Guidehouse

Arkansas Highway Commission Review and Advisory Subcommittee Meeting

Recommendations Report Presentation:
Procurement & IT

September 16, 2020

Agenda

Guidehouse

| The recommendations and findings included in the presentation are a point in time representation and are subject to change. Also, Anticipated Impacts are estimates, directional in nature. Please see the assumptions slide in the appendix for further details.

Recommendations

Guidehouse

Procurement

Guidehouse

Procurement - Current State Findings

Key Finding(s)	Supporting Evidence
Recommendation 5: Implement efficiencies in procurement and purchasing	**PR1.2:** Low bid procurement is viewed by staff as a cultural and financial necessity **PR4.1:** ArDOT takes advantage of legislation that allows consideration of qualifications in some procurement **PR4.2:** Alternative contract methods have allowed ArDOT to influence contractor behavior **PR5.1:** ArDOT is not using data to understand procurement trends and identify efficient practices **PR5.2:** E&P has minimal authority to facilitate implementation of efficient procurement practices	• From 2014 – 2019, ArDOT levied ~*$20M in Disincentives/Item Deductions; ~$44M in Incentives* • ArDOT does not have formal protocols to **standardize decision-making** around use of specific strategies • ArDOT spends on average ~$24.4M and ~$12.7M in Small Order and Competitive Bid purchases per year • ArDOT does not have *formalized policies to identify purchasing trends* and establish term/supply contracts *to yield savings*
Recommendation 6: Implement construction contractor performance measurement	**PR2.1:** Pre-qualification and bonding approximate likelihood of project completion, but do not screen for quality **PR2.2:** ArDOT's Standard Specifications (2014) mandate certain performance criteria, but do not screen for quality **PR3:** Opportunities exist to improve existing quality issues	• Performance bonds provide "*no guarantee against a contractor's marginal quality of work*, so long as the contractor's failures are not large enough to trigger a default," according to the FHWA • Current policies *do not limit* the ability of *poor-quality contractors to compete for bids* • ArDOT's 2019 TAMP identifies *poor quality construction work as a "very high impact" risk factor* for asset management • *ArDOT does not formally monitor contractor quality*

Guidehouse

GLOSSARY

E&P: Equipment and Procurement Division   FHWA: Federal Highway Administration   TAMP: Transportation Asset Management Plan

| The recommendations and findings included in the presentation are a point in time representation and are subject to change. Also, Anticipated Impacts are estimates, directional in nature. Please see the assumptions slide in the appendix for further details.

5. Implement efficiencies in procurement and purchasing

ArDOT prioritizes cost savings, but lacks the data to demonstrate what works and when. By optimizing and standardizing procurement and purchasing procedures, ArDOT may more effectively use resources and maximize costs savings including and beyond construction.

Anticipated Impact[*]

- Applying policies **similar to TxDOT's change order policy**, ArDOT **could save ~1.4M (3.5%)**
- Adopting **leading practices in spend analysis and management could reduce small order** (<$20k) and competitive bid ($20K-$75K) costs by up to **~$1.8 to 7.1M** (5-20%)

See Appendix for calculation assumptions

Considerations

- **IT systems,** such as the **new Oracle platform, will facilitate** collection and tracking of data
- **Staff capacity and expertise** may need to be developed to conduct **data analysis**
- **ArDOT may need to re-align responsibility** between districts and divisions, and shift culture from **low bid to best value**
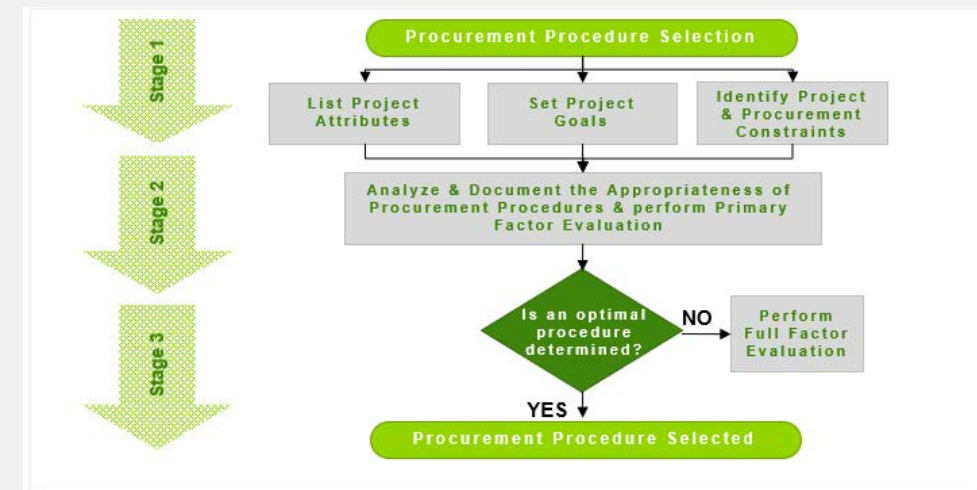
Implementation Summary

- Design and implement **data-driven approaches** like spend analysis and lifecycle costing **to inform procurement and purchasing decisions**
- **Standardize** usage of project acceleration techniques, procurement methods, and delivery methods beyond Design- Build and CMGC
- **Adopt policies and procedures at the district level**

Leading Practices

- Transportation Construction Management (a working group of DOTs, AASHTO, FHWA, and researchers) commissioned a guidebook (see right) for project delivery, and procurement. The provided frameworks and tools **enable DOTs to select the optimal methods for projects based on desired outcomes, constraints, and other factors**
- A 2015 Institute for Public Procurement report indicates that State governments can **save "5% to 20% of expenditures by improving procurement processes"**

Source: Transportation Construction Management

GLOSSARY

TxDOT: Texas DOT   AASHTO: American Association of State Highway Transportation Officials   FHWA: Federal Highway Administration

Implementation Roadmap

• • •

1 CREATE DATASETS

Identify focus areas:
- Procurement spend
- Equipment ownership cost
- Change orders
- Alternative procurement and purchasing strategies

Identify data points:
- Spend by district, category, season, total
- Lifetime cost of purchase, considering repair
- Change order by project, vendor, type
- Strategy by cost, ROI, schedule, safety, convenience

Assign data collection roles and set frequency

2 ASSESS TRENDS

Gain insights into:
- Supply trends
- Demand trends
- Term contracts / CBA
- Commodity price changes
- Ownership costs / CBA
- Change order amounts, consistency, and drivers
- Cost estimates (in comparison to bids)
- Project delivery methods effectiveness
- Procurement procedures effectiveness
- Purchasing methods effectiveness

Identify conditions under which practices are most effective at yielding results

3 INSTITUTIONALIZE BEST PRACTICES

Develop policies and procedures to implement best practices, such as:
- Decision matrix for when certain strategies are used
- Authority of divisions to push Department-wide efficiencies to districts and policies for consistency

Communicate policies to staff and vendors, outlining:
- Purpose of change
- Performance metrics
- Frequency of evaluation
- Owners of data and decision-making
- Opportunities for feedback
- Opportunities for training

4 MONITOR & REEVALUATE

Evaluate policies and procedures by continuing to monitor trends in key areas, at predetermined frequencies

Determine if revisions to policies and procedures are necessary to obtain desired outcomes, and if so, implement necessary revisions

Consider data points for inclusion in broader KPI monitoring and evaluation (i.e., change order volume)

6. Implement construction contractor performance measurement

ArDOT lacks a comprehensive tool to screen for contractor quality during procurement. By implementing performance-based prequalification, ArDOT may improve project delivery; reward high-performing contractors; and encourage low-performers to improve.

Anticipated Impact

ArDOT may see similar improvements to those reported by implementing DOTs, such as, improved:
- **Safety**
- **Timely work completion**
- **Contractor cooperation**

Considerations

- There may be **differing impact on contractors of various sizes**
- Emphasis on a **quantitative approach could minimize any appearance of subjectivity** in scoring
- Contractors should have a **clear path to raise or appeal their scores**
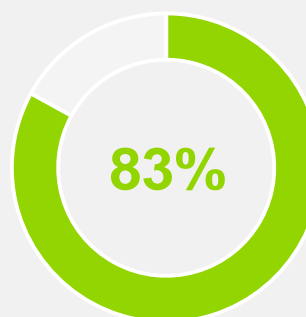- In preventing contractors in L/D from bidding, **a "precedent" exists**

Implementation Summary

- **Identify performance quality indicators** (e.g. repeated disincentives, delays, etc..)
- **Develop scoring system** to quantify performance
- **Track and monitor performance**, using indicators and costs
- **Integrate into prequalification**

Leading Practices

- An FHWA-commissioned study **provides a framework for a quantitative, performance-based prequalification system**.
- The framework **evaluates contractors on administrative, performance, and project-specific** (i.e., technical qualifications) **factors**.
- Finally, the study report revealed that performance bonds provide "**no guarantee against a contractor's marginal quality of work**, so long as the contractor's failures are not large enough to trigger a default"

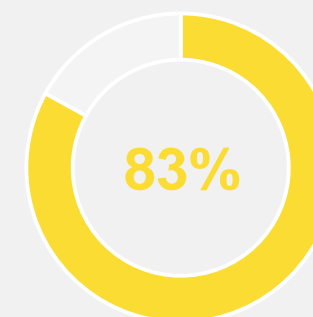## Percentage of surveyed DOTs (6) reporting improvement in work quality factor

83%
Safety

100%
Timely Work Completion

83%
Contractor Cooperation

GLOSSARY

L/D: Liquidated Damages   FHWA: Federal Highway Administration

Implementation Roadmap

● ● ●

1 **IDENTIFY QUALITY INDICATORS**

Determine which indicators define quality for ArDOT:
- Past performance (i.e., quality of workmanship)
- Managerial ability
- Safety record
- Technical capability
- Traffic and public impact
- Cooperation with ArDOT

Identify the ArDOT staff that will conduct performance evaluations and how their work product will be audited

Determine frequency of performance evaluation

2 **DEVELOP SCORING SYSTEM**

Use an industry standard formula or algorithm to convert performance evaluations into bid capacity scores (see Leading Practices for an example)

Determine how bid capacity score will be used to modify bidders' submissions

Publicize process widely, for example through Q&As with contractors; integrate stakeholder feedback

Complete rulemaking process, as required

3 **TRACK PERFORMANCE**

Collect performance data at the closeout of each contract, and more frequently, in accordance with set policies (building up a full dataset will take time, and will vary by the number and length of projects ArDOT lets annually)

Continue to iterate on the scoring system while building up the dataset

4 **INTEGRATE INTO PREQUALIFICATION**

Determine monetary threshold at which process will be used (i.e., >$100K)

Determine which project types process will be used

Determine policy for contractors that are new to working with ArDOT

Begin to implement performance-based prequalification approach, in accordance with set policies

Evaluate regularly to ensure effectiveness and relevance

Guidehouse

8

Information Technology

Guidehouse

IT - Current State Findings

Key Finding(s)	Supporting Evidence
Recommendation 9: Build an IT Governance Structure to guide ArDOT's IT investments **IT2.1:** ArDOT has not developed a Governance Structure to ensure IT investments support objectives, manage enterprise risk, and meet external stakeholder needs **IT2.2:** There is no overarching enterprise architecture or blueprint to standardize, organize, and align IT infrastructure and solutions with business goals	• ArDOT continues to *increase its IT investment* with the IT Budget *increasing* dramatically *from ~$9.2M in FY16 to ~$23.5M in FY20:* Operating Expenses and Equipment costs being the biggest budget drivers. • A review by a 3rd party consultant, *Info-Tech*, revealed that there is an *"Unclear decision making process"* and "no IT Governance" for these expenditures • Enterprise Architecture *is siloed organizationally* with this *responsibility residing with each of the divisions and districts* that primarily "own" their respective IT platforms and solutions
Recommendation 10: Implement mid-term IT initiatives that can optimize business operations **IT1.1:** ArDOT appears to be approaching data center modernization phases, but without a formal integration plan **IT1.2:** ArDOT has preliminarily identified software needs, but efforts to align IT purchases across the Department has not been universally implemented	• ArDOT has prioritized the *Mainframe upgrade, Oracle implementation,* and several storage and server infrastructure upgrades • ArDOT *deploys ~263 applications, has 300+ databases* (DBs), and an *unknown amount of data* stored locally on staff computers • Internal strategic planning documents reveal a *lack of alignment between IT solutions purchases*, as well as *poor data quality and difficult data access* • *10 instances* in FY19 of *significant IT spend without prior IT involvement*

Guidehouse

GLOSSARY

DB: Databases

| The recommendations and findings included in the presentation are a point in time representation and are subject to change. Also, Anticipated Impacts are estimates, directional in nature. Please see the assumptions slide in the appendix for further details.

IT - Current State Findings (Cont'd)

Key Finding(s)	Supporting Evidence

| Recommendation 11: Develop necessary pillars to establish IT as an effective business partner | **IT2.3:** ArDOT lacks a service catalog and defined service level expectations, yielding confusion on what IT will deliver, when, and how support is distributed

IT2.4: ArDOT's efforts to establish a project management infrastructure to ensure effective delivery of IT projects is still in its infancy | • Internal strategic planning documents reveal a *lack of clarity around core IT service offerings*
• It *does not appear that the IT division has established service level agreements (SLA), nor tracks performance* against these SLAs
• ArDOT has recently *restructured its IT Department to include a Project Management Office (PMO)*
• ArDOT has *not adopted any formal Project Management (PM) standards* or protocols to help drive IT Project delivery |

GLOSSARY

SLA: Service Level Agreement   PMO: Project Management Office   PM: Project Management

Guidehouse

9. Build an IT Governance Structure to guide ArDOT's IT investments

ArDOT's IT investments have grown to $23M in FY2020 under unclear enterprise level guidance. Establishing a formal governance structure may enable the IT Division to better support business objectives, help optimize Department operations, and meet stakeholder needs.

Anticipated Impact

- *Improved ArDOT performance on business outcomes* such as system condition and operational effectiveness measures
- *Strengthened* enterprise level *IT capability and performance*
- *Reduced security and disaster-related risk*

Considerations

- Implementing IT Governance is an ongoing process and will require sustained *Leadership support*
- *IT should consistently track and communicate how it enables business performance* and *reduces risk*
- Enterprise *goals should cascade to* actual underlying *IT processes to strengthen connection* of business goals and IT efforts

Implementation Summary

- *Lay the groundwork* to establish a robust governance structure
- *Establish a structure* that identifies a *cross-section of business and IT personnel* to create a *charter and decision making framework*
- Execute on a governance roadmap; *measure and communicate progress*

Leading Practices

- *Numerous resources* are available to ArDOT to establish an effective *IT Governance structure*
- Leading practice research reveals *four key objectives for IT Governance:*
  - Only *approve projects aligned* with strategic objectives
  - *Balance future investments and current operations*
  - *Focus on Risk Management*
  - Hold *IT accountable* for *ROI and service delivery*

90%

Business leaders that believe strong technology governance leads to improved business outcomes

Source: ISACA

63%

Percent of IT executive respondents reporting root cause of ineffective IT departments as a lack of a well defined IT operating model and clarity related to IT's role and services

Source: McKinsey & Company

GLOSSARY
ROI: Return on Investment

12

Implementation Roadmap

• • •

1 LAY THE GROUNDWORK

Build on Info-Tech report to assess the maturity of the Department's current IT Governance Structure

Identify current structure of IT operations and potential future states:
- Centralized
- Decentralized
- Federated

Conduct an analysis of existing IT Governance frameworks to identify a potential best fit such as:
- COBIT
- ITIL
- CMMI

2 ESTABLISH A GOVERNANCE STRUCTURE

Identify a formal IT Governance committee with appropriate representatives from around the Department such as:
- Assistance Chiefs
- Key Division Heads

Create a reporting structure directly beneath the ArDOT Director

Select a governance framework and establish a charter

Identify IT domains and processes that require governance such as IT investments, data management, business continuity, and cybersecurity

3 CREATE AND EXECUTE ON A GOVERNANCE ROADMAP

Establish governance priorities and create corresponding subcommittees:
- Portfolio management
- Data governance
- Service management
- Technology standards
- Project management

Create high-level governance roadmap and subcommittee charters

Establish Governance committee and subcommittee meetings and reporting frequency

Develop success measures (KPIs) and an IT performance scorecard

10. Implement mid-term IT initiatives that can optimize business operations

ArDOT spends ~$5.3M on software applications and has 300+ databases. Implementing leading data management and software application rationalization practices can deliver cost savings and unlock data value.

Anticipated Impact*

- Software *application management* can yield *cost savings* of up to *~$1M*
- *Increase* already captured *data management savings* of ~$600K
- Improved data analytics may *increase Department productivity*
- *Open data access* can *unlock data value* and private sector *innovation*

See Appendix for calculation assumptions

Considerations

- *Upfront investment* should *yield mid- to long-term savings*
- Implementation plan and change management can *help overcome resistance* and *assist staff in shifting to a new model*
- *Requires software application* such as new ITSM Tool

Implementation Summary

- *Build software application* and *database inventory*
- Assess and *score each software application and database*
- *Identify target state* for each application and database
- *Build phased roadmap* for migration processes

Leading Practices

- *Application rationalization* can yield up to *20% cost savings* in a 12-month period
- *"Top one third data driven"* companies are **5% more productive** than their competitors
- *Data* represents *~25% of an organization's assets*
- *Several DOTs* such as Virginia (see right), New York, and Kentucky *unlock the value of the data* by providing *open data portals*

Source: Virginia Department of Transportation

| The recommendations and findings included in the presentation are a point in time representation and are subject to change. Also, Anticipated Impacts are estimates, directional in nature. Please see the assumptions slide in the appendix for further details.

GLOSSARY

ITSM: IT Service Management

14

Implementation Roadmap

● ● ●

1 **BUILD APPLICATION AND DATABASE INVENTORY**

Determine preliminary enterprise-wide data governance and application development/operations standards

Complete existing application and database inventory data per standards

Conduct targeted interviews with SMEs and external stakeholders

Review relevant policies, procedures, trainings, and database schema

Develop preliminary catalog of applications and databases by business function

2 **ASSESS APPLICATION AND DATABASE INVENTORY**

Update preliminary standards per findings in Step 1

Develop application and database scoring methodology based on business relevancy, technology risks, total cost of ownership

Score each application and database via scoring methodology

Review and validate scoring assessments with internal SMEs

Create an assessment for the entire portfolio of applications and databases

3 **DEVELOP TARGET STATE AND ROADMAP**

Determine high-level database architecture, implementation methodologies, and business intelligence approach

Determine target state for each application and database, for example: retain as is; eliminate, re-engineer, and migrate

Develop implementation road map subdivided into phases:
• Phase 1: Retain As Is/Eliminate
• Phase 2: Re-Engineer
• Phase 3: Migrate

Guidehouse

GLOSSARY

SME: Subject Matter Expert

15

11. Develop necessary pillars to establish IT as an effective business partner

ArDOT's IT Division is not able to definitively articulate what services it will deliver, when it will deliver them, and its standards for effective delivery. Implementing an ITSM framework may enhance IT service delivery and internal customer satisfaction; and reduce IT costs.

Anticipated Impact

- *Improved internal customer service*, and more *efficient delivery of IT solutions*
- Reduction in IT service delivery costs of **up to ~26%**

Considerations

- *Establish quick wins* by creating a basic *service catalog*, *capturing IT demand*, and *tracking requests*
- *Include PM infrastructure* in the long-term *ITSM plan*
- *Emphasize communication and training* to *mitigate resistance* to change

Implementation Summary

- *Establish baseline policies* and procedures, and *preliminary service catalog*
- Select *appropriate software tools*
- *Establish a long-term IT Service Management Plan* that includes appropriate communications and training to staff, and mature service catalog

Leading Practices

- *Numerous resources* are available to ArDOT to establish an effective *IT Service Management Plan and PM framework*
- Leading practice research reveals that**:**
  - *Effective PM yields* alignment between business and IT operations, *project savings*, and *fewer failed projects*
  - *Robust ITSM implementation yields cost savings*, increased *productivity*, and *faster response times* to customers

42%
Surveyed executives who agree that ITSM has reduced business costs

Source: Forbes

26% vs. 6%
Cost savings per project for firms with mature PM infrastructure versus those firms with less mature PM infrastructure

Source: PM Solutions

GLOSSARY

ITSM: IT Service Management   PM: Project Management

16

Implementation Roadmap

● ● ●

1 **ESTABLISH BASELINE STANDARDS AND POLICIES**

IT project management:
- Adopt a preliminary set of project management standards and protocols
- Create a preliminary set of PM tools, templates, and project success metrics (e.g. DIR PM Lite)
- Establish and provide necessary training to staff members

IT Service Management (ITSM):
- Identify and socialize core service offerings in an IT Service Catalog
- Create initial service policy and standards for existing IT offerings
- Identify success metrics relevant to business need

2 **SELECT APPROPRIATE SOFTWARE TOOLS**

Identify a proven ITSM framework such as ITIL to establish a baseline

Select ITSM tool and prioritize the "out of the box" ITSM capabilities:
- Service desk capabilities, including incident and problem management, and fulfillment request management,
- Service catalog management, risk management, vendor management
- Demand and capacity measurement
- Asset catalog and IT configuration
- PM capabilities including PM plan creation, project progress and performance dashboarding, change management,

Ensure ITSM tool scales to include a comprehensive ITSM Model build out

3 **ESTABLISH A LONG-TERM ITSM PLAN**

Synthesize existing IT demand and service data, and conduct an ITSM maturity analysis

Identify ITSM maturity gaps and create a multi-year roadmap

Create a communications and rollout plan with engagement of change champions across the Department, and appropriate training for staff

Integrate project management maturity within the ITSM roadmap
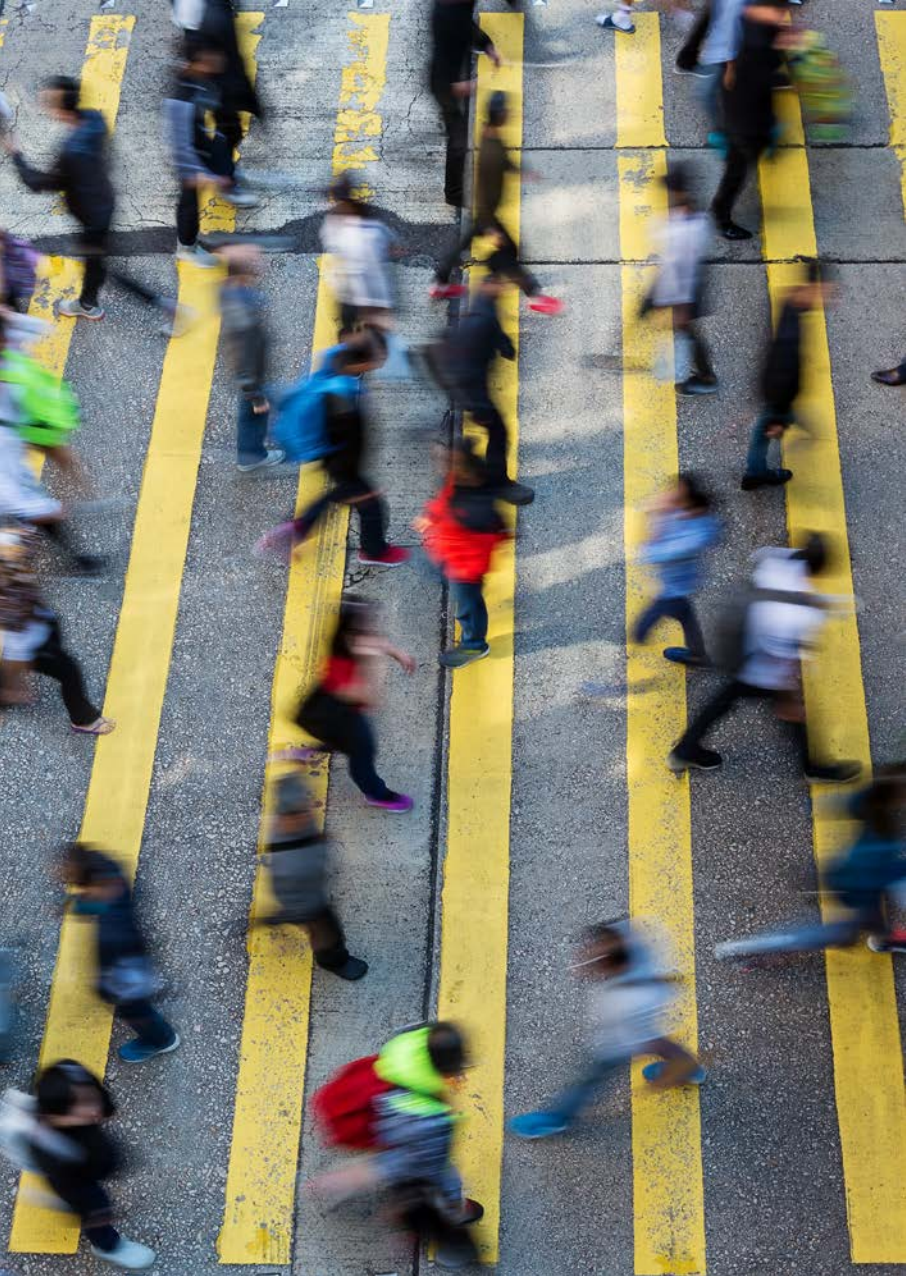
Guidehouse

GLOSSARY

PM: Project Management   *ITSM: IT Service Management*   *ITIL: Information Technology Infrastructure Library*

17

Questions?

Guidehouse

Appendix

Guidehouse

Appendix Contents

Guidehouse

Assumptions

1. The recommendations included in the presentation and in the corresponding Recommendations Report are based on a point in time Current State Report delivered to the Highway Commission and Advisory Subcommittee on March 13, 2020. This Current State Report was based on interviews conducted with the Arkansas Department of Transportation (ArDOT) staff members and various external stakeholders and a review of documents ArDOT provided to Guidehouse from September 2019 – February 2020. Recommendations and Findings are subject to change based on mitigating documentation and clarifications provided by ArDOT subsequent to the publication of this report.
2. The Anticipated Impacts identified within this presentation and the corresponding Recommendations Report are estimates, directional in nature, and represent the upper end of the savings range

Recommendation 5 - Anticipated Impact Assumptions

• • •

1

~$1.4M (3.5%) in direct project savings by adopting TxDOT's policy of limiting change orders

TxDOT reduced direct and indirect costs for project modifications by 3-4% by altering change order policies. ArDOT spends $40.4M on average in change orders annually
- 3.5% * $40.4M = $1.4M

2

~$1.8 to 7.1M (5-20%) in savings on small order (<$20K) and competitive bid ($20K-$75K) purchases by adopting NIGP's best practices in spend analysis, management, and oversight

A 2015 Institute for Public Procurement report identified that State governments can save 5-20% of expenditures by improving procurement processes (i.e., spend analysis). ArDOT spends on average $22.5M annually on small order purchases (<$20K) and $12.8M on competitive bid purchases ($20K-$75K)
- At 5%, savings would be $1.1M and $639K respectively (total: $1.8M)
- At 20% savings would be $4.5M and $2.6M respectively (total: $7.1M)

Guidehouse

GLOSSARY

TxDOT: Texas DOT   NIGP: Institute for Public Procurement

Disclaimer: Anticipated Impacts are estimates, directional in nature, and represent the upper end of the savings range

Recommendation 10 - Anticipated Impact Assumptions

• • •

1	**Up to $1M in savings from application management, per Gartner analysis** A 2009 Oracle Report quotes a Gartner analysis which reveals that Chief Information Officers report application rationalization combined with business process optimization can yield on average 20% cost savings within one year. ArDOT spent ~$5.3M on software in FY2019[2]. It does not appear that ArDOT separately tracks software license expenditures or application development/support. As a result, using the total software expenditure as a proxy for the costs that could be reduced as a result of application rationalization, and applying the 20% cost savings from the Oracle report yields: • 20% * $5.3M = $1.06M

Guidehouse

Procurement Current State Findings

PR 1.1: ArDOT adheres to state procurement and transportation laws that limit its flexibility and do not necessarily apply.	PR 1.2: Low bid procurement is viewed by staff as a cultural and financial necessity.

- State procurement law excludes constitutional Departments and construction projects. Both exclusions apply to ArDOT, which resides under the constitutional office of the Highway Commission and conducts significant procurement for construction.

- State and federal transportation law require procurement for construction projects, and award to the lowest responsive bidder meeting established criteria. Yet both allow exceptions for engineering and design services related to construction and for design-build and construction manager / general contractor construction projects.

- Further, state transportation law suggests the Commission has authority to "award a project contract on a qualification basis that offers the greatest value for the state."

- Separately, this law requires equipment and supply purchases "be awarded to the lowest and best bidder, price, quality, delivery cost, and time being considered."

- Though exempt, ArDOT views state procurement law as a best practice and has aligned its policies and procedures to it, specifically its prioritization of low bid procurement. As a result, ArDOT does not take full advantage of the flexibility that the governing laws may allow for in order to consider qualifications and best value.

- Anecdotally, staff across construction and non-construction divisions believe that low bid procurement is imperfect but impartial, which is essential to public trust.

- Staff shared concerns that strategies that give preference based on other criteria, such as vendor past performance, would be subjective and, therefore, unreliable.

- For equipment and supplies, staff also reported a tension between maintaining annual budgets and investing in higher-quality products with a lower cost of ownership.

- For construction, staff pointed to the pre-qualification process, bonding requirements, and the Standard Specifications for Highway Construction as existing criteria that fulfill a comparable function as qualifications-based procurement strategies.

Guidehouse

| The recommendations and findings included in the presentation are a point in time representation and are subject to change. Also, Anticipated Impacts are estimates, directional in nature. Please see the assumptions slide in the appendix for further details.

Procurement Current State Findings

PR 2.1: Pre-qualification and bonding approximate likelihood of project completion, but do not screen for quality.

- Construction contractors are screened through pre-qualification and by receipt of bid, performance, and payment bonds, but these do not consider quality of past work.
- ArDOT's pre-qualification review determines if a contractor can complete a project based on their completed and ongoing projects, history of incomplete projects, financial stability, equipment condition, and officer information.
- ArDOT also requires contractors to obtain performance and payment bonds, a federal requirement. Bonding companies evaluate "character, capacity, and capital" to determine if they will complete the project and pay their subcontractors.
- However, performance bonds provide "no guarantee against a contractor's marginal quality of work, so long as the contractor's failures are not large enough to trigger a default," according to a Federal Highway Administration's (FHWA) report.
- Consultant contractors for engineering and design-related services and for equipment and supplies must apply to be added to bidder's lists. Bid bonds and performance bonds are also used as part of ArDOT's standard bid conditions.

PR 2.1: The Standard Specifications mandate certain performance criteria, but do not screen for quality.

- ArDOT's 2014 Standard Specifications for Highway Construction establishes exhaustive guidelines for construction and standards of acceptability, and is updated as needed.
- ArDOT's Qualified Products List includes pre-approved products for construction.
- Contractors are required to comply with these specifications and guidelines.
- The Department rigorously validates the quality through testing and site inspections.
- Contractors that do not meet thresholds may need to redo work at no cost to ArDOT. As appropriate, ArDOT will adjust the unit price for contract items based on quality.
- Yet these measures only come into play after the bidder has been selected. Current policies do not limit the ability of poor-quality contractors to compete for bids.
- If contractors frequently repeat tasks until they reach the quality level sought by ArDOT, there may be indirect costs to the Department due to delays and staff time, as well as public safety concerns and economic impacts.

GLOSSARY

FHWA Federal Highway Administration

| The recommendations and findings included in the presentation are a point in time representation and are subject to change. Also, Anticipated Impacts are estimates, directional in nature. Please see the assumptions slide in the appendix for further details.

Procurement Current State Findings

PR 3.1: Anecdotes and data suggest some existing quality issues that may be improved through alternate contractor strategies.

- ArDOT's 2019 Transportation Asset Management Plan (TAMP) identifies pavement materials quality and poor-quality construction work as "very high impact" risk factors for asset management. Quality materials are linked to managing lifecycle costs and achieving performance targets, while quality construction work is linked to achieving desired outcomes.

- Yet the Department does not formally monitor contractor quality through such measures as: long-term maintenance and repair costs, repeated delays, repeated overruns, repeated poor performance on Standard Specifications quality measures, etc.

- Maintaining quality contractors should be a priority for ArDOT, since between 2014 – 2019, ArDOT released over $6B of projects into the bidding pool; in that time, 10 bidders controlled 46% of the value of those projects.

- ArDOT construction staff anecdotally report challenges with contractor workmanship and mitigating contractor disputes, but these issues are not formally tracked.

- The Department quantifies the costs of construction delays through its Road User Cost, which considers the economic impact and safety risks of work zone activity. It is applied as a disincentive: a "site use" fee to contractors who are behind schedule at a key milestone.

- The tables (right) provide detail on one indicator of quality issues: high volumes of change orders overall, and total change orders issued related to disincentives.

- District construction and maintenance staff also report challenges with equipment procurement that favors lower capital outlays over lower lifetime costs. These anecdotes suggest the lack of cost-benefit analysis in equipment procurement. For one, a piece of equipment procured by low bid did not have a corresponding parts supplier in the vicinity, reportedly increasing costs for maintenance and repair.

GLOSSARY

TAMP: Transportation Asset Management Plan

| The recommendations and findings included in the presentation are a point in time representation and are subject to change. Also, Anticipated Impacts are estimates, directional in nature. Please see the assumptions slide in the appendix for further details.

Procurement Current State Findings

- Qualifications-based procurement enables DOTs to consider factors beyond cost and time during bid evaluation. Absent this approach, low and high performing contractors may have equal standing in evaluation.
- ArDOT is permitted to use qualifications-based procurement for design-build projects and construction manager/general contractor projects.
- The advantages of design-build are well documented: fewer engineering and inspection costs, design errors and omissions, and overruns.
- ArDOT's 30 Crossing project was procured through design-build, and the Department recently released Construction Manager/General Contractor RFQs (a similar method) for Independent Cost Estimating.
- ArDOT also uses qualifications-based procurement for engineering and design related services, managed by Consultant Contracts.
- Some divisions have developed qualifications-based approaches to screen for contractors that provide the best value. For example, Surveys requires consultants to complete its in-house certification program.
- Others have developed ratings systems to track vendor performance, and use tools like score cards to consider such ratings in bid evaluation.

PR 4.2: Alternative contract methods have allowed ArDOT to influence contractor behavior.

- Construction contractors are not able to bid on new projects if they have uncompleted contracts with ArDOT, incentivizing on-time completion.
- Incentive/Disincentive (I/D) bidding is used for projects with a high public value of early completion (i.e., traffic). Contractors are awarded bonuses for early completion and penalized for delays, based on a preset value.
- ArDOT issued ~$7.3M per year on average in such incentives, between 2014 and 2019. Disincentives averaged $3.4M per year during this time.
- A+C bidding is used to evaluate contractors based on their proposed cost and schedule, as opposed to cost only, based on a time multiplier.
- Anecdotally, staff shared concerns that A+C bidding may favor larger contractors who can absorb the risk of shorter completion times.
- Lane Rental is used to disincentivize unnecessary lane closures, especially during peak travel time, through an hourly lane usage charge. ArDOT charged $118K per year on average in fees, between 2014 and 2019.
- However, ArDOT does not have formal protocols to standardize decision-making around when to use specific strategies, which limits their ability to evaluate the effectiveness of strategies and analyze contractor payments.

Guidehouse

GLOSSARY

I/D: Incentive/Disincentive

Procurement Current State Findings

PR 5.1 ArDOT is not using data to understand procurement trends and identify efficient practices.	PP 5.2: E&P has minimal authority to facilitate implementation of efficient procurement practices.

- Equipment & Procurement (E&P) does not formally review procurement trends, such as prices or staff demand.
- There is no formal mechanism to identify when term contracts would be most cost efficient. This is notable as ArDOT spends an average of $24.4M per year in purchases below $20K, some of which may be more cost efficient through term contracts.
- There is no system to monitor change in commodity prices and reevaluate term contracts. E&P uses short-term contracts, but relies on districts to identify fair prices.
- There is no formal protocol to check if "split purchases" are being used to circumvent the requirement for competitive bidding for purchases above $20K.
- E&P lacks a formal lifecycle cost-based management system.
- This may explain some dissatisfaction with the equipment available to staff: only 58% of ArDOT staff agree "I have all the tools I need to do a great job."
- The Oracle implementation will bring many aspects of purchasing and self-service procurement together and provide approval and reporting capabilities, but will not in itself facilitate the level of data-driven decision-making discussed here.

- E&P is the only central division with procurement oversight, but its role is primarily compliance-based. If it identified a Department-wide cost efficiency based on analysis of trends, it would not have authority to implement it across divisions and districts.
- For example, current fuel expenditures suggest a gradual shift to electric and hybrid vehicles may be efficient for the Department to undertake.
- There is most oversight for purchases $75K+, on which ArDOT spends an average of $24.5M per year (this excludes construction). Below this threshold, E&P conducts a compliance check. Purchases under $20K have minimal oversight, though staff report this will increase slightly with the implementation of the new Oracle system.
- "If we know there's going to be a lot of buying throughout the year, we recommend they get a contract so we can get the best price in the front end… Ultimately we don't have authority to force them; we can strongly encourage, and usually folks do."
- E&P also lacks authority over inventory management, which is decentralized.

GLOSSARY

E&P: Equipment and Procurement

| The recommendations and findings included in the presentation are a point in time representation and are subject to change. Also, Anticipated Impacts are estimates, directional in nature. Please see the assumptions slide in the appendix for further details.

IT Current State Findings

IT 1.1: ArDOT appears to be approaching data center modernization phases, however, there does not appear to be a formal plan for integration.

- There appear to be 300+ databases (DBs) operating over 14 servers.
- Interviews with IT indicate there is an unknown amount of data stored locally on ArDOT staff computers.
- There are several DBs for which the origin or the purpose have not been established and may be ready for decommissioning.
- ArDOT's own internal analysis revealed that "Data quality is poor, data access across divisions is difficult and not real time".
- Interviews with IT revealed that ArDOT has been approaching its data center modernization in phases prioritizing the Mainframe upgrade, Oracle implementation, several storage and server infrastructure upgrades and then will move to consolidate the remaining databases. Nevertheless, there is not a documented plan leaving the organization open to risks related to ensuring appropriate data capture, storage, and integration.

IT 1.2: ArDOT has preliminarily identified staff's software needs but efforts to align technology purchases across the Department has not been universally implemented.

- ArDOT currently deploys approximately 263 software applications.
- Support for these applications is distributed across a number of divisions including construction and maintenance as it relates to SiteManager, SiteManager Access Report System (SARS), and State Highway Police (SHP) radio communications.
- ArDOT's software expenditures has increased significantly over the last 5 years, rising ~73% to ~$5.3M in FY2019.
- Interviews with IT indicate that ArDOT has not conducted a software license inventory for these deployed applications which may increase IT costs and leave the Department exposed to risk/liability.
- Although in the current state IT has to approve application acquisition and enable installation, there is still a culture of divisions independently securing IT applications without IT approval.
- ArDOT's own internal strategic planning documents reveal that there is lack of alignment between technology solutions purchases leading to multiple solutions for one business problem.

Guidehouse

GLOSSARY

DB: Database   SARS: SiteManager Access Report System   SHP: State Highway Police

29

| The recommendations and findings included in the presentation are a point in time representation and are subject to change. Also, Anticipated Impacts are estimates, directional in nature. Please see the assumptions slide in the appendix for further details.

IT Current State Findings

IT 1.3: ArDOT has enlisted a number of vendors to rapidly implement Enterprise Infrastructure upgrades.

- An Info-Tech IT Capabilities assessment in 2019 indicated the need for ArDOT to focus on Network and Communications Infrastructure.

- A Converge One Data Center Resiliency assessment (in 2019) revealed the need for critical Server, Storage, and Disaster Recovery (DR) Infrastructure upgrades.

- Recognizing that it needs to stabilize its baseline infrastructure in the above areas (Storage, Servers, Hardware, Security and DR) ArDOT has secured consultants to rapidly attend to these IT Infrastructure upgrades.

IT 1.4: ArDOT recognized that IT customer support is of critical importance and is looking to secure a supporting ITSM tool.

- ArDOT's internal IT Survey indicates that customer support is a critical pain point for the Business.

- The IT Department is working to release an RFP to procure an IT Service Management (ITSM) tool in Q1 of 2020; and is looking to deploy this tool concurrently with the Oracle "go-live" window (July 2020).

- It does not appear that IT has any frameworks to guide effective customer support but is looking to secure this as part of the ITSM solution acquisition.

- Interviews revealed that IT is looking to broaden the utilization of this ITSM tool across numerous divisions (e.g. HR, Facilities, Construction).

- A review of the requirements indicates that ArDOT IT seeks to expand the platform's capabilities to support Change Control, Project Management, Problem resolution, and service catalog definition.

Guidehouse

GLOSSARY

30

DR: Disaster Recovery   ITSM: IT Service Management

IT Current State Findings

IT 1.5: Although ArDOT is making progress on developing Disaster Recovery (DR) platform, they currently lack a cyber security function, policies, and standards.

- ArDOT is addressing its DR related data storage risks via the Data Center infrastructure upgrade. This upgrade will also inform the creation of broader Disaster Recovery policies and procedures.

- ArDOT has identified its Barling facility as a dedicated DR facility, but has yet to formalize the plan, or associated IT/business continuity policies and procedures.

- ArDOT's plans to address the remaining DR risks (such as Fire risks, Firewalls and email security, and lack of DR environment) are in their infancy.

- Interviews reveal that ArDOT is in the process of building a cybersecurity platform, and have recently hired a security architect to lead that effort.

- ArDOT has expressed a desire to align with the Criminal Justice Information Services (CJIS) cybersecurity policies, but an ArDOT specific policy has not been developed.

- ArDOT's Security Architect has put in a platform to conduct threat monitoring and detection, and ArDOT is partnering with Arkansas Department of Emergency Management (ADEM) to understand best practices on cybersecurity training, but ArDOT is not currently conducting any cybersecurity audits across the Departments and divisions.

Guidehouse

31

GLOSSARY

DR: Disaster Recovery   ADEM: Arkansas Department of Emergency Management   CJIS: Criminal Justice Information Services

| The recommendations and findings included in the presentation are a point in time representation and are subject to change. Also, Anticipated Impacts are estimates, directional in nature. Please see the assumptions slide in the appendix for further details.

IT Current State Findings

IT 2.1: ArDOT has not developed a Governance Structure to ensure IT investments support objectives, manage enterprise risk, and meet external stakeholder needs.

- IT staff meet with division and districts to catalog IT needs and gather requirements, the project intake process is not formalized nor documented (beyond capturing needs through customer-initiated IT service tickets).

- ArDOT recently implemented the use of a Project and Prioritization tool, however it does not appear to complete, tied to an enterprise strategy, or connected to a governance structure.

- Beyond a long- and short-term initiatives document, it does not appear that ArDOT has an operational plan that supports the implementation of the 3 Year IT Strategic Plan.

- There does not appear to be a formal decision-making body related to IT investments, nor formal policies to govern and/or prioritize any investments. Interviews revealed that the Assistant Chief of Administration ultimately approves project prioritization.

- ArDOT has created a Data Governance Plan to help operationalize how data is managed across the organization however, this document is in its infancy and only supported by three draft policy documents: Data Management, Backup, and Access.

- ArDOT continues to increase its IT investment as the IT Budget has increased dramatically from ~$9.2M in FY16 to ~$23.5M in FY20 with Operating Expenses and Equipment costs being the biggest Drivers.

IT 2.2: There is no overarching Enterprise architecture or "Blueprint" to standardize and organize IT infrastructure and solutions to align with business goals.

- Enterprise Architecture is siloed organizationally with this responsibility residing with each of the divisions and districts that primarily "owned" their respective IT platforms and solutions.

- Within the IT division, architecture responsibility is distributed across various teams and is siloed on a project by project basis, and in many cases outsourced to external vendors.

Guidehouse

32

IT Current State Findings

IT 2.3: ArDOT has not adopted a service catalog nor defined service level expectations which has led to confusion on what IT will deliver, when it will deliver it, and how support is distributed.

- ArDOT's own internal strategic planning documents reveal that there is lack of clarity around core IT service offerings.
- Interviews with IT revealed that IT has informally identified its core service offerings, however, it is not clear that a robust analysis has led to this determination nor whether this set of core service offerings has been formally adopted or communicated.
- Interviews with IT revealed that determination of service offerings is handled on a case by case basis, however, a formalized Cost Benefit Analysis (CBA) has not historically been utilized to aid decision making.
- It does not appear that the IT division has established service level agreements (SLA), nor tracks performance against any service level measures.

IT 2.4: ArDOT's efforts to establish a Project Management (PM) infrastructure to ensure effective delivery of IT projects is still in its infancy.

- ArDOT has recently restructured its IT Department to include a Project Management Office (PMO) with five positions, but as of 10/25/2020 it still has 2 vacancies.
- ArDOT has not adopted any formal Project Management (PM) guidelines, standards, or protocols to help drive IT Project delivery. Interviews with IT Staff indicated that they employ a "Waterfall" approach to project management.
- Beyond templates to report on project status, ArDOT does not have core technology project planning execution and evaluation documents such as Project Charter, Risk Management Plan, Stakeholder Registers and Requirements Identification Templates.

Guidehouse

GLOSSARY

CBA: Cost Benefit Analysis   SLA: Service Level Agreement   PMO: Project Management Office   PM: Project Management