Performance Audit

Department of Mobility and Infrastructure

Report by the
Office of City Controller

MICHAEL E. LAMB
CITY CONTROLLER

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August 2022

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CITY OF PITTSBURGH
OFFICE OF THE CITY CONTROLLER
Controller Michael E. Lamb

August 2022

The Honorable Ed Gainey, Mayor of Pittsburgh
and Members of Pittsburgh City Council

Dear Mayor Gainey and Members of City Council:

The Office of the City Controller is pleased to present this performance audit of Pittsburgh's **Department of Mobility and Infrastructure (DOMI)** conducted pursuant to the Controller's powers under Section 404(c) of the Pittsburgh Home Rule Charter. This audit addresses the formation, organization, and mission of the Department, along with the commitment to the Complete Streets initiative, the Mon-Oakland Mobility Project, the Neighborhood Traffic Calming Program, improvements to the paving program, and the Department's response to the COVID-19 pandemic.

EXECUTIVE SUMMARY

With the department's inception in 2017, DOMI became responsible for coordinating the transportation of people and goods throughout the City of Pittsburgh including functions such as paving and permitting, as well as multimodal street improvements and transportation policy development. It also manages the operation of all public rights-of-way, which includes sidewalks, curbs, streets, and bridges. The mission of DOMI is to provide the physical mobility necessary to enable the social and economic mobility of the people of Pittsburgh through the management, design, improvement, and operation of the public rights-of-way.

The formation of DOMI was hampered by delays in the city's response to its requested report from the National Association of City Transportation Officials. This report found that the formation of a department to handle the city's approach to transportation was to the city's advantage and could be operational by the spring of 2017. However, by March 2017, the city had only just codified the formation of the department and had hired its director and a few staff. Further, some of the report's suggested actions cannot be assessed due to DOMI and the previous mayoral administration being unable to furnish records. (**Recommendations 1, 2**). DOMI reported that they have partnered with the city's archivist to review, catalog, and store its earlier records.

Once operational, DOMI took over the responsibility for transportation policies, including the city's Complete Streets initiative and the Mon-Oakland Mobility Project. Complete Streets is the city's

response to the state and county requesting an all-encompassing transportation policy to link city transportation networks with ones beyond city boundaries. (**Recommendations 5, 6**). One of DOMI's largest projects to date is the Mon-Oakland Mobility Project, linking the neighborhoods of Hazelwood and Oakland, which utilizes multimodal transportation options and existing bicycle and pedestrian routes.

The Neighborhood Traffic Calming Program seeks to increase safety by reducing vehicle speed on residential streets. There are various methods to achieve traffic calming, including speed humps, road diets, line diets, and the installation of pedestrian islands. In areas in which DOMI has installed speed humps, the number of drivers exceeding the speed limit has been reduced on average by 38%. (**Recommendation 7**). The Neighborhood Traffic Calming Program has made considerable contributions to making the city's rights-of-way safer and is committed to sharing its data online.

Paving was moved from the Department of Public Works and remains a contentious issue, as there is not enough money to pave all the streets in need. It is expected that the addition of a robust catalog of street conditions available through the Cartegraph software system will enable a more equitable system to be built going forward. It is equally important to track the paved streets for signs of degradation within the contractor's warranty period and to hold utility companies responsible for repairing a street to its original condition after underground repairs are made. (**Recommendations 8, 9, 10, 11, 12, 14, 16**). Meeting these goals will require higher staffing levels. DOMI administration is actively pursuing a budget increase to hire additional staff. (**Recommendations 13, 15, 17**).

Finally, the COVID-19 pandemic required unparalleled responses from municipal governments. By May 2020, DOMI had partnered with community leaders and organizations and formulated plans to enable the redesign of city streets in response to the demands of social distancing. Many of the changes proved to be advantageous to the city and its residents and have been maintained past the acute phase of the pandemic, including the streamlined permitting process and various changes to streets and policies to make the streetscape more accessible and enjoyable by all. It is hoped that the relationships DOMI has built with community groups during the pandemic can be nurtured into collaborative partnerships in the future. (**Recommendation 18**).

Our findings and recommendations are discussed in detail beginning on page 12. We believe our recommendations will provide more efficient operations with the department. We would like to thank the Department of Mobility and Infrastructure staff for their cooperation and assistance during this audit.

Sincerely,

Michael E. Lamb
City Controller

INTRODUCTION

This performance audit of the **City of Pittsburgh's Department of Mobility and Infrastructure (DOMI)** was conducted pursuant to the City Controller's powers under section 404(c) of Pittsburgh's Home Rule Charter. This audit assesses the policies, processes, procedures, and performance data of DOMI. This is the first performance audit of DOMI as the department began operations in 2017 and is the city's newest department.

Prior to 2017, most of the duties and responsibilities of DOMI were under the city's Department of Public Works (DPW) and the Department of City Planning (DCP). The City Controller's office has conducted several performance audits of DPW. In 2009, an audit of DPW's Street Maintenance Program was performed that focused on the department's programs for street resurfacing, street repair, and snow and ice removal. Previous performance audits of DPW's Street Repair and Maintenance Program were released in 1996 and 1999, respectively.

OVERVIEW

Municipal transportation can be defined as building, operating, and maintaining assets, programs, and policies that move people, goods, and ideas around and throughout a city. Despite the importance of thoughtful, holistic approaches to this issue, cities have only recently started devoting centralized organizational structures to update processes for improving municipal transportation. Failure to consider all parts of transportation, e.g., street design, public spaces, and parking, to name a few, threatens the quality of life for residents and creates congestion for the transportation systems in the city.

With the department's inception, DOMI became the department responsible for coordinating the transportation of people and goods throughout the City of Pittsburgh. It also manages the operation of and access to all public rights-of-way, which includes sidewalks, curbs, streets, and bridges. The mission of DOMI is to provide the physical mobility necessary to enable the social and economic mobility of the people of Pittsburgh through the management, design, improvement, and operation of the public right-of-ways.

The City's Mobility Principles are as follows:

- No one dies or is seriously injured traveling on city streets.
- Every household in Pittsburgh can access fresh fruits and vegetables within 20 minutes travel of home, without the requirement of a private vehicle.
- All trips less than one mile are easily and enjoyably achieved by non-vehicle travel.
- No household must spend more than 45% of household income to satisfy basic housing, transportation, and energy needs.
- The combined cost of transportation, housing, and energy does not exceed 45% of household income for any income group.

- The design, maintenance, and operation of city streets reflects the values of our community.

Formation of DOMI

In 2015, city administration officials asked the National Association of City Transportation Officials (NACTO) to examine the current structure of Pittsburgh's approach to transportation and offer suggestions for improvement. The idea was not only to bring Pittsburgh more up to date in this field but to become a leading city of progressive transportation goals among its peers. The resulting NACTO report named *Rethinking Transportation in Pittsburgh Prepared for the City of Pittsburgh, PA* was released in the spring of 2016. This report was heavily relied upon to establish Pittsburgh's transportation policies for the future.

This report has four major findings: 1) no one person or department has clear responsibility for transportation, 2) no communication process for leadership's vision for transportation exists, 3) communicating and coordinating transportation projects is a difficult task, and 4) evaluating the effectiveness of transportation changes is not being done.

The report also outlined what worked well in other cities. Among the findings were: an agency's scope and executive's vision are important, and the agency should be structured to facilitate project delivery, collaboration, coordination, and communication. The agency must be consistent and intentional, and generally cities do struggle to define and measure transportation effectiveness.

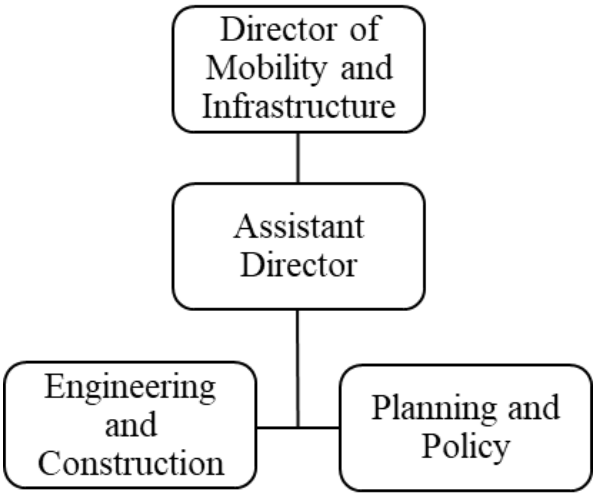
Before the creation of DOMI, the City of Pittsburgh handled transportation responsibilities among multiple departments and various divisions. For example, the DCP created plans in collaboration with the community and neighborhood objectives. DPW handled engineering projects, construction projects, and the maintenance of infrastructure. Specifically, DPW had three divisions under its Transportation & Engineering section (Traffic, Engineering and Construction), as well as a separate Operations section. DCP had a Strategic Planning division which housed the Bike/Pedestrian Planning, Long-Term Planning, and Development Review and other separate divisions which included Community Development and Zoning.

Organization, Staffing and Budget

In 2017, DOMI's mission statement was to provide a safe, sustainable, and efficient system of transportation and accessibility. The departmental overview stated "This is a new department for 2017. Once hired, the Director of Mobility & Infrastructure will be tasked with establishing the organizational structure, goals, and objectives." There were four positions budgeted in 2017 for a total of $341,182. These positions consisted of the director, who was hired in February, an assistant director of project delivery, an assistant director of policy & planning, and an administrator responsible for engineering and construction. Figure 1 shows DOMI's 2017 organizational chart.

As the following organizational charts in Figures 1-3 show, the department has grown since being established in 2017.

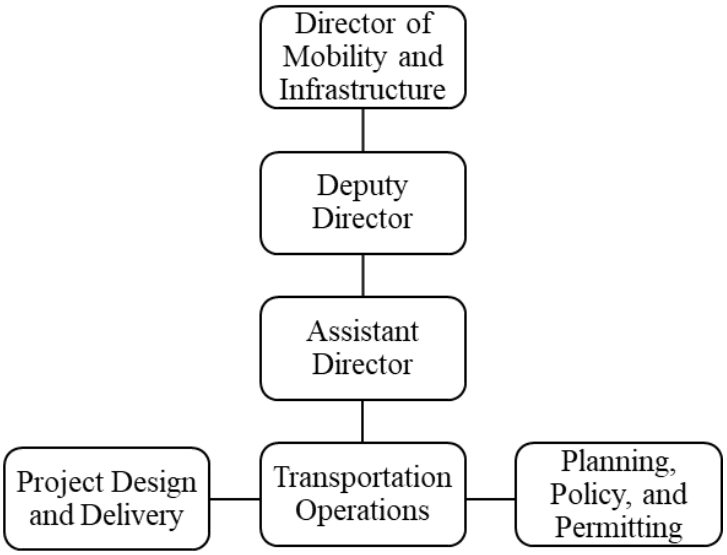
FIGURE 1
DOMI's 2017 Organizational Chart



Source: 2017 City Budget

In 2018, DOMI's budget expanded to 74 positions for a total of $4,158,124. The mission statement was to "Provide the physical mobility to support the social and economic mobility of the citizens of Pittsburgh through the management, design, improvement and operation of the public street rights of way." Figure 2 shows the 2018 organizational chart.

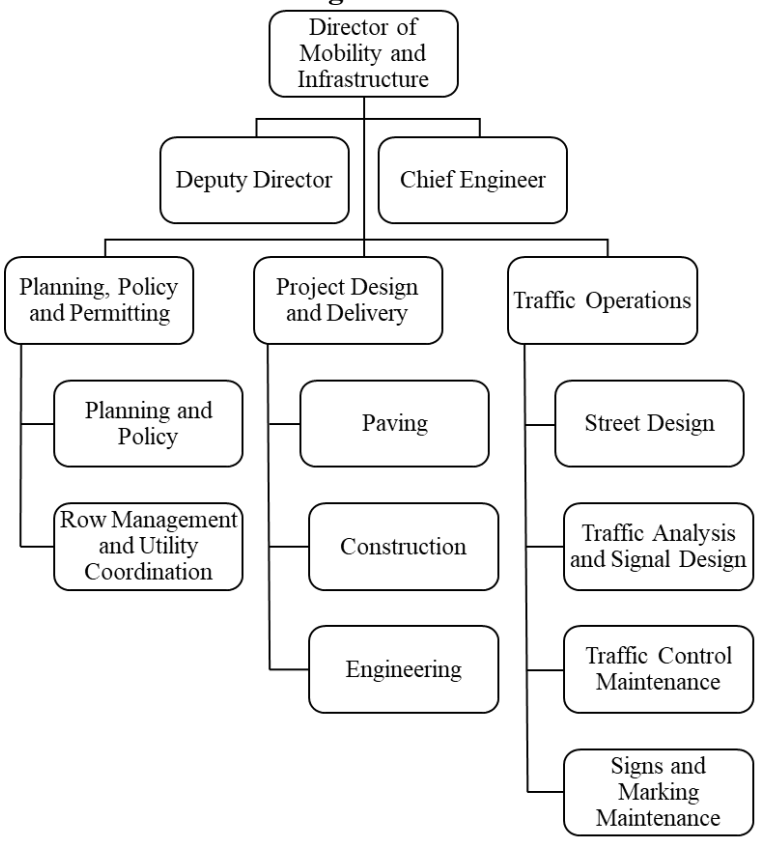
FIGURE 2
DOMI's 2018 Organizational Chart



Source: 2018 City Budget

In 2019, DOMI's budget included 95 positions for a total of $5,270,527. The mission statement was identical to 2018's statement. The department was comprised of three bureaus: Planning, Policy and Permitting, Project Design and Delivery and Traffic Operations. Figure 3 shows the 2019 DOMI organizational chart operating under these three bureaus.

FIGURE 3
DOMI's 2019 Organizational Chart



Source: 2019 City Budget

The planning, policy, and permitting bureau is responsible for the comprehensive vision, guiding policies, and permitted uses of the urban mobility network and public rights-of-way in the city.

The Project Design and Delivery Bureau is led by a Chief Engineer. This bureau is responsible for all capital improvement projects involving transportation or mobility infrastructure. This includes street and bridge work along with engineering services that are needed to address major slope failure and flood control in the city.

The Traffic Operations Bureau is led by a municipal traffic engineer and oversees the whole transportation and mobility network throughout the city.

DOMI's updated organizational chart is shown in the Findings and Recommendations section of this audit representing 2020, the final year of our audit scope.

OBJECTIVES

1. To report DOMI's formation, organization structure, mission, and responsibilities,
2. To assess Department of Mobility and Infrastructure's policies and procedures,
3. To examine the city's complete streets transportation design,
4. To report the status of the Mon-Oakland Mobility Project,
5. To evaluate the Department's performance and effectiveness,
6. To assess the traffic calming program,
7. To assess the street milling and paving process,
8. To report the status of past street maintenance audit recommendations,
9. To examine pandemic-related responses,
10. To make recommendations for improvement.

SCOPE

The scope of this performance audit is all policies, procedures, and practices related to the formation of DOMI in 2016, and the policies and procedures DOMI has implemented since its delayed launch in 2017 through 2020. Street paving data and street hump data includes 2021. Street opening fees and application fees are listed for 2021. DOMI's pandemic-related responses reported also expand to 2021. Updated costs related to the Mon-Oakland Mobility Project include 2021 and 2022.

METHODOLOGY

The auditors held an entrance conference meeting using Microsoft Teams with DOMI's director, assistant director, and fiscal and contracting supervisor, to discuss the audit objectives.

The auditors reviewed materials related to DOMI's mission primarily from NACTO and various academic papers related to intergenerational mobility and poverty.

The auditors attended the following meeting: Pedestrian Action Plan lunch and learn on June 16, 2021.

Data was requested and received from DOMI personnel including updated street hump data, paving budgets access to computer systems, Complete Streets information, and Smart Growth America's National Complete Streets Coalition.

A presentation about the City's Cartegraph system was received and reviewed. Information about Cartegraph contracts was retrieved from the Controller's Office OpenBook website. Auditors later met with Innovation & Performance employees for further information.

The auditors interviewed the City Controller's Office Engineer, who oversees and audits the contractors' paving invoices.

Auditors met with DOMI's Paving Supervisor and his staff.

Auditors met with DOMI's Inspection & Utility Supervisor and the Senior Right-of-Way (ROW) Manager.

Auditors received training in the software system called OneStop, now being used by DOMI for their permitting processes.

The auditors examined the paving spreadsheet stored at the Western Pennsylvania Regional Data Center. This file is updated weekly by Innovation & Performance (I&P) personnel. The information is available via spreadsheet or on a map. The file also contains information about other types of paving projects from 2009 to 2021, including utility work, base repairs, mechanical patching, and slab replacements.

Auditors researched and reviewed DOMI's website for the department's information pertaining to the formation, organization structure, mission and responsibilities, along with the policies and procedures. Also researched was the Mon-Oakland Mobility Project; and DOMI's traffic calming procedures and program.

Auditors researched and reviewed city budgets from 2016-2022 for relevant DOMI information.

FINDINGS AND RECOMMENDATIONS

DOMI Formation and Organization

In 2011, DCP unveiled an overall planning process for the entire city, called PLANPGH; the transportation section was entitled MovePGH. PLANPGH was a comprehensive city planning document developed to guide decision-making citywide for the next 25 years. In 2012, as an integral part of MovePGH, city administration asked IBM to conduct a study to offer recommendations around the city's transportation issues. The engineers noted the following challenges: topographical complexities, confluence of rivers disrupting the land area, adverse weather conditions restricting alternative transportation opportunities, and limited options for expanding current street networks. It was further noted Pittsburgh's urban core doubled every workday with 52% of commuters taking public transportation. In March 2011, Port Authority reduced services by 15% due to budgetary cuts. Taken in combination, these issues were flagged as the biggest challenges for the city's comprehensive transportation strategy.

NACTO is a coalition of Departments of Transportation in North American cities. NACTO's mission is a commitment to "raising the state of the practice for street design and transportation by building a common vision, sharing data, peer-to-peer exchange in workshops and conferences and regular communication among member cities." When the new mayoral administration for the City of Pittsburgh asked for an analysis of the city's approach to transportation, NACTO was contacted to assess the situation and their report was released in the Spring of 2016. Their predominant finding was no one had clear responsibility for Pittsburgh's transportation issues. Furthermore, during the time the city was under Act 47, the DCP was primarily managing existing transportation projects rather than proactive planning, due to staffing and fiscal constraints.

The NACTO report offered a few different remedies for the situation, and the city administration chose the creation of a new department, which radically changed the city's departmental landscape. Creating a new department required a major buy-in by city employees and citizens. Therefore, the choice of Director was noted as the single most important step to improve mobility and infrastructure in the city.

NACTO stated that the Director of this new department had four immediate responsibilities as follows: 1) coordination of transportation within Pittsburgh's government, 2) serving as the city's ambassador to external stakeholders, 3) establishing and promoting a cohesive vision for mobility and infrastructure, and 4) defining evaluation metrics to assess progress.

The report also offered a pathway to form a functioning all-encompassing transportation department. The pathway and the city's actions are detailed in Table 1. The first three columns are taken from the report, the other columns are the city's adherence to them. Note, the report refers to what will become "DOMI" as "DOTI".

TABLE 1
NACTO Recommended Timeline and City Response 2016

Projected Date	Activity	Detail	Completion Date and Activity
April 2016	Mayor holds all-hands meeting with DCP/DPW staff	Mayor, DCP and DPW should meet and explain goals for reorganization and solicit employee engagement. As the report states, 'the importance of employee engagement in change management cannot be underscored.'	Date: None The mayor's office was asked for notes from this meeting, and they were unable to be produced.
April 2016 – June 2016	Recruit & hire Director of [DOMI]	Pittsburgh should conduct a nationwide search for the Director position, while also encouraging internal and local candidates to apply.	Dates: September 2016-March 2017 DOMI Director position is posted on 9/26/2016. DOMI Director hired February 2017. DOMI was created by ordinances 15,16, and 17 of 2017, final action date 3/14/2017.
Summer 2016	[DOMI] begins work	The Mayor and Pittsburgh should actively promote [DOMI] through the press and external stakeholders to help emphasize that transportation is a priority for Pittsburgh.	The administration begins discussing the formation and role of DOMI to the press in September 2016, coinciding with the Director position being posted. The administration was unable to produce materials detailing introducing the Department to external stakeholders.
Summer 2016	Begin weekly internal transportation coordination meeting	Each week, [DOMI] should convene a meeting with relevant city staff to discuss current projects, upcoming projects, and relevant impacts on other stakeholders, and ideas for future projects. This group should also begin to establish a set of measures of effectiveness and outcomes for Pittsburgh to work towards.	DOMI unable to produce materials detailing the activity.

TABLE 1 (continued)
NACTO Recommended Timeline and City Response 2016

Projected Date	Activity	Detail	Completion Date and Activity
Summer 2016	Begin monthly external stakeholder coordination meeting	Each month, [DOMI] should convene a meeting with external stakeholders such as Port Authority, etc. and key city staff to discuss current and upcoming projects as well as any other areas needing coordination.	DOMI unable to produce materials detailing the activity.
Summer 2016	Employee engagement meetings	Upon starting, [DOMI] should take time to meet with city employees both one-on-one and in groups to solicit feedback. This is a key step in change management and should include employees on all levels (from top managers to street maintenance crews).	DOMI unable to produce materials detailing the activity.
Summer 2016	External stakeholder "road show"	[DOMI] should also spend a lot of their time meeting with the key external stakeholders in transportation both to establish working/personal relationships as well as to gauge their understanding of what does/does not work in Pittsburgh. These meetings will also be helpful informing what goes into the reorganization & vision/priorities plan.	DOMI unable to produce materials detailing the activity.
Fall 2016	Vision/priorities plan and reorganization planning processes begins	Based on meetings inside and outside of government, [DOMI] will convene a small group to form a more complete set of goals and strategies to support the city's priorities and vision for transportation. Throughout the planning process, internal and external stakeholders should provide feedback and counsel.	DOMI unable to produce materials detailing the activity.
Winter 2017	Release vision/priorities plan and present reorganization plan	The [DOMI] and the mayor should release the transportation vision/priorities and reorganization plans internally to city staff on all levels first.	DOMI unable to produce materials detailing the activity.
Winter / Spring 2017	Reorganize agencies, continue piloting new collaboration processes, and begin measuring effectiveness of policies/projects.		In discussions with DOMI leadership, it is felt that DOMI did not properly start until 2018.

Source: First three columns paraphrased from *Rethinking Transportation in Pittsburgh Prepared for the City of Pittsburgh, PA*

The steps listed above were considered by NACTO to be attainable by the City of Pittsburgh in the establishment of the department. Instead, due to significant delays in getting Council to codify the department, the leadership of the department could not be hired for almost a year beyond the expected time. The fact that a massive overhaul of current city departments first had to be approved by Council should have been navigated as soon as the NACTO report was published. Responsibility of delays is outside the scope of this audit; however, this should be a lesson for future administrations.

The auditors requested documentation from DOMI regarding the department's formation. No documentation was available. It is concerning that DOMI was unable to produce materials documenting its own origin and early evolution. Records should be kept at all times, particularly at the beginning of a new venture. Employee turnover occurs in all places of employment, and without records, there is no concrete evidence of why certain decisions were made at the beginning.

Finding: No records could be produced by DOMI detailing their formation as a department.

RECOMMENDATION 1:

A thorough review of records should be undertaken, and those records should be digitized and catalogued for documentation purposes.

DOMI Mission

In the landmark study "The Impacts of Neighborhoods on Intergenerational Mobility," published in the Quarterly Journal of Economics, it was determined that access to transportation is the factor most likely to influence household economic success. Commuting time has emerged as the single strongest factor in the odds of escaping poverty. In other words, the longer the average commute time, the less likely a low-income family will be able to move up the economic ladder. Nathaniel Hendren, one of the study authors, was quoted in the New York Times as saying "... this relationship between transportation and social mobility is stronger than that between crime, elementary school test scores, or the percentage of two-parent families in a community."

With this in mind, the newly formed team at DOMI established the following mission statement, called The City's Mobility Principles:

1. No one dies or is seriously injured traveling on city streets.
2. Every household in Pittsburgh can access fresh fruits and vegetables within 20 minutes travel of home, without the requirement of a private vehicle.
3. All trips less than 1 mile are easily and enjoyably achieved by non-vehicle travel.
4. No household must spend more than 45% of household income to satisfy basic housing, transportation and energy needs.

5. The combined cost of transportation, housing and energy does not exceed 45% of household income for any income group
6. The design, maintenance and operation of city streets reflects the values of our community.

This mission statement is laudable for its vision; however, it is difficult to track progress given that will take some time to realize. It may be helpful to add trackable metrics towards each mission point to share progress with the public.

Finding: According to DOMI administration, DOMI lacked a mission statement when it was formed and DOMI administration needed to develop one themselves, The City's Mobility Principles were developed by DOMI administration as the Department's mission statement, after the formation of the Department.

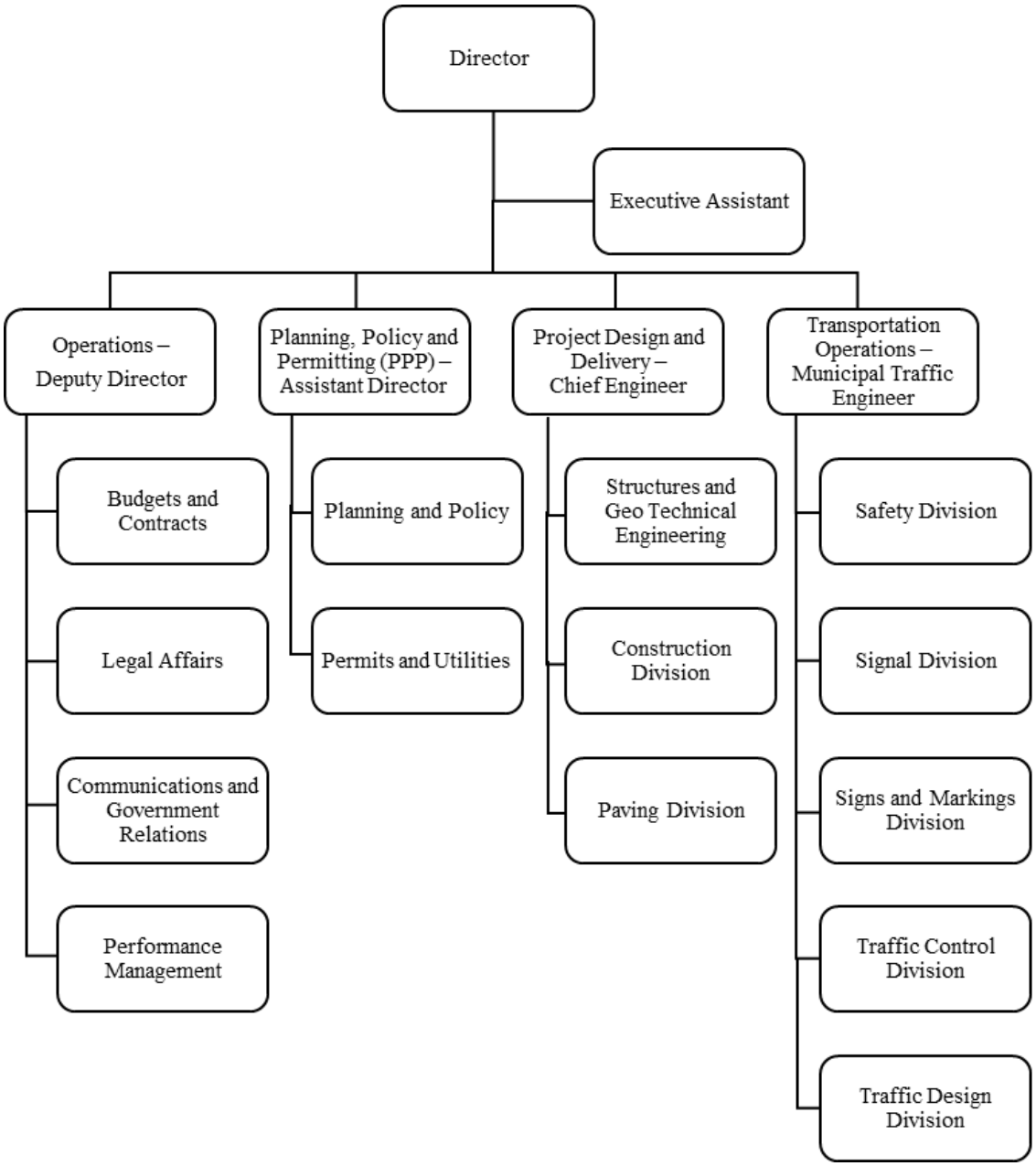
RECOMMENDATION 2:

The director of DOMI stated that the mission statement has not been analyzed to check for progress towards its goals. The Controller's Office understands that recent years have offered different and more difficult challenges. It is recommended that DOMI revisit and construct some concrete short-term steps that lead to the attainment of these goals.

Figure 4 shows the 2020 organizational chart outlining DOMI's structure. A total of 70 positions from two city departments were transferred to DOMI, they included Public Works (67) and City Planning (3). DOMI created 27 additional positions to fulfill their staffing needs. In 2020, DOMI's budget was $5,866,608 with 97 positions. The Director told the auditors that there were 17 vacancies at end of 2020.

A fourth bureau, Operations, was added in the 2020 DOMI organizational chart. However, this addition was not explained in the 2020 city budget (nor was it in the 2021 and 2022 budgets). The Operations bureau is responsible for budgets and contracts, legal affairs, communications, government relations, and performance management procedures.

FIGURE 4
DOMI's 2020 Organizational Chart



Source: DOMI

More detailed information on the structure of DOMI's four bureaus can be found in the appendix.

RECOMMENDATION 3:

DOMI administration needs to update their organizational chart in the city's budget and other documents to properly explain each of the four bureaus' responsibilities. The Operations bureau's responsibilities and duties are missing.

DOMI Responsibilities

In the past, the city's transportation responsibilities were stretched across multiple departments. This was specifically criticized as being inefficient and ineffectual in the NACTO report. NACTO's primary recommendation was the creation of a centralized department to improve operations. Once DOMI was operational, a more thorough list of responsibilities was developed with a lead division from within DOMI and partners, as listed below:

Administration and Fiscal Management

- Human resources liaison and processing (Staff Lead: Fiscal and Contracting Supervisor, Partners with HR, OMB)
- Payroll and Timekeeping (Staff Lead: Fiscal and Contracting Supervisor, Partners: HR, OMB)
- Staff Development and Performance Planning (Staff Lead: Deputy Director, Partners: Office of the Mayor)
- Contracts, Grants and Agreements (Staff Lead: Deputy Director, Partners: OMB, Law, Controller's Office)
- Legislation and Legal (Staff Lead: Deputy Director, Partners: Law)
- Communications, Website, and Media Relations (Staff Lead: Director, Partners: Office of the Mayor)

Planning, Policy and Permitting

- Equity and performance metrics (Staff Lead: Assistant Director, Partners: Office of the Mayor)
- Planning principals and standard policies (Staff Lead: Assistant Director)
- Area and corridor transportation planning (Staff Lead: Planning, Partners: DCP)
- Modal network planning (bicycle, pedestrian, truck, etc.) (Staff Lead: Planning, Partners: DCP)
- Safety and mobility data analytics (Staff Lead: Planning, Partners: I&P
- Traffic Impact Analysis (Development Review) (Staff Lead: Planning, Partners: DCP (Zoning)
- Mobility as a Service (MaaS) and curbside policy and management (Staff Lead: Policy)
- Transportation policy development (Staff Lead: Policy)
- Safe Routes to School program (Staff Lead: Policy, Partners: Pittsburgh Public Schools)
- Right-of-Way permitting and management (Staff Lead: Permitting, Partners: PLI
- Utility coordination and telecommunications (Staff Lead: Permitting)

- Permit inspection and enforcement (Staff Lead: Permitting, Partners: PLI)
- Streetlights, transit shelters and maintenance contract management (Staff Lead: Permitting)

Traffic Operations

- Traffic design and operation standards (Staff Lead: Municipal Traffic Engineer)
- Traffic signal design and timing (Staff Lead: Municipal Traffic Engineer)
- Traffic calming program (Staff Lead: Traffic Signal Division)
- Complete Streets and Safety Project Design (Staff Lead: Traffic Design Division)
- Development Review (Traffic) (Staff Lead: Signal Design Division)
- Traffic Signal Maintenance (Staff Lead: Traffic Control Division, Partners: 911/311)
- Roadway line and sign maintenance (Staff Lead: Signs and Markings Division)

Project Design and Delivery

- Construction standards and design specifications (Staff Lead: Chief Engineer)
- Bridge design, construction, and maintenance (Staff Lead: Engineering Design)
- Slope failure mitigation (affecting public right-of-ways) (Staff Lead: Engineering Design, Partners: PLI/DPW)
- Flood mitigation (affecting public right-of-way) (Staff Lead: Engineering Design, Partners: Public Safety
- Wall and tunnel design, construction, and maintenance (Staff Lead: Engineering Design)
- Street, sidewalk and trail design and construction (Staff Lead: Engineering Design, Partners: DPW)
- Development review (civil engineering) (Staff Lead: Engineering Design, Partners: DCP, PLI)
- Concrete, Brick and Block stone street repair (Staff Lead: Engineering Design)
- Asphalt resurfacing and inspection (Staff Lead: Paving Division)
- Construction inspection (Staff Lead: Construction Division)
- Mitigation of emergency disruptions to streets (Staff Lead: Construction Division, Partners: DPW)

Finding: DOMI has a large online presence for members of the public seeking news about current and past individual projects, as well as a vision for the department. However, basic information about the Department's organizational structure and range of responsibilities is not found on the Department's 'About DOMI' webpage.

RECOMMENDATION 4:

DOMI administration should work with I&P to update their website to make information about the department, including divisions, names of division leaders, phone numbers and addresses, and other pertinent information more accessible to the public.

Complete Streets

'Complete Streets' is a commonly used term and is defined as a transportation design that requires streets to be planned, operated, and maintained to enable safe access for users of all ages and abilities regardless of their mode of transport. Complete Streets also considers the ongoing climate crisis as well as seeks ways to boost neighborhood business districts and reverse decades of inequitable transportation decisions which allowed some neighborhoods to prosper at the expense of others. The mayor's Complete Streets executive order in April 2015 coincided with Allegheny County's Active Allegheny Plan and the Southwestern Pennsylvania Commission's Long-Range Plan calling for the city to prepare a Complete Streets network to connect the city.

The City's Complete Street policy, approved in 2016, includes in the vision statement the mandate that all transportation improvement projects be opportunities for multimodal street improvements. These improvements include compliance with Americans with Disabilities Act (ADA) modifications such as curb cuts, crosswalks, audible signals (with pedestrian buttons), and adequate sidewalks; as well as bike lanes, runnels, steps, signage, street trees, bus lanes, enhanced transit stops and streetscape, and traffic calming elements, among many others. All these potential improvements are now to be considered as a matter of routine.

The City's Complete Streets policy contains the following principles: experience, environment, economy, accessibility, and efficiency. These principles are summarized below accordingly:

Experience

Complete Streets shall provide a safe and comfortable travel experience for all roadway, street, and transportation infrastructure users. When designing new or updating existing streets, the city must consider the safety of all users: drivers of motor vehicles, pedestrians, people on assisted mobility devices, people on bicycles, and those waiting for transit. Research has shown that the vast majority of road crashes are preventable (World Health Organization, 2004), and designing streets and intersections with all users in mind can greatly reduce the risk of traffic-related fatalities.

Complete Streets shall contribute to the vitality of the public realm, providing users with a variety of interesting sensory experiences and access to open space. Streets make up a sizable proportion of public space in a city and need to be thought of as an integral part of the public realm. When streets and intersections maximize the ways the public can experience public space, retail and neighborhood ties are strengthened.

Environment

Complete Streets shall preserve and protect Pittsburgh's environment. By encouraging less automobile dependence, greenhouse gases will be reduced. This will help the city's sustainability and climate goals of reducing transportation emissions by 50% by 2030 (City of Pittsburgh Office of the Mayor, 2015). This cannot come at a more critical time, as the metropolitan area ranks 6th in the nation for year-around soot pollution and the American Lung Association graded the county an F for overall air quality. Additionally, incorporating green

infrastructure in street design would alleviate the amount of stormwater flowing through Pittsburgh's combined sewer system.

Complete Streets improvements shall incorporate flexible design approaches and be context sensitive. Due to Pittsburgh's unique topography, neighborhoods, and weather, Complete Streets must not take on a 'one-size-fits-all' approach, but rather incorporate a provision for flexibility of design and a broad approach to ensure targeted appropriate solutions.

Complete Streets shall improve the health of Pittsburgh residents. Two-thirds of Allegheny County residents are overweight or obese and more than a quarter report not getting adequate daily physical activity according to the Allegheny County Health Department (Allegheny County Health Department, 2015). As part of Allegheny County's Active Transportation Plan, Complete Streets chooses to integrate physical activity and active transportation options into Complete Street plans. Mental health is also benefited via incorporating visually pleasing streetscapes and street trees into the public right-of-way.

Economy

Complete Streets shall build a stronger, more resilient workforce that has access to multiple mobility options. Most Pittsburgh residents have an average commute time of less than 25 minutes (U.S. Census, 2014) and more than half of the workers in Pittsburgh's largest job center commute by a mode other than driving alone (Green Buidling Alliance and Envision Downtown, 2016). Having options that include no or low-cost commuting choices helps lift low-income people out of poverty, and in turn, build a stronger economy.

Complete Streets shall be implemented with fiscal responsibility. Large roadway improvements exclusively benefiting automobile traffic can cost millions of dollars. Concentrating on pedestrian, bicycle, and transit improvements keep costs to a fraction of that and benefits many people. If projects can be coordinated with existing paving and utility work, money can be saved.

Access

Complete Streets serve all users and all modes. Since the city is home to people of all ages and abilities, Complete Streets should service the needs of the entire city. Anyone, from a child to a senior to a person with a disability, should feel safe and comfortable using public rights-of-way.

Complete Streets are implemented equitably and inclusively throughout the city. Complete Streets can be a tool of social justice that reverses decades of auto-only decision making. By prioritizing safe, accessible, and affordable mobility in all of Pittsburgh's neighborhoods, trust can be rebuilt in underserved neighborhoods, leading to healthier communities and improved social equity.

Multi-Modal Efficiency

Complete Streets shall be part of a larger connected network and projects shall consider all modes in all phases. Mobility requires a connected network to function. The city will

prioritize projects that contribute to a connected and complete network for all modes of travel. Every city project or improvement will consider network links in the transportation system.

The city shall incorporate intelligent technology in Complete Streets, when appropriate, in order to improve the way intersections and streets function for all road users. Upgrading the city's transportation infrastructure using smart technology can reduce pollution, improve traffic congestion, and increase safety. Upgrades like Transit Signal Priority for buses and freight and intelligent cameras for detecting bicycles and pedestrians make the streets safer and more efficient for all users.

Pittsburgh's Complete Streets Policy can serve as an innovative model for the region, state, and nation. Pittsburgh was one of the first municipalities in western Pennsylvania to adopt a Complete Streets Policy and is uniquely positioned to share knowledge and set precedents for the region, state, and nation.

The cornerstone of the Complete Streets Policy is the mandate to make all improvements safer and more accessible for all users. Pittsburgh's Complete Streets Policy applies to all city roads, sidewalks, bridges, trails, and step connections; publicly accessible land; and all public connections in between that facilitate mobility in the City of Pittsburgh. As such, the following criteria was established for input by the Complete Streets Policy (taken verbatim):

1) *Any street improvements initiated or that require a permit or approval by the Department of Public Works that proposes permanent changes to the width of the sidewalk, curb line, travel lanes or intersections, including full depth reconstruction projects, large curb cuts, signal upgrades and improvement projects that trigger traffic studies.*
2) *Any local, state, or federally funded project undertaken by the city, Urban Redevelopment Authority, or other local governmental or quasi-governmental agency, including planning, improvement, and maintenance projects which alter or perform work in the right-of-way regardless of the need for a permit.*
3) *Public and private developments subject to review by the Planning Commission, the Zoning Board of Adjustment, or Site Plan Review, where the specific review criteria include assessment of potential transportation impacts, including proposed developments that trigger Transportation Impact Studies.*

Exemptions to this policy can be made with supporting evidence: specific users are prohibited (pedestrians on interstate highways), integration of Complete Streets would cause significant hardship or burden upon the city, and if Complete Street elements would be structurally unfeasible.

The Complete Streets initiative was adopted by the Planning Commission and was unanimously approved by City Council in November 2016. The Complete Streets team held a policy launch and public comment meeting in July 2017 which outlined its history from inception and detailed its policy development. Although DOMI's website provides information about policies and future plans, reports on progress towards their goals are not found.

Finding: The information about Complete Streets is easily accessible on the city's website. Even though DOMI has a robust social media presence, information regarding progress towards these goals is not being published.

Many DOMI Complete Streets projects took place before the COVID-19 pandemic, therefore review and analysis of preliminary data would have taken place during the pandemic, when DOMI staff had to pivot their attentions elsewhere.

Finding: Complete Streets reports were mandated by resolution to be submitted to City Council every two years. This has not yet occurred.

Reports such as New York City's Vision Zero Year Four Report from March 2018, illustrate the reasoning behind decisions made and the statistics that show that various safety measures are working to keep everyone safer on city streets. A report such as this could serve as valuable public outreach and could be drawn heavily from the City Council report.

RECOMMENDATION 5:

DOMI administration needs to update Council on the Complete Streets progress and continue to meet the biennial updated reporting requirement.

RECOMMENDATION 6:

DOMI should update their website as the Complete Streets goals are accomplished, perhaps in a format like New York City's linked above. If results are shown that Complete Streets projects work, more public interest and acceptance might then occur.

Transportation Improvement Initiatives

As part of DOMI's transportation improvements, the Mon-Oakland Mobility Project began in the past few years. This plan included adding a mobility corridor (parallel roadway/ trail) to connect Oakland and the adjoining neighborhoods. This corridor would run between Hazelwood Green and Hazelwood, through the lower part of Greenfield Avenue, along Junction Hollow Trail in Schenley Park and then into Oakland. The corridor would be open to bicyclists, pedestrians, and micro transit options that may include electric scooters and human operated electric shuttles. The shuttle system is referred to as the Mon-Oakland Connector.

Mon-Oakland Mobility Project

The city's Mon-Oakland Mobility Project focused on the development, design, and construction of infrastructure improvements to create a publicly accessible mobility corridor that connects various public transportation modes (motor vehicles, pedestrians, bikes, or other forms of transit) to the neighborhoods of Hazelwood, Greenfield/ Four Mile Run, and Oakland. This

mobility corridor program originally included expanding the network of bicycle and pedestrian routes, trails, and a roadway along Oakland's Junction Hollow Trail through Greenfield's Four Mile Run, and onto Hazelwood's Sylvan Avenue. The project would also address the flooding and stormwater overflow issues and include the implementation of green infrastructure.

This direct connection of the city's Hazelwood neighborhood, with its historic industrial past, to Oakland, the image of its high-tech future and medical hub, using various modes of transportation would provide easier access to employment opportunities, educational institutions, and medical care facilities to the residents living in these neighborhoods. An expansion of the Three Rivers Heritage Trail would occur, as well as making improvements to South Neville and Joncaire streets in Oakland, Saline Street in the Four Mile Run area, and Sylvan Avenue and Gloster streets in Hazelwood. According to the district's City Councilperson, the road part of the project was eliminated due to strong opposition from residents.

Preliminary Studies

Three main studies were considered by DOMI in the design phase of the Mon-Oakland Mobility Project. PWSA's Green First Infrastructure Plan completed in 2016, emphasized the need for green infrastructure to mitigate flooding in the Four Mile Run area. In 2017, Pittsburgh Parks Conservancy completed a preliminary engineering design for the Four Mile Run area. This included green infrastructure, park improvements, and mobility facilities. Also, in 2018 PWSA completed a detailed engineering design for stormwater management for this area.

The original Mon-Oakland Mobility Project had three phases: the Study Phase, Phase One, and Phase Two. The Study Phase collected information on the best route to create the connector and investigated what residents wanted from the project. The other two phases focused on creating the project.

The Study Phase began in 2018, when DOMI held three public meetings (January 18, February 20, and May 22) to gather public opinion on the building, planning, and engineering of the project. The first public meeting consisted of organizers of the Mon-Oakland Mobility Project and residents from the neighborhoods that would be affected by the project. Discussions centered around the studies performed by PWSA's stormwater management design and the Parks Conservancy's Four Mile Run improvements.

The second public meeting addressed all concerns from the first meeting, the priorities of each neighborhood group in the design of the project, location constraints, and the technical aspects of creating an effective connection. Alternative routes and technology to the proposed design, such as electric bicycles and shuttles, were also discussed. Other topics discussed included: environmental threats, connectivity and access of the route, development and implementation of sustainable mobility, safety, the quality of life of all the residents in the neighborhoods, and the two-year time frame for completion.

The consensus from the second public meeting found citizens selected electric scooters, electric bike-share systems, and electric shuttles to be the ideal solutions. Designers of the project stated the importance of allowing traditional means of mobility, such as pedal bicycles

and pedestrian traffic, to still have access to the routes. Private vehicles and full-sized transit buses would not have access to the routes.

The third public meeting shared the findings of the mobility study conducted by DOMI and discussed the final design of the Pittsburgh Water and Sewer Authority's project in Four Mile Run.

Concerns for the project suggested by neighborhood residents included:

- Exploring the demand for connectivity access between the neighborhoods
- Preserving the natural integrity of pre-existing parks and trails
- Fulfilling the project in a zero or low-carbon manner
- Supporting economic revitalization for all
- Integrating with the public transit system, *not* adding frequent bus/shuffle traffic to the surrounding neighborhoods
- Addressing/not adding to the stormwater flooding or landslide slope failure in Mon Valley neighborhoods

Goals of the project:

- Promoting sustainable mobility and development
- Preserve/enhance neighborhood/traveler safety
- Buildable/operable in near term (two years from the meeting date)

Throughout the Study Phase, the following groups and companies were consulted in the design of the Mon-Oakland Mobility Project:

- City of Pittsburgh Department of Mobility and Infrastructure
- Consultant team from Michael Baker International
- Oakland Planning and Development Corporation
- Pittsburgh Parks Conservancy
- Pittsburgh Water and Sewer Authority
- The Run Resident Action Team
- Squirrel Hill Urban Coalition
- Urban Redevelopment Authority of Pittsburgh

Three additional public meetings were held to discuss the design of the project, including: landscaping and stormwater improvements in the Four Mile Run area. Two additional virtual public presentations were also held. Phase One of the project was scheduled to start in Oakland and be focused on the Junction Hollow and Four Mile Run segments. Drafting of the design began in the Summer of 2019 and include geotechnical investigation, preliminary design, LIDAR surveying, and mapping development.

The bulk of Phase One and Phase Two work has not commenced because they require the completion of the Pittsburgh Water and Sewer Authority Four Mile Run Stormwater Improvement Project design, which currently is 90% complete according to the PWSA's website.

There were also six ‘stakeholder’ committee meetings held during the design phase that involved numerous community groups to gather feedback, concerns and encourage the public engagement process surrounding the project.

The stakeholder committee included representatives from: Bike Pittsburgh, CMU, Greenfield Community Association, Hazelwood Green, Hazelwood Initiative, Oakland Business Improvement District, Oakland Community and Economic Development, Oakland Transportation Management Association, Pittsburgh Community Reinvestment Group, Pittsburgh Technology Center Association, Port Authority of Allegheny County, The Run Resident Action Team, Squirrel Hill Urban Coalition, University of Pittsburgh, UPMC

There was one resident advisory meeting held for continued public engagement. The resident advisory group included representation from: The Run Resident Team, Squirrel Hill Urban Coalition, Hazelwood Initiative, Oakland Planning and Development Corporation, Greenfield Community Association and Junction Hollow Coalition.

Phase Two of the project would include improvements to Sylvan Avenue, including adding onto the Three Rivers Heritage Trail, and additional bicycle and pedestrian connectivity from Four Mile Run to Hazelwood. Phase Two would include the mobility options of the project, including bicycle kiosks, an electric shuttle, and a possible light-rail system. The timeline for Phase Two began with preliminary designs in Fall of 2019 with an estimated final design and final bid packaged by Fall of 2021.

Study Phase Costs

As of May 22, 2018, $9,472,500 was spent on the Study Phase portion of the project. Costs were broken down into three categories: street improvements, bicycle and pedestrian connections, and charging locations and kiosks for an electric bike-share system. Table 2 shows the costs associated with each category.

TABLE 2

Mon-Oakland Mobility Project Costs of Study Phase	
Category	**Amount**
Street Improvements for South Neville, Joncaire, Saline	$2,246,600
Street Improvements for Sylvan and Gloster	$4,755,700
Bike and Pedestrian Connections	$1,794,200
Charging Locations and Kiosks	$ 676,000
TOTAL	**$9,472,500**

Source: Four Mile Run Watershed and Mobility: Stormwater Improvements & Mobility

Phase One Design Costs

In addition to the Study Phase Costs listed above, DOMI's total costs spent on Phase One design amounted to $1,459,307.33 (including costs in 2021 & 2022). The yearly breakdown of these design costs are: $182,251.22 for 2019, $777,462.22 for 2020, $489,217.34 for 2021 and $10,376.55 as of April 7, 2022.

2020 Project Updates

There were two additional public meetings held virtually in October of 2020 to discuss the status of the project. The purpose of the meetings was to provide updated information on the designs for the project, how park landscapes would be affected, and project operations.

In December of 2020, the Joint Permit for the Mon-Oakland Mobility Project and the Pittsburgh Water and Sewer Authority Four Mile Run Project was posted on DOMI's website for public viewing. This Joint Permit included construction drawings, street cross sections, erosion and sediment pollution control plans and post-construction stormwater management plans.

Hazelwood-Oakland Shuttle

The original proposal for the shuttle was made by Almono LP, the primary landowner of Hazelwood Green. The owners of this limited partnership are made up of the Richard King Mellon Foundation, the Claude Worthington Benedum Foundation, and the Heinz Endowments. This shuttle would include stops near Carnegie Mellon University and the Hazelwood Green site by way of Four Mile Run and Junction Hollow.

The shuttle was to be an electric, human-operated, van-like vehicle that operated a six-mile loop between Hazelwood and Oakland with stops in between. It would use a trail as well as public streets. Almono LP stated they would fund the shuttle operations and obtain an operating permit from DOMI. The shuttle was expected to be free to the public and serve 180 commuters a day.

However, residents pushed back against the proposed shuttle and the anticipated $23 million budget of the project. There was vocal concern the shuttle would be a misuse of taxpayer dollars. Public feedback indicated it would not meet the transportation needs of existing residents in the areas, and residents suggested putting the money towards improving the existing public transportation in Oakland and Hazelwood.

The following is a breakdown of how the remaining $23 million budget will be spent: $3.1 million to realign and reconstruct Boundary Street to provide safe and accessible pedestrian and bicycle accommodations to Schenley Park; $250,000 to restore the Three Rivers Heritage Trail through Junction Hollow (it will be disrupted by PWSA for stormwater remedial work); $2 million in added park and trail features in Schenley Park; $3.7 million to connect Junction Hollow to Panther Hollow Lake via a new tunnel beneath the rail tracks; $5.7 million to provide

a direct connection to the Eliza Furnace Trail and make improvements; $1.7 million to stabilize and reopen Sylvan Avenue right-of-way as a trail connection; $950,000 in lighting and landscaping improvements for the Sylvan Trail and $2.2 million for improvements to Sylvan Street.

In December 2019, a Consolidated Shuttle Route was proposed by the developers of Hazelwood Green. Hazelwood Green is the former steel mill site located on 178 acres of Hazelwood's riverfront along the Monongahela River. The Hazelwood Green site is close to downtown and is designed for open green space along with commercial, residential, and light industrial real estate. This plan route consists of consolidating the shuttles utilized by the University of Pittsburgh, Carnegie Mellon University, and the University of Pittsburgh Medical Center to create a unified network of shuttles. The estimated operating cost was $1.5 million annually and would take an estimated 2-3 years to become operational. This network of shuttles would operate on a 4.6-mile loop with approximately 15 stops along the route. The shuttle would take about 23 minutes per loop and operate 18 hours a day.

Finding: The auditors found that multiple names for this shuttle program were used to reference it. This causes confusion to the public. For example, Mon-Oakland Shuttle, Mon-Oakland Connector Shuttle or just Mon-Oakland Connector were found to be used interchangeably.

2022 Project Revision

While out of the scope of this audit, in February 2022, the newly elected mayor announced the end to the Mon-Oakland Connector project, which was part of the Mon-Oakland Mobility Project. The mayor released a statement that said, in part, "This decision was made in consultation with community leaders and transit advocates. The revised Mon-Oakland project will no longer support a vehicular shuttle between Oakland and Hazelwood (the Mon-Oakland Connector). Instead, the City of Pittsburgh will prioritize increased connectivity and equitable transit improvements by addressing the Boulevard-Bates-Second Avenue Corridor."

The mayor's revised plans eliminated the original shuttle route design which included the Oakland-Hazelwood shuttle. The new plan now includes improvements to Bates Street, the East Parkway Interchange, and Second Ave to relieve traffic congestion between Oakland and Hazelwood and to improve public transportation. The mayor intends to work with Carnegie Mellon University, the University of Pittsburgh, and the Port Authority of Allegheny County to accomplish these goals. The mayor also wants to upgrade bicycle, pedestrian, and stormwater infrastructure between Oakland and Hazelwood, specifically in Junction Hollow, Four Mile Run, and Hazelwood's Sylvan Street. He believes these plans will bring about more green infrastructure jobs.

The revised Mon-Oakland Mobility Project will still create improvements in green stormwater infrastructure to mitigate flooding in the Four Mile Run area, a new recreational trail for better access to the Schenley Park trail system, and a new pedestrian trail to connect Oakland and Hazelwood.

Modifications to Already Existing Transportation Modes

Historically, transportation planning has been more focused on drivers instead of all users of the public sphere. Under DOMI's Complete Streets policy, all improvements must consider all users of public corridors. Examples of these improvements include bike lanes, bump outs, curb ramps, signage, green infrastructure, traffic signal improvements for drivers and pedestrians, street designs, and safe routes to schools. DOMI's overall approach is to make city infrastructure more user-friendly and safer for everyone.

Neighborhood Traffic Calming Program

Traffic calming is a traffic management approach that uses physical design changes to help alleviate danger to drivers, pedestrians, and all users of public streets. Since the most substantial danger comes from drivers, various design elements are implemented to reduce excessive speed or other risky driving behaviors. Strong and safe multi-modal access between neighborhoods helps to improve transportation means throughout the city.

The framework of neighborhood traffic programs includes the following components: Engineering, Education, and Enforcement. Engineering happens at the city planning and public works level. Engineers transform the physical environment of the city street with wise usage of street design and planners examine all possible transportation modes available and consider ways to have them coexist harmoniously. Various education programs are offered throughout the city including classes and instructions at parks facilities, presentations on how to ride a bike safely in a city environment, and speakers at schools that educate children on how to safely walk to and from school. It should be noted that DOMI also promotes school safety through its own Safe Routes to School program. Lastly, Enforcement and is the responsibility of the police department. Enforcement can take the form of stopping drivers for speeding or erratic driving, including detaining cyclists and pedestrians for their unlawful behavior.

Pittsburgh's Neighborhood Traffic Calming Program seeks to increase safety by reducing the speed on residential streets. Residents can request that a street be included in the program. To request a street to be considered for inclusion into the program, an application needs to be completed. The application includes the following: street location, council district, and neighborhood; the requester's contact information and any neighborhood group affiliation, if any. Also, the following questions need to be addressed: how close do you live to the street in question (requesters must live in the immediate area), traffic concerns or issues, who is most impacted by issues on the street, and the requestor must demonstrate that they have tried to address the issues with the location's representative on City Council or their staff. Prior to the pandemic, requesters were asked to submit a petition and gather signatures, but as of March 2022, this requirement is still waived.

Once the application has been submitted, DOMI staff assesses the street request for eligibility. These eligibility criteria are as follows: the street must be owned by the City of Pittsburgh, have a maximum of two travel lanes, be a local, collector or minor arterial street, and have a roadway grade less than or equal to 13%.

Street applications passing the initial eligibility screen will then be evaluated by staff for their speed and volume of traffic. The requirement for eligibility is the street must pass the Speed Threshold (85th percentile speed must be 5 mph or more than the posted speed limit). If that threshold is met, a DOMI Equity Index is calculated using vehicle speed, volume, crash history, pedestrian generators, and presence of sidewalks. It is possible that a street may meet all the eligibility criteria, but due to budgetary restrictions may not be able to be modified under this program during the budget cycle. These streets are, however, kept in the system for consideration for next year.

Speed Humps

Speed humps are a tool in the toolbox of the Neighborhood Traffic Calming Program. A speed hump is a parabolic vertical traffic calming device used to reduce vehicle speed on residential streets. It is important to distinguish between speed humps and speed bumps. The latter are usually encountered in parking lots, are usually about 3 to 6 inches in height and 1 to 3 feet in length, and force motorists to slow to 5 to 10 mph. Speed *humps* are generally placed across the road to slow traffic and are often installed in a series to prevent cars from speeding before or after the hump. Generally, speed humps are 3-4 inches high and 12-14 feet wide, with a ramp length of 3-6 feet, depending on target speed. Speed humps reduce speed by 15-20 mph, and despite their technical name, are often referred to as "bumps" on signage.

DOMI utilizes PennDOT's Pennsylvania Traffic Calming Handbook for the use and design of their speed humps. DOMI uses the two designs recommended by PennDOT for specific conditions on the prospective roadway: Watts speed humps and Seminole County speed humps. A Watts speed hump, designed by the Transport and Road Research Laboratory in Great Britain, is a parabolic hump 12 feet in length. The Watts hump is recommended for local streets with an average daily traffic rate of less than 3,500 vehicles and posted speeds of 30 mph or less. A Seminole County speed hump is 22 feet in length with 6-foot ramps on either end of a 10-foot flat top. This type of speed hump design is also called a "speed table" and it is the design DOMI uses on transit and emergency service priority routes. The Seminole County hump can be used in a greater variety of situations: on more moderate traffic roads, streets with average daily traffic volumes of up to 6,500 vehicles, emergency routes, and transit routes.

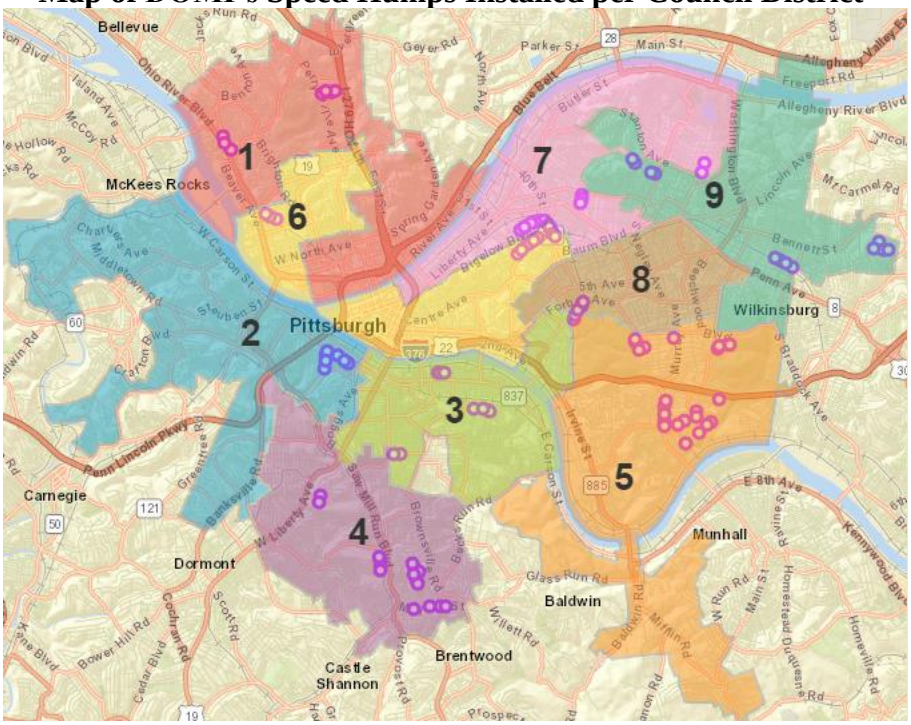
Humps are generally used at mid-block locations and within typical residential travel speeds, creating a gentle rocking motion encouraging motorists to slow to a safe speed at or below the speed limit. Watts humps are designed to slow vehicles down to 15 to 20 mph at each hump and 25 to 30 mph in-between each properly spaced hump. According to PennDOT's handbook, Watts humps reduce speeds by about 8 mph and reduce volumes by 12%. Seminole County humps are gentler in profile and designed to lower the speed down to 25 to 30 mph at the hump and approximately 35 mph in between humps. They have been shown to reduce speed by about 6.5 mph and volumes by 12%. As of 2021, DOMI has used Watts speed humps in all projects except for Maytide Street and Pioneer Avenue where Seminole humps were constructed.

Other considerations listed in the PennDOT handbook suggest that humps should be placed 250 to 600 feet apart and no hump should be placed within 150 feet of an unsignalized intersection or 250 feet of a signalized intersection. Furthermore, speed humps should not be

used on grades exceeding 8%. Ideally, speed humps should extend horizontally, from curb to curb so that a motorist is prevented from driving in the gutter to avoid the hump on one side. This method also has the advantage of making it safer for cyclists, who may be riding in the area that the driver would swerve to miss the hump. PennDOT also notes that Watts humps delay emergency vehicles from anywhere from 1 to 10 seconds, with most delays in the range of 3 to 7 seconds. Seminole humps reduce this delay to approximately 1 second.

PennDOT suggests in areas needing snow removal, a measure such as a flexible delineator can be used at each hump to alert plow drivers to lift their blades. When asked about the snowplow issues, DOMI traffic engineers have not yet heard of any significant issues with snowplows and speed humps. Legal and appropriate signage exists before all speed humps; therefore, snowplow drivers are aware of their location and can adjust their plows accordingly. Figure 5 shows the speed humps DOMI installed per council district as of December 2021.

FIGURE 5
Map of DOMI's Speed Humps Installed per Council District



Source: Information from DOMI's Municipal Traffic Engineer

DOMI has published traffic calming data on their website. As of 2020, there are 106 individual speed humps installed in Pittsburgh, many acting as a set for a single project, for example when a street has multiple street humps within a short amount of distance. Table 3 shows the data related to streets where speed humps have been placed prior to 2021. The 85th Percentile Speed column is the speed that 85% of drivers drive on a particular road without regard to posted limit. The three numbers in the column are the 85th percentile speed before traffic calming measures were installed, after they were installed, and the difference between

these two speeds. *It is important to remember that since speed humps are only used on residential streets, all posted speed limits are 25 mph or lower on the streets listed below.*

TABLE 3

Speed Hump Projects Completed by DOMI 2018-2020, Maximum Speed Observed and 85% Percentile Speed							
Street Name	**Neighborhood**	**Maximum Speed Observed (mph)**			**85th Percentile Speed (mph)**		
		Before	**After**	***Change***	**Before**	**After**	***Change***
Bausman	Knoxville	84	51	*-33*	34	22	*-12*
Beechwood (at 1930 Beechwood)	Squirrel Hill South	34	32	*-2*	38	36	*-2*
Beechwood (at 2050 Beechwood)	Squirrel Hill South	61	66	*+5*	32	30	*-2*
Black	Garfield/East Liberty	77	56	*-21*	36	26	*-10*
Boundary	Oakland	70	61	*-9*	35	30	*-5*
Darlington	Squirrel Hill	25	19	*-6*	30	24	*-6*
Edmond	Bloomfield	58	45	*-13*	30	24	*-6*
Grandview	Mt Washington	60	55	*-5*	33	29	*-4*
Heberton	Highland Park	77	55	*-22*	33	31	*-2*
Jacob	Brookline	30	23	*-7*	35	27	*-8*
Maytide	Carrick	106	71	*-21*	41	30	*-11*
Melwood	Polish Hill	24	21	*-3*	29	26	*-3*
Mission	South Side Slopes	49	48	*-1*	30	21	*-9*
Parkfield	Carrick	71	56	*-15*	31	28	*-3*

TABLE 3 (continued)

Speed Hump Projects Completed by DOMI 2018-2020, Maximum Speed Observed and 85% Percentile Speed							
Street Name	**Neighborhood**	**Maximum Speed Observed (mph)**			**85th Percentile Speed (mph)**		
		Before	**After**	***Change***	**Before**	**After**	***Change***
Saline (at Federal Hill St)	Squirrel Hill South	25	19	*-6*	28	23	*-5*
Saline (at Lilac)	Squirrel Hill South	26	21	*-5*	29	25	*-4*
Spokane	Carrick	63	42	*-21*	33	25	*-8*
Venture	Perry North				32	26	*-6*
Webster	Middle Hill	27	22	*-5*	32	25	*-7*

Source: Information from DOMI

Most importantly, the function of speed humps is to create a situation whereby a driver must reduce their speed.

Table 4 illustrates the percentage of the total number of drivers traveling over the posted speed limit before traffic calming measures were installed and after they were installed.

It should be noted that not all installed speed humps have before and after data. DOMI engineers give drivers about three months, but sometimes less, to become acquainted with the speed humps before they take an “after” analysis. The speed hump data below is pre-2021.

TABLE 4

Percentages of Drivers Exceeding Posted Speed, Before and After Speed Hump Installation		
Street Name	**Percentages of Drivers Exceeding the Posted Speed Limit**	
	Before	**After**
Bausman	82	4
Beechwood (at 1930 Beechwood)	96	94
Beechwood (at 2050 Beechwood)	94	49
Black	97	15
Boundary	87	47
Darlington	48	8
Edmond	45	8
Heberton	64	39
Grandview	61	31
Jacob	85	23
Maytide	99	30
Melwood	40	17
Mission	80	22
Parkfield	43	32
Saline (at Federal Hill St)		6
Saline (at Lilac)		11
Spokane	66	13
Venture	73	15
Webster	66	15

Source: Information from DOMI

Finding: Overall, DOMI reported speed humps installed before 2021 have reduced the 85th Percentile speed from an average of 32.5 mph to 26.5 mph. An overall reduction of the percentage of drivers exceeding posted speed limits decreased from 62.5% to 24.7%, a reduction of 37.8%.

RECOMMENDATION 7:

Traffic calming methods provide a safer experience for all users of public streets. It is recommended this data be published on the website as soon as possible to help educate residents about the effectiveness and benefits of traffic calming.

Paving

Street paving, or resurfacing, has many components. Asphalt must be manufactured carefully so that quality and durability are not compromised. Water drainage must be adequately accounted for, as moisture under the pavement leads to cracking, buckling, and potholes. Underlying soil must be evenly and thoroughly compacted to prevent buckling. Most importantly, preventive maintenance processes must be addressed. Potholes must be repaired quickly, and a regular seal-coating schedule must be formulated. Therefore, when a street is going to be 'repaved,' the process is generally as follows: milling of existing asphalt and/or concrete pavements, resurfacing and overlay, grade adjustments, and final restoration. DOMI's aim is that a street should only require to be repaved every ten years. There are 957 miles of publicly maintained streets in the City of Pittsburgh.

Pittsburgh has had challenges adhering to the ten-year paving standard. One barrier is that the city's infrastructure is designed for more than double the current population. Pittsburgh's population peaked in the 1950's at 700,000, and as of the 2020 census, our current population is 305,000. The city's infrastructure needs, however, remain the same. The city's population decline means less revenue that can be utilized in the paving budget. Legacy issues, chiefly the overall condition of our roadways, along with weather and topography are also contributors to these challenges.

Status of Previous Audit Recommendations

The Controller's Office completed a Department of Public Works: Street Maintenance performance audit in 2009. Part of this audit addressed the city's street paving process. Two recommendations made in that audit now fall under DOMI's responsibility. The auditors inquired about the current status of these recommendations to the Paving Supervisor. Past 2009 recommendations are italicized; current recommendation status is found under the Update heading.

In 2009, the auditors found that many streets have been resurfaced over their original base. Original bases can be the cobblestone, brick or even some imbedded trolley tracks. Eventually, these bases will begin to shift and cause cracking on the asphalt surface. Resurfacing over these bases is not the optimal way to ensure street longevity, however the costs to replace these bases is considerable. Presently, out of financial necessity, the city must continue to contend with these legacy issues. Effort is being made to input all of these material differences into the street inventory so that subsequent workers know about the issues they may encounter beforehand and are able to plan. In 2008, a City Councilperson detailed concerns about the methods used in the distribution of paving services. The Councilperson stated that these methods at times appeared to be politically driven. In the 2009 audit, the auditors assessed this assertion by comparing the DPW's lists of evaluated streets against the finalized paving list for the prior year. They found that about half of streets on the finalized paving list do not appear on DPW's list, which they took to mean that worse rated streets are not always the ones that are selected for paving. Auditors did note that the streets on the paving list that were less in need of paving oftentimes were primary streets which do see more traffic.

In 2015, the city contracted with Cartegraph to provide software support to build a street inventory and classification system. Each block has been assessed by city personnel and this information is recorded along with previous repairs completed. Cartegraph is also more flexible than the old paving software system was, as it can also handle warehouse inventories, street tree locations and street sign management. It is hoped with this advancement in technology and record-keeping, paving can be made to be more objective. More information on Cartegraph appears later in this audit.

As it is now, paving contractors must warrant their work for the city. DPW inspectors were then in charge of monitoring street conditions and if a newly paved street showed degradation above and beyond regular aging, the contractor would have to then repair.

***2009 Recommendation**: Warranty inspection reports should include basic information such as the date when the warranty begins to run ('the date of Final Acceptance of the work') and date or dates the street was inspected. This would ensure that periodic inspections are occurring and would provide a more accurate record of the warranty inspection program.*

Current Update: DOMI paving personnel now track streets as they are completed. This information is inputted into Cartegraph. When the warranty is due to expire, DOMI inspectors conduct a field inspection for any damages or degradation that the paving contractor could repair prior to expiration.

The auditors in 2009 also briefly raised concerns about utility companies adding to the degradation of public roadways. It was noted that DPW inspectors were responsible for ensuring all streets were restored to its original condition and the work warranted for two years. However. any disturbance to the asphalt surface contains a risk to the street itself. The Controller's Office urged DPW to consider implementing a degradation fee to offset the disturbance to the street.

***2009 Recommendation**: DPW should consider charging a degradation fee in addition to street opening permit fees. A degradation fee would help cover the city's cost of repair work after the two-year warranty has expired.*

Current Update: To date, this has not been implemented. Permit fees for street opening permits have increased since the recommendation was made in 2009, as discussed later in this audit.

Milling and Paving Process

The preliminary set of streets selected for paving is determined by using the city's mapping and inventory software system called Cartegraph, which is further described later. However, other factors are considered during the selection process. For example, the mayor's 311 call center complaints, neighborhood community group requests, and DOMI staff street inspections can also weigh in on the selection process.

Once a street has been selected for paving, DPW personnel issue notices of street repairs in the form of doorknob hangers to houses on the street. According to the paving supervisor,

DPW personnel are only required to perform this notification 24 hours in advance, but they try to give residents 48 hours' notice.

A street selected for paving must also be evaluated for compliance with the ADA. For streets not in compliance with the ADA, a handicapped accessible curb ramp must be added. Already existing ramps are tested and possibly re-designed for compliance. The design and installation are completed while the street is being repaved. The city has one inspector for handicapped ramps.

After the site is prepared and residents are notified, the milling begins. Milling occurs when the street surface is ground up and removed. This step of the process does not take very long. If, however, the base of the street is cracked or worn, a base repair must be done. When this occurs, crews mill deeper into the pavement and into the base itself. Usually, a new layer of asphalt is applied to the base to support it and then that area is milled down to the level of the surface around it. At this point the street repair continues, and a new layer of surface asphalt is applied to the street. A city street with a solid base has an average lifespan of 10-14 years. When old streetcar tracks are under the street, that lifespan decreases to 6-10 years. A street heavily travelled by buses and trucks will naturally degrade faster than a seldom-used residential secondary street.

Per the contract with the milling and paving contractor, paving projects are warranted for two years. According to DOMI's paving division, a small percentage of paving jobs require the contractor to perform additional work to meet this warranty. The contractor is not paid until the road is finalized or sealed. This has alleviated some of the pressure for DOMI to track all streets which were not sealed but the contractor promised to repair. Auditors requested a list of warranty inspections and were provided with the spreadsheets for 2019-2020. According to DOMI Paving personnel, it is easier to track these inspections via spreadsheets, but they could track warranty inspections via Cartegraph if they had the capacity to input the data.

Finding: Being understaffed means that DOMI Paving has not had the ability to fully utilize Cartegraph.

Base Repairs

Milling can be used to remove asphalt anywhere from just enough thickness to level and smooth the surface, or if issues are found, a full-depth removal of the base called a base repair. The base of a street is the concrete bottom of the street itself. The base is covered with, various materials leading up to asphalt laying on top. According to DPW's Right-of-Way manual when streets are repaved, primary streets are to be milled to a depth of 4 inches, and secondary streets to a depth of 3.5 inches. Occasionally exceptions are made due to the condition of the street or the original street materials.

Base repairs are costly, as extra labor and materials are required. Per the city's contract with its milling and paving contractor, base repairs require the excavation of the street to a depth of 18 inches and an area of one foot in all directions from the defect in the base. After excavation, the area is filled with paving materials compacted and the new asphalt is poured to

create the surface of the street. While not all base repairs are done in the presence of a DOMI paving inspector owing to low staffing, all base repairs are approved by the Director of DOMI and/or their designee.

Finding: The cost of base repairs is made on a square yard basis, meaning materials and labor are calculated by the contractor for each occurrence. Oftentimes DOMI inspectors are not onsite when the need for a base repair is discovered, and the contractor calculates the area in need of repair, and the labor and materials needed.

RECOMMENDATION 8:

In order to ensure the city is being prudent with limited resources, DOMI should work to ensure that when the need for a base repair is discovered, a paving inspector is dispatched to the site. Future contracts should work to prevent independent contractor assessments of base repairs.

Milling and Paving Contracts

The city utilizes two separate contracts to conduct its milling and paving work: a milling and paving contract that covers labor and the machinery to mill and pave and an asphalt materials contract that covers materials.

The current milling and paving contract is held by Folino Construction. This contract includes requirements about the equipment that the company must have and maintain, the standards to which milling and paving work must be performed, and the ability of the city to have an inspector on site to monitor the work.

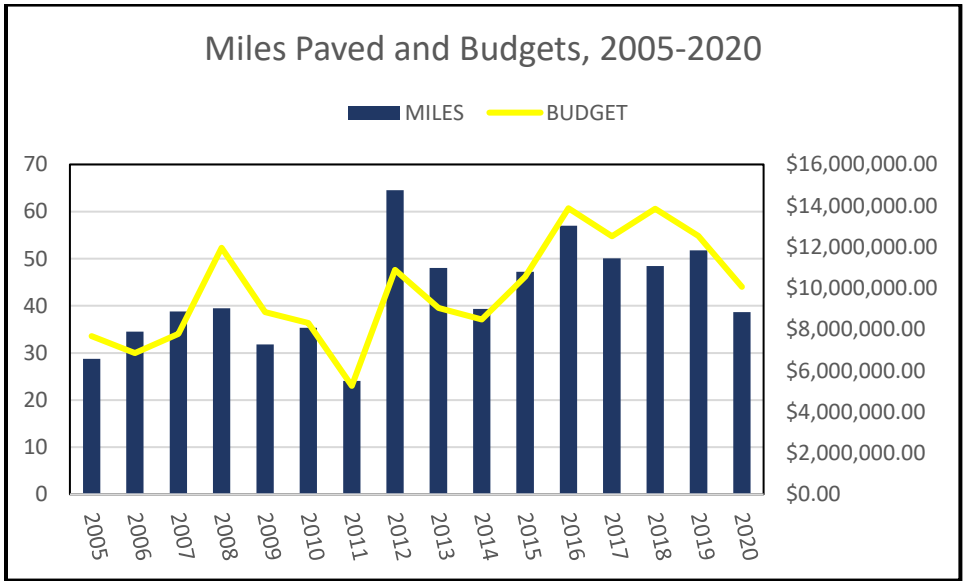
The asphalt materials contract was awarded to Lindy Paving. According to the Paving Supervisor, Lindy Paving has been the city's materials contractor for the past 15 years. There are two asphalt plants where these materials are available: the Second Avenue plant and the Neville Island plant. Lindy Paving does its own lab tests on the quality of the asphalt. The Paving Division also conducts its own quality testing of asphalt at its division headquarters in Oakland on Centre Avenue.

According to the Paving Supervisor, the city can piggyback off a state contract for asphalt materials if the price is lower than the two local asphalt plants. DOMI paving personnel report that they regularly check to see if the city is receiving the lowest rates and calculate budgets using a combination of milling, paving, and material costs by square yard. This calculation dictates the amount of paving the department can expect to do in any given year. The contract also requires that the contractor must pave the street within five (5) days of milling, contingent on favorable weather conditions, or incur a fine of $5,000/day.

DOMI Paving Organization

Street paving is a massive cost to the city and a very visible and valuable city service. Accordingly, this process of choosing how the paving budget is spent must be approached with the utmost care and consideration. Chart 1 shows miles paved from the years 2005-2020. In 2003, the city entered Act 47, or financially distressed status, which triggered budget cuts. A city-owned asphalt plant was considered to not be as cost-effective as hiring contractors and was sold. DPW Paving division personnel were cut from six staff positions and one clerk position to four staff positions and no clerk, which includes one laborer on loan from the Department of Public Works. Low staffing levels persist to this day.

CHART 1



Source: DOMI Paving Division

Finding: It may have made financial sense to cut positions when the asphalt plant was sold but having three fewer staff members to do all paving inspection work, administration, budgetary, and even custodial work is a significant hurdle for DOMI's street paving program.

Additional inspectors could be utilized to improve paving operations and to oversee work completed by the paving contractor to ensure that it is being properly conducted. An inspector is needed to monitor base repairs, re-inspect streets when approaching their warranty expiration, and update street assessments in Cartegraph, which could prove to save the city money in the long run. Thoughtful deployment of inspectors is paramount, and tasks should be distributed to new inspectors and output monitored for cost savings.

RECOMMENDATION 9:

More inspectors are needed, to help the paving division be more efficient and increase its ability to make sure paving work is completed properly and information about our streets is being inputted and updated.

Selection of Streets to be Paved and the Use of Cartegraph

Cartegraph is a leading operations management software for governmental clients, higher education entities, utilities, and businesses. Cartegraph primarily works to improve infrastructure management, citizen engagement, and provide efficient data-driven decision-making. In July 2015, the State of Pennsylvania's Office of Administration Technology approved an Invitation to Qualify Contract with Cartegraph, which is based in Iowa. This contract covered consulting services/IT project management and commercial off-the-shelf software services. The city had contracted with Cartegraph previously to provide asset management systems for DPW. City Planning, Office of Management and Budget, and Human Resources and Civil Service also use Cartegraph.

I&P estimates that tasks now assigned to Cartegraph, such as inspections and inventorying and processing citizen requests, have increased the city's efficiency, as much of the information prior to implementation was being kept on paper by the respective departments. City personnel have inventoried tens of thousands of city assets, including signs, streets, and playgrounds, conducted inspections of playgrounds and streets, and processed thousands of citizen requests. Cartegraph has been expanded to include city warehouses as well, as failure to have an accurate and accessible inventory is a frequent finding in Controller's Officer Performance audits.

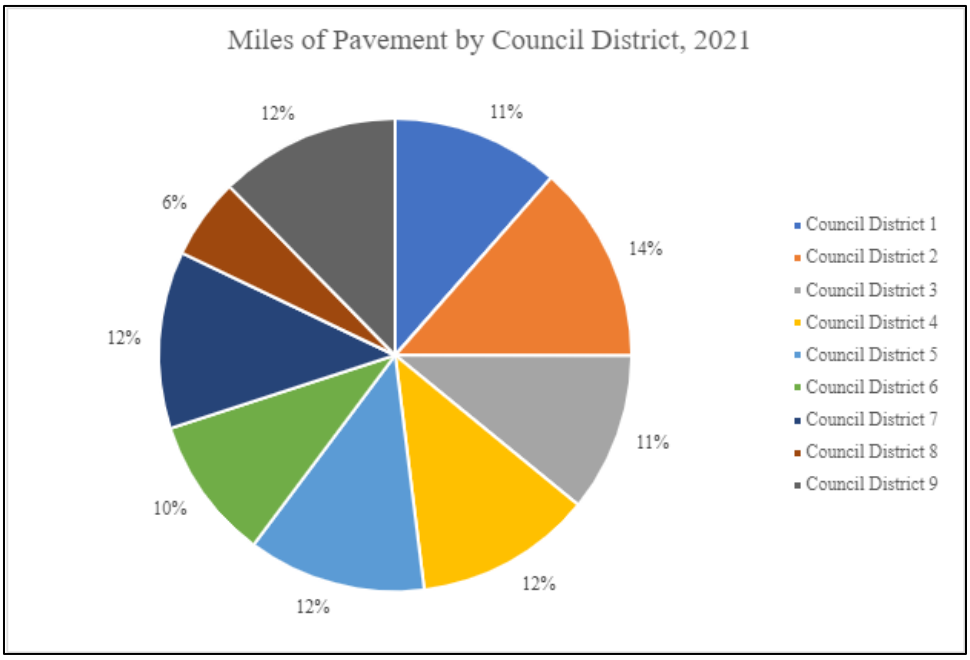
Cartegraph has been deployed to manage street inventorying, assessing and paving. Prior to 2014, city councilors were asked to provide lists of streets in their districts that they felt were in need of repair. As mentioned previously in the 2009 Controller's Office audit, this led to occasions where it appeared that political favors were the basis of lists instead of a data-driven process as to which streets needed the most attention. Money for resurfacing was also divided equally between all nine council districts, with no regard as to what streets were most in need. Prior to Cartegraph, the only street condition data was on paper in the DPW paving office.

In 2016, the city contracted with Cartegraph to help inventory and analyze city streets. DPW personnel carried out this project, which took a year. DOMI and DPW can use Cartegraph inspection data and a scenario builder for making decisions as to which streets get resurfaced. The initial score given to a street is recalculated using a formula called a degradation curve, which considers numerous factors such as average wear, type of street/amount of use, and prior repairs. This new score is called the operational conditional index.

The process of street selection for repaving still straddles the old and the new ways. Operational conditional index scores are tallied, and the worst street list, comprising the streets with the lowest operational conditional scores, is generated. At this time, however, street maintenance personnel, 311 data, and council members are also polled to gather additional information. When a budget is created for the following year, the amount of paving is calculated for the year by DOMI paving personnel. This is a difficult process due to the variable costs of labor and materials. At this point, a list is generated from these varied inputs, and they are then divided into primary, secondary, and tertiary streets. Prior to 2018, this list was then divided into DPW divisions and rechecked for equity amongst the areas. The Director of DOMI realigned this category into council areas in 2018. Money is divided roughly equally across council districts.

In order to examine if having the council districts play a role in budgetary decisions, auditors examined miles of streets per council district and how money was distributed in 2021. Auditors requested the number of miles per council district and received the figures from the city's Cartegraph software system displayed in Chart 2. Note that Council boundaries change every ten years as new census data is released and further that as streets do straddle council boundaries, the information in the chart below is approximate. The Chart below is current for the scope of the audit.

CHART 2



Source: Data from I&P personnel via Cartegraph

The proportion of streets per council district falls between 11% and 14% of the total, except for council districts 6 (10%) and 8 (6%). It may appear ideal to have the council district budgets calculated to be equally distributed. However, council districts are redrawn regularly and are driven by different factors than DPW division sites. DPW has had static division boundaries for several years, which means that DPW personnel who are polled about the condition of the streets in their division are knowledgeable. Most importantly, DOMI's paving division can schedule work using DPW divisions (of which there are only five) to better coordinate and lessen the possibility of a situation occurring in which one end of the street is paved but DPW staff must come back later to do the other half because the street straddles council district lines.

Finding: Interviews with the DPW Paving division and the Controller's Office inspectors indicate that a better alternative might be to divide work by DPW districts (see map in Appendix). This would ensure that DOMI's paving inspectors can properly manage the projects and would prioritize streets for repair by condition, paving the streets in worse repair first, rather than dividing the budget by political boundaries. Having paving decisions still divided amongst arbitrary council district lines and numerous inputs may be occurring at the expense of equity.

Continuing to consult 311 data to guide decision-making runs the risk of a 'squeaky wheel getting the grease' scenario more than streets getting repaved that greatly need it.

Finding: DOMI administration should appeal to City Council to change this process by presenting detailed analysis on a strictly data-detailed approach to street paving. This could be accomplished using a Cartegraph add-on called Scenario Builder. This add-on, which DOMI already has, analyzes street data with several different factors, which will provide more equity in the process. This would improve efficiency and utilize the city's current Cartegraph capabilities to maximize the investment and use of all the detailed data collected.

Cartegraph data is not and should not be the only tool used to select streets to be repaved. DOMI paving personnel now inspect the streets generated by Cartegraph before inclusion onto a preliminary paving list to ensure an error has not occurred in the data. Moreover, Cartegraph has the capabilities to be more useful than a simple mapping and inventory tool. Scenario builder can be used to create lists using several different criteria, such as metrics on street usage, that would help drive DOMI decision-making and therefore be a more proactive and equitable process.

RECOMMENDATION 10:

DOMI administration should analyze different scenarios and present and explain the data to the public as to how streets are being selected for repaving. Real-world variables necessitate some departure from a computer-driven list, however choosing too many from the non-Cartegraph list may signify those streets are still being repaved at the expense of more degraded ones. Before concrete and accessible data existed, it was arguably a good idea to tie paving projects in with council districts to ensure equity across the city. However, we now have more comprehensive data, and as a result, more data-driven decisions can be made.

I&P personnel updates the Western Pennsylvania Data Center's list of City Paving projects on a weekly basis, using information from Cartegraph. There is sometimes a delay during the summer months due to the amount of work being done by the paving personnel at that time.

RECOMMENDATION 11:

In order to provide a more accurate view of paving work, more staff time should be devoted to updating Cartegraph information as work is completed. Having accurate information entered in Cartegraph means DOMI has the information needed when it is time to formulate decisions. Updating Cartegraph with work completed as it occurs, as well as with information workers find in the field, should be a departmental priority. Cartegraph is easy to use, and when new staff is hired, a new worker can be quickly trained to perform these tasks.

RECOMMENDATION 12:

DOMI administration should work with I&P to review the information provided to the public via updating the Western Pennsylvania Data Center's list of city paving projects for completeness and organization. Inserting a column listing the neighborhood a street is in, for example, might make it easier for people new to the city to use.

RECOMMENDATION 13:

DOMI administration needs to request an increase in staffing levels with OMB and City Council to improve oversight throughout the divisions which are lacking staff. Recommendation numbers 8, 9, 11, 12 and 14 all demonstrate the need for more staffing levels to improve operations.

Recycling Asphalt

When a street is milled, the asphalt is generally taken away from the site. Asphalt milled for street repairs can also be recycled. By recycling asphalt, the city avoids adding old asphalt to area landfills and reduces the amount of new oil needed in the construction process. Money is saved in a variety of ways–contractors save money by reducing energy, materials, and transportation costs. Asphalt can also be recycled multiple times.

Asphalt can be recycled with a couple of different methods. After the asphalt is milled, it can be taken to an asphalt plant where it is screened, sized, and then used to make new pavement. Another option is a process called asphalt pulverization. When this process is used, asphalt is ground down at the job site and blended with sub-layers which creates a new asphalt layer with all old materials. This process saves money because old base layers do not have to be excavated and new materials do not have to be transported in. It also is the fastest option since milling and paving are done at the same time.

According to the PennDOT Recycling Material Fact Sheet: Reclaimed Asphalt Pavement (RAP) written in 2013 and updated in 2021, innovations in asphalt recycling have had environmental benefits, such as reduced landfill usage, and economic benefits, such as reduced costs of transporting new materials to the job site. PennDOT finds that asphalt recycling has improved performance, safety, and longevity of asphalt pavement. In 2019, PennDOT implemented a policy that directed the use of warm mix asphalt over hot mix asphalt for all PennDOT projects. According to PennDOT research, warm mix (which includes RAP) has not compromised the finished product. PennDOT's asphalt recycling best practices is freely available to all entities that maintain streets.

Auditors examined the Invitation to Bid (FIFB19000160) that the Office of Management and Budget (OMB) released on March 27, 2019. There is no specific mention of recycling asphalt materials. DOMI needs to communicate to OMB the importance of considering environmentally friendly approaches to its operations.

Finding: According to DOMI's Paving Supervisor, the asphalt the city uses contains 15% RAP from their asphalt contractor.

RECOMMENDATION 14:

It is important to consider more environmentally friendly approaches to all city operations. DOMI administration should meet with OMB to propose suggestions for soliciting contracts that will honor the city's more environmentally friendly approaches to its operations. The asphalt contract should require the contractor to use a proportion of RAP.

Finding: The city included a stipulation in the milling and paving contract that the contractor must haul away all milled asphalt because the city has nowhere to store the milled product due to EPA restrictions. The city sells the milled asphalt back to the contractor and then receives a 15-20% credit on the invoiced amount.

Right-of-Ways, Utilities, and Paving

Under the Constitution of the United States, it is the right of the government to acquire land for public purposes. States have the inherent right of passage, or eminent domain, to acquire land when it is needed for public use. Right-of-Way (ROW) is the term used to describe acquiring this land for public purposes. More commonly, a ROW is used to define the public area of a street, bridge, bicycle lane, retaining wall, sewer, steps, trails, parks, and greenways or public sidewalks.

The city manages the requirements, procedures, standards, and methods by which utility companies, private contractors, and other entities are permitted to gain access to and work within the public ROW. It is unlawful for any person to obstruct or perform any construction activities within a public ROW without obtaining the necessary permits. Activities not allowed without a permit include: demolition, erection, excavation, removal, relocation, and repair or maintenance of any surface, overhead, or underground facility. Further information can be found in the City of Pittsburgh Code of Ordinances (City Code), Article I Public Right-of-Way.

The goals around the oversight of ROW are to ensure public safety for all users of the ROW, minimize inconvenience to residents and business owners by establishing standards and time constraints for obstructions and construction, and protect the city's infrastructure investment by establishing constructions standards.

DOMI's role in ROW management is to: administer permits to obstruct, excavate, or construct in the ROW such as street opening, sidewalk repair, and curb cuts; administer licenses to occupy for uses such as sidewalk cafes, valet parking operators, and commercial dumpsters; and review plans to render a decision about the use of ROW such as petitions to permanently encroach, vacate, alter, or dedicate roadways or infrastructure. DOMI's rules and regulations surrounding permits, licenses, and plan reviews include but are not limited to: standards for-fee payments, billing and eligibility, minimum requirements for all applicants, requirements specific

to certain permit licenses and plan review types, application processing and reviews and rules around effective data, expiration, renewals, extensions, and amendments. ROW management prior to DOMI was within the purview of DPW.

A large part of DOMI's ROW management is street openings, or an event that causes an excavation of a public street. Street openings are simply when a street is opened. This usually happens when a utility company must make repairs to what lies beneath. There are many reasons a street needs to be opened, but in conversations with DOMI's ROW administration, 90% of street opening events stem from utility companies conducting repairs.

Underground utility work is difficult due to utility companies having an incomplete picture of what needs to be done before opening the ROW to see the issue. However, if there was no oversight by a governing entity with the public's interest in mind, a contractor or utility company might be tempted to use a less expensive, lower quality, and/or a slower repair. One way that government ensures that the work is completed in a timely and adequate way is to require permits to be issued and inspections on the ROW repair be conducted.

Controller's Office auditors conducting the 2009 audit of street maintenance recommended a "degradation fee" be collected from the utility company to offset costs the city might incur if the repair did not withstand normal use. This degradation fee was never initiated. However, the permit fees did slightly increase. Table 5 below outlines what permit fees were collected in 2009 for street opening permits. Please note these permits were issued for a 14-day period. If work continued past 14 days, the permit had to be reapplied for and the fee paid again. The fee amounts in Table 5 were set in 1998.

TABLE 5

2009 Permit Issuance Fees Associated with Street Opening Events	
Square Yards	**Fee**
3 or less	$77.25
Over 3 to 50	$155.00
Over 50 to 100	$310.00
Over 100	$310.00 plus $2.00 per additional square yard

Source: Information retrieved by DOMI personnel

At the end of 2019, ROW fees were removed from the City Code and put into DOMI's fee schedule. A new fee was added, called the application fee, when DOMI migrated to the OneStopPGH platform in the Spring of 2020. As of Fall 2021, ROW Street Opening Fees are shown in Table 6.

TABLE 6

2021 Permit Issuance Fees Associated with Street Opening Events		
Permit Type	**Fee**	**Note**
Application Fee (Single street opening, less than 3 sq yds)	$25.00	
Opening Fee (Single street opening, less than 3 sq yds)	$80.00	
Application Fee (Single street opening 3-49 sq yds)	$75.00	
Opening Fee (Single street opening 3-49 sq yds)	$160.00	
Application Fee (Single street opening, 50-99 sq yds)	$75.00	
Opening Fee (Single street opening, 50-99 sq yds)	$320.00	
Application Fee (Single street opening, 100 or more sq yds)	$75.00	
Opening Fee (Single street opening, , 100 or more sq yds)	$320.00 +	$2.00 per sq yd for each 14 day period
Application Fee (Multiple street openings)	$250.00	Work must be completed in same permit period and with the same traffic obstruction
Additional Application Fee (Winter opening)	$50.00	Per application (November 1-March 31)

Source: DOMI

Finding: Street opening permit fees have slightly increased and additional permits are now required.

RECOMMENDATION 15:

DOMI administration should continue to monitor the fees associated with ROW permit work and advocate for increases as necessary.

Utility Work Coordination

Auditors met with the DOMI's utility supervisor to discuss how the city coordinates utility work with the paving schedule that the city develops. Currently, the paving supervisor meets monthly with the utility companies and maintains near-daily contact with utility company contacts about upcoming work, emergency work, etc. He did note that prior to 2018 when his

position was created, there was no coordination between utility companies and DPW, who had all street responsibility prior to the creation of DOMI.

Finding: Coordination with utility companies is imperative since costs can be shared if a utility must make repairs on a street that DOMI wants to repave. This issue is recognized by DOMI as important and substantial progress has been made to more fully coordinate with utility companies so costs can be shared.

In addition to the fees listed in Table 6 above, utility companies agree that DOMI inspectors should have the right to inspect the work being done at any time. A governmental entity within the Commonwealth of Pennsylvania cannot dictate how a utility repair is completed, owing to rules and regulations from Pennsylvania's Public Utility Commission (PUC); however, they do retain the right to say how a public ROW is restored. According to DOMI's ROW supervisor, paving inspectors would ideally be deployed three times to a permitted site: before the work is started, during construction, and a final inspection of the site.

Finding: DOMI currently employs nine inspectors who, in 2020, conducted 50,000 inspections for more than 18,000 permits.

There have been many improvements since DOMI's management of ROW work. Along with having coordination with utility companies, the ROW supervisor is endeavoring to hold utility companies to a higher standard. Utility companies are only required to pave the half of the street where work occurred, per the city's contract with these utility companies. The City of Pittsburgh's agreements with utility companies have a moratorium clause, which means that if the city repaved a street within the last three years and a utility company needs to make a repair, the utility company is then responsible for repaving the entire street, curb to curb. Effective in 2022, this time limit has been increased to five years. Also, if a utility company does not clean the site and take all materials (signs, etc.) with them, DOMI's ROW personnel will issue a citation. A company that receives a citation will have to apply for a new application permit and clean the site before a final inspection is approved.

Increasing utility company compliance has a positive impact on city residents. However, as described above, the city's ability to cost-share paving projects is still hampered by the city's processes. Not only does sharing the cost of repaving city streets have enormous and obvious advantages to city residents, but the amount of disruption on city streets could be drastically reduced. Utility companies finalize their project list by November of each year. DOMI's paving division finishes their final inspections at that time, and Cartegraph is used to develop a preliminary paving list. However, final approval for the paving list does not happen until March. This means that, although the information from the utility companies is available early on, it is not being integrated into the street selection process; therefore, the ROW Utility supervisor must start to coordinate with utilities in March of the following year for work beginning at the same time.

Finding: Planned utility work is not being entered into Cartegraph and information about utility company repairs are not being fully integrated into the decision-making process, resulting in missed opportunities for saving money and reducing incidents of service duplication.

Finding: Finished utility work is not consistently being entered into Cartegraph, except for larger projects. Entering sites where utility work has been completed and re-grading the street with the repair would give DOMI a more accurate picture of street surfaces needs.

RECOMMENDATION 16:

Scheduled utility work and finished utility projects must be inputted into Cartegraph. Sites with scheduled work must be flagged in the software so these streets can be considered for a possible cost-sharing plan. If this is done, the paving list could be finalized by January and released to residents instead of having City Council vote on a paving list in March.

Finding: According to DOMI's ROW administration, prior to the formation of DOMI, ROW fees were supposed to be collected every two weeks but were not being collected. Now with oversight from DOMI and a computerized system doing billing, this fee is being collected correctly.

RECOMMENDATION 17:

It is important that applications for ROW permits, collection of fees, and inspections of work completed are completed in a timely manner. Additional staff members should be hired to ensure that this work is done and the city is not left with substandard paving patches which later necessitate repaving at the city's expense. DOMI's staff should review all ROW invoices on a quarterly basis to ensure that these fees area being collected.

COVID-19 Response

The COVID-19 pandemic tested every system in the world. Successfully navigating the virus meant being able to think outside the box, anticipating future problems, and acting quickly to implement changes. On March 6, 2020, the Governor of Pennsylvania signed a COVID-19 disaster declaration and by March 13, 2020, the Mayor of Pittsburgh signed the second COVID-19 Executive Order which suspended most non-essential city services.

As a result of the pandemic, a Task Force on Streets and Mobility convened on May 1, 2020, and the report was released on May 10, 2020. The Task Force had more than 20 members and represented a variety of interests: neighborhood groups, business owners, and transit planners, among others. The Task Force identified pandemic-related challenges for Pittsburgh's businesses, namely restaurants, food services, grocery stores, as well as deliveries, consumer goods, transit, and overall residential quality of life. The goal was to strategize around finding solutions for redesigning public streets to meet the changing needs of the public at this perilous time. Some actionable items identified were: a "toolkit" for rapid street redesign, strategies for enabling greater mobility and curbside management, identifying strategies that promoted core

equity and inclusion, especially for more vulnerable neighborhoods, and identifying funding and other assistance to aid in implementation.

The recommendations from this report were, broadly speaking, as follows:

1) Allow more stakeholders a voice and broaden the conversation about streets and mobility to include new ideas. The Task Force was a hastily put together out of necessity. In that spirit, it was recommended that the plans were allowed to shift as new voices were heard.
2) Clear and consistent communication was crucial.
3) When a process is implemented, designate one point of contact and update the stakeholders regularly.

The overall findings of the Task Force were that in order to sustain local businesses, curbside pickup and delivery along with vehicle queuing had to be implemented. Even when restaurants would reopen, public health officials hoped that social distancing would still be followed. Accommodations to allow for social distancing were necessary; suggestions were made to convert parking spaces to outdoor seating or utilizing local parks, plazas, or vacant parcels to provide additional outdoor, socially distanced seating areas. The Task Force suggested that the city look for clusters of businesses to roll out these changes and think of the public right-of-way holistically.

By June 2020, the Governor of Pennsylvania moved the state into the less restrictive green phase and NACTO released 'NACTO Streets for Pandemic Response & Recovery.' Public spaces now had to be re-planned to include responsible measures to ensure public health. NACTO offered six fundamental principles to guide decision-making.

1) *Support the most vulnerable people first*. COVID-19 amplified existing racial and socioeconomic inequities and exposed the most vulnerable to the greatest impacts. NACTO urged decisions to be guided by this principle first.
2) *Amplify & support public health guidance*. Physical distancing is a core public health strategy and one that governments should set as an example. Increasing the number of outdoor spaces where people can gather is a key component in protecting public health.
3) *Safer streets for today and tomorrow.* Essential workers needed to travel in the safest way possible, especially in the pre-vaccine months. As stay-at-home orders were rescinded and travel increased, ways to alleviate congestion and emissions would also serve to aid public health.
4) *Support local economies.* Schools, daycares, retail locations, and restaurants have all been majorly impacted by COVID-19. Supporting safe ways to operate will have a huge impact on financial recovery for these entities as well as overall livability of an area.
5) *Bring communities into the process.* Project implementation must be rapid and must be cognizant of these three phases: emergency, stabilization, and recovery. Regular and clear communication must be in place for all shareholders and the larger community at all phases of response.

6) *Act now and adapt over time.* Related to the guideline above, the ability to adapt a plan that is not working and communicate that plan to stakeholders in a timely fashion.

NACTO outlined several ideas which could be implemented in response to the pandemic crisis. As a reminder, this NACTO report was written in May 2020 when little was known about how the pandemic would unfold. The information summarized below is taken from this report.

Neighborhood Streets (local/residential)
Stay-at-home orders in place- "open streets" (pop-up parks), slow streets or local access only, speed management (movable barriers, gateway treatments, signs), WiFi hotspots, open-air cooling zones/sanitation
Pre-vaccine re-opening- local-access only treatments, lane removal/street closures for schools & religious/cultural service providers
Vaccine/Post-COVID- speed management (e.g. speed limit changes & geometry), play streets, slow streets, and local-access-only policies & design

Neighborhood Main/High Streets (small retail/office, residential, schools, institutions)
Stay-at-home orders in place- sidewalk expansions for queuing, outdoor markets, & access, pop-up bike and roll lanes, temporary pick-up/drop-off delivery zones
Pre-vaccine re-opening- tactical lane/parking space removal, street closures for outdoor restaurant seating, outdoor markets, etc., sidewalk expansions for queuing & access, tactical bike lanes, designated pick-up/drop-off delivery zones, bike & shared micromobility parking corrals,
Vaccine/Post-COVID- sidewalk widenings, speed management (e.g. speed limit changes & geometry), expanded bike lanes & bike/shared micromobility parking zones

Edge Streets & Boulevards (in/alongside parks, waterfronts, etc.)
Stay-at-home orders in place- street closures to vehicular traffic, for medical services, recreation, markets, etc.
Pre-vaccine re-opening- street closures to vehicular traffic, e.g. for recreation, markets, schools, etc., expanded bike lanes & bike/shared micromobility parking zones, speed management
Vaccine/Post-COVID- open space expansions, expanded bike lanes & bike/shared micromobility parking zones, speed management

DOMI acted on these suggestions chiefly by creating DOMI's Temporary Outdoor Dining & Retail program, implementing permitting processes around sidewalks, parking lane cafes, full street closures, curbside pickup zones, and neighborhood slow streets. Some of these changes required making the process itself more easily navigable by business owners and some changes required thinking outside of standard processes. As of April 2021, there were 86 storefronts permitted to expand into the public right-of-way as well as 30 storefronts permitted to expand into on-street parking spaces to make allow easier carry-out operations.

DOMI's prompt modification of the permit application process to a less expensive, more flexible one in response to the pandemic cannot be overstated. For example, to add outdoor seating for a restaurant before the pandemic, the sidewalk café had to be constructed in such a way as to still allow a 4-5 foot clear pedestrian path, depending on the width of the sidewalk. An

architect had to be retained to draw up the plan, additional insurance coverage had to be arranged, and costly fees ($500 plus $1 per square foot) made the average cost of applying for and receiving a Sidewalk Café license $1,300, according to DOMI's ReOpen PGH Street Life Pilots Evaluation. To lessen the economic burden, City Council waived fees when they enacted these temporary measures.

There was still a process to ensure public safety and fairness to business owners. A commercial property owner or the owner of a business occupying a ground floor must still have sufficient sidewalk space in front of their property to be considered eligible to apply. Furnishings for sidewalk cafes had to be moveable and at least one table had to be ADA compliant. The square footage of the sidewalk area determined the number of tables and chairs permitted and awnings must be adequately secured and retractable. Umbrellas and canopies had to be within the permitted area, with no encroachment into the public way.

Initially, an application required reviews by both DOMI and PLI, with two separate applications, and the certificate of insurance being emailed to yet another input stream. The processes required city staff to have to gather information for a permit within three different systems and there were some delays, even for applications that were complete and approved. DOMI reviewed this process in the Fall of 2020 with a What Works Cities grant. DOMI worked with I&P and the Behavioral Insights Team (BIT) and identified several recommended improvements, including:

- Consolidate the 3 input streams for all Temporary Outdoor Dining and Retail spaces applications, routing all applicants to OneStopPGH. Behind the scenes, DOMI and PLI could work on their respective parts at that point.
- DOMI should create a guidance document for using OneStopPGH.
- DOMI should require terms and conditions to be signed by each business contact for the permit to be approved.

Finding: DOMI recognized a problem in their process and sought expert help to solve it. DOMI implemented this guidance, and the process is sufficiently explained on public-facing websites.

When City Council amended the City Code to temporarily allow an expedited review and lower barriers, DOMI and PLI were allowed to waive the associated fees and remove the requirement for the Council member to approve the application. The most significant change was the relaxing of the requirement to have a certified architect draw the site plan. DOMI also had to work with the Public Safety Department around issues of safety. At least a 10-foot-wide emergency access lane had to be maintained, as well as a 13.5-foot clearance for all stringed lights over a right-of-way. A 10-foot distance between heaters and combustible materials had to be maintained and all propane tanks are to be locked in a cage or shed.

Many of these temporary policies were directed toward business owners, but a neighborhood business group saw an opportunity and worked with DOMI to create a public space. The Oakland Business Improvement District (OBID) received permission to close Oakland Avenue between Sennott Street and Forbes Avenue and use the area as space for business establishments to operate and for the public to have a seating area for dining and

socializing. In 2021, OBID's use of the space expanded to include a free recreational activity (mini golf).

Finding: DOMI was able to reconfigure their processes to meet the needs of the pandemic and was also able to see new visions for a public right-of-way. Arguably, the needs of the city during this crisis could not have been met as quickly, creatively, or as fairly as they were without the formation of DOMI.

RECOMMENDATION 18:

DOMI should continue to lobby City Council to continue these streamlined changes in their right-of-way permitting process. DOMI should also partner with community groups such as OBID, who have the intimate knowledge of their neighborhood to find ways to continue to transform public space into a more enjoyable, accessible, and creative experience.

Update: In February 2022, City Council unanimously passed a permanent permitting process for outdoor dining and retail activities. This bill also included a more detailed set of regulations to assist with making these public spaces more accessible to people with disabilities.

APPENDIX

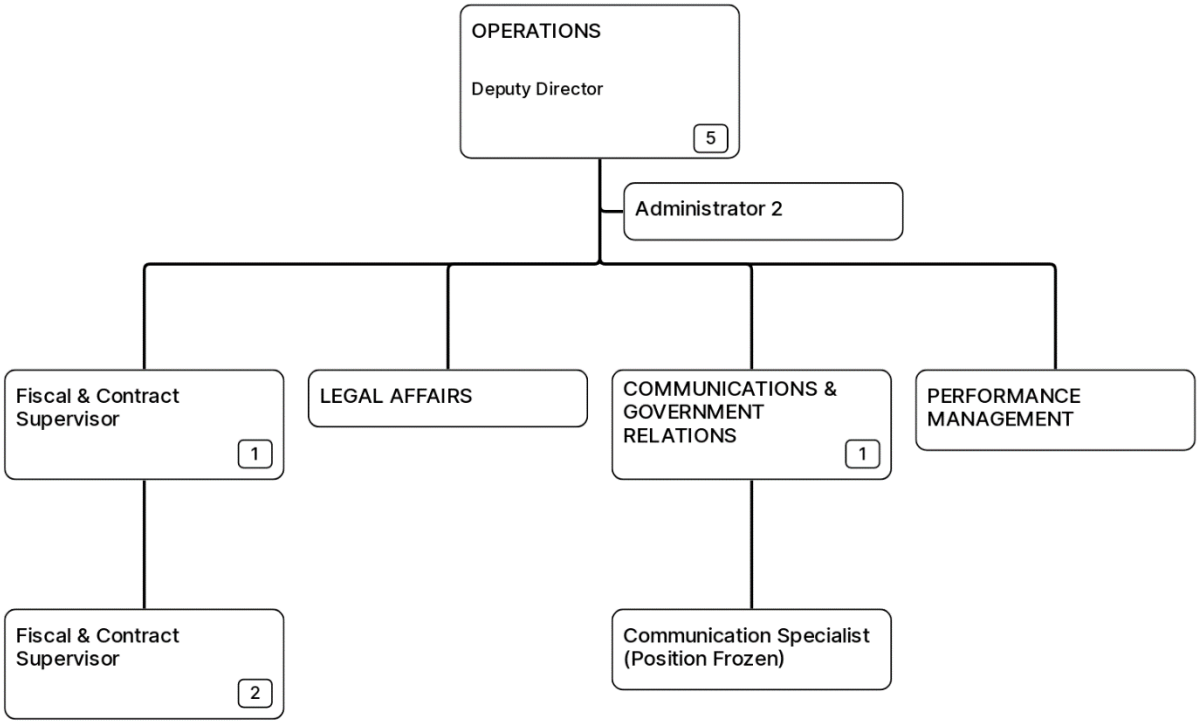
Below is the list of policies and standards publicly available on DOMI's website as of Fall 2021.

Topic	Policies and Standards
Accessible Design	Policy – Residential On-Street Parking for People with Disabilities (02 05 2020) Application Packet – Residential On-Street Parking for People with Disabilities (02 03 2020) 2010 ADA Standards for Accessible Design One Step Program
Autonomous Vehicles	Pittsburgh Principles for Autonomous Vehicles (03 2019)
Bikes	Pittsburgh Bicycle Parking Guidelines (06 03 2015) (pdf)
Complete Streets	Complete Streets Policy (11 22 2016)
Construction	Right-of-Way Procedures Manual (06 01 2017) (pdf) 4201-0001 Clearing and Grubbing, Modified Specifications (08 25 2020) (pdf) 4901-0001 Minor Maintenance and Protection of Traffic during Construction, Modified Specifications (08 25 2020) (pdf) 4901-0002 Major Maintenance and Protection of Traffic during Construction, Modified Specifications (08 25 2020) (pdf) 4802-0003 Topsoil Furnished and Placed, Modified Specifications (08 25 2020) (pdf) 9000-0006 Setting or Resetting Survey Monuments Specifications (08 25 2020) (pdf)
Crosswalks	In-Street Pedestrian Crossing Sign Warrants (01 28 2008) (pdf) Mid-Block Crosswalk Warrants (12 10 2007) (pdf)

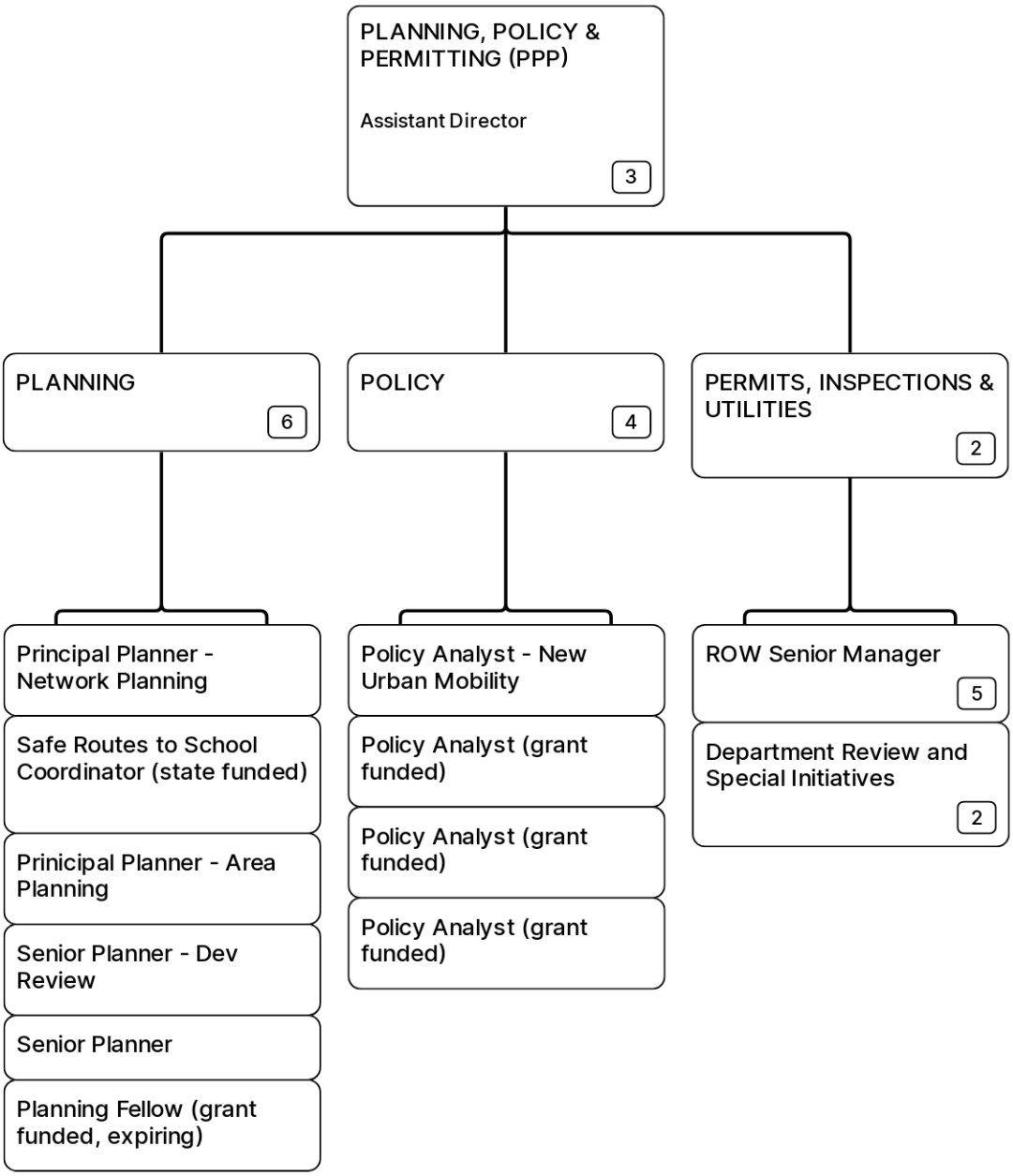
Curbs	Specifications for the Installation of Curb Cuts for Off-Street Parking (#20-0003) (08 06 2020) (pdf) Curb Cut Permit Fillable Checklist (08 06 2020) (pdf) 9000-0001 Concrete Deep Curb Specifications (08 25 2020) (pdf) 9000-0002 Concrete Deep Radius Curb Specifications (08 25 2020) (pdf) 9000-0003 Cement Concrete Curb Ramp Specifications (08 25 2020) (pdf) 4695-0004 Detectable Warning Surface, Modified Specifications (08 25 2020) (pdf)
Loading Zone	Loading Zone Application (pdf)
Micromobility	Guidance for Powered Micromobility Device Use in the City of Pittsburgh (#20-0001) (06 05 2020) (pdf)
Public Transit	Guidelines for the Temporary Relocation or Removal of Bus Stops for Construction Activities (02 20 2019) (pdf)
Sidewalks	Sidewalk Maintenance (Code of Ordinances § 417.02) 4676-0001 Concrete Sidewalk, 4", Modified Specifications (08 25 2020) (pdf) 4676-0002 Concrete Sidewalk, 6", Modified Specifications (08 25 2020) (pdf) 9000-0007 Concrete Knee Wall / Curb Cheek Wall Specifications (08 25 2020) pdf)
Signs	Multi-Way Stop Sign Warrants (01 03 2008) (pdf) "Watch Children" Sign Warrants (01 28 2008) (pdf)
Street Trees	Planting Application & Street Tree Removal PL-200 Street Tree Standard Detail (pdf)

Street Trees (continued)	Procedures for Reimbursement for Sidewalk Damage Resulting from City Tree Roots (pdf) 9000-0005 Tree Pit Specifications (08 25 2020) (pdf)
Streets	Neighborhood Slow Streets Guidelines (05 19 2020) (pdf) Guidelines for Street Modifications for Outdoor Operations (06 10 2020) (pdf) 4501-0200 Reinforced Cement Concrete Pavement, 8" Depth, Modified Specifications (08 25 2020) (pdf) 4501-0202 Reinforced Cement Concrete Pavement, 10" Depth, Modified Specifications (08 25 2020) (pdf)
Traffic Calming	Traffic Calming Program

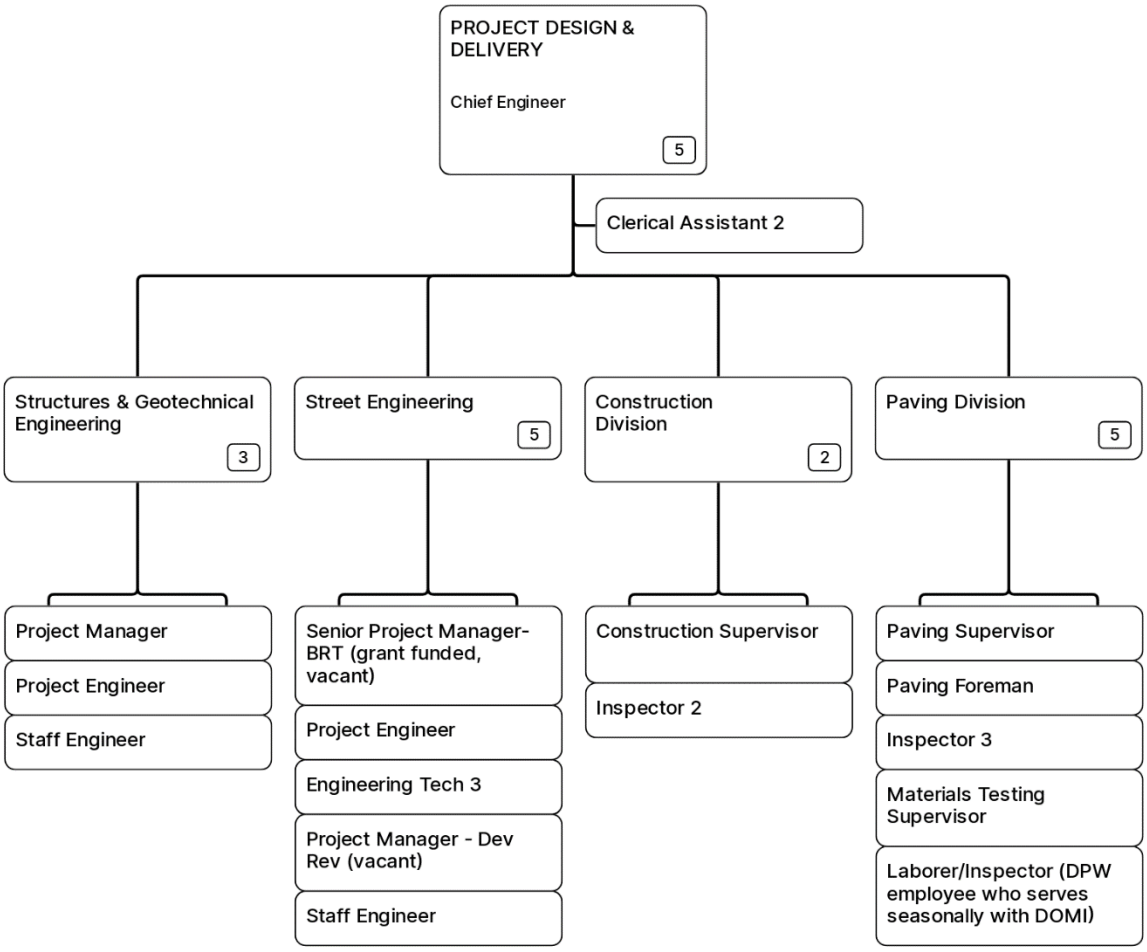
Organization Structure of DOMI's Divisions, 2020
Operations



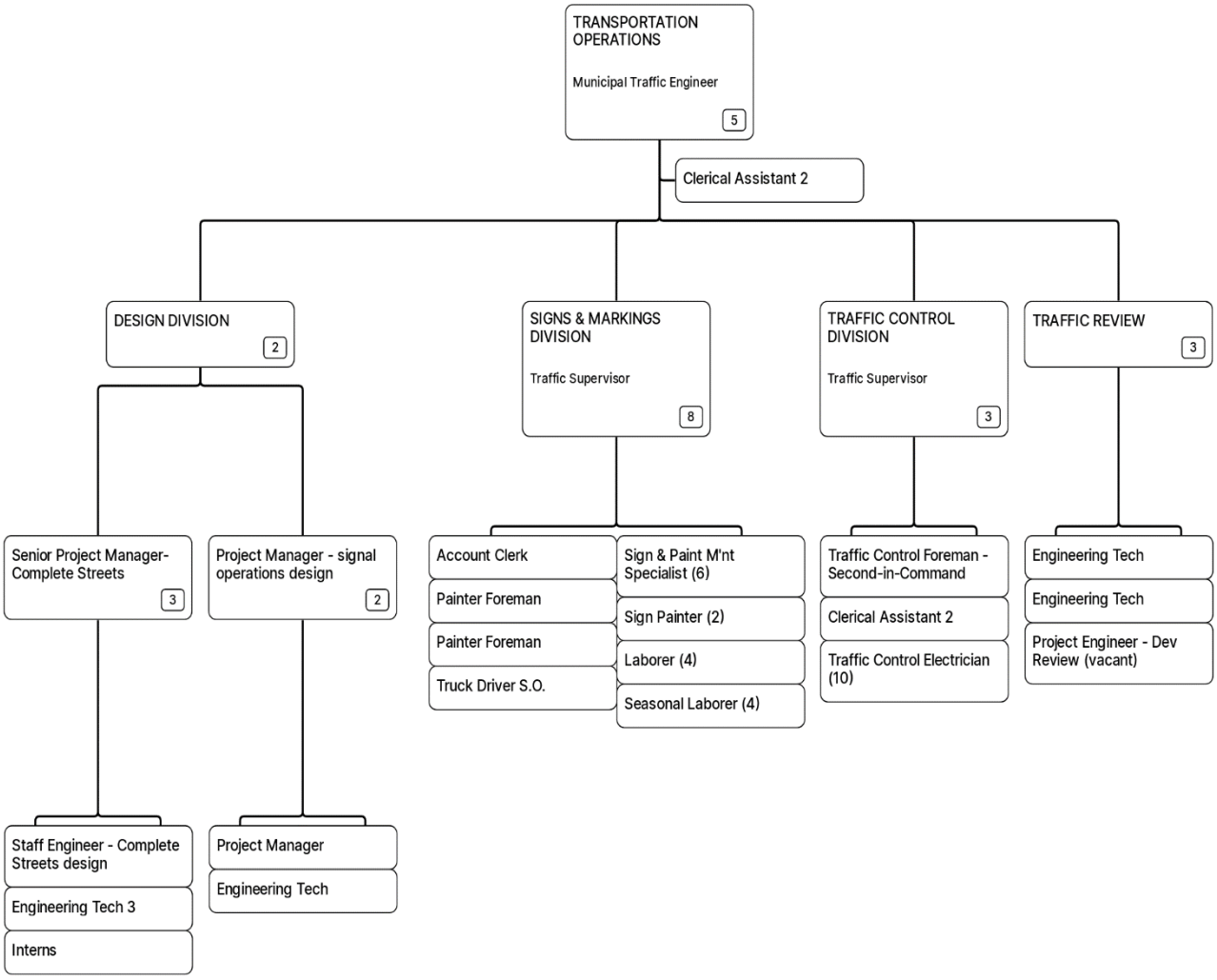
Planning, Policy, and Permitting



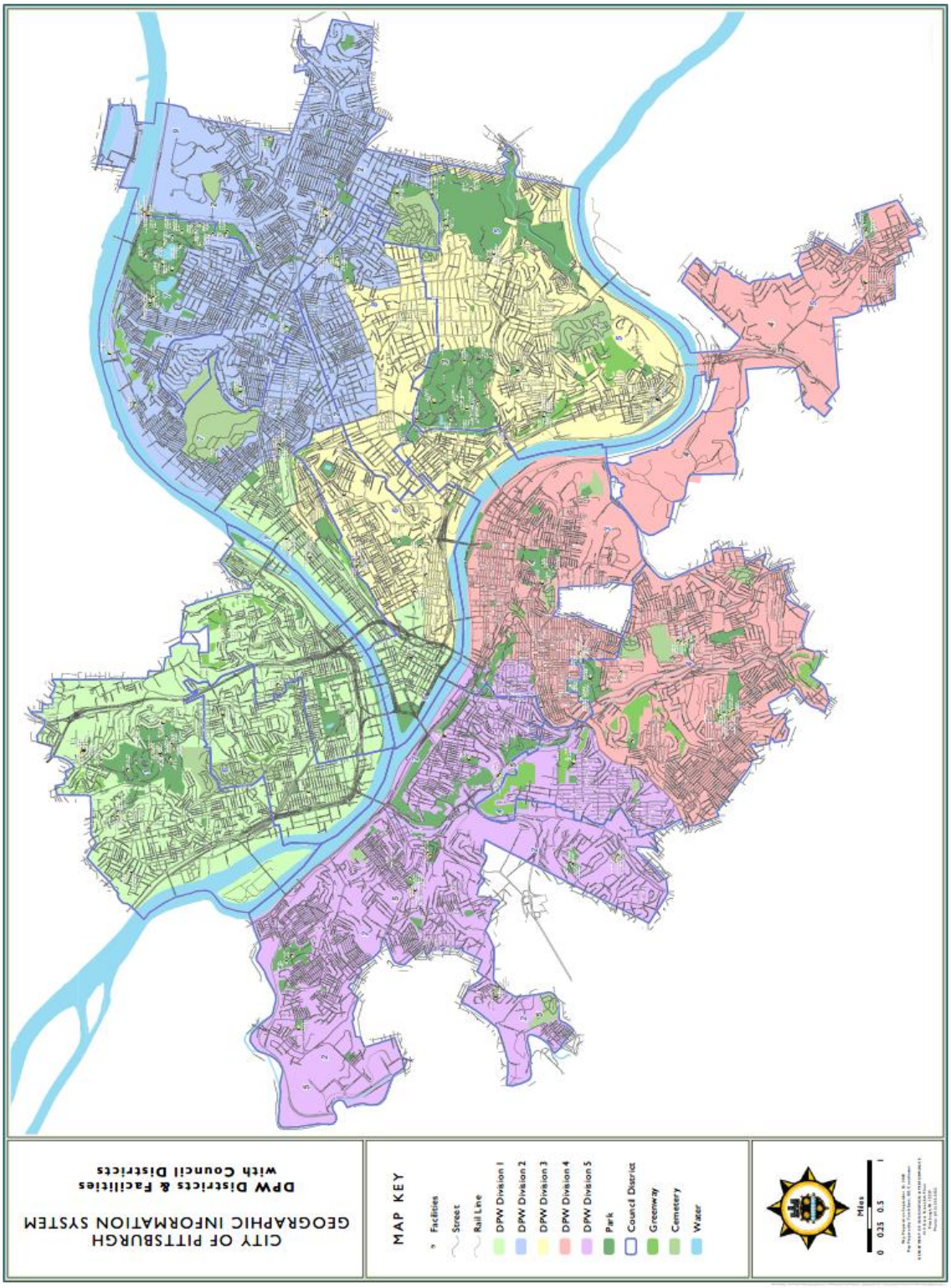
Project Design & Delivery



Transportation Operations



DPW Divisions & Facilities with Council Districts



DOMI Accomplishments as noted in City of Pittsburgh Operating Budgets, 2017-2020

2017:

DEPARTMENTAL / BUREAU OVERVIEW: This is a new department for 2017. Once hired, the Director of Mobility & Infrastructure will be tasked with establishing the organizational structure, goals, and objectives.
MISSION: Provide a safe, sustainable, and efficient system of transportation and accessibility

- Completed the $20M Beechwood Boulevard (Greenfield) Bridge replacement project
- Completed the $5M Forbes Avenue reconstruction project in downtown Pittsburgh
- Installed cycle tracks on Allegheny Circle on the North Side and Forbes Avenue in Oakland
- Installed bike lanes on Bigelow Boulevard, Negley Avenue, and the Greenfield Bridge
- Installed over 1,500 Handicapped curb ramps
- Conducted the review of over 30 applications from developers making improvements in the Right-of-Way (ROW)
- Installed over 400 miles of centerlines, 30,000 feet of curbs, 3,600 crosswalks, and 2,300 stop bars
- Upgraded five signalized intersections
- Completed repairs to the Oakley, Roundtop, Bigelow, and Greenwood steps
- Remediated two major slides: Newton Street and Woodruff Street
- Repaired/Rebuilt four walls: South 18th Street, Tinsley Way 1, Tinsley Way 2, and Mooney Road
- Completed major repairs to the Mission Street Bridge
- Replaced 4,300 feet of sidewalk: Grandview, Hilman, Saline, Boundary, and Henderson
- Reinstalled the Troy Hill Monument and enhanced the pedestrian accommodations area around the monument
- Replaced 25 roadway slabs of concrete
- Repaired 7 brick crosswalks in Downtown
- Put out to bid two major federal design projects: Penn Avenue Phase 2 and Charles Anderson Bridge
- Repaired six neighborhood brick and blockstone streets

2018:

- Paved more than 60 miles of city streets
- Responded to 20 major land slide events; designed and executed improvements to mitigate and restore 14 of these locations
- Restored 5 streets heavily damaged by major flooding events in Carrick
- Led a citywide process to deliver mobility solutions through "The City of Tomorrow Challenge"
- Developed a citywide bicycle network plan
- Completed a pedestrian safety action plan
- Initiated Complete Streets Design Guideline development and a new network priority map
- Introduced electric pedal assist bicycles to the city
- Developed a policy for the operation of autonomous vehicles in the city
- Issued one of the country's first Electric Moped Organization Right-of-Way Permits ("Scooter Share")
- Piloted “sparks” in the city creating two public seating areas in key commercial districts.
- Issued 17,000 Right-of-Way permits

- Placed all public Right-of-Way permits online and available as information to the general public through the ‘Burgh’s Eye application
- Established coordination meetings with the multiple public and private utilities to coordinate work done in the public right of way
- Responded to more than 5,000 requests to the Traffic Bureau through the city’s 311 system
- Established a new traffic calming program for the city; developed traffic calming plans for 12 different areas of frequent concern and implemented effective improvements including speed humps and pedestrian refuge islands
- Developed and deployed a “neighborhood pace car” program
- Made major safety improvements to five intersections of concern
- Construction of 63 Handicap ramps
- Planned/Installed 684 Linear Feet of Guiderail
- Brick Street resurfacing from Seventh Avenue to Liberty Avenue
- Rebuilt the Joncaire Steps
- Designed streetscape improvements for East Carson Street and Smallman Street
- Developed a concept plan for mobility connections between Oakland and Mon River neighborhoods
- Completed a step prioritization plan
- Installed or repainted more than 300 miles of center lines and 3,600 crosswalks
- Replaced/Installed 4 signalized intersections
- Completed traffic signal retiming plans to 50 intersections
- Completed revisions to 15 traffic signals
- Reviewed plans for improvements to approximately 30 signalized intersections

2019: ***It should be noted these are identical to 2018 accomplishments***

- Paved more than 60 miles of city streets
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- Installed or repainted more than 300 miles of center lines and 3,600 crosswalks
- Completed revisions to 15 traffic signals
- Reviewed plans for improvements to approximately 30 signalized intersections

2020:

In response to the COVID-19 pandemic:

- Rapidly assembled a street response task force who issued a rapid response strategy to support healthy streets and local businesses
    - Worked with over 100 establishments and permitted 55 "streeteries" closing streets or curb lanes to enable outdoor dining by local restaurants
    - Established 28 neighborhood slow streets limited to local traffic only to enable use of street for safe outdoor physical exercise, play and non-motorized transportation
    - Temporarily closed Reservoir Drive to permit a more physically distanced place for active recreation activities
- Resurfaced more than 46 miles of asphalt streets
- Completed concrete, brick or blockstone repairs on 23 streets across the city
- Installed or repainted more than 300 miles of center lines and 3,600 crosswalks
- Completed major signal upgrades at 8 intersections, signal re-timing plans for 50 intersections, and repair and maintenance on hundreds of individual signals
- Developed the Concept of Operations Plan for the $25M smart spines project (adaptive traffic signals)
- Launched OneStopPGH and issued more than 17,000 Right-of-Way permits; completed more than 24,000 Right-of-Way inspections
- Released the 2020 Bike+ Plan; the first 10-year bicycle plan issued in twenty years
    - Launched the MoveForwardPGH" initiative
    - Added more than 10 miles of new or upgraded bicycle facilities
    - Introduced "neighborways" (low speed, bicycle-friendly residential streets) to the city and implemented 5 neighborway projects including Southside Neighborhood Street and the new bike/pedestrian underpass under the Birmingham Bridge
- Completed construction of the Cattail Trail along Washington Blvd and the Forward/Saline trail in Squirrel Hill South
- Completed final engineering design for the first phase of the Mon-Oakland connector trail

- Started Pittsburgh's first Safe Routes to School (SRTS) program and completed walkability audits at the four inaugural champion schools
- Released the Pedestrian Safety Action Plan and completed critical sidewalk gap construction in three neighborhoods of need: Homewood, Hill District and Hazelwood
- Reconstructed the Vista Street steps
- Completed several major safety improvements including
    - Chateau Avenue road diet
    - 40th and Penn intersection safety
    - Beechwood Blvd/Mellon Park pedestrian crossing
    - Pioneer and Brookline Boulevard intersection safety
    - Millerton and Route 65
- Installed traffic calming countermeasures, such as speed humps, in 10 areas; completed traffic speed and volume data collection from 22 locations
- Installed rectangular rapid flash beacons (RRFBs) at three high priority crosswalk locations
- Initiated the launch of the Pittsburgh Mobility Collective (Move412) with the installation of the first 15 mobility hubs
- Executed a new contract for transit shelter maintenance and expansion
- Collaborated with the Port Authority of Allegheny County to complete final engineering design for the $200M East End-Oakland-Downtown bus rapid transit project
- Implemented the first phase of Smallman Street streetscape improvements
- Responded to 15 areas experiencing land slide activity
- Initiated work to rebuild the West Ohio Street Bridge
- Constructed significant portions of the I-579 CAP project
- Completed construction of the McFarren Bridge in Duck Hollow
- Completed significant maintenance on 8 other bridges and advanced engineering design for rehabilitation or replacement of 5 others
- With multiple partners, restored 10th Street downtown after a major sinkhole event
- In partnership with the University of Pittsburgh, completed major streetscape, safety, and Complete Streets transformation of Bigelow Boulevard between Fifth and Forbes
- Completed final engineering design and issued for construction bids 2-way conversion of Allegheny Circle
- Completed streetscape and safety improvements on Broadway Avenue in Beechview
- Established a new Policies and Standards page for more predictable guidance on permitting and project reviews
- Updated the city Right-of-Way Policy Manual to better manage and preserve public streets
- Developed and posted numerous policies for Right-of-Way use to improve consistency and predictability
- Developed new fees and guidelines for small cell antenna installations in the city; issued more than 50 permits for new and upgraded small cell facilities
- Responded to more than 7,000 requests through the city's 311 system

EDWARD C. GAINEY
MAYOR

KIMBERLY LUCAS
DIRECTOR

CITY OF PITTSBURGH
DEPARTMENT OF MOBILITY & INFRASTRUCTURE
CITY- COUNTY BUILDING

June 2022

Michael E. Lamb, City Controller
Office of the City Controller
414 Grant Street
Pittsburgh, PA 15219

RE: Performance Audit of the Department of Mobility and Infrastructure

Dear Controller Lamb,

Thank you for allowing DOMI to respond to the findings of the audit report. I believe you will be pleasantly surprised to learn that many of the report's recommendations have, or are already in process, of being addressed. Please do not hesitate to reach out if we may provide additional information.

RECOMMENDATION 1: A thorough review of records should be undertaken, and those records should be digitized and catalogued for documentation purposes.

Response: **DOMI is actively working with the City's Archivist to develop a document retention policy. Since 2021 or earlier, we have actively begun digitizing many of our paper records, and are participating in a digital asset management and data governance study led by the Department of Innovation & Performance.**

RECOMMENDATION 2: The director of DOMI stated that the mission statement has not been analyzed to check for progress towards its goals. The Controller's Office understands that recent years have offered different and more difficult challenges. It is recommended that DOMI revisit and construct some concrete short-term steps that lead to the attainment of these goals.

Response: **As part of developing the City's 50-year mobility plan, Envision 2070, the Department developed a Strategic Action Agenda (included) which identifies 300+ initiatives, including performance standards for various departmental programs. This is an internal document that we may consider making public.**

RECOMMENDATION 3: DOMI administration needs to update their organizational chart in the city's budget and other documents to properly explain each of the four bureaus' responsibilities. The Operations bureau's responsibilities and duties are missing.

Response: **We will continue to submit current organizational charts for the budget book (attached is our current interactive version), but we don't have control over what is ultimately published once we submit.**

RECOMMENDATION 4: DOMI administration should work with I&P to update their website to make information about the department, including divisions, names of division leaders, phone numbers and addresses, and other pertinent information more accessible to the public.

Response: **We continually update our webpage so that it reflects current programs and policies, and have added additional contact and leadership information. We use the EngagePGH platform for all active projects and programs where we are soliciting feedback, and the project contacts are included in each of those pages.**

RECOMMENDATION 5: DOMI administration needs to update Council on the Complete Streets progress and continue to meet the biennial updated reporting requirement.

Response: **We provide an update on an annual basis as part of the capital budget forum for the Council and public. We report out on complete streets work achieved in the previous year. We would like to know more about any additional reporting that may be required.**

RECOMMENDATION 6: DOMI should update their website as the Complete Streets goals are accomplished, perhaps in a format like New York City's linked above. If results are shown that Complete Streets projects work, more public interest and acceptance might then occur.

Response: **DOMI welcomed our first Senior Systems Analyst this year who is focused on data governance and transparency for the department. We already display the recommended information for our traffic-calming program, and are expanding this approach to other areas of the Department. Traffic Calming Data | pittsburghpa.gov**

RECOMMENDATION 7: Traffic calming methods provide a safer experience for all users of public streets. It is recommended this data be published on the website as soon as possible to help educate residents about the effectiveness and benefits of traffic calming.

Response: **We already make this information available here: Traffic Calming Data | pittsburghpa.gov We are also developing a traffic calming request map so that residents may check the status of all requests that have been received.**

RECOMMENDATION 8: In order to ensure the city is being prudent with limited resources, DOMI should work to ensure that when the need for a base repair is discovered, a paving inspector is dispatched to the site. Future contracts should work to prevent independent contractor assessments of base repairs.

Response: **We have limited inspectors, and have increased budget recently for contracted inspectors. We try to keep a close eye on this as much as possible, but ultimate solution is to make sure we have enough inspectors to be everywhere we need to be.**

RECOMMENDATION 9: More inspectors are needed, to help the paving division be more efficient and increase its ability to make sure paving work is completed properly and information about our streets is being inputted and updated.

Response: **The Paving Division needs additional staff, and is one example, but nearly every division of our department is understaffed. In 2021, nine Right of Way inspectors performed 50,000 inspections, which is truly astounding. However, in 2021 we issued 18,000 Right of Way permits, and at a minimum would want to see at least three inspections per permit totaling a minimum of 54,000 inspections, let alone any non-permit related inspection activity (for example, 311 complaints about damaged sidewalks, etc.) Another example: the Federal Highway Administration recommends at least one (1) Traffic Signal Engineer per 100 signalized intersections in a City. Pittsburgh has over 600 signalized intersections and only (1) Traffic Signal Engineer. In order to responsibly maintain the infrastructure of our City, increases in staffing across the Department are desperately needed.**

RECOMMENDATION 10: DOMI administration should analyze different scenarios and present and explain the data to the public as to how streets are being selected for repaving. Real-world variables necessitate some departure from a computer-driven list, however choosing too many from the non-Cartegraph list may signify those streets are still being repaved at the expense of more degraded ones. Before concrete and accessible data existed, it was arguably a good idea to tie paving projects in with council districts to ensure equity across the city. However, we now have more comprehensive data, and as a result, more data-driven decisions can be made.

Response: **We are working with I&P to extract pavement condition scores from the most recent round of high-resolution imagery that was captured this year. We are on track to begin using Cartegraph and updated paving scores to be more transparent and equitable than ever in our paving program.**

RECOMMENDATION 11: In order to provide a more accurate view of paving work, more staff time should be devoted to updating Cartegraph information as work is completed. Having accurate information entered in Cartegraph means DOMI has the information needed when it is time to formulate decisions. Updating Cartegraph with work completed as it occurs, as well as with information workers find in the field, should be a departmental priority. Cartegraph is easy to use, and when new staff is hired, a new worker can be quickly trained to perform these tasks.

Response: **We are continually improving our data reporting and collection processes, but this is another example of how additional staff to support asset management is needed.**

RECOMMENDATION 12: DOMI administration should review the information provided to the public via [updating the Western Pennsylvania Data Center's list of City Paving projects] for completeness and organization. Inserting a column listing the neighborhood a street is in, for example, might make it easier for people new to the city to use.

Response: **We will review information provided to the public via this mechanism for completeness and organization, and consider adding a column in for neighborhood.**

RECOMMENDATION 13: DOMI administration needs to request an increase in staffing levels with OMB and City Council to improve oversight throughout the divisions which are lacking staff. Recommendation numbers 8, 9, 11, 12, 14, and 16 all demonstrate the need for more staffing levels to improve operations.

Response: **We will be providing a request for additional staff in the 2022 budget season.**

RECOMMENDATION 14: It is important to consider more environmentally friendly approaches to all city operations. DOMI administration should meet with OMB to propose suggestions for soliciting contracts that will honor the city's more environmentally friendly approaches to its operations. The asphalt contract should require the contractor to use a proportion of RAP.

Response: **We will explore this idea and consult the asphalt plant to see if this is feasible.**

RECOMMENDATION 15: DOMI administration should continue to monitor the fees associated with ROW permit work and advocate for increases as necessary.

Response: **As staffing resources permit, we will evaluate our fee structure and recommend increases in existing fees, and introduction of new fees, as able.**

RECOMMENDATION 16: Scheduled utility work and finished utility projects must be inputted into Cartegraph. Sites with scheduled work must be flagged in the software so these streets can be considered for a possible cost-sharing plan. If this is done, the paving list could be finalized by January and released to residents instead of having City Council vote on a paving list in March.

Response: **This does not accurately reflect the process for selecting streets for repaving. We agree that increased coordination of our paving list with utilities is a goal that we are striving towards, and believe the development of our paving list much farther in advance than the calendar year that it will be undertaken will support this goal. From a technical stand-point, we will explore automated ways to do this as we don't think that utilities can use Cartegraph, but there may be opportunities with our online permitting system, OneStopPGH, to achieve this.**

RECOMMENDATION 17: It is important that applications for ROW permits, collection of fees, and inspections of work completed are completed in a timely manner. Additional staff members should be hired to ensure that this work is done and the city is not left with substandard paving patches which later necessitate repaving at the city's expense. DOMI's staff should review all ROW invoices on a quarterly basis to ensure that these fees are being collected. penalties.

Response: **We agree, and have previously tried withholding permits to get utilities to complete work, but we weren't able to uphold that method. PUC or other law may prevent this mechanism. We are beginning to look at ROW invoicing practices to increase efficiency and accuracy.**

<u>RECOMMENDATION 18:</u> DOMI should continue to lobby City Council to continue these streamlined changes in their right-of-way permitting process. DOMI should also partner with community groups such as OBID, who have the intimate knowledge of their neighborhood to find ways to continue to transform public space into a more enjoyable, accessible, and creative experience.

Response: **We successfully completed this is February 2022.**

As I hope you've seen in the above responses, DOMI's staff has accomplished incredible feats in the short five-years of the Department's existence. We are confident that as we continue to evolve as an organization and strengthen our policies and practices, that these advancements will translate into better public spaces and higher quality of life for the residents of Pittsburgh.

Sincerely,

Kimberly Lucas

Kimberly Lucas
Director
cc: