INDYGO TRANSIT ASSET MANAGEMENT PLAN

2018-2022

FINAL

9.11.2018

DOCUMENT CONTROL HISTORY

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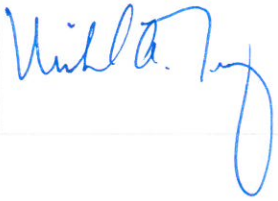
TRANSIT ASSET MANAGEMENT PLAN COMMITTEE

Participant Name	Title	Email	Division
Michael Terry	President and Chief Executive Officer	mterry@indygo.net	Administration
Nancy Manley	Vice President and Chief Financial Officer	nmanley@indygo.net	Finance
Roscoe Brown	Vice President and Chief Operating Officer	rbrown@indygo.net	Operations
Richard Joseph	Chief Information Officer	rjoseph@indygo.net	Information Technology
Justin Stuehrenberg	Vice President of Planning and Capital Projects	jstuehrenberg@indygo.net	Planning and Capital Projects
Bryan Luellen	Vice President of Public Affairs	bluellen@indygo.net	Public Affairs
Brian Atkinson	Director of Accounting	batkinson@indygo.net	Finance
Hardi Shah	Director of Budget and Internal Controls	hshah@indygo.net	Finance
Justin Burcope	Finance and Internal Audit Manager	jburcope@indygo.net	Finance
Cassandra Burmeister	Grant Manager	cburmeister@indygo.net	Finance
Edward Parsley	Director of Facilities	eparsley@indygo.net	Operations
Mark Crane	Facilities Maintenance Manager	mcrane@indygo.net	Operations
Victoria Learn	Director of Fleet and Inventory	vlearn@indygo.net	Operations
Ryan Wilhite	Strategic Planner	rwilhite@indygo.net	Planning and Capital Projects
Jane Canada	Civil Design Project Manager	jcanada@indygo.net	Planning and Capital Projects
Connie Berkowitz	Project Management – Contractor	cberkowitz@indygo.net	Administration
Candice Moor	Business Analyst – Contractor	cmoor@indygo.net	Administration
Annette Darrow	Director of Service Planning	adarrow@indygo.net	Planning and Capital Projects

AUTHORITY ACCEPTANCE

Recipient Name	Title	Signature
Michael Terry	President & Chief Executive Officer	

ACKNOLEDGEMENTS

The entire core team members are shown above as the Transit Asset Management Plan Committee. This document is the culmination of a collaborative effort involving all committee members and the Indianapolis Public Transportation Corporation Board of Directors.

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1. INTRODUCTION

1.1 OVERVIEW OF INDIANAPOLIS PUBLIC TRANSPORTATION CORPORATION

The Indianapolis Public Transportation Corporation (IPTC) is the largest public bus-only transit property in Indiana and has been serving Indianapolis since 1973. IPTC, more commonly known as IndyGo, is governed by a five-member board appointed by the Mayor of Indianapolis and the City County Council of Marion County and City of Indianapolis.

IPTC has a long-standing commitment to preserving and improving the quality and quantity of transit service for thousands of Indianapolis passengers that populate a more than 368-square mile service area. IPTC carries about 725,000 riders on an average month, along 31 routes.

Following years of public input and technical analysis, a county-wide transit vision, the Marion County Transit Plan (MCTP) was introduced to Indianapolis residents. The MCTP outlined significant transit investment – more than 70% of an increase in service, including three rapid transit routes. Community approval of a .25% income tax increase in November 2016, provided the necessary income to begin implementing the MCTP. IndyGo anticipates delivering the full MCTP by 2022, significantly enhancing mobility and accessibility for all Indianapolis residents.

1.2 TAM APPROACH

An IPTC TAM Plan Committee was established to evaluate existing asset management programs and identify improvements to deliver a plan that exceeds community expectations and complies with the FTA TAM Final Rule.

The IndyGo TAMP is informed by TAM Policy 02-2018, the vision of which is below:

> *The IPTC is committed to maintain assets in a State of Good Repair through financial stewardship and reinvestment, transparency, and collaboration with its funding partners; promoting a culture that supports asset management across the organization, and by focusing on high quality data-driven asset condition and performance information to provide with safe, reliable, sustainable service for the communities served by IndyGo.*

The TAM Plan Committee includes key stakeholders from departments that play a critical role in the lifecycle management of IndyGo assets. Figure 1 illustrates the TAM Plan Committee structure which is comprised of two general groups: Executive Governance and TAM Implementation. Executive Governance is responsible for establishing strategy and policy directives, while also assuming responsibility for the implementation and results of the TAMP. TAM Implementation is comprised of staff responsible for the lifecycle of an asset, particularly maintenance.

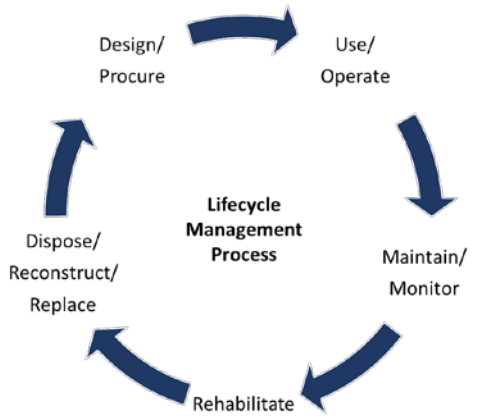
Figure 1 TAMP Committee

This Plan sets forth IPTC's approach to improving its TAM capabilities in compliance with

requirements initially established by the *Moving Ahead for Progress in the 21st Century* (MAP-21) Act of 2012 and further defined by the Federal Transit Administration's (FTA's) Final Rule on TAM (49 CFR 625 and 630). Known as the Transit Asset Management Plan (TAMP), this document sets agency-wide objectives and strategies for delivering all commitments in IPTC's TAM Policy and its mission. The TAMP also identifies priority projects to improve IPTC's TAM capabilities across the agency, and, by reference, specifies the lifecycle management activities conducted for each department that is responsible for the operations and/or maintenance of a given asset class.

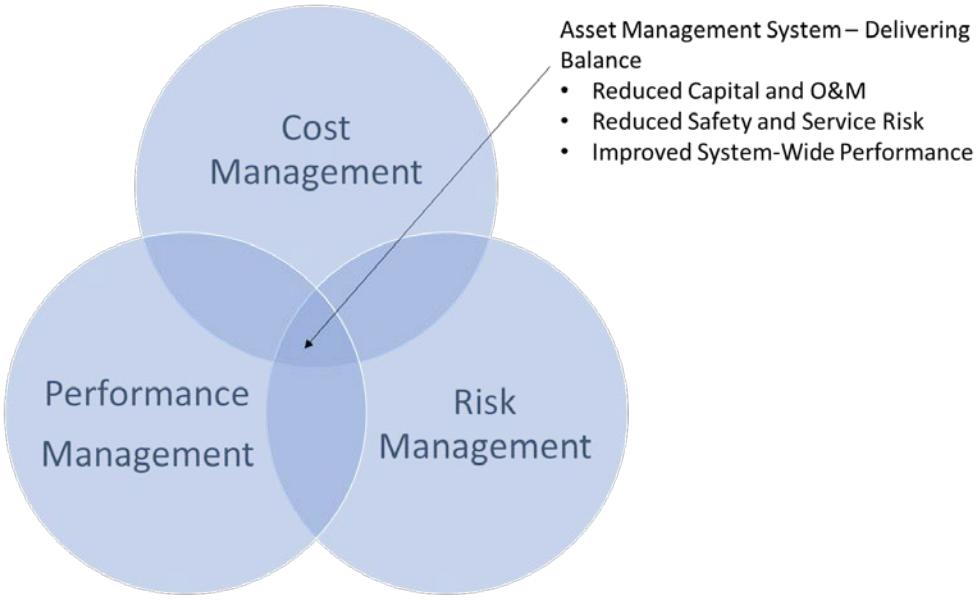
IPTC's core business is to provide safe, reliable and sustainable transportation options. To accomplish this, IPTC must continually improve its management of fleet and facilities. When executed properly, TAM improves coordination of *all* departments across *all* phases of an asset's lifecycle as shown in Figure 2 to manage assets and required resources more efficiently.

Figure 2 Typical Lifecycle Phases of a Transit Asset



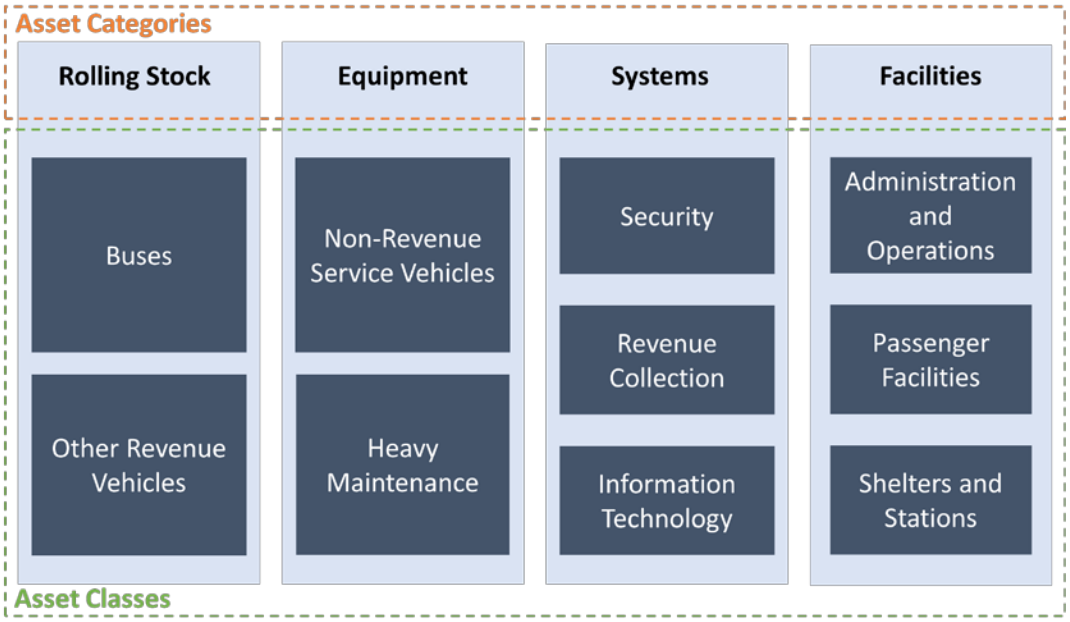
The TAMP aims to optimize the costs, risks, and performance of the transit system, and provide a range of benefits to IPTC through an ongoing planning effort as depicted in Figure 2. In addition, the TAMP enhances the IPTC's ability to communicate with the public and stakeholders about the IPTC's successful approach to asset management, the benefits of investing in the transit system and the consequences of underinvestment, as shown in Figure 3.

Figure 3 Asset Management System Role in Enterprise



Federal regulations currently require that all assets used in the provision of public transportation be included in this TAMP. Industry best practices suggest that the scope of this TAM Plan should be expanded to include all assets procured through IPTC's capital program. TAM Policy 01-2018 dictates that IndyGo maintain an asset inventory for all assets over $5,000 in acquisition value and/or 3 years in useful life. Accordingly, this TAMP includes objectives and strategies to optimize the management of assets that align with FTA reporting requirements for the National Transit Database (NTD). Figure 4 illustrates the hierarchy of IPTC's current asset categories and asset classes.

Figure 4 IndyGo Asset Hierarchy: Categories, and Classes



1.3 FEDERAL TAM REQUIREMENTS

1.3.1 OVERVIEW

As part of MAP-21 and the subsequent *Fixing America's Surface Transportation* (FAST) Act, the FTA has enacted regulations for transit asset management that require transit service providers receiving federal assistance to establish asset management performance measures and targets and develop a TAM Plan.

The Final TAM Rule was published on July 26, 2016 and went into effect on October 1, 2016. The rule itself amended the United States (U.S.) Code of Federal Regulations (CFR) Title 49 Parts 625 and 630, which relate to TAM and the NTD, respectively. The Final TAM Rule distinguishes requirements between larger (Tier I) and smaller or rural transit agencies (Tier II).

FTA defines a Tier I provider as:

- "Owns, operates, or manages either 101 or more vehicles in revenue service during peak regular service or in any one non-fixed route mode" Or,
- "Operates rail transit."

Based on the criteria, and the type of service provided, IPTC is a Tier I provider.

1.3.2 STATE OF GOOD REPAIR PERFORMANCE MEASURES

The Final TAM Rule requires that transit agencies establish state of good repair (SGR) performance measures and targets for each asset class. As a Tier I provider, IPTC must report on the SGR measures for the following asset categories and assets:

- Rolling stock (revenue vehicles): Percent of vehicles that have either met or exceeded their Useful Life Benchmark (ULB)
- Equipment (including non-revenue service vehicles): Percent of vehicles that have either met or exceeded their ULB
- Facilities: Percent of facilities rated below condition 3 on the FTA TERM scale

Note: Infrastructure (rail fixed guideway, track, signals and systems) does not apply to IPTC because it is a bus-only transit property.

Transit agencies may also develop additional SGR performance measures for each asset category or class. IPTC has chosen to do so and are identified in Section 3.3.

1.3.3 TAM PLAN REQUIREMENTS

As a Tier I provider, IPTC must develop its own TAMP that includes all nine (9) elements of the Final TAM Rule. These elements must:

- Define the TAM and SGR policy
- Include the capital asset inventory
- Provide asset condition assessment information
- Describe the decision support tools used to prioritize capital investment needs
- Identify project-based prioritization of investments
- Discuss the TAM Plan implementation strategy
- Describe the key TAM activities to be undertaken during the four-year horizon period
- List resources needed to carry out the TAMP
- Outline how the TAMP will be monitored and updated to support continuous improvement

Table 1 below reflects the strategies that IPTC plans to implement to provide a visual of the federal regulations and elements listed above. This table also describes the criteria for TAMP compliance that will be addressed in the initially submitted TAM Plan.

Table 1 TAMP - U.S. 49 CFR Compliance Matrix

No:	Code	Requirement	TAM Plan Compliance
1	49 CFR § 625.25 (b)(1)	Inventory of the number and type of all capital assets a provider owns, except equipment with an acquisition value under $50,000 that is not a service vehicle.	Capital Inventory for all asset-classes are presented in Section 4. Annual changes to the inventory will also be reported in Section 4 in future versions of the TAMP.
2	49 CFR § 625.25 (b)(1)	An inventory must also include third- party owned or jointly procured exclusive-use maintenance facilities, passenger station facilities, administrative facilities, rolling stock, and guideway infrastructure used by a provider in the provision of public transportation.	A discussion of inventory ownership is included in Section 4 of the TAM Plan.

No:	Code	Requirement	TAM Plan Compliance
3	49 CFR § 625.25 (b)(2)	Condition assessment of those inventoried assets for which a provider has direct capital responsibility and to level of detail to monitor, predict performance of assets, and inform investment prioritization.	The assessed condition of the assets is included in Section 4.2.
4	49 CFR § 625.25 (b)(3)	Description of analytical processes or decision-support tools to estimate capital investment needs over time and develop its investment prioritization.	Use of tools, asset lifecycle strategies, and approaches to support decision making is described in Sections 7 and 8.
5	49 CFR § 625.25 (b)(4)	Project-based prioritization of investments.	The methodology for prioritizing projects is outlined in Section 8.
6	49 CFR § 625.25 (b)(5)	Provider's TAM and SGR policy.	IndyGo's TAM Policy is outlined in Section 1.2 and attached as appendices.
7	49 CFR § 625.25 (b)(6)	Provider's TAM Plan implementation strategy.	TAMP implementation strategy is defined in Section 2.1 and Section 6. Section 9 includes an implementation schedule. The TAMP and its associated business processes will both be monitored and reviewed annually or sooner if needed.

No:	Code	Requirement	TAM Plan Compliance
8	49 CFR § 625.25 (b)(7)	A description of key TAM activities that a provider intends to engage in over the TAM Plan horizon period.	Section 6 describes the TAM business process activities as well as a summary of recommendations is included in Section 9.
9	49 CFR § 625.25 (b)(8)	A summary or list of the resources, including personnel that a provider needs to develop and carry out the TAM Plan.	Staff resources are listed in Section 1 where the TAM Plan Committee is defined; in Section 7 where capital investments are defined; and in Section 3.2.
10	49 CFR § 625.25 (b)(9)	An outline of how a provider will monitor, update, and evaluate, as needed, its TAM Plan and related business practices, to ensure the continuous improvement of its TAM practices.	TAM business processes related to TAM Planning and continuous improvement are included in Section 6. Monitoring and updating of the TAMP is contained in Section 9.
The following will be considered when developing investment prioritization:			
11	49 CFR § 625.33 (a)	Include an investment prioritization that includes program of projects to improve or manage the SGR of capital assets for which the provider has direct capital responsibility over the TAM Plan horizon period;	Prioritization of investments, work plans, cost and budget schedules by year are presented in Section 8.
12	49 CFR § 625.33 (b)	Rank projects to improve or manage the SGR of capital assets in order of priority and anticipated project year;	Prioritization of investments, work plans, cost and budget schedules by year are presented in Section 8.
13	49 CFR § 625.33 (c)	Ensure project rankings are consistent with its TAM policy and strategies;	The approach to prioritizing projects is set out in Section 7 and in Section 8.

No:	Code	Requirement	TAM Plan Compliance
14	49 CFR § 625.33 (d)	Give due consideration to state of good repair projects to improve those that pose an identified unacceptable safety risk;	Identification and management of risks are set out in Section 8.
15	49 CFR § 625.33 (e)	Take into consideration its estimation of funding levels from all available sources that it reasonably expects will be available in each fiscal year during the TAM Plan horizon period; and	Prioritization of investments, work plans, cost and budget schedules by fiscal year are presented in Section 8.
16	49 CFR § 625.33 (f)	Take into consideration requirements under 49 CFR 37.161 and 37.163 concerning maintenance of accessible features and the requirements under 49 CFR 37.43 concerning alteration of transportation facilities.	Strategies for maintaining assets are described in Section 7.
17	49 CFR § 625.55 (a)(1) and (a)(2)	Each provider must submit the following reports: (1) An annual data report to FTA's National Transit Database that reflects the SGR performance targets for the following year and condition information for the provider's public transportation system (2) An annual narrative report to the National Transit Database that provides a description of any change in the condition of the provider's transit system from the previous year and describes the progress made during the year to meet the performance targets set in the previous reporting year.	NTD Reporting requirements are addressed in Section 1.3.5 which outlines the annual data report reflecting SGR Performance Targets for the upcoming year and the Narrative report will provide a descriptionof changes in condition from the prior year.

Each section of the TAM Plan contains references to the requirements of the Final Rule on Asset Management in the U.S. CFR.

1.3.4 TAM HORIZON AND UPDATES

The FTA requires transit providers to update TAM Plans in their entirety at least once every four (4) years, with the first completed TAM Plan required by October 1, 2018.

The TAM Rule requires that plans cover at least a 4-year planning horizon and be updated every 4 years.

Reference: *49 CFR Part 625 Subpart E Section 625.29* : (a) "A TAM plan must cover a horizon period of at least four (4) years."…(c) A provider must update its entire TAM plan at least once every four (4) years. A provider's TAM plan update should coincide with the planning cycle for the relevant Transportation Improvement Program or Statewide Transportation Improvement Program."

IndyGo's TAMP has a horizon year of 2022. The Indianapolis MPO's transportation improvement program (TIP) has a current horizon year of 2021 (2018-2021) and the IndyGo Capital Plan was recently adopted with a horizon year of 2023 (2019-2023).

Although TAMPs are required to be updated in their entirety at least once every four (4) years, IPTC currently plans to review its TAMP annually and update it as needed to reflect current conditions, specifically the asset inventory, condition assessment, and targets.

1.3.5 TAM REPORTING REQUIREMENTS

FTA regulations require that all transit agencies annually report their state of good repair targets for the following year, as well as the condition for the provider's system.

The TAM Rule requires that agencies annually report on their progress towards meeting SGR performance targets and any change in condition from the previous year.

Reference: *49 CFR Part 625 Subpart E Section 625.55(a)(2)* "Each provider must submit … (2) An annual narrative report to the National Transit Database that provides a description of any change in the condition of the provider's transit system from the previous year and describes the progress made during the year to meet the performance targets set in the previous reporting year."

The TAM Final Rule requires that two (2) additional asset management reports be submitted to the NTD annually. The Finance Department will submit the Data Report and Narrative Report to NTD. The following reports are due to the NTD no later than four months after the IPTC's fiscal year end:

- The **Data Report** should describe the condition of the transportation system currently and the SGR performance targets for the upcoming year.
- The **Narrative Report** should describe changes in the transportation system condition and report progress on meeting the performance targets from the prior year.

Figure 5 below shows an example of the National Transit Database, TAM Plan, Performance Metrics and Targets Module Form A-90.

Figure 5 NTD FORM A-90 Targets Report

	Annual Target	Annual Performance	Difference	Row Complete Yes / No
AB - Articulated bus	10%			No
AG - Automated guideway vehicle				
AO - Automobile				
BR - Over-the-road bus	10%			No
BU - Bus	10%			No
CC - Cable car				
CU - Cutaway Bus	10%			No

2. ASSET MANAGEMENT POLICY

The TAM Rule requires that all Tier I agencies outline a TAM and SGR Policy.

Reference: *49 CFR Part 625 Subpart C Section 625.25(b)* "Transit asset management Plan elements … (5)A provider's TAM and SGR Policy."

The TAMP outlines IPTC's overall asset management approach in a manner consistent with its stated policy (see Appendix A) and current federal regulations (49 U.S.C. 5326) and sets the direction for establishing and maintaining transit asset management strategies and plans that areachievable with available funds.

IndyGo is committed to asset management and affirms it in the following vision for its TAM:

The IPTC is committed to maintain assets in a State of Good Repair through financial stewardship and reinvestment, transparency, and collaboration with its funding partners; promoting a culture that supports asset management across the organization, and by focusing on high quality data-driven asset condition and performance information to provide with safe, reliable, sustainable service for the communities served by IndyGo.

Beyond the vision of TAM, IPTC, specifically the TAM Plan Committee, commits to:

- Maintaining an asset inventory that includes vehicles, facilities, and facility equipment used in the delivery of transit service;
- Identifying safety-critical assets within the asset inventory and prioritizing efforts to maintain those safety-critical assets in a SGR;
- Clearly defining ownership, control, accountability, and reporting requirements for assets, including leased and third-party assets;
- Setting asset performance targets and measuring, monitoring, and reporting on progress towards meeting those targets;
- Basing capital project prioritization and other asset management decisions on asset safety, condition, performance, available funding, and on the evaluation of alternatives that consider full lifecycle benefits, costs, and risks;
- Maintaining an agency-wide TAM Plan current with Federal Transit Administration requirements, IPTC Policies, Standard Operating Procedures and TAM best practices;
- Continuously working to implement and improve the asset management efforts, including workforce development, software support, and regular communication between responsible agency members.

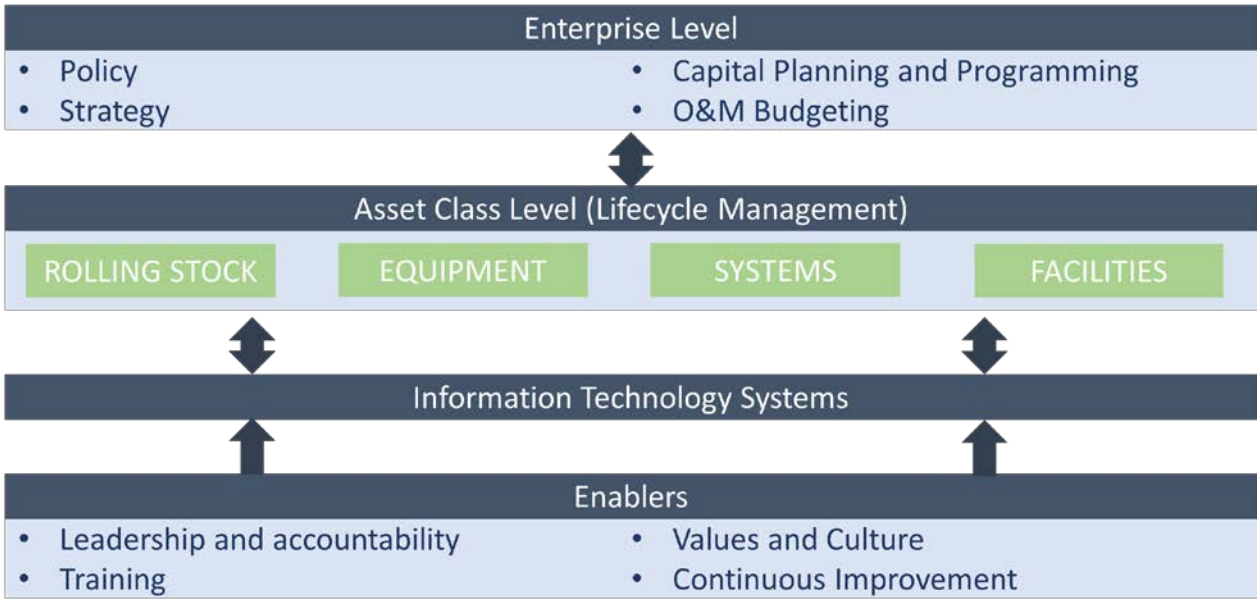
2.1 TAM APPROACH AND VISION

Transit asset management provides tools and processes to manage physical assets and achieve a state of good repair. By achieving a state of good repair, agencies optimize asset performance; useful life; and minimize the total cost of ownership. In improving asset management, an agency hopes to reduce asset lifecycle costs and re-invest those savings into better service.

Asset management is more than a plan; it's a comprehensive business process. IndyGo incorporates asset management into its decisions. Recently, IndyGo further refined this process by creating a five-year Capital Plan. The CP, as part of a larger initiative to roll out transit service via the Marion County Transit Plan, serves as a tool for the agency to outline its capital needs, understand available resources, and prioritize asset acquisition and replacement that supports the mission of IndyGo.

FTA's *Transit Asset Management Guidebook* provides a good starting point in which to define the IndyGo asset management framework. Figure 6 outlines the TAM framework and is adopted from the TAM Guidebook.

Figure 6 Transit Asset Management Framework

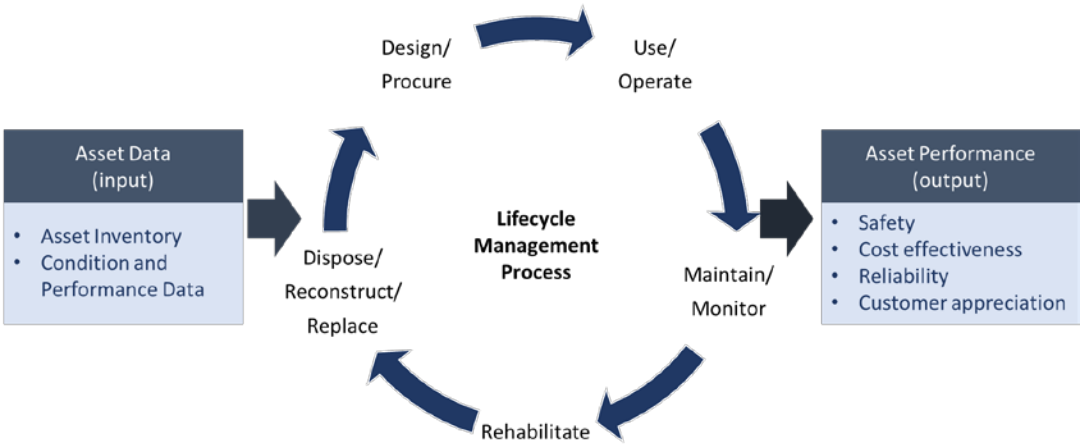


At the Enterprise Level, the IndyGo Executive Team, comprised of the Vice Presidents, craft and direct policies and strategies. The TAM Policy is such a collaboration, as are the strategies documented in this TAMP. Another important aspect of the Enterprise Level is policy and strategy. Maintenance and Planning need to be in communication during the development of important service planning documents to ensure that proper asset management policies can be properly carried out.

The operating budget and capital budget teams work together to understand departmental needs to fulfill IndyGo's mission. This process aligns two important processes – operating expenses and capital expenses. As highlighted previously, operating expenses can be directly affected by high lifecycle costs of capital assets. Proper maintenance and careful attention to asset procurement can reduce lifecycle costs.

Lifecycle management is an aggregate of the costs to maintain an asset. This aggregation includes the rehabilitation, preventative maintenance, and unplanned maintenance to asset performance, which aims to maximize asset performance, minimize total ownership costs, and manage risk. A representation of this process is shown in Figure 7.

Figure 7 Asset Lifecycle Management



Information technology continues to be a critical component in any company. For asset management, strong information technology resources allow for efficient delivery of services and effective asset management.

For asset management at IndyGo, the Enablers include members of the TAM Plan Committee. These team members practice asset management daily and seek continuous improvement in their processes and in their communication with each other.

3. SYSTEM PERFORMANCE

As a public transportation provider and mobility manager for the Indianapolis-Marion County Area, the IPTC's goal is to provide service in an efficient, effective, and equitable manner. To accomplish this goal, IPTC is updating its Service Standards document to match the expectations established in the 2015 *Comprehensive Operations Analysis (COA)* and the *Marion County Transit Plan (MCTP)*. The Route Type Service Standard is shown below in Table 2.

IndyGo regularly reviews the performance of the entire network, identifying service deficiencies, diagnosing those deficiencies, and implementing solutions. These reviews range from day-to-day operational reviews to regular network reviews and redesigns through the *COA*. These analyses utilize performance measures to understand service performance, including productivity, on-time performance, and ridership.

In the draft Service Standards document, IndyGo plans to formally evaluate its service in a Productivity Review, likely to occur at least annually. The Productivity Review will evaluate the performance of individual routes and recommend modifications depending on performance.

Table 2 Span and Frequency Service Standards

Service Category	Total Span of Service Category (Daily)	Weekday Peak Frequency Standard
Rapid	16 – 20 hours	10 minutes
Frequent	16 – 20 hours	15 minutes or better
Basic	16 – 18 hours	30 minutes or better
Coverage	16 hours	60 minutes or better
Open Door Service	16 – 20 hours	On-Demand service*

* Open Door Service does not have a frequency standard because it is a door-to-door, appointment-based service.

The primary purpose of the TAMP is to help the agency achieve its stated level of service. TAM processes that aid to this end include asset reliability standards, preventive maintenance programs, meantime to repair, and fuel efficiency standards. Managing these technical levels provide asset management decision making and investment prioritization to enhance the levels of service.

3.1 MARION COUNTY TRANSIT PLAN

A decade-long planning process, including significant public outreach, resulted in the development of the *Marion County Transit Plan (MCTP)*. The plan is a community-wide commitment to a different set of values for transit in Marion County. Transit by 2022 in Marion County will include three rapid transit lines: Red (North-South), Blue (East-West) and Purple (North-South). These rapid transit lines will provide Marion County residents with rapid transit for the first time in decades. Rapid transit is only part of the plan – the other is a revisioned bus network that prioritizes frequency and a grid-based network, increasing directness and understanding of the network.

The *MCTP* is a significant step for Marion County to provide better mobility options for all residents and could be the first step for a regional commitment to more transportation options. Community-support for the *MCTP* was evident in a November 2016 income tax referendum by nearly 60% of the county voters, which was subsequently enacted by the City-County Council.

The expansion of service and goal of an all-electric fleet requires an additional emphasis on asset management. Implementing the *MCTP* will require the acquisition of new assets in all asset classes. Constant communication between departments, specifically Maintenance and Capital Projects and Planning, is vital to the success of the *MCTP*.

3.2 TAM TECHNOLOGY RESOURCES

The TAM Rule requires that TAM Plans describe decision support tools.

Reference: *49 CFR Part 625 Subpart C Section 625.25(b)* "Transit asset management Plan elements … (3) A description of analytical processes or decision-support tools that a provider uses to estimate capital investment needs over time and develop its investment prioritization"

Information technology is a critical asset management enabler. Best practice either at the enterprise level or during any aspect of lifecycle management for individual asset classes is data driven and requires the application of innovative and creative information technologies. IPTC's Department of Information Technology provides and maintains technology tools that are primarily software-based. Table 3 below describes IPTC's main technology tools used in support of this TAMP.

Table 3 Technology Products Used Throughout IndyGo

TECHNOLOGY	DESCRIPTION / CONFIGURATION	OWNER
Microsoft Dynamics AX	-Enterprise Asset Management System for Fleet and Facilities asset management. Software solution that improves planning, scheduling, routing and completing work orders based on priority, resources and assets. -Enterprise Resource Planning System – Master inventory (other than assets) for the organization - -Finance information.	Information Technology
ADP	Human Resource (HR) and Human Capital Management (HCM) information.	Human Resources
S&A Systems FleetWatch	Fluid Management – provides real-time control and data acquisition for fluids and tank monitor systems to monitor fluid usage, schedule preventive maintenance, and reconcile fluids.	Maintenance
Hastus	Scheduling & Dispatch – provides improved planning, scheduling, operations, passenger information and analysis.	Service Planning

CAD/AVL	The CAD/AVL system connects our vehicles seamlessly with our back-office scheduling and dispatching software. It automatically collects vital data used by dispatchers such as bus GPS locations, schedule adherence status, breakdowns and emergencies.	Service Planning/ Maintenance
Ellipse	Current asset management software but will be replaced with AX within the horizon year of the TAMP.	Maintenance, Facilities
Microsoft Office	Excel spreadsheets continue to be used where there are gaps in existing software. Spreadsheets are also used to support operating and capital budget processes through spreadsheet models.	All Departments

3.3 PERFORMANCE MEASURES AND TARGETS

The TAM Rule requires SGR performance measures for capital assets.

Reference: *49 CFR Part 625, Subpart D, Section 625.43 "SGR performance measures for capital assets. (a) 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 ULB. *(b) Rolling stock*. The performance measure for rolling stock is the percentage of revenue vehicles within an asset class that have either met or exceeded their ULB. … *(d) Facilities*. The performance measure for facilities is the percentage of facilities within an asset class, rated below condition 3 on the TERM scale.

The TAM Rule requires setting targets for performance measures.

Reference: *49 CFR Part 625, Subpart D, Section 625.45* "(a)(1) A provider must set one or more performance targets for each applicable performance measure. (a)(2) A provider must set a performance target based on realistic expectations, and both the most recent data available and the financial resources from all sources that the provider reasonably expects will be available during the TAM Plan horizon period. … (b)(2) At least once every fiscal year after initial targets are set, a provider must set performance targets for the following fiscal year.

To comply with the FTA requirements associated with SGR, performance measures for capital assets have been established for each asset class along with performance targets for the horizon year of the plan.

Vehicles can be evaluated by age or condition; IndyGo and the Final TAM Rule both utilize age. However, the Final TAM Rule uses Useful Life Benchmark (ULB), which is intended to reflect the point in an asset's life when its maintenance cost is cost-prohibitive and the asset should be replaced. ULB differs from Useful Life, as defined in FTA Circular 5010.1E, which outlines the useful life (in years or mileage) that an asset needs to reach to fully depreciate the asset. Useful Life refers to the point in which the asset should be replaced but can still operate in service without major maintenance costs.

For the purposes of complying with the Final TAM Rule, default Useful Life Benchmark (ULB) figures are used for each asset class for vehicles purchased after January 1, 2019. These figures are based on the *2017 Asset Inventory Module Reporting Manual*. Vehicles before will use the ULB employed at the time. Vehicles receiving refurbishment, remanufacturing, or other significant maintenance to extend the life of the vehicle will have extended ULB based on work performed and new anticipated useful life of the vehicle.

Targets for vehicles are expressed in terms of percentage of assets that are at or beyond the

Useful Life Benchmark (ULB), therefore the ideal situation is to be less than the target. Table 4 provides an overview of the ULB used by IndyGo and the targets for each asset class.

Table 4 Rolling Stock Performance Targets

Asset Class	UL	ULB	Target
Articulated Buses (AB)	12	14	0%
40ft/30ft Buses (BU)	12	14	0%
Cutaways (CU)	5	8	0%
Minivans (MV)	7	8	100%

A non-revenue service vehicle is any service vehicle used to support public transportation. This includes any vehicle of any acquisition cost that is considered street legal or is major construction equipment. These are both reportable to the NTD asset inventory, if there is direct capital responsibility. The useful life benchmark is the required metric for performance targets for non-revenue service vehicles.

Table 5 Non-Revenue Service Vehicle Performance Targets

Asset Class	UL	ULB	Target
Automobile (AO)	4-7	8	17%
Other Steel Wheel Vehicles	12	14	0%

Targets for facilities are expressed in terms of percentage of assets that are rated below a 3 on the FTA's Transit Economic Requirements Model (TERM) scale.

Table 6 Facilities Performance Targets

Asset Class	Condition Benchmark	Target
Facilities	3	0%

Table 4,Table 5, and Table 6 outline the performance measures and targets as required by the Final TAM rule. *TCRP 172: Guidance for Developing a Transit Asset Management Plan* provides a list of recommended measures, which includes average asset age (covered by the Final TAM rule). The other core TAMP measures are outlined in Table 7 below. Targets are not established for the Core TAMP Measures in this TAMP.

Table 7 Core TAMP Measures

Performance Measure	Definition
Backlog of Investment Needs	Sum of costs for unmet needs for achieving SGR
Average Asset Age	Year of manufacture for vehicles
Mean Distance Between Failures	Vehicle-miles traveled/number of road calls or failures
Average Accumulated Mileage	Total lifetime mileage average among all vehicles in the fleet

The target setting process is informed by FTA guidance and best practices. Development of targets for IndyGo TAM performance measures is contained in the memo “Target Setting Methodology”, included as an appendix to the TAMP and developed through the TAMP process.

4. TRANSIT ASSET INVENTORY

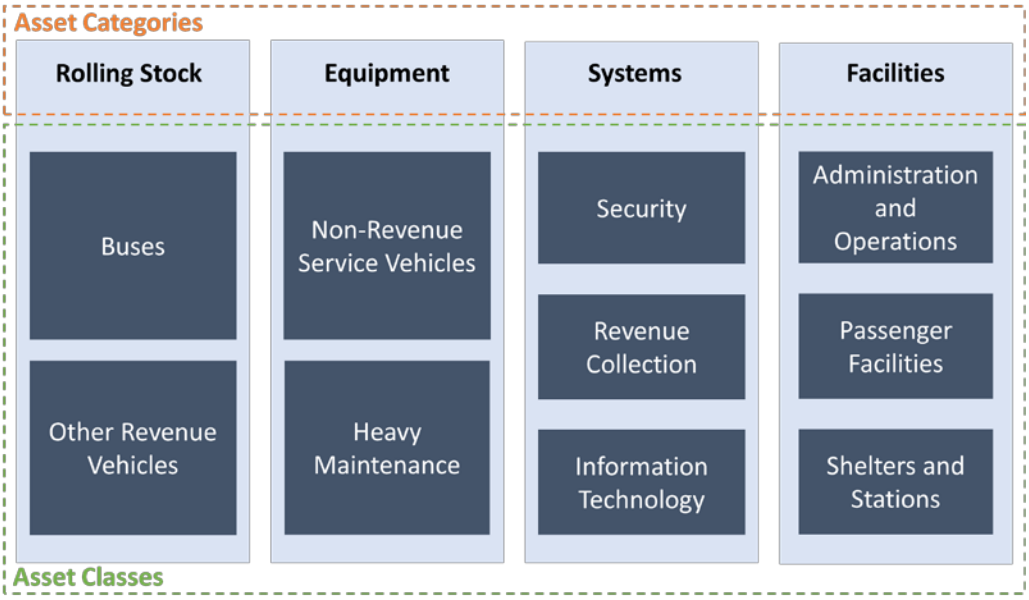
The TAM Rule requires a detailed inventory of all assets.

Reference: *49 CFR Part 625 Subpart C Section 625.25(b)(1)* "… a TAM Plan must include …

(1) "An inventory of the number and type of capital assets. The inventory must include all capital assets that a provider owns, except equipment with an acquisition value under $50,000 that is not a service vehicle. An inventory also must include third-party owned or jointly procured exclusive-use maintenance facilities, passenger, station, facilities, administrative facilities, rolling stock, and guideway infrastructure used by a provider in the provision of public transportation. The asset inventory must be organized at a level of detail commensurate with the level of detail in the provider's program of capital projects.."

As outlined in the Introduction, IndyGo divides assets into four categories, as shown in Figure 8.

Figure 8 IndyGo Asset Hierarchy



Federal regulations require the asset inventory to include all rolling stock, non-revenue service vehicles, facilities, infrastructure, and equipment over $50,000 in acquisition value. IndyGo's inventory is more expansive, including any equipment with an acquisition value greater than $5,000 and/or with more than 3 years of useful life.

IPTC manages an asset portfolio estimated to be approximately $ 180,000,000.00 in

replacement cost, not including all soft costs associated with asset replacement such as design and construction management costs. Soft costs could be estimated to be an additional 35% for major systems, and 10% for equipment and vehicles.

This asset portfolio is comprised of the Asset Type Fleet or Asset Type Facilities, by Asset Category and, by Asset Class.

Table 8 IPTC TAMP Inventory

Category	Class	Asset	Qty	Replacement Cost	Total Replacement Cost
Rolling Stock	Buses	Articulated Bus	11	$3,025,000	$75,058,000
		40' Bus	178	$66,193,000	
		Cutaway Bus	69	$5,520,000	
	Other Revenue Vehicles	Minivans	4	$320,000	
Equipment	Non-Revenue Vehicles	Automobiles	32	$907,000	$10,184,000
		Other Rubber Tired Vehicles	2	$135,000	
	Heavy Maintenance	Facilities Equipment	13	$8,487,000	
		Heavy Maintenance Equipment	3	$655,000	
Systems	Security	Main CCTV	223	$425,800	$11,236,442
		Vehicle CCTV	1,749	$947,587	
		All others	895	$980,679	
	Revenue Collection	Fare Boxes	190	$2,565,000	
	Information Technology	CAD/AVL	285	$3,907,500	
		Radio	325	$2,065,000	
		Wireless	54	$58,800	
		Switches and Storage	14	$137,680	
		All others	2	$148,396	
Facilities	Administration and Operations	1501 W. Washington Street	1	$44,074,440	$83,964,440

		2222 Hillside Avenue	1	*	
	Passenger Facilities	Downtown Transit Center	1	$36,400,000	
	Stations and Shelters	Bus Shelters	230	$3,490,000	
*** Third party asset**					

Table 8 summarizes IPTC's asset inventory; a detailed asset inventory is available. The level of detail presented in the detailed TAMP Inventory is commensurate to the level of detail in the Capital Plan.

A detailed transit asset inventory is maintained in both Ellipse and spreadsheets. During asset procurement and receipt or acceptance, specific asset identification, useful life, warranty and maintenance interval information is collected from the Original Equipment Manufacturer (OEM). This practice ensures the asset data is properly recorded into the EAMS for effective and efficient lifecycle management.

Newly acquired software (i.e. Microsoft Dynamics AX) should consolidate asset inventory reporting. Deployment of this software should also assist Facilities and Fleet Management in their day-to-day operations, including tracking parts and work orders.

5. TRANSIT ASSET CONDITION

The TAM Rule requires inclusion of condition assessments in an agency's TAM Plan. Condition assessments should collect sufficient information to inform asset replacement.

Reference: *49 CFR Part 625 Subpart C Section 625.25(b)(2)* "… a TAM Plan must include …(2) A condition assessment of those inventoried assets for which a provider has direct capital responsibility. A condition assessment must generate information in a level of detail sufficient to monitor and predict the performance of the assets and to inform the investment prioritization."

IndyGo is required to conduct a condition assessment for all TAMP assets that IndyGo has direct capital responsibility of. An agency is considered to have direct capital responsibility if it owns the asset, jointly owns the asset, or is responsible for replacing, overhauling, refurbishing, or conducting major repairs on that asset, or the costs of those activities are itemized as a capital line item in your budget.

All asset categories in the IndyGo TAMP asset inventory are assigned a condition rating based on the FTA TERM Condition Assessment Scale. The rating criteria assigned is reflected in Table 9.

Table 9 Asset Condition Assessment Rating Criteria

Rating	Assessment	Criteria
5	**Excellent**	No visible defects, new or near new condition, may still be under warranty if applicable
4	**Good**	Good condition, but no longer new, may be slightly defective or deteriorated, but is overall functional
3	**Adequate**	Moderately deteriorated or defective; but has not exceeded useful life
2	**Marginal**	Defective or deteriorated in need of replacement; exceeded useful life
1	**Poor**	Critically damaged or in need of immediate repair; well past useful life

5.1 ROLLING STOCK CONDITION

Condition ratings for rolling stock are expressed in terms of the percentage of assets that are 'at', or 'beyond' the Useful Life Benchmark (ULB) based the FTA Default Useful Life Benchmark. The asset inventory also includes a TERM condition for each asset. The full Rolling Stock Condition Rating Scale is included in the Appendix, but a summary of the criteria is included in Table 10:

Table 10 Rolling Stock Condition Rating Scale

Condition Criteria	Description
Equipment/Vehicle Useful Life Benchmark (ULB)	Percent of ULB Based on Age Remaining
Equipment/Vehicle Mileage (ULB)	Percent of ULB Based on Mileage Remaining
Equipment/Vehicle Condition	Quality, Level of Maintenance Required
Equipment/Vehicle Performance	Reliability, Safety, Meets Industry Standards
Equipment/Vehicle Level of Maintenance Required	Level of Preventive and Corrective Maintenance

Maintenance and Fleet Inventory regularly inspects vehicles to determine their condition and ensure the vehicles are in safe, working order and can still provide revenue service. Table 11 captures the current rolling stock condition for IndyGo.

Rolling stock condition in the TAMP includes vehicles that are considered inactive vehicles; they are not readily available for revenue service. Although the condition for these vehicles is included in the TAMP Inventory, those vehicles will not be used in setting TAMP targets.

Table 11 Rolling Stock Condition

Category	Class	Asset	Qty	# Below ULB	Average Condition	Average Age	% Below ULB
Rolling Stock	Buses	Articulated Bus	11	11	2.9	5	100%
		40' Bus	178	66	3.75	10	37.1%
		Cutaway Bus	69	11	4.06	3	14.5%
	Other Revenue Vehicles	Minivan	4	0	3.00	6	0%

5.2 EQUIPMENT CONDITION

Similar to rolling stock, equipment condition is determined by a combination of factors: safety and useful life (UL). Facilities conducts an annual condition assessment of equipment, including Non-Revenue Service Vehicles as part of the facility; Vehicle Maintenance and Fleet Inventory conduct regular assessments for Heavy Maintenance Equipment and the bulk of Non-Revenue Service Vehicles. These assessments help directors determine appropriate actions, beyond preventative maintenance, for each piece of equipment. Assessments also provide the Capital Plan with a list of equipment that should be replaced in the next Capital Plan cycle. Table 12 provides an overview of the condition of equipment over $50,000 and all non-revenue service vehicles.

Table 12 Equipment Condition

Category	Class	Asset	Qty	# Below ULB	Average Condition	Average Age	% Below ULB
Equipment	Non-Revenue Vehicles	Automobile	32	11	3.19	6.8	34.4%
		Other Rubber Tired Vehicles	2	0	3.5	7.5	0%
	Heavy Maintenance	Heavy Maintenance Equipment	2	2	2.67	34	100%
		Facilities Equipment	9	0	2.89	15	0%

5.3 SYSTEMS CONDITION

Systems assets are assigned a condition rating based solely on the condition of the asset, based on the TERM rating scale. Although some assets are listed individually in the more detailed TAM inventory, for purposes of the TAMP, assets in the systems category are provided in a detail commensurate to the IndyGo Capital Plan.

Table 13 Systems Condition

Category	Class	Asset	Qty	Average Condition
Systems	Security	Facility CCTV	223	2.40
		Vehicle CCTV	1,749	2.47
		All others	895	3.48
	Revenue Collection	Fare Boxes	190	3.08
	Information Technology	CAD/AVL	285	2.00
		Radio	325	4.00
		Wireless	54	2.67
		Switches and Storage	14	5.00
		All others	2	3.50

5.4 FACILITY CONDITION

To determine an asset's condition, the FTA's Transit Economic Requirements Model (TERM) scale is being used. A TERM scale condition rating ranges from (5) Excellent to (1) Poor. Per the FTA Final TAM Rule, assets with a condition rating score of 3.0 and above are in a state of good repair. Assets with a condition score lower than 2.9 are not in a state of good repair and may require prioritization during capital programing to ensure safe, efficient, and reliable transitservice.

Table 14 Facility Condition

Asset Category	Asset Class	Asset	Desired Condition (TERM)	Count	Average Condition	% Facilities Below 3
Facilities	Administration and Operations	Administration and Operations Building	**3**	1	3.80	0%
	Passenger Facilit	Downtown Transit Center	**3**	1	5	

	ies					
	Shelters and Stations	Bus Shelters	**3**	230	3.77	N/A

5.4.1 FACILITY CONDITION WEIGHTING

To determine the aggregate asset condition for facilities, Primary Levels of a facility are rated, and replacement costs are determined. Using the Weighted Average Condition, as outlined and recommended in the *TAM Facility Performance Guide*, the following steps are taken:

1. Calculate the average rating of the facility using primary level TERM scores and the replacement costs. Each primary level TERM score is multiplied by its respective replacement costs and divided by the sum of all replacement costs, determining a weight for each primary level. The calculation is expressed as:

$$FR = \frac{\sum_i CR_i CW_i}{\sum_i CW_i}$$

   Where FR is the overall facility rating, CR_i is the TERM score for rating level *i*, and CW_i is the weighting, or replacement cost, for rating level *i*.

2. Round off the overall rating to the nearest integer value and report the integer condition rating to NTD.

Assets with a condition rating score of 3.0 and above are in a State of Good Repair (SGR). Assets with a condition score lower than 2.9 are ***not*** in a SGR and may require prioritization during capital programming to ensure safe, efficient, and reliable transit service.

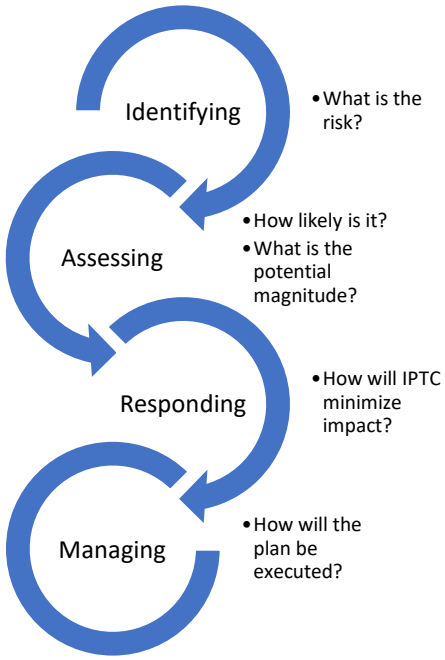
6. TAM RISK OVERSIGHT

Risk oversight and management is the process through which risks are identified, assessed and managed. The primary objective of IPTC's TAM risk oversight approach is to improve the performance of the agency and individual business areas. The agency's approach seeks to anticipate risks and opportunities and then develop management strategies to mitigate the occurrence of negative events.

Oversight is driven by the TAMP Committee, through regular meetings and planning sessions. The committee is made up of agency executives, asset owners, and other staff members with stake in the TAM process. This group can provide up to date information on the status of agency assets as well as subject matter expertise in their respective business units.

Managing risks to the TAM system consists of four steps: identifying, assessing, responding, and managing (shown in Figure 9).

Figure 9 TAM Risk Oversight Steps



Risks to successful TAM implementation can take many forms and come from both external and internal sources. Externally, economic factors beyond IPTC's control have the potential to impact funding levels. Decreases in local property and income tax collections as well as federal grant disbursements reduce agency revenues. These reductions can impact the amount of resources available to be directed towards asset management. Organizational TAM risks largely within IPTC's control include inadequate communication among stakeholders, poor data collection and record keeping, as well as gaps in roles and responsibilities related to TAM.

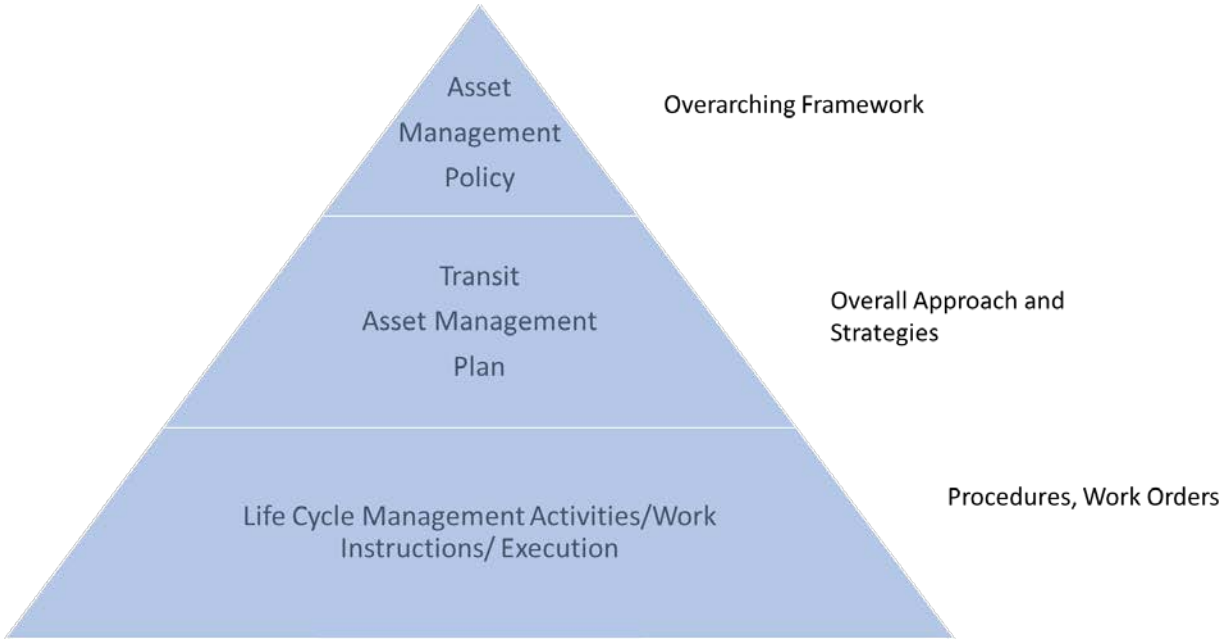
7. ASSET LIFECYCLE STRATEGIES

This section identifies IPTC's key asset management practices across the lifecycle for its assets. Figure 10 shows the hierarchy of the TAM documents.

Lifecycle management is a critical part of asset management and "enables agencies to make better investment decisions across the lifecycle using management processes and data specific to each asset as a basis for predicting remaining useful life".[1] Lifecycle management can allow an agency to better align all parts of asset management to reduce overall lifecycle costs.

IPTC uses Ellipse ™ Enterprise Asset Management and Asset Performance Management software, in addition to spreadsheets, to manage all the lifecycle management activities. These activities make up the lifecycle strategies. This includes all the Preventive Maintenance Tasks, Standard Operating Procedures (SOPs), inspections and proactive maintenance activities performed to ensure consistent asset lifecycle management at the asset class level.

Figure 10 Asset Management Document Hierarchy



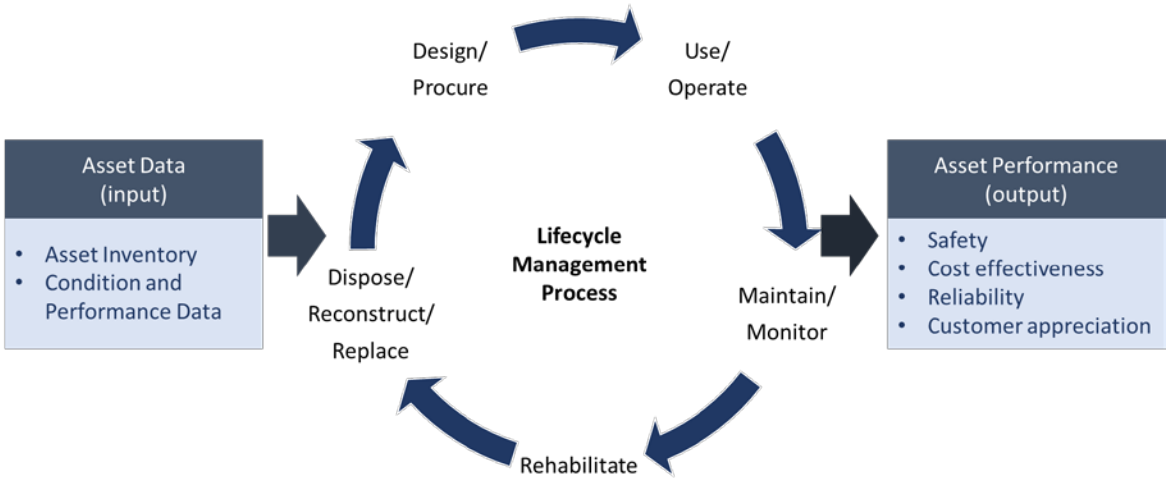
[1] *Transit Asset Management Guidebook,* p. 146.

7.1 LIFECYCLE MANAGEMENT STRATEGIES

Transit Asset Management is a strategic approach in managing fleet and facilities; to optimize their performance; their useful life; and to minimize the total cost of ownership. As shown in Figure 11, lifecycle management requires good data, including a comprehensive inventory and condition assessment. The IndyGo TAMP will formalize the input portion of lifecycle management with the necessary inventory and condition data.

IndyGo follows manufacturer guidelines and professional judgement in creating a maintenance schedule for its assets. Vehicle maintenance includes the required federal preventative maintenance, warranty replacement, and select predictive component changes for key vehicle parts. Facilities at IndyGo follow checklists as outlined in the *Facility Preventative Maintenance Plan.* As a practice, IndyGo performs predictive component changes for key parts of vehicles.

Figure 11 Asset Lifecycle Management Process



8. INVESTMENT PRIORITIZATION AND FUNDING

A TAM is required to identify investment prioritization, rank projects to address state of good repair, pay attention to projects that address safety or accessibility shortcomings, and identify the tools or processes used for the investment prioritization.

Reference: *49 CFR Part 625 Subpart C Section 625.33* "(a) A TAM Plan must include an investment prioritization that identifies a provider's programs and projects to improve or manage over the TAM Plan horizon period the state of good repair of capital assets for which the provider has direct capital responsibility. (b) A provider must rank projects to improve or manage the state of good repair of capital assets in order of priority and anticipated project year. (c) A provider's project rankings must be consistent with its TAM policy and strategies. (d) When developing an investment prioritization, a provider must give due consideration to those state of good repair projects to improve that pose an identified unacceptable safety risk when developing its investment prioritization. (e) When developing an investment prioritization, a provider must take into consideration its estimation of funding levels from all available sources that it reasonably expects will be available in each fiscal year during the TAM Plan horizon period. (f) When developing its investment prioritization, a provider must take into consideration requirements under 49 CFR 37.161 and 37.163 concerning maintenance of accessible features and the requirements under 49 CFR 37.43 concerning alteration of transportation facilities."

Transit agencies are also required to outline their analytical process or tools for capital prioritization purposes.

Reference: *49 CFR Part 625 Subpart C Section 625.25(b)* "Transit asset management Plan elements … (3) A description of analytical processes or decision-support tools that a provider uses to estimate capital investment needs over time and develop its investment prioritization"

This chapter identifies and highlights IPTC's asset investment process, including prioritization of asset replacement. These processes are based on asset management strategies, available revenues, and organizational goals.

8.1 PROCESS OVERVIEW

IPTC's capital budget funds the planning, design, acquisition, capital maintenance and rehabilitation of all assets subject to this TAMP. The operating budget funds the use and routine maintenance of those same assets, including the staff needed to perform those functions.

IPTC currently adopts yearly operating and capital budgets. The capital budget for a given year is based on a five-year Capital Plan (CP) in which capital projects are programmed. IPTC adopted a five-year CP with the start of the FY 2017 budget year. The Capital Projects and Planning Division works with all divisions to gather needed projects, evaluate requests, and program projects.

Figure 12 Capital Plan Process

The Division of Capital Projects and Planning convenes a Capital Plan Committee which is central to the CP process. The basic process for assembling the CP is shown in Figure 12.

1. **Capital Projects Identified.** Departments provide a list of projects to the Capital Planning Committee. These projects are determined based on asset conditions and resources needed to meet service delivery expectations. Projects are determined by the Directors based on condition and resource needs.

2. **Funding Sources and Amounts Estimated.** Based on historical and projected revenues, funding sources and amounts are estimated. These sources include local property and income taxes, state contributions, and federal funds.

3. **Projects and Funding Amounts Matched.** The Capital Planning Committee then reviews a timeline of acquisition and available resources. The timeline is divided into quarters but summarized by year. Each capital project is assigned a funding source (s) and a timeline.

4. **Plan Approval.** Following the Capital Planning Committee's revisions, the Draft Capital Plan is approved by the Board of Directors.

8.2 CAPITAL INVESTMENT PRIORITIZATION

IPTC uses an existing capital project prioritization process which considers several factors, including the asset's condition, age, function, and safety along with investment categorization. Directors provide the Division of Capital Projects and Planning with capital project needs. The project lists and available resources are distributed to the Capital Plan Committee, which then discuss and decide which projects should receive priority.

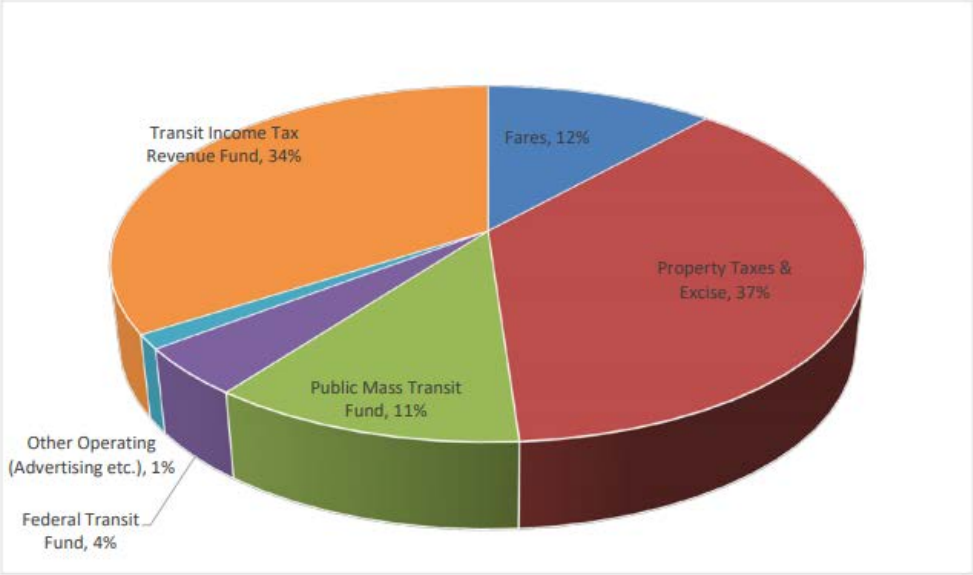
The recent transit referendum provided IndyGo with a significant boost in available revenues, enabling divisions to plan to return assets to a SGR or purchase new assets.

8.3 CAPITAL PLANNING & OPERATING BUDGET

IPTC's operating budget funds service delivery and maintenance, including employee wages, spare parts, consumables, and a variety of support services used throughout the organization. This also includes payments to third-party contractors responsible for consulting and maintenance activities.

The operating budget is currently approved on a yearly basis through the Board of Directors. IPTC's FY 2018 operating budget is $94.5 million, with labor costs as the largest portion (61%) of the budget. Figure 13 below shows the composition of the FY 2018 operating budget.

Figure 13 Operating Revenue Budget (FY2018)



Along with the operating budget the Board also approves a capital budget for the fiscal year. The capital budget for the year includes the projected grant and IPTC Capital spending for the projects included in the CP.

IPTC currently has a five-year CP that was adopted in August 2018. Table 15 below shows the capital budget spending by category from 2018-2023, including anticipated funding sources. This table is taken from page 3 of the *2018-2023 Capital Plan.*

Table 15 Capital Program Spending and Fund Sources

	Q3/Q4 2018	2019	2020	2021	2022	2023	Total
Expected Expenditures	$58,625,489	$140,921,186	$91,227,025	$117,932,642	$118,608,874	$16,677,999	**$543,993,214**
Bus Rolling Stock	$9,737,470	$3,490,118	$5,676,664	$5,350,664	$5,382,664	$5,697,664	**$35,335,242**
On-Street Inf. & BRT	$37,503,942	$123,093,058	$82,700,361	$110,443,019	$111,897,149	$10,727,383	**$476,364,911**
Facilities & Equipment	$7,298,466	$9,595,400	$1,500,000	$1,920,000	$1,100,000	$0	**$21,413,866**
Information Technology	$4,085,611	$2,892,611	$0	$0	$0	$0	**$6,978,222**
Safety & Security	$0	$1,850,000	$1,350,000	$218,959	$229,061	$252,953	**$3,900,973**
Expected Sources	**$58,625,489**	**$140,921,186**	**$91,227,025**	**$117,932,642**	**$118,608,874**	**$16,677,999**	$543,993,214
Grants	$45,462,729	$85,772,745	$58,593,726	$60,162,795	$63,874,593	$11,880,697	**$325,747,284**
Cash	$4,702,760	$34,036,237	$14,685,304	$6,931,774	$9,578,706	$3,735,769	**$73,670,551**
Bonds	$1,160,000	$19,962,204	$17,947,995	$36,538,073	$45,155,575	$1,061,533	**$121,825,379**
Other	$7,300,000	$1,150,000	$0	$14,300,000	$0	$0	**$22,750,000**
Expected Capital Surplus (Deficit)	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	$0

9. IMPLEMENTATION STRATEGY

The TAM Rule requires that TAM Plans provide an implementation strategy, identify key personnel, and outline how the plan and processes will be updated.

Reference: *49 CFR Part 625 Subpart C Section 625.25(b)* "Transit asset management Plan elements … (6) a provider's TAM Plan implementation strategy; (7) A description of key TAM activities that a provider intends to engage in over the TAM Plan horizon period; (8) A summary or list of the resources, including personnel, that a provider needs to develop and carry out the TAM plan; and (9) An outline of how a provider will monitor, update, and evaluate, as needs, its TAM plan and related business practices, to ensure the continuous improvement of its TAM practices."

9.1 ROLES AND RESPONSIBILITIES

The TAM Plan Committee counts among its membership the most important staff at IndyGo in carrying out asset management. Table 16 outlines Departments / Divisions within IndyGo and their responsibility in implementation and maintaining assets at IndyGo.

Table 16 TAMP Roles and Responsibilities

Department/Division	Asset Classes Responsibility	Roles and Responsibilities
Administration	All	President, CEO is the Accountable Executive.
Finance	All	Responsible for NTD reporting, Operating budget and coordination
Facilities	Administrative, Passenger	Responsible for daily maintenance, inventory, and condition assessment.
Maintenance	Bus, Cutaways, Maintenance Equipment	Responsible for daily maintenance, inventory, and condition assessment.
Planning and Capital Projects	All	Capital Plan maintenance and coordination
Information Technology	Information Technology	Responsible for daily maintenance, inventory, and condition assessment.
Service Planning	Shelters and Stations	Inventory and oversight of shelters
Security	Security, Revenue Collection	Responsible for daily maintenance, inventory, and condition assessment.

9.2 IMPLEMENTATION TASKS

The transit asset management process is visible in many current activities within IPTC, including coordination meetings between departments, board reporting, and intradepartmental meetings. However, as part of the TAM Plan effort, the creation of the TAM Plan Committee will create a more formal and identifiable process. To support the implementation of the TAMP, the TAM Plan Committee will meet quarterly to update the asset inventory.

As part of the implementation of the Marion County Transit Plan, Department directors are preparing for an expansion of service, including a larger and all-electric fleet.

Figure 14 Key TAMP Activities and Implementation Timeline

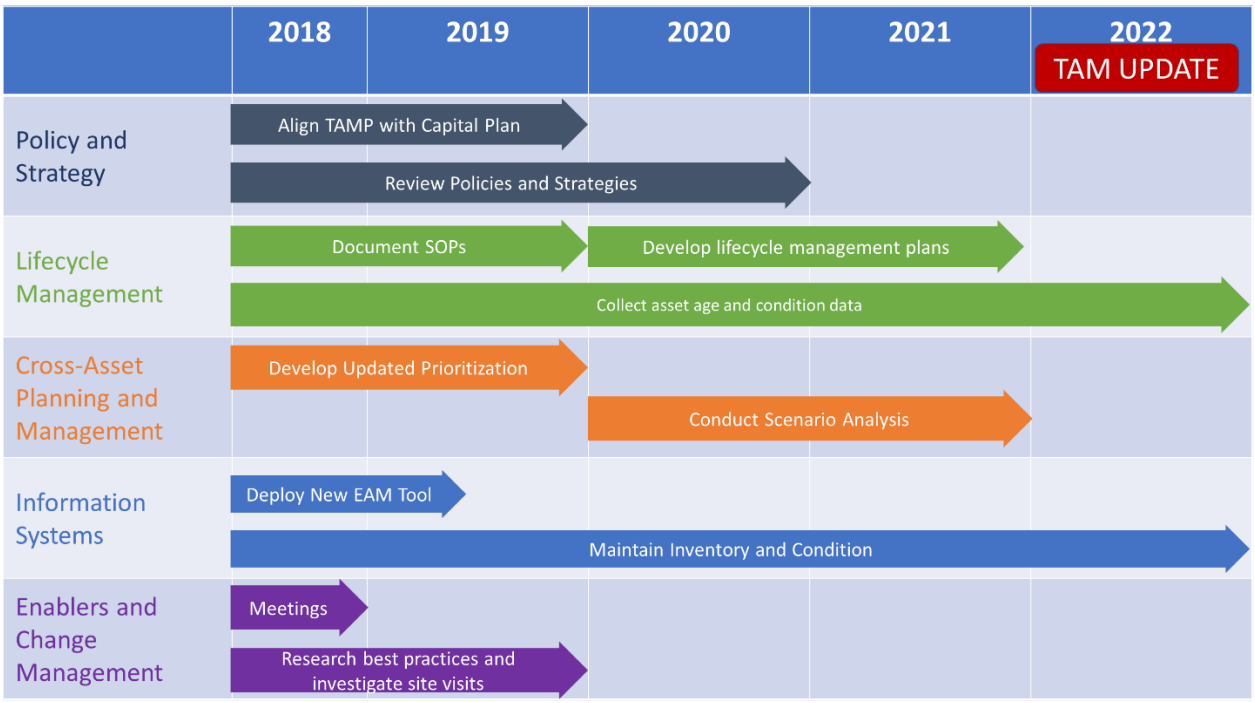


Figure 15 Implementation Task List

FOCUS	TASK	ESTIMATED TIMELINE
POLICY AND STRATEGY		
Align TAMP with Capital Plan	TAM policies, procedures, and annual tasks should be reviewed and aligned with the Capital Plan. This task should strengthen the tie between asset management and programming.	6-12 months
Review Policies and Strategies	Review existing organizational policies and strategies through the lens of transit asset management. Update policies to incorporate the	6-24 months

	TAMP, if needed.	
LIFECYCLE MANAGEMENT		
Document Standard Operating Procedures	Determine a basic outline for standard operating procedures for transit asset management. SOPs should be created for each department that is responsible for an asset in the TAMP.	6-18 months.
Develop Lifecycle Management Plans	Each asset class should have a lifecycle management plan, particularly rolling stock, equipment, and facilities.	1-2 years
Collect Asset Age and Condition Data	Conduct asset condition reviews annually and update the inventory. This process should include a review of the data collected and modified if needed.	Annually
CROSS ASSET PLANNING AND MANAGEMENT		
Develop Updated Capital Plan Prioritization	Create a methodology to prioritize assets during the process to update the Capital Plan. The methodology should produce a prioritized list of assets requiring replacement.	6-12 months
Conduct Scenario Analysis	Prior to the next TAMP, create a spreadsheet model to conduct scenario analysis for asset management.	1-2 years
INFORMATION SYSTEMS		
Deploy new EAM Tool	Deploy new software to create a single point asset management tool that multiple users can view. Creation and use of the tool should be tailored to the needs of the heaviest users but accessible by select IndyGo users.	6-9 months
Maintain Inventory and Condition	Maintain the new EAM tool; TAM inventory and condition assessments should be stored in a central location accessible by key TAM Plan Committee members.	Ongoing.
ENABLERS AND CHANGE MANAGEMENT		
Establish quarterly meetings of the TAM Plan Committee	Quarterly meetings should be established for all TAM Plan Committee members to monitor TAMP implementation progress.	Within 6 months.
Research best practices and investigate site visits	Research transit asset management best practices and create a white paper that outlines how IndyGo could implement the best practices. Investigate site visits either to agencies or bringing in other agencies to share their TAM practices and embed those practices into IndyGo daily practice.	6-12 months.

9.3 TAMP MONITORING AND UPDATING

The TAMP Committee is responsible for monitoring progress on the implementation strategy. At a minimum, the TAMP Committee will meet quarterly, as work dictates, to discuss the implementation strategy, review existing TAMP processes, and identify and mitigate any risks to implementing the TAMP. Information about TAMP updates (Section 1.3.4), Roles and Responsibilities (Section 9.1) and Tasks (Section 9.2) can be found in the appropriate sections.

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APPENDIX A: TAM POLICIES

IndyGo

EFFECTIVE DATE:	May 23, 2018
AREAS INVOLVED:	All of IndyGo
POLICY NUMBER:	TAM 01-2018
POLICY NAME:	Fixed Asset Policy

I. PURPOSE

The purpose of this policy is to establish requirements for the acquisition and monitoring of fixed assets.

II. PERSONS AFFECTED

All IPTC Personnel.

III. DEFINITIONS

"Fixed Asset" means all tangible, nonexpendable property that has a useful life of more than three years and an acquisition cost that exceeds $5,000 per unit. This includes rolling stock, equipment and all other property used in the provision of public transit service.

IV. POLICY

A. Planning Process for Fixed Asset Acquisition

1. The fixed asset needs of IPTC should be identified through the 5-year Capital Improvement Plan (also known as the Capital Plan) which identifies the basic equipment replacement needs of IPTC as well as defining future equipment needed to implement the service plan defined in the 5-year Capital Improvement Plan.

2. A more detailed approach to IPTC and grant funded short-term equipment needs is defined in the Capital Improvement Plan phase of the annual budget development process.

3. Unanticipated fixed asset needs that arise during the fiscal year are addressed on a case-by-case basis by the Chief Financial Officer and Chief Operating Officer with final review done by the President & CEO.

The last method is primarily for use in IPTC purchased fixed assets or in response to

emergency requirements (to be determined by the President & CEO and/or Chief Financial Officer.)

B. Purchasing Process

1. Fixed Assets shall be procured in accordance with Procurement Policies.

C. Monitoring Fixed Assets

1. The IPTC's Microsoft Dynamics AX is designed to serve as the IPTC's Official Fixed Asset System of record. It is charged with meeting all the record requirements of Federal Transit Administration (FTA) Circular 5010.1D, as well as successor and related circulars.

2. A physical inventory of the IPTC's Fixed Assets will be conducted every two years in compliance with FTA regulations.

D. Transfers/Dispositions of Fixed Assets

1. All inter-departmental transfers of fixed asset items with a IPTC Fixed Asset Tag and/or a value of $5,000 or greater, must be reported on a Fixed Asset Disposal and Transfer Form available from the Fixed Asset Accountant or Procurement Office.

2. For disposition of fixed assets, please refer to Transfer and Disposition Policy 03-2018 of the IPTC.

V. AUTHORITY

A. Board Authority

The Board of Directors authorizes the acquisition of fixed assets through the procurement process in accordance with the Procurement Process.

IndyGo

EFFECTIVE DATE:	May 23, 2018
AREAS INVOLVED:	All of IndyGo
POLICY NUMBER:	TAM 02-2018
POLICY NAME:	INDYGO ASSET MANAGEMENT APPROACH

I. PURPOSE

The Indianapolis Public Transportation Corporation is committed to effectively manage its capital assets and maintain its system in a State of Good Repair (SGR) to support safe, efficient, and reliable transit. This directive outlines the IPTC's overall asset management approach in a manner consistent with current federal regulations (49 U.S. Code § 5326) and sets the direction for establishing and following through with transit asset management strategies and plans that are achievable with available funds. This directive complies with the Federal Transit Administration (FTA) Transit Asset Management (TAM) Final Ruling on July 26, 2016.

The purpose of the TAM Policy 02-2018 is to communicate to the Board of Directors, management, staff, and external stakeholders IPTC's commitment to maintain its system in a State of Good Repair; and foster a culture of continuous improvement in asset management planning and performance.

The difference between this policy and Fixed Asset Policy 01-2018 is this policy is specific to the management of IPTC Transit Assets, as defined by the FTA, which have a value of $50,000 or more and are included in The IPTC's Transit Asset Inventory maintained in the Asset Management System (AMS).

II. PERSONS AFFECTED

All IPTC Board members, staff and members of the public are affected since the TAM Policy provides direction needed to assess, fund and maintain IPTC assets in a State of Good Repair.

III. DEFINITIONS

"Transit Asset Management Plan (TAM Plan)" means the Plan through which the IPTC will document its asset base, asset conditions, backlog and State of Good Repair, asset management policy, TAM goals and objectives, governance structure for asset management, strategy for capital asset funding and prioritization, and key priorities for asset management.

"Transit Asset" as defined by the FTA, means both fixed long-life infrastructure assets (including, for example, structures, tunnels, facilities, and maintenance of way) and equipment (bus, rail, and paratransit rolling stock).

"State of Good Repair (SGR)" means a condition in which assets are fit for the purpose for which they were intended.

"TAM Final Ruling" means a set of federal regulations that sets out minimum asset management practices for transit providers to bring all the nation's transit assets into a state of good repair.

"Capital Improvement Plan (CIP)" means a short-range plan that covers five years and identifies capital projects and equipment purchases, provides a planning schedule, and identifies options for funding the plan. The CIP is also known as the Capital Plan.

"Tier I Agency" as defined by the FTA, means agencies that operate rail, or with 101 vehicles or more across all fixed-route modes, or with 101 vehicles or more in one nonfixed route mode. Tier I agencies must develop their own TAM Plan.

IV. POLICY

A. Commitment to Maintaining Assets in a State of Good Repair

1. The IPTC is committed to maintaining assets in a State of Good Repair through financial stewardship and reinvestment, transparency, and collaboration with its funding partners; promoting a culture that supports asset management across the organization; and by focusing on high quality data-driven asset condition and performance information to provide with safe, reliable, sustainable service for the communities served by IPTC.

2. The IPTC's asset management program supports the timely implementation of projects and programs which maintain IPTC assets in a State of Good Repair.

B. IPTC TAM Vision

The IPTC's TAM Vision is an extension of its mission statement. It sets the direction for establishing and continually improving asset management strategies and plans, including setting goals, objectives, and measures to monitor and continually improve performance.

C. Lifecycle Management

A data-driven set of activities will be used to evaluate the cost, condition, and performance of each class of assets over their entire lifecycle.

D. Optimizing Use of IPTC Funds across asset lifecycle

The Capital Improvement Plan (CIP) will be aligned with TAM investment priorities:

- Public and employee safety
- Optimize useful life and maintain existing assets
- Replace assets in accordance to TAM targets
- Leverage available funds and optimize IPTC costs
- Improve system-wide reliability
- Environmental sustainability goals

E. TAM Plan Elements

The FTA regulation defines the IPTC as a Tier I agency and, as such, requires the IPTC to implement a TAM Plan that includes the nine TAM Elements listed below.

1. Inventory of assets – A register of capital assets and information about those assets.
2. Condition assessment – A rating of the assets' physical state.
3. Decision support tool – Analytic process or tool to assist in capital asset investment prioritization needs.
4. Prioritized list of investments – A prioritized list of projects or programs to manage or improve the SGR of capital assets.

5. TAM and SGR policy – Executive-level direction regarding expectations for transit asset management.
6. Implementation strategy – Operational actions to achieve IPTC TAM goals and policies.
7. Key annual activities – Describe the key TAM activity four-year plan.
8. Identification of resources – List resources needed to carry out the TAM Plan.
9. Evaluation plan – Monitor and update to support continuous TAM improvement.

V. AUTHORITY

A. President and CEO Authority

The President and CEO or designee will have overall responsibility for overseeing the development of asset management plans and procedures, in cooperation with the executive leadership team, and reporting to the Board on the status of asset management for the IPTC.

In accordance with this policy, implementation of the TAM Policy will be a shared responsibility for all departments within the IPTC regarding expectations and mandatory requirements.

VI. ATTACHMENTS

None.

APPENDIX B: RESOURCES

IndyGo Documents

Indianapolis Public Transportation Corporation. *Facility Preventative Maintenance Plan*, IndyGo. Indianapolis, no date.

Indianapolis Public Transportation Corporation. *Facility Improvement Plan*, by Parsons Brinckerhoff. Indianapolis, 2014.

Federal Transit Administration (FTA) Documents

Federal Transit Administration. *TAM Facility Performance Measure Reporting Guidebook: Condition Assessment Calculation*, Federal Transit Administration. Version 1.2. March 2018.

Federal Transit Administration. *Transit Asset Management Guide*, Federal Transit Administration Research, prepared by Dr. David Rose, Lauren Isaac, Keyur Shah, Tagan Blake; Updated by U.S. DOT Volpe National Transportation Systems Center staff Brian DeChambeau and Anna Biton. FTA Report No. 0098. 2016.

Federal Transit Administration. *Transit Asset Management Training: Calculating Performance Measures and Setting Targets*, Transportation Safety Institute, Version 2.0.

Federal Transit Administration. *Transit Asset Management Training: Calculating Performance Measures and Setting Targets, Participant Guide*, Transportation Safety Institute, Version 1.0, U.S. Department of Transportation.

Other Documents

Alameda-Contra Costa Transit District. *Asset Management Plan*, Alameda-Contra Costa Transit District. 2018.

American Public Transportation Association. *Defining a Transit Asset Management Framework to Achieve a State of Good Repair*, American Public Transportation Association, Standards Development Program. 2013.

Transit Cooperative Research Program. *Guidance for Developing a Transit Asset Management Plan*, by William Robert, Virginia Reeder, Katherine Lawrence, Harry Cohen, and Katherine O'Neal. TCRP Report 172. 2014.

Washington State Department of Transportation. *A Guide to Preparing your Transit Asset Management Plan*, Washington State Department of Transportation, Public Transportation Division. 2018-2020.

APPENDIX C: TARGET SETTING METHODOLOGY

Indianapolis Public Transportation Corporation
dba IndyGo
1501 W. Washington Street
Indianapolis, IN 46222
T: 317.635.2100
F: 317.634.6585
www.IndyGo.net

RE: TAMP 2018-2022 Transit Asset Management Targets

Federal Requirements

The FTA Transit Asset Management (TAM) Final Rule requires that transit agencies receiving federal funding must create a transit asset management plan and adopt targets for certain performance measures. Those measures are outlined below:

- Revenue vehicles: % of a particular asset class that is beyond the Useful Life Benchmark;
- Equipment: Non-revenue service vehicles: % of a particular asset class that is beyond the Useful Life Benchmark;
- Facilities: % of facilities that are below 3 on the FTA TERM scale; and
- Infrastructure: % of infrastructure that is below 3 on the FTA TERM scale.

Targets are adopted annually and reported to the National Transit Database (NTD). Since IndyGo does not have any rail infrastructure, it is not required to submit a target. Failure to meet the targets has no consequences currently.

Annual targets will be informed by the TAMP. TAMP targets are set for the horizon year of the plan; IndyGo's TAMP has a horizon year of 2022.

Steps to Set Targets

Best practice and FTA guidance all provide an outline for establishing targets. The rest of this section details IndyGo's approach and results for each step to establish targets. As part of this process, the TAM Plan Committee, as outlined in the TAMP, will be utilized. For annual targets, coordination with the Indiana Department of Transportation (INDOT) and the Indianapolis Metropolitan Planning Organization (MPO) will also occur as part of the target-setting process. The coordination is not just a requirement but good practice as part of the federal transportation planning process.

Gather Data

Data are the base ingredient in a target-setting process and the data must be reviewed and vetted to generate a strong target.

A current inventory of all assets is needed to establish targets. As the TAM Final Rule requires public transportation provides to maintain and report an inventory in their TAMP, IndyGo has the required data to set targets. The current regulations require IndyGo to collect an inventory of all assets, as long as it has a value above $5,000 and/or a useful life above 3 years. This inventory is more comprehensive than required by the TAM Final Rule.

For the purposes of target-setting, not all assets need to have a condition analysis. Federal regulations do not require recipients to report a condition on assets that they do not have direct capital responsibility (e.g. ownership or maintenance responsibility) over.

Historical data on an inventory can be useful as well. The historical data allows an agency to evaluate different trends and understand how different decisions affects the performance of its fleet. This can be valuable when attempting to understand the trajectory of an asset's condition.

Where historical data is not present, IndyGo intends on using the current inventory to establish targets.

For target-setting, IndyGo intends on gathering the following data for each asset:

Table 1 Minimum Data Required for Target Setting

Asset	Data	Source
Rolling Stock/Non-Revenue Service Vehicles	• Current size • Age • ULB • # over ULB	TAMP Inventory and Fleet Inventory
	• Projected Retirements • Projected Replacements/Purchases	Capital Plan, Fleet Inventory, and Operations
Administrative/Maintenance and Passenger	• Number • Current Condition	TAMP Inventory and Facilities
	• Facility Capital Projects	Capital Plan and Facilities

Rolling Stock

Rolling stock is categorized by IndyGo as all revenue vehicles, including buses and minivans. IndyGo currently operates four asset types as necessary to report to NTD: Articulated buses, buses, cutaways, and minivans. Most of the buses are 40' and used in local fixed route service. Cutaways are used for paratransit service. Although the paratransit service is contracted, and the contractors are responsible for maintenance, IndyGo purchases the vehicles and so maintains direct capital responsibility for the cutaways.

While historical information is present for IndyGo's rolling stock, the passage of a new local income tax to fund transit transforms the revenue stream for IndyGo. This new revenue stream allows IndyGo to replace rolling stock at a faster rate and relieve its fleet of its backlog. As such, 2018 is used as a baseline for the TAMP. Table 2 provides a glimpse of the rolling stock as of June 15, 2018 and is used in the body of the TAMP.

Table 2 Rolling Stock (As of 6/15/2018)

Category	Class	Asset	Qty	# Below ULB	Average Condition	Average Age	% Below ULB
Rolling Stock	Buses	Articulated Bus	11	11	2.9	5	100%
		40' Bus	178	66	3.75	10	37.1%
		Cutaway Bus	69	11	4.06	3	14.5%
	Other Revenue Vehicles	Minivan	4	0	3.00	6	0%

Equipment – Non-Revenue Service Vehicles

Non-Revenue Service Vehicles are all street legal vehicles used to provide support service to IndyGo revenue service. These vehicles include supervisor vehicles, tow trucks, and maintenance vehicles.

Similar to Rolling Stock, Non-Revenue Service Vehicles will see new purchases due to the local income tax and service expansion.

Table 3 Non-Revenue Service Vehicles (As of 6/15/2018)

Category	Class	Asset	Qty	# Below ULB	Average Condition	Average Age	% Below ULB
Equipment	Non-Revenue Vehicles	Automobile	32	11	3.19	6.8	34.4%
		Other Rubber Tired Vehicles	2	0	3.5	7.5	0%

Facilities

IndyGo has direct capital responsibility for two facilities: The Administration and Maintenance Facility at 1501 West Washington Street and the Downtown Transit Center at 201 E. Washington Street. The

Downtown Transit Center was constructed from 2015-6, with its opening in mid-2016. IndyGo's combined headquarters and maintenance facility opened in 1984.

As part of the Marion County Transit Plan and the adopted, dedicated local income tax for transit, IndyGo's headquarters and maintenance facility is undergoing significant renovations. These renovations include replacement of equipment, accommodations for a larger fleet, and renovations to administrative offices.

Asset Category	Asset Class	Asset	Desired Condition (TERM)	Count	Average Condition	% Facilities Below 3
Facilities	Administration and Operations	Administration and Operations Building	3	1	3.80	0%
	Passenger Facilities	Downtown Transit Center	3	1	5	

Evaluate Trends and Establish a Baseline

Each asset class has information that can be used for a baseline. In some cases, available historical data can be used to establish a baseline. However, historical data may not be an accurate reflection of transit asset management practices or resources and could be ignored. In some circumstances, the baseline information for an asset class could be current data if historical data is unavailable or inconsistent with current data.

For all asset classes, due to the introduction of a significant new revenue stream, scenario analysis will use 2018 as the base year.

Create scenarios

Establishing targets should involve some projections based on different scenarios. Currently, IndyGo is evaluating targets based on three scenarios:

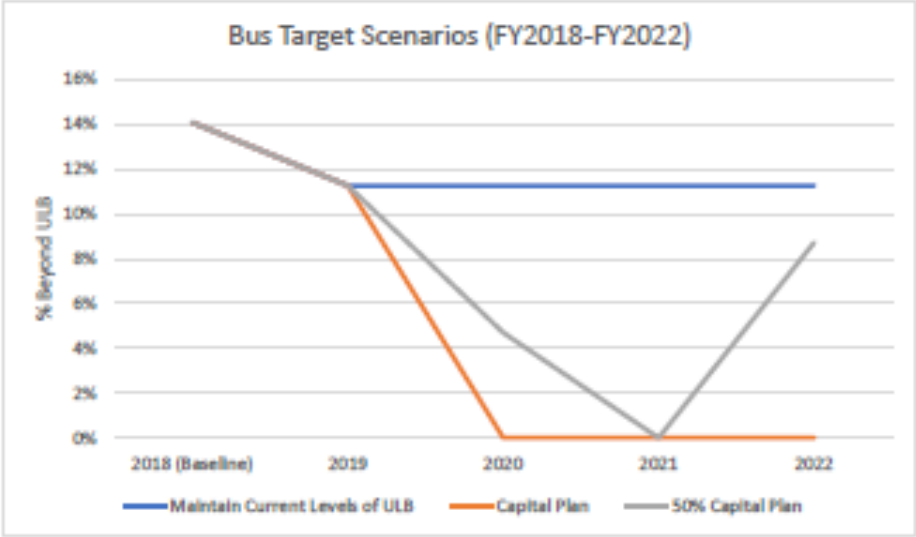
- Maintain current ULB: In this scenario, each asset class is assumed to maintain the same performance on the metrics as the base year.
- Capital Plan: Investments outlined in IndyGo's current Capital Plan (2018-2023) are factored into performance of each asset class.
- Fifty-percent of the Capital Plan: This scenario assumes that only 50% of the funds outlined in the Capital Plan are available and adjusts retirements and purchases accordingly.

Rolling Stock

Articulated Buses are not examined here because many of the articulated buses are currently on order.

Performance of IndyGo's bus fleet are shown Figure 1.

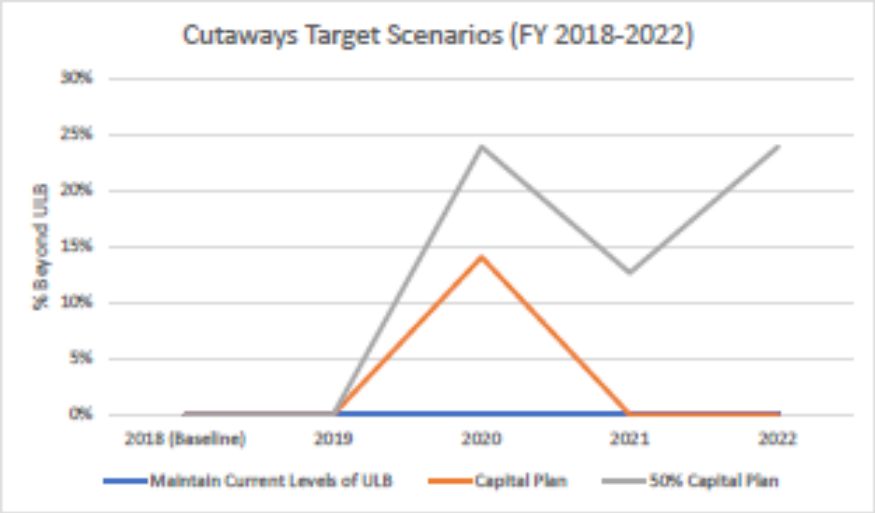
Figure 1 Bus Target Scenarios



With the investments of the Capital Plan, IndyGo forecasts that it should remove all vehicles past their useful life benchmark by 2020. If the resources outlined in the Capital Plan are not available, the projection would change to 9% past the useful life benchmark. Either mark is an improvement of the 2018 mark of 14%.

Cutaways see a similar improvement, as shown in Figure 2.

Figure 2 Cutaways Target Scenarios



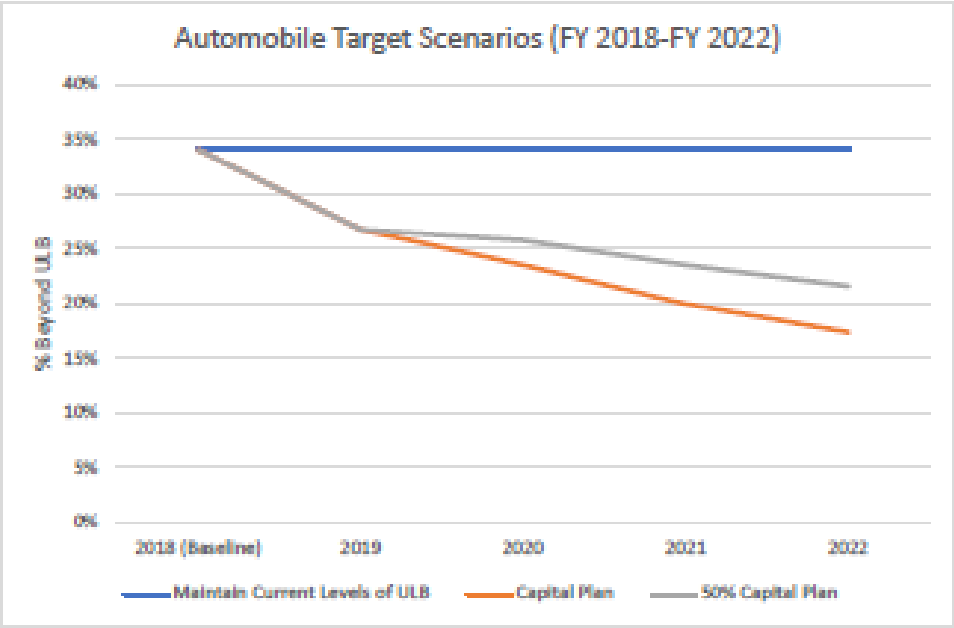
The spike in 2020 is largely related to a large fleet (40) purchased in 2015. The 2015 fleet accounts for nearly 60% of the cutaway fleet. Although IndyGo anticipates slowly retiring them from its active fleet, the size of the fleet will affect the target for cutaways. By the horizon year of the TAMP, IndyGo anticipates that it will have 0% of its cutaway fleet above the useful life benchmark.

If resources are not available, however, it is forecasted that the fleet could be nearly 25% beyond its ULB.

Equipment – Non-Revenue Service Vehicles

The Capital Plan will include purchasing several new non-revenue service vehicles each year, reducing the current backlog of older vehicles in its fleet.

Figure 3 Automobile Target Scenarios



As shown in Figure 3, the current fleet of non-revenue service vehicles is just below 35% beyond its ULB. Even with 50% of investment of the Capital Plan, that figure would be reduced to 22%. IndyGo does not assume that it will retire these vehicles once they reach the ULB but instead will shift vehicles that extend beyond their ULB to other support services. The newer vehicles will be given to critical operations areas; therefore, it is assumed that no automobiles are retired in these scenarios but it's likely that automobiles will be discarded during the life of the TAMP.

Other Rubber Tired Vehicles include non-automobile, street legal vehicles. IndyGo currently only has 2 of those vehicles and projects that they will not exceed their ULB during the duration of the TAMP.

Facilities

With the significant renovations at IndyGo headquarters and the recent construction of the Downtown Transit Center, IndyGo does not project that its facilities will fall below a 3 on the FTA Term Scale.

Establish targets

Following the evaluation of each scenario, an acceptable target is chosen for the TAMP. These targets will be communicated in the TAMP and used in the annual target-setting process.

Each target will use the Capital Plan scenario as its basis.

Table 4 TAMP Targets

Asset Category	**Asset Class**	**Targets**
Rolling Stock	Articulated Buses	0% over ULB
	Buses	0% over ULB
	Cutaways	0% over ULB
	Minivans	100% over ULB
Equipment	Automobiles	17% over ULB
	Other Rubber Tired Vehicles	0% over ULB
Facilities	Administrative and Operations Facilities	0% under 3 on the TERM scale
	Passenger and Parking Facilities	0% under 3 on the TERM scale