Asset Management

2018

ATLANTA'S
TRANSPORTATION PLAN
The Access Strategy for Atlanta City Design

TABLE OF CONTENTS

Page

TABLE OF FIGURES

Page

INTRODUCTION

Atlanta's Transportation Plan is the access strategy for Atlanta City Design. The Plan is divided into a concise final report and a series of detailed technical appendices. The final report summarizes Atlanta's Transportation Plan in an easily digestible manner using infographics, maps, and images and is intended for the general public and elected officials. The technical memorandums are intended for planners, City staff, and implementation partners that require a higher level of detail.

As part of Atlanta's Transportation Plan, this technical appendix documents existing conditions and maintenance policies, identifies needs, and recommends policy and implementation strategies to maintain Atlanta's transportation system and achieve a state of good repair.

BACKGROUND

The City of Atlanta maintains an extensive transportation network consisting of streets, traffic signals, bridges, and bicycle and pedestrian facilities. Faced with a growing population and economy as well as limited sources of funding, asset management systems allow agencies to maximize return on investment. The following definitions are important for understanding how maintenance and a state of good repair are components of the transportation system:

- Maintenance is the process of repairing and improving transportation facilities over time to improve their condition
- State of good repair means transportation facilities and systems are maintained in a condition allowing operation at their full level of performance

The benefits of achieving a state of good repair are an increase in infrastructure performance and decrease in maintenance costs over its useful life. This is accomplished by strategically investing in maintenance activities at the time when the money spent is most effective. Generally, smaller expenditures earlier in the maintenance cycle can save substantial amounts in the future. This is true because transportation infrastructure typically deteriorates rapidly after its condition falls below a specific threshold.

Asset management is a process to inventory existing asset conditions, model performance over time, and allocate maintenance investments to increase system performance over time as well as long-term cost savings. Achieving a state of good repair at the lowest possible cost by more efficiently allocating investments is the desired outcome of in an overall asset management strategy.

Examples of asset management tools and systems include:

- Pavement management systems – assists in developing rehabilitation programs and budgets; already implemented by the City of Atlanta
- TERM-Lite – software developed by the Federal Transit Administration (FTA) for assessing investment required to achieve a state of good repair.

This document describes asset management, maintenance and state of good repair practices with regard to the City's transportation system.

EXISTING CONDITIONS

An understanding of existing characteristics pertaining to the transportation network is important to identify roads, bridges, bicycle facilities, sidewalks, and transit infrastructure in need of repair or replacement. An analysis of current maintenance policies and asset management systems is important to identify potential ways to more efficiently allocate funding and increase return on investments.

ROADS

The purpose of analyzing existing roadway and bridge conditions is to identify places in the existing network where pavement or bridges may be substandard and in need of near-term replacement as well as facilities where a small investment now can prevent the need for larger investments in the future. Additionally, an understanding of roadway and bridge locations that need replacement soon may be beneficial for prioritizing project recommendations.

The Department of Public Works has responsibility for maintaining pavement, traffic signals, the Atlanta Traffic Control Center (TCC), and the communications infrastructure linking signals to the TCC. This section describes the existing conditions, maintenance policies, and/or asset management systems that are currently in place.

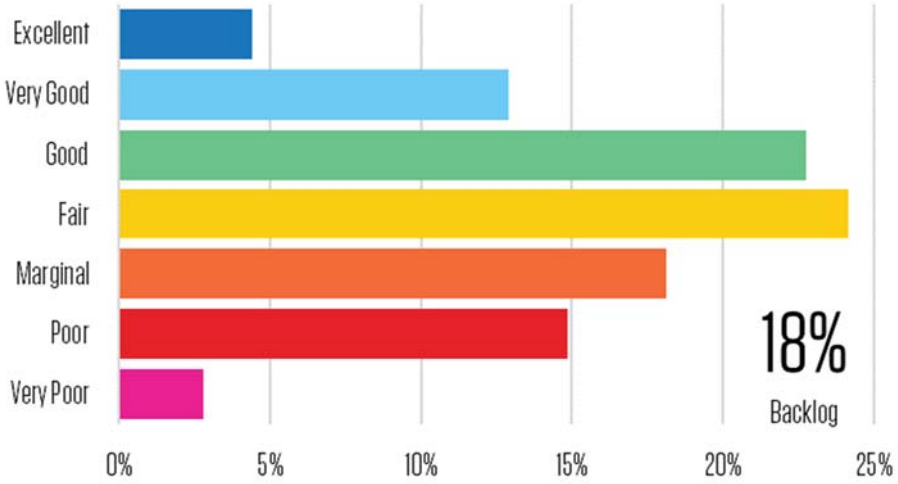
Pavement Conditions

An inventory of existing pavement conditions is important because streets that are repaired when they are in good condition cost less to maintain during their lifetime than streets that deteriorate to a poor condition. Figure 1 illustrates how pavements typically deteriorate rapidly after reaching 40 percent of their useful life. Delaying investment until a street has reached 55 percent of its useful life typically costs eight times as much.

FIGURE 1: PAVEMENT LIFECYCLE COSTS

The City of Atlanta has approximately 1,600 centerline miles of roadways. To manage these pavement assets, the City of Atlanta's Department of Public Works (DPW) has a new pavement management system called LUCITY. It has been in use since late 2015. To create the database of pavement conditions, all roads, both pavement and concrete, in the City were scanned and spatially referenced to document surface data (e.g. rutting, cracking). A sub-grade stress test determined the quality of structure and materials below grade. Figure 2 shows the condition of all pavement in Atlanta.

FIGURE 2: EXISTING PAVEMENT BY CONDITION

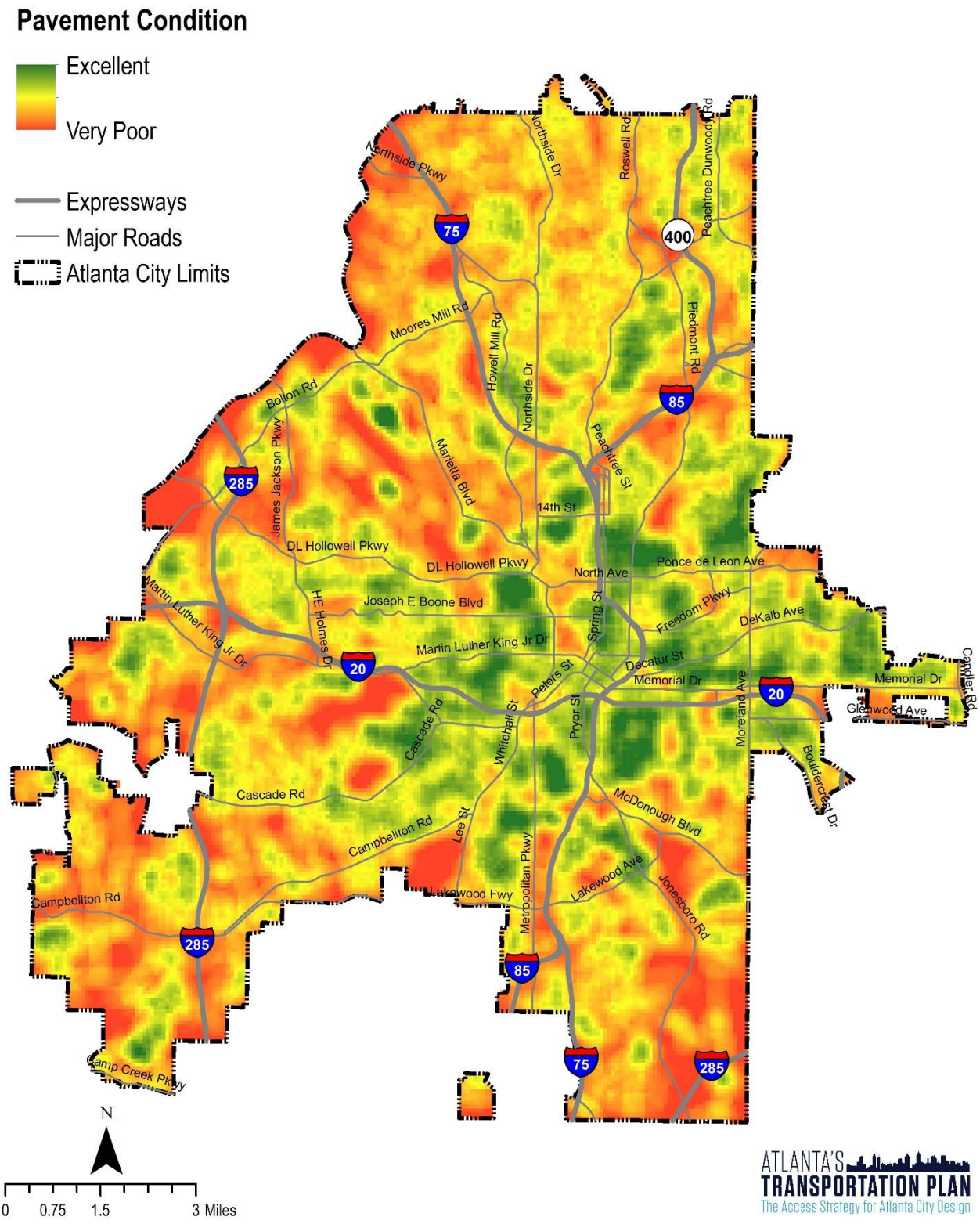


Of note, approximately 18 percent of existing pavement is in poor or very poor condition, which is referred to as backlog. A backlog approaching 20 percent is at risk of becoming unmanageable, as the decrease in condition begins to exceed the availability of funding to address the large number of streets in need of rehabilitation.

Overall, the distribution of pavement in marginal, poor, and very poor condition is evenly disbursed across the City. Figure 3 is a map showing the condition of streets throughout the City.

The recommended maintenance of the LUCITY system includes updating information annually with roads that are resurfaced, and re-scanning 20% of the City's roads for surface data each year to keep the system up to date. The ongoing re-scanning would result in road pavement information always being 5 years old or less. To maintain the existing quality of pavement, the City will need to invest $40 million per year in maintenance and re-paving.

FIGURE 3: EXISTING PAVEMENT CONDITIONS (2016)



Traffic Signals

There are approximately 964 traffic signals in the City of Atlanta. Management and maintenance of those signals is spread among DPW, Georgia Department of Transportation (GDOT), and Community Improvement Districts. Each of these programs requires COA DPW participation at different levels. The following list breaks down the number of signals managed by each responsible party:

- 267 are managed by COA DPW
- 262 are managed by GDOT's Regional Traffic Operations Programs (RTOP & RTOP 2)
- GDOT is updating and taking the operation and maintenance responsibility of an additional 160 intersections through the Atlanta Traffic Signals Operations Program
- 146 are managed through the Downtown Traffic Operations Program (DTOP)
- 99 are managed through the Midtown Traffic Operations Program (MTOP)

Historically, the City was a pioneer in this area with one of the first Urban Traffic Control Systems (UTCS) in the nation and, later, in preparation for the Olympics with the Atlanta Advanced Transportation Management System (ATMS) deployment, which led to the GDOT NaviGAtor system. That system is still one of the most iconic and impressive regional transportation management systems in the nation. However, over the last 20 years, the City's portion of the system has degraded. Only 130 traffic signals are currently communicating back to the Atlanta Traffic Control Center (ATCC). Additionally, this communication is basic with no active control equipment, closed circuit television (CCTV) monitoring operation, or active control capabilities being used by the ATCC.

In comparison, other jurisdictions across the country such as Cobb County, Charlotte, Los Angeles, Utah, Anaheim, and Orlando, have 80 to 100% of their traffic signals communicating back to a transportation control center.

ATLANTA TRAFFIC CONTROL CENTER

Atlanta has a technologically advanced traffic control center, which went through a significant upgrade and transformation recently. The investment in the ATCC included improvements to video displays, computing hardware, state-of-the-art Ethernet communication, and removal of outdated components.

However, the field monitoring, control and communication infrastructure is in various stages of operational disrepair due to minimal preventative maintenance. Professional observations and further discussions with COA DPW staff engaged in routine and emergency maintenance revealed that such activities are being performed in a "fire-fighting" mode. There is a perception of more tickets/systematic failures (e.g. failed LED signals) than there are resources to adequately address them. This has led to the practice of doing the bare minimum to address a ticket or call without fully addressing the primary, underlying issues and results in a patchwork of

non-functional communication infrastructure and poorly maintained, minimally functional intersection hardware.

The City currently has no functional CCTV cameras capable of monitoring traffic operations that are communicating back to the ATCC.

When compared to other jurisdictions across the nation, the City has the lowest percentage of active functional CCTV cameras and signal communication for the purposes of monitoring and signal control. These deficiencies prevent the use of more advanced control strategies such as traffic responsive and adaptive to address heavy traffic volumes and special events.

FIBER AND WIRELESS COMMUNICATIONS

To connect the City's traffic signals, monitoring equipment and cameras, Internet of Things (IoT) devices, ATCC, and GDOT's Transportation Management Center (TMC), a rapidly growing network of fiber and wireless devices is being employed by the City and GDOT. The City's fiber will soon be used for WiFi, connecting City facilities, 911, voice over IP, and has the opportunity to be leased out to other entities. The new fiber being rolled out is 144 strand fiber, containing excess strands for future needs. The City's fiber plan calls for 60% of the fiber to be above ground and the remaining 40% below ground though the final locations will be determined based on feasibility and cost.

The existing and future planned network of fiber is mapped in geographic information systems (GIS) software by the Department of Atlanta Information Management (AIM) and is accompanied by inventory spreadsheets for the fiber network and wireless communications devices. There is currently no complete asset management system in place for the growing fiber and wireless network. AIM is considering PATCH manager which includes intelligence and logs. GDOT uses TEAMS to access information for their traffic operations programs, including the Regional Traffic Operations Program (RTOP) and Downtown Traffic Operations Program (DTOP).

The useful life of fiber is about 25 years. The uninstalled fiber and supporting materials (conduits, coils, etc.) are stored at DPW's signal shop, but are in need of a separate storage space to prevent mixing with signal equipment and supplies.

Some of the key challenges with the fiber network include:

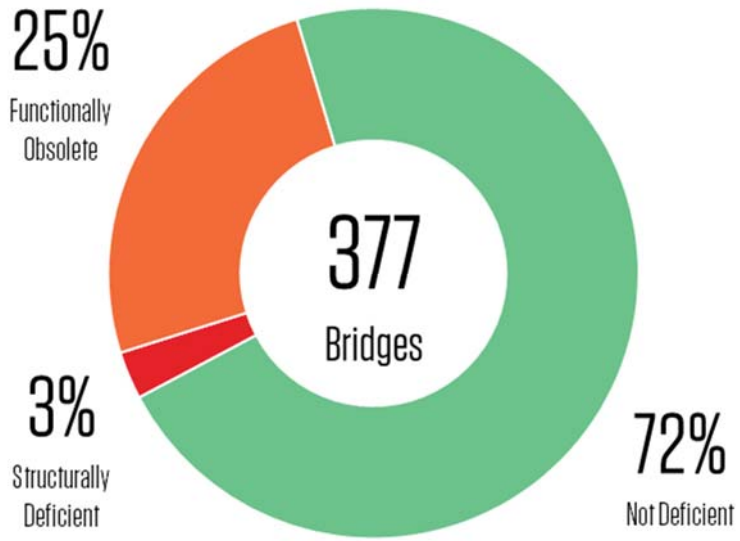
- Managing the fiber trunk lines aerially (underground is much easier), particularly preventative maintenance of fiber housing
- Working to have 24-hour access to hubs (as opposed to GDOT operated hubs)
- Contracting out repair & maintenance (GDOT's RTOP, DTOP, and MTOP maintain their systems)
- Funding strategy and sources

Bridges

An understanding of existing bridge conditions is important because weight limits or closures on structurally deficient bridges negatively impacts freight and traffic flows. Likewise, functionally obsolete bridges with lane widths, shoulders, or vertical clearances that are inadequate for current traffic volumes may cause traffic congestion. Neither structurally deficient nor functionally obsolete bridges are in imminent danger of collapse, but these classifications indicate the need for significant maintenance or even reconstruction to perform at an adequate level of service. Bridge conditions also have funding implications. To be eligible for federal matching funds for repairs, a bridge must have a sufficiency rating below 80, while a rating below 50 is needed for reconstruction. To analyze bridge conditions, an inventory of existing bridges in the City of Atlanta including sufficiency ratings and status was obtained from the Georgia DOT.

Overall, bridges in the City of Atlanta are generally in good condition. As of 2016, 11 bridges in the City were classified as structurally deficient or 3 percent of the total. This compares favorably to the nation, where 9 percent of bridges are structurally deficient[1]. Within the City, 95 bridges were classified as functionally obsolete or 25 percent of the total. This is higher than the 14 percent of functionally obsolete bridges nationwide[1]. Figure 4 shows almost three quarters of bridges in the City are not deficient.

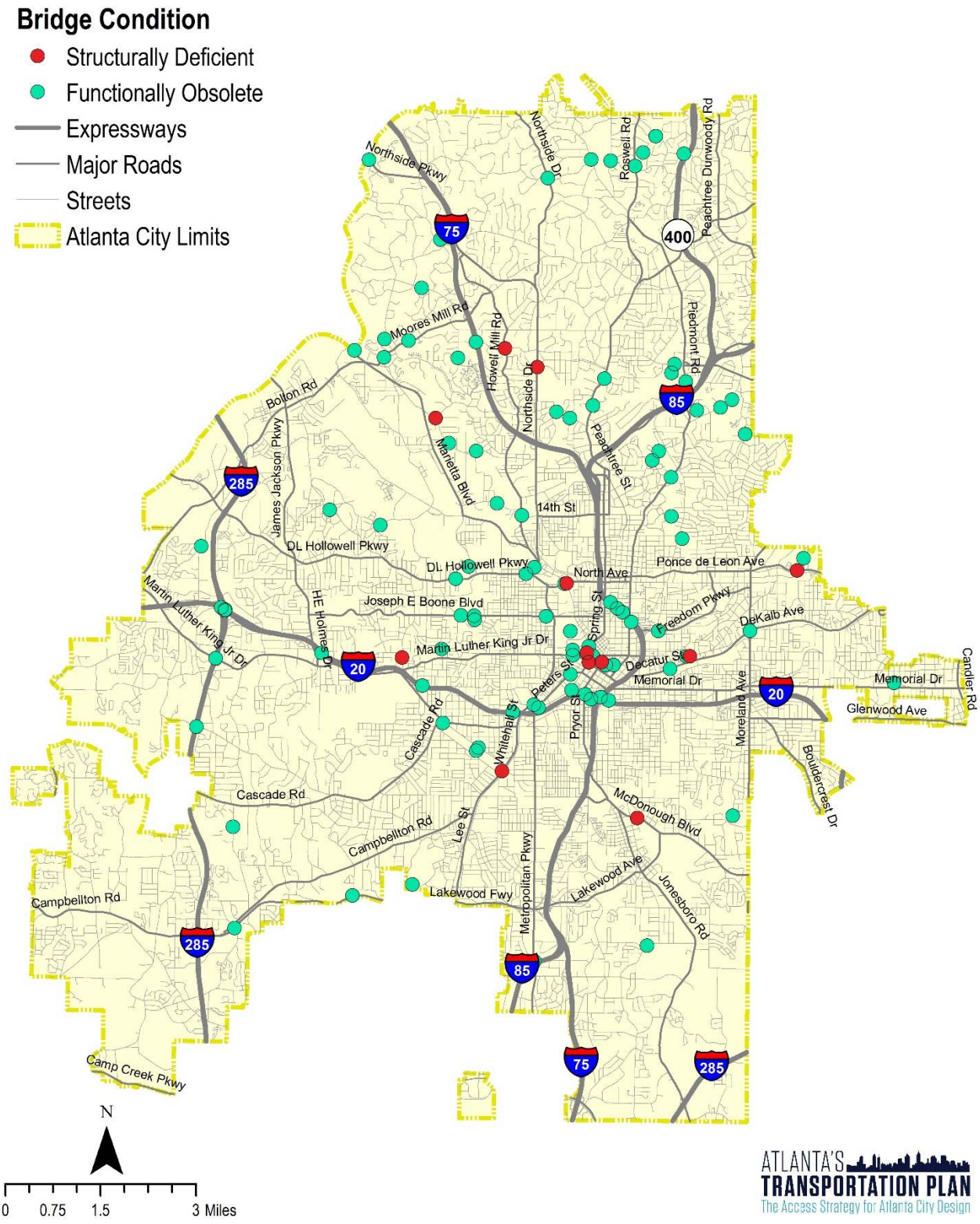
FIGURE 4: EXISTING BRIDGES BY SUFFICIENCY STATUS



Structurally deficient and functionally obsolete bridges are distributed throughout the City of Atlanta. Figure 5 is a map showing bridges in the City of Atlanta by sufficiency status.

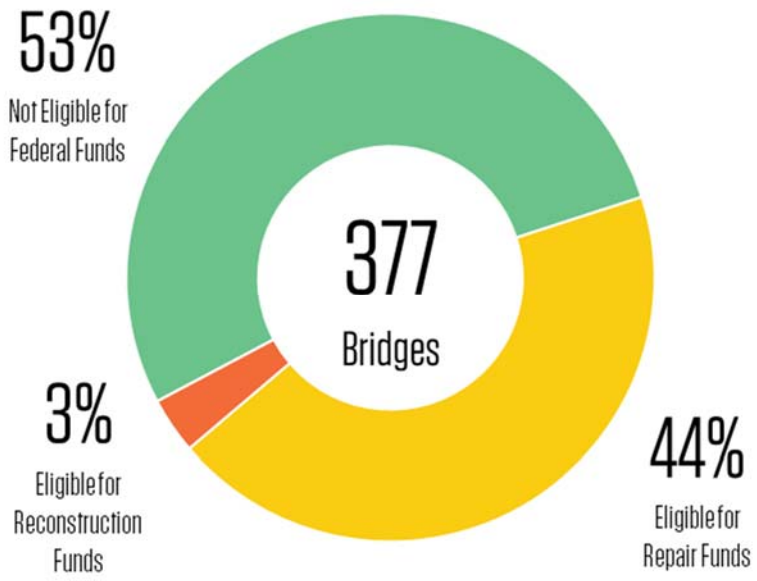
[1] ASCE 2017 Infrastructure Report Card

FIGURE 5: EXISTING BRIDGE CONDITIONS (2017)



A limited number of bridges in the City are eligible for federal matching funds for reconstruction. Only 13 bridges, or 3 percent of the total meet the threshold for reconstruction funding. Significantly more bridges, a total of 165, meet the threshold for accessing federal matching funds for repair. Figure 6 shows that over half the bridges in the City are not eligible for federal matching funds, which means they are in good condition.

FIGURE 6: EXISTING BRIDGES BY ELIGIBILITY FOR FEDERAL FUNDS



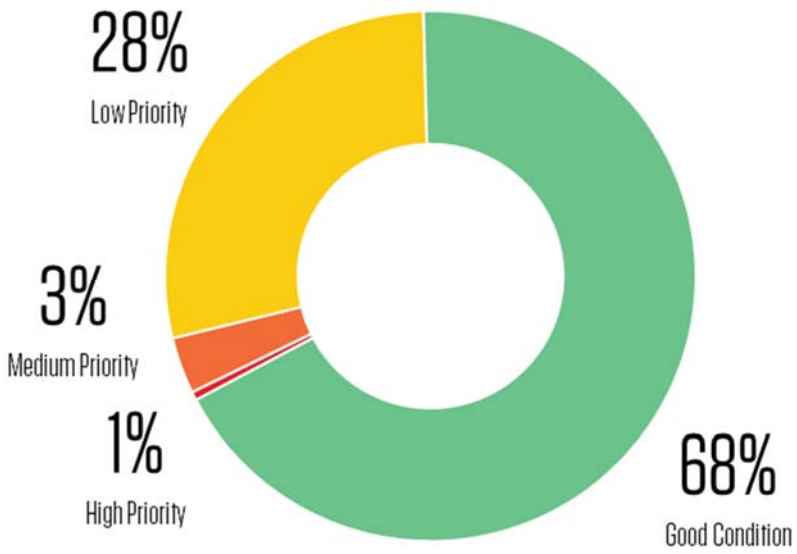
Bridge Maintenance Policies

The City of Atlanta Department of Public Works is responsible for maintaining bridges. Their maintenance policy is based on bridge sufficiency ratings and is broken down into the following categories:

- High priority: 0 – 34
- Medium priority: 35 – 50
- Low priority: 51 -75

Consistent with the previous analysis of existing bridge conditions, most bridges in the City of Atlanta are not prioritized for maintenance. Based on the Department of Public Works maintenance policy, 107 bridges are low priority, 13 are medium priority, and 2 are high priority. Figure 7 on the following page shows over two-thirds of bridges in the City are in good condition.

FIGURE 7: EXISTING BRIDGES BY MAINTENANCE PRIORITY



BICYCLE AND PEDESTRIAN CONDITIONS

An understanding of current bicycle and pedestrian infrastructure maintenance policies and conditions is necessary to identify needs and recommend policies and programs to address them. This technical memorandum focuses on maintenance policies, as both the bicycle and pedestrian facilities technical memorandums provide detailed reviews of existing bicycle infrastructure and sidewalk conditions.

Bicycle Infrastructure Maintenance Policies

The City has implemented several bicycle facilities in recent years including bicycle lanes, two-way cycle tracks, and has partnered with Relay to open approximately 65 bike share stations with a total of 500 bicycles in the system.

Maintenance of bicycle lanes and cycle tracks is performed by the Department of Public Works and is generally undertaken at the same time as the adjacent roadways are repaved. The City does not perform maintenance on the bike share system that is currently contracted out to Cyclehop.

Sidewalk Maintenance Policies

Historically, sidewalk repair and maintenance in the City of Atlanta was the responsibility of the abutting property owner. In July of 2015, the Atlanta City Council passed an ordinance allowing the Department of Public Works to use public funds to pay for sidewalk repairs. A Public Improvement and Infrastructure Account, to be phased in by 2020, will dedicate 3.5 percent of

the City's general fund each year to repair sidewalks, roads, and bridges. When the program takes full effect in 2020, funding available for sidewalk repairs is forecasted to be $20 million per year.

Currently, sidewalk maintenance is prioritized by street classification, with arterials being the highest priority, collectors the medium priority, and local streets the lowest priority. Researchers at the Georgia Institute of Technology (Georgia Tech) have developed and deployed a mobile system to collect sidewalk condition information such as roughness that can be used to further prioritize sidewalk repairs and/or replacement.

BeltLine

The BeltLine is a 22-mile loop encompassing railroad corridors that formerly bypassed downtown Atlanta. An additional 11 miles of multi-use trails are planned that will connect the main BeltLine loop to neighborhoods and other multi-use trails, for a total of 33 miles. Through the end of 2016, 8.7 miles of multi-use trail projects out of the 33 miles envisioned have been delivered. The three-mile paved section of the Westside Trail was delivered in September of 2017.

Because Atlanta BeltLine Incorporated is an implementing agency and does not perform any maintenance, the existing sections of the BeltLine are currently maintained by the City of Atlanta Parks Department or volunteers. Currently Park Pride is running an adopt-a-quarter-mile program that matches volunteers with segments of the BeltLine.

TRANSIT CONDITIONS

As the City's population and employment grows and density increases, transit services will play a key role in providing mobility and access. Maintaining transit infrastructure and vehicles in a state of good repair is important to provide reliable service to citizens and visitors. However, the responsibility for maintaining transit assets currently resides outside the City with several individual transit agencies that provide service in the City of Atlanta. These agencies include the Metropolitan Atlanta Rapid Transit Authority (MARTA), CobbLinc, Gwinnett County Transit (GCT), and Georgia Regional Transportation Authority (GRTA). While the City initially owned the Atlanta Streetcar and contracted with MARTA for operations and maintenance, it is anticipated that MARTA will take over ownership and full responsibility on October 1st, 2017.

PUBLIC INPUT

Based on survey results and comments gathered during the public outreach process, maintenance of roadways and sidewalks is important to citizens of the City. This section summarizes what Atlanta's Transportation Plan team heard throughout the course of the study.

During the first phase of public engagement, a survey asking about existing transportation choices and preferences for future investments was administered primarily online. The survey was promoted during traditional public open-houses and at "pop-up" meeting locations held throughout the City of Atlanta. At all the meetings, attendees were given the opportunity to complete surveys online using tablets. Over 2,600 persons completed the survey.

Roadway maintenance is a concern for approximately half of the people who took the survey, with just less than a third indicating it should be a top priority. Almost 50 percent of respondents chose "roadway maintenance" when answering the question "what are the transportation investments you would like to see more of?" When asked to identify the top three transportation priorities, 30 percent of respondents chose "roadway maintenance."

With over half of survey respondents are in favor of repairing and improving the condition of existing sidewalks, maintenance concerns are not limited to roadways. When asked, "what additional transportation options would you like to see in the City of Atlanta," 60 percent of respondents chose "repair existing sidewalks." Similarly, when asked, "which of the following improvements would encourage you to bicycle, walk, or use public transportation," 60 percent of survey respondents indicated "sidewalks in better condition."

IDENTIFIED NEEDS

To determine state of good repair and maintenance needs in Atlanta, the existing physical conditions, maintenance policies, asset management systems currently in place, and the overall goals and objectives of Atlanta's Transportation Plan were considered. Figure 8 on the following page shows how a state of good repair can contribute towards meeting the plan's identified goals and objectives and begins to point toward specific recommendations that support the City's vision.

The assessment of existing conditions as well as maintenance policies and asset management systems in place throughout the City of Atlanta indicates there are needs across the entire transportation system to achieve a state of good repair. Additionally, several opportunities exist to improve the timing of investments to more efficiently manage infrastructure maintenance.

FIGURE 8: RELATIONSHIP OF ATP GOALS AND OBJECTIVES TO STATE OF GOOD REPAIR AND MAINTENANCE

Goal	Objective	State of Good Repair and Maintenance
Safety	Eliminate traffic fatalities	Facilities in poor condition can put drivers, transit riders, bicyclists, and pedestrians at higher risk of crashing.
	Reduce serious injuries	Facilities in a state of good repair can reduce the number of crashes and associated injuries.
	Reduce transportation-related emissions to improve air quality	Well maintained transit, bicycle, and pedestrian facilities can encourage people to switch to those modes from driving.
	Provide all residents with active transportation opportunities to improve public health	Transit, bicycle facilities, and sidewalks in a state of good repair increase opportunities for walking and bicycling for recreation and exercise. Likewise, well maintained facilities that provide direct pedestrian connections to transit and/or final destinations attract more people to take active trips, promoting improved health.
Mobility	Focus density and economic development to support transportation investments	Well maintained transportation facilities can encourage private investment, especially near transit stations, as well as along popular bicycling and walking routes.
	Reduce congestion by maximizing the existing transportation system	While the streets and highways are already near or at their capacity, the City has opportunity to better use and to greatly increase the capacity for walking, biking and transit trips.
	Leverage local transportation funding to achieve the greatest impact	Using all available funding sources is key to preserving and maximizing the efficiency of existing infrastructure.
	Fix existing infrastructure and address critical maintenance	Repair or reconstruction of transportation facilities in the most cost-effective way facilitates efficient mobility.
Affordability	Provide transportation options to economically disadvantaged neighborhoods	Improving the conditions of roadways, transit vehicles and shelters, bicycle facilities, and sidewalks increases the mobility options available.
	Expand access to jobs and services	Facilities in good condition improve access to jobs and services.
	Reduce household transportation costs for lower income households	Keeping transportation facilities in a state of good repair reduces operating costs for roadway users and increases the attractiveness of low cost mobility options such as transit, bicycling and walking.
	Support livable communities and local character through great design	Well maintained transportation facilities, improve public safety and contribute to great communities.

RECOMMENDATIONS

Transportation asset management is a strategic approach to managing infrastructure assets. It focuses on the processes for resource allocation and utilization with the objective of better data-driven decision-making. In layman terms, it's getting the best performance of transportation assets given the resources available. Currently, there is no comprehensive transportation asset management system in place in the City of Atlanta. Transportation assets are primarily managed by the Department of Public Works (DPW), but several other city departments and partner agencies play a role or manage specific assets.

An Asset Management program is important because it can:

- maximize performance of existing transportation assets
- minimize costs
- improve customer satisfaction
- improve transparency and decision-making credibility

To meet the City's goals of safety, efficiency, and equity, an asset management plan and system is necessary. An asset management plan will outline the opportunities to maximize the existing life and safety of assets and minimize maintenance issues and costs. Importantly, it will lay out the framework for the management systems, personnel, and funding mechanisms. The building blocks of the asset management plan will include:

- Asset Inventory & Conditions Assessment
  - Identify all transportation assets and the condition of each asset
  - Identify the life span and value of each asset

- Level of Service/Performance Measures
  - Describe what the asset delivers
  - Identify how to measure the level of service or performance

- Risk
  - Identify and rank the existing risk by considering the consequences and likelihood of any given type of asset failure
  - Mitigate risks through operations, maintenance, and capital decisions

- Life-cycle cost planning
  - Identify the minimum cost for capital, operations, and maintenance over the whole life of the asset, from acquisition to retirement
  - Measure cost including social, environmental, and financial components

Developing an asset management plan would combine the information collected in the items above to build decision rules on asset investments and management. Additionally, the plan would share this information throughout the involved city departments and partners described below.

There are many departments within the City that have their hand in a piece of transportation asset management. Likewise, there are a handful of outside agencies that are intimately involved in funding and building these assets, or who use the assets to provide transportation services to citizens. These groups are identified below in Figure 9. The city departments, shown in color, may have decision making authority when it comes to asset management, and the city partners, shown in grey, may have coordination and input. On a high level, these groups will need to work together to share data, insights, updates, and lessons learned, and communicate regularly on priorities and strategies for maintenance and replacement of assets. Details of exact groups included and the structure and roles of the group should be identified in the recommended Asset Management Plan.

FIGURE 9: POSSIBLE CITY OF ATLANTA ASSET MANAGEMENT COLLABORATION TEAM

The following recommendations are organized in a logical order to take Atlanta from its current condition, an informal approach to asset management, to a future condition where the structure

of representatives from involved city departments in coordination with partners outside the City can work collaboratively to make strategic decisions that meet their goals of safety, efficiency, and equity with data that is continuously updated. It is important to implement these recommendations in the recommended order to avoid collecting data that is incomplete or does not meet the needs of all the potential users, or to have the data become outdated while a collaborative team is being organized and structured. Figure 10 summarizes the asset management recommendations.

FIGURE 10: ASSET MANAGEMENT RECOMMENDATIONS

Relevant Action	Description	Timeframe	Cost	Responsible Party	Related ATP Goal
Develop Asset Management Plan	A comprehensive transportation asset management plan should include the following elements: Summary listing of the multimodal transportation assets including a description of the condition of those assets Asset management objectives & measures Performance gap identification Lifecycle cost & risk management analysis Financial plan Investment strategies	Short-term	$	DPW to lead in coordination with Asset Management Collaboration Team	Mobility Safety Affordability
Develop Transportation Asset Registry	Based on the recommended investment strategies from the Asset Management Plan, develop a transportation asset registry to be the central repository for asset inventory data. The type of data recommended for inclusion in the registry will guide needed data collection. The registry could be expanded beyond being just an inventory database and include built-in analytics and reporting capabilities.	Mid-term	$$	DPW to lead in coordination with Asset Management Collaboration Team	Mobility
Decision-making using Asset Registry Data	Concurrent to and following development of the asset registry, use available asset data and insights in decision-making for maintenance and capital improvement funding and implementation.	Mid-term	$	Asset Management Collaboration Team	Mobility Safety Affordability
Ongoing data collection and maintenance of Asset Registry	Develop and fund a program for ongoing data collection and maintenance of the asset registry. This should include coordination with partner agencies.	Mid & Long-term	$$	Asset Management Collaboration Team	Mobility

This page was intentionally left blank