

# **NORTH HIGHLAND**

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**HARNESSING  
BIG DATA BY ENABLING  
A COMPREHENSIVE DATA  
MANAGEMENT STRATEGY**

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IBTTA Technology Summit



**IBTTA**  
TOLLING. MOVING SMARTER.

**Data** is one of any organization's **most strategic assets** and this is no different for Tolling Agencies. Just like physical assets (roads, bridges, etc.), **data must be managed, maintained, and harnessed.**

As we look to **the future of transportation** and things like connected and autonomous vehicles (CAVs), smart cities, v2x communication, smart mobility solutions, complex back-office and ERP systems and LiDar/IoT/Telematics data collection, the amount of data that transportation organizations have will only be **exponentially increasing.**





# TRANSPORTATION TRENDS IN TOLLING



## Truck Transportation

Increasing adoption of **autonomous trucks**

Electric trucks gaining more traction



## Passenger Transportation

Use of **electric vehicles** for transit and ground transportation

**Intelligent transport guidance systems**



## Transportation Infrastructure

Growing investment in **transportation infrastructure**

Significantly growing **electric vehicle infrastructure**

Increasing digitalization of transportation infrastructure

**Interoperability and integration of technology**  
(Back-office, Cloud Platforms, ERP, etc.)



## Transportation Support & Technology

Rising importance of **cybersecurity**

The rise of **Mobility as a Service** (MaaS)

Explosion of **IoT, DSRC & Telematics** technology

Increasing technological innovations in **last-mile delivery**

Seamless **Digital Customer Experience** (cashless, etc.)



## Transportation Assets, Warehousing & Storage

Increased integration of robotics systems

Increasing use of electric and fuel-cell-powered machinery (forklifts, etc.)

Widespread use of **RFID technology**

# COMMON SYMPTOMS WITH NO DATA MANAGEMENT

What happens when data is not managed?

“**Data breaches** - Exposure of data/records (such as: employee SSNs, Bank Info, Background Check, etc.)”

“**Non-compliance** of level I highly sensitive data.”

“**Inability to synthesize** vehicle, driver/rider, weather, asset, incident and location data in real time”

“**Incorrect installation** of a beam due to inaccurate location parameters pulled from the wrong plan. Resulting in construction delays due to inaccurate data”

“**Cannot produce meaningful analytics** from Dedicated Short-Range Communication (DSRC) Vehicle and Infrastructure Data”

“**There is too much time spent** in manual data processing, analysts and developers spend significant time finding, cleaning and preparing data”

“**Not able to diagnose and predict** traffic congestion and demand patterns, transaction revenue, and infrastructure state of repair”

“**Cannot share and sync data** between different applications (Engineering, Finance, Program Management, Location, Asset Management Platforms, GIS, etc.)”

# ENTERPRISE DATA MANAGEMENT (EDM)

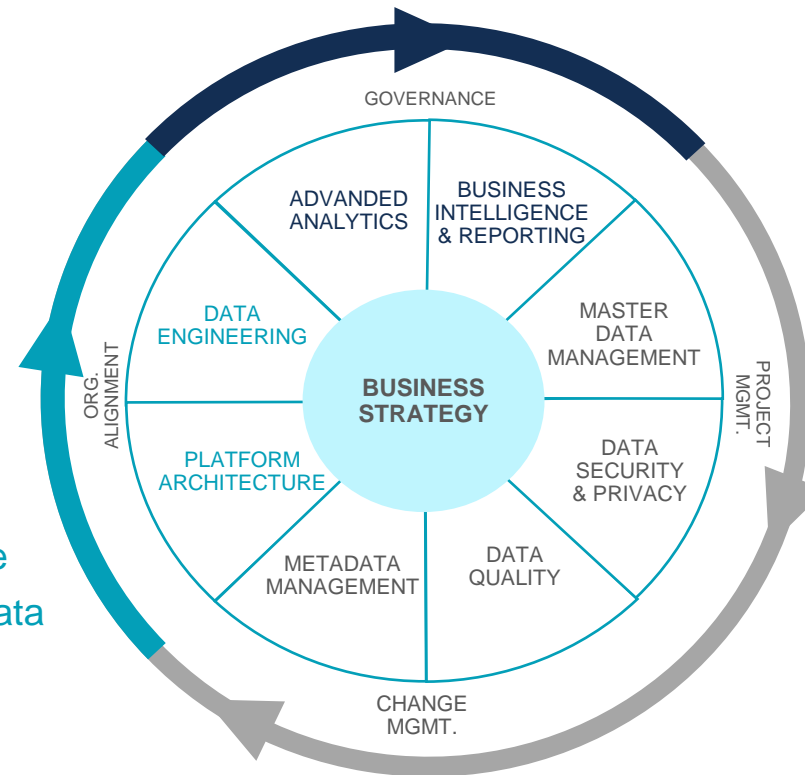
“Enterprise Data Management is the ability of an organization to precisely define, easily integrate and effectively retrieve data for both internal analytics & insights and external communication.”

## Define the analytics solution model

1. Strategic Vision & Objectives
2. Business Decisions, Insights & Metrics
3. Dashboards & Reports
4. Advanced Analytics Capabilities

## Data Architecture, Integration and Enabling System Components

1. Cross System Interoperable Architecture
2. Unstructured, Structured, Specialized Data
3. Data Movement Protocols



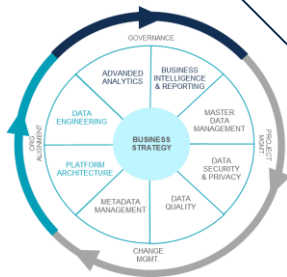
North Highland's Enterprise  
Information Management  
Component Model

## Define the Data Standards and Protocols

1. Data Definition & Format
2. Storage and Retention Rules
3. Security Classifications
4. Communication Protocols & Speed
5. Access, Usage & Sharing
6. Data Quality
7. Data Governance and Ownership

# MATURITY ASSESSMENT SUMMARY

The recommended maturity levels below form the basis of the Future State Roadmap



Legend: ● Current state maturity      ● Future state maturity

COMPONENT	1 AD HOC	2 REPEATABLE	3 DEFINED	4 MANAGED	5 OPTIMIZED
1. Business Strategy		●		●	
2. Governance		●		●	
3. Organizational Alignment	●		●		
4. Project Management	●		●		
5. Enterprise Change Management		●	●		
6. Data Engineering		●	●		
7. Platform Architecture		●		●	
8. Master Data Management	●		●		
9. Data Quality		●	●		
10. Metadata Management		●	●		
11. Advanced Analytics	●		●		
12. Dashboards & Reporting		●	●		
13. Security & Privacy			●	●	

# ENTERPRISE DATA MANAGEMENT (EDM)

Data Management brings value to organizations

## What is EDM?

Enterprise Data Management is the ability of an organization to precisely define, easily integrate and effectively retrieve data for both internal analytics/insights and external communication.

## What will it do?



Achieve a **common language** around key information that is aligned to the business strategy



Facilitate **better access to trustworthy data** and **make better, analytically driven, decisions**



Improve business intelligence and analytics capabilities to **become diagnostic** (why did something happen?) and **predictive** (what will happen?)



Define how to **govern, store, secure, integrate, use, and share data**



Facilitate **clear ownership** of information



Prepare for a **highly connected world** (connected vehicles and infrastructure, IoT, AV/EV, 5G, AI/ML, etc.)

## What is the impact?

Avoidance of **Data Breach Fines** = 1-2% of annual revenue

2-3 Times Faster **Analytics and Decisions Made**

60% Improvement in **Analysts/ Developers Time**

**Records with Errors** dropped from 20.9% to 11.8%

Reduction in **Annual Storage Costs** from \$400k to \$100k

8.3% YoY Improvement in **Resolving Customer Issues**

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Knowing what to measure and how to measure it makes a complicated world much less so. If you learn how to look at data in the right way, you can explain riddles that otherwise might have seemed impossible. Because there is nothing like the sheer power of numbers to scrub away layers of confusion and contradiction.

**Freakonomics**



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**THANK YOU**

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