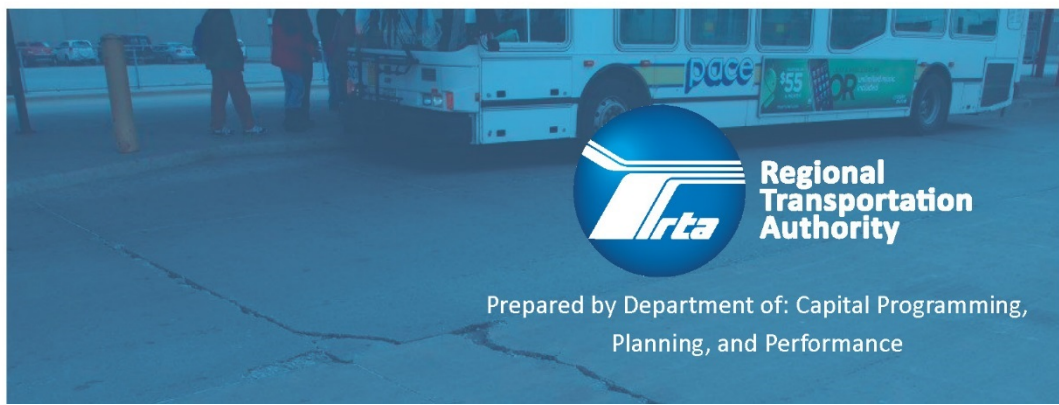


# CAPITAL ASSET CONDITION 2016

## YEAR 5 ASSESSMENT



**Regional  
Transportation  
Authority**

Prepared by Department of: Capital Programming,  
Planning, and Performance

December 2016

Dear Rider:

This is the 2016 update of the Regional Transportation Authority (RTA) Capital Asset Condition report. This series of reports, first published in 2010, provided an assessment of the current physical conditions and 10-year capital reinvestment needs of the transit capital assets owned and operated by the RTA and the three Service Boards. This 2016 Report reflects the reinvestment needs of the region's transit assets as of December 31, 2015.

The RTA is responsible for planning, funding, and oversight of public transportation in Northeastern Illinois. As such, the RTA allocates funding to three Service Boards: the Chicago Transit Authority (CTA), Metra commuter rail and Pace suburban bus and regional ADA paratransit service. The RTA network serves the third largest US transit market, with approximately nine million residents and two million riders each weekday. The RTA's asset base includes about 7,500 passenger vehicles, almost 1,500 track miles, over 400 stations, and nearly 70 maintenance facilities. With some of the nation's oldest transit assets, the RTA has significant reinvestment needs to attain and maintain a state of good repair (SGR).

The Regional Transit Strategic Plan established goals to ensure financial viability in the region, and to advocate for and be a trusted steward of public transportation. To accomplish these goals, the RTA conducted the fifth capital asset condition and inventory update and refined the Capital Optimization Support Tool (COST), in collaboration with the Service Boards, to provide the RTA and the Service Boards the ability to assess and prioritize transit capital investment needs within the parameters of regional funding and long-term strategic objectives. COST also aligns with the goals and expectations of the Federal Transit Administration (FTA). It should be noted that the Service Boards are implementing individual asset management systems in response to the new FTA ruling on Transit Asset Management (TAM) published in July 2016. The RTA recognizes that the success of this regional initiative is largely dependent upon the foundation built by the Service Board asset management practices.

Key findings of this report include:

- The state-of-good-repair (SGR) backlog for the region is \$19.4 billion.
- The 10-year capital need for normal capital reinvestment is \$18.3 billion.

The backlog and 10-year needs have decreased slightly since the 2014 Assessment (in inflation-adjusted dollars). While periodic variations are expected given replacement schedules, the current estimates should be viewed as a snapshot in time, with the underlying Service Board capital asset inventory data and methods of analysis continually improving. In addition, an improvement due to recent capital reinvestments in the system, and asset cost and replacement revaluation assumptions by the Service





Boards also influence the needs assumptions. The 2016 Assessment identifies a \$19.4 billion backlog. Despite significant shortfalls in funding that has led to this backlog, the region's service as compared to peer regions fares well in terms of performance and customer satisfaction.

To address the region's capital needs, the RTA Board of Directors has approved the 2017 operating budget, 2018-2019 financial plan, and five-year 2017-2021 capital program that allow the RTA to issue up to its full bonding capacity during this period to further increase funding for the CTA, Metra and Pace capital programs. In addition, the RTA approved the allocation of the Innovation, Coordination, and Enhancement (ICE) funds to the Service Boards, which can be used for capital projects. The CTA and Pace have each also programmed bonds from their own sources for transit improvements. The CTA has also programmed significant increased funding for the Red Purple Modernization (RPM) project from a \$957 million federal Core Capacity grant and \$622 million in Transit Tax Increment Financing (TIF) from the City of Chicago. The federal core capacity grant funding will extend beyond the five-year capital program period, with \$656 programmed in the current 2017- 2021 period.

Despite these efforts, current capital funding is still not sufficient to support the much needed renewal of the region's aging transit infrastructure. The RTA and the Service Boards have determined that they require an annual funding level of between \$2 and \$3 billion to address the SGR needs of the system and undertake limited modernization, enhancement and expansion initiatives. Deferring infrastructure maintenance and replacement has negative impacts on the quality of service provided, including deteriorating service reliability. The RTA, in accordance with the Strategic Plan, is committed to seeking stable, long-term capital funding solutions critical to renewing and maintaining the region's transit system. The RTA and the Service Boards must collectively work to educate the public on the region's transit needs and advocate for funding, especially from the State. The 2017 capital program represents the third consecutive year in which the State of Illinois has not provided capital investment funding.

The RTA recognizes the commitment, collaboration, cooperation and level of effort each Service Board provided in order for the capital asset condition update to be a success. The RTA is extremely appreciative and pleased to note the exemplary and ongoing commitment of transit agency personnel during this process. The RTA will continue to work with the CTA, Metra and Pace to advocate for more capital funding at both the state and federal level to ensure our transit system continues to prioritize and work towards a State of Good Repair.

Sincerely,

A handwritten signature in dark ink, appearing to read 'L. Redden', is positioned above the printed name.

Leanne P. Redden  
Executive Director

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## 1. EXECUTIVE SUMMARY

### 1.1 Background

This report is an update of the Regional Transportation Authority Capital Asset Condition Assessment. This report focuses on the 10-year capital reinvestment needs of the transit capital assets owned and operated by RTA and its three Service Boards, CTA, Metra and Pace. Specifically, it reflects the condition and the reinvestment needs of the entire region's capital transit assets as of December 31, 2015.

The main report findings include:

- State-of-Good-Repair (SGR) backlog for the region is \$19.4 billion<sup>1</sup>.
- 10-Year capital need for normal capital reinvestment is \$18.3 billion<sup>2</sup>.

RTA's asset management process is consistent with the latest direction from FTA through the 2012 Transportation Legislation bill, Moving Ahead for Progress in the 21<sup>st</sup> Century (MAP-21). The Fixing America's Surface Transportation Act (FAST Act) was signed in December 2015 and builds on MAP-21. It is the first long-term transportation authorization enacted in a decade that provides long-term funding certainty for surface transportation. FTA released its new Transit Asset Management (TAM) Rule in July 2016.

Sections 2.4 and 4.1 provide an overview of FTA's final TAM rule and performance metric reporting, effective October 1, 2016. Specifically, the asset management process calls for:

- Annual asset inventory updates
- Discussion of SGR measures and targets
- Condition assessments.

### 1.2 SGR Backlog and 10-Year Needs

As of December 2015, the region's total capital reinvestment needs over 10 years are estimated to be roughly \$38 billion (Figure 1-1). This includes \$19.4 billion to address the existing investment backlog (51 percent of total needs) and an additional \$18.3 billion to address normal reinvestment needs expected over the next 10 years (2016 to 2025), or \$1.8 billion per year. Normal reinvestment includes ongoing asset replacement, rehabilitation, and expenditures on minor capital repairs grouped under "annual capital maintenance." As considered in more detail later in the report, a significant proportion of the region's reinvestment needs (the backlog in particular) are associated with the region's older rail assets and insufficient capital reinvestment over time.

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<sup>1</sup> Backlog consists of deferred reinvestment in asset rehabilitation, replacement, and annual capital maintenance.

<sup>2</sup> Normal capital reinvestment includes normal replacement, plus scheduled rehabilitation work and annual capital maintenance.



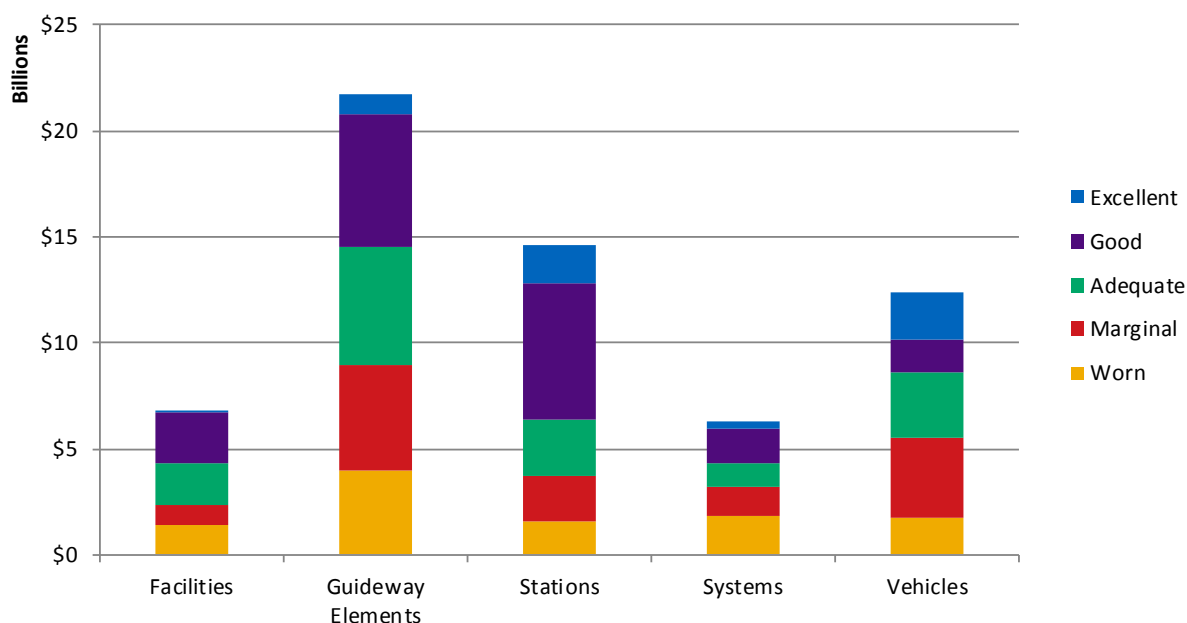
Figure 1-1. Backlog and 10-Year Normal Reinvestment Needs Summary (Millions of \$2015)

Service Board	SGR Backlog	Normal Reinvestment			Total
		Replace	Rehab	Capital Maint.	
CTA	\$12,456	\$5,729	\$4,199	\$698	<b>\$23,082</b>
Metra	\$6,139	\$4,260	\$1,282	\$323	<b>\$12,004</b>
PACE	\$755	\$1,150	\$561	\$120	<b>\$2,586</b>
<b>Total</b>	<b>\$19,350</b>	<b>\$11,139</b>	<b>\$6,043</b>	<b>\$1,140</b>	<b>\$37,672</b>
<b>% of Total</b>	51.4%	29.6%	16.0%	3.0%	100.0%

### 1.3 Condition Assessment and its effect on investment needs

Investment backlog and condition are linked. Since the backlog is comprised of deferred investment in asset replacements, rehabilitation, and annual capital maintenance, assets in the worst condition are the most likely to make up the backlog. Figure 1-2 represents the full distribution of transit asset conditions for the region for each of the major asset types: facilities; guideway elements; stations; systems; and vehicles. The height of each bar represents the total value of the assets by category in billions of 2015 dollars. Figure 1-2 includes all assets, not just those needing reinvestment, so the sum of the bars has greater value than the \$37.7 billion “needs” number (The total asset value estimate is \$62 billion, not including the estimated \$100 billion for tunnels).

Figure 1-2. Distribution of Asset Conditions by Asset Category: RTA (\$2015)

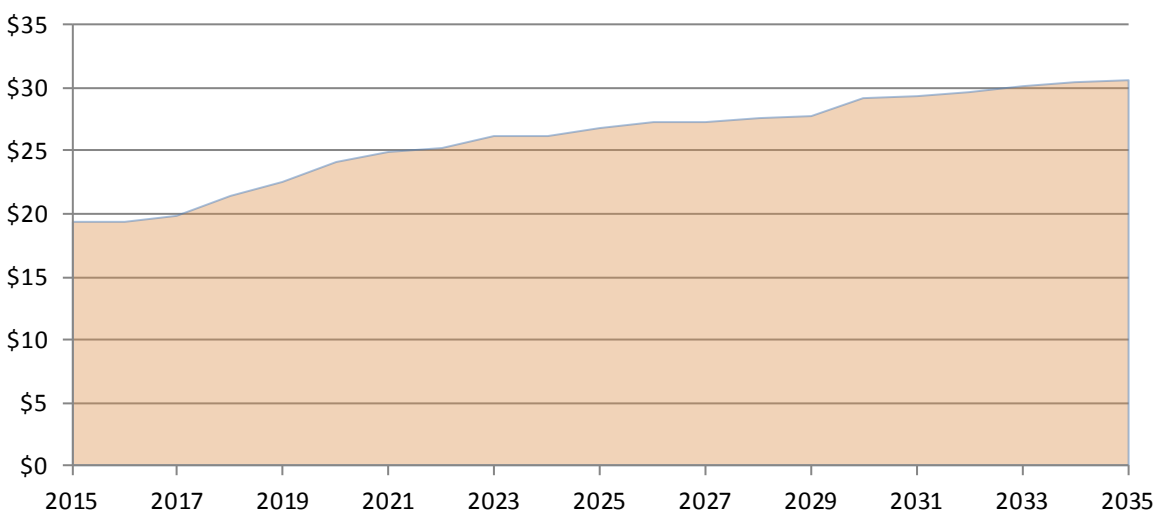


The figure illustrates, for instance, that guideway elements and vehicles have large proportions of assets in marginal condition and may need the most attention. Stations have a large share of assets in good or excellent condition.

## 1.4 Regional Funding Capacity, Reinvestment Needs and the Investment Backlog

The needs estimates presented in Figure 1.1 indicate that a total investment of \$18.3 billion would be required to address expected normal reinvestment needs over the next 10 years, with an additional \$19.4 billion in funding required to eliminate the backlog. The region's current combined rate of capital reinvestment is estimated at \$785 million annually. This is considerably less than \$1.5 billion annual amount required to maintain the size of the current backlog or the \$2.6 billion in annual funding required to eliminate that backlog over the next 20 years. This outcome implies continued growth in the region's deferred investment backlog, as illustrated below in Figure 1-3, and potentially increasing proportions of assets in marginal or worn condition. If the needs funding levels are not met, the region's backlog may reach \$25 billion by 2021 and \$30 billion by 2033.

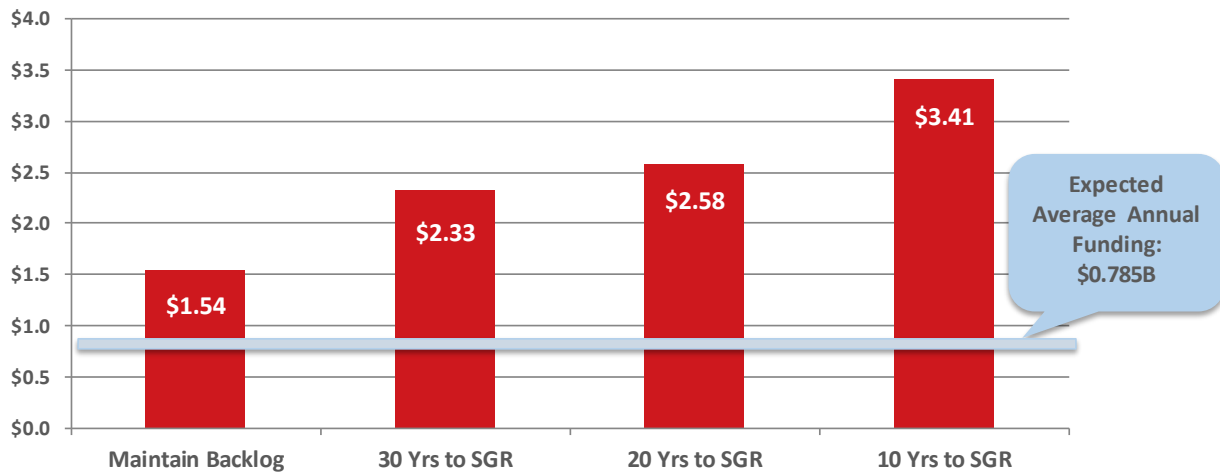
**Figure 1-3. Regional Backlog Projections (Billions of \$2015)\***



\*Projections based on \$785 million in annual average funding.

Expected RTA region capital funding for the next 20 years is currently projected to be an average of \$785 million per year. This estimate includes no Illinois state capital funding due to the current lack of a State capital investment program. The estimate does take into consideration the increased CTA funding for the Red Purple Modernization (RPM) project, but does not assume that level of funding continues beyond the project timeframe. Figure 1-4 presents the level of investment required to attain specific investment targets and the gap between the required and expected funding. For example, an estimated \$2.6 billion in annual reinvestment is required to attain SGR in 20 years (including full elimination of the backlog). To maintain the current size of the region's investment backlog requires an estimated \$1.5 billion in annual expenditures.

**Figure 1-4. Required Annual Funding to Attain Specific Reinvestment Targets (Billions of \$2015)**



Right-sizing public transportation infrastructure re-investment is critical to maintaining Chicago's position as a leading national and international city. The RTA system requires annual funding of \$2 to 3 billion for capital investment. An annual funding level of \$2.5 billion could achieve the goal set by the Service Boards of bringing 80% of the region's assets to a state of good repair in 20 years. An annual funding level of \$2.6 billion would bring the system to a full (100%) SGR in 20 years. Funding of \$3 billion would allow for the modernization and limited expansion of the system over 20 years. Almost as important as the level of funding is the consistency of the funding, which will allow for the long-term planning required for capital projects. Predictable funding would also provide revenue streams to guarantee federal loan programs, bond issuances, public-private partnerships, or other financing mechanisms.

## 1.5 Report Organization

This 2016 report contains the following sections:

- Section 1, Executive Summary – high level summary.
- Section 2, Introduction – background on the study effort, TAM Rule, and a high-level overview of the local transit service providers (i.e., Service Boards).
- Section 3, Capital Needs Assessment Findings – current backlog and asset capital reinvestment needs for the next 10 and 20 years, and related discussion. Reinvestment needs are presented at the regional level and by Service Board.
- Section 4, Performance Metrics – FTA State of Good Repair metrics and targets; region-wide SGR measures and condition charts.

Supporting information is contained in five appendices:

- Appendix A, Glossary and Acronyms
- Appendix B, Major Assumptions
- Appendix C, Asset Inventory Update
- Appendix D, Capital Optimization Support Tool (COST)
- Appendix E, 10-Year Annual Reinvestment Detail

## 2. INTRODUCTION

### 2.1 Background

The Regional Transportation Authority (RTA) performs financial oversight, public funding distribution, and regional policy planning in support of the three transit operators (also known as Service Boards) that provide transit services in northeastern Illinois:

- **Chicago Transit Authority (CTA)** – The CTA operates the nation's second largest public transportation system and covers the City of Chicago and 35 surrounding communities. Through its bus and rail systems, it provides more than 80 percent of the public transit trips in the six-county Chicago metropolitan area either with direct service or connecting service to Metra and Pace.
- **Metra** – Metra is the commuter rail agency serving Cook, DuPage, Will, Lake, Kane and McHenry counties. Metra serves more than 100 communities with 241 stations on 11 lines running from Chicago's city center.
- **Pace** – Suburban Bus and Regional Paratransit. Pace is the suburban transit provider for the Chicago area. Pace serves riders with fixed bus routes, vanpools and Dial-a-Ride programs covering 3,500 square miles spread over six counties - suburban Cook, DuPage, Kane, Lake, McHenry and Will - and 284 municipalities. Pace is also the ADA paratransit provider for the region, both for city and for suburban service.

Figure 2-1 highlights transit resources and the service provided by CTA, Metra and Pace by mode for calendar year 2015.

**Figure 2-1. Representative Service Board Resources and Transit Provided (2015)**

	CTA Bus	CTA Rail	Metra	Pace
Active Revenue Vehicles	1,888	1,470	1,302	2,906*
Other Vehicles	605		644	154
Total Fixed Guideway/Track Miles	3.8	288	1,206	N/A
Fixed Bus Route Miles	1,301	N/A	N/A	4,111
Annual Revenue Miles	52.3 million	71.3 million	43.4 million	37.0 million**
Annual Revenue Hours	5.7 million	4.0 million	1.4 million	2.2 million**
Annual Passenger Miles	670 million	1,477 million	1,623.7 million	290.2 million
Unlinked Passenger Trips (FY)	274 million	242 million	73 million	37 million
Stations, Bus Stops and Turnarounds	10,835 posted bus stops 17 parking stations 109 bus turnarounds	145	241	9 transfer centers, 9 Park-n-rides, 18 boarding/turnaround facilities

Sources: All fields are from National Transit Database for the 2015 Calendar Year, except for Other Vehicles, and stations, bus stops, turnover facility information which was provided directly by the Service Boards.

\* Includes both fixed route bus and demand response/paratransit.

\*\* Excludes ADA service.

The RTA was created in 1974 by approval of a referendum by the residents of Cook, DuPage, Kane, Lake, McHenry, and Will counties. The RTA is a special purpose unit of local government and a municipal

corporation of the State of Illinois. The three Service Boards - each led by a Board of Directors - individually handle their respective transit operations and fare responsibilities. The RTA regional system is the third largest in the country measured by transit trips. It covers almost 1,500 track miles and 6,000 route miles, and provides more than two million daily rides. Assets owned and operated by the Service Boards include approximately 7,500 passenger vehicles, 400 stations, and 70 maintenance facilities.

The RTA's current Transit Asset Management (TAM) program consists of three main elements:

- An ongoing regional transit asset inventory/condition assessment program
- A State of Good Repair (SGR) needs assessment process that is based on the inventory
- A project screening and prioritization process, which uses the goals and objectives set in the RTA Strategic Plan, and is linked to an ongoing performance measurement program.

The RTA, in conjunction with the three Service Boards, is continuing to develop a systematic and integrated approach to TAM. Each Service Board will be developing an individual TAM Plan (49 CFR Part 625) that will enable them to comply with the new Federal TAM Plan reporting requirements (49 CFR Part 630).

#### Why is This Important?

Maintaining assets in State of Good Repair for public transportation is vitally important to the greater Chicago region and to the State of Illinois:

- The cost of delay and lost productivity per auto commuter in the Chicago region (estimated at \$1,500) is fifth highest in the nation and the yearly delay per auto commuter is seventh in the nation (TTI)
- Five of the 20 most congested stretches of roads in United States are located in the Chicago area
- Roadways are at maximum capacity during rush hours, therefore public transit is critical to economic growth (for the city of Chicago, the region, and the state)
- 62% of commuters into Chicago's Loop arrive via public transportation
- Younger commuters, age 20-44, are increasingly reliant on public transit, and in fact prefer to commute via public transit
- Each dollar invested in public transit, particularly in maintaining assets in SGR, generates \$1.21 to \$1.90 in benefits: direct labor, regional mobility, household savings from reduced automobile usage, reduction in highway accidents, and improved air quality

*Sources: Urban Mobility Scorecard, Texas A&M Transportation Institute, RTA Chicago Press Release for Earth Day 2016, American Public Transportation Association.*

## 2.2 Approach to Needs Estimation

This report presents estimates of the level of capital investment required to address all of the RTA region's deferred transit reinvestment needs (the investment backlog) as well as all anticipated future rehabilitation and replacement needs for the 10-year period 2016 to 2025 (Chapter 3). The needs estimates were developed using RTA's Capital Optimization Support Tool (COST), a decision support tool designed to estimate capital reinvestment needs based on the known ages, rehabilitation requirements, expected useful lives and replacement costs of the region's transit assets. Specifically, COST estimates the following types of capital reinvestment needs:



- Investment Backlog: The level of reinvestment required to replace all assets that currently exceed their useful life (e.g., the cost to replace all 40 foot buses that exceed 12 years of age, the FTA minimum for this type of vehicle).
- Normal Replacement: Investments required to replace existing assets expected to reach the end of their useful life over the next 10-year period (normal replacement does not include deferred replacement needs).
- Rehabilitation: Investments required to rehabilitate existing assets over the next 10-year period. COST's estimates of rehabilitation needs do not include deferred rehabilitation needs, only those rehabilitation activities that will arise over the next 10-year period.
- Annual Capital Maintenance: Ongoing minor capital investments as required to maintain a state of good repair over the next 10-year period.

Given the large magnitude of the reinvestment needs and the limitations of existing funding capacity and other factors, it should not be expected that all of these needs will or even can be addressed within the upcoming 10-year period. Rather, these estimates are intended to provide an understanding of the total extent of the region's reinvestment needs, to underline the value of potential funding increases to address that problem and to foster discussion of how to best manage the remaining investment backlog. As indicated in the Regional Transit Strategic Plan, even if a significant infusion of funding becomes available to address the backlog, having an ongoing funding commitment to maintain the transit's infrastructure is a vital element to ensure the long-term state of good repair of the transit system. It is one of RTA's goals to increase and stabilize revenue through existing and new funding sources in order to improve the system while maintaining reasonable fares.

## 2.3 Service Board Asset Management Activities

This section provides a high level overview of recent Service Board asset management efforts and asset responsibilities. It is anticipated that as federal grantees each Service Board will develop and complete its own individual TAM plan as required by the TAM Final Rule<sup>3</sup>.

### 2.3.1 CTA

#### CTA Asset Management Activities and MAP-21/FAST Plans

CTA maintains two Enterprise Asset Management Systems (EAMs), one for vehicle and one for infrastructure assets. In 2012 CTA launched an extensive condition assessment and inventory of its bus garages, rail maintenance warehouses, rail stations (inventory only) and bus turnarounds. That data served as the asset data foundation used by CTA's infrastructure Enterprise Asset Management (EAM) software system – Infor EAM – to manage its assets, including maintenance defect identification and work orders. Infor EAM has recently been implemented for track and structure assets; work on including signals and traction power assets is under way. The Infor EAM system includes asset management functionality where condition and costs can be collected at the asset level and incorporated in system structures, thus providing for data rollup at different levels – an important functionality needed for capital planning. For the vehicle EAM system, CTA will soon be migrating from its old Maintenance Management Information System, used for managing vehicle assets, to the latest version of Trapeze EAM, which should improve tracking and oversight of revenue vehicle maintenance.

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<sup>3</sup> Further detailed in Section 2.4.

CTA is actively involved in the regional Capital Asset Condition Assessment Update process. CTA is also involved in developing their TAM Plan and developing an approach to update facility condition assessments on a regular basis.

#### CTA Asset Ownership and Responsibility for Rehabs/Replacement

Generally speaking, most assets in CTA's inventory are owned by CTA, or in the case of some assets owned by the City of Chicago, other municipalities, or the Illinois Department of Transportation. CTA is responsible for their maintenance through signed legal agreements. CTA carries out the rehabilitations and replacements according to its maintenance and replacement practices and funding availability.

CTA has maintenance and operations agreements with the local municipalities (City of Chicago, Village of Skokie, etc.) for stations the municipality builds. This makes CTA responsible for ongoing capital maintenance, rehab and replacement. The City of Chicago has reconstructed some downtown CTA stations using funding that otherwise would have been shared for the City of Chicago (i.e., between CTA and CDOT). Exceptions to asset ownership by CTA are listed below.

- The City of Chicago owns the entire downtown subway infrastructure and associated real estate.
- Some rail stations were built by, and are owned by, local municipalities (e.g., Chicago, Skokie).

CTA is currently undertaking extensive renovations of above-ground track and stations on the Blue (O'Hare) line and is initiating renovations of other Blue Line stations, track/tunnels and electrical substations. Track, structure and signal renovation was also undertaken on the Ravenswood Loop Connector (Merchandise Mart to Armitage). Other major work includes repairs and renovations at seven bus maintenance facilities, and redesign and rebuilding of the 95<sup>th</sup> Street Station on the south Red Line, the Wilson Station on the north Red Line and the new Washington/Wabash Station on the Loop line.

Revenue fleet vehicles are owned by the CTA and through 2015 the CTA completed the purchase and delivery of 714 new 5000 Series railcars and 300 new Nova buses, and in 2016 another 125 new buses were purchased. All new vehicles were placed into service as of the fourth quarter of 2016.

### **2.3.2 Metra**

#### Metra Asset Management Activities and MAP-21/FAST Plans

Metra's capital assets are diverse and extensive, including rolling stock, track, signal and communications equipment, yard and maintenance facilities, station buildings, platforms, parking lots, and property at administrative headquarters. In 2014 Metra completed the primary data collection for a "top to bottom" inventory update using a new custom asset database system. Metra uses this system internally and to provide the RTA with inventory and condition information for all major asset classes.

Currently, Metra uses the Maximo Enterprise Asset Management System for their Mechanical Division. Ultimately, Metra plans to migrate all asset data to Maximo.

Like the other Service Boards, Metra is an active member of the Capital Asset Condition Assessment and the Capital Optimization Support Tool (COST) projects. Metra has initiated a procurement for the development of its individual TAM Plan to comply with the Federal TAM Rule.

#### Metra Asset Ownership and Responsibility for Rehabs/Replacement

Vehicles (locomotives, coaches, non-revenue vehicles) are fully owned by Metra.

Metra owns the Milwaukee, Rock Island/Southwest Service, and Electric Lines. The other lines are owned by the UP, BNSF, and other private carriers. What Metra owns, and pays for, on those other lines is based on their Purchase of Service agreements with those other railroads. This percentage, which can vary from 5% to 95%, also may change with the business climate (i.e., depending on level of freight traffic). This applies to track, structures, and systems assets on those lines. The analysis for this report used estimates provided by Metra for the amount of capital maintenance and reinvestment funding contributed by the private carriers: the investments from private carriers are not included in Metra's capital needs. For stations, Metra has the responsibility for capital replacement. However, community desired upgrades are paid for by the community. Other facilities are 100% Metra owned and Metra does not lease assets.

Metra is currently undertaking renovations at Chicago Union Station and doing repairs or replacement of the UP/North Ravenswood station and 11 bridges on the UP/North Line in Chicago. Another major project is to replace and expand the single-track bridge over the Fox River on the Milwaukee West line (originally built in 1881) with a modern 2-track structure, removing a delay-causing bottleneck. To maintain the condition of its track, Metra replaces 80,000 cross ties each year. Metra is also undertaking the unfunded federal mandate to install Positive Train Control (PTC), safety signal system, on all the lines that Metra operates, at a cost of approximately \$385 million.

### **2.3.3 Pace**

#### Pace Asset Management Activities and MAP-21 /FAST Plans

As an ongoing agency commitment to quality assurance and quality control, Pace continues to refine its asset inventory and condition assessment reporting activities consistent with the regional efforts on the Capital Asset Condition Assessment Update project.

Several years ago, Pace implemented the Oracle Enterprise Asset Management system. Pace divisions use this system to track the status and maintenance record of its rolling stock from time of purchase to the end of useful life.

Pace's extensive involvement with the Capital Asset Condition Assessment and the Capital Optimization Support Tool (COST) projects allows Pace to ensure a workable database and an individual solution for a Tier I provider MAP-21 compliant TAM Plan Program. Pace is actively engaged in planning its own TAM Plan.

Lastly, COST, in addition to Pace's own capital criteria, is used during the Pace annual budget process to assess, evaluate, and prioritize transit capital reinvestment needs within the parameters of regional funding and long term strategic objectives.

#### Pace Asset Ownership and Responsibility for Rehabs/Replacement

Pace suburban assets are largely owned, operated, and maintained by Pace. Pace contracts with private carrier service providers for the provision of required ADA equipment, facilities, and services that cannot be met with internal efforts. Pace carries out rehabilitations and replacements of its assets in accordance with transit industry standard best practices for routine and preventative maintenance schedules. Private carriers are contractually required to adhere to Pace performance standards for vehicle asset maintenance. Pace also has lease agreements for off-site ADA and Vanpool offices, and a Print Shop facility.

Pace also has agreements with communities, municipalities, and the other Service Boards to use their properties to provide passenger services. In these instances, Pace has varying responsibility for asset maintenance and replacement, outlined in the agreements.

Pace has completed and continues to work on multiple capital projects. These include the dedication of a CNG Fueling Facility at its South Division Garage in Markham, a major renovation of its Elgin Transportation Center, construction of the first of three Park-n-Ride facilities along the I-90 corridor at Randall Road and the beginning of design for a Park-n-Ride facility in Plainfield to accommodate ridership growth on the overwhelmingly successful Bus on Shoulder (BoS) Service.

## **2.4 MAP 21, FAST Act and TAM Policy Implications**

The United States Department of Transportation (USDOT), through the Federal Transit Administration, renewed and revised the 2012 Transportation Legislation bill, Moving Ahead for Progress in the 21<sup>st</sup> Century (MAP-21) with the 2015 Fixing America's Surface Transportation Act (FAST). As stipulated by MAP-21, the FTA released a Notice of Proposed Rulemaking (NPRM) for Transit Asset Management (TAM) on September 30, 2015, followed by a two-month public comment period, which culminated in a set of new TAM rules, issued July 12, 2016 and effective October 1, 2016.

FTA requires all transit agencies which receive federal funding to submit a TAM Plan based on analysis of asset inventories, condition assessments, investment prioritization and SGR performance targets by October 2018. Thereafter, full revisions will be required every four years. The asset management process allows for:

- Annual asset inventory updates
- Condition assessments (actual/field conditions for Facilities SGR performance measures, otherwise TAM Plans allow for age-based asset condition<sup>4</sup>).
- Detailed estimates of capital reinvestments over 10 and 20 years and data supporting investment prioritization.
- SGR performance measures and targets reporting through the National Transit Database.

As FTA Tier 1 grantees, CTA, Metra and Pace are responsible for developing their individual TAM Plans as well as meeting new National Transit Database (NTD) requirements. However, the RTA is not required to submit a regional TAM Plan. RTA and the Service Boards have already accomplished a great amount of work under the current TAM program. Leveraging prior work undertaken by the Service Boards with RTA support can help the Service Boards develop their individual TAM Plans.

As the RTA provides regional policy planning in support of the three transit operators, particularly in the area of asset management through its annual capital asset condition assessment program, RTA can provide valuable support to the Service Boards while also benefitting the region as a whole:

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<sup>4</sup> Condition assessment requirements are further outlined in Chapter 4.

Service Board “Direct” Activities

- Meet new National Transit Database requirements (e.g., determine own SGR performance targets, begin reporting condition and narrative data as per regulations)
- Meet new FTA TAM Rule requirements (e.g., prepare individual TAM Plans)

Potential RTA Role

- Coordinate performance measure targets for transparency and integration with CMAP
- Technical assistance and information sharing
- Continue modeling work for regional needs reporting
- Ensure consistency amongst the Service Boards
- Funding advocacy for region.



### 3. CAPITAL NEEDS ASSESSMENT FINDINGS

#### 3.1 Definitions

The 10-Year capital needs assessment is based on the dollar value estimation for total backlog, normal replacement, rehabilitation, and annual capital maintenance of assets for the three Service Boards. Each of these activities is required to maintain a State of Good Repair (SGR). Definitions for each of these terms are provided in Figure 3-1.

**Figure 3-1. Definitions for the Types of Capital Replacement Need**

<b>Backlog</b>	Investment to replace all assets that currently exceed their useful life (does not include deferred rehabilitation needs)
<b>Normal Replacement</b>	Ongoing replacement of existing assets as they reach the end of their expected useful life. Normal replacement does not include deferred replacement needs, only those needs for assets that will reach the end of their useful life over the next 10-year period.
<b>Rehabilitation</b>	Ongoing rehabilitation needs for existing assets. Rehabilitation does not include deferred rehabilitation needs, only those rehabilitation activities that will arise over the next 10-year period as required to maintain a state of good repair.
<b>Annual Capital Maintenance (ACM)</b>	Ongoing minor capital investments as required to maintain a state of good repair over the next 10-year period.

The backlog can be thought of as the total amount of deferred reinvestment actions (such as overdue asset replacements). At the present time, backlog does not include deferred rehabilitation of replaceable assets, normally scheduled to occur at mid-life or at major component intervals within the asset's useful life. Deferred rehabs are not yet measured/tracked by the Service Boards and as such this unmet need is not included in the inventories. The RTA recognizes that the deferral of rehabs has occurred for many assets due to funding shortages such as for facilities, which have a long useful life (60 years) and may have missed significant rehabs and annual capital maintenance in that time period.

The remaining capital replacement needs elements include normal replacement of assets, rehabilitation ("rehab") of assets, and annual capital maintenance (ACM) of assets. Rehabs are estimated, by asset class, by individual Service Board rehabilitation cycle assumptions. ACM typically represents a minor ongoing capital reinvestment required to maintain a SGR (for example, an annual painting or paving contract). These three elements represent ongoing needs that will arise over the 10-year analysis timeframe (from 2016 through 2025) and have been grouped together throughout this report under the name "normal reinvestment needs." Two other cost components are important in estimating total capital maintenance needs - soft costs and contingency costs - which are applied to each asset type as appropriate, according to the assumptions delineated in Figure 3-2.

Figure 3-2. Definitions for the Types of Capital Replacement Need

<b>Soft Costs</b>	<ul style="list-style-type: none"> <li>• The majority of soft costs are expended in the planning, engineering, project management, and operational costs for track impacts/access during construction. These services include in-house agency staff, government related support staff, and consultants. Project start-up expenses are also included in this category. Project financing cost and “other” expenses (reconciliation and unaccountable costs) comprise the full range of project development capital costs (FTA definition)</li> <li>• Rail and Bus Guideway, Facilities, Stations, Systems: Additional 22.7% of total base cost.</li> <li>• Rail and Bus Vehicles: Additional 15% of total base cost.</li> </ul>
<b>Contingency Costs</b>	<ul style="list-style-type: none"> <li>• Contingency costs are budgeted for unforeseen emergencies or design shortfalls typically identified after a project commences. The contingency is included in the budget so the project can proceed with minimal interruption for changes or cost overruns.</li> <li>• Rail and Bus Guideway, Facilities, Stations, Systems: Additional 20% of total base cost.</li> <li>• Rail and Bus Vehicles: Additional 15% of total base cost.</li> </ul>

### 3.2 Key Assumptions

The Update report is also based on several other assumptions:

- **Unconstrained Needs.** Capital reinvestment needs estimates presented in this report are financially unconstrained. That is, these estimates determine the level of investment to fully eliminate the current investment backlog (and attain SGR) and then to address all subsequent reinvestment needs (to maintain SGR) with the assumption there is unlimited funding capacity. However, the level of annual investment required to address these needs is in excess of the region’s current rate of capital reinvestment. This unconstrained analysis also assumes that the backlog can be eliminated in a very short time period (this is not realistic when real world financial, service impacts and project management constraints are introduced).
- **Constant Dollar Needs Estimates.** All backlog and needs estimates are presented in constant, 2015 dollars (2015\$). If an asset inventory cost is reported in 2010\$ for example, the historic cost is inflated to 2015\$ using Producer Price Index factors.
- **In-Kind Replacement.** While some level of technological change can be expected over the 10-year period of analysis, the Update analysis assumes that all assets are replaced by new, identical assets.
- **Impact of Regulatory Requirements.** Except for Positive Train Control (PTC), which is federally mandated to be in place by December 31, 2018, the 10-year needs estimates do not include future regulatory type costs that may impact future needs and reinvestments.

### 3.3 Region-Wide Results for 10-Year Needs Assessment

Region-wide reinvestment needs for the 10-year projection period are presented in Figure 3-3 (expressed in millions of 2015 dollars). Over this time period, total reinvestment needs are estimated to be roughly \$37.7 billion, including \$19.4 billion to eliminate the current investment backlog (51 percent

of needs) and an additional \$18.3 billion to address normal reinvestment needs (including asset replacements, rehabilitations and capital maintenance) over the 10 years. Note that rail (CTA rail and Metra) accounts for about 82 percent of the combined backlog and normal reinvestment needs. Reinvestment needs for bus (CTA and Pace) account for about 15 percent of regional needs while the remaining 3 percent of needs are for paratransit, vanpool and “shared” assets (assets that serve more than one mode, such as IT or security systems).

**Figure 3-3. Backlog and 10-Year Normal Reinvestment Needs: 2016 – 2025 (Millions of \$2015)**

Service Board	Mode	SGR Backlog	10-Year Normal Reinvestment Needs			Total	% of Total
			Replacements	Rehabs	Capital Maint.		
CTA	Rail	\$11,048	\$4,349	\$2,967	\$528	\$18,892	50.1%
	Bus	\$1,388	\$1,347	\$1,224	\$163	\$4,122	10.9%
	Shared	\$20	\$32	\$8	\$8	\$68	0.2%
	<b>CTA</b>	<b>\$12,456</b>	<b>\$5,729</b>	<b>\$4,199</b>	<b>\$698</b>	<b>\$23,082</b>	<b>61.3%</b>
Metra	<b>Metra</b>	<b>\$6,139</b>	<b>\$4,260</b>	<b>\$1,282</b>	<b>\$323</b>	<b>\$12,004</b>	<b>31.9%</b>
PACE	Bus	\$596	\$456	\$526	\$96	\$1,675	4.4%
	Shared	\$158	\$694	\$36	\$24	\$912	2.4%
	<b>Pace</b>	<b>\$755</b>	<b>\$1,150</b>	<b>\$561</b>	<b>\$120</b>	<b>\$2,586</b>	<b>6.9%</b>
<b>RTA Total</b>		<b>\$19,350</b>	<b>\$11,139</b>	<b>\$6,043</b>	<b>\$1,140</b>	<b>\$37,672</b>	<b>100.0%</b>
<b>% of Total</b>		<b>51.4%</b>	<b>29.6%</b>	<b>16.0%</b>	<b>3.0%</b>	<b>100.0%</b>	

Figure 3-4 provides a graphical presentation of these same needs; however, the normal reinvestment needs are spread out over the 2016 to 2025 time period. Figure 3-4 highlights the significant size of the investment backlog relative to the annual level of reinvestment required to cover normal needs once the backlog has been addressed.

Again, the backlog represents the level of investment required to bring all of the region’s transit assets (as they exist today) to SGR while normal reinvestment is the level of annual investment required to maintain SGR once attained. The ratio of these two numbers (average

annual normal needs once in SGR divided by the size of the investment to attain SGR, i.e., the backlog) provides a useful measure of the relative size or severity of the backlog and is referred to as the “SGR Backlog Ratio.” Given an annual average normal reinvestment need of approximately \$1.8 billion and a backlog of \$19.4 billion, the value of this SGR Backlog Ratio for RTA is approximately 10.8. This can be interpreted as the number of years that annual reinvestment would need to be doubled to fully eliminate the backlog and also address normal reinvestment needs. The region’s recent rate of reinvestment – projected to be about \$785 million annually - is well below the estimated \$1.8 billion required to address estimated normal reinvestment needs. This implies the backlog will continue to increase without an increase in regional SGR expenditures.

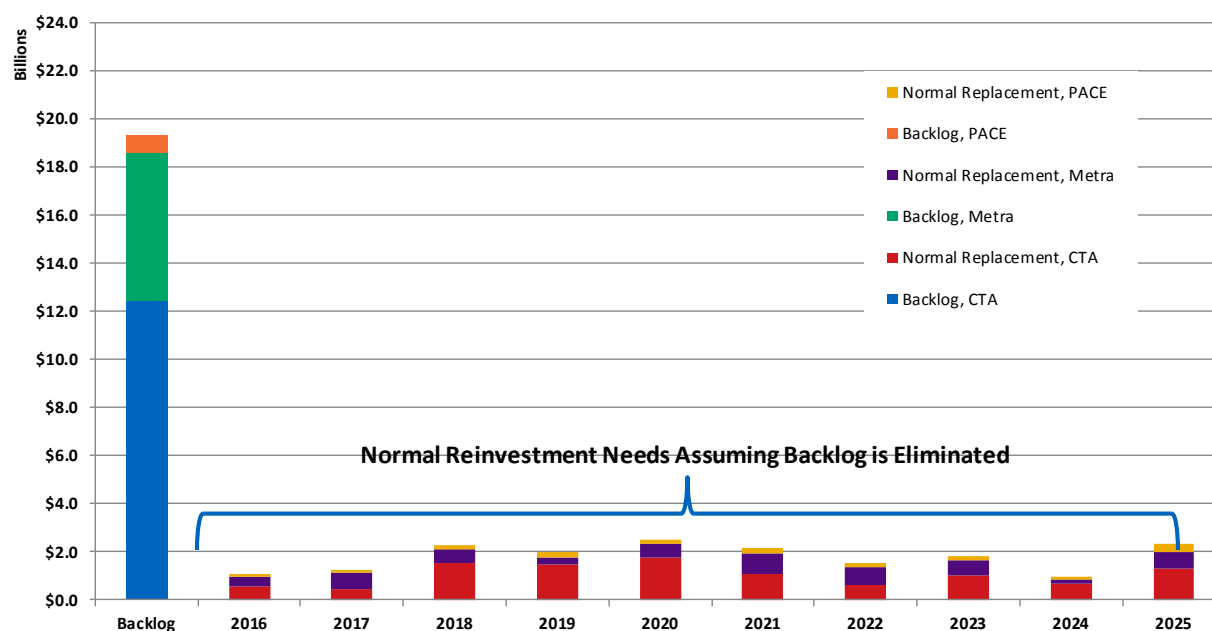
#### SGR Backlog Ratio

The SGR Backlog Ratio measures the size of the investment backlog relative to average annual normal investment needs (i.e., non-deferred reinvestment needs as they arise). The higher the Ratio, the more severe the backlog. For older rail agencies, the SGR ratio can range anywhere from 10 to 20. For younger rail and bus agencies the ratio can be on the order of 2. The SGR Backlog is calculated as follows:

$$\text{SGR Backlog Ratio} = \frac{\text{SGR Backlog}}{\text{Average Annual Normal Investment Needs}}$$

The SGR ratio can also be interpreted as the number of years of normal reinvestment to eliminate the investment backlog

Figure 3-4. Region-wide Summary 10-Year Unconstrained Needs by Year



### 3.4 Region-Wide Results for 20-Year Needs Assessment

While the objective of this report is the region's 10-year reinvestment needs, RTA's COST tool can be used to estimate needs over a longer time frame. Figure 3-5 expands the analysis to cover 20 years. The 20-year analysis can help the RTA identify and plan for any large reinvestment needs not apparent over the 10-year time frame. Average annual reinvestment needs for the second 10-year period (2026 through 2035) are appreciably higher than for the 10-year period covered by this report (averaging roughly \$1.8 billion for the report period vs. \$2.2 billion for the subsequent 10-year period). The higher needs estimates for the 2026 - 2035 period are primarily driven by replacement needs for buses and other shorter lived assets that COST assumes are replaced when the backlog is eliminated (at the start of the period of analysis).

Figure 3-5 Backlog and 20-Year Normal Reinvestment Needs: 2016 – 2035 (Millions of \$2015)

Service Board	SGR Backlog	Normal Reinvestment		20-Year Total	Percent of Total
		2016 - 2025	2026 - 2035		
CTA	\$12,456	\$10,626	\$11,894	\$34,976	58.6%
Metra	\$6,139	\$5,865	\$7,737	\$19,741	33.1%
PACE	\$755	\$1,832	\$2,340	\$4,926	8.3%
<b>Total</b>	<b>\$19,350</b>	<b>\$18,322</b>	<b>\$21,970</b>	<b>\$59,643</b>	<b>100.0%</b>

### 3.5 Comparison with 2014 Report

A comparison of the current needs estimates for the 2016/Year 5 report as compared to the 2014/Year 3 report is presented in Figure 3-6\*\*. The current needs estimates – including both the backlog and normal reinvestment needs – with some exceptions are lower than those presented in the prior report in inflation-adjusted dollars. Total needs are roughly 2% less as can be seen in the lower right corner of Figure 3-6. Reasons for this reduction are outlined in Figure 3-7.

**Figure 3-6. Needs Assessment Comparison – 2014 and 2016 Update Reports (\$Millions)\***

Need Type		2014 Report (\$2013)	2014 Report (\$2015)	2016 Report (\$2015)	Difference (\$2015)	Percent Difference
CTA	Backlog	\$12,939	\$13,694	\$12,456	(\$1,238)	-9%
	Normal Reinvestment	\$9,235	\$9,774	\$10,626	\$852	9%
Metra	Backlog	\$6,126	\$6,483	\$6,139	(\$344)	-5%
	Normal Reinvestment	\$5,576	\$5,901	\$5,865	(\$36)	-1%
Pace	Backlog	\$475	\$503	\$755	\$252	50%
	Normal Reinvestment	\$1,789	\$1,893	\$1,832	(\$61)	-3%
Region	Backlog	\$19,540	\$20,680	\$19,350	(\$1,330)	-6%
	Normal Reinvestment	\$16,600	\$17,568	\$18,322	\$754	4%
Total		<b>\$36,140</b>	<b>\$38,248</b>	<b>\$37,672</b>	<b>(\$576)</b>	<b>-2%</b>

\* Note: The 2014 Report needs were adjusted from \$2013 to \$2015 using the Producer Price Index.

\*\* No report was produced in 2015, therefore the most recent prior report is the 2014 report with data as of December 31, 2013.

It is important to appreciate the range of factors that drive differences in estimated needs between reports –the main ones are:

- Variations due to changes in data quality and assumptions: RTA, the Service Boards and the region should expect ongoing variations in the region’s needs estimates (including variations in the Service Boards’ shares of regional reinvestment needs) over time, as the result of ongoing improvements to analysis methods, assumptions (e.g., unit cost, useful life, soft/contingency cost assumptions) and asset inventory data. These ongoing improvements will also yield improved accuracy in the region’s needs estimates over time, allowing for more meaningful comparisons of needs and backlog estimates from one period to the next. Developing these capabilities is a long-term process.
- Variations due to differing periods of analysis: Given that the needs assessment process is designed to cover a fixed period of time (10 or 20 years) and the “lumpy” nature of reinvestment needs (i.e., new reinvestment needs can be minor one year but very large the next), RTA should expect some natural variation in regional needs estimates and in each Service Board’s share of those needs estimates over time. RTA and the Service Boards should take this into account with the current backlog and needs estimates, and shares of reinvestment needs. The region should expect that regional needs can and will change from one time period to the next based on the timing of normal reinvestment needs and the growth (or decline) of the backlog.



- Increases due to inflation: Ongoing capital cost inflation will lead to a natural increase in the size of backlog and normal reinvestment needs over time.
- Unexpected capital investments: Finally, Service Boards sometimes benefit from one-time only capital grants which can affect the year to year comparisons. Where the assets are replaced with new or rehabbed assets, these dramatically improve asset conditions.

There are several differences between the 2014 and 2016 needs estimates, several of which are identified in Figure 3-7. Note the needs, increased or decreased compared to the prior report, represent, in fact, a full 10-year need. Some variation with normal replacement schedules as they related to the given 10-year period, is completely normal.

**Figure 3-7. Differences 2016 versus 2014 Reports**

Service Board	Major Changes
CTA	<ul style="list-style-type: none"> <li>• Increased needs: Substations and facilities</li> <li>• Decreased needs: Rail vehicles</li> </ul>
Metra	<ul style="list-style-type: none"> <li>• Increased needs: Train control, major shops, and vehicles</li> <li>• Decreased needs: Trackwork and station building components</li> </ul>
Pace	<ul style="list-style-type: none"> <li>• Increased needs: Vehicles – Suburban rolling stock, ADA rolling stock, vanpool vehicles, and ITS related equipment</li> <li>• Decreased needs: Fare collection equipment</li> </ul>

### 3.6 Service Board Results for 10-Year Needs Assessment

The following provides additional analysis of the 10-year need for each Service Board.

#### 3.6.1 Chicago Transit Authority (CTA)

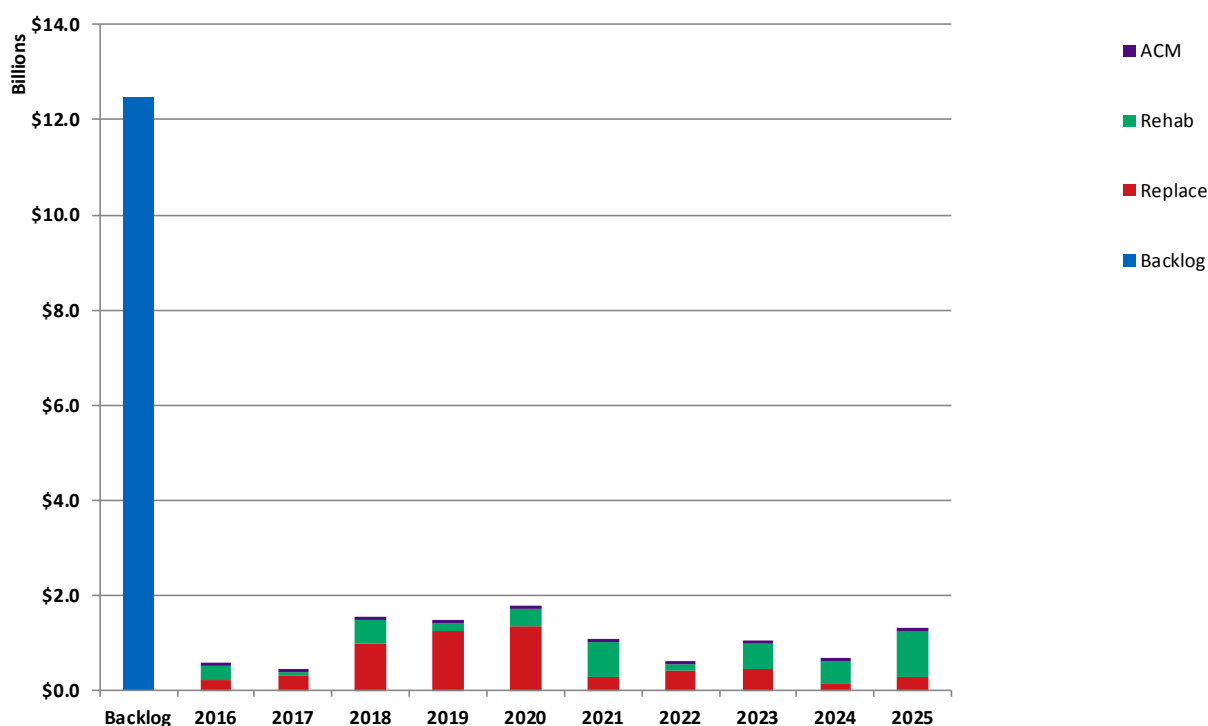
Figure 3-8 shows the estimates of CTA's share of the region's reinvestment needs. For the 10-year period 2016 to 2025, CTA is estimated to have \$23.1 billion in unconstrained reinvestment needs, including a backlog of \$12.5 billion (investment to attain SGR) and normal reinvestment needs of \$10.6 billion (to maintain SGR). Note that the backlog is estimated to account for 54 percent of CTA's estimated 10-year reinvestment needs. Rail assets account for 82 percent of CTA's reinvestment needs, which are concentrated in rail track and structures (guideway elements), rail rolling stock, and stations. Bus needs account for 18 percent of the remaining needs, and are dominated by major bus fleet rehab and replacement needs late in the 10-year analysis period. There is also significant need in backlog and out-years reinvestment needs for bus facilities. Reinvestment needs for shared assets (e.g., assets serving both bus and rail) account for the rest. A more detailed breakout by asset type can be found in Appendix E.

Figure 3-8. CTA Backlog and 10-Year Normal Reinvestment Needs (Millions of \$2015)

Mode	Asset Group	SGR Backlog	10-Year Normal Reinvestment Needs			Total	% of Total
			Replacements	Rehabs	Capital Maint.		
Rail	Facilities	\$502	\$300	\$324	\$81	\$1,207	5.2%
	Guideway Elements	\$4,300	\$1,667	\$581	\$199	\$6,747	29.2%
	Stations	\$2,824	\$647	\$536	\$208	\$4,216	18.3%
	Systems	\$2,094	\$1,115	\$0	\$39	\$3,248	14.1%
	Vehicles	\$1,329	\$620	\$1,526	\$0	\$3,475	15.1%
	<b>Rail</b>	<b>\$11,048</b>	<b>\$4,349</b>	<b>\$2,967</b>	<b>\$528</b>	<b>\$18,892</b>	<b>81.8%</b>
Bus	Facilities	\$945	\$87	\$358	\$153	\$1,544	6.7%
	Guideway Elements	\$258	\$7	\$162	\$10	\$437	1.9%
	Systems	\$0	\$5	\$0	\$0	\$5	0.0%
	Vehicles	\$185	\$1,247	\$704	\$0	\$2,137	9.3%
	<b>Bus</b>	<b>\$1,388</b>	<b>\$1,347</b>	<b>\$1,224</b>	<b>\$163</b>	<b>\$4,122</b>	<b>17.9%</b>
Shared	Facilities	\$2	\$2	\$8	\$8	\$19	0.1%
	Vehicles	\$18	\$30	\$0	\$0	\$49	0.2%
	<b>Shared Assets</b>	<b>\$20</b>	<b>\$32</b>	<b>\$8</b>	<b>\$8</b>	<b>\$68</b>	<b>0.3%</b>
<b>CTA Total</b>		<b>\$12,456</b>	<b>\$5,729</b>	<b>\$4,199</b>	<b>\$698</b>	<b>\$23,082</b>	<b>100.0%</b>

Figure 3-9 provides a graphical presentation of CTA's reinvestment needs, including elimination of the existing investment backlog and the level of investment to address normal reinvestment needs thereafter. Normal reinvestment consists of annual capital maintenance (ACM) asset rehabs and replacements. Similar to the region as a whole, CTA's investment backlog is large relative to the annual level of reinvestment required to address normal needs (i.e., sustain SGR) once the backlog has been addressed. Given annual average normal reinvestment needs of roughly \$1.06 billion and a backlog of \$12.5 billion, the value of the "SGR Backlog Ratio" for CTA is roughly 11.8 (the equivalent of almost 12 years of normal reinvestment funding would be required to eliminate the backlog).

Figure 3-9. Summary 10-Year Unconstrained Needs by Year – CTA



### 3.6.2 Metra

The current estimates of Metra's reinvestment needs are presented in Figure 3-10. For the 10-year period 2016 to 2025, Metra is estimated to have \$12.0 billion in unconstrained reinvestment needs, including a backlog of \$6.1 billion (investment to attain SGR) and normal reinvestment needs of \$5.9 billion (to maintain SGR). Note that the backlog is estimated to account for fully one half of Metra's reinvestment needs and is driven primarily by deferred bridge reinvestment needs (part of guideway elements) and revenue vehicles. A more detailed, asset type-level breakout of Metra's 10-year annual reinvestment needs can be found in Appendix E.

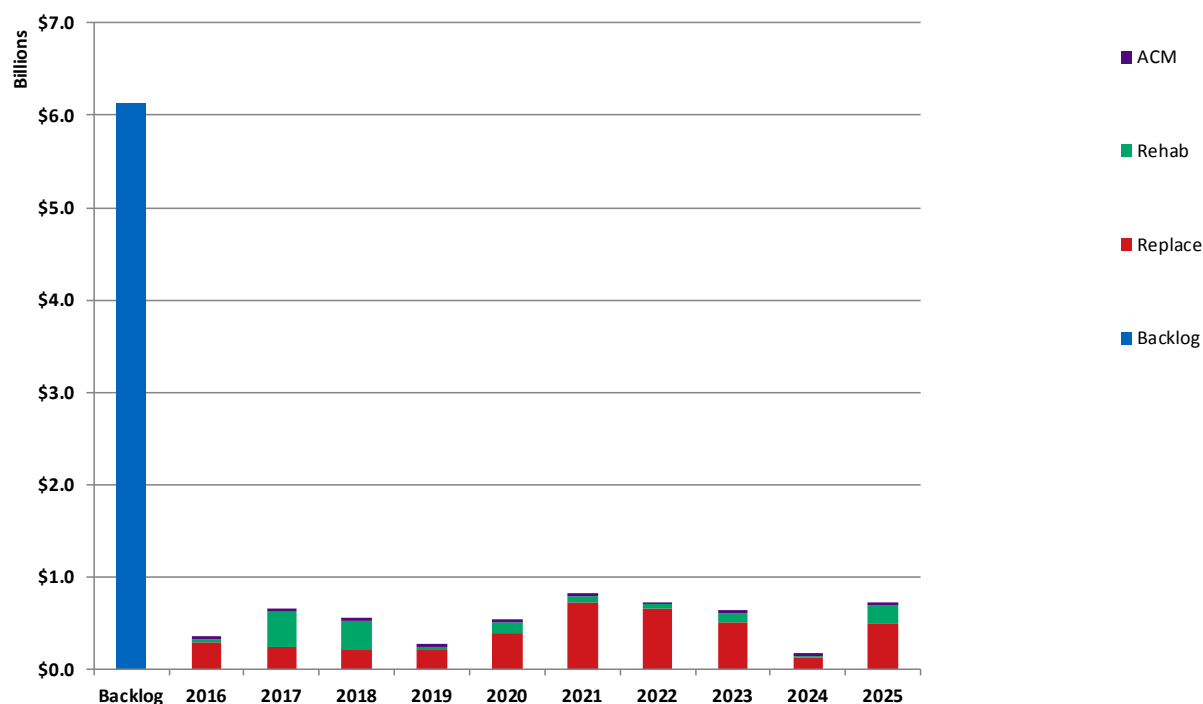
**Figure 3-10. Metra Backlog and 10-Year Normal Reinvestment Needs (Millions of \$2015)**

Mode	Asset Group	SGR Backlog	10-Year Normal Reinvestment Needs			Total	% of Total
			Replacements	Rehabs	Capital Maint.		
Rail	Facilities	\$192	\$373	\$14	\$85	\$664	5.5%
	Guideway Elements	\$2,578	\$1,141	\$13	\$121	\$3,853	32.1%
	Stations	\$149	\$345	\$271	\$88	\$853	7.1%
	Systems	\$591	\$559	\$1	\$29	\$1,181	9.8%
	Vehicles	\$2,628	\$1,842	\$983	\$0	\$5,453	45.4%
	<b>Rail</b>	<b>\$6,139</b>	<b>\$4,260</b>	<b>\$1,282</b>	<b>\$323</b>	<b>\$12,004</b>	<b>100.0%</b>
<b>Metra Total</b>		<b>\$6,139</b>	<b>\$4,260</b>	<b>\$1,282</b>	<b>\$323</b>	<b>\$12,004</b>	<b>100.0%</b>
<b>% of Total</b>		<b>51.1%</b>	<b>35.5%</b>	<b>10.7%</b>	<b>2.7%</b>	<b>100.0%</b>	

The 10-year reinvestment needs for Metra's rail vehicles increased by roughly \$2.7 billion in prior reports between 2013 and 2014. This change was less the result of aging fleets than it is the result of reduction in the useful life assumption used to assess Metra's rail car conditions and reinvestment needs. Specifically, while the 2013 report assumed a 50 year useful life for Metra rail cars, the 2014 report and this report assume a 25 year useful life for these vehicles, the minimum assumed FTA useful life. Also note that the Metra capital reinvestment needs for Guideway Elements now reflect percent ownership and capital maintenance reinvestment responsibility as described in Section 2.3.2. While Metra is fully responsible for the reinvestment needs of lines owned and operated by Metra, Metra is only responsible for a share of the capital reinvestment needs for service run on right-of-way that is owned by freight railroads (including Burlington Northern, Union Pacific, and Canadian National). That share depends on both on the track rights agreement held with each railroad as well as on Metra's share of the line traffic at any given location. The needs estimates presented here only capture Metra's share of reinvestment needs for lines owned by the freight rail operators.

Figure 3-11 illustrates Metra's reinvestment needs, with normal reinvestment needs distributed out over the 2016 to 2025 time period. Normal reinvestment consists of annual capital maintenance (ACM) and asset rehabs and replacements. Similar to CTA and the region as a whole, Metra's investment backlog is large relative to the annual level of reinvestment required for normal needs. Given an annual average normal reinvestment needs of roughly \$0.6 billion and a backlog of \$6.1 billion, the value of the "SGR Backlog Ratio" for Metra is roughly 10 (approximately 10 years of normal reinvestment funding would be required to eliminate the backlog).

Figure 3-11. Summary 10-Year Unconstrained Needs by Year, METRA



### 3.6.3 Pace

Figure 3-12 shows the estimates of Pace's share of the region's reinvestment needs. For the 10-year period 2016 to 2025, Pace is estimated to have \$2.6 billion in unconstrained reinvestment needs, including a backlog of \$755 million (investment to attain SGR) and normal reinvestment needs of \$1.8 billion (to maintain SGR). The backlog accounts for 29% of Pace's reinvestment needs. The remaining 71% of need is for 10-year normal reinvestment and is dominated by vehicle replacements and rehabs. The \$1.8 billion to maintain SGR over the period equates to \$183 million per year, on average.

A more detailed, asset type level breakout of Pace's 10-year annual reinvestment needs can be found in Appendix E.

**Figure 3-12. Backlog and 10-Year Normal Reinvestment Needs (Millions of \$2015)**

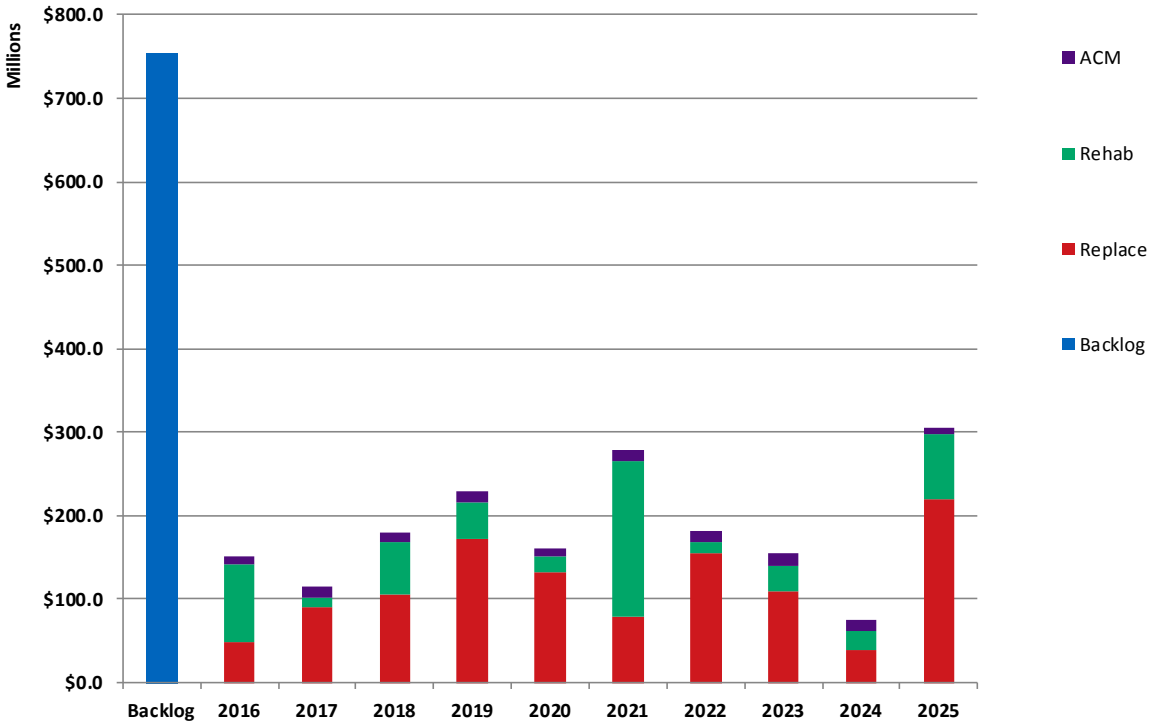
Mode	Asset Group	SGR Backlog	10-Year Normal Reinvestment Needs			Total	% of Total
			Replacements	Rehabs	Capital Maint.		
<b>Bus</b>	Facilities	\$164	\$0	\$191	\$70	<b>\$425</b>	16.4%
	Stations	\$83	\$72	\$21	\$26	<b>\$202</b>	7.8%
	Systems	\$47	\$59	\$0	\$0	<b>\$106</b>	4.1%
	Vehicles	\$303	\$325	\$314	\$0	<b>\$942</b>	36.4%
	<b>Bus</b>	<b>\$596</b>	<b>\$456</b>	<b>\$526</b>	<b>\$96</b>	<b>\$1,675</b>	64.7%
<b>Paratransit</b>	Facilities	\$32	\$21	\$30	\$12	<b>\$94</b>	3.7%
	Stations	\$0	\$22	\$5	\$12	<b>\$39</b>	1.5%
	Systems	\$43	\$101	\$0	\$0	<b>\$144</b>	5.6%
	Vehicles	\$42	\$350	\$0	\$0	<b>\$391</b>	15.1%
	<b>Paratransit</b>	<b>\$117</b>	<b>\$493</b>	<b>\$36</b>	<b>\$24</b>	<b>\$669</b>	25.9%
<b>Vanpool</b>	Systems	\$2	\$3	\$0	\$0	<b>\$5</b>	0.2%
	Vehicles	\$23	\$111	\$0	\$0	<b>\$133</b>	5.2%
	<b>Vanpool</b>	<b>\$24</b>	<b>\$114</b>	<b>\$0</b>	<b>\$0</b>	<b>\$138</b>	5.3%
<b>Shared</b>	Systems	\$16	\$82	\$0	\$0	<b>\$98</b>	3.8%
	Vehicles	\$1	\$5	\$0	\$0	<b>\$6</b>	0.2%
	<b>Shared Assets</b>	<b>\$17</b>	<b>\$87</b>	<b>\$0</b>	<b>\$0</b>	<b>\$104</b>	4.0%
<b>Pace Total</b>		<b>\$755</b>	<b>\$1,150</b>	<b>\$561</b>	<b>\$120</b>	<b>\$2,586</b>	100.0%
<b>% of Total</b>		29.2%	44.5%	21.7%	4.6%	100.0%	

Note: "Shared" refers to assets serving multiple modes such as central revenue collection.

Figure 3-13 provides a graphical presentation of Pace's reinvestment needs, with normal reinvestment needs distributed out over the 2016 to 2025 time period. Normal reinvestment consists of annual capital maintenance (ACM) and asset rehabs and replacements. The value of the "SGR Backlog Ratio" for Pace is roughly 4, in other words approximately the equivalent of four years of normal reinvestment level funding need would be required to eliminate the backlog.



Figure 3-13. Summary 10-Year Unconstrained Needs by Year – Pace



### 3.7 Impact of Maintaining Current Rate of Reinvestment

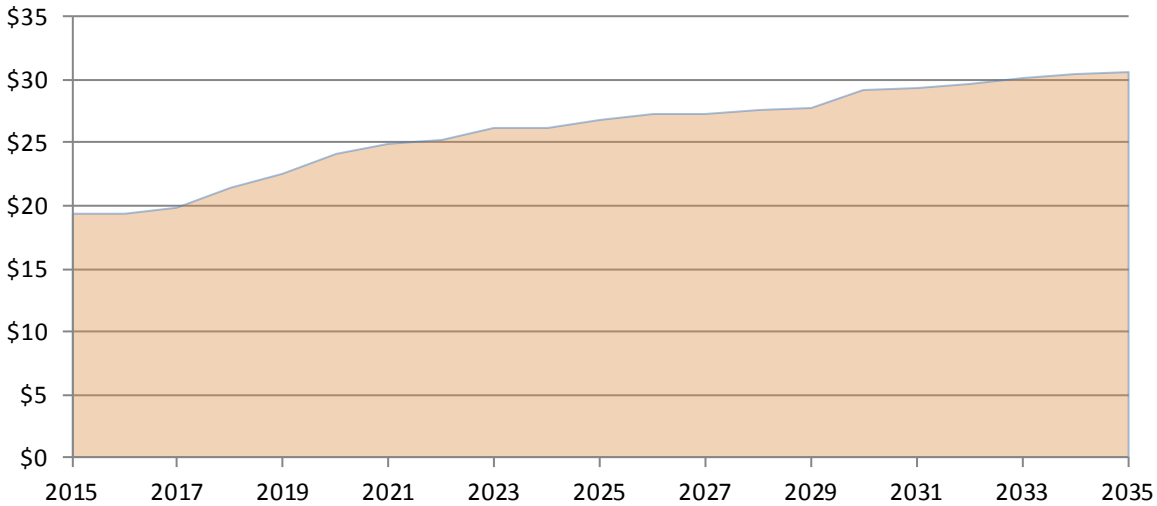
It is important to understand that the reinvestment needs analyses presented in this report are financially unconstrained (i.e., it presents the level of investment required to address all reinvestment needs without regard to existing funding capacity) and also that existing funding sources are insufficient to address those needs. Recent historical and expected future funding levels are well below what would be required to address reinvestment needs or even prevent the size of the investment backlog from growing. The annual funding gap between what is received and what is needed just to maintain the existing backlog level is approximately \$800 million.

In addition, sometimes there are capital investments being made that do not extend the useful life of an asset (“move the needle”) because they don’t ultimately change the underlying replacement need, even if they help maintain the assets safely and comfortably for the customer.

This assessment assumes capital funding for reinvestment will be trending slightly upward from recent levels. It assumes the RTA and the Service Boards continue to issue bonds to cover some reinvestment needs and that there is increased funding in the early years of the forecast related to the CTA Red Purple Modernization project. This forecast assumes no state funding, however. Average annual funding under this scenario is estimated to be \$785 million.

Figure 3-14 illustrates the impact of the investment on the size of the region’s investment backlog over 20 years (2015\$, no inflation assumed). The analysis predicts an increase in the size of the region’s investment backlog – increasing from roughly \$19 billion in 2015 to \$30 billion by 2033. Recent historical and expected future funding levels are well below that required to address reinvestment needs or prevent continued and ongoing growth in the size of the region’s reinvestment backlog, resulting in an increasing share of the region’s assets requiring some level of reinvestment and with potential consequences for regional service quality and reliability.

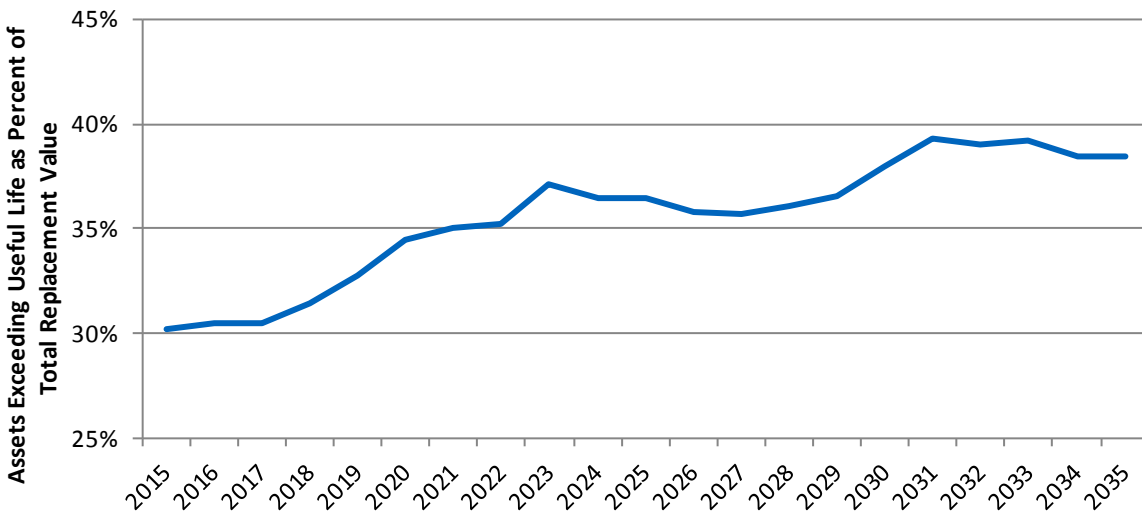
**Figure 3-14. Regional Backlog Projections (Billions of \$2015)\***



\*Projections based on \$785 million in annual average funding.

Figure 3-15 shows the impact of these same rates of reinvestment on the share of transit assets that exceed their useful life (i.e., assets that remain in service past their expected retirement date). Specifically, this figure shows the percent of assets that exceed their useful life as a percent of the total replacement value for all replaceable transit assets documented in the RTA's current asset inventory (excluding the value of subway tunnels, which are not considered "replaceable" in this analysis). Similar to the investment backlog analysis, this analysis projects the proportion of assets that exceed their useful life to increase from roughly 31 percent today to 37 percent by 2035.

**Figure 3-15. Percent of Replaceable Assets Exceeding Useful Life\***

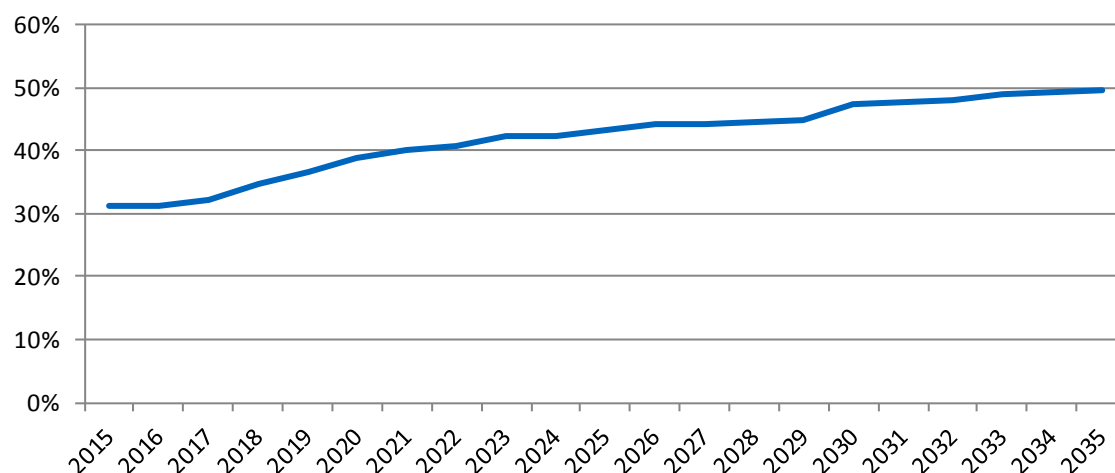


\*Projections based on \$785 million in annual average funding.

Next, Figure 3-16 presents the size of the investment backlog relative to the total replacement value of the region's transit assets (only for replaceable assets). This measure is similar to that presented in Figure 3-15. However, whereas Figure 3-15 only includes those assets that exceed their useful life (deferred replacements), Figure 3-16 also includes the estimated cost of future rehabilitations and capital maintenance needs (in addition to deferred replacements) due to funding shortfalls.

Therefore, this backlog-to-replacement value ratio is higher than that presented in Figure 3-15 since it includes additional deferred needs. This measure only considers capital needs, there is no consideration of the increased cost to operate and maintain a stock of aging assets. The level of total deferred reinvestment is estimated to increase from 31 percent currently, to 49 percent by 2035. The implication of each of these preceding analyses is that the current level of reinvestment is insufficient to prevent continued and ongoing growth in the size of the region's investment backlog, with potential consequences for regional service quality and reliability.

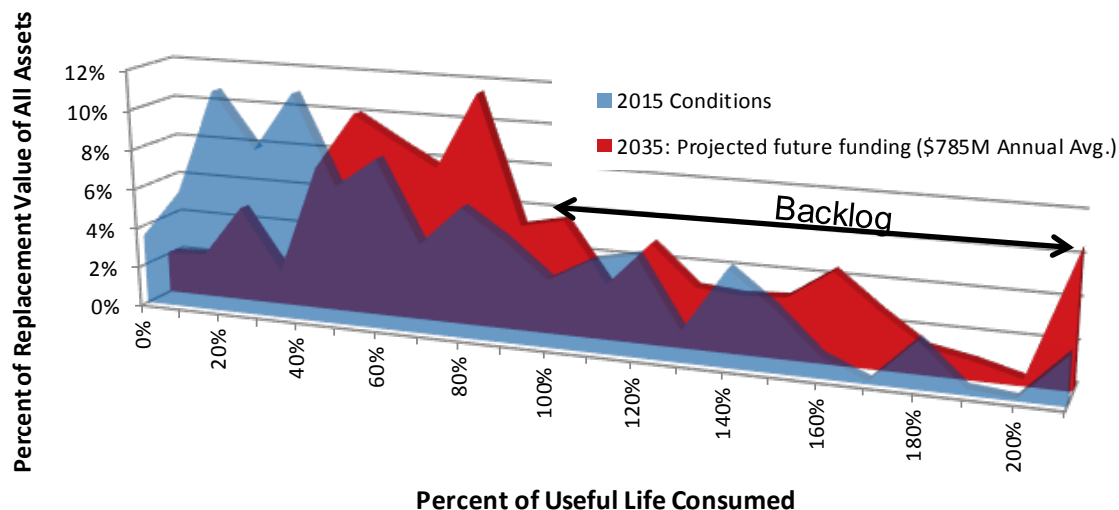
**Figure 3-16. Backlog to Replacement Value Ratio (Replaceable Assets)\***



\*Projections based on \$785 million in annual average funding.

Finally, Figure 3-17 provides a different view of the impact of sustaining recent rates of reinvestment on regional asset conditions and reinvestment needs. Figure 3-17 shows both the current and projected future age distributions of the region's transit assets (expressed as a percent of useful life consumed vs. percent share of the total replacement value of all regional transit assets). The assumed annual funding yields asset age distributions that have the effect of shifting the 2015 distribution "to the right" (i.e., if you don't replace assets they become older). The shape of the projected future distributions partially reflect the reinvestment priorities used by COST to determine which assets are addressed and which are not when funding is constrained.

Figure 3-17. Current and Projected Asset Age Distribution – RTA Region



### 3.8 Regional Funding Capacity, Reinvestment Needs and the Investment backlog

As discussed above, the current rate of annual reinvestment is insufficient to address the region's normal replacement needs, leading to predicted ongoing growth in the size of the investment backlog and an associated decline in overall asset conditions. The question arises then: What level of funding would be required to stop or reverse growth in the investment backlog? The question is addressed by Service Board and for the region as a whole in Figure 3-18.

Specifically, this figure indicates that an estimated \$1.5 billion in annual reinvestment is required to maintain the current size of the region's backlog (note that this amount is roughly double the level of expected funding for this time period). Similarly, an estimated \$2.6 billion in annual reinvestment would be required to attain SGR in 20 years (including full elimination of the backlog) and \$3.4 billion annually to do so in 10-years. Given the volume of infrastructure needs that would need to be addressed, it should be noted that full elimination of the backlog over a single 10-year period is not considered to be either financially or physically feasible.

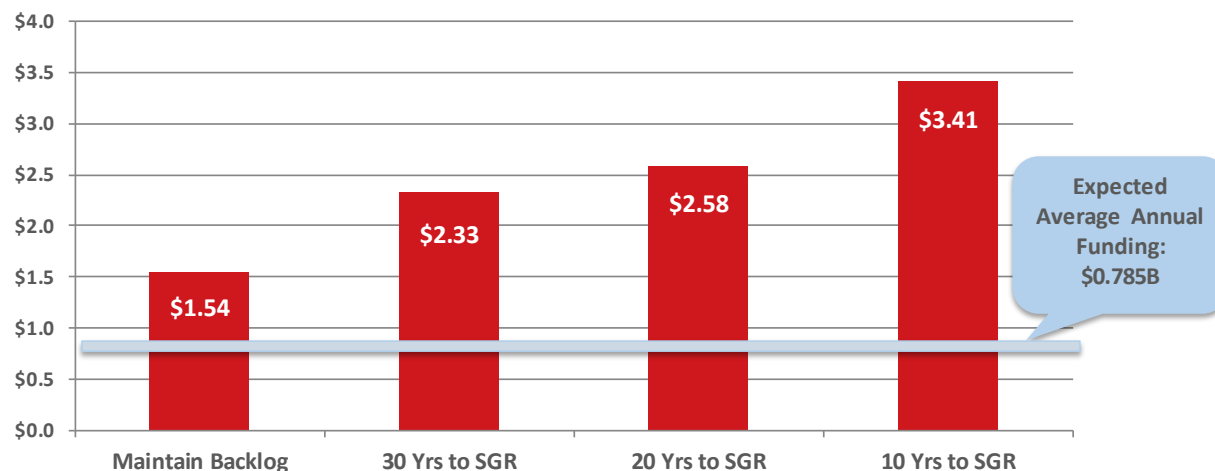
Figure 3-18. Required Funding to Attain Specific Reinvestment Targets (Millions of \$2015)

Service Board	SGR Backlog	Normal Reinvestment	Maintain Backlog	Attain SGR in 30 Years	Attain SGR in 20 Years	Attain SGR in 10 Years
CTA	\$12,456	\$10,626	\$878	\$1,371	\$1,540	\$2,138
Metra	\$6,139	\$5,865	\$539	\$787	\$847	\$1,046
PACE	\$755	\$1,832	\$125	\$171	\$194	\$223
<b>Total</b>	<b>\$19,350</b>	<b>\$18,322</b>	<b>\$1,541</b>	<b>\$2,329</b>	<b>\$2,581</b>	<b>\$3,407</b>

This information is presented graphically in Figure 3-19. The total height of the bar indicates the average annual level of investment to attain each investment target (e.g., \$2.6B annually to draw down the existing backlog and attain full SGR in 20 years). The horizontal bar shows expected average annual

funding for the next 20 years (\$785M) while the red portion above the bar represents the unfunded level to reach each target.

**Figure 3-19. Required Funding to Attain Specific Reinvestment Targets (Billions of \$2015)**



## 4. STATE OF GOOD REPAIR PERFORMANCE METRICS

### 4.1 SGR Measures and Targets

The FTA released its new transit asset management (TAM) Rule on July 12, 2016. Significantly, the rules include a definition of state of good repair, establish deadlines for submission of TAM Plans, and add a set of state of good repair performance metrics to the National Transit Database (NTD) annual reporting requirements. The SGR performance measures include:

- Equipment: (non-revenue) service vehicles. The performance measure for non-revenue, support-service and maintenance vehicles equipment is the percentage of those vehicles that have either met or exceeded their Useful Life Benchmark (ULB).
- Rolling stock. The performance measure for rolling stock is the percentage of revenue vehicles within a particular asset class that have either met or exceeded their ULB.
- Infrastructure: rail fixed-guideway, track, signals, and systems. The performance measure for rail fixed guideway, track, signals, and systems is the percentage of track segments with performance restrictions.
- Facilities. The performance measure for facilities is the percentage of facilities within an asset class, rated below condition 3 on the TERM scale (1 to 5 where 1 is poor/worn and 5 is excellent).

FTA has also provided a set of default ULBs, which can be used where applicable. It is the responsibility of each operator to determine the ULB that corresponds to its operating environment and asset replacement goals.

NTD reporting requires submission of service providers' asset inventory and assessment of asset condition. This asset inventory must include all owned equipment, rolling stock, facilities and infrastructure, as well as any third party-owned rolling stock, facilities and infrastructure used by the provider to deliver public transit services. Equipment with an acquisition value of less than \$50,000, excepting service vehicle equipment, may be excluded from the inventory.

FTA has defined State of Good Repair (SGR) in the TAM Rule. SGR principles are given as:

- A capital asset is in SGR if it is in condition sufficient for the asset to operate at a full level of performance
- An individual asset may operate in SGR regardless of condition of other assets within a public transportation system
- A provider's Accountable Executive must balance TAM, safety, day-to-day operations, and expansion needs in approving and carrying out a TAM plan and an agency safety plan.

Further, the FTA states that a capital asset is in SGR if it meets the following objective standards:

- The capital asset is able to perform its designed function
- The use of the asset in its current condition does not pose an identified unacceptable safety risk
- The life-cycle investment needs of the asset have been met or recovered, including all scheduled maintenance, rehabilitation, and replacements.

Under the final rule, agency TAM plans must include a condition assessment of all inventoried assets. The rule does not establish a required condition rating scale and agencies are permitted to develop their

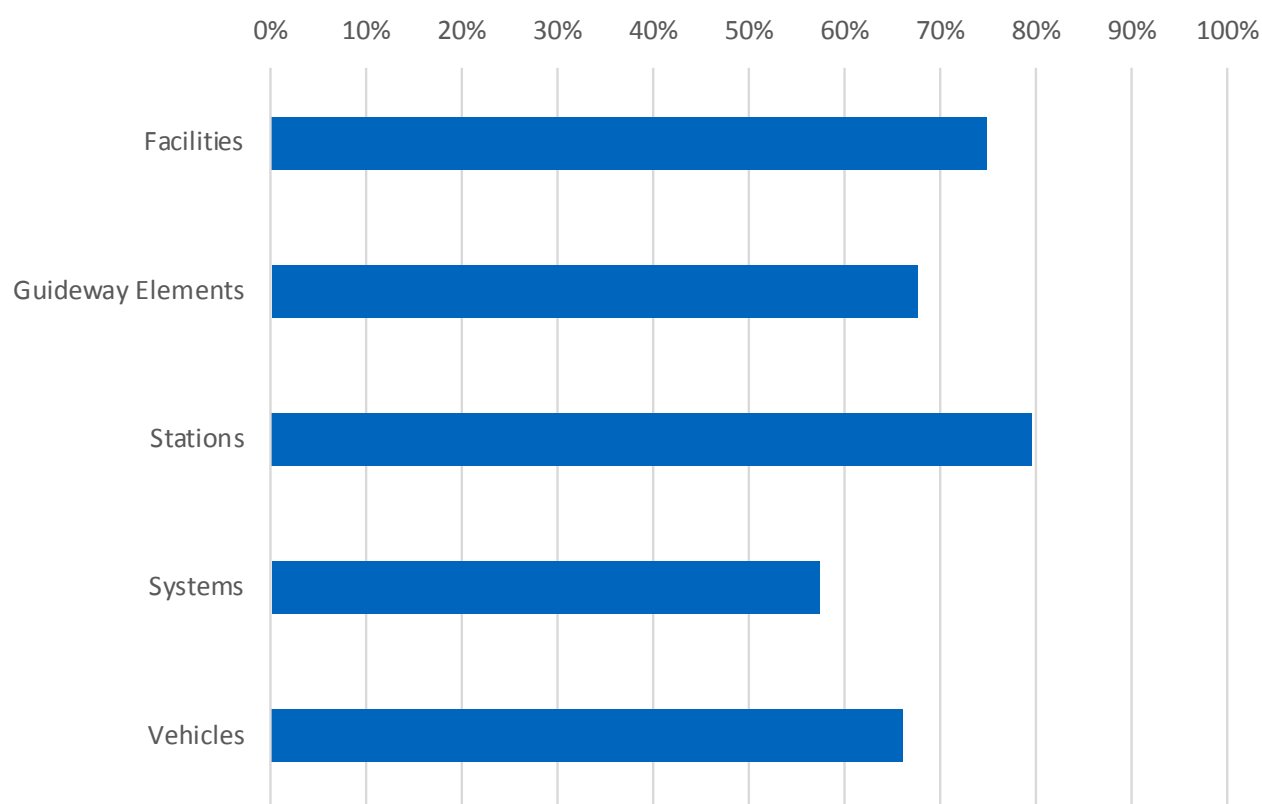


own scales and methodology for asset assessment (including the use of decay curve based condition estimates if desired). However, it is important to note FTA has provided specific guidance on the calculation of the “facilities” condition performance measure (to be reported to NTD). This measure must be developed based on the results of an on-site, physical condition assessment utilizing the TERM 1 to 5 condition rating scale (FTA has provided preliminary guidance on this measure, with final guidance expected in early 2017).

## 4.2 Regional Measures of SGR

For the past several years, RTA has reported on several measures of SGR, based on the data updates for the current year. For this purpose, SGR is defined as the degree of attainment of SGR for a group of assets evaluated as the total level of reinvestment required to replace all assets that exceed their useful life and address all outstanding rehabilitation and annual capital maintenance needs divided by the total replacement value of those assets. Note this “in state of good repair” definition is not relative to the FTA description above, it is relative to the COST-estimated condition value based on age.

**Figure 4-1. Percent of Regional Transit Assets in State of Good Repair  
(Percent of Assets Within Their Useful Life)  
(All Assets as of December 31, 2015)**



Interpretation of the results is similar to that of Figure 1-2, with Stations exhibiting the highest relative SGR, and with Systems trailing.

### 4.3 Overall Asset Condition

Finally, regional metrics include the overall distribution of age-based condition for the various asset types, ranging from excellent to poor. The data driving these charts is for all Service Board assets as of December 31, 2015.

Figure 4.2 identifies the entire region's assets, while Figures 4.3-4.5 identify the individual charts for each Service Board. The height of the bars represents the total value of the assets in the asset group based on replacement value.

**Figure 4-2. Distribution of Asset Conditions by Asset Category: RTA (\$2015)**

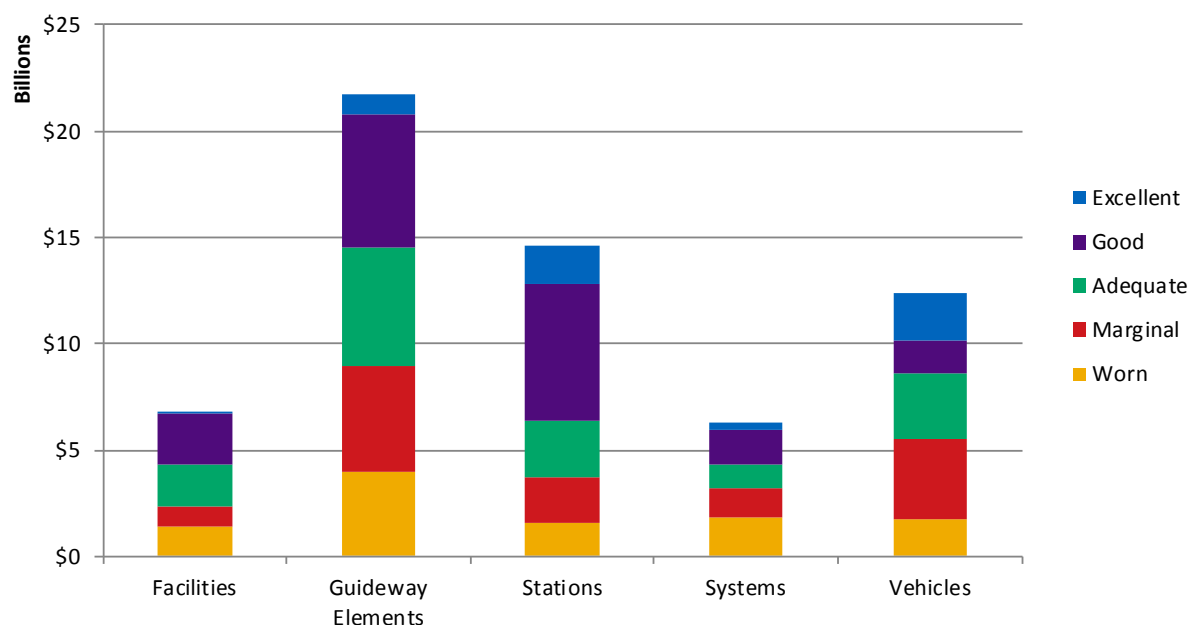


Figure 4-3. Distribution of Asset Conditions by Asset Category: CTA (\$2015)

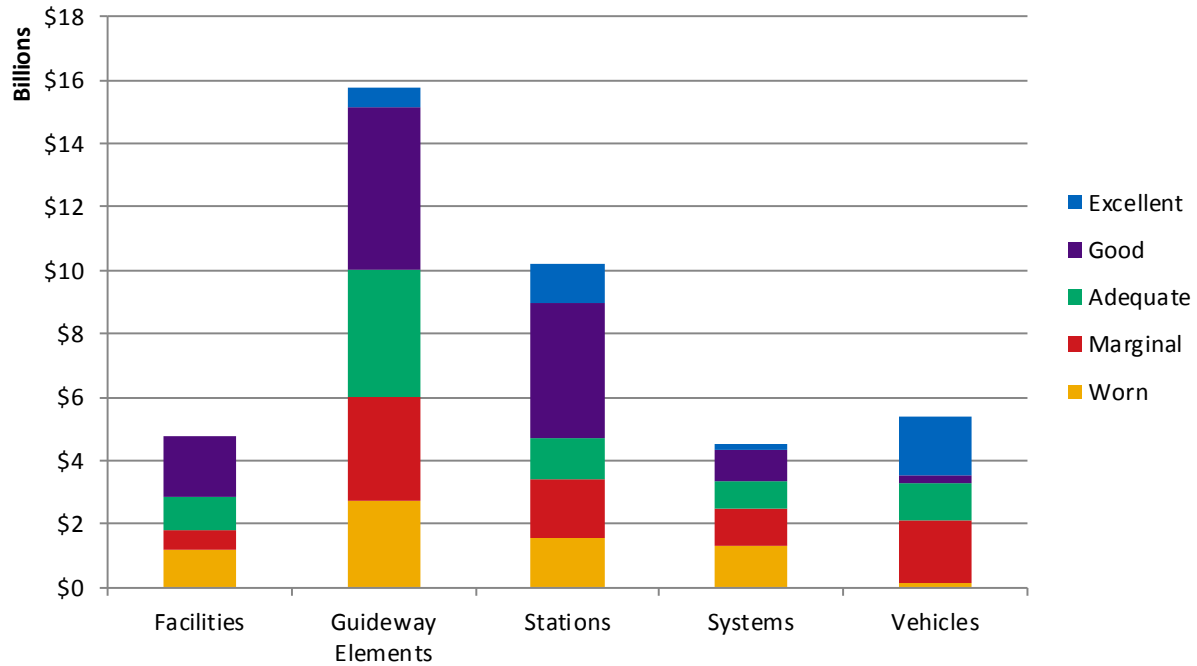


Figure 4-4. Distribution of Asset Conditions by Asset Category: Metra (\$2015)

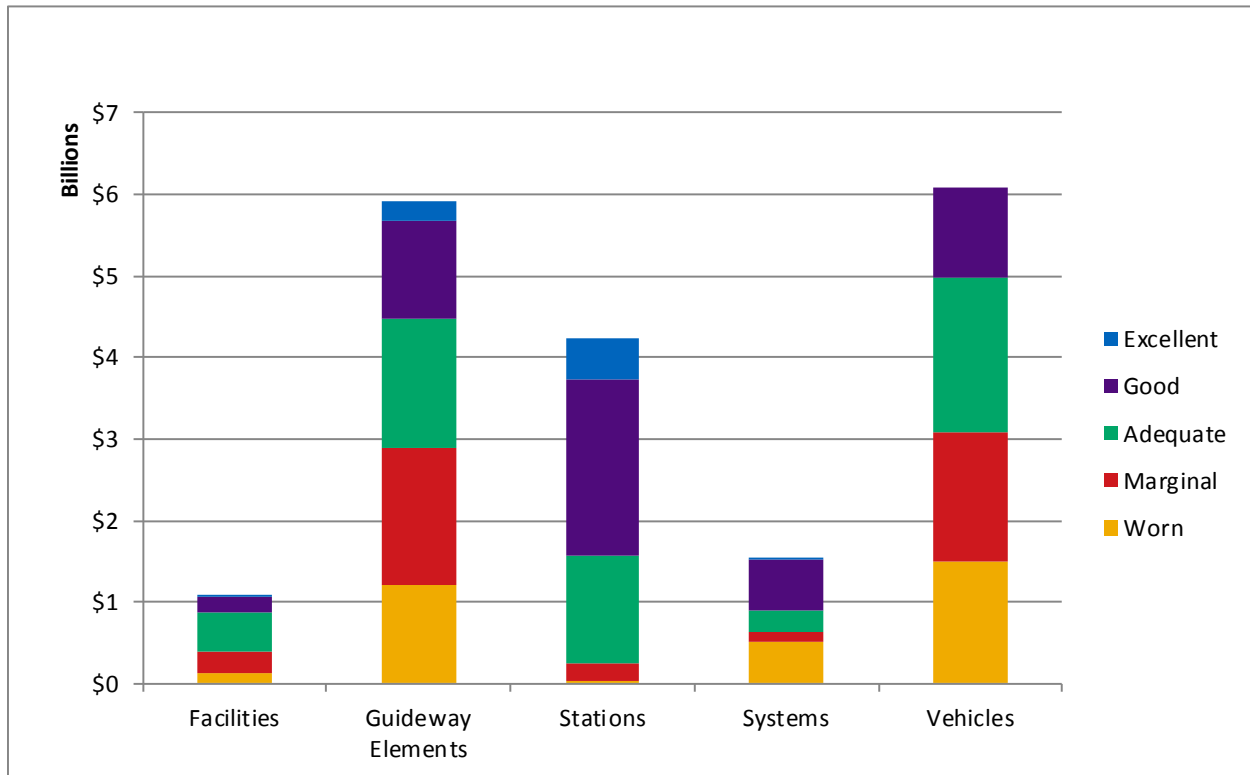
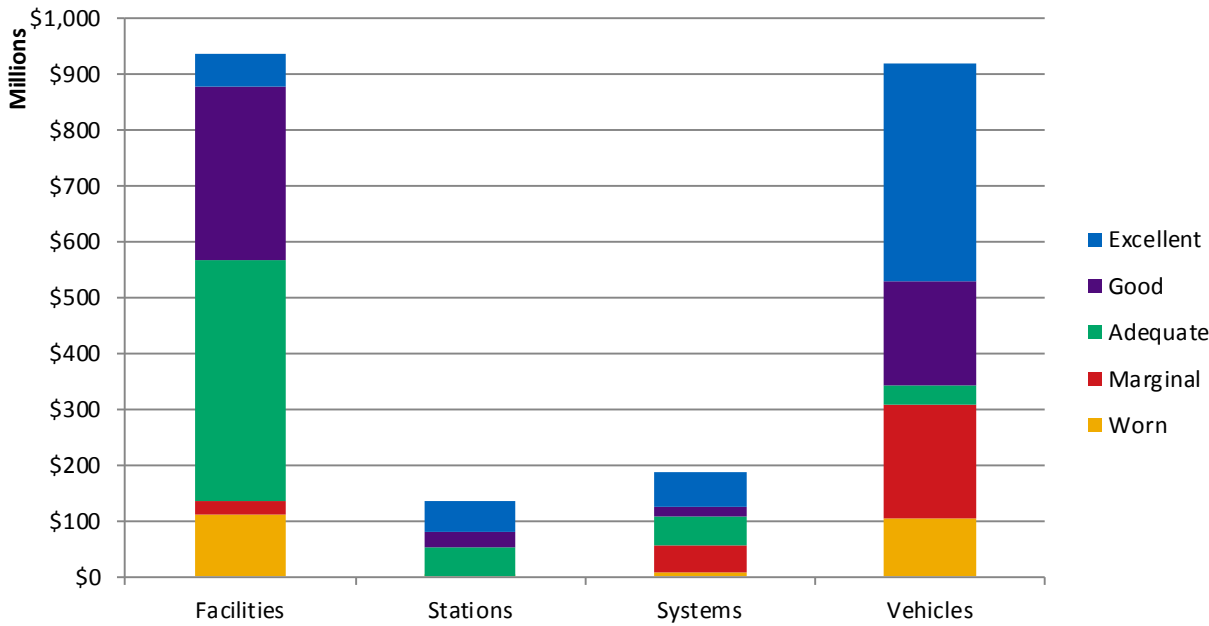


Figure 4-5. Distribution of Asset Conditions by Asset Category: Pace (\$2015)



## APPENDIX A, GLOSSARY AND ABBREVIATIONS

<b>ACM</b>	Annual Capital Maintenance – Ongoing minor capital investments as required to maintain a state of good repair over the next 10-year period.
<b>Asset Decay Curves</b>	FTA has developed “generic” transit asset decay curves for major asset types using data collected from transit agencies nationwide. An asset decay curve joins age with physical condition so the curve itself becomes the predictor of the asset’s physical condition.
<b>Asset Types/Categories</b>	Categories of assets making up each Service Board asset inventory. The Capital Decision Prioritization Support Tool uses five main categories of assets: Guideway; Stations; Facilities; Systems and Vehicles.
<b>Backlog</b>	Deferred reinvestment in asset rehabilitation, replacement, and annual capital maintenance.
<b>BN</b>	Burlington Northern Railroad
<b>Condition Rating Levels</b>	Rating levels established by RTA and the Service Boards for purposes of categorizing physical condition of assets. The five levels are: 5 (excellent), 4 (good), 3 (adequate), 2 (fair), and 1 (worn).
<b>Contingency Costs</b>	Contingency costs are budgeted for unforeseen emergencies or design shortfalls typically identified after a project commences. The contingency is included in the budget to minimize interruptions due to changes or cost overruns.
<b>COST</b>	<p>Capital Optimization Support Tool - Decision support tool developed by RTA with support from the Service Boards to assess and prioritize transit capital reinvestment needs within the parameters of regional funding and the region’s long-term strategic objectives. The tool was initially called Decision Tool, later renamed COST.</p> <p>COST is a model that can be used to demonstrate the outcome in terms of asset condition and backlog based on a given funding level. It can also help prioritize investments in specific asset types based on a pre-set of priorities and estimated needs.</p>
<b>Facilities</b>	Facilities includes all assets related to maintenance and administrative facilities. Facilities represent one of five main COST asset types.
<b>FAST Act</b>	Fixing America’s Surface Transportation Act (December, 2015)
<b>FTA</b>	Federal Transit Administration
<b>Guideway</b>	Guideway includes all assets related to the Service Board guideway elements including the track itself, the guideway for track or Bus Rapid Transit, and associated structures. Guideway is one of five main COST asset types.
<b>MAP-21</b>	Moving Ahead for Progress in the 21 <sup>st</sup> Century, the 2012 federal Transportation Legislation bill
<b>Master DB</b>	Master Database containing combined Asset Table data from all three Service Boards.

<b>Normal Reinvestment or Normal Capital Reinvestment</b>	Normal replacement, plus scheduled rehabilitation work and annual capital maintenance.
<b>Normal Replacement</b>	Ongoing replacement of existing assets as they reach the end of their expected useful life. Normal replacement does not include deferred replacement needs, only those needs for assets that will reach the end of their useful life over the next 10-year period.
<b>NICTD</b>	Northern Indiana Commuter Transportation District
<b>NTD</b>	National Transit Database
<b>Rehabilitation</b>	Ongoing rehabilitation needs for existing assets, based on a defined schedule. Rehabilitation does not include deferred rehabilitation needs, only those rehabilitation activities that will arise over the next 10-year period as required to maintain a state of good repair.
<b>RTA</b>	Regional Transportation Authority of Northeastern Illinois
<b>RTU</b>	Remote Terminal Unit
<b>SB</b>	Service Board (i.e., CTA, Metra or Pace)
<b>SCADA</b>	Supervisory Control and Data Acquisition
<b>State of Good Repair (SGR)</b>	<p>For RTA, SGR is used primarily as a major assumption for determining capital needs – that is, assets are replaced once they reach useful life, all rehabs are performed and capital maintenance is up to date. In order to measure SGR, RTA further developed a performance measure called “Percent of Assets in SGR.” Definition of the Measure: The degree of attainment of SGR for a group of assets is evaluated as the total level of reinvestment required to replace all assets that exceed their useful life and address all outstanding rehabilitation and annual capital maintenance needs divided by the total replacement value of those assets.</p> <p><b>FTA definition:</b> (a) A capital asset is in SGR if it is in condition sufficient for the asset to operate at a full level of performance  (b) An individual asset may operate in SGR regardless of condition of other assets within a public transportation system  (c) A provider’s Accountable Executive must balance TAM, safety, day-to-day operations, and expansion needs in approving and carrying out a TAM plan and agency safety plan.</p>
<b>Stations</b>	One of five main COST asset types. Stations represent customer facing facilities, and include assets such as passenger stations, transfer terminals, and park and ride locations. Station assets exclude systems assets already accounted for under Systems.
<b>Soft Costs</b>	The majority of soft costs are expended in the planning, engineering, and project management efforts. These services include in-house agency staff, government related support staff, and occasionally consultants. Project start-up expenses are also included in this category. Project financing cost and “other” expenses (reconciliation and unaccountable costs) comprise the full range of project development capital costs (FTA definition).



<b>Systems</b>	Systems include all infrastructure support categories, such as communications, train control, traction power, and fare collection systems. Systems represent one of five main COST asset types.
<b>TAM</b>	Transit Asset Management
<b>TAM Plan</b>	Transit Asset Management Plan (new FTA rule/ MAP-21 requirement)
<b>TERM</b>	Transit Economics Requirements Model – FTA-led program, which is FTA’s capital needs analysis tool. FTA has also developed a regional/local version of the tool called TERM-Lite.
<b>Useful Life</b>	Expected life cycle of a capital asset, or the acceptable period of use in service (definition from TAM Rule Federal Register). Expected useful lives for individual assets are driven by several factors, including historical performance, manufacturer recommendations, and policy.
<b>Useful Life Benchmark</b>	Expected life cycle of a capital asset for a particular transit provider’s operating environment, or the acceptable period of use in service for a particular transit provider’s operating environment (definition from TAM Rule Federal Register).
<b>Unconstrained Needs</b>	Financially unconstrained. Unconstrained needs scenarios are typically the first run to establish total asset management needs in order to fully measure the combination of upcoming needs as well as any existing backlog.
<b>Vehicles</b>	Vehicles include both revenue vehicles and non-revenue vehicles. Vehicles represent one of five main COST asset types.

## APPENDIX B, MAJOR ASSUMPTIONS

<b>Needs Projections</b>	All needs projections are based upon Inventory Data current as of December 2015, as well as key Service Board assumptions regarding asset useful life, timing and cost of rehabilitations, and capital maintenance.
<b>Life Cycle Events (Rehabs and Capital Maintenance)</b>	RTA and the Service Boards developed improved life cycle cost assumptions for a variety of asset types, most notably passenger stations and maintenance facilities. These life cycle assumptions provide a reasonable assessment of the timing and cost of rehabilitation and capital maintenance events required to keep Service Board assets in a state of good repair.
<b>Unit Costs</b>	Service Boards provided updated life cycle cost assumptions for December 2015.
<b>Dollars of Analysis</b>	The 2016 needs assessment was conducted in \$2015. Future updates are expected to be conducted similarly though perhaps not every year. Year-to-year projections are compared both in real terms, as well as inflation-adjusted terms.
<b>Inflation</b>	Inflation is determined based on the Producer Price Index. Inflation tables are presented below in this section.
<b>Useful Life</b>	Estimated useful life assumptions attributed to individual assets. Current useful life assumptions for each Service Board are presented below in this section

## B.1 Assumptions for Inflation Factors

COST uses an inflation index to ensure that historical cost data used in needs estimation are brought to a common report year dollar (e.g., \$2015 for the current report). Specifically, each asset record in COST has a field (CostYear) that denotes the dollar year in which asset's unit costs are valued. For example, an asset record with a CostYear value of 2011 indicates that that asset's unit cost is denominated in \$2011. COST then uses the CostYear field to convert historical cost values from the CostYear in which they are denominated (e.g., \$2011) to a common report dollar year value across all assets (e.g., \$2015). It is important to note that the CostYear values used to identify what year unit costs are denoted in can be, and typically are very different than, the asset Date Built values used to record the year the asset was acquired or constructed.

Inflation factors for the last five years are presented below.

Year	Inflation Factor	% Change
2011	153.60	1.20%
2012	159.47	3.82%
2013	163.14	2.30%
2014	167.53	2.69%
2015	172.66	3.06%

Source: Producer Price Index

## B.2 Useful Life Assumptions, CTA<sup>5</sup>

RTA Asset Type	Asset Code	Category	Sub-Category	Element	Sub-Element	Useful Life
Track Structures	10110	Guideway	Guideway	At Grade Exclusive	-	80
Track Structures	10322	Guideway	Guideway	Elevated Structure	Non Ballasted Steel or Concrete	80
Track Structures	10402	Guideway	Guideway	Elevated Fill	Retained Embankment	80
Track Structures	10512	Guideway	Guideway	Underground	Tunnel - Concrete	80
Track Structures	10600	Guideway	Guideway	Retained Cut	-	80
Rail	11115	Guideway	Trackwork	Direct Fixation	Tangent - CTA	60
Rail	11116	Guideway	Trackwork	Direct Fixation	Curve - CTA	60
Rail	11155	Guideway	Trackwork	Open Deck	Tangent - CTA	40
Rail	11156	Guideway	Trackwork	Open Deck	Curve - CTA	40
Rail	11213	Guideway	Trackwork	Ballasted	Tangent - CTA	40
Rail	11223	Guideway	Trackwork	Ballasted	Curve - CTA	40
Grade Crossings	11330	Guideway	Trackwork	Embedded	At-Grade Crossings	20
Rail	11411-2	Guideway	Trackwork	Special	CTA Loop (High/Low use)	25
Bus Turnaround	13201	Guideway	Bus Guideway	Turnaround	CTA	20
Other Major Facilities	21100	Facilities	Buildings	Administration	-	60
Bus Garages	21211	Facilities	Buildings	Maintenance	CTA -- Interior Bus	60
Other Major Facilities	21211	Facilities	Buildings	Maintenance	CTA -- Interior Bus	60
Other Major Facilities	21221	Facilities	Buildings	Maintenance	CTA -- Rail	60
Railcar Maint Shops	21221	Facilities	Buildings	Maintenance	CTA -- Rail	60
Other Major Facilities	21231	Facilities	Buildings	Maintenance	CTA -- Warehouse	60
Yard	21251	Facilities	Storage Yard	Rail	-	50
Work Equipment Misc	23400	Facilities	Equipment	Maintenance	-	20
Other Major Facilities	25000	Facilities	Central Control	Building Only	-	60
Cab Signals	31200	Systems	Train Control	Wayside Train Control	-	25
Grade Crossings	31400	Systems	Train Control	Roadway Crossings	-	25
Interlockings	31800	Systems	Train Control	Interlocking	-	25
Substations	32200	Systems	Electrification	Substations	-	24
Substations	32200	Systems	Electrification	Substations	-	30
SCADA RTUs	32210	Systems	Electrification	Substations	SCADA RTUs	7
ROW Traction Power	32400	Systems	Electrification	Contact Rail	Contact Rail, Chairs, Anchor and Incline	20
ROW Traction Power	32400	Systems	Electrification	Contact Rail	Contact Rail, Chairs, Anchor and Incline	25
Substation Distribution	32801	Systems	Electrification	Power Cable	Substation feed	30
Substation Distribution	32801	Systems	Electrification	Power Cable	Substation feed	40
Fiber Optic BB	33101	Systems	Communications	Cable Transmission System (CTS)	Fiber Optic Cable Transmission System	10
Cable Plant Fiber	33102	Systems	Communications	Cable Transmission System (CTS)	Cable	20
Bus Rail Radio Systems	33502	Systems	Communications	Radio	Base Radio Stations	15
Subway Illumination	36101	Systems	Utilities	Lighting	Subway	20
Subway Pumps	36204	Systems	Utilities	Sump Pumps	Subway	30
Subway Fans	36302	Systems	Utilities	Ventilation - Control Systems	Subway	25
Subway Electrical Serv	36501	Systems	Utilities	Electrical Service	Subway	25
Stations	40051	Stations	Rail	CTA	At-Grade	60
Stations	40052	Stations	Rail	CTA	At-Grade Median	60
Stations	40053	Stations	Rail	CTA	Elevated	60
Stations	40054	Stations	Rail	CTA	Subway	60
Station Parking	46210	Stations	Access	Parking	Garage	20
Station Parking	46220	Stations	Access	Parking	Lot	20
Buses	55120	Vehicles	Revenue Vehicles	Bus	Articulated bus -- Diesel	12
Buses	55130	Vehicles	Revenue Vehicles	Bus	Articulated bus -- Hybrid	12
Buses	55130	Vehicles	Revenue Vehicles	Bus	Large Bus (60 ft) -- Hybrid	12
Buses	55220	Vehicles	Revenue Vehicles	Bus	Large Bus (40 ft) -- Diesel	12
Buses	55230	Vehicles	Revenue Vehicles	Bus	Large Bus (40 ft) -- Hybrid	12
Buses	55240	Vehicles	Revenue Vehicles	Bus	Large Bus (60 ft) -- Electric	12
Rail Revenue Cars	56400	Vehicles	Revenue Vehicles	Rail	Heavy Rail	25
Work Trucks	59100	Vehicles	Non-Revenue Vehicles	Car	-	10
Work Trucks	59200	Vehicles	Non-Revenue Vehicles	Truck	-	10
Railborne Work Equipment	59300	Vehicles	Non-Revenue Vehicles	Special	Various - Range	5-20
Work Equipment Trailers	59300	Vehicles	Non-Revenue Vehicles	Special	Various - Range	5-18

<sup>5</sup> CTA's bus and rail vehicles are managed on longer asset life terms, but with robust funding levels would use stated life cycles.

## B.2 Useful Life Assumptions, Metra

[illegible]

## B.2 Useful Life Assumptions, Metra (Continued)

AssetType	Asset Code	Category	Sub-Category	Element	Sub-Element	Useful Life
Rail Bridges - Burlington Northern Santa Fe/Main Line	10352	Guideway	Guideway	Elevated Structure	MSY Masonry	80
Rail Bridges - Electric District/Main Line	10352	Guideway	Guideway	Elevated Structure	MSY Masonry	80
Rail Bridges - Heritage Corridor/Main Line	10352	Guideway	Guideway	Elevated Structure	MSY Masonry	80
Rail Bridges - Milwaukee District North/Main Line	10352	Guideway	Guideway	Elevated Structure	MSY Masonry	80
Rail Bridges - Milwaukee District West/Main Line	10352	Guideway	Guideway	Elevated Structure	MSY Masonry	80
Rail Bridges - Rock Island District/Main Line	10352	Guideway	Guideway	Elevated Structure	MSY Masonry	80
Rail Bridges - SouthWest Service/Main Line	10352	Guideway	Guideway	Elevated Structure	MSY Masonry	80
Rail Bridges - Union Pacific North/Main Line	10352	Guideway	Guideway	Elevated Structure	MSY Masonry	80
Rail Bridges - Union Pacific Northwest/Main Line	10352	Guideway	Guideway	Elevated Structure	MSY Masonry	80
Rail Bridges - Union Pacific Northwest/McHenry Branch	10352	Guideway	Guideway	Elevated Structure	MSY Masonry	80
Rail Bridges - Union Pacific West/Main Line	10352	Guideway	Guideway	Elevated Structure	MSY Masonry	80
Rail Bridges - Milwaukee District North/Main Line	10353	Guideway	Guideway	Elevated Structure	TPP Timber Pile Pier	60
Rail Bridges - North Central Service/Main Line	10353	Guideway	Guideway	Elevated Structure	TPP Timber Pile Pier	60
Rail Bridges - SouthWest Service/Main Line	10353	Guideway	Guideway	Elevated Structure	TPP Timber Pile Pier	60
Rail Bridges - Union Pacific Northwest/Main Line	10354	Guideway	Guideway	Elevated Structure	GIP Galvanized Iron Pipe	60
Rail Bridges - Burlington Northern Santa Fe/Main Line	10358	Guideway	Guideway	Elevated Structure	CON Concrete	80
Rail Bridges - Electric District/Blue Island Branch	10358	Guideway	Guideway	Elevated Structure	CON Concrete	80
Rail Bridges - Electric District/Main Line	10358	Guideway	Guideway	Elevated Structure	CON Concrete	80
Rail Bridges - Heritage Corridor/Main Line	10358	Guideway	Guideway	Elevated Structure	CON Concrete	80
Rail Bridges - Milwaukee District North/Main Line	10358	Guideway	Guideway	Elevated Structure	CON Concrete	80
Rail Bridges - Milwaukee District West/Main Line	10358	Guideway	Guideway	Elevated Structure	CON Concrete	80
Rail Bridges - North Central Service/Main Line	10358	Guideway	Guideway	Elevated Structure	CON Concrete	80
Rail Bridges - Rock Island District/Beverly Branch	10358	Guideway	Guideway	Elevated Structure	CON Concrete	80
Rail Bridges - Rock Island District/Main Line	10358	Guideway	Guideway	Elevated Structure	CON Concrete	80
Rail Bridges - SouthWest Service/Main Line	10358	Guideway	Guideway	Elevated Structure	CON Concrete	80
Rail Bridges - Union Pacific North/Main Line	10358	Guideway	Guideway	Elevated Structure	CON Concrete	80
Rail Bridges - Union Pacific Northwest/Main Line	10358	Guideway	Guideway	Elevated Structure	CON Concrete	80
Rail Bridges - Union Pacific Northwest/McHenry Branch	10358	Guideway	Guideway	Elevated Structure	CON Concrete	80
Rail Bridges - Union Pacific West/Main Line	10358	Guideway	Guideway	Elevated Structure	CON Concrete	80
Rail Bridges - Union Pacific West/Main Line	10359	Guideway	Guideway	Elevated Structure	SFM Steel Bents on Masonry	80
Rail Bridges - Milwaukee District North/Main Line	10360	Guideway	Guideway	Elevated Structure	TPB Timber pile Bents	40
Rail Bridges - North Central Service/Main Line	10360	Guideway	Guideway	Elevated Structure	TPB Timber pile Bents	40
Rail Bridges - SouthWest Service/Main Line	10360	Guideway	Guideway	Elevated Structure	TPB Timber pile Bents	40
Rail Bridges - Union Pacific Northwest/Main Line	10360	Guideway	Guideway	Elevated Structure	TPB Timber pile Bents	40
Rail Bridges - Union Pacific West/Main Line	10360	Guideway	Guideway	Elevated Structure	TPB Timber pile Bents	40
Rail Bridges - Rock Island District/Beverly Branch	10361	Guideway	Guideway	Elevated Structure	TFB Timbers framed	40
Rail Bridges - Electric District/Main Line	10365	Guideway	Guideway	Elevated Structure	CFT Concrete Pedestals	40
Rail Bridges - Rock Island District/Beverly Branch	10365	Guideway	Guideway	Elevated Structure	CFT Concrete Pedestals	40
Rail Bridges - Burlington Northern Santa Fe/Main Line	10366	Guideway	Guideway	Elevated Structure	CAB Concrete Abutments	80
Rail Bridges - Heritage Corridor/Main Line	10366	Guideway	Guideway	Elevated Structure	CAB Concrete Abutments	80
Rail Bridges - Milwaukee District North/Main Line	10366	Guideway	Guideway	Elevated Structure	CAB Concrete Abutments	80
Rail Bridges - Milwaukee District West/Main Line	10366	Guideway	Guideway	Elevated Structure	CAB Concrete Abutments	80
Rail Bridges - Rock Island District/Main Line	10366	Guideway	Guideway	Elevated Structure	CAB Concrete Abutments	80
Rail Bridges - SouthWest Service/Main Line	10366	Guideway	Guideway	Elevated Structure	CAB Concrete Abutments	80
Rail Bridges - Union Pacific North/Main Line	10366	Guideway	Guideway	Elevated Structure	CAB Concrete Abutments	80
Rail Bridges - Union Pacific Northwest/Main Line	10366	Guideway	Guideway	Elevated Structure	CAB Concrete Abutments	80
Rail Bridges - Union Pacific West/Main Line	10366	Guideway	Guideway	Elevated Structure	CAB Concrete Abutments	80
Rail Bridges - North Central Service/Main Line	10367	Guideway	Guideway	Elevated Structure	SPB Driven Steel Bents	80
Rail Bridges - Milwaukee District West/Main Line	10368	Guideway	Guideway	Elevated Structure	SPP Driven Steel Piers	80
Rail Bridges - North Central Service/Main Line	10368	Guideway	Guideway	Elevated Structure	SPP Driven Steel Piers	80
Rail Bridges - Electric District/Main Line	10370	Guideway	Guideway	Elevated Structure	MSY Masonry or Stone	80
Rail Bridges - Heritage Corridor/Main Line	10370	Guideway	Guideway	Elevated Structure	MSY Masonry or Stone	80
Rail Bridges - Milwaukee District North/Main Line	10370	Guideway	Guideway	Elevated Structure	MSY Masonry or Stone	80
Rail Bridges - Milwaukee District West/Main Line	10370	Guideway	Guideway	Elevated Structure	MSY Masonry or Stone	80
Rail Bridges - Rock Island District/Main Line	10370	Guideway	Guideway	Elevated Structure	MSY Masonry or Stone	80
Rail Bridges - Union Pacific North/Main Line	10370	Guideway	Guideway	Elevated Structure	MSY Masonry or Stone	80
Rail Bridges - Union Pacific Northwest/Main Line	10370	Guideway	Guideway	Elevated Structure	MSY Masonry or Stone	80
Rail Bridges - Union Pacific Northwest/McHenry Branch	10370	Guideway	Guideway	Elevated Structure	MSY Masonry or Stone	80
Rail Bridges - Union Pacific West/Main Line	10370	Guideway	Guideway	Elevated Structure	MSY Masonry or Stone	80
Rail Bridges - Union Pacific Northwest/Main Line	10371	Guideway	Guideway	Elevated Structure	DTDR Double Track Deck Riveted Truss	80
Rail Bridges - Milwaukee District North/Main Line	10372	Guideway	Guideway	Elevated Structure	MBC Masonry Box Culvert	80
Rail Bridges - Milwaukee District West/Main Line	10373	Guideway	Guideway	Elevated Structure	DTTPGTF Dble Trk TPG w/ FBMs	80
Rail Bridges - Union Pacific Northwest/Main Line	10373	Guideway	Guideway	Elevated Structure	DTTPGTF Dble Trk TPG w/ FBMs	80
Rail Bridges - Union Pacific West/Main Line	10373	Guideway	Guideway	Elevated Structure	DTTPGTF Dble Trk TPG w/ FBMs	80
Rail Bridges - Burlington Northern Santa Fe/Main Line	10374	Guideway	Guideway	Elevated Structure	TPG Through Plate Girder Span	80
Rail Bridges - Electric District/Main Line	10374	Guideway	Guideway	Elevated Structure	TPG Through Plate Girder Span	80
Rail Bridges - Milwaukee District North/Main Line	10374	Guideway	Guideway	Elevated Structure	TPG Through Plate Girder Span	80
Rail Bridges - North Central Service/Main Line	10374	Guideway	Guideway	Elevated Structure	TPG Through Plate Girder Span	80
Rail Bridges - Rock Island District/Main Line	10374	Guideway	Guideway	Elevated Structure	TPG Through Plate Girder Span	80
Rail Bridges - SouthWest Service/Main Line	10374	Guideway	Guideway	Elevated Structure	TPG Through Plate Girder Span	80
Rail Bridges - Union Pacific North/Main Line	10374	Guideway	Guideway	Elevated Structure	TPG Through Plate Girder Span	80
Rail Bridges - Union Pacific Northwest/Main Line	10374	Guideway	Guideway	Elevated Structure	TPG Through Plate Girder Span	80
Rail Bridges - Union Pacific West/Main Line	10374	Guideway	Guideway	Elevated Structure	TPG Through Plate Girder Span	80
Rail Bridges - Milwaukee District North/Main Line	10376	Guideway	Guideway	Elevated Structure	PCC Prestressed Concrete Culverts	80
Rail Bridges - Burlington Northern Santa Fe/Main Line	10377	Guideway	Guideway	Elevated Structure	DPG Deck Plate Girder	80
Rail Bridges - Electric District/Main Line	10377	Guideway	Guideway	Elevated Structure	DPG Deck Plate Girder	80
Rail Bridges - Heritage Corridor/Main Line	10377	Guideway	Guideway	Elevated Structure	DPG Deck Plate Girder	80
Rail Bridges - Milwaukee District North/Main Line	10377	Guideway	Guideway	Elevated Structure	DPG Deck Plate Girder	80
Rail Bridges - Milwaukee District West/Main Line	10377	Guideway	Guideway	Elevated Structure	DPG Deck Plate Girder	80
Rail Bridges - North Central Service/Main Line	10377	Guideway	Guideway	Elevated Structure	DPG Deck Plate Girder	80
Rail Bridges - Rock Island District/Main Line	10377	Guideway	Guideway	Elevated Structure	DPG Deck Plate Girder	80
Rail Bridges - SouthWest Service/Main Line	10377	Guideway	Guideway	Elevated Structure	DPG Deck Plate Girder	80
Rail Bridges - Union Pacific North/Main Line	10377	Guideway	Guideway	Elevated Structure	DPG Deck Plate Girder	80
Rail Bridges - Union Pacific Northwest/Main Line	10377	Guideway	Guideway	Elevated Structure	DPG Deck Plate Girder	80
Rail Bridges - Union Pacific West/Main Line	10377	Guideway	Guideway	Elevated Structure	DPG Deck Plate Girder	80



## B.2 Useful Life Assumptions, Metra (Continued)

AssetType	Asset Code	Category	Sub-Category	Element	Sub-Element	Useful Life
Rail Bridges - Burlington Northern Santa Fe/Main Line	10378	Guideway	Guideway	Elevated Structure	TPGTFB Through Plate Girder span w/ Transverse FBms.	80
Rail Bridges - Electric District/Blue Island Branch	10378	Guideway	Guideway	Elevated Structure	TPGTFB Through Plate Girder span w/ Transverse FBms.	80
Rail Bridges - Electric District/Main Line	10378	Guideway	Guideway	Elevated Structure	TPGTFB Through Plate Girder span w/ Transverse FBms.	80
Rail Bridges - Heritage Corridor/Main Line	10378	Guideway	Guideway	Elevated Structure	TPGTFB Through Plate Girder span w/ Transverse FBms.	80
Rail Bridges - Milwaukee District North/Main Line	10378	Guideway	Guideway	Elevated Structure	TPGTFB Through Plate Girder span w/ Transverse FBms.	80
Rail Bridges - Milwaukee District West/Main Line	10378	Guideway	Guideway	Elevated Structure	TPGTFB Through Plate Girder span w/ Transverse FBms.	80
Rail Bridges - North Central Service/Main Line	10378	Guideway	Guideway	Elevated Structure	TPGTFB Through Plate Girder span w/ Transverse FBms.	80
Rail Bridges - Rock Island District/Beverly Branch	10378	Guideway	Guideway	Elevated Structure	TPGTFB Through Plate Girder span w/ Transverse FBms.	80
Rail Bridges - Rock Island District/Main Line	10378	Guideway	Guideway	Elevated Structure	TPGTFB Through Plate Girder span w/ Transverse FBms.	80
Rail Bridges - SouthWest Service/Main Line	10378	Guideway	Guideway	Elevated Structure	TPGTFB Through Plate Girder span w/ Transverse FBms.	80
Rail Bridges - Union Pacific North/Main Line	10378	Guideway	Guideway	Elevated Structure	TPGTFB Through Plate Girder span w/ Transverse FBms.	80
Rail Bridges - Union Pacific Northwest/Main Line	10378	Guideway	Guideway	Elevated Structure	TPGTFB Through Plate Girder span w/ Transverse FBms.	80
Rail Bridges - Union Pacific West/Main Line	10378	Guideway	Guideway	Elevated Structure	TPGTFB Through Plate Girder span w/ Transverse FBms.	80
Rail Bridges - Electric District/Main Line	10379	Guideway	Guideway	Elevated Structure	DTTRT Double Trk Thru Riveted Truss	80
Rail Bridges - Heritage Corridor/Main Line	10379	Guideway	Guideway	Elevated Structure	DTTRT Double Trk Thru Riveted Truss	80
Rail Bridges - Rock Island District/Main Line	10379	Guideway	Guideway	Elevated Structure	DTTRT Double Trk Thru Riveted Truss	80
Rail Bridges - SouthWest Service/Main Line	10379	Guideway	Guideway	Elevated Structure	DTTRT Double Trk Thru Riveted Truss	80
Rail Bridges - Union Pacific West/Main Line	10381	Guideway	Guideway	Elevated Structure	DDPT Double Trk Deck pin Truss	80
Rail Bridges - Rock Island District/Main Line	10383	Guideway	Guideway	Elevated Structure	TRT Through Riveted Truss	80
Rail Bridges - SouthWest Service/Main Line	10383	Guideway	Guideway	Elevated Structure	TRT Through Riveted Truss	80
Rail Bridges - Union Pacific North/Main Line	10383	Guideway	Guideway	Elevated Structure	TRT Through Riveted Truss	80
Rail Bridges - Burlington Northern Santa Fe/Main Line	10385	Guideway	Guideway	Elevated Structure	PCB Prestressed Concrete Beams	80
Rail Bridges - Burlington Northern Santa Fe/Main Line	10387	Guideway	Guideway	Elevated Structure	CSS Concrete Slab Span	80
Rail Bridges - Electric District/Main Line	10387	Guideway	Guideway	Elevated Structure	CSS Concrete Slab Span	80
Rail Bridges - Heritage Corridor/Main Line	10387	Guideway	Guideway	Elevated Structure	CSS Concrete Slab Span	80
Rail Bridges - Milwaukee District North/Main Line	10387	Guideway	Guideway	Elevated Structure	CSS Concrete Slab Span	80
Rail Bridges - Milwaukee District West/Main Line	10387	Guideway	Guideway	Elevated Structure	CSS Concrete Slab Span	80
Rail Bridges - North Central Service/Main Line	10387	Guideway	Guideway	Elevated Structure	CSS Concrete Slab Span	80
Rail Bridges - Rock Island District/Beverly Branch	10387	Guideway	Guideway	Elevated Structure	CSS Concrete Slab Span	80
Rail Bridges - Rock Island District/Main Line	10387	Guideway	Guideway	Elevated Structure	CSS Concrete Slab Span	80
Rail Bridges - SouthWest Service/Main Line	10387	Guideway	Guideway	Elevated Structure	CSS Concrete Slab Span	80
Rail Bridges - Union Pacific North/Main Line	10387	Guideway	Guideway	Elevated Structure	CSS Concrete Slab Span	80
Rail Bridges - Union Pacific Northwest/Main Line	10387	Guideway	Guideway	Elevated Structure	CSS Concrete Slab Span	80
Rail Bridges - Union Pacific West/Main Line	10387	Guideway	Guideway	Elevated Structure	CSS Concrete Slab Span	80
Rail Bridges - Burlington Northern Santa Fe/Main Line	10388	Guideway	Guideway	Elevated Structure	RCB Reinforced Concrete Box Culvert	80
Rail Bridges - Electric District/Main Line	10388	Guideway	Guideway	Elevated Structure	RCB Reinforced Concrete Box Culvert	80
Rail Bridges - Heritage Corridor/Main Line	10388	Guideway	Guideway	Elevated Structure	RCB Reinforced Concrete Box Culvert	80
Rail Bridges - Milwaukee District North/Main Line	10388	Guideway	Guideway	Elevated Structure	RCB Reinforced Concrete Box Culvert	80
Rail Bridges - Milwaukee District West/Main Line	10388	Guideway	Guideway	Elevated Structure	RCB Reinforced Concrete Box Culvert	80
Rail Bridges - Rock Island District/Main Line	10388	Guideway	Guideway	Elevated Structure	RCB Reinforced Concrete Box Culvert	80
Rail Bridges - SouthWest Service/Main Line	10388	Guideway	Guideway	Elevated Structure	RCB Reinforced Concrete Box Culvert	80
Rail Bridges - Union Pacific North/Main Line	10388	Guideway	Guideway	Elevated Structure	RCB Reinforced Concrete Box Culvert	80
Rail Bridges - Union Pacific Northwest/Main Line	10388	Guideway	Guideway	Elevated Structure	RCB Reinforced Concrete Box Culvert	80
Rail Bridges - Union Pacific West/Main Line	10390	Guideway	Guideway	Elevated Structure	GIP Galvanized Iron Pipe	40
Rail Bridges - Union Pacific Northwest/Main Line	10390	Guideway	Guideway	Elevated Structure	GIP Galvanized Iron Pipe	40
Rail Bridges - Electric District/Main Line	10391	Guideway	Guideway	Elevated Structure	CIB Concrete Encase I-beams	80
Rail Bridges - Milwaukee District North/Main Line	10391	Guideway	Guideway	Elevated Structure	CIB Concrete Encase I-beams	80
Rail Bridges - Rock Island District/Main Line	10391	Guideway	Guideway	Elevated Structure	CIB Concrete Encase I-beams	80
Rail Bridges - Union Pacific North/Main Line	10391	Guideway	Guideway	Elevated Structure	CIB Concrete Encase I-beams	80
Rail Bridges - Union Pacific Northwest/Main Line	10391	Guideway	Guideway	Elevated Structure	CIB Concrete Encase I-beams	80
Rail Bridges - Union Pacific West/Main Line	10391	Guideway	Guideway	Elevated Structure	CIB Concrete Encase I-beams	80
Rail Bridges - Burlington Northern Santa Fe/Main Line	10392	Guideway	Guideway	Elevated Structure	WBM Steel Wide Flange 8m Sp	80
Rail Bridges - Electric District/Main Line	10392	Guideway	Guideway	Elevated Structure	WBM Steel Wide Flange 8m Sp	80
Rail Bridges - Heritage Corridor/Main Line	10392	Guideway	Guideway	Elevated Structure	WBM Steel Wide Flange 8m Sp	80
Rail Bridges - Milwaukee District North/Main Line	10392	Guideway	Guideway	Elevated Structure	WBM Steel Wide Flange 8m Sp	80
Rail Bridges - Milwaukee District West/Main Line	10392	Guideway	Guideway	Elevated Structure	WBM Steel Wide Flange 8m Sp	80
Rail Bridges - North Central Service/Main Line	10392	Guideway	Guideway	Elevated Structure	WBM Steel Wide Flange 8m Sp	80
Rail Bridges - Rock Island District/Beverly Branch	10392	Guideway	Guideway	Elevated Structure	WBM Steel Wide Flange 8m Sp	80
Rail Bridges - Rock Island District/Main Line	10392	Guideway	Guideway	Elevated Structure	WBM Steel Wide Flange 8m Sp	80
Rail Bridges - SouthWest Service/Main Line	10392	Guideway	Guideway	Elevated Structure	WBM Steel Wide Flange 8m Sp	80
Rail Bridges - Union Pacific North/Main Line	10392	Guideway	Guideway	Elevated Structure	WBM Steel Wide Flange 8m Sp	80
Rail Bridges - Union Pacific Northwest/Main Line	10392	Guideway	Guideway	Elevated Structure	WBM Steel Wide Flange 8m Sp	80
Rail Bridges - Union Pacific West/Main Line	10392	Guideway	Guideway	Elevated Structure	WBM Steel Wide Flange 8m Sp	80
Rail Bridges - Milwaukee District North/Main Line	10393	Guideway	Guideway	Elevated Structure	CBM Concrete Beams, Reinforced	80
Rail Bridges - Burlington Northern Santa Fe/Main Line	10394	Guideway	Guideway	Elevated Structure	IBM Steel I-Beam Span	80
Rail Bridges - Heritage Corridor/Main Line	10394	Guideway	Guideway	Elevated Structure	IBM Steel I-Beam Span	80
Rail Bridges - Milwaukee District North/Main Line	10394	Guideway	Guideway	Elevated Structure	IBM Steel I-Beam Span	80
Rail Bridges - North Central Service/Main Line	10394	Guideway	Guideway	Elevated Structure	IBM Steel I-Beam Span	80
Rail Bridges - Rock Island District/Main Line	10394	Guideway	Guideway	Elevated Structure	IBM Steel I-Beam Span	80
Rail Bridges - SouthWest Service/Main Line	10394	Guideway	Guideway	Elevated Structure	IBM Steel I-Beam Span	80
Rail Bridges - Union Pacific North/Main Line	10394	Guideway	Guideway	Elevated Structure	IBM Steel I-Beam Span	80
Rail Bridges - Union Pacific Northwest/Main Line	10394	Guideway	Guideway	Elevated Structure	IBM Steel I-Beam Span	80
Rail Bridges - Union Pacific West/Main Line	10394	Guideway	Guideway	Elevated Structure	IBM Steel I-Beam Span	80
Rail Bridges - Heritage Corridor/Main Line	10395	Guideway	Guideway	Elevated Structure	TBR Timber Stringers	40
Rail Bridges - Milwaukee District North/Main Line	10395	Guideway	Guideway	Elevated Structure	TBR Timber Stringers	40
Rail Bridges - North Central Service/Main Line	10395	Guideway	Guideway	Elevated Structure	TBR Timber Stringers	40
Rail Bridges - Rock Island District/Beverly Branch	10395	Guideway	Guideway	Elevated Structure	TBR Timber Stringers	40
Rail Bridges - Union Pacific West/Main Line	10395	Guideway	Guideway	Elevated Structure	TBR Timber Stringers	40
Rail Bridges - Union Pacific Northwest/Main Line	10396	Guideway	Guideway	Elevated Structure	3PLY Three Tim Strngs/Rail	40
Rail Bridges - Milwaukee District North/Main Line	10397	Guideway	Guideway	Elevated Structure	CMP Corrugated Metal Pipe	40
Rail Bridges - Union Pacific Northwest/Main Line	10397	Guideway	Guideway	Elevated Structure	CMP Corrugated Metal Pipe	40

## B.2 Useful Life Assumptions, Metra (Continued)

AssetType	Asset Code	Category	Sub-Category	Element	Sub-Element	Useful Life
Ballast	11200	Guideway	Trackwork	Ballasted	-	20
Rail - Tangent	11210	Guideway	Trackwork	Ballasted	Tangent	40
Rail - Curved	11220	Guideway	Trackwork	Ballasted	Curve	7
Rail - Curved	11220	Guideway	Trackwork	Ballasted	Curve	20
Rail - Curved	11220	Guideway	Trackwork	Ballasted	Curve	30
Grade Crossing	11330	Guideway	Trackwork	Embedded	At-Grade Crossings	20
Diamond Crossing	11401	Guideway	Trackwork	Special	Diamond Crossover	10
Turnout	11407	Guideway	Trackwork	Special	Turnout	15
Turnout	11407	Guideway	Trackwork	Special	Turnout	20
Turnout	11407	Guideway	Trackwork	Special	Turnout	25
Ties	11600	Guideway	Trackwork	Ties	-	25
Ties	11600	Guideway	Trackwork	Ties	-	28
Ties	11600	Guideway	Trackwork	Ties	-	32
Ties	11600	Guideway	Trackwork	Ties	-	80
Ties	11600	Guideway	Trackwork	Ties	Timber	28
Ties	11600	Guideway	Trackwork	Ties	Timber	32
Ties	11600	Guideway	Trackwork	Ties	Timber	50
Ties	11602	Guideway	Trackwork	Ties	Concrete	40
Retaining Walls	12201	Stations	Special Structures	Retaining Walls	Cast in Place Concrete <10	40
Retaining Walls	12201	Stations	Special Structures	Retaining Walls	Cast in Place Concrete <10	80
RetainingWall	12201	Stations	Special Structures	Retaining Walls	Cast in Place Concrete <10	80
Retaining Walls	12202	Stations	Special Structures	Retaining Walls	Cast in Place Concrete 10-20	40
Retaining Walls	12202	Stations	Special Structures	Retaining Walls	Cast in Place Concrete 10-20	80
RetainingWall	12202	Stations	Special Structures	Retaining Walls	Cast in Place Concrete 10-20	80
Retaining Walls	12203	Stations	Special Structures	Retaining Walls	Cast in Place Concrete >20	40
Retaining Walls	12203	Stations	Special Structures	Retaining Walls	Cast in Place Concrete >20	80
RetainingWall	12203	Stations	Special Structures	Retaining Walls	Cast in Place Concrete >20	80
RetainingWall	12204	Stations	Special Structures	Retaining Walls	Pre Cast Concrete <10	40
RetainingWall	12205	Stations	Special Structures	Retaining Walls	Pre Cast Concrete 10-20	40
Retaining Walls	12207	Stations	Special Structures	Retaining Walls	Masonry <10	80
RetainingWall	12207	Stations	Special Structures	Retaining Walls	Masonry <10	80
Retaining Walls	12208	Stations	Special Structures	Retaining Walls	Masonry 10-20	40
Retaining Walls	12208	Stations	Special Structures	Retaining Walls	Masonry 10-20	80
RetainingWall	12208	Stations	Special Structures	Retaining Walls	Masonry 10-20	80
Retaining Walls	12209	Stations	Special Structures	Retaining Walls	Masonry >20	80
RetainingWall	12209	Stations	Special Structures	Retaining Walls	Masonry >20	80
Retaining Walls	12210	Stations	Special Structures	Retaining Walls	Steel <10	80
RetainingWall	12210	Stations	Special Structures	Retaining Walls	Steel <10	80
Retaining Walls	12211	Stations	Special Structures	Retaining Walls	Steel >9	80
Retaining Walls	12212	Stations	Special Structures	Retaining Walls	Timber <10	40
Retaining Walls	12213	Stations	Special Structures	Retaining Walls	Timber >9	40
RetainingWall	12213	Stations	Special Structures	Retaining Walls	Timber >9	40
Misc Elec Equip	21250	Facilities	Storage Yard	-	-	35
Structure Shell	21521	Facilities	Major Rail Shops	Mechanical Repair Shop	Shell	60
Structure Windows	21522	Facilities	Major Rail Shops	Mechanical Repair Shop	Windows	30
Structure Doors	21523	Facilities	Major Rail Shops	Mechanical Repair Shop	Doors	30
Structure Electrical	21524	Facilities	Major Rail Shops	Mechanical Repair Shop	Electrical	60
Structure Plumbing	21525	Facilities	Major Rail Shops	Mechanical Repair Shop	Plumbing	60
Structure Shell	21526	Facilities	Major Rail Shops	Track Shop	Shell	60
Structure Windows	21527	Facilities	Major Rail Shops	Track Shop	Windows	30
Structure Doors	21528	Facilities	Major Rail Shops	Track Shop	Doors	30
Structure Electrical	21529	Facilities	Major Rail Shops	Track Shop	Electrical	60
Structure Plumbing	21530	Facilities	Major Rail Shops	Track Shop	Plumbing	60
Structure Shell	21531	Facilities	Major Rail Shops	Crew Facility	Shell	60
Structure Windows	21532	Facilities	Major Rail Shops	Crew Facility	Windows	30
Structure Doors	21533	Facilities	Major Rail Shops	Crew Facility	Doors	30
Structure Electrical	21534	Facilities	Major Rail Shops	Crew Facility	Electrical	60
Structure Plumbing	21535	Facilities	Major Rail Shops	Crew Facility	Plumbing	60
Structure Shell	21536	Facilities	Major Rail Shops	Locomotive Fueling	Shell	60
Structure Doors	21537	Facilities	Major Rail Shops	Locomotive Fueling	Doors	30
Structure Electrical	21538	Facilities	Major Rail Shops	Locomotive Fueling	Electrical	60
Structure Plumbing	21539	Facilities	Major Rail Shops	Locomotive Fueling	Plumbing	60
Structure Fire Protection	21540	Facilities	Major Rail Shops	Train Washer	Shell	30
Structure Electrical	21541	Facilities	Major Rail Shops	Train Washer	Electrical	60
Structure Plumbing	21542	Facilities	Major Rail Shops	Train Washer	Plumbing	60
Structure Shell	21543	Facilities	Major Rail Shops	Power Equipment	Shell	60
Structure Doors	21544	Facilities	Major Rail Shops	Power Equipment	Doors	30
Structure Electrical	21545	Facilities	Major Rail Shops	Power Equipment	Electrical	60
Structure Shell	21546	Facilities	Major Rail Shops	Maintenance of Way	Shell	60
Structure Windows	21547	Facilities	Major Rail Shops	Maintenance of Way	Windows	30
Structure Doors	21548	Facilities	Major Rail Shops	Maintenance of Way	Doors	30
Structure Electrical	21549	Facilities	Major Rail Shops	Maintenance of Way	Electrical	60
Structure Plumbing	21550	Facilities	Major Rail Shops	Maintenance of Way	Plumbing	60
Structure Shell	21551	Facilities	Major Rail Shops	Storehouse	Shell	40
Structure Doors	21552	Facilities	Major Rail Shops	Storehouse	Doors	20
Structure Electrical	21553	Facilities	Major Rail Shops	Storehouse	Electrical	40
Structure Plumbing	21554	Facilities	Major Rail Shops	Storehouse	Plumbing	40

## B.2 Useful Life Assumptions, Metra (Continued)

AssetType	Asset Code	Category	Sub-Category	Element	Sub-Element	Useful Life
Structure Shell	21555	Facilities	Major Rail Shops	Pump Room	Shell	60
Structure Doors	21556	Facilities	Major Rail Shops	Pump Room	Doors	30
Structure Electrical	21557	Facilities	Major Rail Shops	Pump Room	Electrical	60
Structure Plumbing	21558	Facilities	Major Rail Shops	Pump Room	Plumbing	20
Structure Plumbing	21558	Facilities	Major Rail Shops	Pump Room	Plumbing	60
Structure Shell	21559	Facilities	Major Rail Shops	Admin Offices	Shell	60
Structure Windows	21560	Facilities	Major Rail Shops	Admin Offices	Windows	30
Structure Doors	21561	Facilities	Major Rail Shops	Admin Offices	Doors	30
Structure Electrical	21562	Facilities	Major Rail Shops	Admin Offices	Electrical	60
Structure Plumbing	21563	Facilities	Major Rail Shops	Admin Offices	Plumbing	60
Structure Shell	21564	Facilities	Major Rail Shops	Components	Shell	60
Structure Roof	21565	Facilities	Major Rail Shops	Components	Roof	20
Structure Roof	21565	Facilities	Major Rail Shops	Components	Roof	30
Structure Windows	21566	Facilities	Building	Components	Window	30
Structure Windows	21566	Facilities	Major Rail Shops	Components	Window	30
Structure Doors	21567	Facilities	Building	Components	Door	20
Structure Doors	21567	Facilities	Major Rail Shops	Components	Door	30
Structure Cooling	21568	Facilities	Building	Components	Cooling	20
Structure Cooling	21568	Facilities	Major Rail Shops	Components	Cooling	20
Structure Cooling	21568	Facilities	Major Rail Shops	Components	Cooling	30
Structure Heat	21569	Facilities	Building	Components	Heating	20
Structure Heat	21569	Facilities	Major Rail Shops	Components	Heating	20
Structure Heat	21569	Facilities	Major Rail Shops	Components	Heating	30
Structure Electrical	21570	Facilities	Building	Components	Electrical	40
Structure Fire Protection	21572	Facilities	Major Rail Shops	Components	Fire Protection	20
Structure Fire Protection	21572	Facilities	Major Rail Shops	Components	Fire Protection	30
Structure Shell	21573	Facilities	Building	Components	Canopy Shell	40
Structure Shell	21574	Facilities	Building	Components	Shelter Shell	40
Structure Roof	21575	Facilities	Building	Components	Roof	20
Structure Roof	21575	Facilities	Building	Components	Roof	25
Structure Plumbing	21576	Facilities	Building	Components	Plumbing	60
Structure Shell	21577	Facilities	Building	Substations	Shell	60
Structure Roof	21578	Facilities	Building	Substations	Roof	30
Structure Windows	21579	Facilities	Building	Substations	Window	30
Structure Doors	21580	Facilities	Building	Substations	Door	15
Structure Doors	21580	Facilities	Building	Substations	Door	30
Structure Cooling	21581	Facilities	Building	Substations	Cooling	20
Structure Heat	21582	Facilities	Building	Substations	Heating	20
Structure Electrical	21583	Facilities	Building	Substations	Electrical	60
Structure Plumbing	21584	Facilities	Building	Substations	Plumbing	60
Structure Fire Protection	21585	Facilities	Building	Substations	Fire Protection	30
Platform Lights	21600	Facilities	Platform	-	-	40
Platform Structure	21600	Facilities	Platform	-	-	40
Platform Surface	21601	Facilities	Platform	Surface	-	20
Parking Pavement	21700	Facilities	Access	Parking	Parking Lot Pavement	40
Parking Pavement	21700	Facilities	Access	Parking	Parking Lot Pavement	60
Parking Access Roadway	21701	Facilities	Access	Parking	Parking Lot Access Roadway	40
Parking Lighting	21702	Facilities	Access	Parking	Lot	40
Parking Lighting	21702	Facilities	Access	Parking	Lot	60
Paved Walkway	21703	Facilities	Access	Pedestrian	-	40
Stair	21704	Facilities	Access	Pedestrian	Stair	60
Ramp	21705	Facilities	Access	Pedestrian	Ramp	60
Crosswalk	21706	Facilities	Access	Pedestrian	Crosswalk	20
Elevator	21707	Facilities	Access	Pedestrian	Elevators	20
Tunnel	21708	Facilities	Access	Pedestrian	Pedestrian bridge	80
Tunnel	21709	Facilities	Access	Pedestrian	Pedestrian tunnel	100
IT Assets	23101	Facilities	Equipment	Office	Software	3
IT Assets	23101	Facilities	Equipment	Office	Software	5
IT Assets	23101	Facilities	Equipment	Office	Software	7
IT Assets	23101	Facilities	Equipment	Office	Software	20
IT Assets	23101	Facilities	Equipment	Office	Software	25
IT Assets	23102	Facilities	Equipment	Office	Hardware -- computers, printers, copiers	3
IT Assets	23102	Facilities	Equipment	Office	Hardware -- computers, printers, copiers	4
IT Assets	23102	Facilities	Equipment	Office	Hardware -- computers, printers, copiers	5
IT Assets	23102	Facilities	Equipment	Office	Hardware -- computers, printers, copiers	7
Work Equipment	23400	Facilities	Equipment	Maintenance	-	10
Industrial Equipment	23422	Facilities	Equipment	Maintenance	Train Washer	40
Industrial Equipment	23422	Facilities	Equipment	Maintenance	Train Washer	50
Industrial Equipment	23423	Facilities	Equipment	Maintenance	Vehicle Paint booth	25
Fuel Systems	23424	Facilities	Equipment	Maintenance	Fuel Island	30
Fuel Systems	23425	Facilities	Equipment	Maintenance	Fuel Tank	15
Fuel Systems	23425	Facilities	Equipment	Maintenance	Fuel Tank	20
Fuel Systems	23425	Facilities	Equipment	Maintenance	Fuel Tank	25
Fuel Systems	23425	Facilities	Equipment	Maintenance	Fuel Tank	30
Fuel Systems	23425	Facilities	Equipment	Maintenance	Fuel Tank	40
Industrial Equipment	23427	Facilities	Equipment	Maintenance	Lifts - Portable	30
Industrial Equipment	23427	Facilities	Equipment	Maintenance	Lifts - Portable	60
Industrial Equipment	23428	Facilities	Equipment	Maintenance	Lifts - Fixed	40
Industrial Equipment	23431	Facilities	Equipment	Maintenance	Wheel truing machines	60
Industrial Equipment	23437	Facilities	Equipment	Maintenance	Hoist	30
Industrial Equipment	23437	Facilities	Equipment	Maintenance	Hoist	40
Industrial Equipment	23437	Facilities	Equipment	Maintenance	Hoist	60
Industrial Equipment	23437	Facilities	Equipment	Maintenance	Hoist	80

## B.2 Useful Life Assumptions, Metra (Continued)

AssetType	Asset Code	Category	Sub-Category	Element	Sub-Element	Useful Life
Industrial Equipment	23439	Facilities	Equipment	Maintenance	Misc Equip	15
Industrial Equipment	23439	Facilities	Equipment	Maintenance	Misc Equip	20
Industrial Equipment	23439	Facilities	Equipment	Maintenance	Misc Equip	30
Industrial Equipment	23439	Facilities	Equipment	Maintenance	Misc Equip	50
Industrial Equipment	23439	Facilities	Equipment	Maintenance	Misc Equip	60
Industrial Equipment	23448	Facilities	Equipment	Major Repair Shops	-	5
Industrial Equipment	23448	Facilities	Equipment	Major Repair Shops	-	6
Industrial Equipment	23448	Facilities	Equipment	Major Repair Shops	-	10
Industrial Equipment	23448	Facilities	Equipment	Major Repair Shops	-	15
Industrial Equipment	23448	Facilities	Equipment	Major Repair Shops	-	30
Structure Shell	25009	Facilities	Central Control	Control Tower	Shell	60
Structure Windows	25010	Facilities	Central Control	Control Tower	Windows	30
Structure Doors	25011	Facilities	Central Control	Control Tower	Doors	30
Structure Electrical	25012	Facilities	Central Control	Control Tower	Electrical	60
Structure Plumbing	25013	Facilities	Central Control	Control Tower	Plumbing	60
Structure Roof	25014	Facilities	Central Control	Control Tower	Roof	30
Structure Cooling	25015	Facilities	Central Control	Control Tower	Cooling	30
Structure Heat	25016	Facilities	Central Control	Control Tower	Heating	30
Structure Fire Protection	25017	Facilities	Central Control	Control Tower	Fire Protection	30
Impedence Bonds	31203	Systems	Train Control	Wayside Train Control	Bonds	35
Signals	31208	Systems	Train Control	Wayside Train Control	Power Supplies	20
Signals	31208	Systems	Train Control	Wayside Train Control	Power Supplies	40
Signals	31212	Systems	Train Control	Wayside Train Control	Relay Cabinet	40
Signals	31213	Systems	Train Control	Wayside Train Control	Relay House (Bungalow)	40
Signals	31213	Systems	Train Control	Wayside Train Control	Relay House (Bungalow)	50
Signals	31216	Systems	Train Control	Wayside Train Control	Signals	40
Signals	31217	Systems	Train Control	Wayside Train Control	Signal Bridge	50
Signals	31302	Systems	Train Control	Centralized Train Control	Logical Controller	5
Signals	31302	Systems	Train Control	Centralized Train Control	Logical Controller	7
Signals	31302	Systems	Train Control	Centralized Train Control	Logical Controller	10
Signals	31400	Systems	Train Control	Roadway Crossings	-	20
Signals	31400	Systems	Train Control	Roadway Crossings	-	40
Signals	31400	Systems	Train Control	Roadway Crossings	-	41
Signals	31400	Systems	Train Control	Roadway Crossings	-	42
Signals	31400	Systems	Train Control	Roadway Crossings	-	50
Signals	31400	Systems	Train Control	Roadway Crossings	-	52
Signals	31411	Systems	Train Control	Roadway Crossings	Crossing Gate Arm	40
Signals	31411	Systems	Train Control	Roadway Crossings	Crossing Gate Arm	41
Signals	31411	Systems	Train Control	Roadway Crossings	Crossing Gate Arm	42
Signals	31411	Systems	Train Control	Roadway Crossings	Crossing Gate Arm	50
Signals	31502	Systems	Train Control	Communications	Train Wayside Comm	40
Signals	31503	Systems	Train Control	Communications	Transmitter	5
Signals	31503	Systems	Train Control	Communications	Transmitter	15
Signals	31503	Systems	Train Control	Communications	Transmitter	40
Signals	31800	Systems	Train Control	Interlocking	-	40
Signals	31801	Systems	Train Control	Interlocking	Switch Machine	40
Signals	31801	Systems	Train Control	Interlocking	Switch Machine	41
Signals	31801	Systems	Train Control	Interlocking	Switch Machine	42
Snowmelter	31806	Systems	Train Control	Interlocking	Switch Heaters	5
Misc Elec Equip	32000	Systems	Electrification	-	-	35
Misc Elec Equip	32200	Systems	Electrification	Substations	-	35
SubStation	32200	Systems	Electrification	Substations	-	35
Misc Elec Equip	32204	Systems	Electrification	Substations	AC Switchgear	35
Misc Elec Equip	32206	Systems	Electrification	Substations	Rectifier	35
Misc Elec Equip	32208	Systems	Electrification	Substations	Battery	35
Misc Elec Equip	32210	Systems	Electrification	Substations	SCADA RTUs	35
Transformer	32211	Systems	Electrification	Substations	Transformer	35
Misc Elec Equip	32212	Systems	Electrification	Substations	Generator	35
Misc Elec Equip	32224	Systems	Electrification	Substations	Disconnect Switch	35
Catenary Cables	32701	Systems	Electrification	Overhead Catenary	Trolley Wire	80
Catenary SubStructure	32710	Systems	Electrification	Overhead Catenary	Poles Reinforced Concrete	80
Catenary SubStructure	32712	Systems	Electrification	Overhead Catenary	Poles Wood Pole	40
Catenary Superstructure	32724	Systems	Electrification	Overhead Catenary	Truss	80
Catenary Superstructure	32726	Systems	Electrification	Overhead Catenary	Bridge Attachment	80
Catenary Superstructure	32727	Systems	Electrification	Overhead Catenary	Portal	80
Catenary Superstructure	32728	Systems	Electrification	Overhead Catenary	Tube Back to Back Cantilever	80
Catenary Superstructure	32729	Systems	Electrification	Overhead Catenary	Tube Single Cantilever	80
Catenary Superstructure	32730	Systems	Electrification	Overhead Catenary	WF	80
Catenary Superstructure	32731	Systems	Electrification	Overhead Catenary	WF Back to Back Cantilever	80
Catenary Superstructure	32732	Systems	Electrification	Overhead Catenary	WF Single Cantilever	80
Catenary Cables	32800	Systems	Electrification	Power Cable	-	35
Power Cables	32800	Systems	Electrification	Power Cable	-	35
Signal Power	32800	Systems	Electrification	Power Cable	-	35
Misc Elec Equip	32801	Systems	Electrification	Power Cable	Substation feed	35

## B.2 Useful Life Assumptions, Metra (Continued)

AssetType	Asset Code	Category	Sub-Category	Element	Sub-Element	Useful Life
Communications	33101	Systems	Communications	Cable Transmission System (CTS)	Fiber Optic Cable Transmission System (FOCS)	20
Communications	33102	Systems	Communications	Cable Transmission System (CTS)	Cable	15
Communications	33201	Systems	Communications	Passenger Communications Systems	Public Address (PA)	10
Communications	33202	Systems	Communications	Passenger Communications Systems	Transit Passenger Information Systems (TPIS)	7
Communications	33202	Systems	Communications	Passenger Communications Systems	Transit Passenger Information Systems (TPIS)	15
Communications	33203	Systems	Communications	Passenger Communications Systems	Variable Message Signs (VMS)	10
Communications	33311	Systems	Communications	Safety and Security	CCTV -- Fixed	10
Communications	33401	Systems	Communications	Phone System	Private Branch Exchange (PBX)	10
Communications	33402	Systems	Communications	Phone System	Telephones	5
Communications	33403	Systems	Communications	Phone System	Fax	10
Communications	33502	Systems	Communications	Radio	Base Radio Stations	15
Communications	33504	Systems	Communications	Radio	Mobile Radios	15
Communications	33504	Systems	Communications	Radio	Mobile Radios	30
Communications	33702	Systems	Communications	Microwave	Tower	50
Misc Elec Equip	33800	Systems	Communications	SCADA	-	5
Misc Elec Equip	33800	Systems	Communications	SCADA	-	7
Misc Elec Equip	33801	Systems	Communications	SCADA	Programmable Logic Controller (PLC)	10
Communications	34000	Systems	Central Revenue Collection	-	-	7
Communications	34000	Systems	Central Revenue Collection	-	-	10
Communications	34000	Systems	Central Revenue Collection	-	-	15
Communications	34000	Systems	Central Revenue Collection	-	-	20
Communications	35115	Systems	Revenue Collection	In-Station	TVMs	5
Communications	35115	Systems	Revenue Collection	In-Station	TVMs	7
Communications	35115	Systems	Revenue Collection	In-Station	TVMs	10
Communications	35115	Systems	Revenue Collection	In-Station	TVMs	15
Yard Lighting	36102	Systems	Utilities	Lighting	Yard	35
Drainage	36200	Systems	Utilities	Drainage	-	30
Drainage	36200	Systems	Utilities	Drainage	-	50
Communications	37004	Systems	ITS	GPS	-	10
Communications	37004	Systems	ITS	GPS	-	15
Structure Shell	44436	Stations	Building	Components	Depot Shell	80
Structure Windows	44437	Stations	Building	Components	Depot Windows	40
Structure Doors	44438	Stations	Building	Components	Depot Doors	20
Structure Electrical	44439	Stations	Building	Components	Depot Electrical	80
Structure Plumbing	44440	Stations	Building	Components	Depot Plumbing	80
Structure Shell	44441	Stations	Building	Components	Warminghouse Shell	60
Structure Windows	44442	Stations	Building	Components	Warminghouse Windows	30
Structure Doors	44443	Stations	Building	Components	Warminghouse Doors	15
Structure Electrical	44444	Stations	Building	Components	Warminghouse Electrical	60
Structure Plumbing	44445	Stations	Building	Components	Warminghouse Plumbing	60
Structure Shell	44446	Stations	Building	Components	Headhouse Shell	60
Structure Windows	44447	Stations	Building	Components	Headhouse Windows	30
Structure Doors	44448	Stations	Building	Components	Headhouse Doors	20
Structure Electrical	44449	Stations	Building	Components	Headhouse Electrical	60
Structure Plumbing	44450	Stations	Building	Components	Headhouse Plumbing	60
Structure Shell	44451	Stations	Building	Components	Circulation Shell	60
Structure Electrical	44452	Stations	Building	Components	Circulation Electrical	60
Structure Shell	44455	Stations	Building	Components	Portico Shell	40
Structure Shell	44460	Stations	Building	Components	Shell	60
Structure Windows	44462	Stations	Building	Components	Window	30
Structure Doors	44463	Stations	Building	Components	Door	20
Structure Cooling	44464	Stations	Building	Components	Cooling	20
Structure Heat	44465	Stations	Building	Components	Heating	20
Structure Electrical	44466	Stations	Building	Components	Electrical	40
Structure Electrical	44466	Stations	Building	Components	Electrical	60
Structure Fire Protection	44468	Stations	Building	Components	Fire Protection	30
Structure Fire Protection	44468	Stations	Building	Components	Fire Protection	40
Platform Surface	45415	Stations	Platform	Surface	Center	20
Platform Surface	45416	Stations	Platform	Surface	Side	20
Platform Structure	45421	Stations	Platform	Structure	Center	40
Platform Structure	45422	Stations	Platform	Structure	Side	40
Platform Lights	45450	Stations	Platform	Lighting	-	40
Platform Tactile	45460	Stations	Platform	Tactile	-	20
Parking Lighting	46210	Stations	Access	Parking	Garage	60
Parking Pavement	46221	Stations	Access	Parking	Parking Garage Pavement	60
Stair Heat	46302	Stations	Access	Pedestrian	Stair Heat	60
Stair	46303	Stations	Access	Pedestrian	Viaduct Stair	80
Ramp Heat	46305	Stations	Access	Pedestrian	Ramp Heat	60
Escalator	46321	Stations	Access	Pedestrian	Escalators	20
Locomotives	56311	Vehicles	Revenue Vehicles	Rail	Commuter Rail: Locomotive GMC/EMD	25
Locomotives	56312	Vehicles	Revenue Vehicles	Rail	Commuter Rail: Locomotive MPI	25
Switchers	56313	Vehicles	Revenue Vehicles	Rail	Commuter Rail: Switcher	30
Coaches	56321	Vehicles	Revenue Vehicles	Rail	Commuter Rail: Passenger Coaches	25
Coaches	56322	Vehicles	Revenue Vehicles	Rail	Commuter Rail: Passenger Access Coaches	25
Coaches	56323	Vehicles	Revenue Vehicles	Rail	Commuter Rail: Passenger Cab Control Car	25
EMU's	56331	Vehicles	Revenue Vehicles	Rail	Commuter Rail: Single Level Self-Propelled Coaches	25
EMU's	56332	Vehicles	Revenue Vehicles	Rail	Commuter Rail: Bi-Level Self-Propelled Coaches	25
NonRevenue Vehicles	59000	Vehicles	Non-Revenue Vehicles	-	-	5
NonRevenue Vehicles	59000	Vehicles	Non-Revenue Vehicles	-	-	7
NonRevenue Vehicles	59000	Vehicles	Non-Revenue Vehicles	-	-	10
Freight Cars	59300	Vehicles	Non-Revenue Vehicles	Special	-	30

## B.2 Useful Life Assumptions, Pace

Asset Type	Asset Code	Category	Sub-Category	Element	Sub-Element	Useful Life
Facilities/Garages - Building	21215	Facilities	Buildings	Maintenance	Pace -- Bus - Small	60
ADA Support Facilities	21215	Facilities	Buildings	Maintenance	Pace -- Bus - Small	60
Facilities/Garages - Building	21216	Facilities	Buildings	Maintenance	Pace -- Bus - Large	60
Facilities/Garages - Site Work	21217	Facilities	Buildings	Maintenance	Pace -- Bus - Site Work	20
Facilities/Garages - Building	22232	Facilities	Buildings	Administration	Pace Admin Facility	60
ADA Call Center and Other Equipment	22232	Facilities	Buildings	Administration	Pace Admin Facility	5
ADA Support Facilities	22232	Facilities	Buildings	Administration	Pace Admin Facility	60
ADA Call Center and Other Equipment	23102	Facilities	Equipment	Office	Hardware -- computers, printers, copiers	5
Paratransit	33301	Systems	Communications	Safety and Security	On-Vehicle Video Systems	5
Suburban Rolling Stock	33301	Systems	Communications	Safety and Security	On-Vehicle Video Systems	5
Vanpool	33301	Systems	Communications	Safety and Security	On-Vehicle Video Systems	5
Division Security Systems	33310	Systems	Communications	Safety and Security	CCTV	5
ADA Call Center and Other Equipment	33401	Systems	Communications	Phone System	Private Branch Exchange (PBX)	5
ADA Call Center and Other Equipment	33500	Systems	Communications	Radio	-	5
Radio Systems	33500	Systems	Communications	Radio	-	5
Radio Systems	33500	Systems	Communications	Radio	-	7
Radio Systems	33500	Systems	Communications	Radio	-	10
Radio Systems	33500	Systems	Communications	Radio	-	20
ADA Call Center and Other Equipment	34000	Systems	Central Revenue Collection	-	-	5
Fare Collection	34000	Systems	Central Revenue Collection	-	-	5
Fare Collection	34105	Systems	Central Revenue Collection	Vault	-	15
Fare Collection	35201	Systems	Revenue Collection	On-Vehicle	Fareboxes	7
Fare Collection	35201	Systems	Revenue Collection	On-Vehicle	Fareboxes	15
ITS IBS	37000	Systems	ITS	-	-	12
ADA Call Center and Other Equipment	37002	Systems	ITS	AVL	-	5
AVL	37002	Systems	ITS	AVL	-	5
TSP (Transit Signal Prioritization)	37004	Systems	ITS	GPS	-	5
ADA Passenger Facilities	40062	Stations	Motor Bus	-	Pace Bus Park & Ride	10
Stations - Site Work	40062	Stations	Motor Bus	-	Pace Bus Park & Ride	10
Stations -- Buildings	41040	Stations	Transit Center	-	-	20
Infrastructure Support	41050	Stations	Shelter	Motor Bus	-	20
Infrastructure Support	45441	Stations	Platform	Signage & Graphics	Electronic	10
Infrastructure Support	45442	Stations	Platform	Signage & Graphics	Static	20
Suburban Rolling Stock	55200	Vehicles	Revenue Vehicles	Bus	Large Bus (40 ft)	12
Suburban Rolling Stock	55300	Vehicles	Revenue Vehicles	Bus	Medium Bus (35 ft)	12
Suburban Rolling Stock	55330	Vehicles	Revenue Vehicles	Bus	Medium Bus (35 ft) -- Hybrid	12
Paratransit	55400	Vehicles	Revenue Vehicles	Bus	Small Bus (<30 ft)	7
Suburban Rolling Stock	55500	Vehicles	Revenue Vehicles	Bus	Over-the-Road Coach	12
ADA Rolling Stock	57400	Vehicles	Revenue Vehicles	Small bus, paratransit, vans and autos	Medium-Duty (14-pass)	4
ADA Rolling Stock	57500	Vehicles	Revenue Vehicles	Small bus, paratransit, vans and autos	Light-Duty (12-pass)	4
CTS (Community Transit Service)	57500	Vehicles	Revenue Vehicles	Small bus, paratransit, vans and autos	Light-Duty (12-pass)	4
Paratransit	57500	Vehicles	Revenue Vehicles	Small bus, paratransit, vans and autos	Light-Duty (12-pass)	4
ADA Rolling Stock	57700	Vehicles	Revenue Vehicles	Small bus, paratransit, vans and autos	Van	4
Vanpool	57700	Vehicles	Revenue Vehicles	Small bus, paratransit, vans and autos	Van	4
ADA Call Center and Other Equipment	59000	Vehicles	Non-Revenue Vehicles	-	-	5
Non- Revenue Vehicles	59000	Vehicles	Non-Revenue Vehicles	-	-	5
Non- Revenue Vehicles	59000	Vehicles	Non-Revenue Vehicles	-	-	7
Non- Revenue Vehicles	59000	Vehicles	Non-Revenue Vehicles	-	-	10

## APPENDIX C, ASSET INVENTORY UPDATE

The foundation of the Capital Asset Condition Assessment Update process is a detailed asset inventory that documents the transit assets of each of the region's three Service Boards. Originally developed for the 2009 Baseline Assessment, the contents of the inventory were updated in 2012, 2013, 2014, and 2016. The inventories were provided originally by the Service Boards and are updated annually by the Service Boards. Updated data sets were used to conduct the regional asset conditions and reinvestment needs analyses present in previous chapters of this report. This Appendix for the 2016 Report provides background on RTA's regional transit asset inventory including its structure, contents, initial development, and updates and revisions representing the most current Service Board inventory data (i.e., inventories as of December 31, 2015).

The RTA's asset inventory uses a hierarchical asset inventory structure that groups all of the regions' transit assets into five categories and related sub-categories, elements and sub-elements. The first two levels of that structure are presented in Figure C-1. This structure represents a slight modification from that used in the Baseline Assessment but is consistent with emerging industry best practices and the newest FTA asset reporting requirements, made effective October 1, 2016, under the Final Rule on Transit Asset Management. All of the asset condition and reinvestment needs analyses presented in this report are founded on this asset structure.

**Figure C-1. Inventory Structure for COST**

Category	Sub-Category
Facilities	Buildings
	Central Control
	Equipment
	Storage Yard
Guideway Elements	Bus Guideway
	Guideway
	Trackwork
Stations	Motor Bus
	Rail
Systems	Central Revenue Collection
	Communications
	Electrification
	ITS
	Revenue Collection
	Security/Surv Equipment
	Train Control
	Utilities
Vehicles	Revenue Vehicles
	Non-Revenue Vehicles



## APPENDIX D, CAPITAL OPTIMIZATION SUPPORT TOOL (COST)

In April 2011, RTA and the Service Boards initiated development of the Capital Optimization Support Tool (COST). COST uses asset data collected through the Inventory Update process (Appendix C) to assess and prioritize transit capital investment needs subject to regional funding capacity and long-term strategic objectives. The estimates of regional asset conditions and reinvestment needs presented in this report were generated using COST.

In addition to being able to estimate the size of the investment backlog and project future reinvestment needs, COST also has the ability to prioritize the order in which these needs might be addressed when funding is limited. Specifically, COST evaluates each reinvestment need based on five evaluation criteria (safety and security, ridership impact, condition, reliability, and cost effectiveness). The evaluation scores for each of these factors is then weighted and summed to arrive at a total prioritization score for that asset. COST then uses that scoring to rank reinvestment priorities (highest to lowest) and then addresses reinvestment needs based on these rankings and available funding capacity. Unaddressed needs enter (or remain) in the investment backlog. At a minimum, COST's prioritization provides the tool with rules to model how limited funds are spent and which assets are consigned to the backlog. At a higher level, the prioritization capability can help the Service Boards make more informed decisions regarding real world funding decisions given existing and anticipated future needs.



COST outputs are based on inventory data, not field condition assessments. As such, the outputs are dependent on the quality and completeness of the inventory input data. Over time the quality of the inventories is subject to ongoing improvement. While currently focused solely on the assessment of regional reinvestment needs (i.e., preservation of the existing stock of transit assets), COST will ultimately help the region identify an optimal balance between replacing aging infrastructure (maintain); improving the throughput, reliability, and safety of existing services (enhance); and the addition of new capacity to improve system performance (expand) – all within the confines of limited financial resources. COST is not intended as a substitute for thoughtful decision-making by those closest to the management of those assets (the Service Boards). More specifically, COST will assist RTA and the region to establish priorities within each of these types of needs (for example, prioritizing between different asset replacement projects).

COST is a Microsoft Access based analysis tool that relies on asset inventory data collected through the Asset Condition Assessment process. At the start of the Condition Assessment Process the three Service Boards each submit data tables (MS Excel based) to a centralized data warehouse. These data tables are then uploaded to the Regional Asset Inventory Database (MS Access based), where the data are reviewed and validated. The validated data are then exported to COST.

Other COST Tool Applications: In addition to its role in generating regional needs estimates, COST was also developed to help prioritize how capital funds are actually spent. As noted in section 1.4 of this report, reinvestment needs exceed the region's available funding capacity and hence RTA and the Service Boards must determine the best use of limited capital funds (i.e., which assets are "first in line"

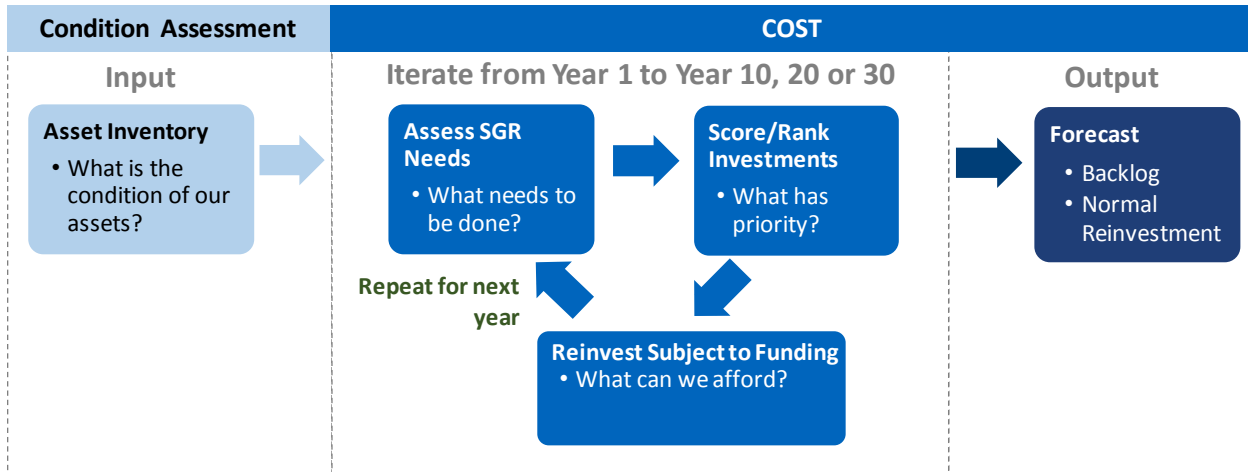
for reinvestment). COST is designed to assist this process by prioritizing those reinvestment actions that offer the greatest improvements to asset conditions, service reliability, safety and security, and operating costs while also benefiting the greatest number of riders. These prioritized needs can then be used to help inform the region's reinvestment decisions. Specifically, the tool's prioritized needs can be compared to regional capital budget proposals to help assure that reinvestment plans align with the region's long term reinvestment goals and objectives. The intention of COST in this context is to help make better informed budgeting decisions, not to drive the budgeting process.

RTA's COST tool provides a unique perspective and understanding – particularly as they relate to long-term reinvestment needs – that other types of analyses cannot. COST is specifically designed to assess reinvestment needs and project asset conditions for all capital assets, and it does so over an extended time horizon of 10, 20 years, or longer. Detailed onsite engineering condition assessments are equally important, and complementary. Condition assessments provide an excellent understanding of reinvestment needs and asset conditions as they exist today and how those conditions will impact near term reinvestment actions (e.g., as outlined in a capital improvement plan). Condition assessments necessarily provide a picture of needs and conditions as they exist at a specific point in time (i.e., at the date of survey) and only do so for those assets included in the assessment.

## **D.1 COST Conceptual Model**

A conceptual model of COST is presented in Figure D-2. As noted above, COST relies on asset inventory data collected through the Update process. This asset inventory data documents the asset type, date built, effective date built, assumed useful life, replacement value, rehabilitation history, and life cycle investment requirements of all assets owned and operated by RTA and the three Service Boards. Based on these assumptions regarding current age, expected useful life and other life cycle investment requirements, the tool first assesses which assets have deferred reinvestment requirements (e.g., which assets are in service past their useful life and what level of investment is required to replace those assets). This assessment provides a measure of the size of the SGR backlog (i.e., the level of reinvestment required to attain a complete state of good repair, as of December 2015). The tool next simulates the ongoing aging of these assets over the upcoming 10-year period to determine the level of reinvestment required to replace (or rehabilitate) assets that will reach the end of their useful life over this 10-year or 20-year of period of analysis (or longer).

Figure D-1: Conceptual Model of COST



The COST user sets the period of analysis, which can be 10 years, 20 years, or another period. FTA does require 20 years of analysis for New Starts financial plans, and several other large agencies work with 20, or more year planning horizons for their needs projections. This report produces a 10-Year Needs Analysis, however in Chapter 3, Capital Needs Assessment Findings, a 20-Year needs assessment is also presented for comparison. The advantage of examining a 20-year period is the ability to view large reinvestment needs not apparent over the 10-year timeframe.










For most analyses presented in this report, it is assumed that the level of future funding will be completely unlimited (i.e., funding is “unconstrained”). This allows the tool to both fully eliminate the backlog while also addressing all other normal replacement needs (e.g., asset replacements, rehabilitations and other minor capital needs) over the 10-year period of analysis. Note, however, that as a “prioritization” tool COST can also be run “financially constrained” (i.e., with insufficient funding to address all needs) to determine (1) which assets will and will not obtain scarce funding over the 10-year period of analysis and (2) what is the impact of this constrained funding on the investment backlog and asset conditions for those assets that do not obtain any reinvestment funding.

Finally, the tool output includes an assessment of both current asset conditions (estimated conditions based on decay curves) and deferred reinvestment needs as well as a forecast of future asset conditions and needs subject to the assumed level of future funding (either unconstrained or some constrained level of reinvestment).

## D.2 COST Key Features

COST offers nine key features that will help the RTA and the Service Boards in the capital planning process, as shown in Figure D-2.

Figure D-2. COST – Key Features

	Feature	Process
	Estimate Reinvestment Needs	Estimates the level of investment required to address the SGR backlog and ongoing needs
	Prioritize by Investment Type	Prioritize <i>between</i> and <i>within</i> capital reinvestment, enhancement, and expansion needs (in development)
	Prioritize within Service Board	Prioritizes Service Board needs on a stand-alone basis between categories of assets
	Support Scenario Analysis	Assess how changes to (1) prioritization weightings and (2) funding availability will impact: <ul style="list-style-type: none"> <li>Investment allocation between asset types</li> <li>The future asset conditions and performance (SGR backlog, ridership capacity, service reliability)</li> </ul>
	Re-score and Re-sequence Deferred Reinvestment	Re-score, reprioritize, and re-sequence the timing of capital maintenance whenever these activities are deferred (i.e., increased deferment yields a higher prioritization score)
	Provide Funding Plan Scenario(s)	Prioritize investments based on current and potential funding levels subject to eligible uses
	Needs-Based Capital Plan Support	Provide input to development of a needs-based, prioritized, and sequenced capital plan
	Supports a Repeatable Process	Provide RTA and the Service Boards with a tool to continually reassess and monitor conditions and needs
	Utilize Existing Data Sources	Utilize the Capital Asset Condition Assessment updates as well the RTAMS database for ridership data by asset location.

## APPENDIX E, 10-YEAR ANNUAL REINVESTMENT DETAIL

The asset-type level breakout of 10-year annual reinvestment needs for the Service Boards is presented in the following pages.

First is listed CTA, then Metra, then Pace, then finally a summary table including the summary for the region and each Service Board.

Note that in some cases totals for the 10-Year needs may not add completely due to rounding.

Figure E.1. CTA Detailed Asset Type Level Breakout of 10-Year Annual Reinvestment Needs (Millions of \$2015)

Asset Group	Asset	Cost Type	Backlog	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	10-Year Needs	10-Year Total Needs	Asset
			\$12,456.4	\$582.9	\$457.4	\$1,563.3	\$1,494.0	\$1,790.3	\$1,086.0	\$613.3	\$1,041.3	\$694.3	\$1,303.0	\$23,082.2		
Facilities	Bus Garages	Backlog	\$482.9											\$482.9	\$1,029.0	Bus Garages
		Rehab and Cap Maint	\$0.0	\$108.6	\$13.2	\$13.8	\$13.8	\$13.8	\$13.8	\$13.8	\$219.3	\$13.8	\$35.0	\$458.7		
		Replace	\$0.0	\$0.0	\$87.5	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$87.5		
	Other Major Facilities	Backlog	\$663.2											\$663.2	\$792.9	Other Major Facilities
		Rehab and Cap Maint	\$0.0	\$6.5	\$7.1	\$6.5	\$6.5	\$6.5	\$6.5	\$31.1	\$6.5	\$13.4	\$38.9	\$129.7		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	Railcar Maint Shops	Backlog	\$0.0											\$0.0	\$203.8	Railcar Maint Shops
		Rehab and Cap Maint	\$0.0	\$6.5	\$6.5	\$7.1	\$8.4	\$42.3	\$20.4	\$8.2	\$30.1	\$8.6	\$6.5	\$144.7		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$24.9	\$0.0	\$34.2	\$0.0	\$0.0	\$0.0	\$0.0	\$59.1		
	Work Equipment Misc	Backlog	\$1.9											\$1.9	\$3.7	Work Equipment Misc
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.4	\$0.0	\$0.1	\$0.6	\$0.0	\$0.7	\$1.8		
	Yard	Backlog	\$300.6											\$300.6	\$740.1	Yard
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$173.9	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$24.8	\$198.7		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$240.8	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$240.8		
Guideway Elements	Bus Turnaround	Backlog	\$258.2											\$258.2	\$436.9	Bus Turnaround
		Rehab and Cap Maint	\$0.0	\$1.8	\$2.5	\$40.2	\$1.3	\$1.3	\$1.8	\$74.7	\$1.7	\$1.3	\$44.6	\$171.3		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$2.5	\$2.5	\$0.0	\$0.0	\$0.0	\$2.5	\$0.0	\$7.4		
	Grade Crossings	Backlog	\$1.0											\$1.0	\$2.3	Grade Crossings
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	\$0.0	\$0.0	\$0.0	\$0.0	\$1.2	\$1.3		
	Rail	Backlog	\$978.6											\$978.6	\$3,175.5	Rail
		Rehab and Cap Maint	\$0.0	\$102.9	\$2.2	\$145.9	\$19.9	\$56.4	\$80.3	\$1.8	\$68.1	\$84.3	\$19.5	\$581.4		
		Replace	\$0.0	\$156.2	\$18.7	\$28.8	\$44.5	\$982.8	\$16.3	\$25.7	\$243.5	\$11.1	\$88.1	\$1,615.5		
	Track Structures	Backlog	\$3,320.2											\$3,320.2	\$3,569.5	Track Structures
		Rehab and Cap Maint	\$0.0	\$19.9	\$19.9	\$19.9	\$19.9	\$19.9	\$19.9	\$19.9	\$19.8	\$19.9	\$19.9	\$198.9		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$45.5	\$1.1	\$3.8	\$50.4		
Stations	Station Parking	Backlog	\$71.2											\$71.2	\$110.4	Station Parking
		Rehab and Cap Maint	\$0.0	\$0.3	\$0.3	\$1.4	\$0.3	\$0.3	\$0.2	\$2.7	\$0.3	\$0.3	\$6.8	\$12.7		
		Replace	\$0.0	\$0.0	\$0.0	\$1.6	\$0.0	\$0.0	\$22.4	\$0.0	\$2.0	\$0.4	\$0.0	\$26.5		
	Stations	Backlog	\$2,752.4											\$2,752.4	\$4,105.2	Stations
		Rehab and Cap Maint	\$0.0	\$120.0	\$45.1	\$28.9	\$36.3	\$79.8	\$66.9	\$36.7	\$135.9	\$87.4	\$95.0	\$732.0		
		Replace	\$0.0	\$0.0	\$0.0	\$263.5	\$0.0	\$44.9	\$22.4	\$290.0	\$0.0	\$0.0	\$0.0	\$620.9		

Note: Rail includes ties

Figure E.1. CTA Detailed Asset Type Level Breakout of 10-Year Annual Reinvestment Needs (Millions of \$2015), Continued

Asset Group	Asset	Cost Type	Backlog	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	10-Year Needs	10-Year Total Needs	Asset
			\$12,456.4	\$582.9	\$457.4	\$1,563.3	\$1,494.0	\$1,790.3	\$1,086.0	\$613.3	\$1,041.3	\$694.3	\$1,303.0	\$23,082.2		
Systems	Bus Rail Radio Systems	Backlog	\$0.0											\$0.0	\$4.7	Bus Rail Radio Systems
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$4.7		
	Cable Plant Fiber	Backlog	\$0.0											\$0.0	\$2.3	Cable Plant Fiber
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.4	\$0.0	\$0.0	\$0.0	\$0.6	\$0.0	\$0.3	\$0.0	\$0.1	\$0.8	\$2.3		
	Fiber Optic BB	Backlog	\$21.4											\$21.4	\$48.2	Fiber Optic BB
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$3.1	\$0.0	\$0.0	\$0.0	\$2.2	\$0.0	\$0.0	\$21.4	\$26.8		
	Grade Crossings	Backlog	\$0.0											\$0.0	\$0.5	Grade Crossings
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.3	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.3		
	ROW Traction Power	Backlog	\$239.9											\$239.9	\$419.9	ROW Traction Power
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$13.5	\$0.0	\$2.3	\$0.0	\$0.0	\$95.2	\$0.0	\$0.0	\$21.2	\$47.9	\$180.1		
	SCADA RTUs	Backlog	\$39.5											\$39.5	\$80.0	SCADA RTUs
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.2	\$0.2	\$0.2	\$0.0	\$0.0	\$39.5	\$0.0	\$0.2	\$0.2	\$40.5		
	Substation Distribution	Backlog	\$27.3											\$27.3	\$79.5	Substation Distribution
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$10.6	\$22.3	\$0.0	\$19.3	\$52.2		
	Subway Electrical Serv	Backlog	\$53.9											\$53.9	\$64.3	Subway Electrical Serv
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$5.2	\$0.0	\$0.0	\$3.5	\$0.0	\$0.0	\$1.7	\$0.0	\$10.4		
	Subway Illumination	Backlog	\$14.6											\$14.6	\$14.6	Subway Illumination
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	Subway Pumps	Backlog	\$0.0											\$0.0	\$0.2	Subway Pumps
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2		
	CCTV Stations - 12_2	Backlog	\$0.0											\$0.0	\$110.5	CCTV Stations - 12_2
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$11.1	\$11.1	\$11.1	\$11.1	\$11.1	\$11.1	\$11.1	\$11.1	\$11.1	\$11.1	\$110.5		
	Cab Signals	Backlog	\$200.2											\$200.2	\$292.4	Cab Signals
		Rehab and Cap Maint	\$0.0	\$1.1	\$1.1	\$1.0	\$1.1	\$1.1	\$1.0	\$1.1	\$1.1	\$1.1	\$1.1	\$10.9		
		Replace	\$0.0	\$0.0	\$5.3	\$41.2	\$0.0	\$0.0	\$34.8	\$0.0	\$0.0	\$0.0	\$0.0	\$81.2		
	Interlockings	Backlog	\$302.3											\$302.3	\$619.9	Interlockings
		Rehab and Cap Maint	\$0.0	\$2.8	\$2.8	\$2.5	\$2.8	\$2.8	\$2.7	\$2.8	\$2.8	\$2.8	\$2.8	\$27.8		
		Replace	\$0.0	\$17.3	\$30.6	\$157.0	\$24.1	\$0.0	\$51.4	\$0.0	\$9.4	\$0.0	\$0.0	\$289.9		
	Substations	Backlog	\$609.3											\$609.3	\$889.9	Substations
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$41.8	\$20.9	\$0.0	\$23.9	\$110.4	\$0.0	\$83.6	\$280.6		
	Subway Fans	Backlog	\$585.9											\$585.9	\$625.6	Subway Fans
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$39.7	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$39.7		

**Figure E.1. CTA Detailed Asset Type Level Breakout of 10-Year Annual Reinvestment Needs (Millions of \$2015), Continued**

Asset Group	Asset	Cost Type	Backlog	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	10-Year Needs	10-Year Total Needs	Asset	
Vehicles	Buses	Backlog	\$12,456.4	\$582.9	\$457.4	\$1,563.3	\$1,494.0	\$1,790.3	\$1,086.0	\$613.3	\$1,041.3	\$694.3	\$1,303.0	\$23,082.2	\$2,137.1	Buses	
		Rehab and Cap Maint	\$185.2	\$0.0	\$0.0	\$55.3	\$0.0	\$0.0	\$218.8	\$0.0	\$0.0	\$2.9	\$427.3	\$704.4			
		Replace	\$0.0	\$0.0	\$0.0	\$5.8	\$854.6	\$276.5	\$0.0	\$0.0	\$0.0	\$110.6	\$0.0	\$1,247.5			
	Rail Revenue Cars	Backlog	\$1,309.3	\$0.0	\$6.5	\$28.8	\$81.2	\$127.0	\$223.9	\$360.1	\$15.6	\$110.0	\$293.6	\$279.1	\$1,525.7	\$3,442.0	Rail Revenue Cars
		Rehab and Cap Maint	\$0.0	\$4.8	\$171.4	\$423.7	\$7.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$607.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	RailborneWork Equipment	Backlog	\$19.4	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$19.4	\$32.6	RailborneWork Equipment
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.6	\$0.0	\$0.1	\$1.8	\$1.6	\$1.5	\$0.9	\$0.2	\$4.1	\$2.4	\$13.2	\$0.0		
	Work Equipment Trailers	Backlog	\$0.7	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.7	\$2.4	Work Equipment Trailers
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.1	\$0.3	\$0.2	\$0.1	\$0.3	\$0.1	\$0.3	\$0.1	\$0.1	\$0.1	\$0.2	\$1.7		
	Work Trucks	Backlog	\$17.5	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$17.5	\$46.1	Work Trucks
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$1.2	\$2.7	\$1.6	\$2.2	\$0.0	\$0.3	\$0.0	\$0.0	\$0.0	\$0.2	\$20.4	\$28.6		
	CTA	Backlog	\$12,456.4	\$377.0	\$129.4	\$577.6	\$237.4	\$448.2	\$792.4	\$208.4	\$595.7	\$529.5	\$1,001.6	\$4,897.2	\$23,082.2		
		Rehab and Cap Maint	\$205.9	\$328.0	\$985.7	\$1,256.6	\$1,342.1	\$293.6	\$405.0	\$445.6	\$164.8	\$301.4	\$5,728.6				
		Total	\$12,456.4	\$582.9	\$457.4	\$1,563.3	\$1,494.0	\$1,790.3	\$1,086.0	\$613.3	\$1,041.3	\$694.3	\$1,303.0	\$23,082.2			

*Note that in some cases totals for the 10-Year needs may not add completely due to rounding.*



Figure E-2. METRA Asset Type Level Breakout of 10-Yr Annual Reinvestment Needs (\$2015 Millions)

Asset Group	Asset	Cost Type	Backlog	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	10-Year Needs	10-Year Total Needs	Asset
Facilities	Work Equipment	Backlog	\$6,139.2											\$62.4	\$130.2	Work Equipment
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$1.5	\$2.5	\$0.3	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.5	\$63.0	\$67.8		
	Elevator	Backlog	\$0.0											\$0.0	\$0.8	Elevator
		Rehab and Cap Maint	\$0.0	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.6		
	Fuel Systems	Backlog	\$0.5											\$0.5	\$2.7	Fuel Systems
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	\$0.0	\$0.2	\$0.0	\$0.6	\$0.0	\$1.2	\$2.2		
	Industrial Equipment	Backlog	\$6.2											\$6.2	\$15.2	Industrial Equipment
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1		
		Replace	\$0.0	\$0.0	\$0.3	\$0.6	\$3.3	\$0.6	\$0.2	\$0.1	\$1.3	\$2.3	\$0.2	\$8.9		
	IT Assets	Backlog	\$61.5											\$61.5	\$96.9	IT Assets
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$1.6	\$5.4	\$1.6	\$4.3	\$5.4	\$5.8	\$1.6	\$5.4	\$4.3	\$35.4		
	Misc Elec Equip	Backlog	\$0.5											\$0.5	\$1.9	Misc Elec Equip
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	\$0.0	\$0.1	\$0.0	\$0.0	\$0.0	\$0.3		
		Replace	\$0.0	\$0.0	\$0.0	\$0.6	\$0.0	\$0.5	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1.1		
	Parking Pavement	Backlog	\$0.0											\$0.0	\$0.2	Parking Pavement
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	\$0.2		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	Structure Cooling	Backlog	\$9.6											\$9.6	\$21.3	Structure Cooling
		Rehab and Cap Maint	\$0.0	\$0.3	\$0.2	\$0.3	\$0.3	\$0.3	\$0.3	\$0.3	\$0.3	\$0.3	\$0.2	\$2.5		
		Replace	\$0.0	\$0.0	\$3.8	\$0.0	\$0.0	\$0.0	\$0.4	\$0.0	\$0.1	\$0.0	\$4.9	\$9.3		
	Structure Doors	Backlog	\$0.8											\$0.8	\$22.5	Structure Doors
		Rehab and Cap Maint	\$0.0	\$0.3	\$0.3	\$0.3	\$1.2	\$0.3	\$1.1	\$0.3	\$0.4	\$0.3	\$0.4	\$4.6		
		Replace	\$0.0	\$0.0	\$4.3	\$0.0	\$0.1	\$0.0	\$0.4	\$0.0	\$0.1	\$0.0	\$12.1	\$17.1		
	Structure Electrical	Backlog	\$1.5											\$1.5	\$17.8	Structure Electrical
		Rehab and Cap Maint	\$0.0	\$1.0	\$1.0	\$1.0	\$1.0	\$1.0	\$1.1	\$1.1	\$1.4	\$1.0	\$2.1	\$11.8		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$4.2	\$0.0	\$0.2	\$0.0	\$0.1	\$4.6		
	Structure Fire Protection	Backlog	\$0.0											\$0.0	\$7.2	Structure Fire Protection
		Rehab and Cap Maint	\$0.0	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$2.0		
		Replace	\$0.0	\$0.0	\$0.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	\$0.0	\$4.9	\$5.2		
	Structure Heat	Backlog	\$19.9											\$19.9	\$73.8	Structure Heat
		Rehab and Cap Maint	\$0.0	\$0.8	\$0.7	\$0.8	\$0.8	\$0.8	\$0.8	\$0.8	\$0.8	\$0.8	\$0.6	\$8.0		
		Replace	\$0.0	\$0.0	\$18.4	\$0.0	\$0.2	\$0.0	\$1.3	\$0.1	\$0.5	\$0.0	\$25.3	\$45.9		
	Structure Plumbing	Backlog	\$16.6											\$16.6	\$30.7	Structure Plumbing
		Rehab and Cap Maint	\$0.0	\$0.6	\$0.6	\$0.6	\$0.6	\$0.6	\$0.5	\$0.6	\$0.7	\$0.6	\$1.6	\$7.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$6.9	\$0.0	\$0.2	\$0.0	\$0.1	\$7.2		
	Structure Roof	Backlog	\$2.9											\$2.9	\$55.6	Structure Roof
		Rehab and Cap Maint	\$0.0	\$0.7	\$0.4	\$0.7	\$0.6	\$0.7	\$0.7	\$0.7	\$0.7	\$0.7	\$0.7	\$6.8		
		Replace	\$0.0	\$0.0	\$28.7	\$0.0	\$12.1	\$0.0	\$0.3	\$0.1	\$0.3	\$0.0	\$4.4	\$45.9		
	Structure Shell	Backlog	\$9.3											\$9.3	\$155.1	Structure Shell
		Rehab and Cap Maint	\$0.0	\$4.5	\$4.5	\$4.5	\$4.5	\$4.5	\$3.8	\$4.6	\$4.9	\$4.5	\$10.3	\$50.5		
		Replace	\$0.0	\$0.0	\$0.0	\$2.4	\$0.0	\$0.0	\$90.4	\$0.0	\$2.3	\$0.0	\$0.2	\$95.3		
	Structure Windows	Backlog	\$0.6											\$0.6	\$32.1	Structure Windows
		Rehab and Cap Maint	\$0.0	\$0.4	\$0.3	\$0.4	\$1.6	\$0.4	\$0.8	\$0.4	\$0.4	\$0.4	\$0.2	\$5.2		
		Replace	\$0.0	\$0.0	\$8.2	\$0.0	\$0.3	\$0.0	\$0.0	\$0.1	\$0.1	\$0.0	\$17.7	\$26.3		

Figure E-2. METRA Asset Type Level Breakout of 10-Yr Annual Reinvestment Needs (\$2015 Millions), Continued

Asset Group	Asset	Cost Type	Backlog	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	10-Year Needs	10-Year Total Needs	Asset
			\$6,139.2	\$362.5	\$1,045.6	\$556.0	\$278.3	\$538.3	\$826.0	\$733.0	\$636.6	\$171.5	\$717.0	\$12,003.8		
Guideway Elements	Ties	Backlog	\$78.2											\$78.2	\$205.6	Ties
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$17.1	\$17.1	\$7.4	\$11.6	\$6.3	\$14.0	\$11.5	\$23.1	\$10.2	\$9.0	\$127.4		
	Ballast	Backlog	\$496.2											\$496.2	\$784.9	Ballast
		Rehab and Cap Maint	\$0.0	\$2.3	\$2.3	\$2.3	\$2.3	\$2.3	\$2.3	\$2.3	\$2.3	\$2.3	\$2.3	\$22.8		
		Replace	\$0.0	\$32.0	\$24.8	\$19.1	\$24.0	\$30.8	\$24.7	\$34.1	\$30.2	\$22.7	\$23.5	\$265.9		
	Diamond Crossing	Backlog	\$2.2											\$2.2	\$25.8	Diamond Crossing
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$12.7	\$0.0	\$0.0	\$8.3	\$0.0	\$0.4	\$0.0	\$0.0	\$2.2	\$23.6		
	Grade Crossing	Backlog	\$3.9											\$3.9	\$41.4	Grade Crossing
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.8	\$0.3	\$0.3	\$0.3	\$0.2	\$32.8	\$0.3	\$0.0	\$0.0	\$2.5	\$37.5		
	Rail - Curved	Backlog	\$177.0											\$177.0	\$404.9	Rail - Curved
		Rehab and Cap Maint	\$0.0	\$0.6	\$0.6	\$0.6	\$0.6	\$0.6	\$0.6	\$0.2	\$0.6	\$0.6	\$0.6	\$5.7		
		Replace	\$0.0	\$6.5	\$10.2	\$4.1	\$3.1	\$11.3	\$0.0	\$165.7	\$8.6	\$8.5	\$4.1	\$222.2		
	Rail - Tangent	Backlog	\$35.1											\$35.1	\$135.0	Rail - Tangent
		Rehab and Cap Maint	\$0.0	\$1.6	\$1.6	\$1.6	\$1.6	\$1.6	\$1.6	\$1.5	\$1.5	\$1.5	\$1.5	\$15.4		
		Replace	\$0.0	\$0.0	\$0.0	\$5.3	\$1.1	\$5.1	\$0.8	\$8.3	\$18.7	\$17.7	\$27.5	\$84.5		
	Rail Bridges - Burlington Northern Santa Fe	Backlog	\$88.3											\$88.3	\$95.5	Rail Bridges - Burlington Northern Santa Fe
		Rehab and Cap Maint	\$0.0	\$0.3	\$0.8	\$0.3	\$0.3	\$0.3	\$0.3	\$0.3	\$0.3	\$0.5	\$0.5	\$4.2		
		Replace	\$0.0	\$3.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$3.0		
	Rail Bridges - Electric District/Blue	Backlog	\$0.0											\$0.0	\$0.4	Rail Bridges - Electric District/Blue
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	Rail Bridges - Electric District/Main	Backlog	\$148.0											\$148.0	\$163.3	Rail Bridges - Electric District/Main
		Rehab and Cap Maint	\$0.0	\$0.6	\$0.6	\$0.6	\$0.6	\$0.6	\$0.8	\$0.6	\$1.6	\$0.6	\$0.6	\$7.6		
		Replace	\$0.0	\$0.0	\$4.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$3.8	\$0.0	\$7.8		
	Rail Bridges - Heritage Corridor/Main	Backlog	\$162.9											\$162.9	\$172.7	Rail Bridges - Heritage Corridor/Main
		Rehab and Cap Maint	\$0.0	\$0.6	\$0.6	\$0.6	\$0.6	\$0.6	\$0.6	\$0.6	\$0.6	\$0.6	\$0.9	\$6.3		
		Replace	\$0.0	\$1.3	\$0.0	\$0.0	\$0.0	\$0.0	\$0.4	\$0.0	\$1.9	\$0.0	\$0.0	\$3.6		
	Rail Bridges - Milwaukee District	Backlog	\$183.5											\$183.5	\$222.9	Rail Bridges - Milwaukee District
		Rehab and Cap Maint	\$0.0	\$0.7	\$0.8	\$1.1	\$0.8	\$0.8	\$1.0	\$0.8	\$0.8	\$0.8	\$0.8	\$8.3		
		Replace	\$0.0	\$14.3	\$0.0	\$0.6	\$7.0	\$2.3	\$3.9	\$0.8	\$2.3	\$0.0	\$0.0	\$31.1		
	Rail Bridges - Milwaukee District	Backlog	\$110.7											\$110.7	\$118.3	Rail Bridges - Milwaukee District
		Rehab and Cap Maint	\$0.0	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$4.6		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$1.9	\$0.0	\$0.0	\$0.5	\$0.0	\$0.7	\$0.0	\$3.1		
	Rail Bridges - North Central Service/Main	Backlog	\$12.3											\$12.3	\$23.1	Rail Bridges - North Central Service/Main
		Rehab and Cap Maint	\$0.0	\$0.2	\$0.1	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.3	\$0.2	\$1.8		
		Replace	\$0.0	\$0.0	\$6.3	\$0.0	\$0.0	\$0.0	\$0.2	\$0.0	\$0.0	\$2.4	\$0.0	\$9.0		
	Rail Bridges - Rock Island District/Beverly	Backlog	\$16.3											\$16.3	\$17.1	Rail Bridges - Rock Island District/Beverly
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.5	\$0.9		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	Rail Bridges - Rock Island District/Main	Backlog	\$71.4											\$71.4	\$92.3	Rail Bridges - Rock Island District/Main
		Rehab and Cap Maint	\$0.0	\$1.0	\$1.0	\$1.0	\$1.0	\$1.0	\$1.0	\$1.0	\$1.0	\$1.0	\$1.0	\$10.2		
		Replace	\$0.0	\$0.0	\$4.9	\$0.0	\$4.0	\$1.9	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$10.7		
	Rail Bridges - SouthWest Service/Main	Backlog	\$188.3											\$188.3	\$213.7	Rail Bridges - SouthWest Service/Main
		Rehab and Cap Maint	\$0.0	\$0.8	\$0.8	\$0.8	\$0.8	\$0.8	\$0.8	\$0.8	\$4.1	\$0.8	\$1.6	\$11.8		
		Replace	\$0.0	\$0.0	\$0.1	\$1.5	\$0.9	\$3.1	\$4.6	\$0.0	\$0.8	\$2.5	\$0.0	\$13.6		
	Rail Bridges - Union Pacific North/Main Line	Backlog	\$262.8											\$262.8	\$297.7	Rail Bridges - Union Pacific North/Main Line
		Rehab and Cap Maint	\$0.0	\$0.9	\$0.9	\$1.0	\$0.9	\$0.9	\$0.9	\$0.9	\$0.9	\$0.9	\$0.9	\$9.3		
		Replace	\$0.0	\$2.6	\$1.0	\$0.9	\$13.1	\$0.7	\$0.6	\$0.0	\$6.7	\$0.0	\$0.0	\$25.6		
	Rail Bridges - Union Pacific Northwest/Main Line	Backlog	\$167.1											\$167.1	\$194.1	Rail Bridges - Union Pacific Northwest/Main Line
		Rehab and Cap Maint	\$0.0	\$0.9	\$1.8	\$1.7	\$0.9	\$0.9	\$1.5	\$0.9	\$0.9	\$1.5	\$0.9	\$11.8		
		Replace	\$0.0	\$3.3	\$0.0	\$0.0	\$0.0	\$5.5	\$1.8	\$3.6	\$1.0	\$0.0	\$0.0	\$15.2		
	Rail Bridges - Union Pacific Northwest/McH	Backlog	\$1.9											\$1.9	\$2.0	Rail Bridges - Union Pacific Northwest/McH
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	Rail Bridges - Union Pacific West/Main Line	Backlog	\$358.6											\$358.6	\$378.8	Rail Bridges - Union Pacific West/Main Line
		Rehab and Cap Maint	\$0.0	\$1.1	\$1.1	\$1.7	\$1.1	\$1.1	\$1.1	\$1.1	\$1.8	\$1.6	\$1.6	\$13.0		
		Replace	\$0.0	\$0.0	\$3.2	\$0.0	\$0.0	\$0.3	\$0.0	\$0.0	\$3.0	\$0.0	\$0.7	\$7.2		
	Turnout	Backlog	\$13.2											\$13.2	\$263.3	Turnout
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.5	\$8.6	\$0.0	\$0.3	\$0.0	\$0.9	\$0.0	\$59.8	\$0.0	\$179.8	\$250.0		

**Figure E-2. METRA Asset Type Level Breakout of 10-Yr Annual Reinvestment Needs (\$2015 Millions), Continued**

Asset Group	Asset	Cost Type	Backlog	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	10-Year Needs	10-Year Total Needs	Asset
Stations	Elevator	Backlog	\$6,139.2	\$8.3										\$8.3	\$35.3	Elevator
		Rehab and Cap Maint	\$0.0	\$1.5	\$0.4	\$0.1	\$0.3	\$0.9	\$0.2	\$0.5	\$0.2	\$0.2	\$1.0	\$5.3		
		Replace	\$0.0	\$0.6	\$0.6	\$1.3	\$0.0	\$0.6	\$14.0	\$0.0	\$0.0	\$0.6	\$3.8	\$21.7		
	Parking Pavement	Backlog	\$0.0											\$0.0	\$125.8	Parking Pavement
		Rehab and Cap Maint	\$0.0	\$6.4	\$3.6	\$1.6	\$1.2	\$2.9	\$10.6	\$3.6	\$54.1	\$7.1	\$24.6	\$115.8		
		Replace	\$0.0	\$0.0	\$0.0	\$6.5	\$0.0	\$0.0	\$2.9	\$0.0	\$0.0	\$0.5	\$0.0	\$9.9		
	Structure Cooling	Backlog	\$1.7											\$1.7	\$4.3	Structure Cooling
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1		
		Replace	\$0.0	\$0.2	\$0.0	\$0.1	\$0.0	\$0.0	\$1.6	\$0.0	\$0.2	\$0.1	\$0.2	\$2.5		
	Structure Doors	Backlog	\$12.0											\$12.0	\$37.5	Structure Doors
		Rehab and Cap Maint	\$0.0	\$0.4	\$0.8	\$0.2	\$0.2	\$0.1	\$0.4	\$0.1	\$0.1	\$0.1	\$2.8	\$5.3		
		Replace	\$0.0	\$1.3	\$0.2	\$0.5	\$0.6	\$1.4	\$10.8	\$0.3	\$1.8	\$0.7	\$2.5	\$20.2		
	Structure Electrical	Backlog	\$0.4											\$0.4	\$19.2	Structure Electrical
		Rehab and Cap Maint	\$0.0	\$0.5	\$0.7	\$0.5	\$0.7	\$0.5	\$0.5	\$0.5	\$0.8	\$0.7	\$11.2	\$16.7		
		Replace	\$0.0	\$0.0	\$0.0	\$0.3	\$0.0	\$0.0	\$0.2	\$0.0	\$0.5	\$0.7	\$0.4	\$2.1		
	Structure Fire Protection	Backlog	\$0.0											\$0.0	\$0.5	Structure Fire Protection
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.3		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	\$0.0	\$0.0	\$0.2		
	Structure Heat	Backlog	\$11.0											\$11.0	\$30.1	Structure Heat
		Rehab and Cap Maint	\$0.0	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$1.0		
		Replace	\$0.0	\$1.3	\$0.1	\$0.5	\$0.2	\$0.5	\$9.9	\$0.3	\$1.8	\$0.6	\$3.0	\$18.0		
	Structure Plumbing	Backlog	\$0.3											\$0.3	\$1.6	Structure Plumbing
		Rehab and Cap Maint	\$0.0	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.2	\$0.1	\$0.1	\$1.1		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	\$0.0	\$0.2		
	Structure Roof	Backlog	\$9.3											\$9.3	\$41.4	Structure Roof
		Rehab and Cap Maint	\$0.0	\$0.2	\$0.2	\$0.2	\$0.2	\$0.1	\$0.2	\$0.2	\$0.1	\$0.2	\$0.2	\$1.5		
		Replace	\$0.0	\$1.1	\$0.4	\$0.1	\$0.2	\$13.4	\$2.8	\$0.1	\$9.5	\$0.5	\$2.3	\$30.6		
	Structure Shell	Backlog	\$2.0											\$2.0	\$57.1	Structure Shell
		Rehab and Cap Maint	\$0.0	\$4.7	\$3.4	\$3.6	\$3.6	\$3.7	\$4.6	\$3.4	\$6.3	\$3.9	\$7.5	\$44.7		
		Replace	\$0.0	\$0.0	\$0.1	\$0.7	\$0.1	\$0.1	\$2.2	\$0.0	\$1.0	\$5.3	\$0.9	\$10.4		
	Structure Windows	Backlog	\$0.0											\$0.0	\$2.7	Structure Windows
		Rehab and Cap Maint	\$0.0	\$0.2	\$0.1	\$0.1	\$0.1	\$0.1	\$0.2	\$0.1	\$0.2	\$0.1	\$0.3	\$1.3		
		Replace	\$0.0	\$0.0	\$0.1	\$0.1	\$0.2	\$0.0	\$0.0	\$0.0	\$0.3	\$0.1	\$0.5	\$1.3		
	Crosswalk	Backlog	\$5.3											\$5.3	\$28.8	Crosswalk
		Rehab and Cap Maint	\$0.0	\$0.3	\$1.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$1.1	\$3.3		
		Replace	\$0.0	\$1.0	\$0.1	\$0.4	\$0.3	\$0.2	\$14.7	\$0.3	\$0.8	\$0.4	\$2.0	\$20.2		
	Escalator	Backlog	\$2.5											\$2.5	\$10.0	Escalator
		Rehab and Cap Maint	\$0.0	\$0.1	\$0.1	\$0.0	\$0.0	\$0.1	\$0.0	\$0.1	\$0.0	\$0.0	\$0.1	\$0.5		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$6.9	\$0.0	\$0.0	\$0.0	\$0.0	\$6.9		
	Parking Access Roadway	Backlog	\$0.0											\$0.0	\$8.2	Parking Access Roadway
		Rehab and Cap Maint	\$0.0	\$0.4	\$0.1	\$0.1	\$0.1	\$0.5	\$0.3	\$0.1	\$1.8	\$0.9	\$3.7	\$8.1		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	Parking Lighting	Backlog	\$0.0											\$0.0	\$31.9	Parking Lighting
		Rehab and Cap Maint	\$0.0	\$0.7	\$0.4	\$0.3	\$0.4	\$0.8	\$6.7	\$0.7	\$13.7	\$2.3	\$5.7	\$31.7		
		Replace	\$0.0	\$0.0	\$0.0	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1		
	Paved Walkway	Backlog	\$0.0											\$0.0	\$0.2	Paved Walkway
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1		

Figure E-2. METRA Asset Type Level Breakout of 10-Yr Annual Reinvestment Needs (\$2015 Millions), Continued

Asset Group	Asset	Cost Type	Backlog	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	10-Year Needs	10-Year Total Needs	Asset
Stations Continued	Platform Lights	Backlog	\$6,139.2	\$362.5	\$1,045.6	\$556.0	\$278.3	\$538.3	\$826.0	\$733.0	\$636.6	\$171.5	\$717.0	\$12,003.8	\$7.5	Platform Lights
		Rehab and Cap Maint	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$0.4	\$0.2	\$0.2	\$0.2	\$0.2	\$2.4		
		Replace	\$0.0	\$0.0	\$0.3	\$2.1	\$0.2	\$0.2	\$0.0	\$0.0	\$1.0	\$0.8	\$0.4	\$4.9		
	Platform Structure	Backlog	\$2.0											\$2.0	\$103.4	Platform Structure
		Rehab and Cap Maint	\$0.0	\$3.9	\$2.3	\$2.6	\$2.3	\$2.7	\$27.2	\$2.6	\$3.2	\$2.6	\$5.5	\$54.8		
		Replace	\$0.0	\$0.4	\$1.3	\$32.1	\$0.9	\$1.1	\$0.0	\$0.0	\$4.8	\$4.0	\$2.0	\$46.5		
	Platform Surface	Backlog	\$76.5											\$76.5	\$210.4	Platform Surface
		Rehab and Cap Maint	\$0.0	\$1.9	\$7.2	\$0.7	\$0.8	\$0.7	\$1.5	\$0.7	\$0.7	\$0.7	\$16.6	\$31.4		
		Replace	\$0.0	\$7.2	\$0.7	\$2.0	\$1.7	\$3.8	\$56.9	\$2.1	\$4.7	\$3.2	\$20.4	\$102.6		
	Platform Tactile	Backlog	\$9.5											\$9.5	\$32.5	Platform Tactile
		Rehab and Cap Maint	\$0.0	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$1.1		
		Replace	\$0.0	\$2.8	\$0.3	\$0.6	\$0.4	\$0.9	\$7.8	\$1.0	\$1.7	\$0.9	\$5.4	\$21.9		
	Ramp	Backlog	\$0.0											\$0.0	\$12.9	Ramp
		Rehab and Cap Maint	\$0.0	\$0.7	\$1.0	\$0.9	\$1.2	\$1.5	\$0.6	\$0.7	\$0.6	\$0.8	\$3.9	\$11.9		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.7	\$0.4	\$0.0	\$0.0	\$0.0	\$1.1		
	Ramp Heat	Backlog	\$0.0											\$0.0	\$0.1	Ramp Heat
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	Retaining Walls	Backlog	\$2.7											\$2.7	\$27.5	Retaining Walls
		Rehab and Cap Maint	\$0.0	\$0.9	\$0.1	\$0.1	\$0.0	\$1.3	\$3.4	\$0.1	\$1.1	\$0.1	\$1.9	\$9.2		
		Replace	\$0.0	\$0.0	\$0.0	\$1.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$13.9	\$0.0	\$15.6		
	Signals	Backlog	\$0.0											\$0.0	\$0.0	Signals
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	Stair	Backlog	\$0.0											\$0.0	\$13.0	Stair
		Rehab and Cap Maint	\$0.0	\$0.3	\$0.4	\$0.4	\$0.8	\$0.4	\$0.3	\$0.3	\$0.4	\$0.4	\$1.8	\$5.4		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1.6	\$0.5	\$0.0	\$5.3	\$0.2	\$7.6		
	Stair Heat	Backlog	\$0.0											\$0.0	\$0.0	Stair Heat
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	Tunnel	Backlog	\$5.7											\$5.7	\$11.3	Tunnel
		Rehab and Cap Maint	\$0.0	\$0.6	\$0.6	\$0.6	\$0.6	\$0.6	\$0.6	\$0.6	\$0.6	\$0.6	\$0.6	\$5.6		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		

Figure E-2. METRA Asset Type Level Breakout of 10-Yr Annual Reinvestment Needs (\$2015 Millions), Continued

Asset Group	Asset	Cost Type	Backlog	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	10-Year Needs	10-Year Total Needs	Asset
Systems	Communications	Backlog	\$6,139.2	\$362.5	\$1,045.6	\$556.0	\$278.3	\$538.3	\$826.0	\$733.0	\$636.6	\$171.5	\$717.0	\$12,003.8	\$79.8	Communications
		Rehab and Cap Maint	\$22.9	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$22.9		
		Replace	\$0.0	\$0.0	\$3.9	\$6.7	\$0.2	\$0.4	\$1.2	\$1.0	\$27.6	\$0.2	\$15.8	\$56.9		
	Misc Elec Equip	Backlog	\$55.5	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$55.5	\$70.9	Misc Elec Equip
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.9	\$0.0	\$6.8	\$0.0	\$7.2	\$0.0	\$0.0	\$0.0	\$0.6	\$0.0	\$15.4		
	Signals	Backlog	\$466.5	\$0.0	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$466.5	\$899.2	Signals
		Rehab and Cap Maint	\$0.0	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$2.8	\$28.0		
		Replace	\$0.0	\$0.0	\$386.2	\$1.9	\$1.6	\$4.5	\$1.8	\$0.2	\$7.0	\$1.5	\$0.2	\$404.8		
	Catenary Cables	Backlog	\$0.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	\$0.2	Catenary Cables
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	Catenary SubStructure	Backlog	\$7.8	\$0.0	\$0.5	\$0.0	\$0.0	\$0.1	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0	\$7.8	\$8.5	Catenary SubStructure
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.6		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	Catenary Superstructure	Backlog	\$11.1	\$0.0	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$11.1	\$11.2	Catenary Superstructure
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	Drainage	Backlog	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1.1	Drainage
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.1	\$0.0	\$0.0	\$0.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.8	\$1.1		
	Impedance Bonds	Backlog	\$10.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$10.0	\$12.5	Impedance Bonds
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.4		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.3	\$0.7	\$1.2	\$0.0	\$0.0	\$0.0	\$2.2		
	Power Cables	Backlog	\$4.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$4.6	\$4.6	Power Cables
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	Signal Power	Backlog	\$2.9	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$2.9	\$2.9	Signal Power
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	Snowmelter	Backlog	\$8.3	\$0.0	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$8.3	\$75.7	Snowmelter
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.1	\$0.7		
		Replace	\$0.0	\$24.7	\$0.3	\$0.0	\$0.0	\$8.3	\$24.7	\$0.3	\$0.0	\$0.0	\$0.0	\$66.7		
	SubStation	Backlog	\$1.1	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1.1	\$11.7	SubStation
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$1.9	\$0.0	\$4.5	\$0.0	\$0.0	\$0.0	\$4.3	\$0.0	\$10.6		
	Transformer	Backlog	\$0.5	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.5	\$1.6	Transformer
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.2	\$0.0	\$0.9	\$0.0	\$0.0	\$0.0	\$0.0	\$0.1	\$1.1		
	Yard Lighting	Backlog	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.6	Yard Lighting
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.6	\$0.0	\$0.6		

Figure E-2. METRA Asset Type Level Breakout of 10-Yr Annual Reinvestment Needs (\$2015 Millions), Continued

Asset Group	Asset	Cost Type	Backlog	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	10-Year Needs	10-Year Total Needs	Asset	
			\$6,139.2	\$362.5	\$1,045.6	\$556.0	\$278.3	\$538.3	\$826.0	\$733.0	\$636.6	\$171.5	\$717.0	\$12,003.8			
Vehicles	Coaches	Backlog	\$1,229.0											\$1,229.0	\$2,969.4	Coaches	
		Rehab and Cap Maint	\$0.0	\$10.9	\$229.4	\$302.2	\$1.4	\$12.3	\$8.7	\$13.1	\$5.9	\$0.6	\$13.0	\$597.4			
		Replace	\$0.0	\$78.9	\$79.0	\$90.2	\$61.9	\$68.7	\$199.5	\$389.0	\$175.8	\$0.0	\$0.0	\$1,143.1			
	Locomotives	Backlog	\$441.0												\$441.0	\$1,162.2	Locomotives
		Rehab and Cap Maint	\$0.0	\$1.9	\$127.6	\$8.8	\$20.9	\$13.2	\$7.0	\$12.8	\$0.0	\$1.9	\$30.9	\$225.1			
		Replace	\$0.0	\$86.6	\$0.0	\$0.0	\$63.0	\$149.6	\$165.4	\$31.5	\$0.0	\$0.0	\$0.0	\$496.1			
	NonRevenue Vehicles	Backlog	\$36.9												\$36.9	\$126.6	NonRevenue Vehicles
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$5.4	\$0.9	\$1.2	\$0.5	\$36.9	\$5.4	\$0.9	\$1.2	\$0.5	\$36.9	\$89.7			
	EMU's	Backlog	\$868.6												\$868.6	\$1,134.9	EMU's
		Rehab and Cap Maint	\$0.0	\$6.0	\$4.2	\$0.0	\$0.0	\$86.4	\$0.0	\$7.4	\$0.0	\$0.0	\$56.1	\$160.2			
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$106.1	\$0.0	\$0.0	\$106.1			
	Freight Cars	Backlog	\$6.8												\$6.8	\$8.5	Freight Cars
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1.5	\$0.0	\$0.2	\$1.6		
	Switchers	Backlog	\$45.8												\$45.8	\$51.5	Switchers
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$5.7	\$0.0	\$0.0	\$5.7		
			\$6,139.2	\$362.5	\$1,045.6	\$556.0	\$278.3	\$538.3	\$826.0	\$733.0	\$636.6	\$171.5	\$717.0	\$12,003.8			
Metra	Backlog		\$6,139.2											\$6,139.2	\$12,003.8		
	Rehab and Cap Maint			\$67.0	\$409.6	\$349.2	\$61.3	\$153.4	\$99.2	\$72.2	\$119.8	\$49.4	\$223.0	\$1,604.2			
	Replace			\$295.5	\$636.0	\$206.7	\$216.9	\$384.9	\$726.8	\$660.8	\$516.8	\$122.0	\$494.0	\$4,260.4			
	Total		\$6,139.2	\$362.5	\$1,045.6	\$556.0	\$278.3	\$538.3	\$826.0	\$733.0	\$636.6	\$171.5	\$717.0	\$12,003.8			

Note that in some cases totals for the 10-Year needs may not add completely due to rounding.

Figure E-3. Pace Detailed Asset Type Level Breakout of 10-Yr Annual Reinvestment Needs (\$2015 Millions)

Asset Group	Asset	Cost Type	Backlog	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	10-Year Needs	10-Year Total Needs	Asset
			\$754.8	\$151.6	\$114.6	\$180.2	\$228.5	\$161.5	\$277.9	\$181.6	\$154.5	\$75.1	\$306.2	\$2,586.5		
Facilities	ADA Call Center and Other Equipment	Backlog	\$9.6											\$9.6	\$29.6	ADA Call Center and Other Equipment
		Rehab and Cap Maint	\$0.0	\$0.1	\$0.3	\$0.0	\$0.0	\$0.0	\$0.1	\$0.3	\$0.0	\$0.0	\$0.0	\$0.9		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$9.6	\$0.0	\$0.0	\$0.0	\$0.0	\$9.6	\$19.2		
	ADA Support Facilities	Backlog	\$22.4											\$22.4	\$53.7	ADA Support Facilities
		Rehab and Cap Maint	\$0.0	\$9.1	\$2.1	\$1.1	\$5.1	\$1.1	\$1.1	\$1.1	\$5.1	\$2.2	\$3.3	\$31.3		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	Facilities/Garage s - Building	Backlog	\$104.6											\$104.6	\$369.5	Facilities/Garage s - Building
		Rehab and Cap Maint	\$0.0	\$66.8	\$15.8	\$58.6	\$18.0	\$7.3	\$14.9	\$19.1	\$7.3	\$27.6	\$29.5	\$264.9		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	Facilities/Garage s - Site Work	Backlog	\$59.0											\$59.0	\$67.0	Facilities/Garage s - Site Work
		Rehab and Cap Maint	\$0.0	\$0.7	\$0.7	\$0.7	\$0.7	\$0.7	\$0.6	\$0.7	\$0.7	\$0.7	\$0.7	\$6.6		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1.4	\$0.0	\$0.0	\$0.0	\$0.0	\$1.4		
Stations	Infrastructure Support	Backlog	\$1.7											\$1.7	\$14.6	Infrastructure Support
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.3		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$10.9	\$0.0	\$0.0	\$0.0	\$1.7	\$12.6		
	ADA Passenger Facilities	Backlog	\$0.0											\$0.0	\$39.1	ADA Passenger Facilities
		Rehab and Cap Maint	\$0.0	\$0.0	\$1.5	\$1.5	\$1.5	\$1.5	\$5.4	\$1.5	\$1.5	\$1.5	\$1.5	\$17.5		
		Replace	\$0.0	\$21.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$21.6		
	Stations – Buildings	Backlog	\$40.1											\$40.1	\$68.2	Stations – Buildings
		Rehab and Cap Maint	\$0.0	\$0.2	\$0.2	\$0.2	\$0.1	\$0.2	\$0.2	\$0.2	\$0.2	\$0.2	\$10.1	\$11.5		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$8.4	\$0.0	\$1.8	\$0.0	\$6.4	\$0.0	\$0.0	\$16.6		
	Stations - Site Work	Backlog	\$41.1											\$41.1	\$118.8	Stations - Site Work
		Rehab and Cap Maint	\$0.0	\$3.0	\$3.0	\$3.0	\$3.3	\$10.4	\$3.0	\$3.0	\$3.0	\$2.9	\$0.1	\$34.7		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1.8	\$41.1	\$43.0		
Systems	Fare Collection	Backlog	\$19.1											\$19.1	\$77.4	Fare Collection
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.5	\$0.9	\$25.2	\$0.0	\$1.7	\$0.0	\$1.9	\$25.6	\$0.9	\$1.7	\$58.3		
	Paratransit	Backlog	\$4.1											\$4.1	\$16.2	Paratransit
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$1.6	\$4.4	\$0.0	\$0.0	\$0.0	\$1.6	\$4.4	\$12.0		
	Vanpool	Backlog	\$1.7											\$1.7	\$5.0	Vanpool
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1.7	\$0.0	\$0.0	\$0.0	\$0.0	\$1.7	\$3.3		
	ADA Call Center and Other Equipment	Backlog	\$24.8											\$24.8	\$74.4	ADA Call Center and Other Equipment
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$24.8	\$0.0	\$0.0	\$0.0	\$0.0	\$24.8	\$49.6		
	AVL	Backlog	\$7.4											\$7.4	\$28.8	AVL
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$2.3	\$0.5	\$0.0	\$0.5	\$7.4	\$2.3	\$0.5	\$0.0	\$0.5	\$7.4	\$21.4		
	Division Security Systems	Backlog	\$1.6											\$1.6	\$4.8	Division Security Systems
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1.6	\$0.0	\$0.0	\$0.0	\$0.0	\$1.6	\$3.2		
	ITS IBS	Backlog	\$23.0											\$23.0	\$31.4	ITS IBS
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$3.9	\$0.5	\$0.0	\$3.4	\$0.0	\$0.5	\$0.0	\$0.0	\$0.1	\$0.0	\$8.4		
	Radio Systems	Backlog	\$5.3											\$5.3	\$40.6	Radio Systems
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.1	\$0.0	\$0.0	\$0.0	\$1.5	\$7.3	\$21.1	\$0.0	\$0.0	\$5.3	\$35.3		
Suburban Rolling Stock	Backlog	\$9.2											\$9.2	\$39.0	Suburban Rolling Stock	
	Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0			
	Replace	\$0.0	\$0.0	\$0.5	\$2.2	\$0.7	\$11.5	\$0.0	\$0.5	\$2.2	\$0.7	\$11.5	\$29.9			
TSP (Transit Signal Prioritization)	Backlog	\$12.0											\$12.0	\$35.9	TSP (Transit Signal Prioritization)	
	Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0			
	Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$12.0	\$0.0	\$0.0	\$0.0	\$0.0	\$12.0	\$23.9			

Figure E-3. Pace Detailed Asset Type Level Breakout of 10-Yr Annual Reinvestment Needs (\$2015 Millions)

Asset Group	Asset	Cost Type	Backlog	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	10-Year Needs	10-Year Total Needs	Asset
Vehicles	ADA Rolling Stock	Backlog	\$754.8	\$151.6	\$114.6	\$180.2	\$228.5	\$161.5	\$277.9	\$181.6	\$154.5	\$75.1	\$306.2	\$2,586.5	\$209.6	ADA Rolling Stock
		Rehab and Cap Maint	\$2.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$2.0		
		Replace	\$0.0	\$10.0	\$23.7	\$45.1	\$8.1	\$10.0	\$23.7	\$45.1	\$8.1	\$10.0	\$23.7	\$207.6		
	Paratransit	Backlog	\$35.9	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$35.9	\$160.9	Paratransit
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$24.6	\$35.9	\$0.0	\$0.0	\$28.5	\$35.9	\$0.0	\$0.0	\$125.0		
	Vanpool	Backlog	\$22.7	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$22.7	\$133.3	Vanpool
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$5.8	\$10.1	\$8.0	\$23.3	\$5.8	\$10.1	\$8.0	\$23.3	\$5.8	\$10.1	\$110.6		
	ADA Call Center and Other Equipment	Backlog	\$2.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$2.2	\$6.7	ADA Call Center and Other Equipment
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$2.2	\$0.0	\$0.0	\$0.0	\$0.0	\$2.2	\$4.5		
	Suburban Rolling Stock	Backlog	\$295.3	\$23.7	\$0.0	\$8.8	\$27.7	\$8.9	\$174.1	\$1.4	\$27.4	\$0.0	\$41.7	\$313.8	\$922.9	Suburban Rolling Stock
		Rehab and Cap Maint	\$0.0	\$2.8	\$54.8	\$0.0	\$83.4	\$31.1	\$20.4	\$47.4	\$0.0	\$17.6	\$56.3	\$313.9		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	CTS (Community Transit Service)	Backlog	\$5.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$5.2	\$21.6	CTS (Community Transit Service)
		Rehab and Cap Maint	\$0.0	\$1.0	\$0.0	\$0.5	\$6.3	\$1.0	\$0.0	\$0.5	\$6.3	\$1.0	\$0.0	\$16.4		
		Replace	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
	Non- Revenue Vehicles	Backlog	\$5.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$5.0	\$17.7	Non- Revenue Vehicles
		Rehab and Cap Maint	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0		
		Replace	\$0.0	\$0.0	\$0.0	\$0.7	\$0.2	\$5.4	\$0.0	\$0.8	\$1.3	\$0.0	\$4.3	\$12.7		
			\$754.8	\$151.6	\$114.6	\$180.2	\$228.5	\$161.5	\$277.9	\$181.6	\$154.5	\$75.1	\$306.2	\$2,586.5		
Pace	Backlog	\$754.8												\$754.8	\$2,586.5	
	Rehab and Cap Maint		\$103.6	\$23.5	\$73.8	\$56.6	\$30.1	\$199.5	\$27.2	\$45.2	\$35.0	\$86.9	\$681.5			
	Replace		\$48.0	\$91.1	\$106.3	\$171.9	\$131.4	\$78.4	\$154.4	\$109.3	\$40.1	\$219.4	\$1,150.2			
	Total	\$754.8	\$151.6	\$114.6	\$180.2	\$228.5	\$161.5	\$277.9	\$181.6	\$154.5	\$75.1	\$306.2	\$2,586.5			

Note that in some cases totals for the 10-Year needs may not add completely due to rounding.



Figure E-4. Summary for All Service Boards, 10-Yr Annual Reinvestment Needs (\$2015 Millions)

Service Board	Cost Type	Backlog	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	10-Year Needs	10-Year Total Needs
CTA	Backlog	\$12,456.4											\$12,456.4	\$23,082.2
	Rehab and Cap Maint		\$377.0	\$129.4	\$577.6	\$237.4	\$448.2	\$792.4	\$208.4	\$595.7	\$529.5	\$1,001.6	\$4,897.2	
	Replace		\$205.9	\$328.0	\$985.7	\$1,256.6	\$1,342.1	\$293.6	\$405.0	\$445.6	\$164.8	\$301.4	\$5,728.6	
	Total	\$12,456.4	\$582.9	\$457.4	\$1,563.3	\$1,494.0	\$1,790.3	\$1,086.0	\$613.3	\$1,041.3	\$694.3	\$1,303.0	\$23,082.2	
Metra	Backlog	\$6,139.2											\$6,139.2	\$12,003.8
	Rehab and Cap Maint		\$67.0	\$409.6	\$349.2	\$61.3	\$153.4	\$99.2	\$72.2	\$119.8	\$49.4	\$223.0	\$1,604.2	
	Replace		\$295.5	\$636.0	\$206.7	\$216.9	\$384.9	\$726.8	\$660.8	\$516.8	\$122.0	\$494.0	\$4,260.4	
	Total	\$6,139.2	\$362.5	\$1,045.6	\$556.0	\$278.3	\$538.3	\$826.0	\$733.0	\$636.6	\$171.5	\$717.0	\$12,003.8	
Pace	Backlog	\$754.8											\$754.8	\$2,586.5
	Rehab and Cap Maint		\$103.6	\$23.5	\$73.8	\$56.6	\$30.1	\$199.5	\$27.2	\$45.2	\$35.0	\$86.9	\$681.5	
	Replace		\$48.0	\$91.1	\$106.3	\$171.9	\$131.4	\$78.4	\$154.4	\$109.3	\$40.1	\$219.4	\$1,150.2	
	Total	\$754.8	\$151.6	\$114.6	\$180.2	\$228.5	\$161.5	\$277.9	\$181.6	\$154.5	\$75.1	\$306.2	\$2,586.5	
Total RTA	Backlog	\$19,350.4											\$19,350.4	\$37,672.5
	Rehab and Cap Maint		\$547.7	\$562.5	\$1,000.6	\$355.4	\$631.8	\$1,091.1	\$307.8	\$760.8	\$613.9	\$1,311.4	\$7,182.9	
	Replace		\$549.3	\$1,055.1	\$1,298.8	\$1,645.4	\$1,858.4	\$1,098.8	\$1,220.2	\$1,071.6	\$326.9	\$1,014.8	\$11,139.2	
	Total	\$19,350.4	\$1,097.0	\$1,617.6	\$2,299.4	\$2,000.8	\$2,490.2	\$2,189.8	\$1,527.9	\$1,832.4	\$940.8	\$2,326.2	\$37,672.5	

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