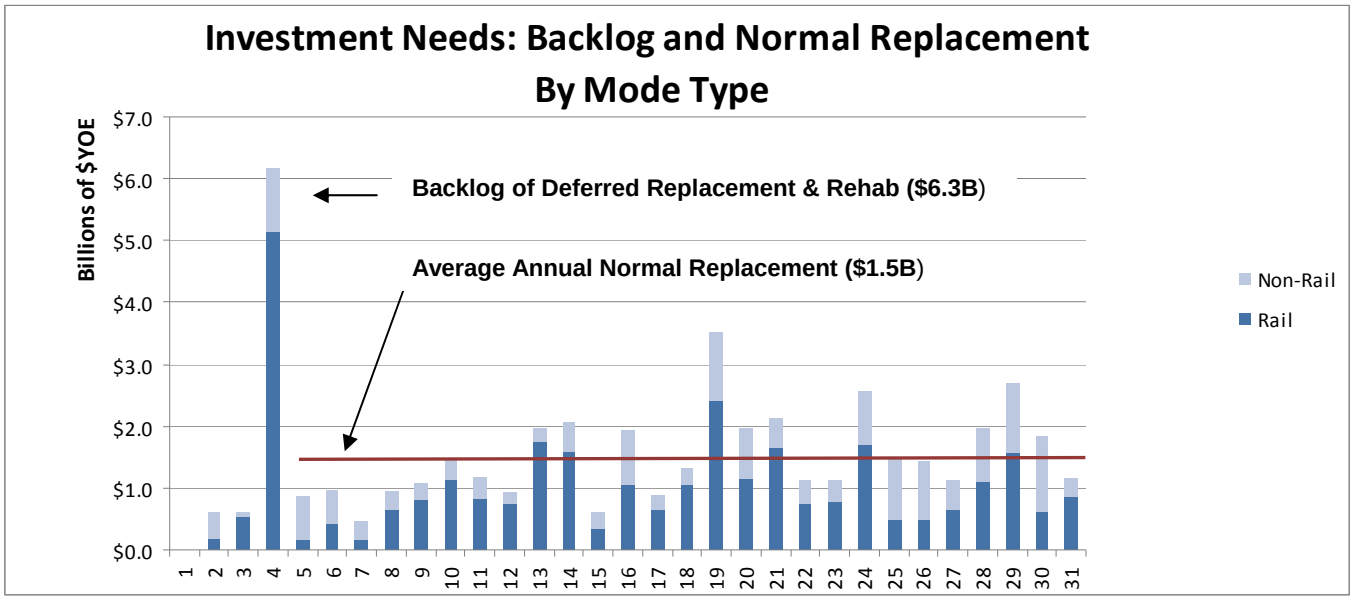
Year-of-Expenditure $ millions

	Asset Category					
Operator	**Facilities**	**Guideway**	**Stations**	**Systems**	**Vehicles**	**Total**
AC Transit	$ 1,560.6	$ -	$ 36.2	$ 320.7	$ 1,526.9	$ 3,444.4
ACE	17.2	-	5.7	18.2	118.8	159.9
BART	1,000.6	3,241.2	1,871.0	3,604.8	5,282.6	15,000.2
Caltrain	151.3	729.0	1,675.7	482.3	907.0	3,945.3
CCCTA	111.4	-	-	32.6	280.8	424.7
ECCTA	22.8	-	-	1.6	172.9	197.3
Fairfield	72.1	-	-	5.1	102.3	179.5
GGBHTD	237.2	87.5	182.5	100.4	697.2	1,304.8
LAVTA	23.1	-	0.1	22.7	178.0	223.8
Marin County	1.7	-	-	-	41.1	42.8
Napa	51.5	-	6.8	5.9	81.0	145.2
Petaluma	4.7	-	4.6	0.7	24.2	34.2
SamTrans	514.9	-	44.6	170.8	766.2	1,496.5
Santa Rosa	11.1	-	3.8	8.6	103.8	127.2
SFMTA	1,857.9	1,133.3	1,413.0	5,821.7	4,269.5	14,495.3
Sonoma Coun	105.2	-	22.9	21.1	117.2	266.4
Union City	-	-	3.6	1.4	58.5	63.4
Vacaville	17.4	-	7.9	3.2	41.0	69.6
Vallejo	84.2	10.4	238.8	29.3	251.9	614.5
VTA	613.1	464.5	403.6	985.5	1,944.4	4,411.2
WETA	11.7	16.3	16.0	0.4	136.9	181.2
Westcat	53.7	-	-	4.8	106.7	165.2
Clipper	-	-	-	43.9	-	43.9
Total	$ 6,523.4	$ 5,682.3	$ 5,936.6	$ 11,685.5	$ 17,209.0	$ 47,036.7

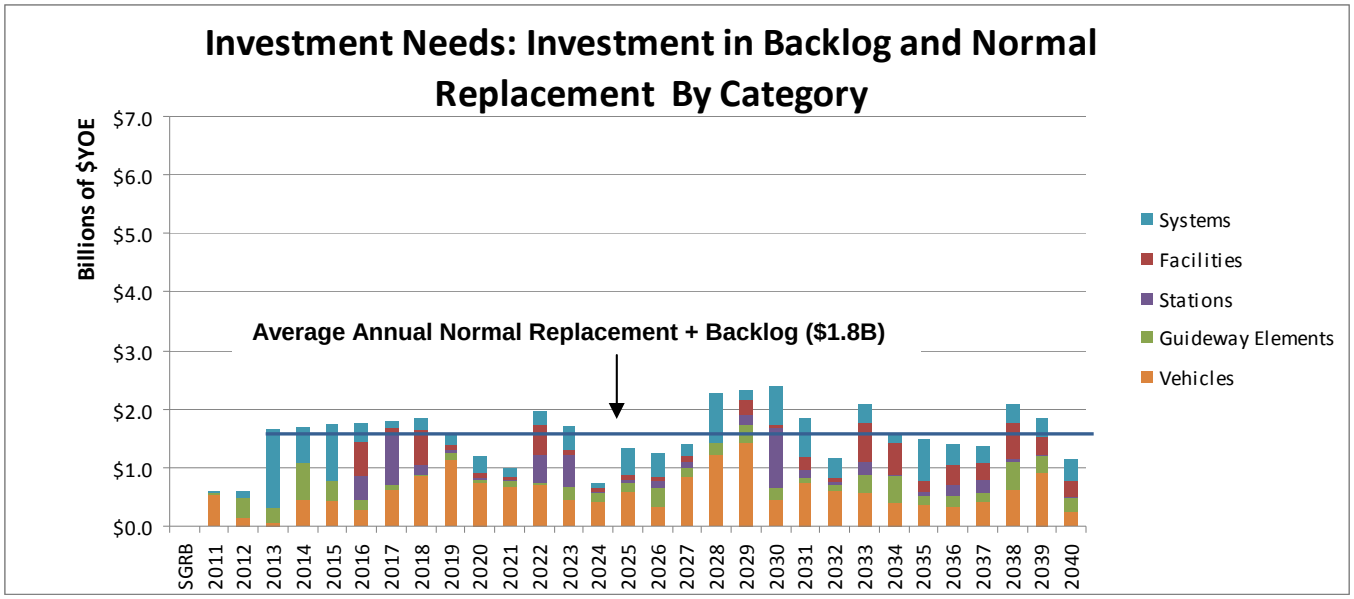
Attachment B.
Plan Bay Area Preliminary Transit Capital Need Projections
State of Good Repair Measures

Unconstrained Scenario – Attain SGR in One Year

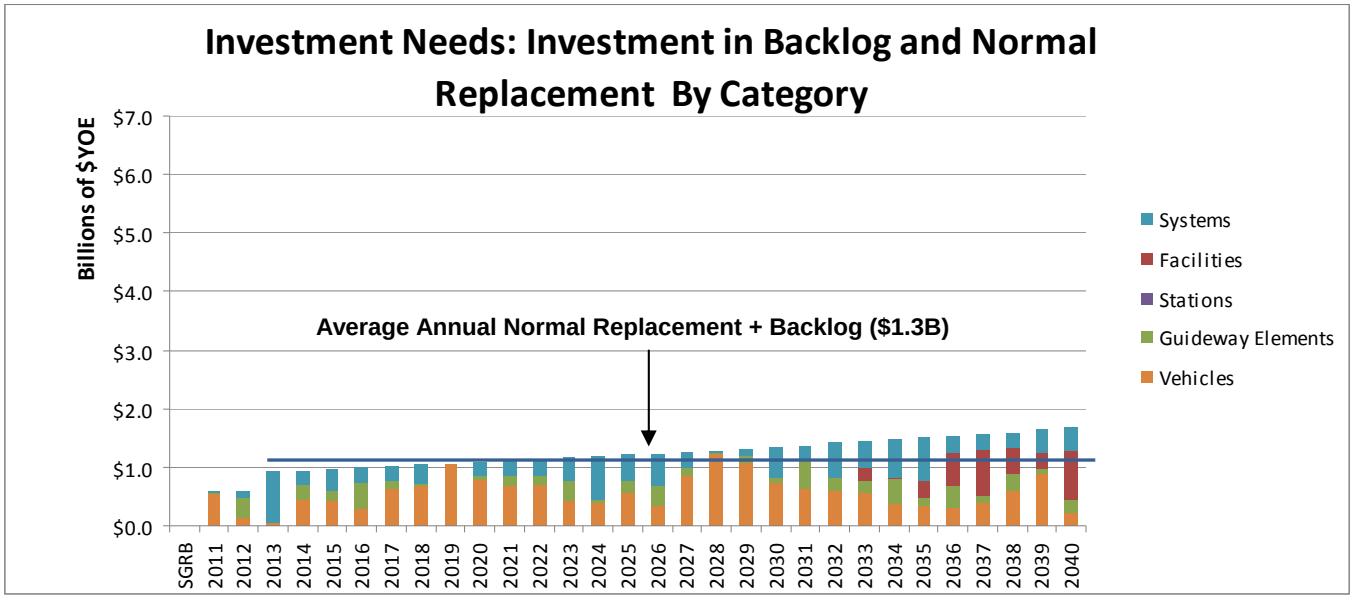




Attain SGR in 10 Years Scenario



Maintain Current Backlog Scenario



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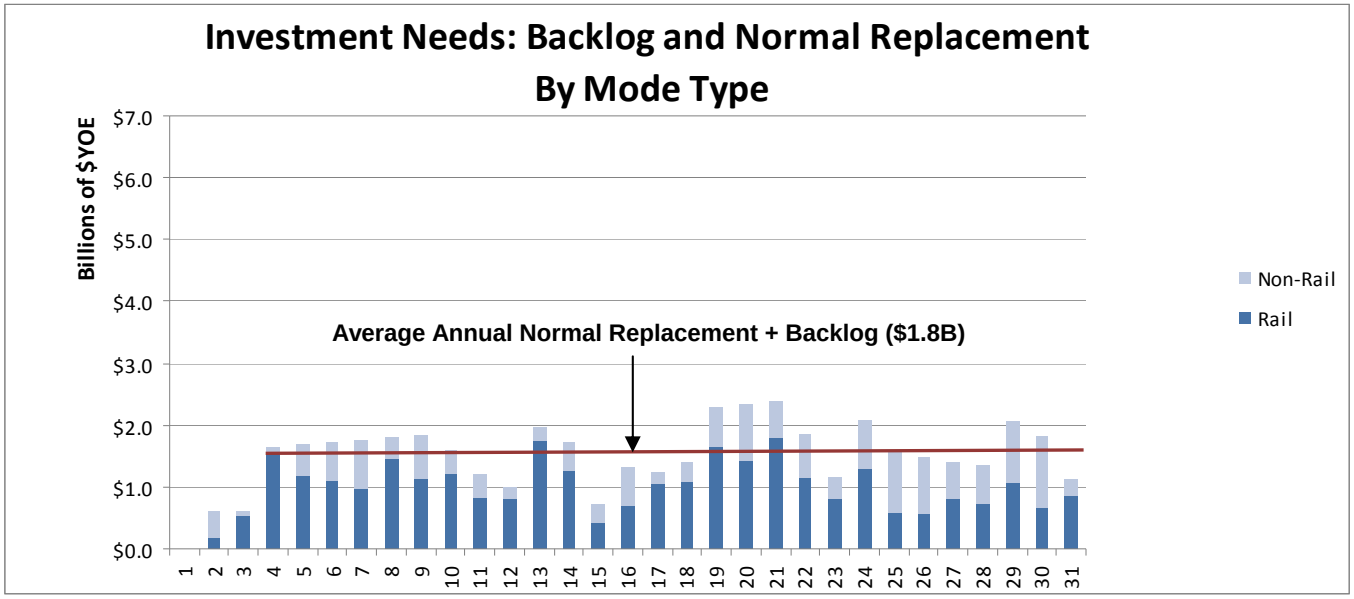

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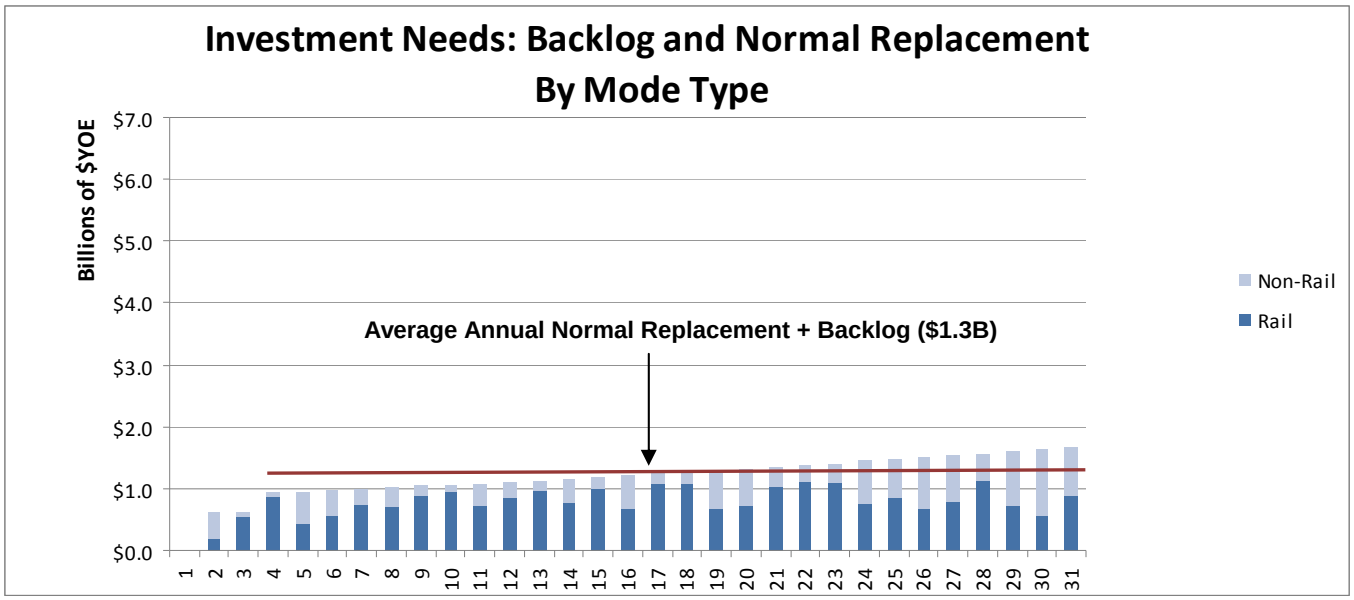

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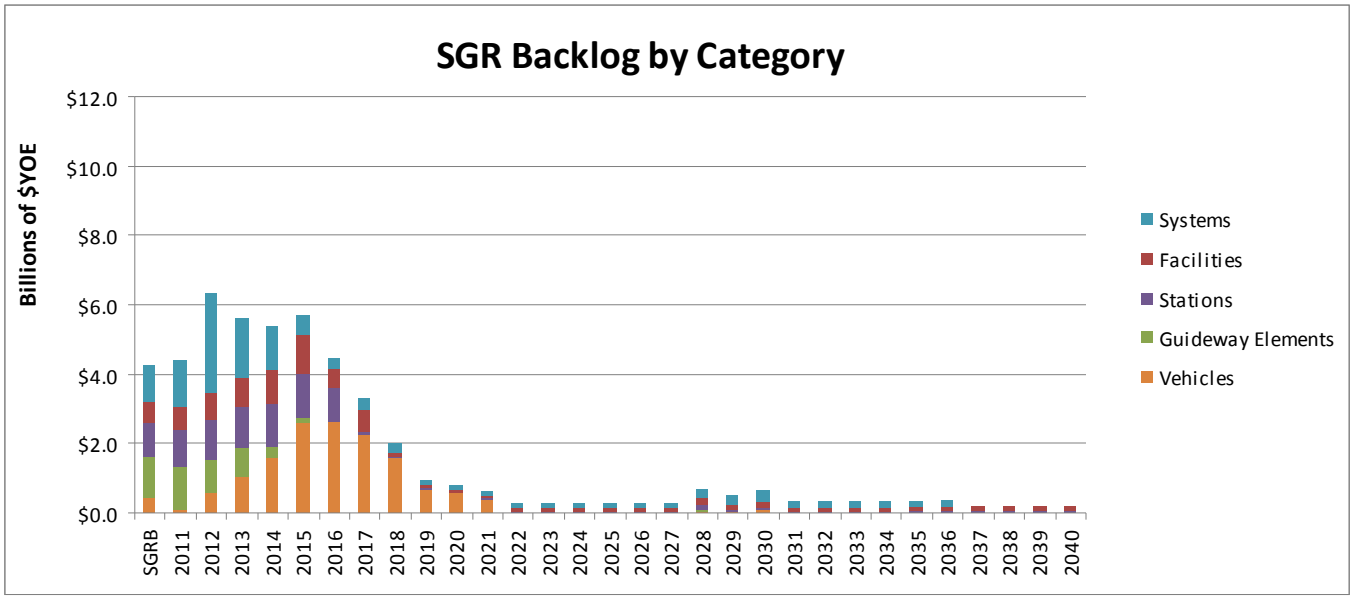

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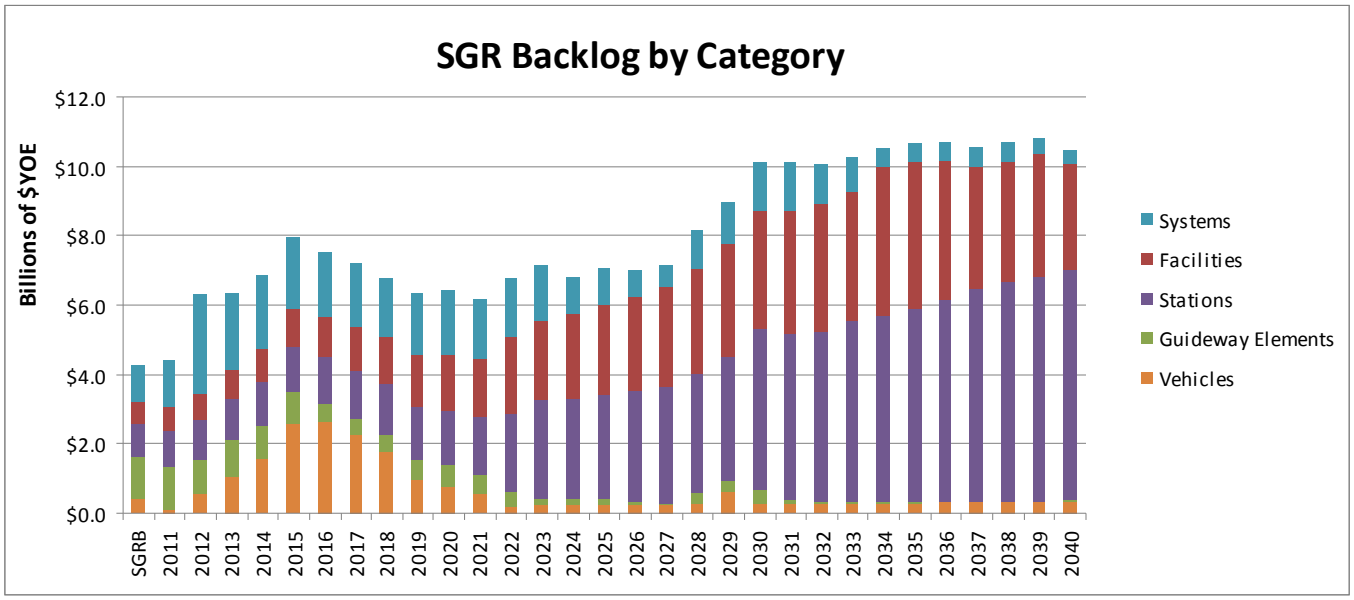
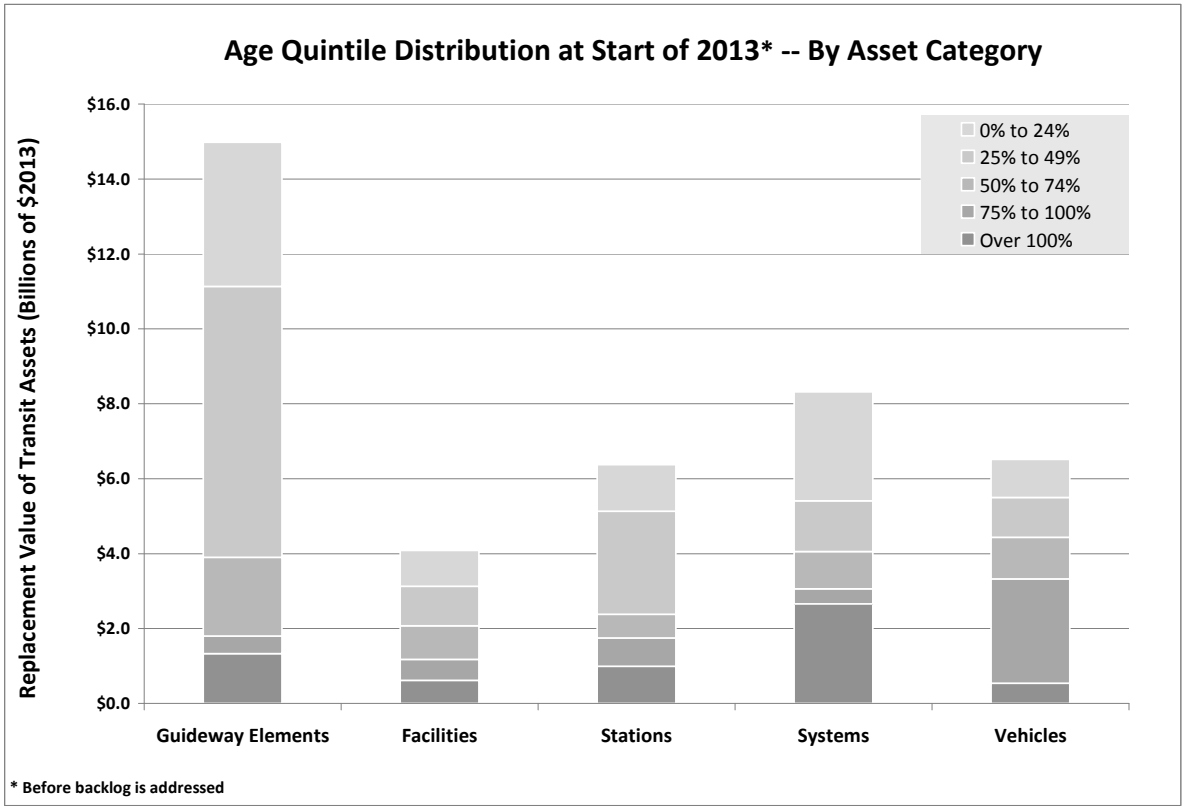


The increase in the backlog in the Maintain Current Backlog Scenario is due to inflation, because costs are expressed in year-of-expenditure dollars. The backlog is maintained at the current level in constant dollars.

All Scenarios



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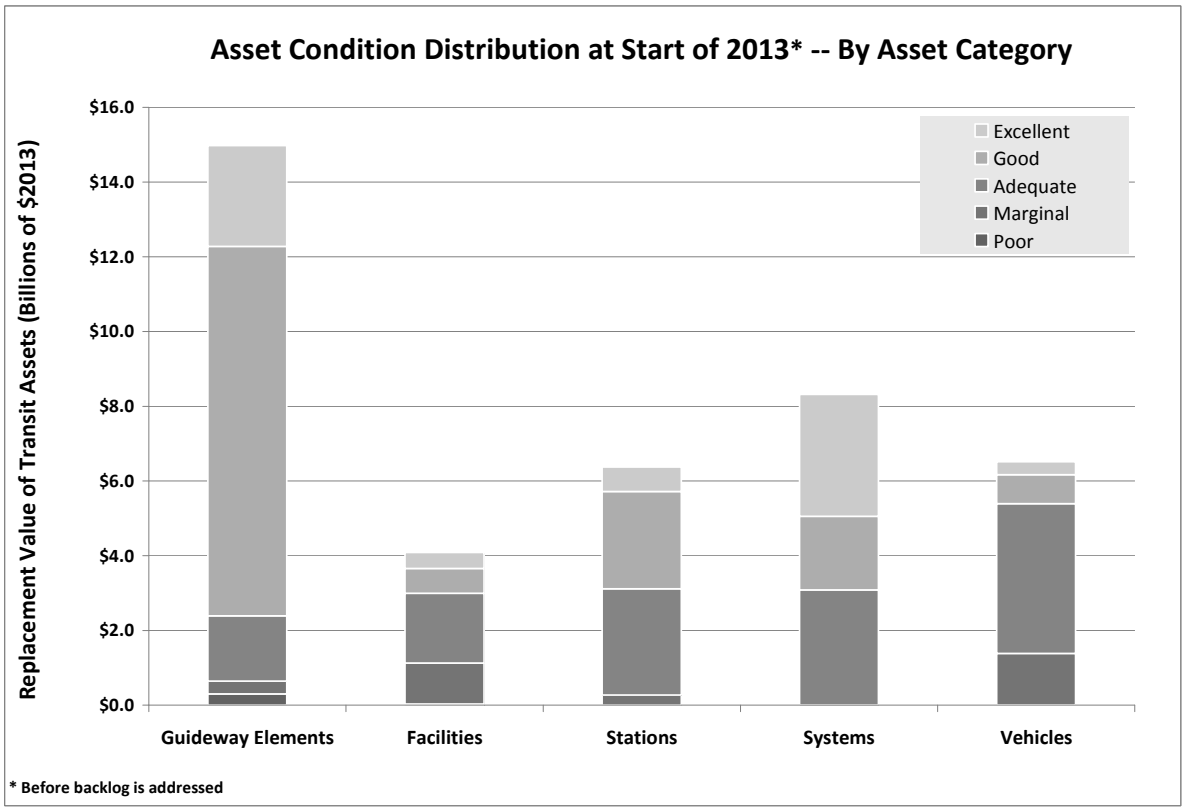

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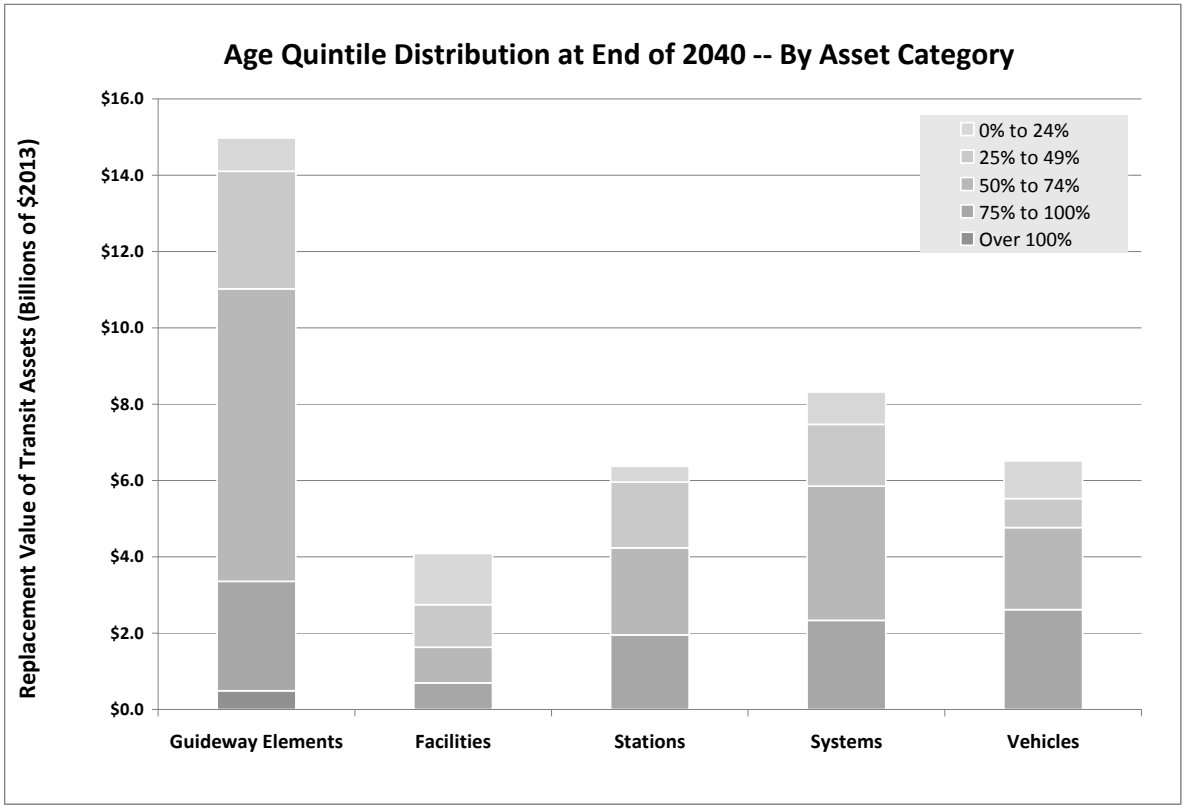

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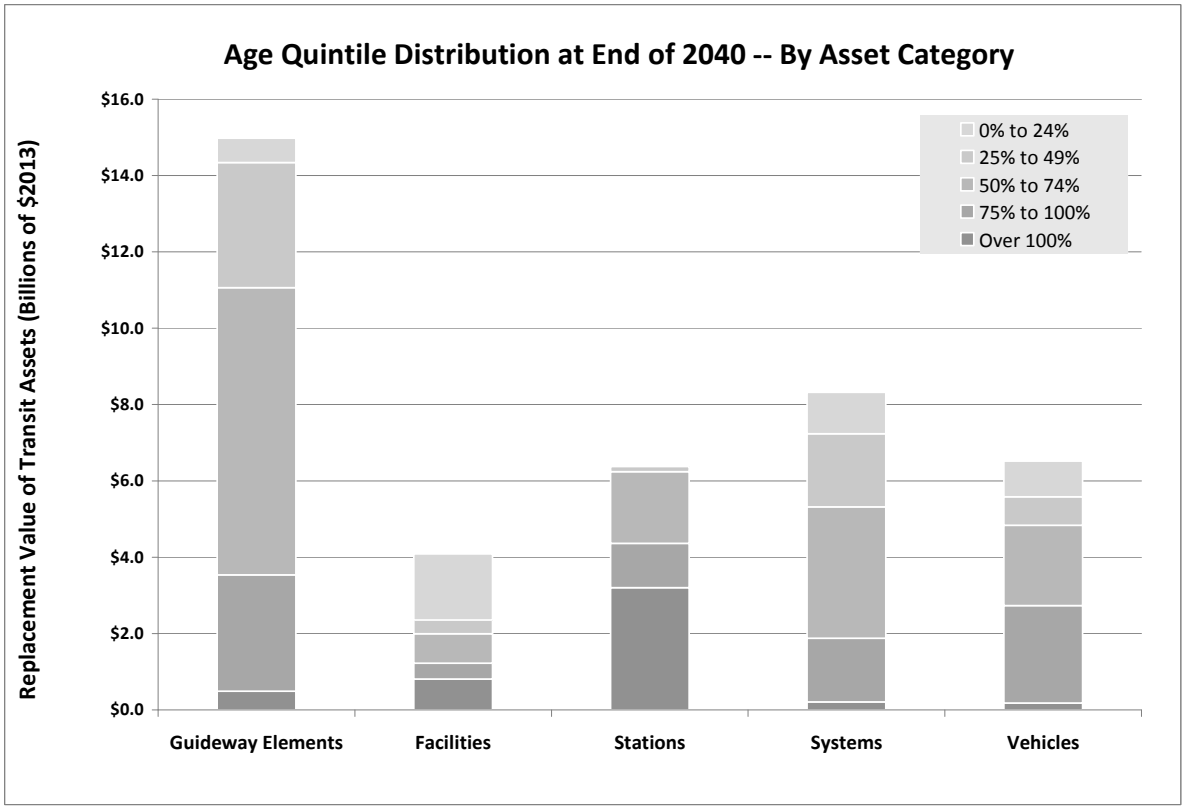

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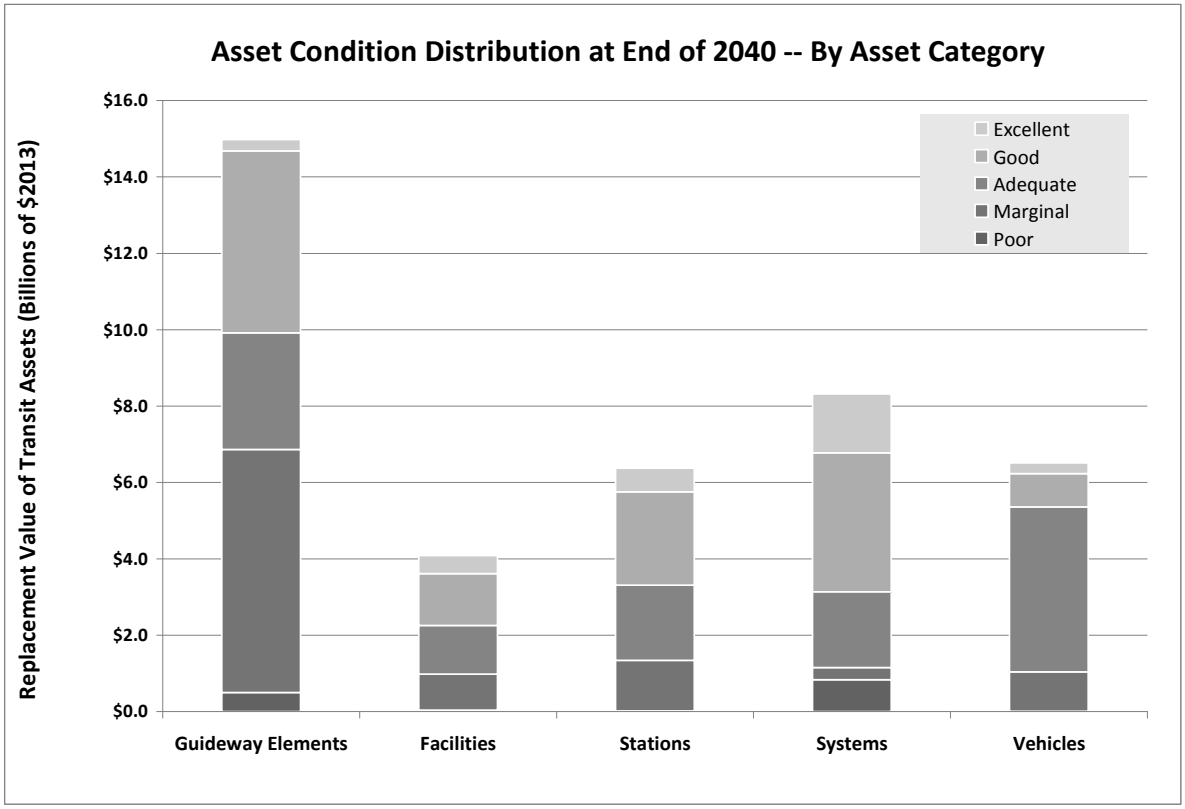

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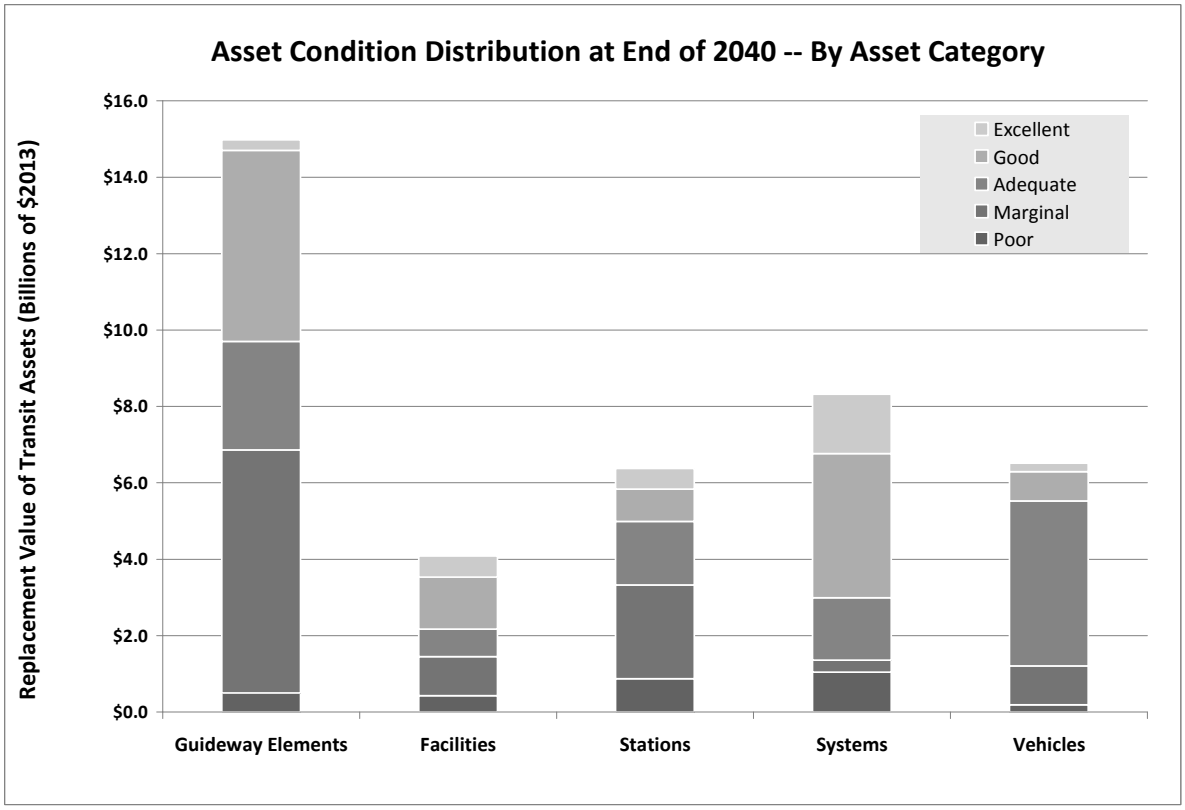

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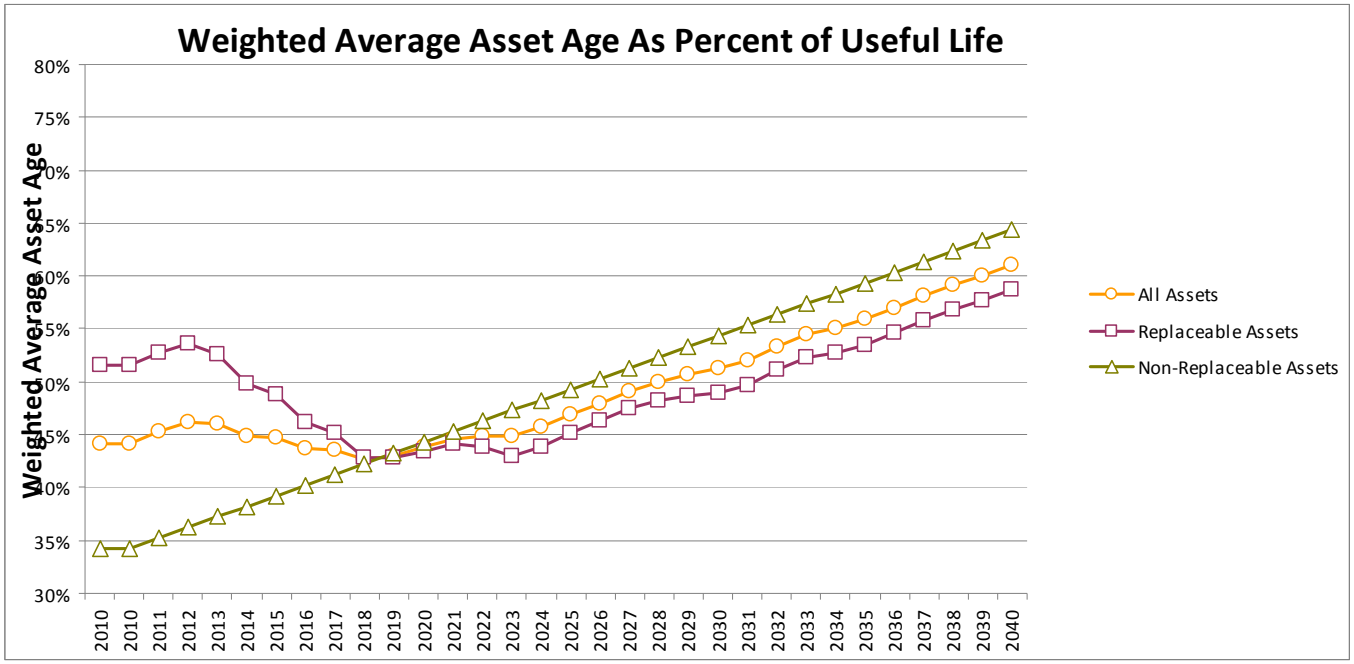

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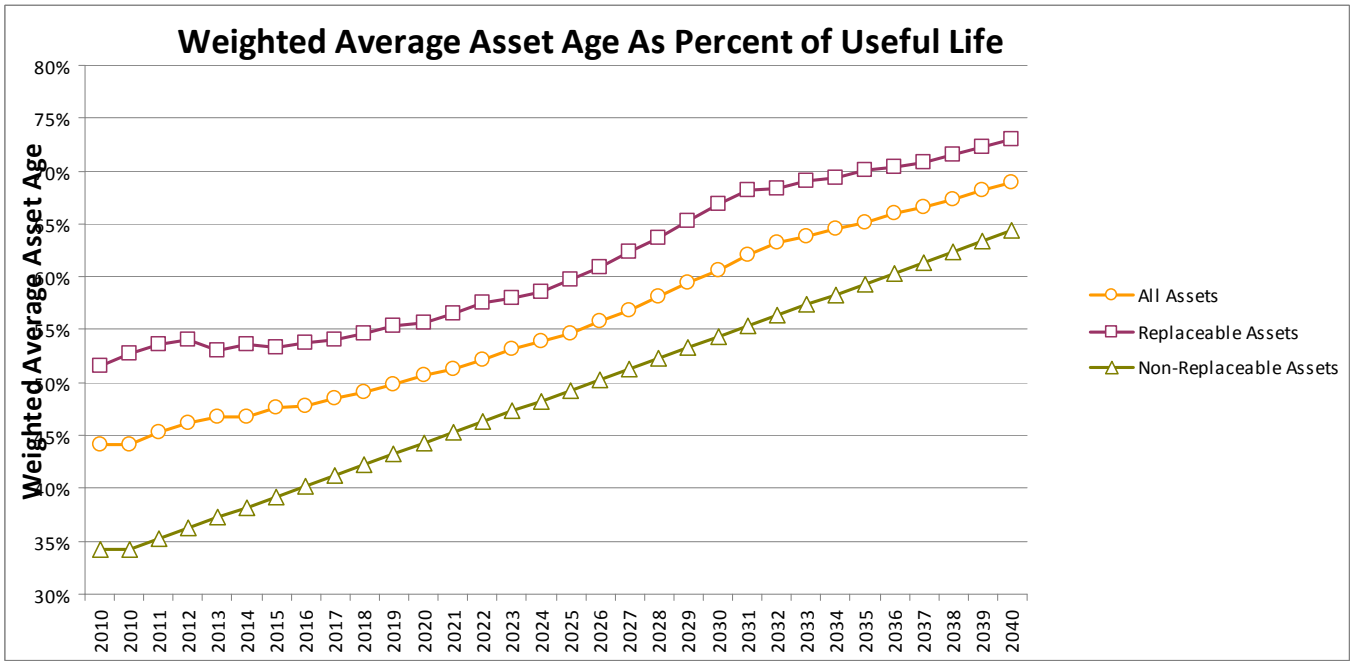

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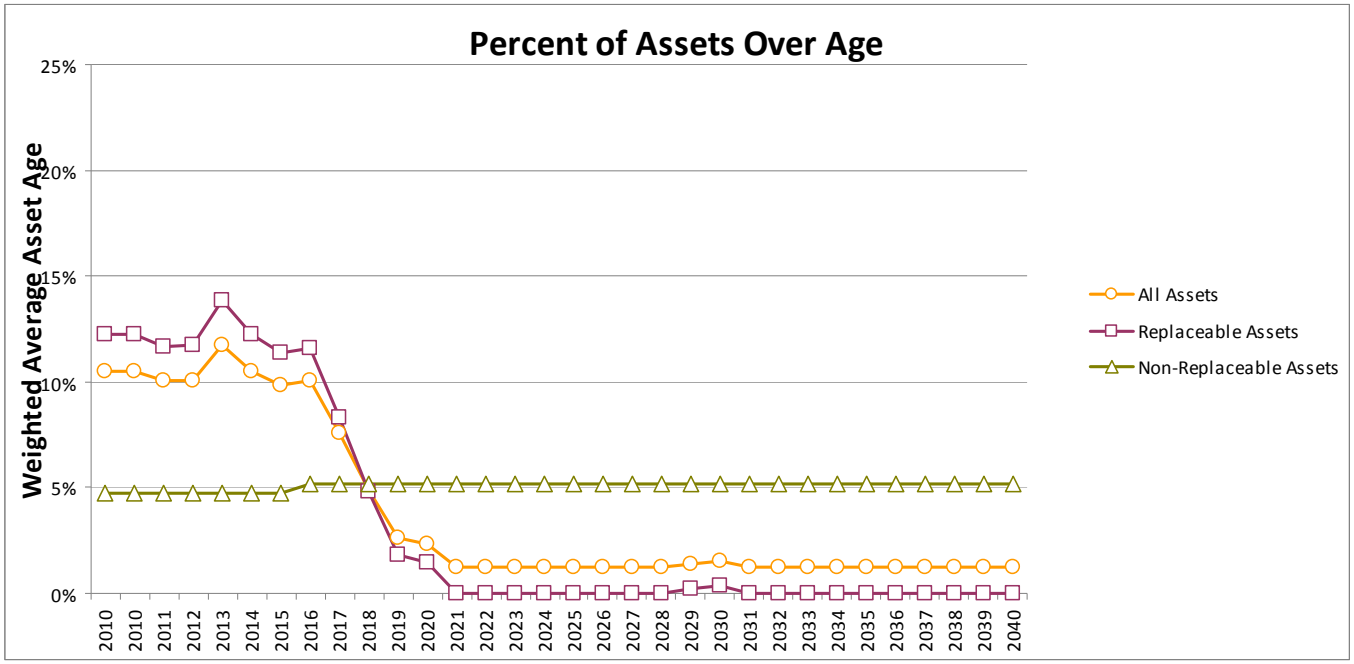

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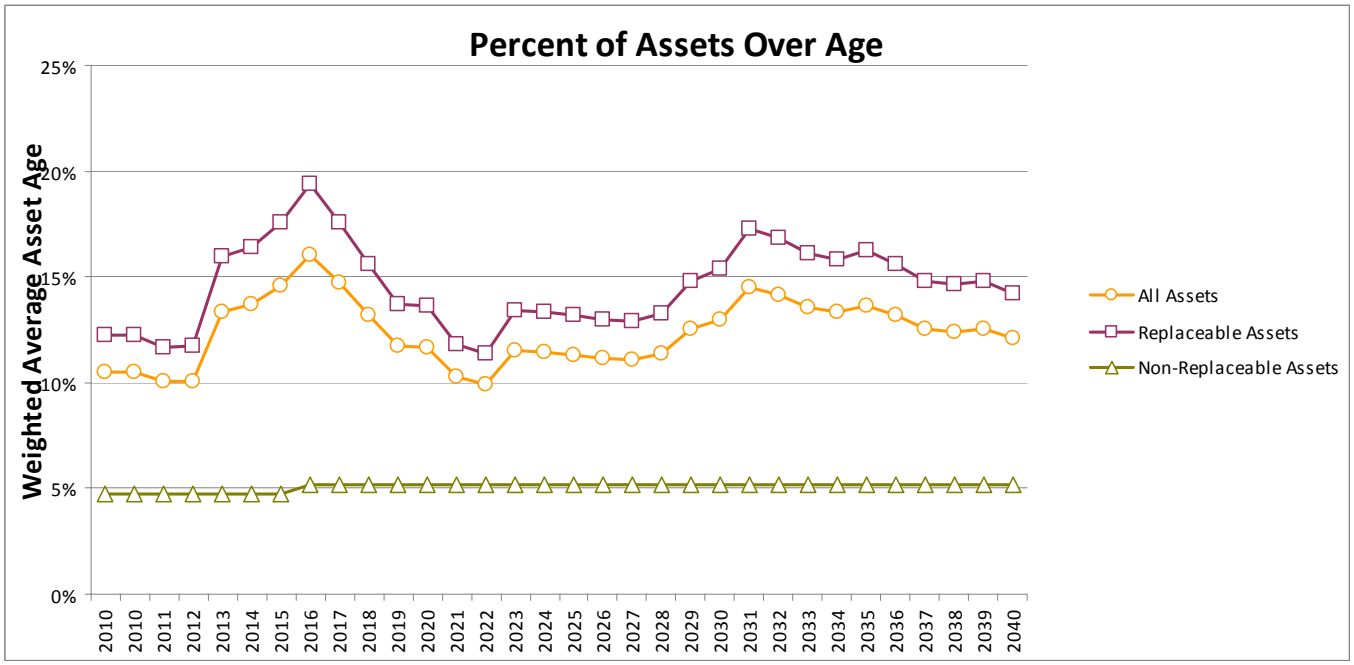

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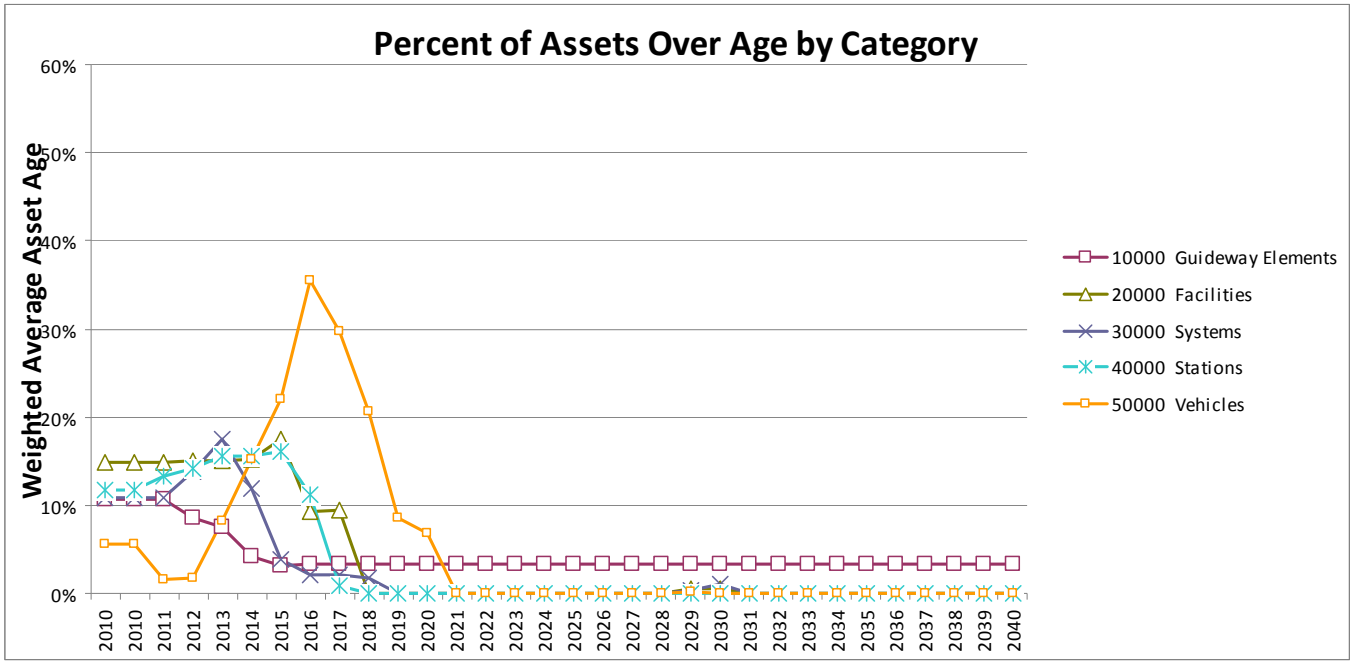

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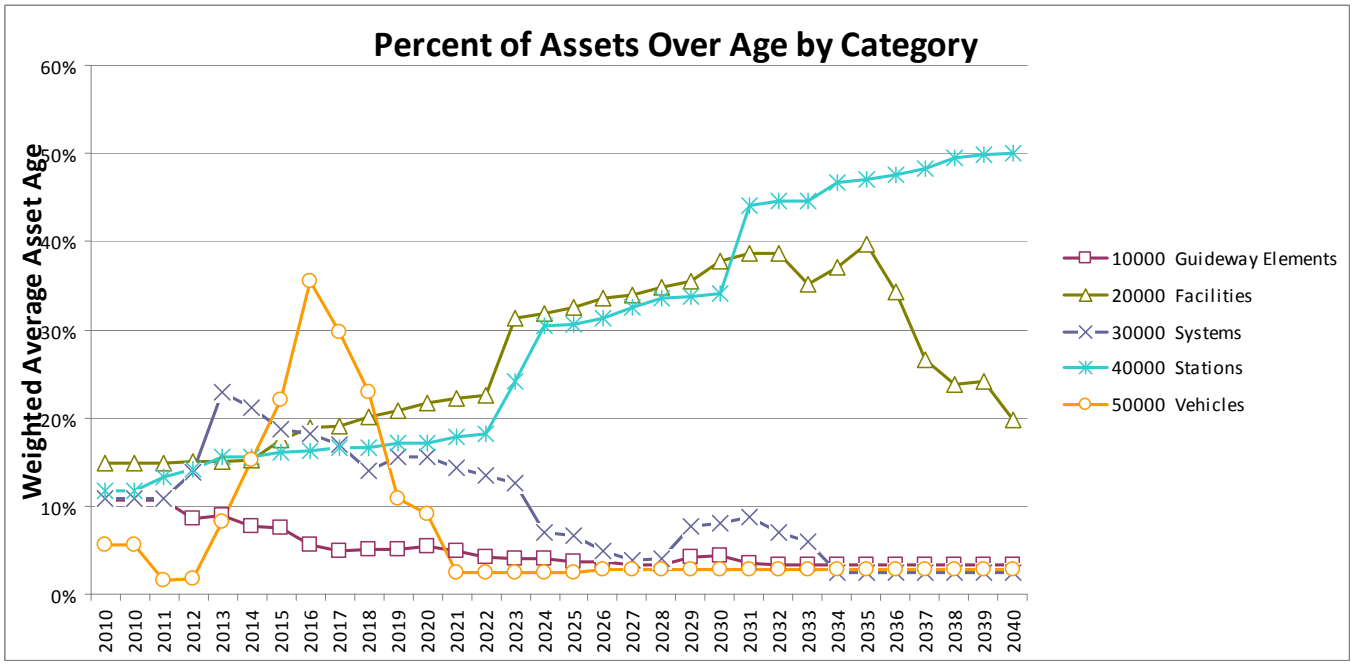

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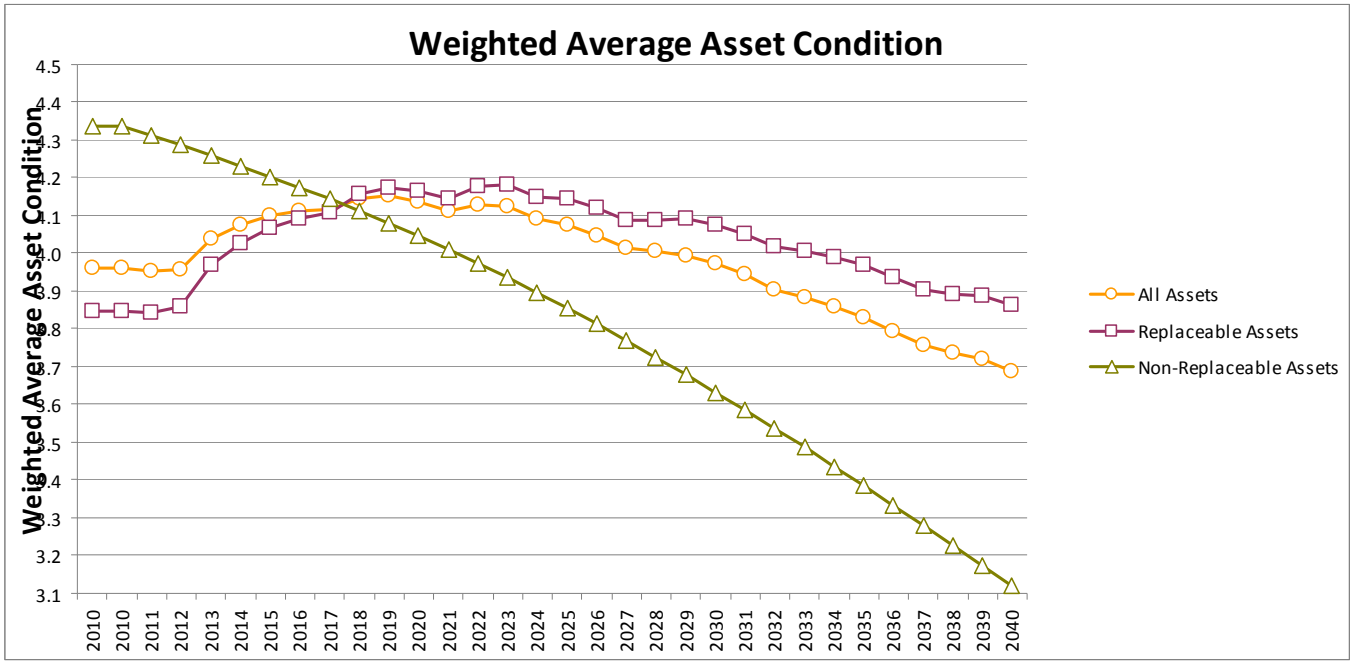
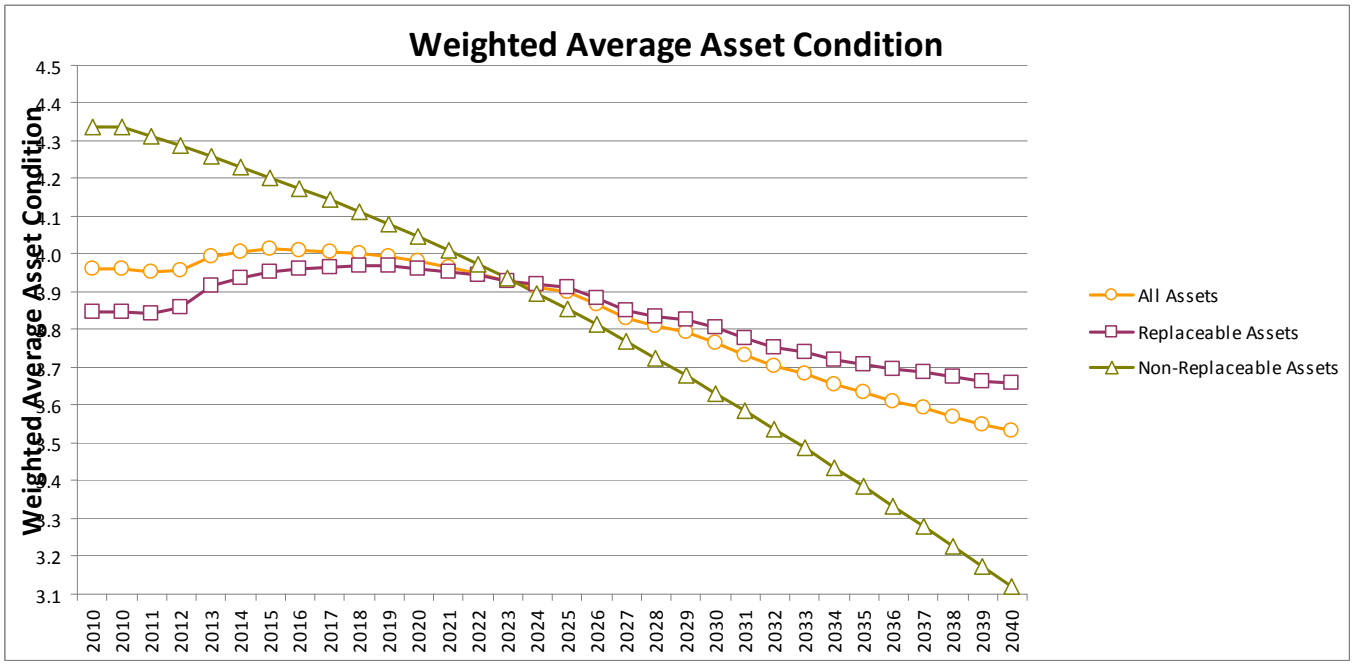
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