Utilities in the State Right-of-Way

A Pennsylvania Transportation Advisory Committee Study | June 2021

State Transportation Commission
Transportation Advisory Committee

pennsylvania
DEPARTMENT OF TRANSPORTATION

Contents

Acknowledgements

About the Transportation Advisory Committee

The Pennsylvania Transportation Advisory Committee (TAC) was established in 1970 by Act 120 of the State Legislature, which also created the Pennsylvania Department of Transportation (PennDOT).

TAC has two primary duties. First, it "consults with and advises the State Transportation Commission and the Secretary of Transportation on behalf of all transportation modes in the Commonwealth." In fulfilling this task, TAC assists the Commission and the Secretary "in the determination of goals and the allocation of available resources among and between the alternate modes in the planning, development, and maintenance of programs, and technologies for transportation systems."

TAC's second duty is "to advise the several modes (about) the planning, programs, and goals of the Department and the State Transportation Commission." TAC undertakes in-depth studies on important issues and serves as a liaison between PennDOT and the general public.

TAC consists of the following members: the Secretary of Transportation; the heads (or their designees) of the Department of Agriculture, Department of Education, Department of Community and Economic Development, Public Utility Commission, Department of Environmental Protection, and the Governor's Policy Office; two members of the State House of Representatives; two members of the State Senate; and 18 public members—six appointed by the Governor, six appointed by the President Pro Tempore of the Senate, and six appointed by the Speaker of the House of Representatives.

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Study Purpose and Methodology

The Pennsylvania State Transportation Advisory Committee (TAC) formed the Utilities in State Right-of-Way Task Force (Task Force) to guide this study to review the current state of the practice relative to the coordination with utilities in state right-of-way and identify potential opportunities for improvement. The focus was to be on how utilities in the state right-of-way coordinate with the facility owner (PennDOT) relative to utility and PennDOT capital projects and to determine where there would be opportunities for improving that coordination. The Task Force was comprised of representatives from the utility companies, design consultants, contractors, municipalities, municipal authorities, the Pennsylvania Public Utility Commission (PUC) and PennDOT. Stakeholders outside the immediate Task Force were also surveyed to identify areas of improvement to the utility coordination process and solicit recommended improvements. Additionally, a review of best practices and previous efforts related to improving utility coordination within the state right-of-way have been reviewed and are summarized in this report. A review of current coordination practices and coordination tools has also been completed to determine where potential improvements can be made or where connections of existing systems may provide improved coordination between the varying entities occupying the state right-of-way. The results of the research and surveys are summarized within the report body and are provided in greater detail in the appendices to this report.

High-Level Summary of Background Research and Stakeholder Inputs

The following is a summary of major inputs considered in this report. Please refer to the individual appendices for more information on each element of the background research and stakeholder input.

PA Next Generation | Utility Relocation Team Completion

"Since 2016, the Utility Relocation PNG team has completed 21 initiatives to help improve the utility relocation process for highway/bridge projects. As a result of these initiatives, policy guidance and clarifications have been implemented as best practices, checklists, a utility relocation process flow chart, a let schedule report, Publication 408 revisions and the issuance of Design Manual Part 5, Changes 1 and 2."

For more information refer to Appendix A.

Federal Highway Administration | National Utility Coordination Process

"Utility relocations have been cited for the past two decades and possibly longer as a leading cause of highway project construction cost-and-time overruns. This issue has been raised in multiple studies and internal Federal Highway Administration (FHWA) reviews, which have repeatedly identified utilities as one of the top causes of cost increases and schedule delays on transportation projects. **The review team assessed the current state of utility coordination in all 50 States, the District of Columbia, and the Commonwealth of Puerto Rico. The review objectives focused on utility agreements; relocation plans, schedules and estimates; information in contract bid documents, and impacts during construction, such as time delays and cost increases."**

For more information refer to Appendix B.

PA Senate Transportation Committee | Delay and Delivery of Road and Bridge Projects

On February 2, 2016, the Pennsylvania State Transportation Committee heard testimony from statewide and utility industry perspectives. Those who provided testimony from a statewide perspective include Leslie Richards, PennDOT Secretary; Brad Heigel, Chief Engineer, PA Turnpike Commission; Gladys Brown, PUC Chair, and others. Utility industry perspectives included those who represented utility contractors, electric/natural gas, telecommunications, cable, water, and railroad industries.

For more information refer to Appendix C.

Transportation Research Board | Strategic Research Needs

In September 2019, the Transportation Research Board published a paper entitled *Strategic Needs in the Area of Utilities.* "A number of critical, emerging, and cross-cutting issues that will influence and shape the transportation community are related to utilities." A list of 12 issues and ideas is presented on how to address those issues through research, research implementation, and knowledge transfer.

For more information refer to Appendix D.

Pennsylvania Department of Transportation

Previous and current PennDOT initiatives related to utilities were considered as follows:

1. Utility Relocation Best Practices – PennDOT identified and published 12 best practices for utility relocation in 2018.
2. Utility Relocation Management System (URMS) – Launched in 2020, URMS is a web-based application to organize and manage all the steps of utility coordination for bridge and highway projects. URMS will be the means for effective utility scheduling and coordination on highway projects.
3. PennDOT Connects – PennDOT Connects is an approach that enhances local engagement and improves transportation project planning, design, and delivery.
4. One Map – One Map is a web-based GIS mapping application for highway and bridge projects on the Commonwealth's 12-Year Transportation Program and Regional Transportation Improvement Plans (TIPs).
5. Planless 2025 – Planless 2025 is an initiative to provide the capability for construction projects to be bid using 3D technology and no longer be in a traditional plan format by 2025.

For more information refer to Appendix E.

PA One Call | Coordinate PA

"Coordinate PA is a web service application developed by Pennsylvania 811 to support public works and utility project planning and utility coordination within the Commonwealth of Pennsylvania. Coordinate PA uses the power of the Internet to represent a spatial, map-based look at underground utility and public works projects to help identify opportunities for coordination and collaboration when projects overlap in space and overlap in time."

For more information refer to Appendix F.

Stakeholder Survey

A survey among Task Force and utility stakeholders was conducted July 21-31, 2020 to gain current perspectives on utility issues. 62 responses were submitted, analyzed, and categorized. Key take-aways from the survey include:

- Schedule and available information are the biggest challenges facing the survey respondents.
- Improved coordination tools and information sharing are the most impactful changes that could be made to address challenges for survey respondents.
- Regulatory improvements related to utility relocation timelines and required responses from aerial owners were preferred by respondents.
- Approximately half of the survey respondents were using or are familiar with the existing coordination tools available.

For more information refer to Appendix G.

Limitations of Stakeholders Engagement

The focus of this study has been narrowly focused on activities by PennDOT within its right-of-way. Stakeholders that were engaged within this framework through this process include utility owners, industry representatives, consulting and contractor representatives, and state agencies. The recommendations below are primarily focused on PennDOT activities or regulations which impact PennDOT activities. It should be acknowledged that municipal governments within the Commonwealth are utility owners, right-of-way and transportation system owners, and asset managers like PennDOT. Additional systems managed at the municipal level, such as Philadelphia's Guaranteed Pavement Information System (GPIS), were not considered in this study because the focus was on state-wide tools that can benefit utility coordination within the state right-of-way and on PennDOT projects. The Process Improvements and Regulatory Improvements would impact a wider cross section of interested parties than the 62 stakeholders that were engaged for this study. Further outreach to additional stakeholders, such as municipalities and other affected parties, may be beneficial prior to implementation.

Recommended Improvements

PennDOT has adopted many of the industry best practices related to utility coordination and has developed a new online utility coordination system, Utility Relocation Management System (URMS), which launched in October 2020. While much progress has been made in recent years, further improvements would be beneficial. The recommendations of this study have been divided into two categories: 1) Process Improvements; and 2) Regulatory Improvements. The Process Improvements can be accomplished with administrative changes within PennDOT and are more achievable in the short-term. Regulatory Improvements require changes to regulations and/or governing legislation and should be considered as longer-term improvements that may require additional stakeholder engagement. The recommended improvements are listed below:

Process Improvements

1. Require utilization of URMS and Coordinate PA on all projects administered by PennDOT.
2. Provide integration of Coordinate PA and PA OneMap to inform utility owners of programmed work.
3. Ensure that Districts are utilizing Best Practices outlined by PennDOT PNG and update DM5 SUE Form to align with Section 6.1 of the PA One Call Law.
    a. Risks-Based Subsurface Utility Engineering (SUE) Process utilizing SUE Utility Impact Form in DM5.
    b. Accommodate Prior Work or Incorporate Work into Project.
4. Require underground infrastructure and utilities installed in state highway right-of-way to provide location as-built information.

Regulatory Improvements

1. Require utilities in the state right-of-way to perform predetermined relocations within a defined timeframe or be responsible for delay costs incurred for non-compliance to the relocation timeframe.
2. Provide new legislation or regulations to define responsibility for tracking and identification of aerial utilities (utility pole attachments).
3. Increase the amount of ticketing required to go through Coordinate PA for utility owners, professional designers, and professional excavators.

Process Improvements

1. **Require utilization of URMS and Coordinate PA on all projects administered by PennDOT.** URMS will be required for all projects initiated after the launch of the system in October 2020. However, the Coordinate PA system is a voluntary tool that requires user input to enhance its efficacy. PennDOT's participation in Coordinate PA for planning and ticketing on its projects will help improve its usefulness for other member firms of One Call and improve coordination with most of the different users of the state right-of-way. The use by PennDOT and agents of PennDOT will occur at the following steps:
    a. Planning – A project that is programmed and included on the 12-Year Program (TYP) and Transportation Improvement Plan (TIP) can be input into Coordinate PA to provide utilities and other PA One Call members to see how programmed PennDOT projects interact with utility renewal and expansion programs and projects.

b. Design – Coordinate PA can be used for requesting design tickets and further refining the limits of the projects that were put in during the planning phase. At this phase URMS and Coordinate PA could incorporate links between the projects in each program to allow mutual users of each system easy cross referencing.
c. Construction – The project in Coordinate PA can be further refined and updated to reflect the construction limits and schedule. The existing project can be utilized by the contractor to request their locating tickets prior to excavation.

2. **Provide integration of Coordinate PA and PA OneMap to inform utility owners of programmed work.** To improve dissemination of information in Coordinate PA and PA One Map, the development of an application programming interface (API) is recommended to exchange GIS information for PennDOT projects in PA One Map (PennDOT TYP and TIP projects) and the utility projects in Coordinate PA. This will help better identify areas and schedules that may overlap or utility work that may be scheduled immediately after PennDOT work. Early identification could help avoid utility cuts or attachments in or on newly rehabilitated or constructed transportation assets. Automating the connection to Coordinate PA will also improve the effectiveness and reach of the information generated and maintained for PA OneMap.

3. **Ensure that Districts are utilizing Best Practices outlined by PennDOT PNG and update DM5 SUE Form to align with Section 6.1 of the PA One Call Law[1].** PennDOT PNG defined a comprehensive list of best practices for utility coordination. Continued emphasis of employing best practices should be continued to ensure more consistency across districts. Special emphasis should be placed on utilizing the following best practices:
    a. **Risks-Based Subsurface Utility Engineering (SUE) Process utilizing SUE Utility Impact Form[2] in DM5.** Determining the appropriate level of SUE investigation and appropriately budgeting for it in the design phase is critical to identification and mitigation of utility conflicts. DM5 should also be updated to reflect the requirement, "To utilize sufficient quality levels of subsurface utility engineering or other similar techniques whenever practicable to properly determine the existence and positions of underground facilities when designing known complex projects having an estimated cost of four hundred thousand dollars ($400,000) or more."
    b. **Accommodate Prior Work or Incorporate Work into Project.** To the greatest extent possible, having utilities perform relocations prior to construction will help mitigate scheduling conflicts and delays. Additionally, when possible, incorporating utility relocation work (with reimbursement mechanisms if necessary) into the construction contract can help the contractor control the schedule. Some states have included design and construction pre-qualifications for utility work which may help expand the scope of utilities that can be included in a highway project. Creating pre-qualifications would provide utility owners with greater confidence that the work incorporated into the PennDOT contract will be constructed correctly. ASCE has provided guidance in its "Subsurface Utility Engineering for Municipalities – Prequalification Criteria and Scope of Work Guide" by James H. Anspach and C. Paul Scott.

[1] https://www.pa1call.org/pocs/7bf4a38e-2dbf-43ce-89b2-aa1f03b2352e/PA-Act-287-as-amended?viewmode=0
[2] https://www.penndot.gov/ProjectAndPrograms/RoadDesignEnvironment/RoadDesign/Right-ofWayandUtilities/UtilityRelocation/Pages/default.aspx

4. **Require underground infrastructure and utilities installed in state highway right-of-way to provide location as-built information.** PennDOT can update the permitting process to require location information that can be used in an asset management system. The type of data such as latitude, longitude, elevation or depth, data type such as GIS or CADD data files, and frequency of data collection would need to be defined. The approach to managing and storing the data by the Department would also need to be determined and likely coordinated with on-going efforts related to Digital Delivery/Planless 2025. Similar as-built requirements may also be included in design and construction projects where underground infrastructure is being located or installed.

Regulatory Improvements

1. **Require utilities in the state right-of-way to perform predetermined relocations within a defined timeframe or be responsible for delay costs incurred for non-compliance to the relocation timeframe.** There is little recourse for non-responsive utilities who do not provide timely information in the planning or design phases or do not adhere to utility relocation schedules agreed upon and relied upon for construction costing and scheduling. Any costs associated with delays due to non-responsive utilities are often carried by the transportation facility owner (PennDOT). This improvement would make utilities responsible for delay costs incurred due to failure to adhere to agreed-upon timelines (on Form 4181) or potentially maximum response or relocation timeframes. There are concerns that will need to be addressed relative to:
    a. Process that allows for appeal of decisions relative to fault.
    b. Incentives, rather than disincentives that could be used.
    c. Considerations for extenuating circumstances such as storms, emergencies, and other public safety needs the utilities may need to divert resources towards.

2. **Provide new legislation or regulations to define responsibility for tracking and identification of aerial utilities (utility pole attachments).** Aerial utilities (overhead power, telecommunication, etc.) are not covered by the PA One Call law or system which serves as a clearinghouse for underground utilities. The ownership of aerial utility poles is often determinable through pole identification tags, however additional attachments (often telecommunications on an electric utility owned pole) are difficult to determine. The rapid proliferation and consolidation of communication companies in the late 20th and early 21st centuries have compounded this issue and the deployment of small cell antennas will only increase the amount of secondary attachments to existing utility poles. Clarifying the responsibility for tracking and identification of secondary aerial utility attachments would minimize the potential for unknown aerial utilities requiring exensive research or delaying relocation of

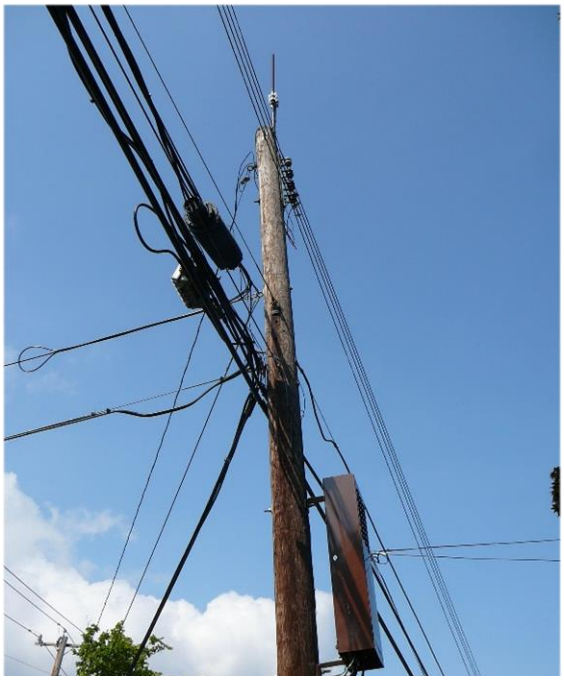

Figure 1 - An example of an electric pole with multiple telecommunication connections. https://upload.wikimedia.org/wikipedia/commons/4/47/NextGDAS.JPG

poles when an unknown utility cannot be determined. It is recognized that this proposed change would create an additional burden for asset management and response for aerial utility owners and in certain instances, the utility pole owners are unaware of the secondary attachments.

3. **Increase the amount of ticketing required to go through Coordinate PA for utility owners, professional designers, and professional excavators.** PennDOT has been moving toward electronic systems for their projects including ECMS, URMS, and the forthcoming electronic contract drawings. PA One Call designed Coordinate PA to meet the requirements for design and excavation ticketing, however, telephone and facsimile-based systems are still available and heavily utilized. Through policy PennDOT can require their consultants and contractors to utilize Coordinate PA, but ultimately an update to the regulations could help transition most of the ticketing to the Coordinate PA system to improve efficiency and visibility of proposed work. There may be a need to maintain the telephonic system for homeowners and other non-professional excavators who do not have One Call credentials. Accommodations must be made to address the needs associated with emergencies, areas without internet access, etc. that would need to be considered before any revisions to the requirements. There may also be challenges for smaller municipal or small utilities in transitioning to an all web-based ticketing approach without additional technical or financial support.

Appendix A | Pennsylvania Next Generation (PNG)

Utility Relocation PNG Team Completion[3]

Below is a summarization of the PNG Outcomes.

Best Practices[4]:

- Accommodating Prior Work - identifies methods to complete utility relocations in advance of construction projects, including activities prior to construction season.
- Prior Utility Work Inspection Work Decision- describes how Districts will address staffing, funding, and workflow if prior work requires inspection.
- DEP Permit Reviews - intended to help the Districts improve the content and timing of DEP permit applications for highway projects.
- Unknown Utility - tips for the Districts to improve project delivery efforts when dealing with unknown utility owners within the project area.
- Utility Laterals - intended to help the District's to improve project delivery efforts when dealing with utility laterals within the project area.
- Educate Municipalities - a list of "Municipality FAQs" within the best practices has been created to help the Municipalities' and improve their understanding of the Department's utility relocation program.

Checklists have been developed to assist utilities in preparing and improving the quality and completeness of utility package submissions for:

- Agreement Packages
- Bridge Occupancy License Packages
- Cost Sharing Request Packages
- Utility Relocation Highway Occupancy Permit Packages
- Checklists have also been developed to assist the District's in preparing utility D-419 and Design Build project utility clearances.

The memorandum referenced in footnote 3 is included on the following four pages.

[3] Melissa J. Batula, P.E., PennDOT Highway Delivery Division Chief; Summarized from Memo *Utility Relocation PNG Team Completion*, September 10, 2018.

[4] https://www.penndot.gov/ProjectAndPrograms/RoadDesignEnvironment/RoadDesign/Right-ofWayandUtilities/UtilityRelocation/Documents/Utility%20Relocation%20Best%20Practices.pdf

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pennsylvania
DEPARTMENT OF TRANSPORTATION

MEMO

DATE: September 10, 2018

SUBJECT: Utility Relocation PNG Team Completion

TO: Assistant District Executives

FROM: Melissa J. Batula, P.E. /s/
Highway Delivery Division Chief

Since 2016, the Utility Relocation PNG team has completed twenty-one (21) initiatives to help improve the utility relocation process for highway/bridge projects. As a result of these initiatives, policy guidance and clarifications have been implemented as best practices, checklists, a utility relocation process flow chart, a let schedule report, Publication 408 revisions and the issuance of Design Manual Part 5, Changes 1 and 2.

Best Practices:

- Accommodating Prior Work - intended to help the District's to promote getting more prior utility work accomplished.
- Prior Work Inspection Work Decision- intended to help the District's to promote getting more prior utility work accomplished.
- DEP Permit Reviews - intended to help the District to improve coordination for the utilities DEP permits reviewed for highway projects.
- Unknown Utility - tips for the District's to improve project delivery efforts when dealing with unknown utility owners within the project area.
- Utility Laterals - intended to help the District's to improve project delivery efforts when dealing with utility laterals within the project area.
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Utility Relocation Process Flow Chart - has been created to help the Municipalities' and improve their understanding of the Department's utility relocation program.

The best practices, checklists and flow chart have been posted to PennDOT' s Utility Relocation webpage:
http://www.penndot.gov/ProjectAndPrograms/RoadDesignEnvironment/RoadDesign/RightofWayandUtilities/UtilityRelocation/Pages/default.aspx

Let Schedule Report - Another tool now available is the crystal report "Letting Schedule with Geographic Limits" which has been created and published for use by the District Utility Administrators as a result of the Cooperation: Schedule and Plan Sharing initiative. This report allows the Department to compile basic project information within a specific Let date range, by county, to be shared with project stakeholders and business partners. The report's output includes hyperlinks to the MPMS-IQ information for each project, which allows users to see mapped results of the project locations.

Revisions to Publication 408, Sections 105.06 & 07 and Section 108 were issued in February 2018.

- Contractor Accountability – Added information to Sections 105.06 & .07 to improve documentation and notifications to utilities. The improved documentation could also support contractor compensation for delays.
    - Construction Scheduling and D-419 – Added information to Section 108 about scheduling requirements.

Design Manual Part 5, Change 1 issued in May 2018:

- Manhole/Valve Box Adjustments & Abbreviated Incorporated Work – The Municipality's and Municipal Authority's will have milestones to coordinate adjustments of the manhole & valve boxes for surfacing and group paving projects. If they miss the dates, the Department can incorporate the work.
    - New Figure A-305 – Manhole & Valve Box Adjustments, Project Notification Letter
    - New Figure A-401 – Manhole & Valve Box Adjustments, Milestone Date Letter
    - Revised Figure A-1205 – Example letter for Abbreviated Incorporated Utility Work (increased the cost from $10,000 to $20,000).

Design Manual Part 5, Change 2 to be issued in July 2018:

- Utility Relocation Activities Prior to Engineering Authorization – Added information about utilities being authorized to do certain utility relocation activities after Phase 3 (Preliminary Engineering) funding is approved.
    - New Figure A-520 – Authorization to Proceed with Preliminary Engineering letter
    - Revised Figure A-522 – Authorization to Proceed with Engineering Letter

- Regional Subsurface Utility Engineering (SUE) Open-End Contracts – Added information about regional SUE open end contracts that can be used to help give the Districts more options using it.
- Inspection of Prior Utility Work – Added information about other units helping to inspect prior utility work. This item also resulted in revisions to Publication 2, *Project Office Manual*, Part A, Section 3, page 1-7.
- D-419 Information – Added information to improve the utility clearance process.
    - Revised Figure A-1101 – Example Utility Clearance, D-419 for a State Project
    - New Figure A-1104 – Example Utility Clearance, D-419 for Resurfacing Projects
    - New Figure A-1105 – Example Utility Clearance, D-419 for a Department Project (Moderately & Most Complex Utility Work)
- Combined Sewer Systems – Added information about payment and approval of combined sewer systems so that settlement agreements can be avoided.
- PUC involvement for issue escalation – Added information about PUC involvement for issue escalation to address dispute resolution and it also provided a means of addressing utility company accountability.
- Constructability Review – Created a checklist for utility relocation items as a new appendix figure
    - New Figure A-200 – Constructability Review Checklist
- Uncased Crossings – Incorporated content from SOL from 2015 that eliminated the need for casing when the applicable Federal and industry standards with respect to wall thickness is met for steel, plastic, ductile iron and reinforced concrete pipes that cross any state highway.
- Buy America – Revised the information by removing the list of miscellaneous items and the 90% rule that was used to determine if a product is or is not predominantly a steel or iron product.
    - A-815p – Added information about the PA Steel Procurement Act to the certification statement.

In addition to these initiatives, the UR-PNG Teams prepared guidance on how to use the new Utility Section of the PSA and reviewed best practices associated with the inspector's utility relocation-construction coordination activities. This guidance was presented as a brief webinar on June 28, 2018 and was recorded for future reference to a broader audience. The UR-PNG Teams also reviewed the utility conflict matrix (UCM) spreadsheet and drafted the SOL for the pilot project.

Finally, there were three initiatives started by UR-PNG Teams that have been tabled for future development, or have been passed on to other groups for completion detailed below:

- Utility IT System – This is currently in development and should be in production in the Spring of 2019.

- Pre-determined Prices – The initiative was not completed due to the time and resources required to develop pre-determined costs for specific items of work. Preliminary information was gathered by the UR-PNG Teams and the Central Office Utility Relocation Unit will continue to work on it.
- Legislation Changes – This initiative was put on hold until the new Utility IT system currently in development is in production, so that more detailed data regarding utility delays can be gathered to support proposed changes.

If you have any questions, please contact Mark Chappell, P.E., Chief, Utilities and Right-of-Way Section at (717) 787-8298.

4824/MJC/jdm

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Bill L. Kovach, P.E., District 12 ADE Construction/UR PNG Legislative Team Leader
Larry Ditty, 7th Floor, CKB
File

Appendix B | Federal Highway Administration (FHWA)

Utility Review[5]

Below is a summarization of the Federal Highway Administration (FHWA) National Utility Review: Utility Coordination Process which is referenced in footnote 4.

Utility Coordination Process

Utility relocations have been cited for the past two decades and possibly longer as a leading cause of highway project construction cost-and-time overruns. This issue has been raised in multiple studies and internal Federal Highway Administration (FHWA) reviews, which have repeatedly identified utilities as one of the top causes of cost increases and schedule delays on transportation projects. These results prompted FHWA to conduct a national program review in 2016 to determine if utility coordination posed a risk to the Federal-aid Highway Program.

To evaluate this risk, the [FHWA] review team assessed the current state of utility coordination in all 50 States, the District of Columbia, and the Commonwealth of Puerto Rico. The review objectives focused on utility agreements; relocation plans, schedules and estimates; information in contract bid documents, and impacts during construction, such as time delays and cost increases.

The review team found that some States have implemented successful practices, which are listed at the end of the executive summary. However, despite these successful practices, several major program and project gaps prevent many State departments of transportation (DOTs) from achieving more effective utility coordination and relocation processes required by Federal regulations. The review team concluded these issues and gaps are serious enough to pose a financial and safety risk to the delivery of the Federal-aid Highway Program.

The review team found that many State DOTs conduct minimal preconstruction utility coordination and instead pass most, if not all, utility coordination and relocation responsibilities to the highway contractor. This conflicts with Federal regulations that require State DOTs to coordinate all utility relocations before construction to protect the investment in the highway project. Few State DOTs have implemented a comprehensive process with the policies, procedures, and practices stipulated in Federal regulations.

Utility coordination gaps fall into several broad categories:

- Lack of accurate utility location information on plans
- Incomplete utility relocation plans
- Lack of justification for utility relocation estimates
- Lack of utility relocation schedules
- Lack of utility information in bid packages
- Inability to quantify utility cost-and-time increases on highway construction projects

[5] Johnston, Julie; Federal Highway Administration (FHWA) *National Utility Review: Utility Coordination Process*, Sept. 2018. Retrieved and summarized from https://www.fhwa.dot.gov/utilities/hif18039.pdf

- Lack of utility relocation oversight/inspection and source documents to support utility payments (utility final vouchers)

These gaps are often tied to underground utilities where subsurface utility engineering (SUE) is lacking. Most State DOTs do not adequately investigate underground utilities, especially vertical or depth (z coordinates), resulting in utility conflicts either being misidentified or not identified at all during the preconstruction phase. This results in contractors unexpectedly encountering utilities during construction, a situation that often increases project cost or causes delays, or sometimes both.

The lack of utility relocation plans and schedules results in minimal information available to contractors. During the bidding process, these unknowns increase project risks that lead to higher bids that can increase overall project costs significantly. When a contractor encounters unexpected utility conflicts and must do extra work, the State DOT typically grants the contractor time extensions rather than money. This process can delay or extend a transportation project by weeks or even months. These gaps are affecting the Federal-aid Highway Program in the following ways:

- Contractors are increasing bids to mitigate or compensate for the increased risks, costing taxpayers more money.
- Construction projects are delayed due to unknown utility issues, leaving the public's transportation needs unmet.
- Construction costs and time are increased unnecessarily because of change orders and other utility issues.
- Highway worker and public safety is jeopardized because of unknown underground utility lines during construction.
- Public safety is compromised when utility-related project delays extend work zones, sometimes into the next construction season.
- Relationships among State DOTs, contractors, and utility companies are strained due to increased risks, lack of communication, and unknown and unexpected problems.

Successful Practices

The review team found that in mitigating the utility risks to highway projects, some state DOTs have implemented successful practices. These practices should be used as benchmarks for other State DOTs to improve their utility coordination process in the following ways:

- Implement the Second Strategic Highway Research Program (SHRP2) Utility Conflict Management (UCM) (R15B) practice.
- Develop detail utility schedules, such as the Massachusetts DOT's Project Utility Coordination (PUC) form explained in more detail in Observation 2B.
- Implement a risk-based subsurface utility engineering (SUE) process.
- Relocate utilities before the start of highway construction.
- Include utility relocation work in the highway contract.
- The review team concludes that Federal-aid highway projects can be built faster, better, safer, and for less money by implementing the previously stated recommendations

Several studies and anecdotal evidence suggest that utility coordination has become a major issue in executing the Federal-aid Highway Program. A 2014 Report to Congress on FHWA's Oversight Program Evaluation for Cost and Schedule Overruns showed that 15 percent of Federal-aid projects reported delays due to utilities and other third-party issues.

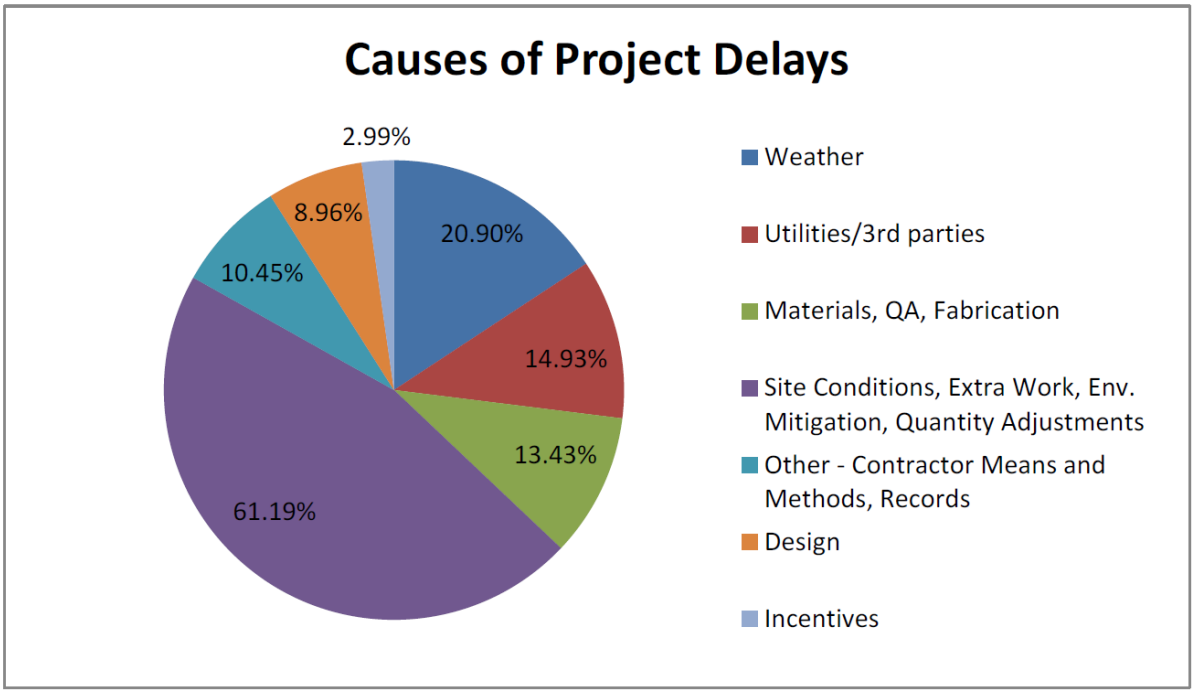

Figure 1. Chart of Federal-Aid Project Delay Causes.

Objectives, Observations, and Recommendations

Objective 1: What is the state of utility investigations nationwide?

- *Observation 1: Few states conduct accurate utility investigations.*
  - Recommendation 1:
    FHWA Division offices should determine if their State DOT is obtaining accurate utility location information to prepare utility relocation plans.

Objective 2: What is the level of detail in the utility agreement, and is it adequate to effectively coordinate the utility work with the construction contract?

- *Observation 2A: Broad Discrepancies Exist Nationwide on the Use and Content of Utility Agreements.*
  - Recommendation 2A:
    FHWA Division offices must ensure that State DOTs are executing a utility agreement even if Federal-aid participation will not be sought.

- *Observation 2B: Most State DOTs Do Not Develop Comprehensive Utility Relocation Plans.*
  - Recommendation 2B:
    FHWA Division offices should review the State DOT's utility relocation plans included in utility agreements and bid packages.

- *Observation 2C: Most State DOTs Fail to Prepare Utility Relocation Schedules.*
  - Recommendation 2C:
    FHWA Division offices should encourage their State DOTs to develop effective utility relocation schedules which can be integrated into the contractor's master schedule.

- *Observation 2D: Most DOTs Do Not Develop Utility Relocation Cost Estimates.*
  - Recommendation 2D:
    FHWA Division offices must ensure that State DOTs are preparing a documented cost estimate based on the State's best estimate of costs.

Objective 3: What utility relocation information is communicated to the contractor in the contract bidding documents?

- *Observation 3: Most State DOTs Fail to Include Adequate Utility Information in the Construction Bid Package, Resulting in Invalid Utility Statements (Certifications).*
  - Recommendation 3:
    FHWA Division offices must ensure that the State DOT is meeting the requirements as outlined below:
    - State DOTs must provide a utility statement (certification), prior to project authorization, stipulating that all utility work has been completed or
    - That all necessary arrangements have been made for utility work to be undertaken and completed.

    State DOTs must develop a process to incorporate effective utility information, including utility relocation plans, special provisions, and utility relocation schedules, into the bid package.

Objective 4: How does utility coordination, prior to opening of bids, impact construction cost and time?

- *Observation 4: Few State DOTs Know the Cost-and-Time Impacts that Utilities Have on Construction Projects*
  - Recommendation 4:
    FHWA Division offices should work with their State DOTs to understand the impacts of utility relocations on highway projects.

Objective 5: What is the level of oversight for utility relocations and are source documents provided to validate Federal payment?

- *Observation 5: State DOTs Are Not Performing Quality Assurance on Utility Relocation Work and Lack Required Documentation to Support Final Payment.*
  - Recommendation 5
    FHWA Division Offices should conduct a Financial Integrity Review and Evaluation (FIRE) Review on a sample of utility relocation final payments to determine if there is sufficient documentation to support the final payment.

Global Recommendations

- Increase educational opportunities.
- Increase awareness within FHWA and with partners on the risks that utilities pose to transportation project delivery.
- Expand utilities knowledge base.
- Issue guidance and “how to” on the requirements

Appendix C | Pennsylvania Senate Transportation Committee

PA Senate Transportation Committee[6]

Below is a summarization of the PA Senate Transportation Committee testimony referenced in footnote 6.

Delay and Delivery of State Road and Bridge Projects

Statewide Perspectives

Pennsylvania Department of Transportation | Leslie Richards, Secretary

Utility Coordination
This area has less predictability and therefore more risk area to delivery schedules. Utility coordination involves identification and possible relocation of existing facilities that may be in conflict with our highway and bridge projects. Successful utility coordination requires early and frequent communication with utility owners, as well as cooperation and clear identification of the project scope and schedule. Under the law, utilities may occupy the highway right-of-way but they must move when impacted by a highway project. Typically, they need to relocate at their own cost. However, we do cost share with municipalities, and pay relocation costs of utilities that have prior property rights. Relocation of utilities plays a large role into the development of our projects. Because of our construction sequencing, coordination becomes a critical aspect of these relocations.

Striving for Improvement
We have worked with utility companies to establish policy regarding needed lead time for plan review and agreement development. We also coordinate during the design period to determine the amount of time needed during construction for the utility to complete their work. The times coordinated with utility companies are then contractually written into our contracts so that the contractor can develop his or her schedule accordingly. The construction contracts include utility provisions that identify:

- the utilities in the project limits,
- the type of work they are doing,
- the areas of relocation,
- a description of work, and
- the amount of time it will take to do the work.

Internal PennDOT Next Generation (PNG) Team
In an effort to better understand and streamline utility relocation, PennDOT convened a special internal task force (PNG team) in the summer of 2015 to fully map the utility process and identify potential areas of improvement. The internal PNG team mapped out 41 distinct interaction points during the project delivery process from early design through construction.

[6] Pennsylvania Senate Transportation Committee: *The Delay and Delivery of Transportation Projects*, Testimony presented on February 2, 2016. Retrieved and summarized from https://transportation.pasenategop.com/020216/

Causation of Issues
Similar to PennDOT, utilities can experience issues with property owners when trying to procure private right-of-way to relocate their facilities. Sometimes the amount of work or the number of needed working days is underestimated during the design phase and not discovered until construction staff becomes involved.

Conclusion
From our perspective, utilities are the biggest remaining area where we currently need assistance in order to make substantial improvements to continue to improve project delivery. The number one issue we have today is unfunded committed projects, and to fund those projects a legislative solution is needed.

Pennsylvania Turnpike Commission | Brad Heigel, Chief Engineer

PTC projects often require coordination with public companies to design and relocate utility facilities which are in conflict with the proposed construction. Utility relocation is particularly an issue on expansion projects such as the Southern Beltway, Mon/Fayette Expressway and other capacity adding projects on the Turnpike mainline. Early coordination with utilities is essential; however, utilities do not consider relocation work for transportation projects a priority. Utilities often do not attend project field view meetings and are slow to provide the PTC with required paperwork (PennDOT Form 4181), cost estimates and relocation plans. Lack of participation by the utilities directly impacts project delivery and subsequently project costs.

- Lack of utility participation during the design process impacts planning and project scheduling for bidding purposes, delaying the start of projects.
- PTC relies on the information that the utilities provide when designing a project. When a utility does not meet timeframes that it has provided, construction contracts are delayed directly impacting project completion and increasing costs.
- PTC has no way to force a utility company to perform a relocation within the timeframes indicated by the company and contained within a project's bid documents.
- There is no third-party arbitrator to resolve issues or require a utility company to proceed forward with the relocation within the timeframes to which the utility company originally agreed.

Recommended Solution

The PTC is supportive of Senator Bartolotta's plan to introduce a Resolution directing the Legislative Budget and Finance Committee (LBFC) to conduct a comprehensive study examining the costs placed on Pennsylvania taxpayers as a result of road projects failing to meet deadlines due to delays associated with the relocation of public utilities. Items for consideration in this study may include:

- Require utility companies to provide timely responses to requests for information in accordance with the timeframes indicated in PennDOT Design Manual Part 5.
- Require utility companies to perform utility relocations within the timeframes that they originally indicated when they submitted their PennDOT Form 4181 and relocation plans.

- Require utility companies to be responsible for reimbursing the PTC for any delay costs that result from the utility's failure to perform the relocation within the timeframes they previously indicated.

Pennsylvania Public Utility Commission | Gladys M. Brown, Chair

Utility Cooperation & Costs Recovery

Secretarial Letters and Commission Orders related to bridge and crossing projects include a directive that all utility companies should cooperate with parties involved so that the alteration and/or relocation of their facilities will not interfere with the completion of the project. Additionally, during the Final Inspection stage of every project, the Commission notifies all involved parties of their right to discuss any outstanding/unresolved matters and to seek reimbursement for any costs incurred by the project, prior to the record being closed by the Commission.

Utility Industry Perspectives

Utility Contractors | Bruce Hottle and James Kutz

On behalf of NUCA of Pennsylvania, a trade association primarily representing contractors, subcontractors, and suppliers performing work on utility and highway construction projects in Pennsylvania. Our contractor members frequently perform work within the public right-of way, and may work for a variety of public and private owners, including performing projects for PennDOT, the PA Turnpike Commission, municipalities, municipal authorities, or for utility firms themselves. A typical project for one of our contractor members might include the replacement of a sanitary sewer system for a municipal authority located within the public right-of-way, which may involve the need to relocate other lines within the same trench or relocation of the aerial lines within the Project limits. Many such projects also involve pavement restoration work. Many of our members also perform paving and bridge construction on PennDOT highway construction projects and/or may work directly for a utility company as their private contractor that performs the utility relocation work on such projects.

While we are aware that others testifying today may address delays which may occur prior to construction, our focus will be on delays to transportation projects after the Notice to Proceed is issued. Also, while many issues can delay construction projects, our testimony will focus on the issue of utility related delays to highway and bridge projects. These delays usually arise out of two things: (1) mismarked or undisclosed utility lines, or (2) delays by utility firms in relocating facilities that must be moved to allow construction to proceed.

Our industry would like to offer input on three primary concerns: (1) taking steps to prevent as many utility relocation delays as possible, and to minimize the impact of the relocation delays that do occur; (2) taking steps to ensure that contractors are fully compensated in the event delays to projects occur through no fault of their own; and (3) continue to take all steps to ensure the safety and well-being of our employees, including not allowing concerns over delayed construction projects to impact the safety of

our employees, and to minimize the job shutdowns and possible layoffs necessary when projects are suspended due to lengthy delays in relocating utility structures or other project delays.

Factors Which Contribute to Utility Delays on Highway and Bridge Projects

We are aware of studies done by various government entities, including a study by the United States General Accounting Office (GAO) regarding the impact of utility relocations on highway and bridge projects completed in the late 1990's. That study addresses many of the same issues that this Committee is currently confronting (i.e. that utility delays affect the completion of highway and bridge projects, and that states have mechanisms in place to pay contractors in the event of such delays). Interestingly, with respect to "mitigation methods" used to reduce the utility delay issue, the GAO report studied the various methods that states used to attempt to encourage or compel utility companies to relocate utilities for federal highway and bridge projects in a timely manner. The study found that forty-one states attempted to resolve the utility relocation problem through early planning and coordination, that seven states utilized monetary penalties for the untimely location of utilities, and that three states used monetary incentives to pay utilities for finishing in a timely manner.

We are also aware of prior attempts made by both PennDOT and the Public Utility Commission to alert utility companies as to their duties to relocate facilities.

To attempt to solve the problem of utility relocation delays and their impact on public highway and bridge projects, it is critical to fully understand the magnitude of the issue this Committee is attempting to solve. The overriding problem is that virtually every highway, bridge, and utility relocation project in Pennsylvania, which total billions of dollars of construction each year, necessarily requires the relocation, (either temporarily or permanently), of existing utilities located within or immediately adjacent to a public right-of way. The very nature of relocating utilities is complex, time consuming, and expensive, and most projects will involve the coordination of multiple parties who are not a party to the contract. Other complicating factors include:

1) Given the age of some of the utility infrastructure located underground, the exact location of existing underground facilities is often unclear, thus making design and construction of highway and bridge projects that much harder;
2) Whether the utility facilities are underground or overhead, the utility relocation process is often "linear" in nature, meaning that one utility company often must complete its work before another firm can begin, thus necessarily extending the project time;
3) Construction projects are delayed by a number of factors, including weather, unforeseen site conditions, slow production, delays in submittal reviews, and a number of other factors which are unrelated to utility relocation, and those project delays will impact the scheduling of the crews necessary to move the utility lines;
4) The crews required to relocate utilities are specialized, and may not necessarily be readily available when the contractor on a particular highway or bridge project is ready for the crew to perform the needed work. These specialized crews may be unavailable for a number of reasons, including, for example, emergency situations that the utility crews might be addressing, a decision by the utility firm to prioritize customer work over highway relocation work, the availability of man power during certain times of the year, or for a number of other reasons;
5) When working for a public owner, contractors have no privity of contract with the utility companies responsible for relocating the utility lines, and thus there is a limit to the

leverage that contractors have in attempting to coordinate the work of multiple utilities who must move their facilities for the highway project to proceed;

6) As this construction proceeds, and contractors find that existing utilities were either mismarked or not disclosed on the plans, there is often a need to redesign the utility infrastructure work during the project, and thus work on the project may be halted while redesign occurs;
7) Many underground utility facilities are aging, and while a traffic pattern is in place and the trenches are open, etc., it is often prudent to spend the time and money to replace those facilities at the same time as a road or bridge project. That often minimizes the impact to the public but may have the appearance of making the job last longer;
8) The relocation of multiple utilities within a tight project site requires significant coordination of many parties. Contractors are not always perfect in coordinating such efforts, which may result in delays. Additionally, not every public owner has the resources or technical capabilities that PennDOT or the Turnpike Commission may have, and thus local jobs may be more prone to such delays; and
9) When multiple utilities must be moved, a delay by one will impact the schedule of another, and thus crews which were scheduled for one project may be moved to another job, and may not be available right away when the project is ready.

Another issue which can result in delayed delivery of highway and bridge projects due to utility delays is that for many reasons, jobs may be put out to bid without fully investigating or understanding how the existing utilities and the relocation of those utilities will impact construction.

Another issue that contributes to utility delays is that road construction contracts requiring utility relocation sometimes utilize unrealistic schedules for contract completion or the completion of the utility work itself.

Cost Impacts of Utility Delays to Contractors

When delays of any sort occur on a construction project, there is a significant cost to the contractor. Some examples of the types of costs that contractors incur on a daily basis in the event of a project delay are such things as: (1) extended field overhead; (2) idle labor and equipment; (3) equipment demobilizations and remobilizations; (4) extended costs for maintenance and protection of traffic items; (5) construction inefficiency costs for having to work around an area of the project on which work cannot be performed; (6) pushing work into unfavorable weather; (7) delaying work into another year resulting in escalation expenses; (8) added bonding and insurance costs; and (9) extended or unabsorbed home office overhead. These costs are borne not only by prime contractors, but by subcontractors and suppliers as well. Once an extensive delay occurs, it is also virtually impossible for a contractor to be made whole.

We also recognize that contractors are not the only entities harmed by utility relocation delays, as the public owners themselves also have inspection costs and other delay related costs in the event the project is delayed by a third party. We also recognize that there is often an inconvenience to the traveling public and to affected business owners when projects extend beyond their anticipated completion date. Reducing the impact of utility delays will help reduce all of these costs.

Safeguards Already in Place

First, Pennsylvania already has in place the Underground Utility Line Protection Act, known as the Pennsylvania One Call Law, 73 P.S. §§ 176-186, which places the responsibility on all parties, including the facility owner, the project owner, the designer, and the contractor, to locate existing facilities in the right-of-way which may be impacted by construction, and to take the necessary steps to ensure that such lines are not hit during construction. We believe that some modifications to the One Call Act may help mitigate the impact of the delays which have given rise to this hearing.

Second, there are many steps that are taken by multiple parties during the design stage of any highway bridge or utility infrastructure project to help minimize the impact of utility delays. PennDOT itself devotes a significant portion of its Design Manual to addressing utility issues in the project plans. Part Five of PennDOT's Design Manual ("DM") deals exclusively with utility relocation. For every project that is designed for PennDOT, or on which DM Part 5 is applicable, there are extensive steps that are required of design professionals, both during preliminary design and final design, to not only identify existing utilities, but to provide engineering for how they are to be relocated during construction. As DM Part 5 indicates, every PennDOT project requires "utility clearances, usually in the form of the preparation of a utility clearance form D-419, which is not to be completed until all acceptable written arrangements are received from utility companies located on the highway project." Such utility clearance certification must be issued prior to project advertisement. These are just a few of the safeguards within PennDOT's Design Manual that attempt to make sure that utility relocation does not impact highway projects.

One other interesting portion of PennDOT's Design Manual identifies the concept of "subsurface utility engineering" ("SUE") as part of the identification process for existing utilities. SUE is defined as "an engineering process that utilizes new and existing technologies to accurately identify, characterize, and map underground utilities early in development of a project or in certain cases during construction." DM Part 5 then notes that there are many different methods of gathering data regarding underground utilities, which require varying levels of efforts. The Design Manual sets forth four "quality levels" of obtaining underground utility data, which include Quality Level D (review of existing records and verbal recollection), Quality Level C (surveying and plotting visible above-ground features), Quality Level B (subsurface geophysical technology to identify the existence and horizontal position of subsurface utilities), and Quality Level A (non-destructive excavation methods to determine precise horizontal positions of sub surface utilities). As the Design Manual notes, the accuracy and reliability of underground information increases from quality level D to quality level A, but the cost of obtaining utility data also increase from quality level D to quality level A. Thus, not all SUE measures are used on every project. While even the use of the highest Quality level of SUE will not solve the issue of timely relocation of utilities, the increased use of such methods could at least reduce the number of delays due to unforeseen utilities.

Design professionals frequently develop well thought out plans with sequences for utility construction which identify the utility work that can occur prior to the highway or bridge project, and what work can be done concurrently with the project. Additionally, there are many discussions between public owners, designers, and utility companies during the design stage before specifications are placed into a construction contract that identify, for example, the utility facilities that are to be moved and the estimated time that it will take to relocate the facility.

The extensive work in the design phase of a public project often results in construction specifications which dictate how utility relocation work is going to be performed. For example, in their contracts,

PennDOT lists all utility companies or local authorities that may be affected by the placement, replacement, relocation, adjustment or reconstruction of utility facilities during construction, and separates them into six categories.

These categories include:

(1) Prior – to be completed before Notice to Proceed;

(2) Restrictive – to be completed by utilities before operating without restriction;

(3) Concurrent – utility work which is simultaneous with, but not restricting construction operations;

(4) Coordinated – utility work which must be phased with specific construction operations;

(5) Not Affected – facilities in the construction area which are not anticipated to be affected by the project work; and

(6) Incorporated – utility relocation work to be incorporated into the prime highway construction contract.

In addition to separating all of the utility structures on a highway project in these six categories, PennDOT also asks utility firms to identify all conditions affecting the utility's ability to perform a certain type of relocation work (such as certain days of the week, times of the year, etc.) and also asks all utilities to provide an estimated time which it will take to complete the work in question.

Third, on most public projects, significant steps are taken after project award and prior to construction proceeding to minimize the impact of the utility delays. Utility companies are asked to attend coordination meetings held between the contractor and the public owner to make sure that the utility relocation process is handled as seamlessly as possible. Utility firms spend considerable resources to attempt to minimize delays. Thus, while utility delays can delay road and bridge projects, significant efforts are expended to make sure that does not occur.

Finally, many public contracts already contain significant protections to attempt to make sure contractors should be paid for the impacted utility delays.

Impact on Employees of Utility Contractors

Any time a construction project is significantly delayed, whether it be for utility delays or some other reason, and particularly if there is a project shutdown, there is an adverse impact on the employees of our member firms as well.

Potential Solutions for Utility Delays on Highway and Bridge Projects

All parties to public contracts, and all third parties involved in any way with a highway construction project, including utilities, other government agencies, etc., can seek to improve their administrative and contracting processes to mitigate delays to these projects. For example, paying more attention to issues such as more realistic scheduling, better coordination, and better contract communication can help mitigate delays to highway projects.

We respectfully submit that there are four areas for possible legislative action that this Committee should consider.

1. Consider revisions to the Pennsylvania One Call Act which increase the responsibilities of Project Owners, Facility Owners, and Design Professionals, to not only locate utility facilities within a project, but to take all steps necessary for timely relocation of those facilities during construction, and to provide financial penalties or direct causes of action against those entities in the event of delays;
2. Create a statutory claim for negligent misrepresentation against either design professionals or utility companies in the event of misrepresentations about the location of facilities are contained in the contract documents or if schedules are not met. Such potential liability would not only protect utility contractors and their employees, but would also create a financial disincentive which will help minimize utility delays;
3. As an alternative to the first two suggestions above, or to be used in combination with one or both suggestions, the General Assembly could also consider creating financial incentives to be paid by the public owner, for timely completion of utility relocation work.
4. Mandate the inclusion in any public contract certain risk allocation provisions that ensure that contractors are compensated in the event of differing site conditions, such as mismarked or undisclosed utilities, and in the event utility firms delay relocating their facilities which are similar to the provisions that already exist in PennDOT contracts.

Electric and Natural Gas | Terrance J. Fitzpatrick

Energy Association of PA -Introduction

EAP performs a number of functions:

–Help member companies to share best practices.
–Sponsor educational conferences on industry operations and consumer issues.
–Advocacy before state agencies and policymakers-such as the PUC and the General Assembly.

Regulation of Electric & Gas Utilities

–Need for coordination with PennDOT and its district offices (as well as municipalities across the state) to achieve reasonable and consistent policies regarding utility infrastructure and to accommodate utility work on roads and bridges.

Energy Association of PA -Summary

- The Energy Association of Pennsylvania and its electric and gas utility members recognize the importance of the successful delivery of state road and bridge projects, since we are dedicated to infrastructure improvement ourselves.
- We look forward to continued opportunities to work collaboratively with PennDOT and Turnpike Commission representatives to resolve problems, address challenges, and provide for common sense approaches to highway occupancy requirements.

Solutions to Help Reduce the Costs and Time of Project Delays

- More advanced planning on projects with all affected utilities and other parties.

- Improve communications on projects.
- Improve consistency utilizing best practices among PennDOT districts.
- Improve PennDOT process for updating contact lists on projects.

Electric | Chad W. Stoneking

Through our success relocating electric facilities associated with PennDOT road and bridge projects, we've found that practicing the three Cs of early and frequent coordination, cooperation and communication is essential throughout the project development and construction phases to avoid potential delays. This includes establishing a Utility Relocation Plan early in the PennDOT project development stage with mutually agreed-upon goals, strategies and expected project milestones.

Keeping these critical factors in mind, West Penn has identified three possible solutions to help prevent utility relocation delays that affect the timely completion of PennDOT road and bridge projects:

1.) Consultation with electric utilities should occur very early in project development. Early communication is crucial and may facilitate minor plan changes that eliminate the need to relocate facilities in the first place, which is the best way to prevent delays. Ideally, coordination should begin well in advance of a project, starting as early as the public-hearing stage.

2.) Key stakeholders must be effectively engaged in project coordination efforts. These include vital engineering and construction staff with in-depth knowledge of the project, as well as support staff in areas such as real estate and environmental services. Regular coordination meetings with utilities to discuss project status would provide a forum for an open, two-way exchange of critical information. These meetings also would provide an opportunity to promptly address issues as they are identified.

3.) When relocation is necessary, the primary goal must be to relocate electric utilities before construction begins, when practical. Granted, early relocation is not always possible when variables such as the acquisition of a right-of-way or environmental permitting come into play. It's important that utilities are provided accurate, firm dates regarding all relocation work.

Natural Gas | Scott Waitlevertch

Factors Related To Natural Gas Utilities That Could Delay A PennDOT Project

- Good communication and coordination is critical
- Lack of knowledge or timely notice of a PennDOT project that may need a natural gas pipeline replaced or moved can be a factor
- Lack of knowledge or timely notice of a PennDOT project that may need a natural gas pipeline replaced or moved can be a factor
- Unknown Construction Challenges
- Utility contact information for PennDOT notifications may be dated

Possible Solutions To Avoid Delays In PennDOT Projects

- Increased and advanced notices/coordination between PennDOT and utilities
- More frequent communication between PennDOT and utilities

- Exploration of more partnerships between PennDOT and utilities
- Is PennDOT willing to obtain additional easements on projects to allow for utility installations around bridge structures and wingwalls or roads?
- Can PennDOT contractors be used for utility work to help expedite projects?

TELECOMMUNICATIONS | SAMARA, WARTA, AND ROBERTS

Telecommunications | Steven J. Samara

All parties involved in the series of meetings [PennDOT/Utility Coordination team] admitted to some level of culpability and believed that developing a more robust and predictable communication process was the key to eliminating both near-term and long-term delays. Among the items on the list [specifically addressing utility relocation] which are particularly relevant today were: minimizing utility relocation, minimizing changes to plans, realistic construction schedules and good communication and utility relocation reimbursement. The timely communication highlighted by the Coordination Team is often the cause of delays and where the solution is to be found from our perspective.

Often times, the companies are bearing the costs of facility relocation for a project which contributes nothing to the service quality of their customers. Costs for utility relocation range from tens of thousands of dollars annually to hundreds of thousands or more. A significant portion of those costs are not reimbursed and are borne by the RLEC and/or its customers. Cost-sharing on these projects was an initiative which we pursued during deliberations on Act 89 and an objective which we believe the General Assembly should consider moving forward.

Telecommunications | James R. Warta

One of the factors causing them [factors that contribute to delays in road and bridge projects] is the Pennsylvania Department of Transportation ("PennDOT") changes in originally planned commitment dates. These changes, which are due to a variety of factors, put pressure on Frontier's resource allocations and budgeting because they frequently increase the original project costs and divert its resources from other projects. Sufficient notice of PennDOT project changes—both in timing and specification—should be required. To ensure adequate notice, Frontier generally recommends that at least a six months advance notice for larger projects be required. However, there are times when the impact on specific customers is so great that more advanced notice is warranted.

In addition to scheduling, Frontier urges PennDOT to collaborate with Frontier on its engineering and planning process. Through collaboration, PennDOT could leverage Frontier's telecom, engineering and construction expertise to ensure projects are completed, on time, on budget and with the least impact to existing facilities.

Further, better collaboration between PennDOT and utilities is in the public interest to ensure that facilities are relocated in a safe manner. There are strict safety protocols that govern their order of relocation and the time needed to perform the work in a safe manner.

Frontier typically responds to more than 75 annual requests from PennDOT to, at its expense, move, relocate or remove Frontier facilities that are impacted by a PennDOT project. These projects are generally very complex and ensuring their safe and timely completion can be challenging. Yet Frontier has reliably met deadlines and utilized its own capital, on average in excess of $1 million annually, to meet PennDOT's needs.

Frontier respectfully suggests the following enhancements to the current planning process:

1- Involve utilities in the advanced planning of PennDOT projects. Frontier's telecom technology, engineering and construction expertise would be a valuable asset to all projects.

2- Require that all PennDOT project plans have clear construction schedules that are developed in collaboration with and agreed to by impacted utilities. This approach allows Frontier, and other utilities, to responsibly add the project to its annual construction schedule.

3- Require each project to seek to minimize the impact on existing facilities in the planning process. This not only reduces disruption to utility service for customers but also reduces overall project costs.

4- Provide for reimbursement for facility relocation expenses. This will encourage better initial design and appropriate compensation for work order changes and delays.

5- Emphasize safety in all aspects of project timelines.

Telecommunications | James Roberts

CenturyLink is a leading provider of high-quality broadband, entertainment and voice services to both consumers and businesses in all or parts of 25 predominantly rural areas in Pennsylvania. CenturyLink estimates that over 90% of the time that projects are not completed by the scheduled due date because communication and ROW issues still remain. We believe increasing opportunities for cooperative communication among all project participants is the key to improving the process rather than legislation.

We are already incented to complete road moves and facility changes in a timely manner.

While CenturyLink already has an incentive to complete projects on a timely basis, CenturyLink is unable to manage or control when project timelines and expectations are not properly communicated. The moving of utility facilities benefits neither the company nor its customers. CenturyLink, as an incumbent local exchange carrier, is already incented to complete projects on a timely basis is our carrier-of-last-resort (COLR) obligation which requires us to provide telephone service throughout our service territory, even to the most rural and costly locations.

If possible, CenturyLink would recommend that DOT provide notice of the following year's proposed projects to be provided by DOT by the end of the third quarter of each year. There should also be a possibility for cost recovery of all or some of the utility's costs to undertake road moves and changes. Unlike natural gas, electric, water and sewer utilities, Pennsylvania's larger incumbent local exchange companies do not have base rate cases in which the costs of road moves and changes are recovered in rates.

Communication processes should be strengthened in place of legislation.

It is without question that ensuring that all parties to a project have continued input into project timing can reduce costs. Better communication during pre-engineering, project management, and post project review is necessary to ensure that there is improvement in establishing realistic expectations, minimizing costs, and reducing project delays. Furthermore, robust communication through the project timeline can avoid delays and reduce costs for all involved participants. Setting realistic expectations is also critical to timely and cost-effective completion of projects.

A major recurring factor hindering efficient project completion is regaining utility right- of-way (ROW). Changing ROWs increases costs and requires time for negotiation and implementation. In fact, gaining access to a new ROW has proven to be CenturyLink's primary impediment to timing for completion of DOT projects. CenturyLink recommends that extra time be allowed when new ROWs are required and that the DOT assist in gaining access to the new ROW.

In summary, CenturyLink believes cooperative and more robust communication among all project participants is key to these processes. Utilities such as CenturyLink are already incented to complete facility moves and changes in an efficient and timely manner. A legislative remedy is unnecessary to improve the timely and cost-efficient completion of projects.

Cable | James M. D'Innocenzo

Notification of the Project:

We have nearly 300 offices in the Commonwealth and nearly 15,000 employees. This, in and of itself causes delays as the mail may not be opened by other employees or if the project plans are sent to the wrong location it will take additional time to determine which system is responsible for that particular project.

The 4181 – Transportation Form

Comcast owns very few poles in Pennsylvania, we rely on the pole and conduit owners to coordinate our work and notify us when all other plant has been attached above our plant. If the pole/conduit owner does not provide us with the information in a timely manner we can't properly complete the 4181 form resulting in yet another delay.

Relocating the Plant

A significant challenge occurs when projects are not contiguous and therefore need to be performed at random locations within the total project. It is significantly more efficient for planning, scheduling and execution when projects are completed contiguously as opposed to having to come back and forth to a project on several different occasions.

Conclusion – Recommendation

From our perspective we recommend continued and regular communication with and between PennDOT, the project management team and all plant owners with progress reports that allow us to plan, schedule and perform our work in a timely fashion. A continued relationship with a contact in each PennDOT district with our regional and system construction teams would also go a long way to eliminate project delays and identify the correct construction expert in each of our regions and systems throughout the Commonwealth.

Water | Jimmy Sheridan

Pennsylvania American Water provides water and wastewater services to approximately 2.2 million people in more than 400 communities across the commonwealth. Pennsylvania American Water is the largest investor-owned water utility in the state. We own and maintain more than 10,000 miles of pipeline in Pennsylvania.

Across the board and from every corner in the state, staff confirmed that we have an exemplary working relationship with PennDOT. Let me share some examples of successful collaboration and timely completion.

a. Participation in PennDOT's Electronic Utility Relocation Management System (UR-EDMS) – The UR-EDMS is an electronic project management system designed for managing utility relocations. The online system saves time, money and is convenient and aids in collaboration.
b. Communication and meeting reporting deadlines

c. Participation in PennDOT project meetings

These three elements are the foundation of on-budget, timely completion of road and bridge projects. Technological advances, communicating and participating with PennDOT and other utilities at key construction meetings go a long way toward preventing delays.

Other causes for delay:

1. New or changes to the letting schedule
2. Right-of-way delays
3. Increase in number of projects as a result of the omnibus Transportation bill (Act 89 of 2013) or unspent reserves

Railroad | Benjamin C. Dunlap, Jr.

Public utility companies have recently used quick-take proceedings in a number of states to acquire easements for the construction of utility pipelines underneath active railroad rights-of- way. Some of the public utility companies have used quick-take procedures to circumvent railroad industry practices which were implemented to protect public safety and railroad operational concerns. There is no effective means in quick-take condemnation proceedings by which the rail industry can challenge the taking prior to the construction of the pipeline. Thus, courts lack authority in quick take condemnation proceedings to ensure that subsurface utility lines are constructed in a safe manner which does not interfere with active railroad operations and is consistent with standard railroad industry safety standards. The proposed amendment to Section 1511(g)(2) discussed herein will protect public safety and railroad operational concerns; and level the playing field between the natural gas, oil and rail industries.

Public Safety Concerns:

Some public utility companies have used quick-take condemnation procedures to circumvent railroad industry practices which were implemented to protect public safety, frequently pursuant to federal safety standards and regulations. In light of the unsafe circumstances which have arisen in the cases outlined above, it is imperative that the legislature amend Section 1511(g)(2) of the BCL to ensure that public utilities cannot use quick-take condemnation proceedings to circumvent public safety concerns.

Operational Concerns:

Some public utility companies have avoided entering into agreements with railroads defining the terms of coexistence between active rail lines and subsurface utility pipelines; instead using quick-take procedures to impose their own terms.

Railroads have traditionally required public utilities and municipal entities seeking subsurface easements to sign standard license agreements which contain terms essential for the protection of railroad operations, including requirements to: (1) construct the pipeline to meet the minimum standards of the American Railway Engineering and Maintenance-of-Way Association (“AREMA”), (2) comply with federal regulatory standards for safety, (3) indemnify railroads from any losses or damages sustained by the railroad on account of the construction of the pipeline and related facilities, and (4) give the railroad the right to require the utility to relocate the subsurface easement at its cost where necessary to permit and

accommodate changes of grade or alignment and improvements in or additions to railroad facilities. Regarding the bearing of costs, it is to be noted that these pipeline occupations generally provide no benefit to the railroads, only risk. The use of Section 1511(g)(2) proceedings to avoid compliance with the standard license agreements described herein is contrary to law and detrimental to the public's interest in maintaining safe operations in the railroad industry.

Standard and Quick-Take Condemnation Procedures:

The primary difference between the quick-take procedures set forth in Section 1511(g) of the BCL and the standard condemnation procedures set forth in the Eminent Domain Code is that the right to possess the condemned property passes in a quick-take proceeding prior to the determination of any challenges that the condemnee may raise to the power of the condemnor to appropriate the property to be condemned or the procedures used to condemn.

Proposed Amendatory Language:

> When this paragraph (2) is utilized to condemn a right-of-way or easement for underground occupations beneath operating railroad property, the corporation shall be obligated (a) to construct the underground line to meet the minimum standards of the American Railway Engineering and Maintenance-of-Way Association specifications then in place; (b) to construct the underground line to meet federal regulatory standards for safety and railroad operational standards; (c) to indemnify the railroad owner and operator for any costs or damages arising out of the construction or presence of the underground occupation, including the exacerbation of any condition of the railroad property; and (d) to bear the costs associated with any subsequent relocation of the underground line necessitated by railroad operations. The potential costs of such indemnification or relocation shall not be considered in the amount of any award of just compensation.

Reasons for the amendment:

There is a long history of cooperation between the rail and other public utility industries regarding the intersection of active railroad rights-of-way and subsurface utility lines. More recently, however, with the explosion of new gas pipelines in particular arising out of the Marcellus Shale boom, some utility companies have refused to enter standard license agreements and instituted condemnation proceedings under Section 1511 (g)(2) instead. The use of quick- take condemnation proceedings to avoid legitimate safety and operational concerns is detrimental to public safety and contrary to law. The proposed legislative amendment to Section 1511(g)(2) would prevent the abuse of the privilege to use the quick-take procedure.

Without the amendment, there will be less certainty and more delays in the delivery of state and federally funded projects. Utilities can and have refused to relocate their lines or demanded that the involved railroad pay up front to do so before doing any work. Even where the PUC is involved and the involved railroad has an agreement, private or municipal utilities can hold the project hostage by refusing to cooperate without the railroad agreeing to pay for its relocation costs upfront.

First, the proposed amendment will protect public safety. Second, the proposed amendment will protect railroad operational concerns. The third and final reason for the proposed amendment is fundamental fairness.

What is proposed in the amended statutory language is to make the utility company obligated to indemnify the railroad owner and operator for any damages that may be caused directly or indirectly by the underground occupation or costs associated with any subsequent relocation of the underground line necessitated by railroad operations. It would provide that the potential costs of such indemnification shall not be considered in the amount of any subsequent award of just compensation to the railroad.

Appendix D | Transportation Research Board (TRB)

TRB[7]

Below is a summarization of the TRB publication referenced in footnote 6.

Strategic Research Needs

It is in the public interest to use the right-of-way of public roads and streets to accommodate utility facilities. In most cases, public agencies do not charge a fee for the accommodation of utility facilities in the public right-of-way. In those cases where there is a fee, the amount usually covers a portion of the administrative cost to review and approve the permit or lease. Fees usually ignore the actual cost of accessing and using the right-of-way.

Public rights of way are becoming increasingly congested. Today's projects, particularly in urbanized areas, typically involve many utility owners and a large number of increasingly complex utility facilities. The increased proliferation of utility infrastructure within the transportation right-of-way calls for new, holistic cradle-to-grave approaches to manage the interdependencies between transportation systems and all types of utility facilities.

This management involves many activities including, but not limited to, effective coordination among stakeholders, robust utility investigations, effective utility conflict management, utility design and construction, relocation management and reimbursement, utility as-built data management, and accommodation and permitting post construction. Coordination is not just between transportation agencies and utility owners, but also between relevant transportation agency units.

Little consideration has been devoted to the quantification and management of utility-related risks during project delivery. Normally, only about 60-80 percent of the utility infrastructure is known and, of that infrastructure, no more than 90 percent has any potential of being located accurately with current technologies.

A growing challenge is the increasing proliferation of out-of-service utility infrastructure. Reasons that out-of-service facilities are difficult to manage include difficulty to obtain reliable records from utility owners and inefficiencies when contractors find out-of-service facilities during construction. In oil and gas regions, out-of-service pipelines can pose significant safety and environmental hazards. In other areas, the sheer number of out-of-service utilities that exist under the pavement or within the public right-of-way generate problems ranging from identifying the actual operational status of existing utility infrastructure to serious design and construction issues for new or relocated infrastructure.

The development of utility records as well as the retention and exchange of those records is a long-standing issue that, according to many practitioners, seems to be getting worse. More investment in utility research is necessary given the increasingly complex demands and costs associated with project

[7] Quiroga, Cesar, et. al.; Transportation Research Board (TRB AFB70) *Strategic Research Needs in the Area of Utilities,* September 2019. Retrieved and summarized from http://onlinepubs.trb.org/onlinepubs/centennial/papers/AFB70-Final.pdf

delays, utility damage and service disruption, as well as the increasing demands on right-of-way use. Research to assess the costs and benefits of evolving technologies integrated with more effective coordination among stakeholders and new standards of professional practice would be useful to establish best practice guidance for a diverse group of stakeholders.

Figure 2. Six Pillars of Utility Engineering.

A Look at the Future

A number of critical, emerging, and cross-cutting issues that will influence and shape the transportation community are related to utilities. The following is a partial list of issues and ideas on how to address those issues through research, research implementation, and knowledge transfer.

1. **Strategies to Eliminate Delays and Higher Costs to Transportation Projects Caused by Conflicts with Utilities**
   With an ever-increasing volume of utility facilities and owners, it has become vital that a series of steps and strategies be developed to focus utility coordination efforts on those utility issues that can be avoided with minor changes to the project design and more quickly resolve those utility conflicts that cannot be avoided. Research is necessary to document examples where the application of the avoid, minimize, and accommodate principles are applied successfully.

2. **Strategies to Improve the Participation of Utility Owners During Project Delivery**
   Despite the value their [utility owners] participation may have, they are often not expressly included in the project delivery processes or consulted directly by the awarded contractor charged with the project delivery. As these parties [transportation agencies and utility owners] often are working in the same area, sometimes at the same time, it is evident that identifying strategies to facilitate cooperative communication and interaction would help improve both work efforts.

3. **Quantification and Management of Utility-Related Risks During Project Delivery**
   There is a need to develop tools and methodologies that enhance utility conflict management tools, including utility conflict lists, to quantify and manage critical elements of utility risks. The tools and methodologies should be presented in a format that enables project managers and designers to quantify, document, analyze, and make informed decisions about uncertainties and risks in the management of utility issues.

4. **Technologies to Improve the Detection and Documentation of Existing Utility Infrastructure**
   It is commonplace for One Call marks and field surveys to indicate significantly different locations for the same facilities. The industry rule of thumb is that only about 60-80 percent of the utility infrastructure within a project footprint is known and, of that infrastructure, no more than 90 percent has any potential of being located accurately with current technologies. There is a significant need to improve methods locate characterize existing utility infrastructure properly and reliably.

5. **Early Data Management Strategies to Enhance Damage Prevention Practices**
   Permitting activities and record keeping will need to produce data that will flow into existing design and construction plans with notifications to users of those plans that there is a change. Opportunities for integration and/or data exchange with state One Call notification centers will need to be explored.

6. **Technologies and Processes to Improve Utility Data Management Practices Through the Entire Life Cycle of Transportation and Utility Features**
   There is need to explore strategies such as electronic utility permitting, automated utility conflict detection, radio frequency identification (RFID) markers, and 3D modeling. Research could help identify strategies to facilitate the implementation of these technologies.

7. **Curriculum Development and Training for Transportation and Utility Stakeholders**
   With the growing acceptance of utility engineering as a specialty comes the need for the development of curriculum and training. The six pillars of the utility engineering specialty hold items of interest to both transportation engineer specialists and utility stakeholders.

8. **Strategies to Ensure an Effective Dissemination of Research Results to Users**
   It would also be helpful to develop minimum requirements for utility research projects to outline a clear implementation path that includes identification of champions at the federal, state, and local levels to guide the implementation.

9. **Strategies to Generate Revenue and Optimize the Societal Value of The Right-of-Way**
   Research has synthesized information about potential opportunities where the public right-of-way could serve alternative uses that would generate revenue for public agencies, such as solar energy generation. Research could generate best practices and lessons learned drawn from past experience to aid public agencies with future alternative right-of-way projects.

10. **Assessment, Risk Management, and Rehabilitation of Aging Utility Facilities within the Right-of-Way**
    Along with research and procedures to map and document that infrastructure is the need to conduct appropriate risk assessments and identify cost-effective strategies to rehabilitate and upgrade that aging infrastructure.

11. **Strategies to Manage Out-of-Service Utility Infrastructure**
    Research would be beneficial in the development of strategies to manage typical out-of-service facility situations, including removing abandoned facilities to make room for new ones and implementing more effective permitting and inspection procedures for existing out-of-service lines.

12. **Small Cell Tower and Other Communication Technologies**
    Research would be useful to determine practical methods to determine the value of providing access to the right-of-way, conditions where such access would be feasible, and potential pitfalls that public agency staff should consider.

Appendix E | Pennsylvania Department of Transportation

Best Practices for Utility Relocation[8]

Below is a summarization of PennDOT Utility Best Practices referenced in footnote 7.

1. WORKING RELATIONSHIP

- Develop and maintain a good working relationship with the utility companies.

2. HIGHWAY DESIGN

- Utility companies need to be included as part of the design process as early as possible. Highway and bridge improvements must be designed to avoid or minimize impacts to utility facilities.
- Adequate levels of Subsurface Utility Engineering (SUE) may be required to determine the horizontal and vertical location of underground utilities.
- Avoid late plan changes that would impact utility facilities

3. UTILITY COORDINATION

- Recognize the importance of long-range highway/bridge project planning with utility project planning
- Hold periodic meetings with utility companies, municipal authorities and political subdivisions to:
    - Discuss future highway projects.
    - Determine utility impacts, resolve issues, answer project specific questions and go over the status of projects having major utility relocations.
- Perform a comprehensive review of utility relocation permit applications and plans to ensure compatibility with the Department's design, project goals/intent and to eliminate the need for second moves of utility facilities.

4. LEAD/CONSTRUCTION TIME

- Make sure utility companies are given adequate time to design the relocations, prepare the permit/agreement packages, obtain their material and complete the relocation.

5. SCHEDULES

- Provide utility companies with long-range highway construction schedules.
- Make sure utility companies are made aware of changes in the let schedule dates

6. OTHER BEST PRACTICES FOR UTILITY RELOCATIONS

- Continue to improve the communication, coordination, and cooperation in utility relocations by:
    - Participating in the Utility Relocation Task Force meetings.
    - Attending the quarterly Utility Highway Liaison Committee (UHLC) meetings.
    - Using standard utility agreements.
    - Using the Utility Relocation Electronic Document Management System (UR-EDMS).
    - Providing training for utility relocations to internal and external business partners.
    - Maintaining a fully staffed utility relocation unit.

[8] PennDOT, *Best Practices for Utility Relocations*, 6/27/2018. Retrieved and summarized from https://www.penndot.gov/ProjectAndPrograms/RoadDesignEnvironment/RoadDesign/Right-ofWayandUtilities/UtilityRelocation/Documents/Utility%20Relocation%20Best%20Practices.pdf

- Developing a certification program for utility relocation coordination performed by consultant business partners.

7. UTILITY RELOCATION- ACCOMMODATING PRIOR WORK

Due to Pennsylvania's limited construction season, it is preferred to conduct utility relocations in advance of Highway construction as PRIOR work. Typically, utility relocations require work to be coordinated with one or more highway construction activities. To maximize the highway construction season and minimize construction delays, several methods have been developed:

A. Tree Clearing
B. Survey Staking
C. Delay Notice to Proceed

8. PRIOR UTILITY WORK INSPECTION WORK DECISION

If it is determined that a utility's PRIOR work will require inspection, the District Utility Administrator (DUA) and the Construction Unit will work together to perform the following items:

A. Staffing
B. Funding
C. Physical Work

9. DEP PERMITS

- In an effort for utility companies to obtain GP-5 permits for projects with incorporated work, a best practice is to note that a companion GP-5 will be submitted by "Utility Company."
- Note that the new Keystone Environmental ePermitting System (KEES) is working now.

10. UTILITY LATERALS

Below is a list of best practices that are used when working with utility laterals.

- If using a pay item to replace drain pipe, ensure it indicates that replacing laterals are incidental.
- Have the laterals located by using subsurface utility engineering (SUE). Note: Not all laterals can be traced.
- Put in an item in the contract to fix it, if it is hit.
- SUE cannot identify sewer laterals unless they have cleanouts.
- For incorporated utility work, relocate laterals within the legal right-of-way and/or the temporary construction easement as required and put in a number of days for it.
- Put a construction item in the contract for the various lateral sizes, quantities and/or per foot with specification from the municipality for all services affected by drainage from main to the curb stop or meter as directed by the resident.
- Request that the utilities to put traceable lines on their new or relocated facilities that are within the public R/W.
- Try to have utilities available in the event they are impacted. If the utility has indicated that they are not affected then include in the 419 that the contractor should, 'Contact the utility (XX hours, XX days or XX weeks) prior to working adjacent to their facilities so the utility can schedule an inspector to be on site.

11. UNKNOWN UTILITIES

Below is a list of best practices that are used when working with unknown utilities.

- Talk to the land owner to determine if they know who owns or operates these unknown facilities.

- Contact the well companies in the area to determine if they own the lines or if they know who owns or operates these unknown facilities.
- Ask the smaller municipal authorities directly to determine if they own the mystery lines or if they know who owns and operates these unknown facilities. The smaller municipal authorities do not always respond to one calls.
- Have our contractor remove the pipe if the line is confirmed to be inactive by qualified personnel.
- Have all abandoned lines removed during construction.
- Prior to removing any inactive lines, have the coating tested for asbestos material. Then place an item in ECMS for the proper handling of that AC material.
- Contact pole owners to determine who is attached to their poles.

12. MUNICIPALITY COST SHARING

- Under Section 412.1 of the State Highway Law, the Department may share in the costs to relocate a utility's facilities that:
  1) are located within the Department's public right-of-way.
  2) are affected by a Department highway or bridge project.
- Cost sharing is at a fixed percentage.

Utility Relocation Management System (URMS) [9]

PennDOT is creating a new web-based application to organize and manage all the steps of utility coordination for bridge and highway projects. The new system, called URMS (Utility Relocation Management System) will replace the existing UR-EDMS system.

Improvements

- Centralized Data and Document Portal
- Streamlined Reimbursements
- Usable Data
- The System Guides the Process

Additional Features

- Task-Based Workflow
- Centralized Conflict List
- Optimized Utility Clearance Forms
- Improved Communication

The first URMS Newsletter is provided on the following pages to provide additional information about the system.

[9] Michael Tavani, PennDOT; Summarized from *Utility Relocation Management System*, March 2020.

Volume 1: 10/22/2020

PennDOT's Utility Relocation Management System (URMS)

Launching in November!

PennDOT will soon launch a new web-based application to organize and manage utility coordination for bridge and highway projects. The new application, URMS (Utility Relocation Management System), will replace the UR-EDMS system and it will transform the existing paper-based forms into on-screen processes and workflows.

- Centralized Utility Relocation Data and Documents
- Centralized List of Utility Conflicts and Supporting Work
- Electronic Forms & Streamlined Reimbursements
- Task-Based Workflows Guide the Process
- Tools to manage workload and tasks across projects
- Automated & Optimized Utility Clearance Forms
- Improved Communications
- Robust Library of Training Videos & Documents

Robust "Just in Time" Training Resources

The PennDOT team has responded to the challenges of the Covid-19 pandemic and moved all Training activities online in a series of Training Videos that you can view just when you need them! Each video is short and focused on a single activity.

The URMS Training resources are one click away and will be available 24/7 to help you learn to navigate URMS and take full advantage of the new functionality.

Excited to learn more about URMS? Training Videos are Available Now!

No need to wait for URMS to be released to the public. PennDOT has made a training environment available for you to not only view the Training Videos but also give you a sneak peek of the application and an opportunity for hands-on practice before URMS is released. This is a safe environment where you can practice and without impact to any actual bridge or highway projects.

1

To access the Training Videos:
See the detailed instructions on the document titled Info Sheet-URMS Training. This Info Sheet is attached to the email you received or available at the URMS Information page.

URMS Self-Registration

If you have not pre-registered as a URMS user, you can self-register once it goes live in November. The process is quick and easy. Simply go to https://urms.penndot.gov ***after*** it goes live and use the ***Register for an Account*** link. There is currently a video tutorial in the training environment. Closer to our launch date, we will provide access with a direct link to the video tutorial.

UR-EDMS Blackout

There will be a lot of work required to prepare URMS for our business partners. In preparation, UR-EDMS will be shut down for a period of time to allow us to get everything just right! Blackout information is attached to the email you received or available at the URMS Information page.

Questions, Issues or Concerns?

If you encounter any problems or have specific questions about the use of URMS, feel free to send an email to the URMS Help account at RA-PDURMSHELP@pa.gov. This account is monitored by several people, and someone will respond as quickly as possible.

Newsletters and Info Sheets are posted to the URMS Information page.

Sincerely,
PennDOT URMS Staff

2

Connects[10]

Recognizing transportation's role in connecting communities and supporting economic development, PennDOT Connects is an approach that enhances local engagement and improves transportation-project planning, design, and delivery. PennDOT Connects formally and proactively brings together leaders from the PennDOT Districts, Planning Partners, and local governments throughout Pennsylvania to discuss local needs, potential project impacts, and ways to collaborate to maximize value for our communities.

The new approach to project planning and development expands the department's requirements for engaging local and planning partners by requiring collaboration with stakeholders before project scopes are developed. PennDOT Connects aims to transform capital and maintenance project development by ensuring that community collaboration happens early, and that each project is considered in a holistic way for opportunities to improve safety, mobility, access, and environmental outcomes for all modes and local contexts. Earlier collaboration will ensure that projects meet current and projected needs as much as possible and can reduce costly changes further in the project development process.

Specific areas to be discussed during collaboration include but are not limited to safety issues; bicycle/pedestrian accommodations; transit access; stormwater management; utility issues; local and regional plans and studies; freight-generating land uses and more.

PennDOT Connects requirements to meet with local governments, Metropolitan Planning Organizations (MPO) and Rural Planning Organizations (RPO) are being implemented on new projects on the state's 2017-2020 Transportation Improvement Program (TIP).

One Map[11]

One Map is a system designed for the Pennsylvania Department of Transportation (PennDOT) to support the provision of improvements to state highways and bridges, as well as to aviation, public transit, and rail freight modes of transportation.

The One Map application is a web-based GIS mapping application for highway and bridge projects on the Commonwealth's 12-Year Transportation Program and Regional Transportation Improvement Plans (TIPs). This application allows users to map and obtain information for highway and bridge projects, and to search these projects by criteria such as:

- Location
- Planning partner
- Legislative district
- PennDOT engineering district
- Highway Occupancy Permits (HOPS)

Projects can also be mapped individually by MPMS Project ID number or by Bridge Key.

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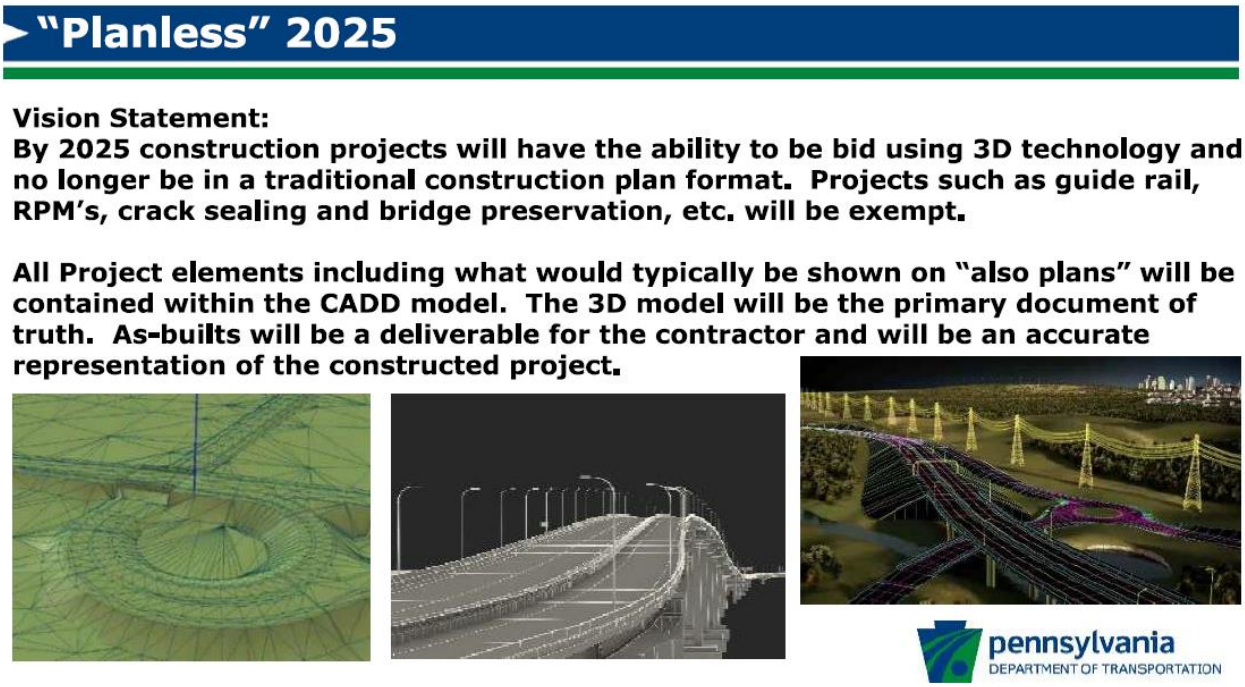
[10]Leslie Richards, Secretary, *PennDOT Connects Implementation Report*, 2018, p.2. Retrieved and summarized from https://www.penndot.gov/ProjectAndPrograms/Planning/Documents/PennDOTConnects/PennDOT_Connects_AR_2018.pdf

[11] *PennDOT One Map*. Retrieved and summarized from https://gis.penndot.gov/onemap/

Planless 2025

Planless 2025 is a PennDOT initiative to provide the capability for construction projects to be bid using 3D technology and no longer be in a traditional plan format by 2025.[12] Part of this initiative is early identification of constructability issues as well as clash detection/conflict resolution, as summarized in the following excerpts from the "Planless" 2025 PennDOT Presentation:[13]



[12] George W. McAuley Jr., P.E., *2019 APC/PennDOT Fall Seminar,* November 21, 2019, p. 25. Retrieved from http://apcfallseminar.com/wp-content/uploads/2019/11/PENNDOT_MCAULEY.pdf

[13] Kelly Barber, P.E., *PennDOT Update*, November 21, 2019, pp. 24-25. Retrieved from http://apcfallseminar.com/wp-content/uploads/2019/11/PENNDOT_UPDATE5.pdf

Planless 2025

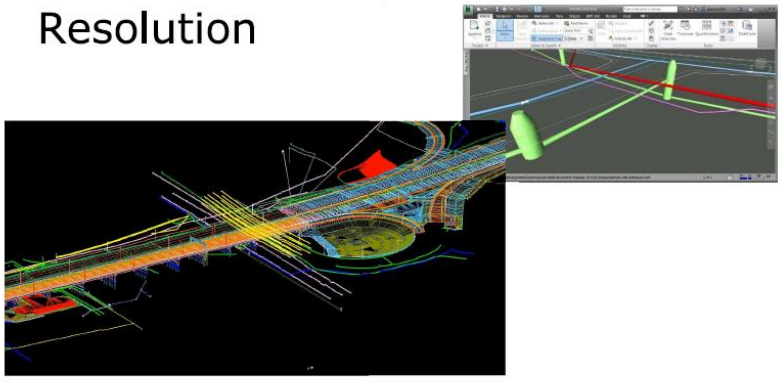
Digital Delivery
- Early identification of constructability issues
- Enhanced design coordination and Quality Control reviews
- Improved design accuracy
- Reduced construction change orders

3D Signed and Sealed Deliverables
- Shift emphasis – 2D plans to 3D models / BIM
- Leverage 3D model thru design and construction
- Reduce contractor risk

pennsylvania DEPARTMENT OF TRANSPORTATION

Planless 2025

Clash Detection / Conflict Resolution



pennsylvania DEPARTMENT OF TRANSPORTATION

Appendix F | Pennsylvania One Call | Coordinate PA

PA One Call[14]

Below is a reproduction of material available at the link in footnote 13.

Coordinate PA is a web service application developed by Pennsylvania 811 to support Public Works and utility project planning and utility coordination within the Commonwealth of Pennsylvania. Coordinate PA uses the power of the Internet to represent a spatial, map-based look at underground utility and public works projects to help identify opportunities for coordination and collaboration when projects overlap in space and overlap in time.

Coordinate PA is the next generation of utility coordination. Instead of meeting to discuss plans, or copy maps, or create a spreadsheet of projects, Utility companies, public works directors and others describe their projects on a map. Coordinate PA then shows the projects and the project time frames for users and automatically identifies opportunities for collaboration between projects. The user can see project overlap within a geographic area (for example, Main Street from First Avenue and Seventh Avenue) and can query for overlap within a specific time frame.

Maps are used to display project scopes and phases to make it easy for stakeholders to identify opportunities to collaborate far enough in advance to recognize cost savings and minimize disruption to the public through sharing and coordination of their effort.

Coordinate PA integrates with Pennsylvania 811's Web Ticket Entry process to create Design and Excavation notifications to increase project safety and reduce project costs as required by Pennsylvania's Underground Utility Line Protection Law.

Benefits

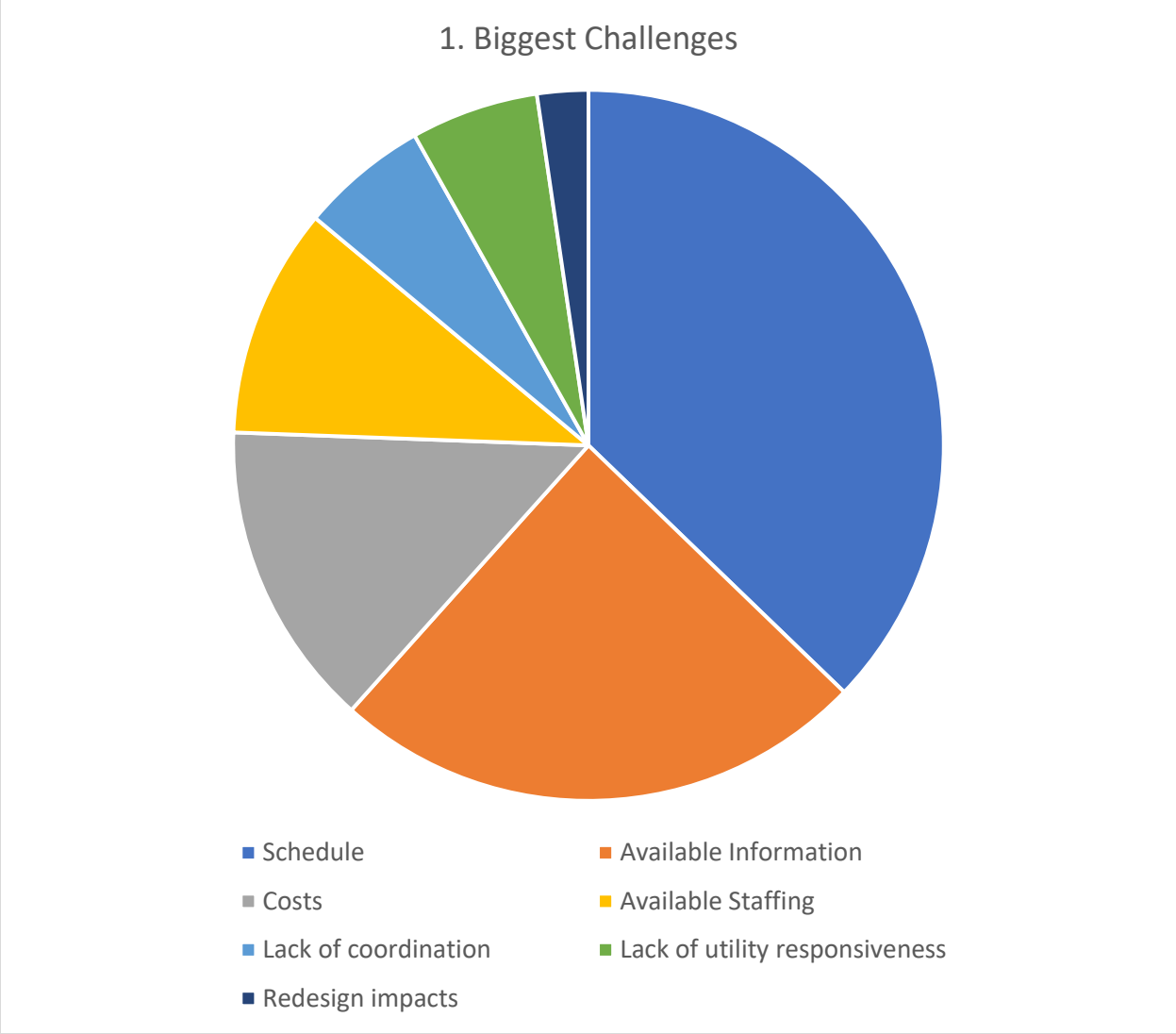
Coordinate PA offers significant benefits to Pennsylvania 811 stakeholders. Coordinate PA has the ability to:

1. Identify project collaboration opportunities across the Commonwealth of Pennsylvania;
2. Identify opportunities to coordinate and collaborate on projects outside your scope of responsibility, saving both parties money and improving the level of service to constituents;
3. Expand information gathering from a broader range of stakeholders beyond project planners and public works officials;
4. Expand information dissemination to a broader range of stakeholders beyond project planners and public works officials;
5. Define projects in an easy to use tool that works inside a Web browser. No special software is required;
6. Record project records, One Call obligations and stakeholder participation of the project in a secure repository;
7. Provide project status and updates in near real time, rather than waiting for a monthly, bi-monthly or quarterly UCC meeting;
8. Significantly improve the impact of utility coordination. Individual project details are captured in a tool that provides a common map base, is available near real time and can be securely accessed from the office or job site

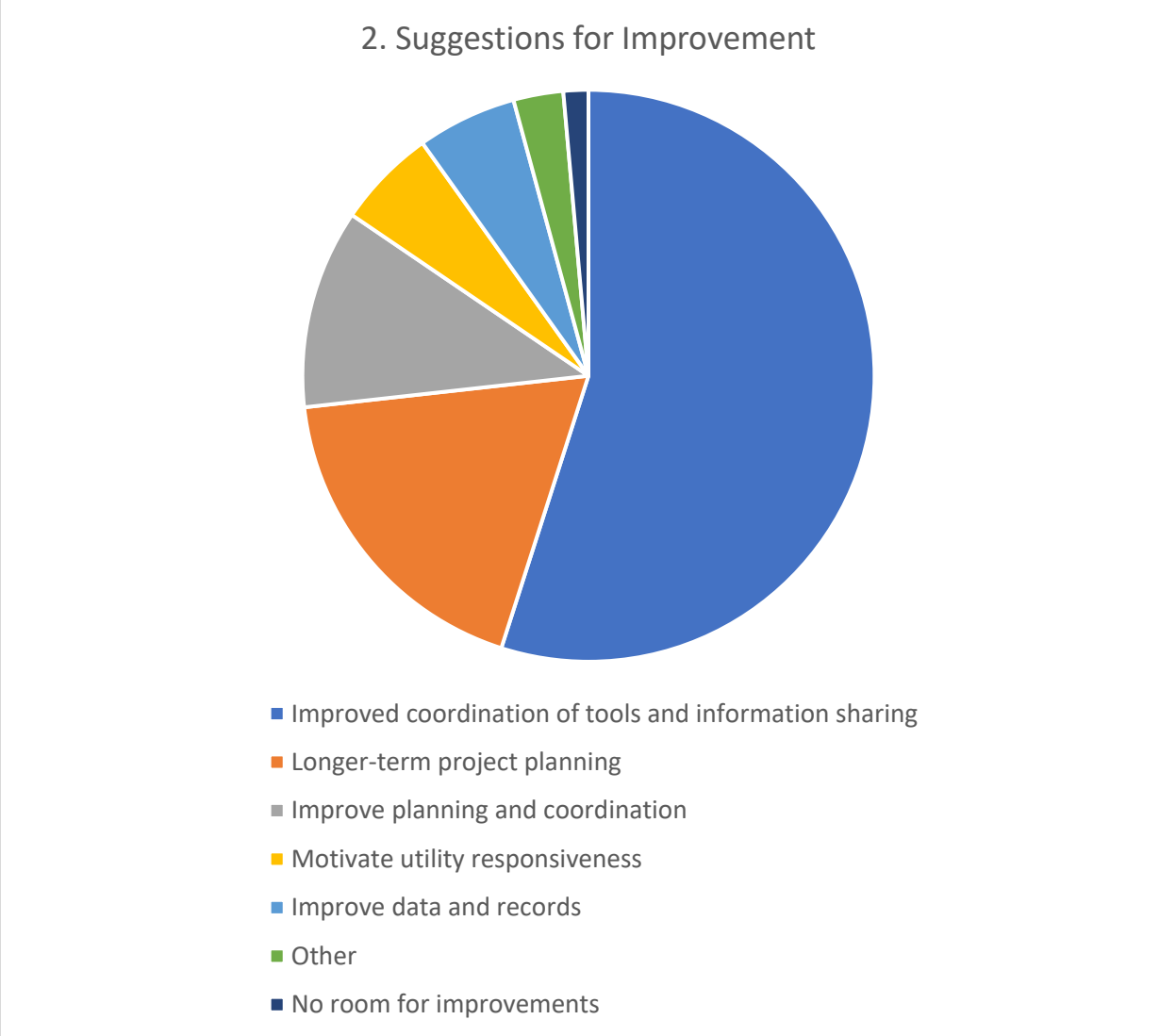
[14] *Coordinate PA*. Retrieved from https://www.pa1call.org/pa811/Public/Products___Services/Excavator_and_Designer_Services/Coordinate_PA/Public/POCS_Content/Products___Services/Coordinate_PA.aspx?hkey=123be3b1-7b1a-457e-9a6a-41c9affcb2e5

Appendix G | Stakeholder Survey

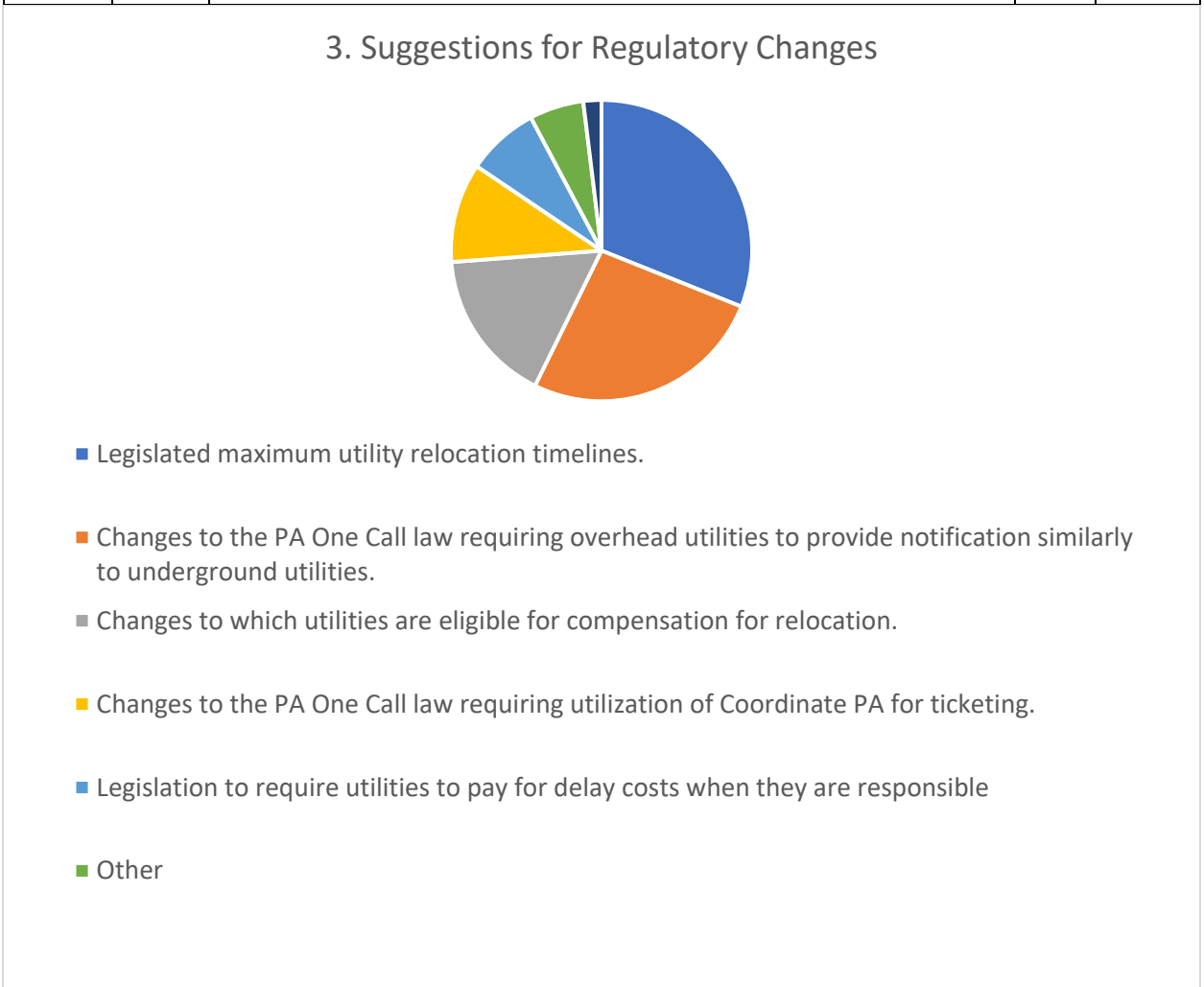
Q1	1	What are the biggest challenges facing your organization related to utility relocation?	#	%
	1.1	Schedule	32	37%
	1.2	Available Information	21	24%
	1.3	Costs	12	14%
	1.4	Available Staffing	9	10%
Other	1.5.1	Lack of coordination	5	6%
Other	1.5.2	Lack of utility responsiveness	5	6%
Other	1.5.3	Redesign impacts	2	2%
		Subtotal	86	100%



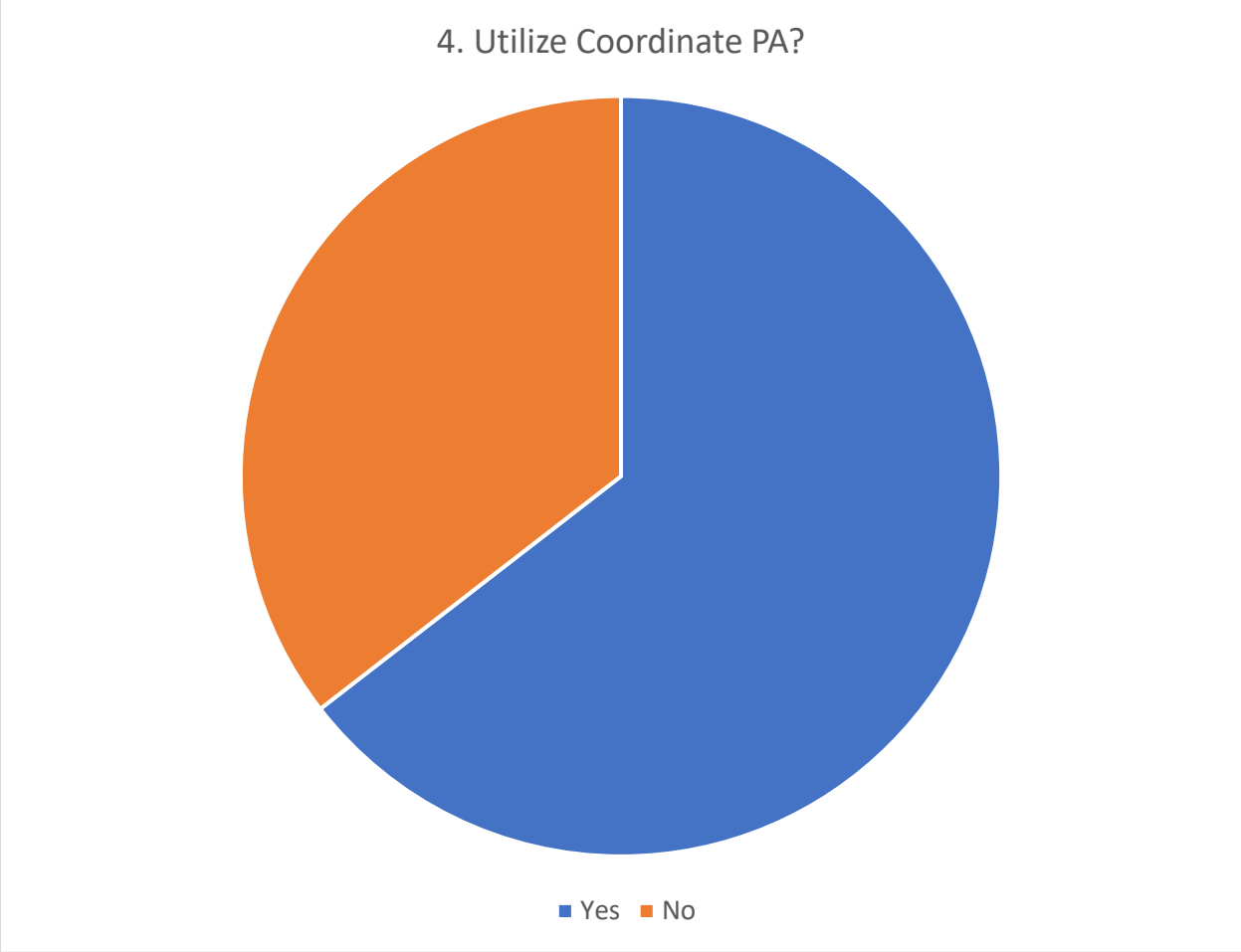
Q2	2	What is the single most important thing that could be done to improve utility coordination in PennDOT right-of-ways?		
	2.1	Improved coordination of tools and information sharing	39	55%
	2.2	Longer-term project planning	13	18%
Other	2.3.1	Improve planning and coordination	8	11%
Other	2.3.2	Motivate utility responsiveness	4	6%
Other	2.3.3	Improve data and records	4	6%
Other	2.4.4	Other	2	3%
	2.4	No room for improvements	1	1%
		Subtotal	71	100%



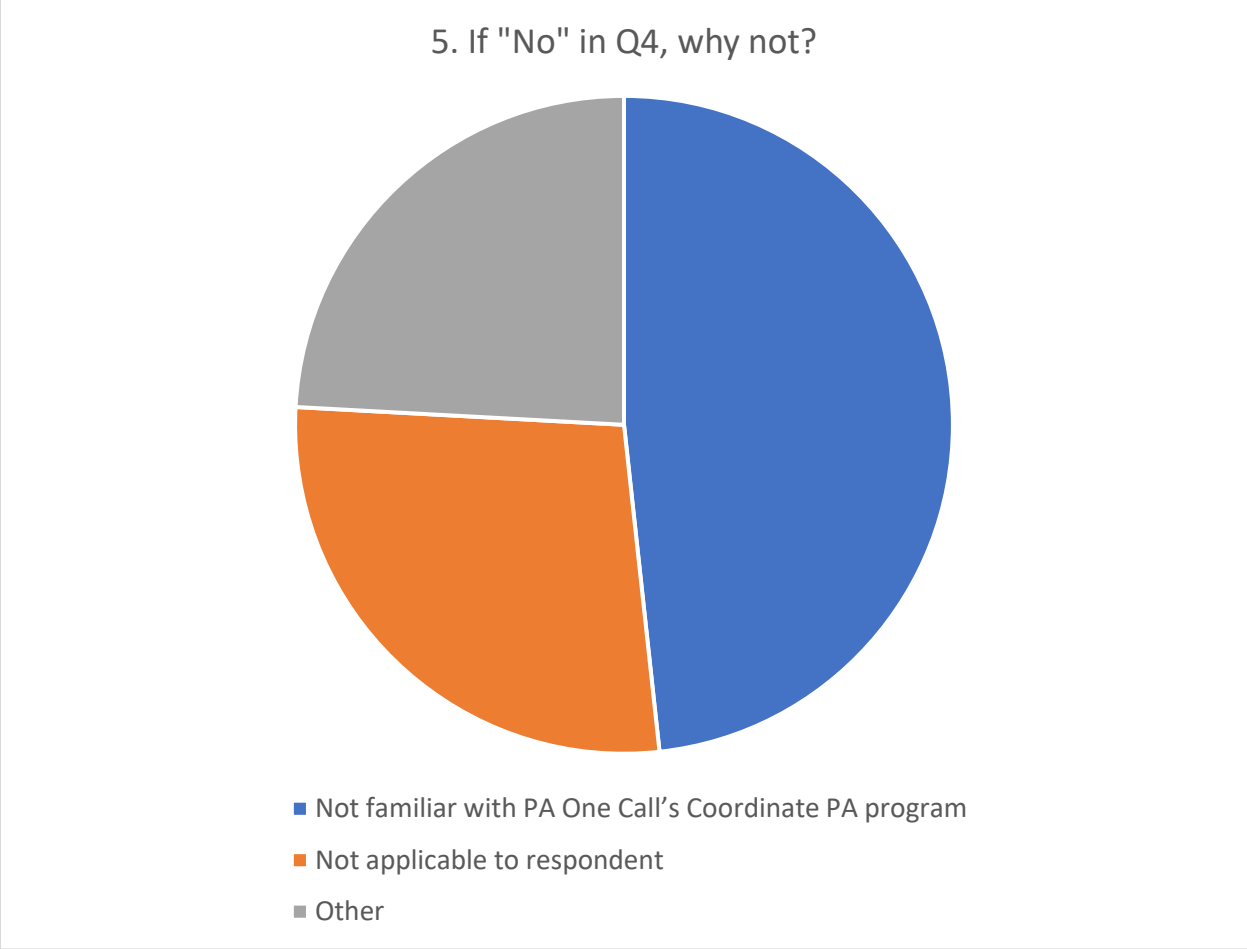
Q3	3	This TAC study may make suggestions related to regulatory changes. Please select below changes you see could be beneficial or provide others not listed.		
	3.1	Legislated maximum utility relocation timelines.	32	31%
	3.2	Changes to the PA One Call law requiring overhead utilities to provide notification similarly to underground utilities.	27	26%
	3.3	Changes to which utilities are eligible for compensation for relocation.	17	17%
	3.4	Changes to the PA One Call law requiring utilization of Coordinate PA for ticketing.	11	11%
Other	3.5.1	Legislation to require utilities to pay for delay costs when they are responsible	8	8%
Other	3.5.2	Other	6	6%
	3.6	No regulatory changes are necessary.	2	2%
		Subtotal	103	100%



Q4	4	Do you or your organization currently utilize PA One Call's Coordinate PA program?		
	4.1	Yes	40	65%
	4.2	No	22	35%
		Subtotal	62	100%



Q5	5	If you answered "No" in question 4, why not?		
	5.1	Not familiar with PA One Call's Coordinate PA program	14	48%
	5.2	Not applicable to respondent	8	28%
	5.3	Other	7	24%
		Subtotal	29	100%



Q6	6	Are you familiar with PennDOT's Utility Relocation Management System (URMS), which is going to be launched in Fall of 2020?		
	6.1	Yes	34	55%
	6.2	No	28	45%
		Subtotal	62	100%