Data Literacy Among Small Transit Agencies

The National Center for Applied Transit Technology (N-CATT)

The National Center for Applied Transit Technology

- Walking small transit agencies through the technology landscape
- Producing resources on adopting emerging technologies
  - Data literacy, scheduling/dispatching software strategies, fare payment technologies
  - Lessons learned, trends, strategies
- Providing in-depth technical assistance to adopting new tech
  - Technical Assistance Teams
  - State Technology Summits
  - Hands-On Workshops

The Data Literacy Initiative

Survey Data Literacy	Provide Training	Provide Expert TA	Create Resources
• Identify critical areas of improvement • Understand capacity to develop knowledge within small-urban, rural, and tribal agencies	• Develop training on collecting, managing, and making decisions from data • Developed in concert with NTI, AASHTO, and other FTA-funded TA Centers	• Help agencies deliver their desired results in improving mobility and transit	• Produce readily accessible online resources • Emphasize benefits of emerging tech, investment/partnership opportunities, and legislative changes

Working Definition of Data Literacy

Data literacy in public transportation is the ability of agency staff, decision-makers, and stakeholders to ***access, interpret, analyze, apply, and communicate data to enable evidence-based decisions that improve operations, guide planning, and shape policy****.*

7 Core Competencies of Data Literacy

1. **Awareness:** Understanding which data exist, what they represent, and how they can be used to inform service and decision-making.
2. **Access:** The ability to reliably obtain relevant data from internal or external sources using available systems and tools.
3. **Interpretation:** The ability to analyze and draw meaning from data, identify trends, and evaluate performance.
4. **Application:** The use of data to guide day-to-day operations and solve practical problems.
5. **Optimization:** Leveraging data to improve service delivery, efficiency, and responsiveness over time.
6. **Communication:** Clearly and appropriately presenting data findings to internal or external stakeholders.
7. **Responsible Use:** Ensuring data are used responsibly, with attention to privacy, fairness, and compliance with legal or regulatory standards.

Survey Responses

- 216 complete responses
  - 198 partial responses. Relevant answers were included in analysis where applicable
  - Responses from 44 states
- 74% of responses from agencies 25 buses or fewer. 91% were 49 or fewer
- 58% of responses from rural areas, 2% from tribal areas
- Over half of respondents are GMs/Directors; 18.1% ops managers; 15.7% grants/admin/support. Under 10% are in a planning or analyst role

Findings: Tools & Technology

- Underutilization of advanced tools/technology
  - Heavy dependence on spreadsheets (75%)
  - Limited technical infrastructure, staffing, training
  - 'Black box' reports and limited customization options
- Underperformance of advanced tools/technology → buyer's remorse
  - Technology procurement often mismatched to agency needs
  - Agencies "locked in" to poorly supported, incompatible systems

Findings: Performance Monitoring & Reporting

- Inconsistent tracking of key performance metrics
  - Ridership widely tracked; nearly 20% do not track OTP
  - Result: limited ability to monitor internal performance
- Visualization tools seldom used
  - 70%+ unfamiliar with visualization tools
  - Result: limited ability to monitor internally AND to convey results externally
- Compliance data often unused for decision-making
  - No clear use cases or processes for applying the data
  - Result: data collection becomes a burden rather than a benefit

Findings: Organizational Culture & Capacity

- Organizational culture matters!
- Staffing shortages and skill gaps are limiting
  - Wearing "all the hats" leaves no time for professional development
- Data use mainly compliance/funding-focused
- Few agencies have structured career pathways and succession planning to sustain data literacy
  - Staff departures can result in a total loss of institutional knowledge
- Peer learning highly valued for capacity building, but fragmented and informal

Stuck in the Middle

Agencies are generally proficient in data use, but need support in deeper engagement for more intensive planning uses and complex analysis

Most Commonly Used Data	Percent Who Use
Ridership data	92%
Financial/budgetary data	72%
Vehicle maintenance data	70%
Customer service/feedback	56%
On-time performance data	54%
Demographic or spatial data	44%
Other	2%

Frequency of Use	Percentage
Daily	43%
Weekly or More Often	69%
Rarely or Never	10%

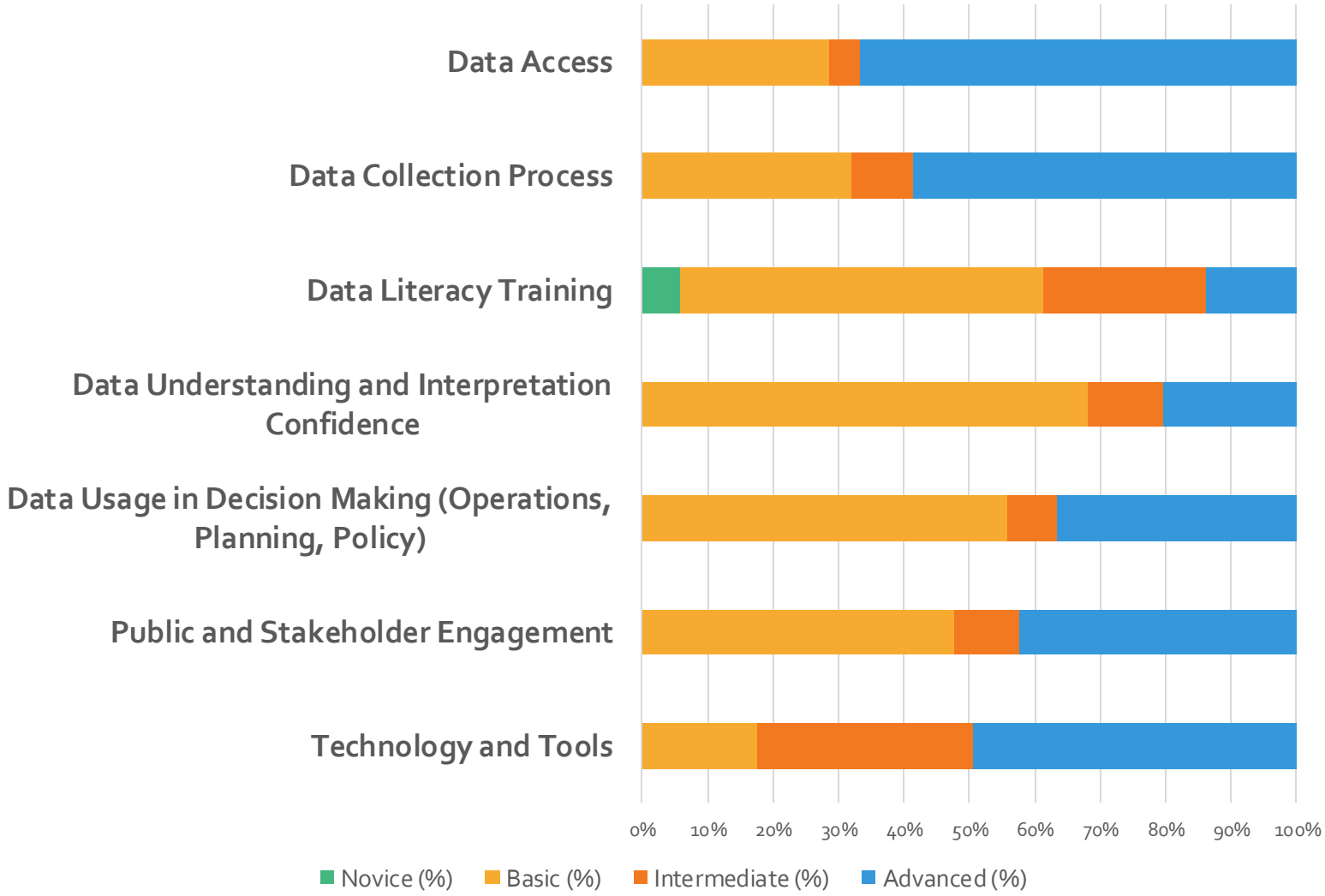
Stuck in the Middle Cont.

Primary Application of Data	Percentage
Budgeting and Funding Justification	32%
Service Planning / Route Adjustments	28%
Improve Scheduling	22%
Define Capital Needs	2%
Other	15%

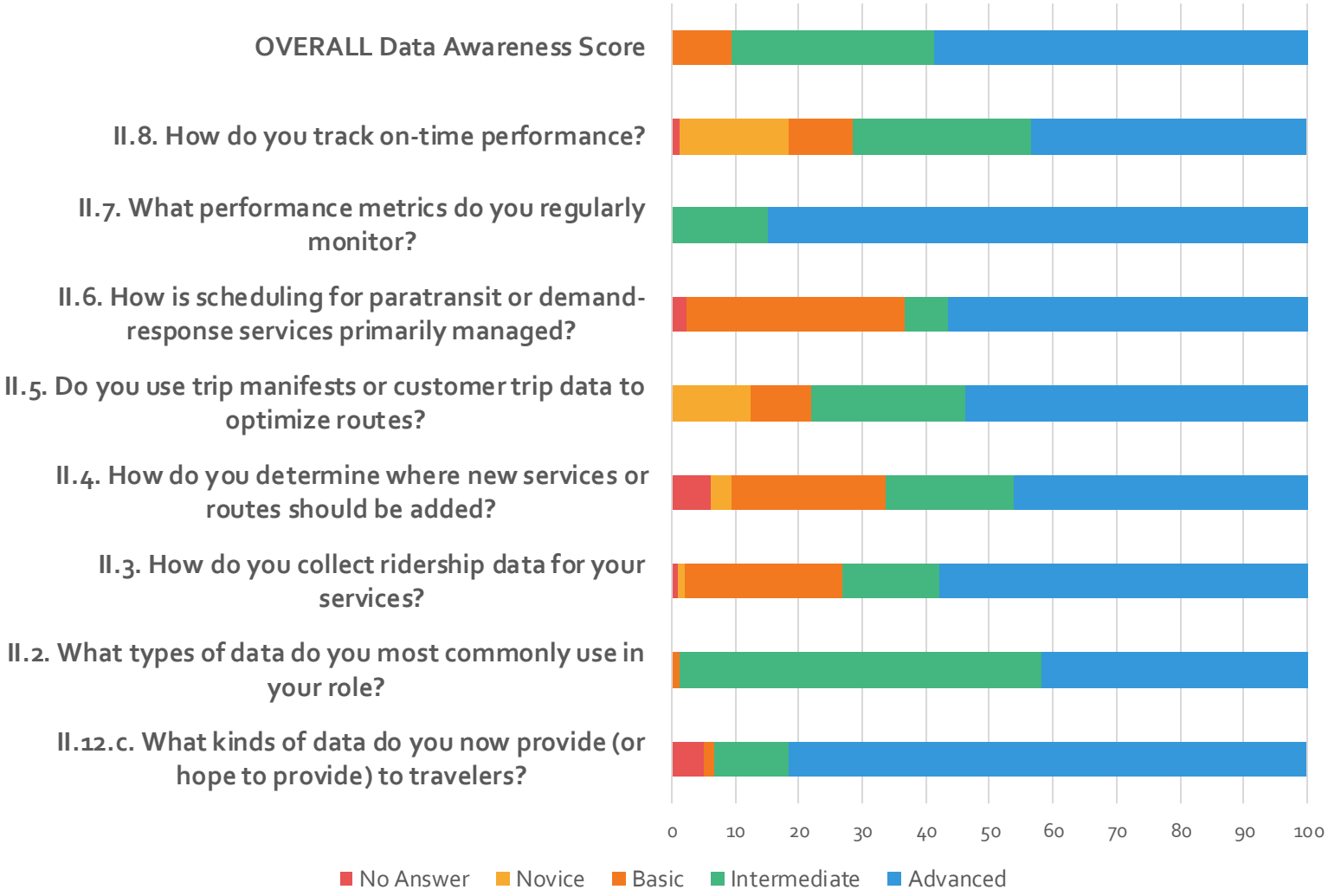
Visualization Tool Use	Percentage
No Familiarity	71.0
Regular Use	5.1
Other / Occasional Use	23.9

Interpreting Complex Data	Percentage
High Confidence	24.5
Somewhat Confident	57.1
No Confidence	18.4

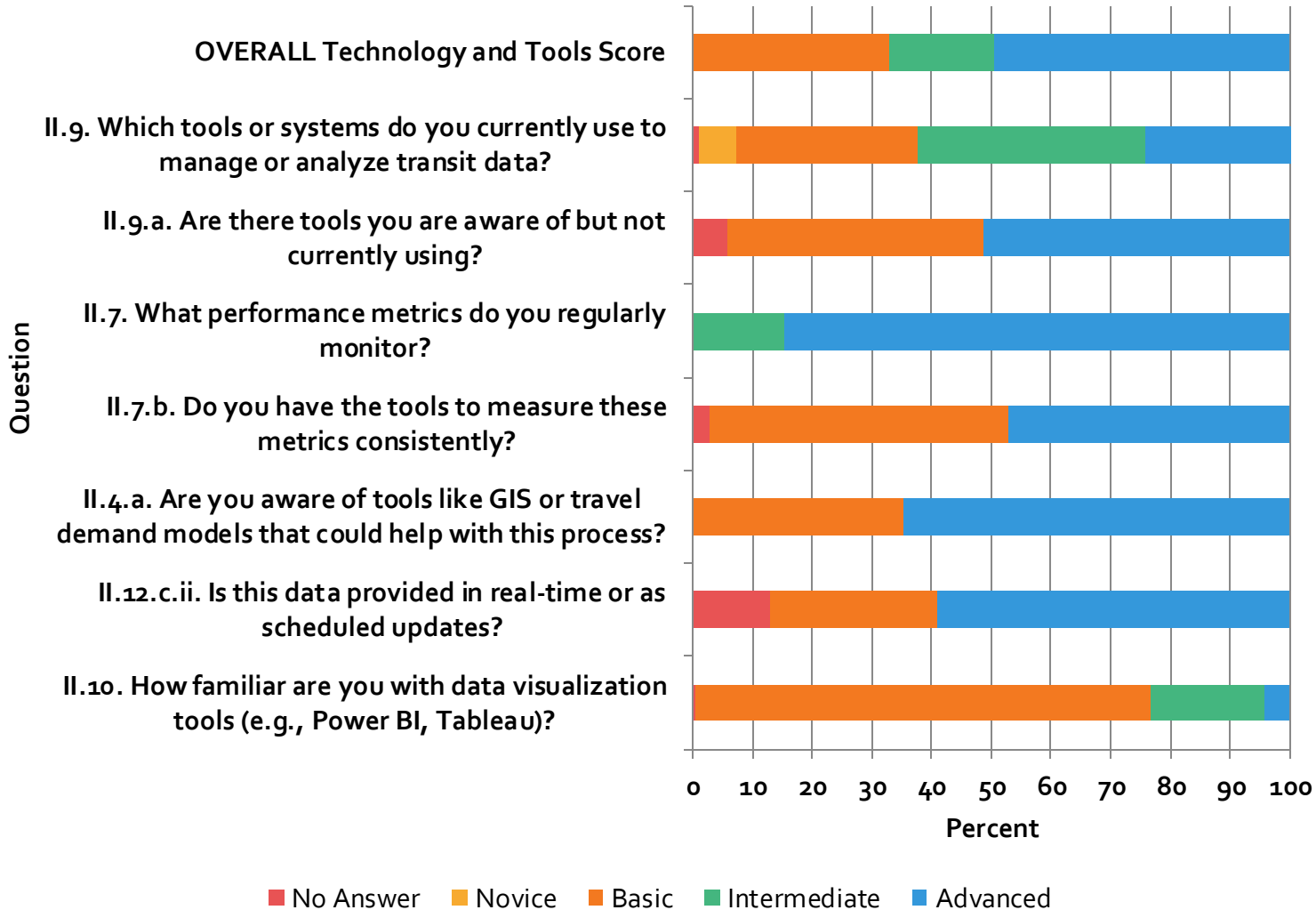
Overall Data Literacy



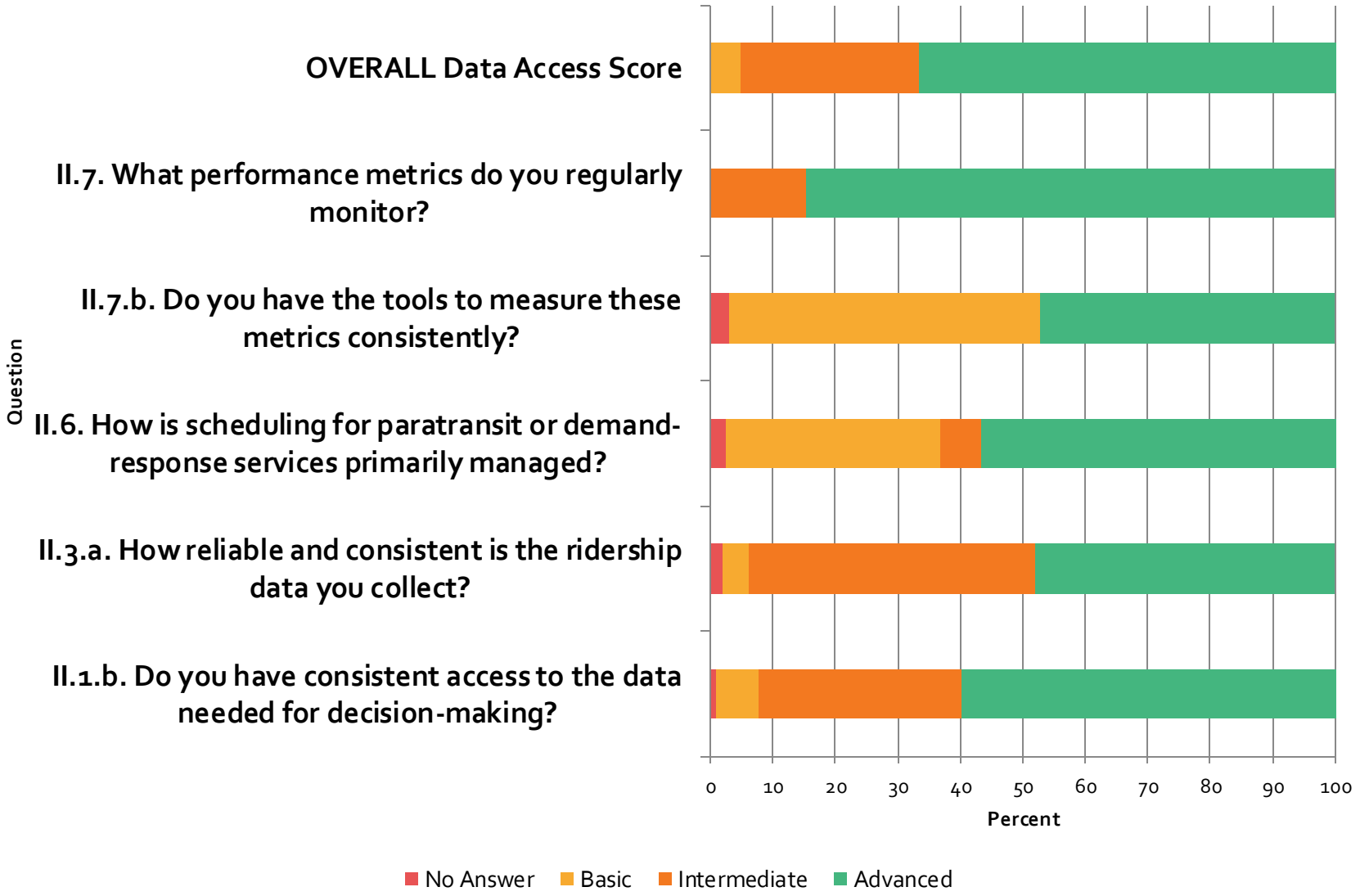
Data Awareness - Collection



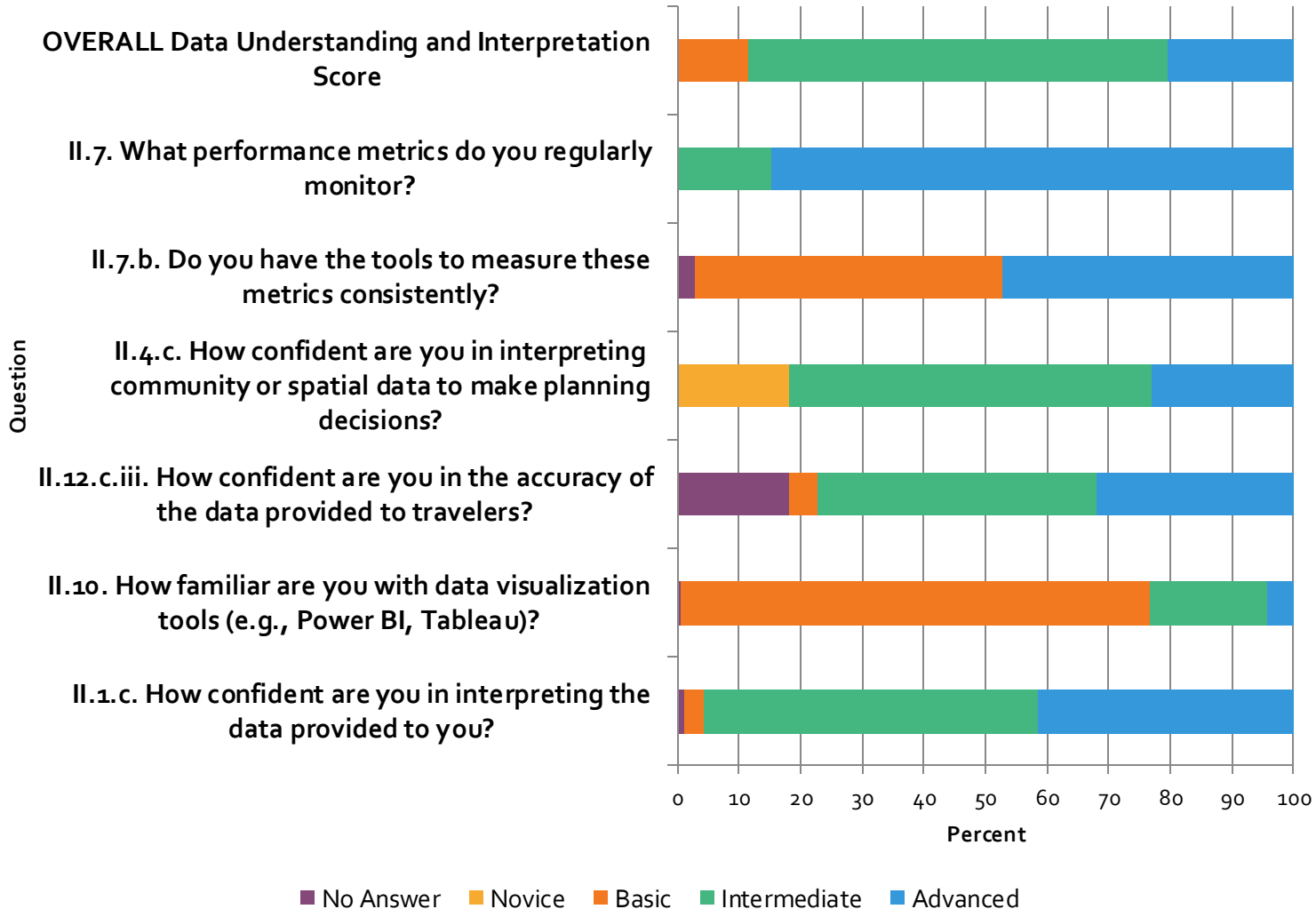
Technology and Tools



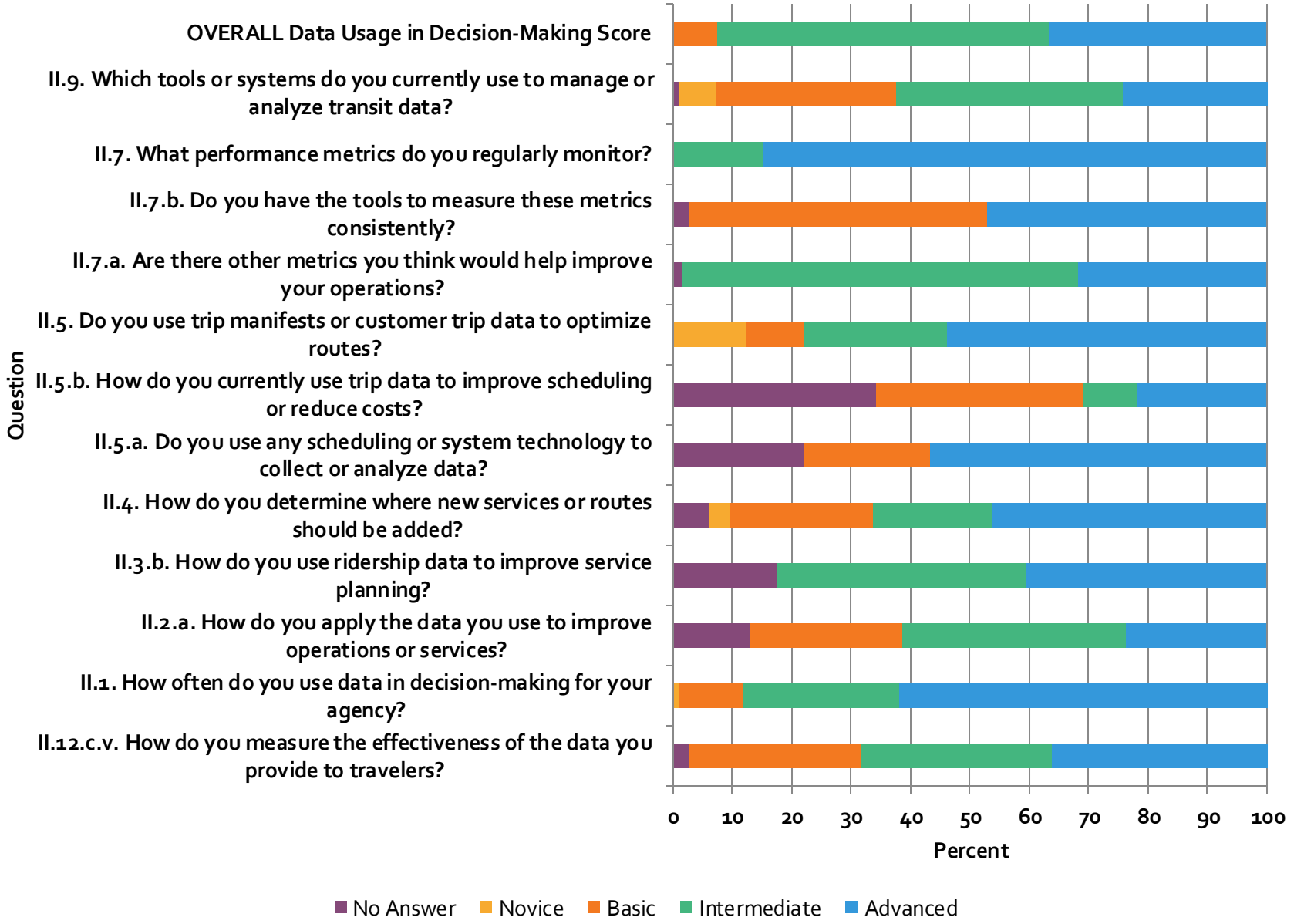
Data Access


OVERALL Data Access Score
II.7. What performance metrics do you regularly monitor?
II.7.b. Do you have the tools to measure these metrics consistently?
II.6. How is scheduling for paratransit or demand-response services primarily managed?
II.3.a. How reliable and consistent is the ridership data you collect?
II.1.b. Do you have consistent access to the data needed for decision-making?
Question
0
10
20
30
40
50
60
70
80
90
100
Percent
No Answer
Basic
Intermediate
Advanced

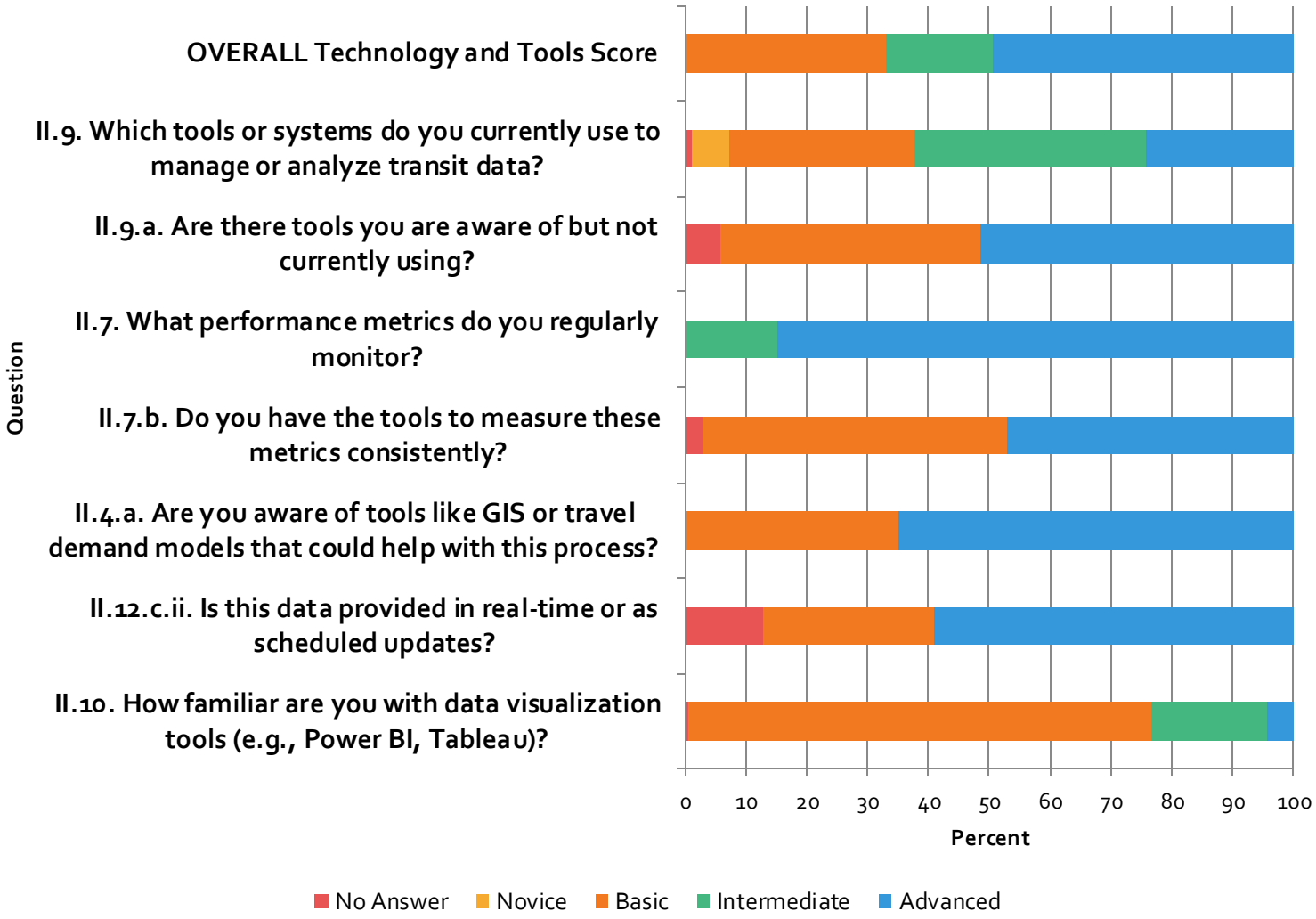
Data Understanding and Interpretation



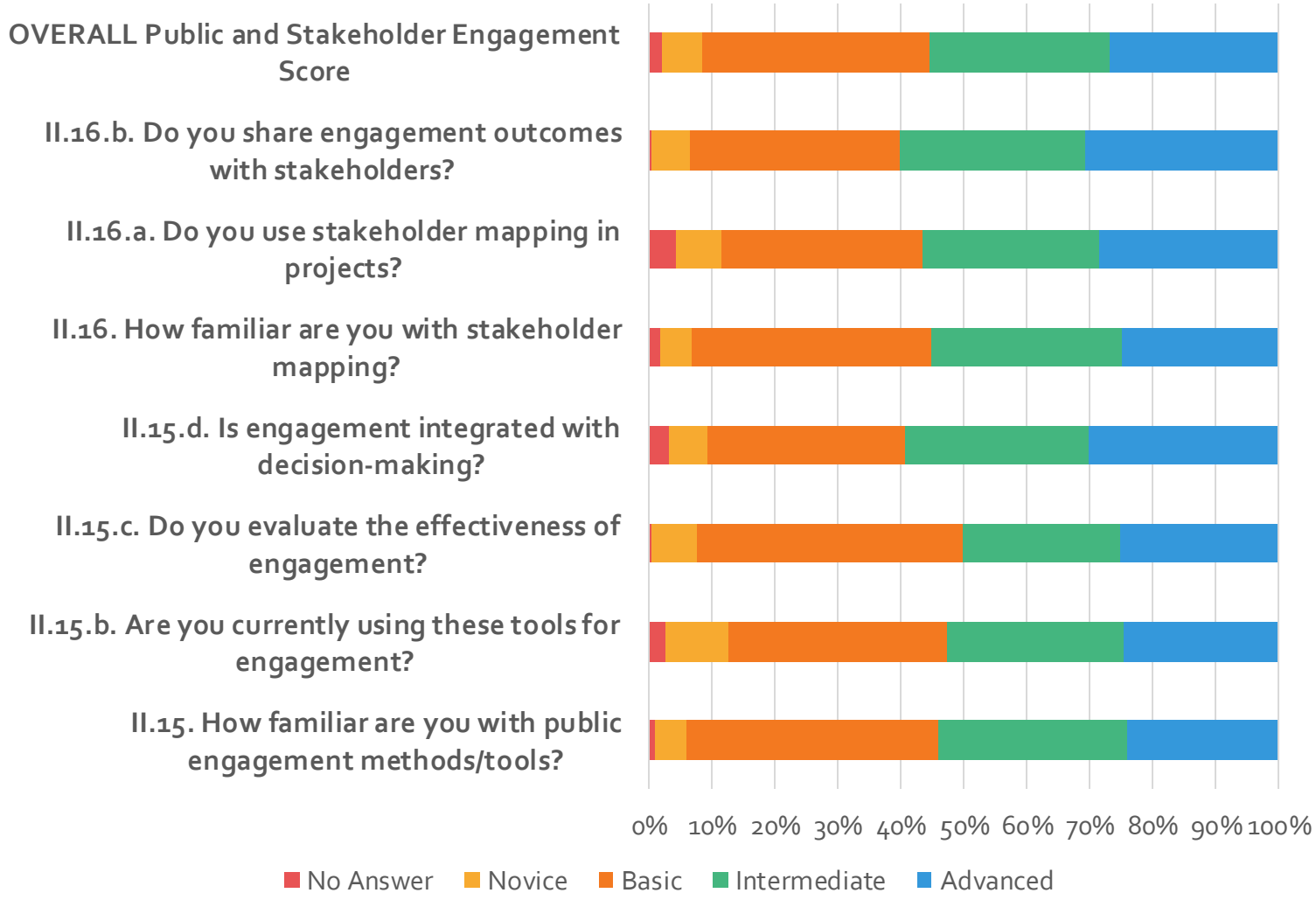
Data Usage in Decision-Making



Technology and Tools



Public Stakeholders and Engagement



Cross-Cutting Themes

1. Strong Technical Foundations, Uneven Human Capacity
2. Persistent Gaps in Paratransit and KPI Instrumentation
3. Awareness Without Full Adoption
4. High Demand for Applied Training and Peer Learning
5. Widespread Dissemination, Limited Impact Measurement
6. Uneven Maturity Across Indicators

Findings and Observations: Data Access, Quality and Interoperability

1. **Many agencies lack consistent, reliable, and timely access to core operational data.**
2. **Legacy systems and nonstandard formats hinder data interoperability and integration.**
3. **Inconsistent data quality and unclear definitions erode trust in agency data.**
4. **Lack of shared interoperability standards and IT–transit coordination hampers integration.**

Findings and Observations: Tools and Technology

5. **Agencies depend heavily on basic tools and underutilize advanced platforms.**
6. **Technology procurement is often mismatched to agency needs, leading to underperformance and "buyer's remorse."**
7. **Lack of vendor transparency and limited customization options constrain effective tool use.**

Findings and Observations: Performance Monitoring and Reporting

8. **Key metrics are tracked inconsistently, with notable gaps in on-time performance measurement.**
9. **Visualization tools for performance reporting are seldom used, reducing the impact of data communication.**
10. **Many agencies collect large volumes of compliance-driven data that go unused for decision-making.**

Findings and Observations: Organizational Culture and Capacity Building

11. Data use is often reactive and compliance-focused rather than proactive and strategic.
12. Capacity constraints and skill gaps limit the ability to fully leverage data and technology.
13. Organizational culture strongly influences the success of data-driven initiatives.
14. Peer learning is a highly valued but under-structured capacity-building mechanism.
15. Few agencies have structured career pathways or succession plans to sustain data literacy.

Recommendations: Resource Development 6 Resource Classifications

1. Diagnostics – simple data maturity self-assessments
2. Diagnostics – simple data maturity self-assessments
3. Dashboards and Templates – plug-and-play KPI tools
4. Toolkits and Playbooks – procurement and integration guides
5. Peer Learning Networks – structured mentoring & exchanges
6. Concierge Technical Help Desk – on-demand technical support

Recommendations: Starter Portfolio of N-CATT Tools

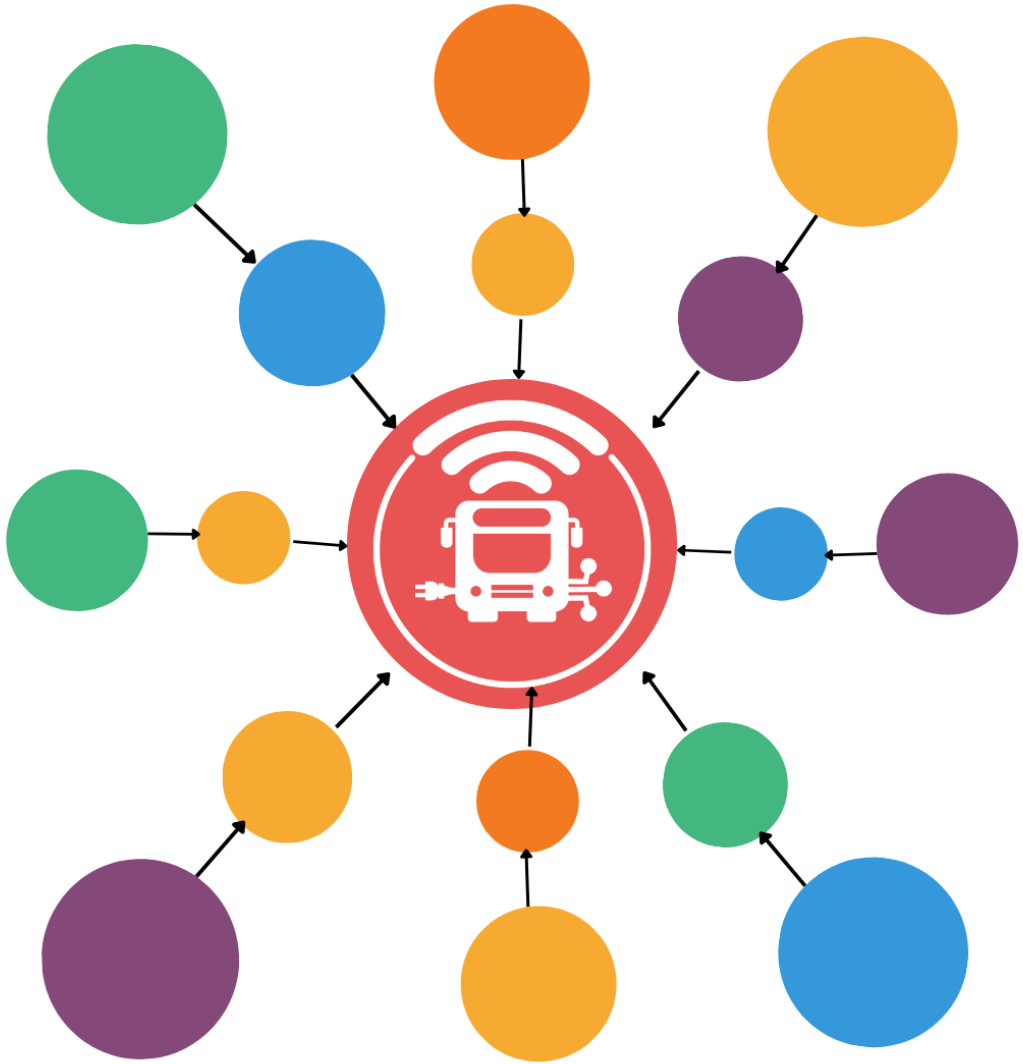
Suite of 10 concrete recommendations:

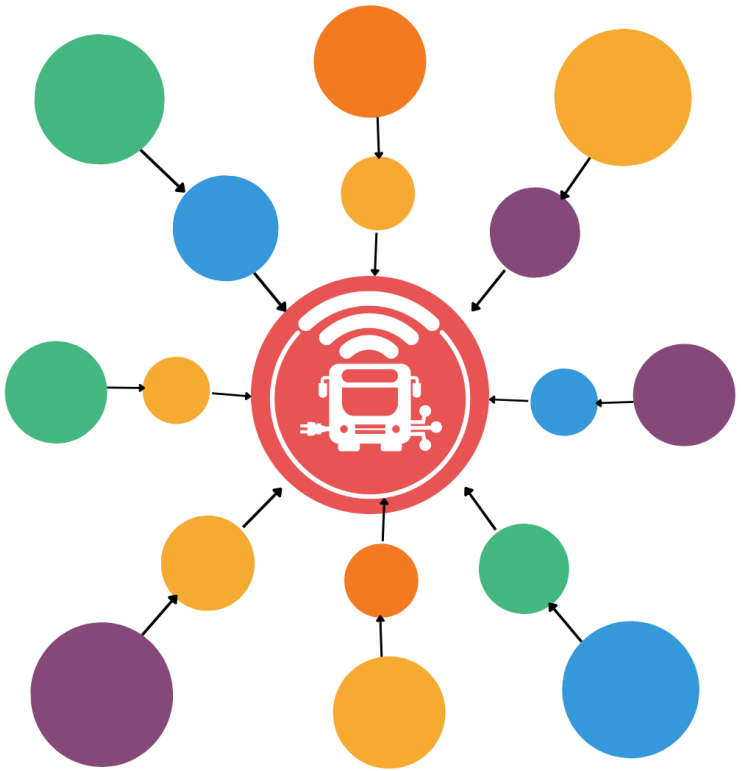
- Purpose
- Key components
- Intended users

1. Transit Data Toolkits
2. Concierge Help Desk
3. Technology/Vendor Matrix
4. Microlearning Resource Library
5. FTA Procurement/Data Compliance Toolkit
6. Peer Learning and Mentorship
7. Service Type Data Management Tools
8. Organizational Change/Leadership Tools
9. FTA Grant Blueprint Series
10. National Free/Low-Cost Tool Repository

Optional: Hub-Based Learning Model

- Builds on N-CATT's current role and reputation
- More integrated, adaptive, scalable
- Ideal for target audiences that are:
  - Resource limited
  - Geographically dispersed





Optional: Hub-Based Learning Model

- Central coordinator (hub)
- Local implementation (spokes)
- Self-correcting feedback loops
- Capacity building via peer learning
- Tasks 4 & 5: Performance monitoring
  - Communities of practice form a natural cohort
  - Built-in channel for gathering KPI data
    - Adoption rates and frequency of use
    - Skill improvements
    - Changes in agency practices

Newsletter

LinkedIn

Website

Questions?

Andrew Carpenter
Director
carpenter@ctaa.org

Jordan Howard
Senior Program Associate
howard@ctaa.org

Lauren Ellis
Program Associate
ellis@ctaa.org

N-CATT Staff