



THE DATA CENTRIC TOLLING ENTERPRISE

Building a Roadmap for Success





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AGENDA

1 Background / Challenge

2 Objectives & Expected Benefits

3 Approach

4 Current State Insights

5 Future State

6 Strategy & Roadmap

7 Questions

TxDOT Tolling Overview

- Vision: "A customer-focused service provider that creates economic opportunities, stimulates investment and enhances quality of life by supporting high-performing transportation systems in Texas and beyond."
- Mission: "Exceed customers' expectations and provide leading mobility solutions by delivering and growing an integrated, safe, reliable and efficient highway system."
- 440M annual transactions
- \$410M annual toll revenue collected
- 275 Toll Road Miles
- Toll roads in the Austin, Dallas, and Houston metros
- TxDOT Tolling was looking to make strategic decisions by leveraging data coming from three primary sources as well as other sources from multiple origins

OBJECTIVES & EXPECTED BENEFITS

The following are the key objectives and anticipated benefits of becoming a Data Centric Organization

KEY OBJECTIVES

Create a sustainable and actionable **Data Warehouse and Business Intelligence strategy**

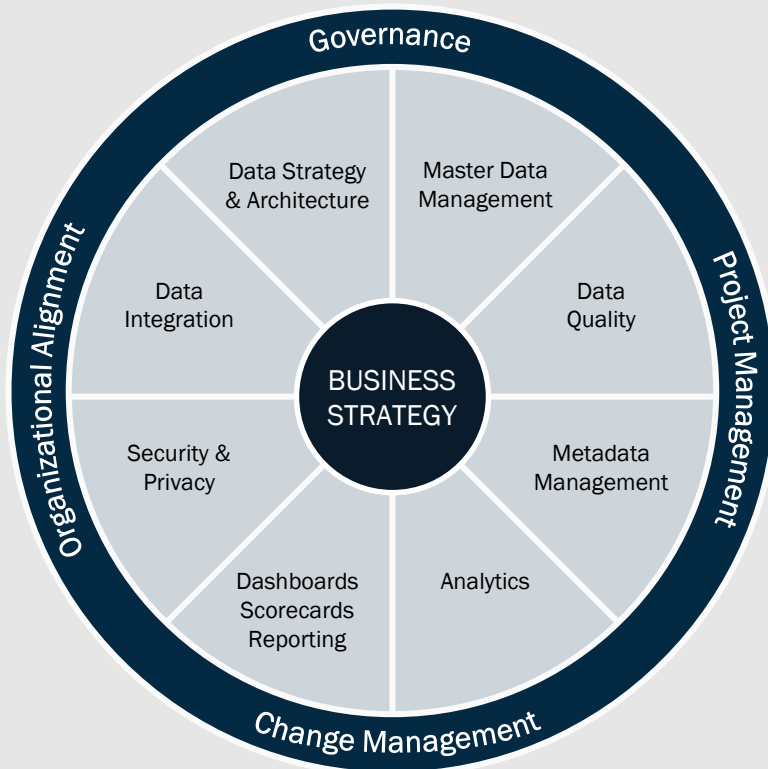
Develop a best practice **Data Governance framework** to support the operationalization of the DW/BI roadmap

KEY BENEFITS

- Promotes fact-based decision making through the effective utilization of data assets
- Creates a common language for critical information
- Aligns business strategy with information
- Enhances data trust
- Standardizes processes

APPROACH - DATA COMPONENT MODEL

The data component model consists of 12 components that align your information to the business strategy through people, process, and technology



GOVERNANCE

- People (governance organization including data stewards)
- Process (best practices and procedures)
- Technology (tools to support data governance)

OPERATIONAL COMPONENTS

- Master Data Management
- Data Quality
- Metadata Management
- Analytics
- Dashboards, Scorecards, and Reporting
- Security and Privacy
- Data Integration
- Data Strategy and Architecture

PROJECT EXECUTION COMPONENTS

- Project Management
- Change Management
- Organizational Alignment

APPROACH - THE PHASES OF THE DW/DG/BI SOLUTION

DISCOVERY

Where you are today

Siloed, manual data operations
limiting the ability to fully
leverage data

FUTURE STATE

Where you want to be

Data-centric operations
promoting analytical insight and
enabling the realization of
strategic initiatives

ROADMAP







How you get there

Advance data competency
through the execution of key
BI/DW/DG activities

Together, we set out to accomplish the key objectives through the execution of three phases

CURRENT STATE INSIGHTS

Several common themes on the current state of tolling data operations, with the following demonstrating some examples.

	1	2	3	4	5	6
						
	DATA AS AN ASSET	SILOED OPERATIONS	METADATA MANAGEMENT	DATA CONTINUITY	DATA INTEGRATION	DATA GOVERNANCE
THEME	Limited view of the role of data as an asset (transactional output vs data as a driver of analytics)	Siloed functional analysis creates operational inefficiencies	Reliance on function-specific knowledge vs. common metadata definitions across the division	Reconciliation between source systems requires extensive manual effort to maintain data continuity, further limited by vendor contracts	Decentralized BI capability reduces the ability to integrate data sources for robust analytics	Lack of data governance hinders progress in building an integrated environment for BI and analytics
IMPLICATION	Significant effort spent on data reconciliation vs. data analysis	Duplication of effort due to lack of knowledge sharing and organizational alignment	Lack of cross-functional knowledge management, risk with employee retention, implications for customer sentiment	Potential misalignment across reporting output requiring additional reconciliation; access limitations due to vendor reliance	Limited capability to derive action-oriented insight and effectively manage public relations / bond reporting	Inhibiting ability to take data competency to the next level

Tolling agencies can expand operations (through interoperability) and achieve strategic initiatives with the current state of data operations

TODAY

Siloed, manual data operations limiting the ability to fully leverage data

CURRENT STATE OF DATA OPERATIONS

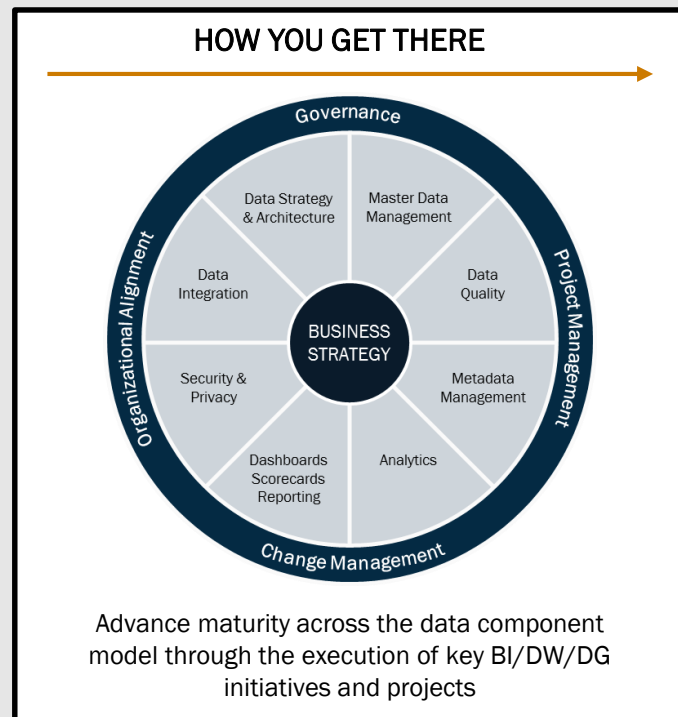
- Limited view of the role of data as an asset (transactional output vs data as a driver of analytics)
- Siloed functional analysis creates operational inefficiencies
- Reliance on function-specific knowledge vs. common metadata definitions across the division
- Reconciliation between source systems requires extensive manual effort to maintain data continuity, further limited by vendor contracts
- Decentralized BI capability reduces the ability to integrate data sources for robust analytics
- Lack of data governance hinders progress in building an integrated environment for BI and analytics

FUTURE

Data-centric operations promoting analytical insight and enabling the realization of strategic initiatives

STRATEGIC INITIATIVES

1. Increase TxTag participation rate
2. Replace back-office system and operator
3. Become nationally interoperable with all toll facilities in the U.S. and Mexico
4. Build a data warehouse to store and manage records
5. Build TxDOT Toll Operations Division staff to operate with the knowledge to manage a world class customer service organization that is both customer focused and efficient.



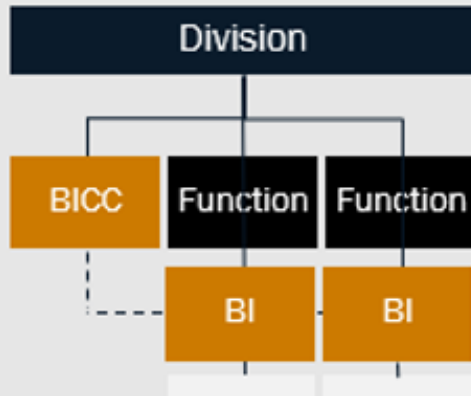
Focus of today's discussion

FUTURE STATE – DW/DG/BI BICC & DATA GOVERNANCE

The Business Intelligence Competency Center (BICC) and Functional Data Governance Organization were selected during the Future State Visioning Session as the core pillars to the Future State Organization to drive the advancement of data competency

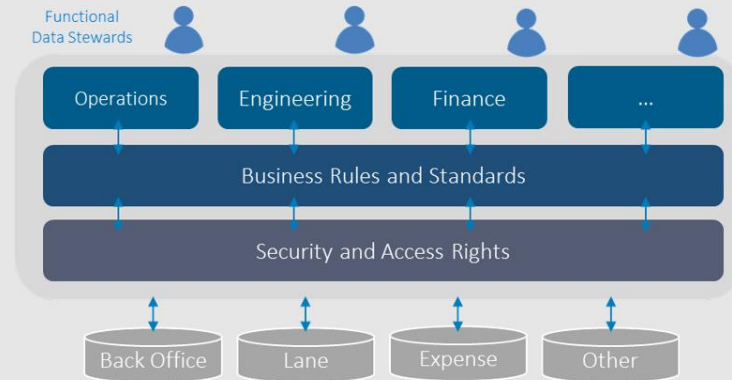
BUSINESS INTELLIGENCE COMPETENCY CENTER

The BICC is comprised of a centralized team closely aligned with functional partners across



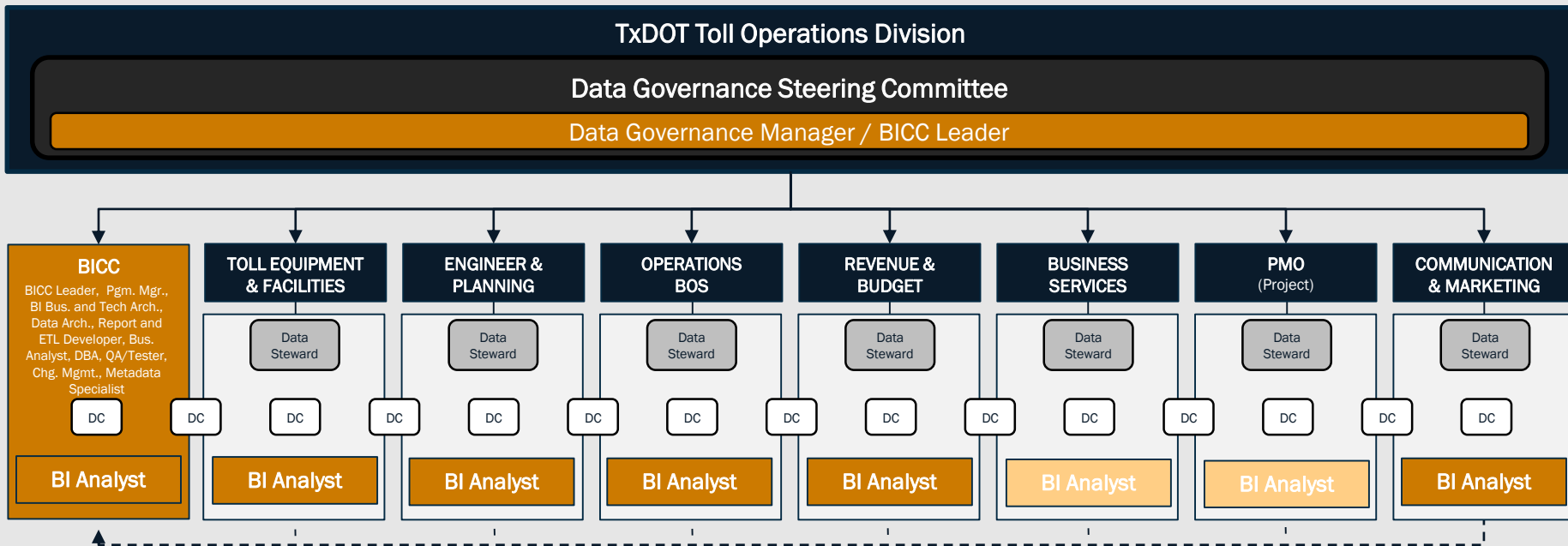
FUNCTIONAL DATA GOVERNANCE

The data governance organization is built around the functional area requirements and usage of data



FUTURE STATE - ORGANIZATIONAL MODEL

The data competency organization integrates the BICC and DG structure to operationalize the future state



*individuals on the transition team

To Be Discussed

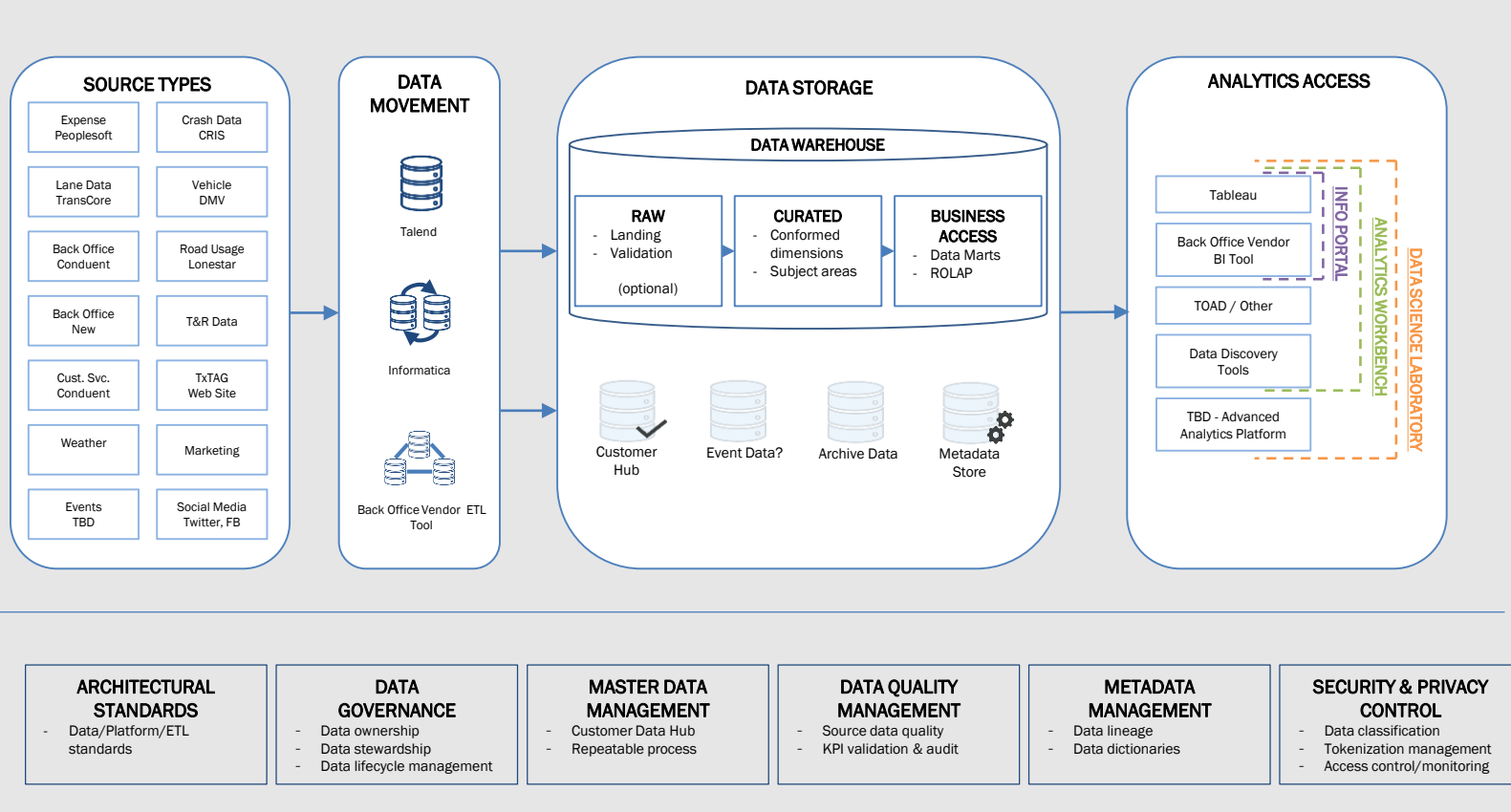
DC = Data Custodian

Note: BI Analyst and Data Steward roles to potentially be fulfilled by the same named resource

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FUTURE STATE - REFERENCE ARCHITECTURE



STRATEGY – FOCUS ON BUSINESS “ANALYTICS” NEEDS

Each data use case has been grouped with similar use cases, which will be developed during the Phased Builds

CATEGORY

SUBCATEGORY

USE CASES

	① TOLLING OPERATIONS	② TRAFFIC PATTERNS	③ CUSTOMER INSIGHT	④ FINANCIAL PERFORM.					
	Understanding operational data, both from the user’s and lane’s perspectives	Discerning trends in traffic and the factors that influence them	Describing customers and measuring how well they are being served	Providing insight into the agency’s past, current, and future financial health					
	Tag Using information sent from driver’s TxTags	Lane Gathering Information from lane equipment	Interop. Collecting tag data used in interoperable settings	Regular Identifying typical traffic patterns that are seen on tolls apart from idiosyncratic events	Event/Weather Tracking and predicting how idiosyncratic events affect traffic patterns	Behavior Measuring driver qualities based on certain actions and characteristics	Service Determining the level of service that is offered to customers	Revenue Calculating received and anticipated payment and funding	Expense Computing the costs incurred and is expected to be incurred
	1. TxTag stats 2. iToll Analysis 3. TxTags on Home 4. Tag Usage	1. Daily Monitoring 2. Monthly Monitoring 3. Speeds GP vs ML 4. Trans. Type 5. Axle Class 6. Postings	1. Away Tag Analysis 2. TxTags on Away	1. Traffic Control/ Management 2. Value of Time 3. Safety 4. Predictive Equipment Maintenance	1. Timeline/ Duration 2. Lane Variation 3. Managed Lanes Predictive Analysis	1. Type of Accounts 2. Zip Code Analysis 3. Trend and Predictive Cust. Behavior 4. Habitual Violator 5. Trips	1. Customer Account Analysis 2. Fraud 3. Cust. Service Stats Analysis 4. Call times 5. Website Response Time 6. Page Refresh 7. Click to Pay	1. Revenue Recognition 2. Rejected Transactions 3. Collections 4. Aging Analysis 5. Invoice Stats 6. Lane to Back Office	1. Budget & Expense Monitoring 2. Contract & Encumbrance Information 3. TCC Metrics 4. TSA

Note: In addition, dashboard views for reporting to various stakeholders – including legislature, districts, bondholders, and drivers – may be compiled on an as needed basis using the above use cases.

STRATEGY – QUICK WINS AND OTHER KEY ACTIVITIES

The key activities around future state realization have been grouped into three key categories

	1	2	3
	QUICK WINS	FOUNDATIONAL ACTIVITIES	PHASED DW BUILD
Objective	Maximize immediate value of the FS DW / DG / BI solution	Standup DW / DG / BI infrastructure for sustainable operations	Accelerate operationalization of the DW / BI solution
Example of Key Activities	<ul style="list-style-type: none">• Create centralized event tracker• Define terms of reference• Standup DG steering committee• Conduct organizational alignment assessment and present key recommendations• Formalize the business strategy with a detailed execution plan to ensure cross-functional alignment• Develop communication plan to begin socializing the value/benefits of the DW / DG / BI solution• Build source system data visualization to demonstrate immediate value	<ul style="list-style-type: none">• Confirm technology platform for the data warehouse (long-term viability, short-term solution)• Select/confirm appropriate required technologies/tools• Detail high level DW data architecture• Define metrics / KPIs across functions• Establish BICC• Setup DG program (People, Process, Technology)• Collect District / Region requirements for DW / BI• Determine interoperability requirements• Define metadata solution / establish data literacy• Develop Master Data Management (MDM) Program	<ul style="list-style-type: none">• Execute Phased build of DW / BI (multiple iterations to deliver business case capabilities)<ul style="list-style-type: none">• Each phase/iteration is intended to deliver one to many business case capabilities/functionality. We will be grouping the “business case capabilities/functionality” into phase/iterations as part of the roadmap phase• The average timeframe for each phase/iterations is approx. 90 days but could vary from 60 to 120 days

ROADMAP - DATA USE CASE PRIORITIZATION

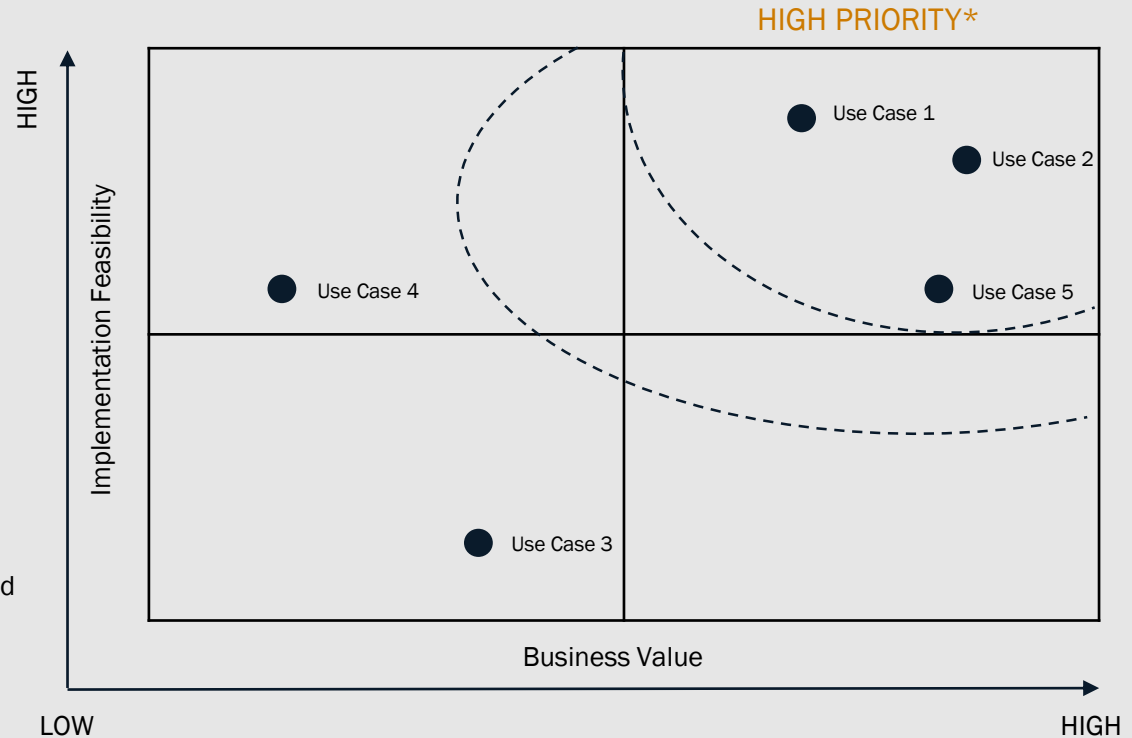
Use cases will be identified and prioritized based on those use cases with the perceived highest value and are most feasible to implement

BUSINESS VALUE CRITERIA -

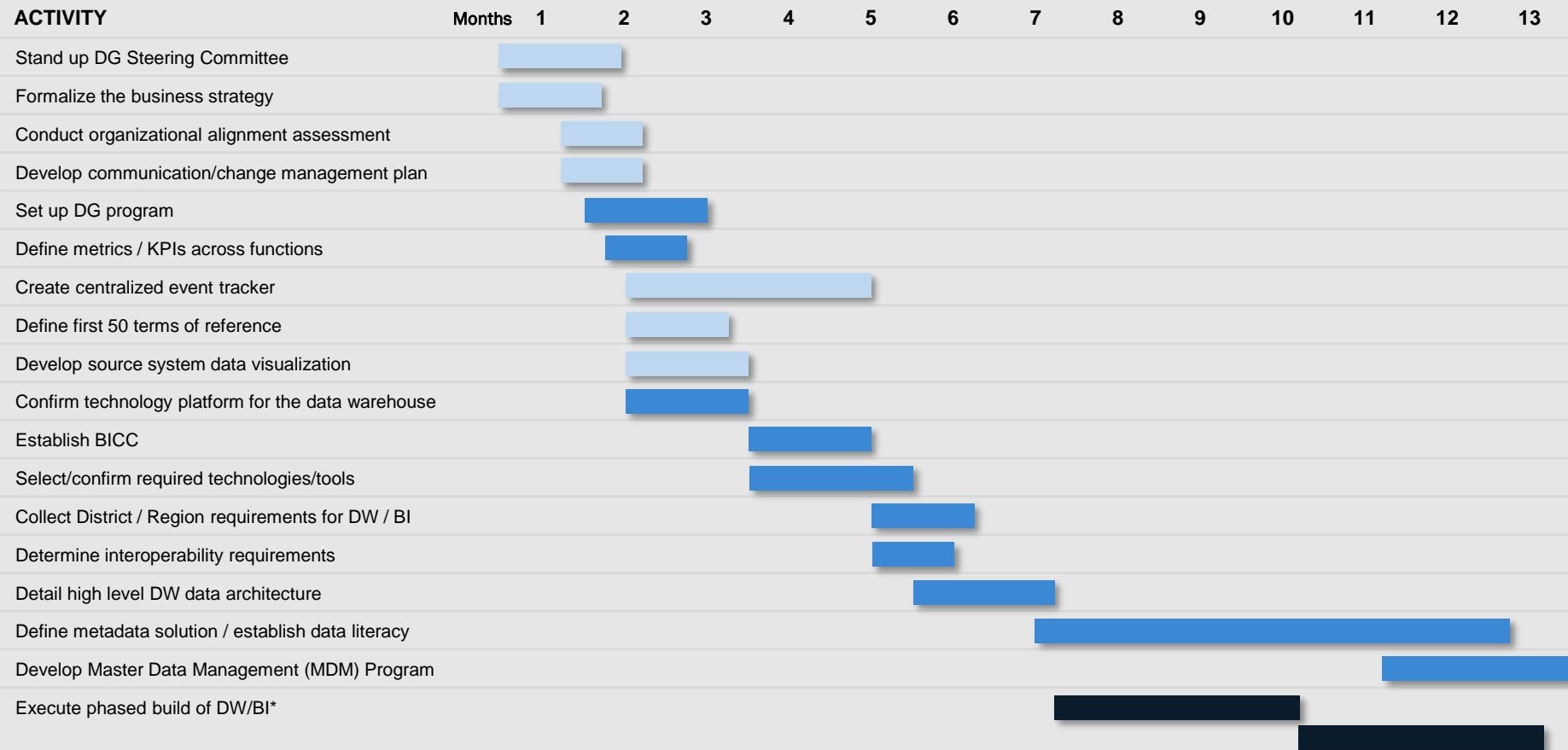
- Tied to Strategic initiatives
- # of business functions impacted
- Efficiency gains
- Improved quality / usability
- Actionable output (dashboard view vs. detail spreadsheet view)

FEASIBILITY CRITERIA -

- # of source systems
- Quality of the data
- Ease of source data access
- Volume of historical data required to be loaded
- Number of data transformations required



ROADMAP – ACTIVITY EXAMPLES



*Phased build to include multiple iterations, informed by data use case prioritization



QUESTIONS?

THANK YOU!

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