



Alaska Department of Transportation & Public Facilities

Strategic Investment Decisions & Transportation Planning Data

JAMES MARKS, MBA

Division Director

Planning & Program Development



Vision for Decision Making

WHY?

Improving Performance,

Improving Outcomes: *"Moving the Needle"*

HOW?

Strategic Investment: Making better, data-informed, decisions



Agenda

1) Retrospective

- Investment Decision Making
- Transportation Data
- Challenges

2) Planning

- Analytics Maturity Model
- Performance-Based Planning & Programming
- Strategic Investment Roadmap

3) Deployment

- Data Literacy Workshop
- The Summit
- Roadmap Action Plan



RETROSPECTIVE



Challenges

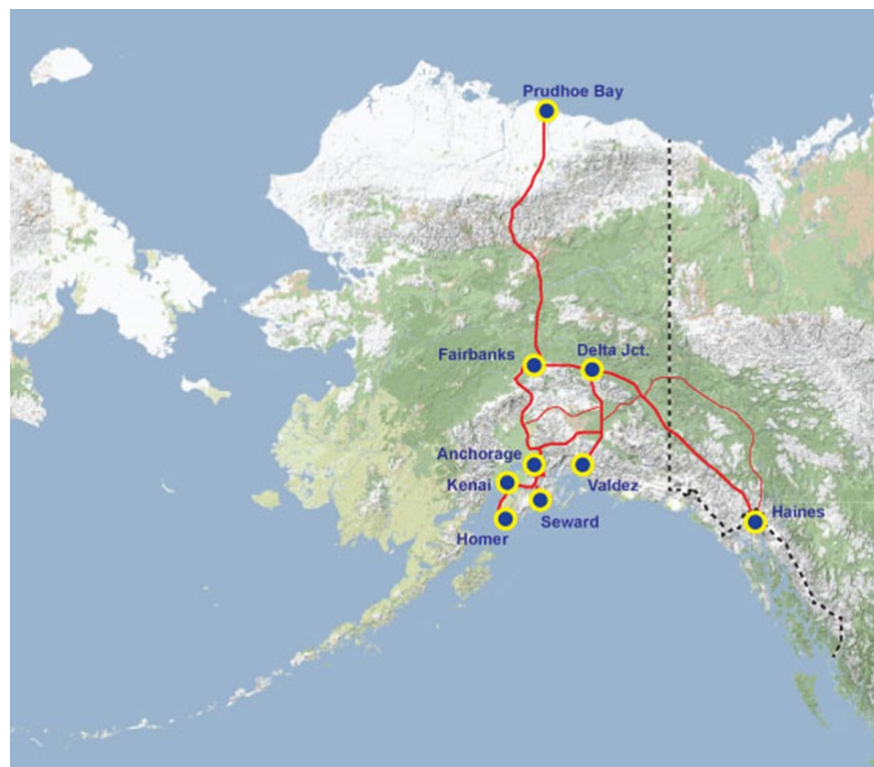
Alaska is big. As the nation's largest state, our allocation decisions are like asking, "do we fund California, Florida or Minnesota?"





Challenges

- Alaska ranks 47th in highway mileage
- Vulnerable Road Users account for >28% of fatalities (2021)
- Remote Communities reliant on air and marine travel
- Our freight must travel a long way, carrying the most VMT per ton in the nation
- Costs are higher in Alaska
- Cost efficiency is important



Challenges Shortcomings of Our Data Practice

1. Vision & strategy
2. Analytics maturity
3. Data governance
4. Data literacy
5. Manual Intervention

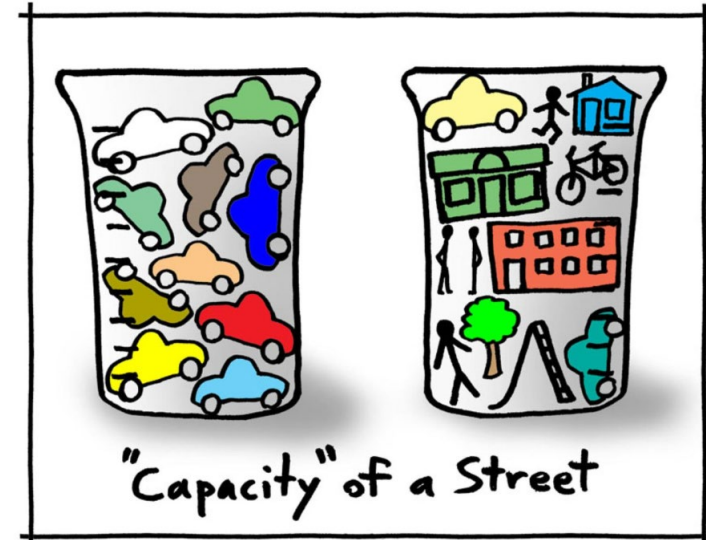
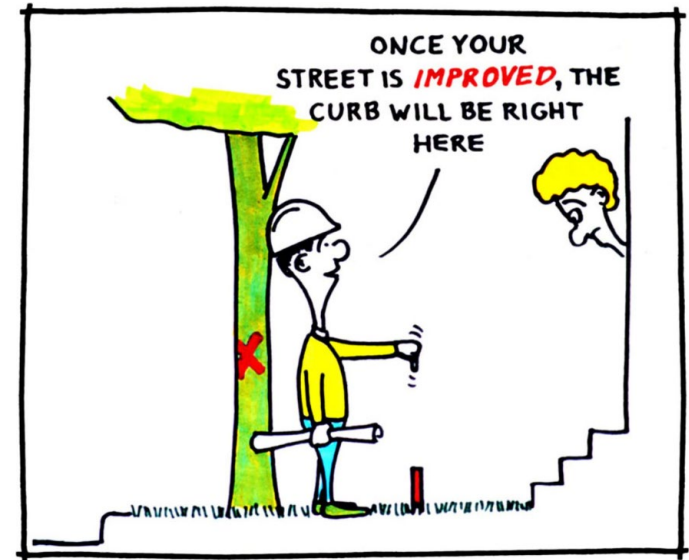
Challenges New Focus & Priorities in Investing

Strategic Investment Areas

1. Safety
2. State of good repair
3. Economic vitality
4. Infrastructure resiliency
5. Sustainable transportation

Overarching Values

1. Equity
2. Access & mobility
3. Performance-management



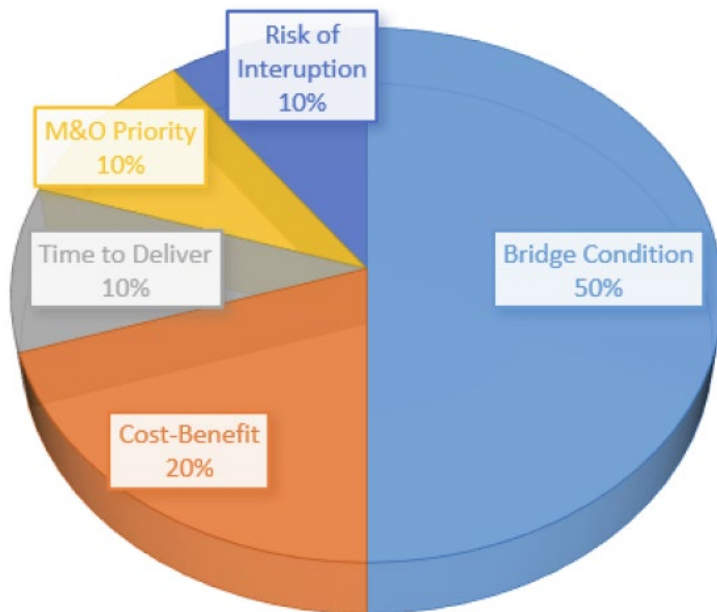


Existing Quality Transportation Data

- **Pavement Condition**
 - Rutting, Cracking, IRI
- **Bridge Condition**
 - Substructure, Superstructure, Deck
- **Safety Data**
 - Crashes, Injuries, Deaths
- **Travel Time Reliability**
- **Linear Reference System (Geospatial Highway Data)**

Continuous Improvement

2022 Criteria



2023 Criteria



Proactive Criteria

- Opportunity Cost
- Service Life Extension per Dollar

Reactive Criteria

- Time in Poor
- Mitigated At [Structural] Risk Deck
- Total Person Delay due to need to Detour [if at risk]*

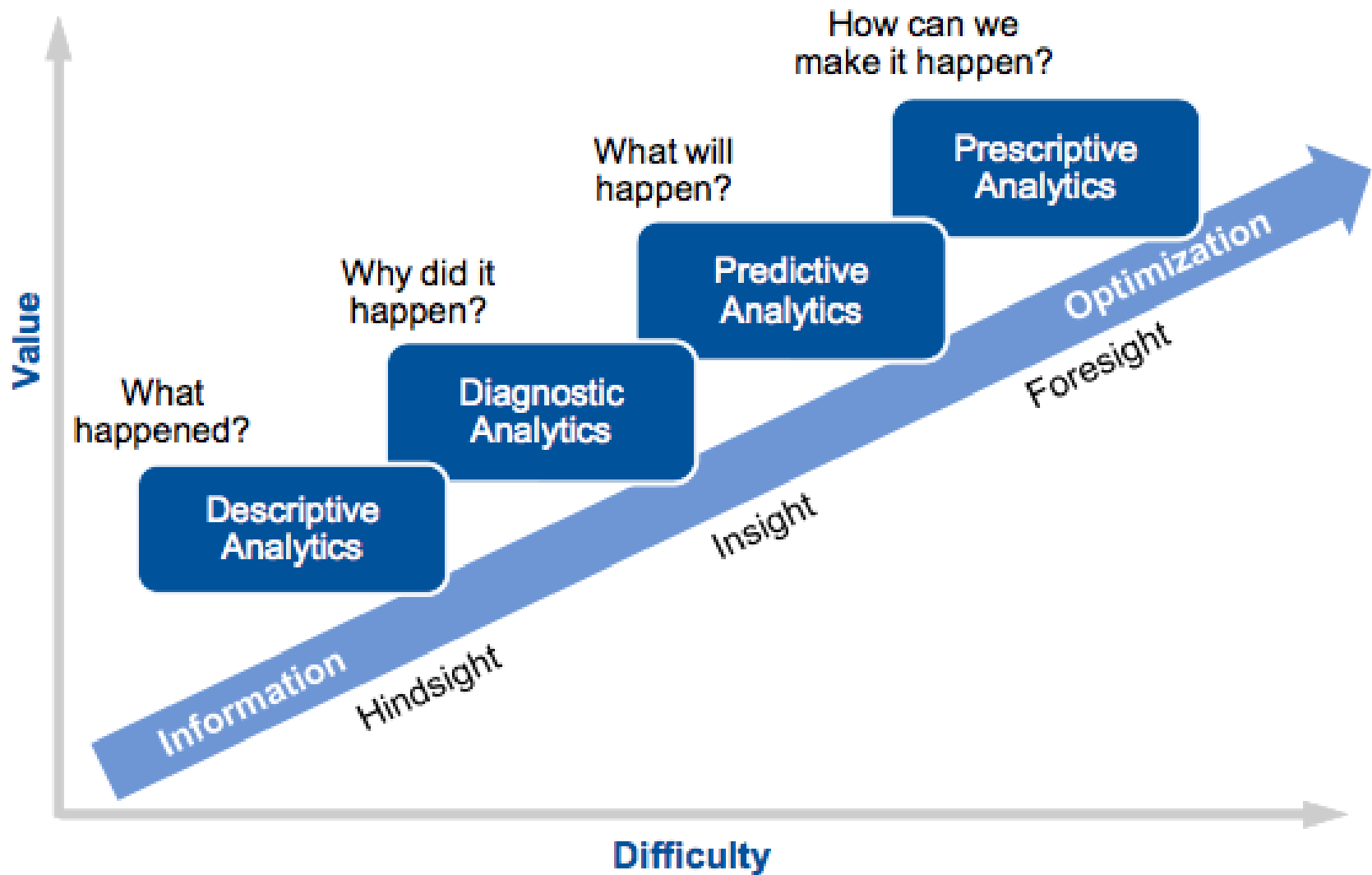
General Criteria

- Deck Area made more Resilient to Environmental Risks
- Change in Functionally Obsolete Deck Area

Planning

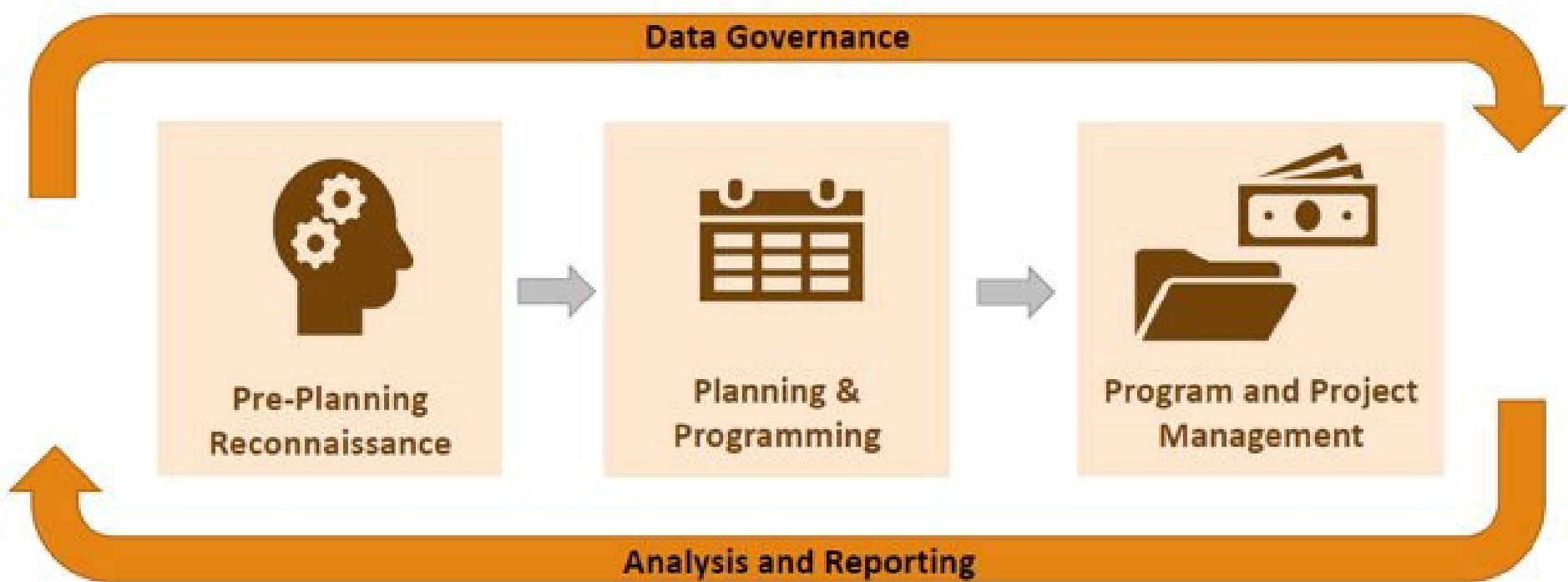


Analytics Maturity Model



Source: Gartner (March 2012)

Cyclical Improvement



Strategic Investment Decision-Making



Pre-Planning
Reconnaissance



Planning &
Programming



Program and Project
Management

2040 ... 2038 ... 2036 ... 2034 ... 2032 ... 2030 ... 2028 ... 2026 ... 2024 ... 2022 ... Today

Long Range
Investment
Planning

Pipeline
Development

Mid-Range
Planning

Programming

Construction

Are we investing towards the
"Right" outcomes?

Are we advancing the
"Right" projects?

Are we setting the
"Right" targets?

Are we focusing on the
"Right" locations?

Are we choosing the
"Right" program?

"Begin with the end in the mind"

-Stephen Covey



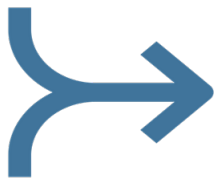


What is PBPP?

Performance-based Planning & Programming (PBPP)

- is a **data-informed** framework that
- ensures decisions make **progress** toward goal attainment
- communicates performance **implications** of different decisions
- data informs, it does not dictate

Data focuses the conversation and provides a level playing field for comparison

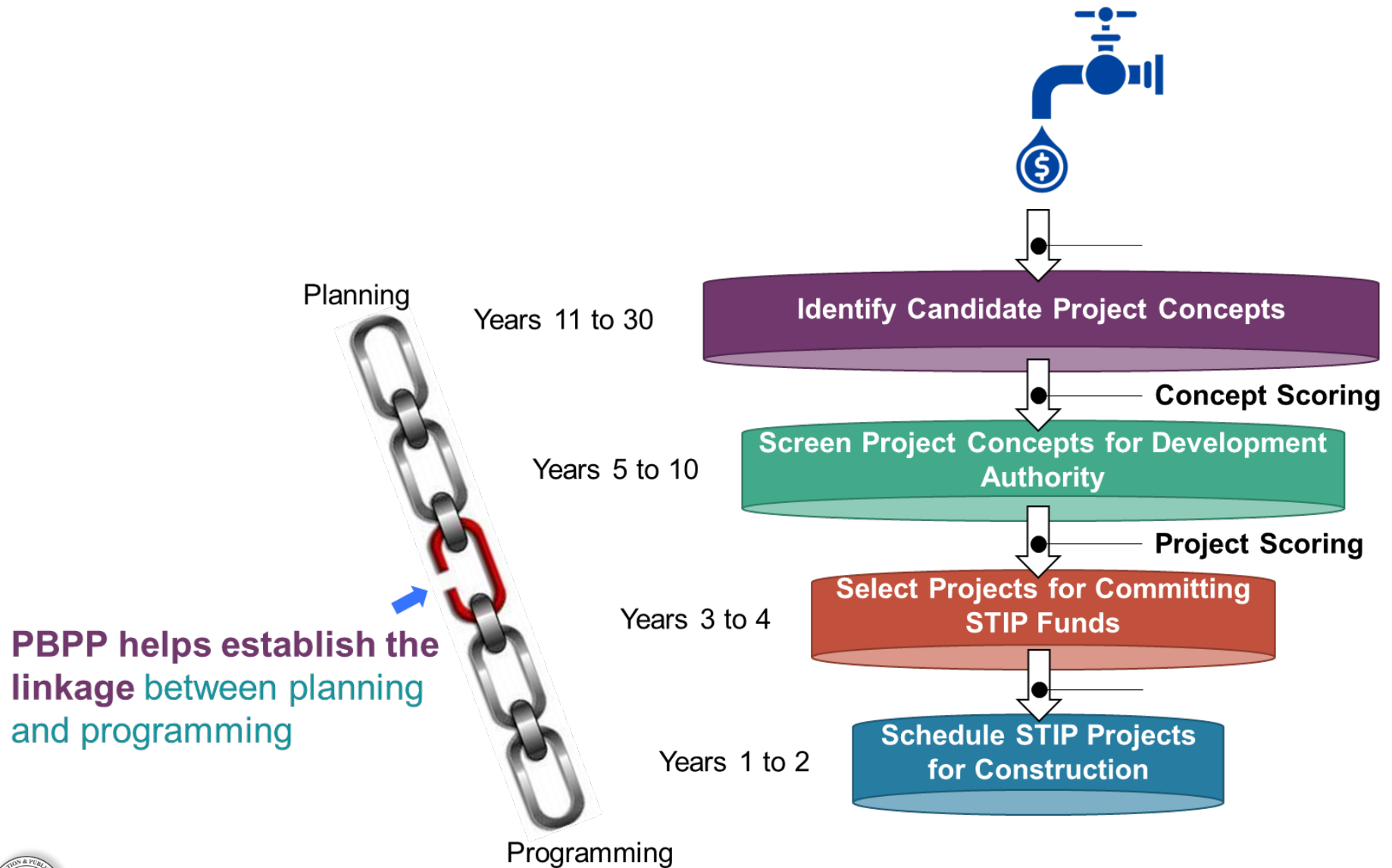


Defensible Decision-Making that drives performance and ensures equity

Judgment interprets the data in the right context and sets priorities



Building the Roadmap Focusing on Decision Points



Deployment





What are we doing about it?

- **Organizational data literacy & awareness**
 - Data literacy workshop, Planning-data summit
- **Vision & Strategy**
 - Creation of Planning Data Roadmap, Strategic Investment Plan, Data Business Plan
- **Analytics Maturity**
 - Organizational Capacity Building, Dedicating Staff & Resources, Reorganization, Structured Training Plans
- **Insufficient data governance**
 - Relooking at data governance with fresh perspective



Data Literacy Workshop

What is Data Literacy?

It is the ability to...

- Read data
- Analyze data
- Communicate with data
- Argue with data

Data Literacy Workshop

- Raise awareness & data literacy
- Demos from data managers, stewards, and custodians
- >80 online participants
- Hold regular cadence of Data Literacy Workshops

Planning Data Summit

“Do More With Data”



Sponsors

DOT&PF would like to thank our 2023 sponsors!

Platinum Sponsor

Michael Baker
INTERNATIONAL

Gold Sponsors



Silver Sponsor



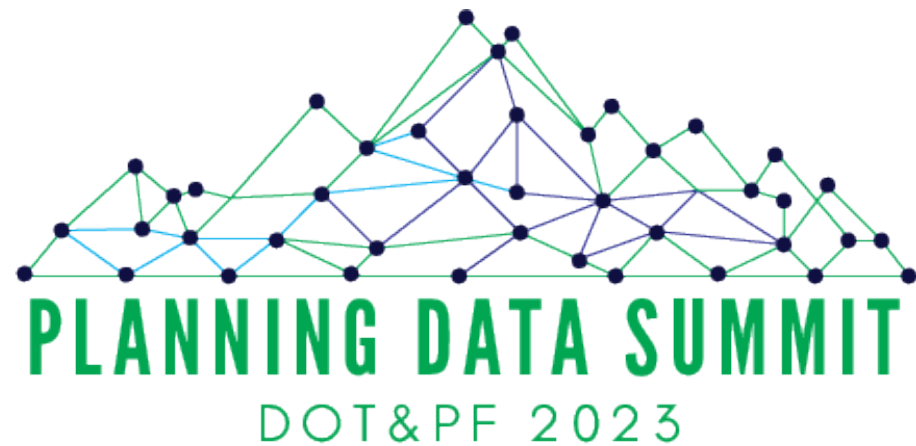
Bronze Sponsors



Attendance

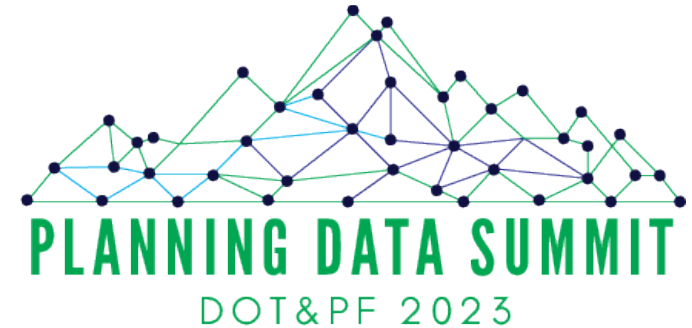
Examples, not all inclusive

- Alaska Department of Transportation & Public Facilities
- Alaska Department of Commerce, Community & Economic Development
- Alaska Department of Natural Resources (Alaska GIS Office)
- Alaska Municipal League
- Anchorage Metropolitan Area Transportation Solutions (AMATS)
- City of Palmer
- Copper Valley Development Association (CVDA)
- Chronic Disease Prevention & Health Promotion
- Fairbanks Area Surface Transportation (FAST) Planning
- Federal Highways Administration (FHWA) Alaska & Headquarters
- Matanuska-Susitna Borough
- Municipality of Anchorage
- Oregon DOT
- Texas A&M Transportation Institute
- Virginia DOT
- Washington DOT
- Western Federal Lands



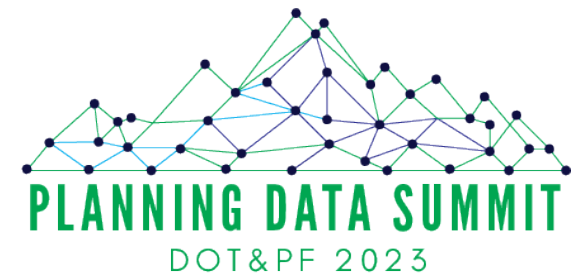
Goals & Objectives

- Demonstrate what's possible
- Organizational data literacy
- Organizational competency
- Tabletop visioning exercises
- Create a data-informed culture
- Create workplan for 2023 to improve



Summit Agenda

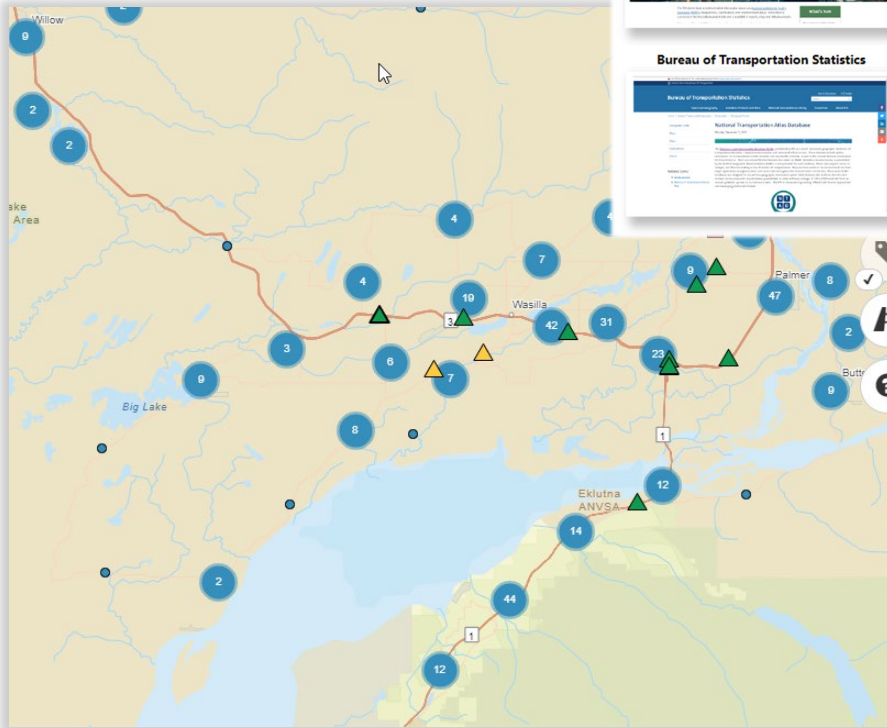
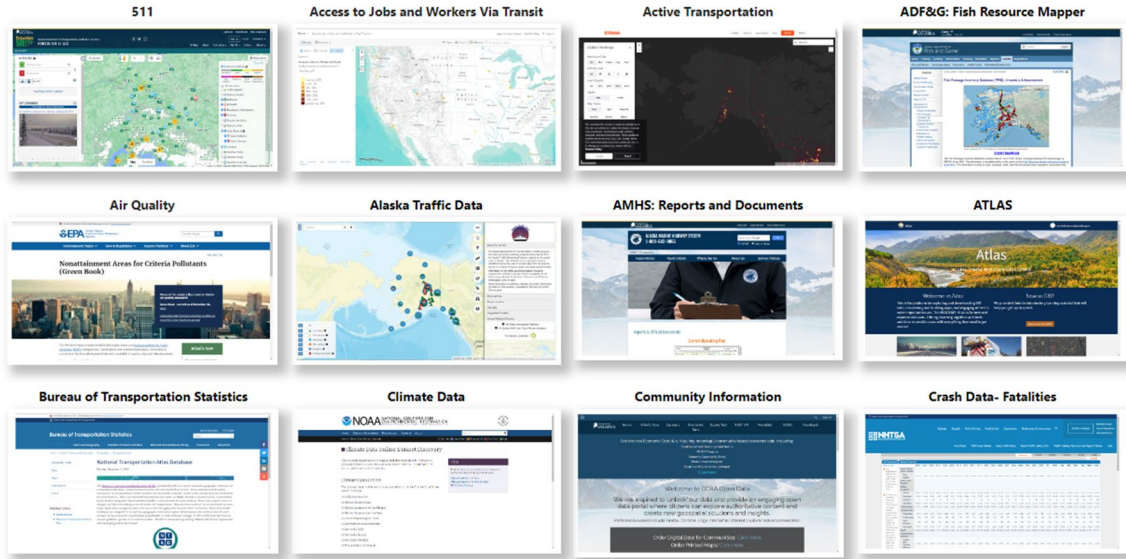
- Lectures
- Tabletop exercise
- Poster Session
- Application Demo's
- Professional Panels



Software Demo's

- Data Catalog
- GIS Applications
- Traffic Data Portal

Alaska DOT&PF Data Catalog - Page 1





Breakout Tabletop Exercise

Identify data challenges...

1. Inadequate staff or bandwidth
2. Training for awareness, access, and utilization
3. Timeliness of data; Missing data
4. Lack of tools





Breakout Tabletop Exercise

...and solutions

1. Dedicated staff to planning data analytics & science
2. Training on how to access and use
3. Common data language & lexicon



Interactive Tabletop Exercise



Data Quality and Completeness Challenges

Increased data literacy

Contextualizing the data for users

More varied data and more people submitting data

X-training between functional groups

Yes, better definitions of data fields, data limitations and inaccuracies if known would be great to let others know about.

Our lack of frequency utilizing individual data systems interferes with our ability to learn each system...

Data governance along with standards

The data should come with

Data Quality and Completeness Solutions

Funding for staffing, Better data literacy

Training on data classification standards and how best to implement them

Freshness

Providing infrastructure, workforce and dedicated time to complete and monitor effort.

Begin integrating the concept of authoritative data into our datasets.

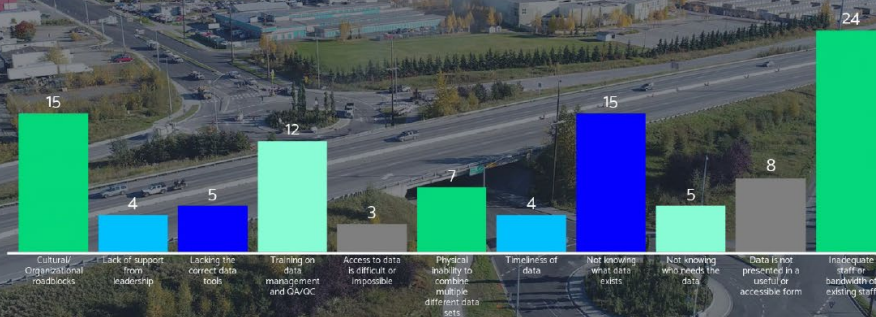
Data should be standardized for consistent application and use. Freeform data creates challenges with comparing datasets.

Data Business Plan

Sort of a related pet peeve. I hate having all these different user names and passwords. It increase the hassle of accessing different data systems.

Updated job description to define data stewardship roles

What is your biggest roadblock to data quality or completeness?



Strategic Roadmap Action Plan

Data Governance

Short-term

Develop a Strategic Data Plan that includes a dataset inventory, identified gaps, roles, and processes to address challenges

Mid-term

Determine which datasets are of statewide significance

Long-term

Build off data governance priorities to continue centralizing data, assessing use cases, and determining ownership



Strategic Roadmap Action Plan

Expand Agency Capabilities



Lead technologist / business manager: Provides strategic oversight and develops the essential skills of the team to draw meaningful insights from data. Coordinates with business leads to understand needs, provides access to raw data, develops automates reporting, and enforces appropriate data governance.



Decision scientist: Facilitates the identification of prioritization criteria in alignment with agency goals and metrics, assesses performance impacts of investments, elicits agency priorities, and coordinates the validation of scoring processes with department experts.



Data scientist: Develops and applies mathematics and statistics to quickly explore business queries, build predictive models, and develop analytical tools/products.



Business analyst: Helps translate data into compelling digital and static visualizations for internal and public-facing reports and dashboards.



Spatial analyst: Joins disparate data to site locations to support corridor prioritizations and empower regional planners/engineers to better scope candidate projects.



Data architect/engineer: Responsible for designing, integrating, and maintaining datasets that can be leveraged for various business purposes.



Strategic Roadmap Action Plan Expand Agency Capabilities



1. Continuous feedback loops
2. Evaluation & improvement of data practices
3. Evaluation & improvement of information systems
4. Individualized (by section & role) training plan
5. Develop training playbooks
6. Reorganization
7. Dedicated staff & resources

Strategic Roadmap Action Plan Resource Allocation

Short-term

More effectively communicate to the public what investments are buying and what not spending in this way would look like.

Develop apportionment formulas for discretionary regional funds

Mid-term

Quantify historic spending by funding program across types of projects

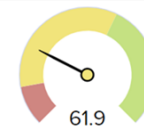
Long-term

Develop programmatic tradeoff tools to explore statewide performance achieved under different project sets and program budgets, and have users submit preferred investment strategies

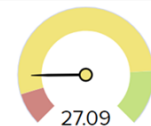
Strategic Investment Areas

1. Safety
2. State of Good Repair
3. Economic Vitality
4. Resiliency
5. Sustainability

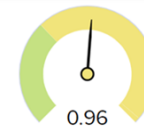
Pavement



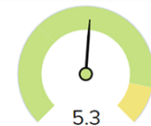
Congestion



Safety



Bridge



Strategic Roadmap Action Plan Pre-Screening Capabilities



Short-term

Evaluate corridors of statewide significance against long-range performance measures to help establish areas of high priority need, which in turn will be used to guide candidate project development.

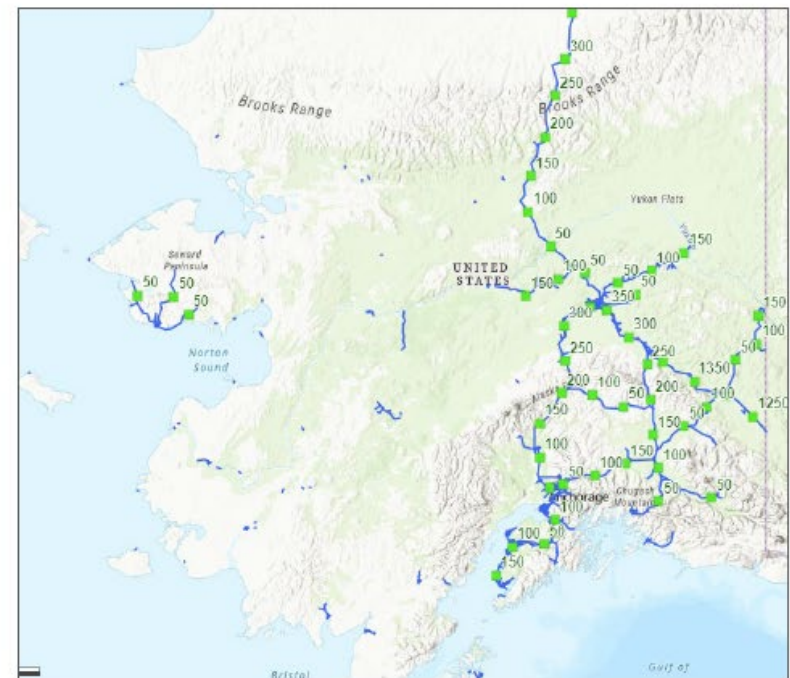
Mid-term

Develop a complete streets policy that encourages planners to look at needs holistically across modes.

Long-term

Develop an automated engine solution for recommending project scopes at locations given similarity to historical projects

Continue to join performance-data to the Roadway Data System (RDS) and leverage for screening



Strategic Roadmap Action Plan

Enhance Project Prioritization



Short-term

Identify impact-based evaluation criteria representative of long-term goal attainment, beginning with modernization projects.

Branch scoring approaches as needed for remote, rural, and urban areas

Mid-term

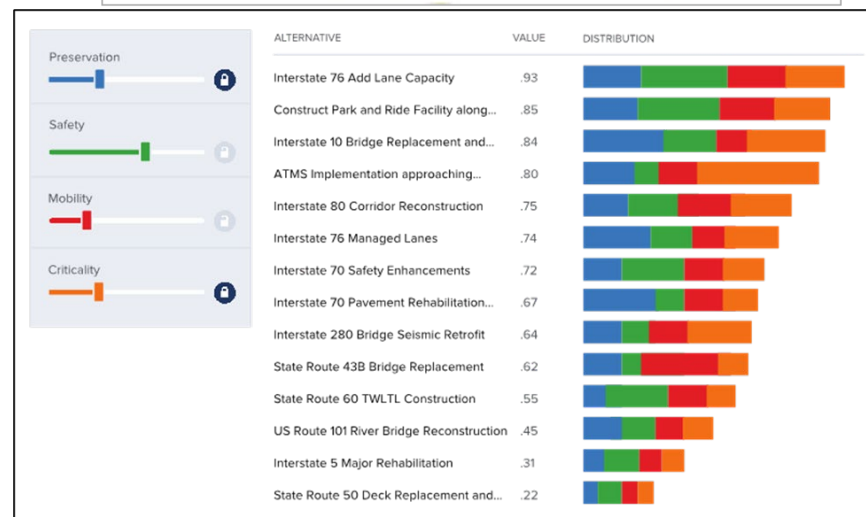
Leverage multiple objective decision analysis to evaluate diverse projects using a commensurate scaling approach with monetization (BCA) and utility normalization

Long-term

Explore scenarios and alternative project selection techniques and/or funding constraints to ensure the strongest projects are being selected

Review selection criteria each long-range plan cycle for alignment with a “family of plans”

Leverage migration to an E-STIP to develop access in real-time to project, financial and map information and reduce the amount of time necessary for review and approval of modifications and amendments to the STIP.



Questions? Thank you.

JAMES MARKS
Division Director
W. (907)465-6981
JAMES.MARKS@ALASKA.GOV

