Transit Technology Goals and Strategies

Purpose and Development

Strong, consensus-based goals and strategies are central to creating a robust and useful Greater Minnesota Transit Technology Plan (see definitions in sidebar below). While MnDOT has primary responsibility for implementing the Greater Minnesota Transit Technology Plan, the transit agencies will purchase and install most of the technology systems. As a result, the statewide goals and strategies must reflect and address the priorities of both MnDOT and transit agencies. The collective, statewide process used to draft and refine these helps ensure that the goals resonate well across all stakeholders and link directly to agency missions/visions. This approach also aims for supporting strategies that are sufficiently relevant and valuable to be incorporated into ongoing planning and implementation as MnDOT and transit agencies incorporate transit technology.

The goals and strategies were jointly developed in a multi-step process by MnDOT, Steering Committee members, and leaders from Greater Minnesota transit agencies using "visual strategy mapping," which is a *causal* mapping process. The consulting team first reviewed prior project work and previous plans to identify a "starter" set of ideas, then launched the strategy mapping effort with this key question: ***"What must MnDOT and Greater Minnesota public transit systems do over the next 5-7 years to advance a transition to digital operations that help meet organizational objectives and rider needs?"*** Over five workshops in January and February 2021, participants from the various groups generated, organized, and refined strategies, and built upward toward long-term goals by articulating critical causal connections between and among the strategies, asking for each strategy, "What do we get as a result of this…?"

Key Definitions

Goals (red): The "whys" that drive the work. They are statements of ends or outcomes, not means, and look out 10-15 years. They resonate well across all stakeholders, remain relevant for many years, and are both inspirational and aspirational.

Key Strategies (blue): These strong, substantive, mid-term (3-7 years) actions are the "whats" that will make the "whys" (goals) happen. The full goal-strategy map also includes sub-strategies that support these key strategies, and all are clustered as they relate *causally* to each other.

Tactics: These are the short-term (1-3 year) "hows" that drive progress on the strategies and in turn the goals. They are typically specific to organizations, detailed as part of those workplans, and generally not included in a strategy map.

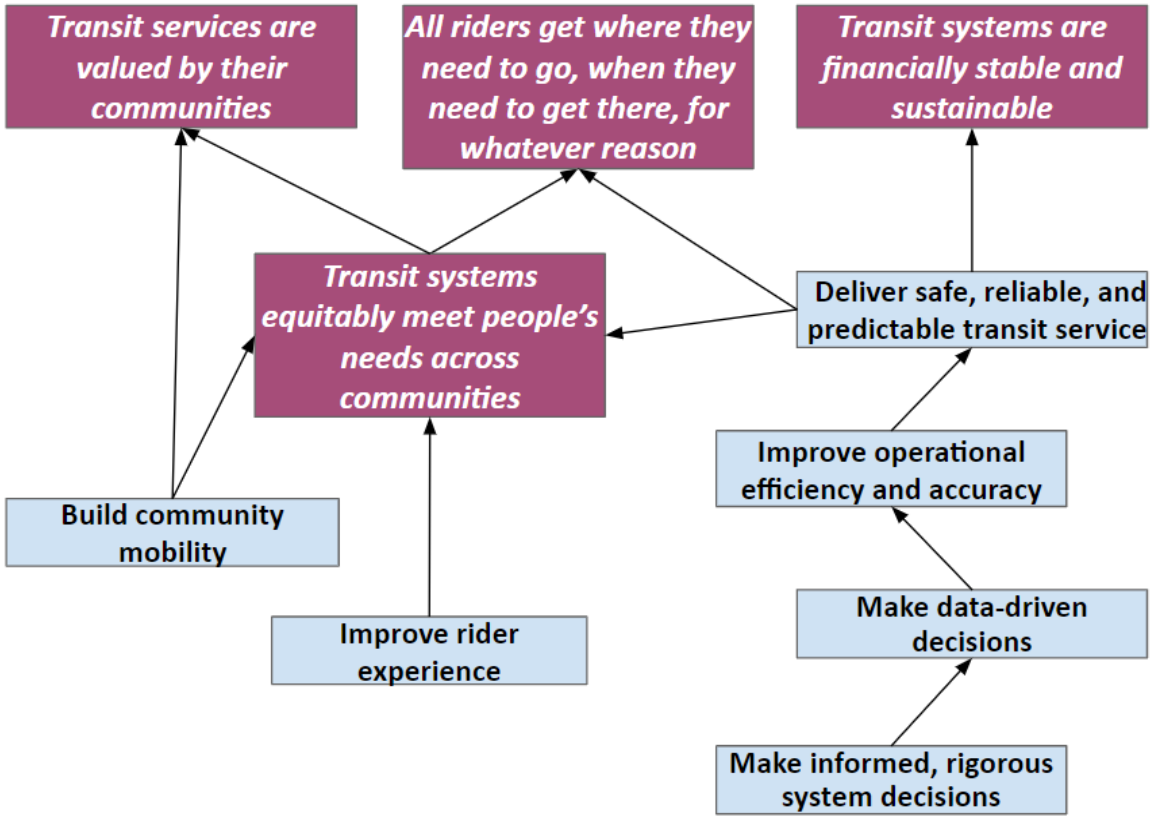
The strategy map is helpful in understanding the foundation that must be in place to achieve the goals as well as the relationships between different groups of strategies. This is a "working" set of strategies and goals to guide more detailed work plans toward common ends. Such work plans may be developed by MnDOT, individual transit agencies, or Regional Transportation Coordination Councils (RTCCs). This strategy map is expected to be refined over time to reflect accomplishments, institutionalized change, technology evolution, new information, and refined priorities.

This section describes the strategies and goals. Some short-term tactics will be identified as part of the growth plans in Chapter 6 of this report; most will be developed and executed as the plan is implemented.

Summary of Goals and Key Strategies

Figure 3.1 shows the statewide long-term technology goals and mid-term key strategies. The four very long-term goals in the magenta boxes speak to statewide goals common across transit systems. The goals are long-term aspirations, intentionally written as outcomes. They will result from MnDOT and Greater Minnesota transit agencies working together to successfully advance key strategies (blue). The key strategies and additional sub-strategies described later, in the sub-strategy clusters, support these goals.

Figure 3.1 Goals and Key Strategies



The goals and key strategies reflect common goals and objectives of agencies providing transit services and are not exclusively related to technology. Well-selected technology helps transit agencies meet such broad imperatives and improve their functioning. Even this high-level summary of goals and key strategies illustrates the breadth of areas that may be impacted by technology and the causal relationships between steps on the strategy map.

The long-term goal on the top left, **Transit services are valued by their communities**, is part of a cluster of strategies about public service delivery. It is most directly supported by another goal: **Transit systems equitably meet people's needs across communities**. Along with the central goal, **All riders get where they need to go, when they need to get there, for whatever reason**, these three goals are directly supported by two mid-term key strategies related to public service delivery: *Build community mobility and Improve rider experience*.

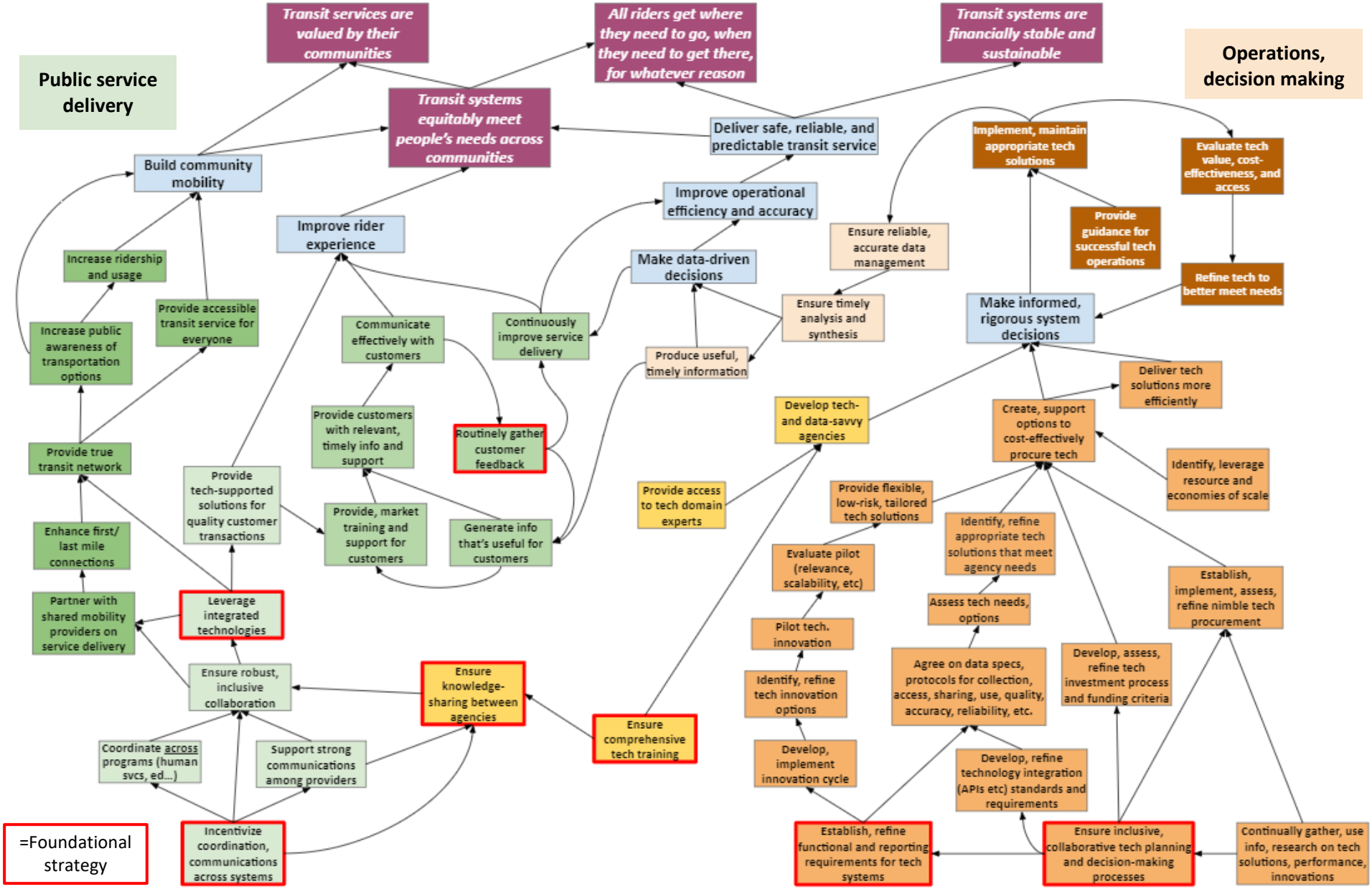
These goals are also supported by a set of strategies about operations and decision making that culminate in: *Deliver safe, reliable and predictable transit service*. That key strategy is further supported by the three strong

strategies shown above, and that set of key strategies directly drives the final long-term goal related to operations and decision making: **Transit systems are financially stable and sustainable.**

Figure 3.2 on the next page shows the complete statewide transit technology goal-strategy map. As shown on the complete map, there are two major clusters of strategies: On the left (green) are strategies supporting public service delivery. On the right (orange) are strategies supporting operations and decision making. Red-bordered strategies are considered foundational – they are essential for success.

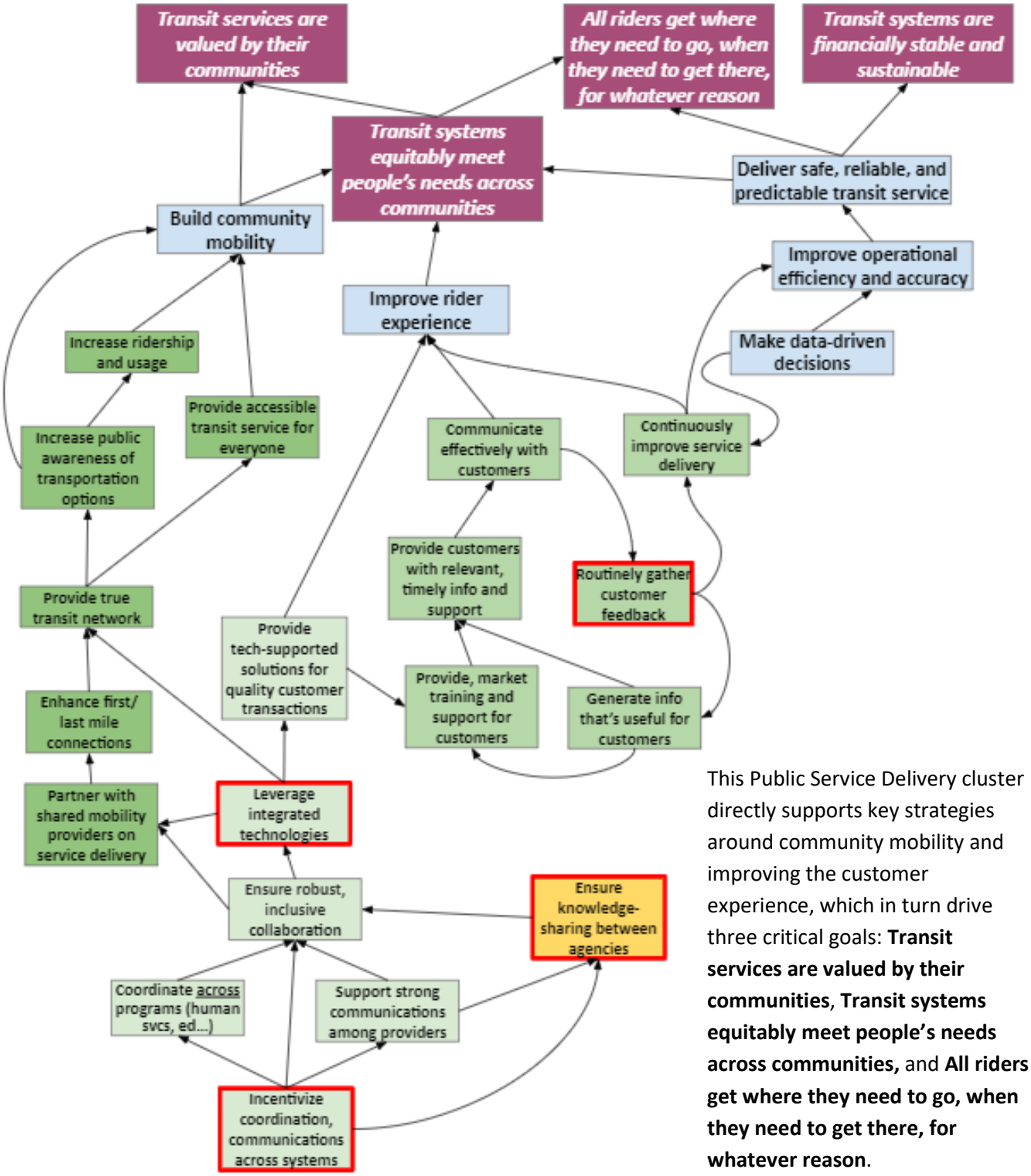
The next section breaks the strategy map into clusters of sub-strategies and provides more information about each, including the role of technology in each area.

Figure 3.2 Complete Statewide Transit Technology Goal-Strategy Map



Strategy cluster: Public service delivery

Figure 3.3 Public Service Delivery Cluster

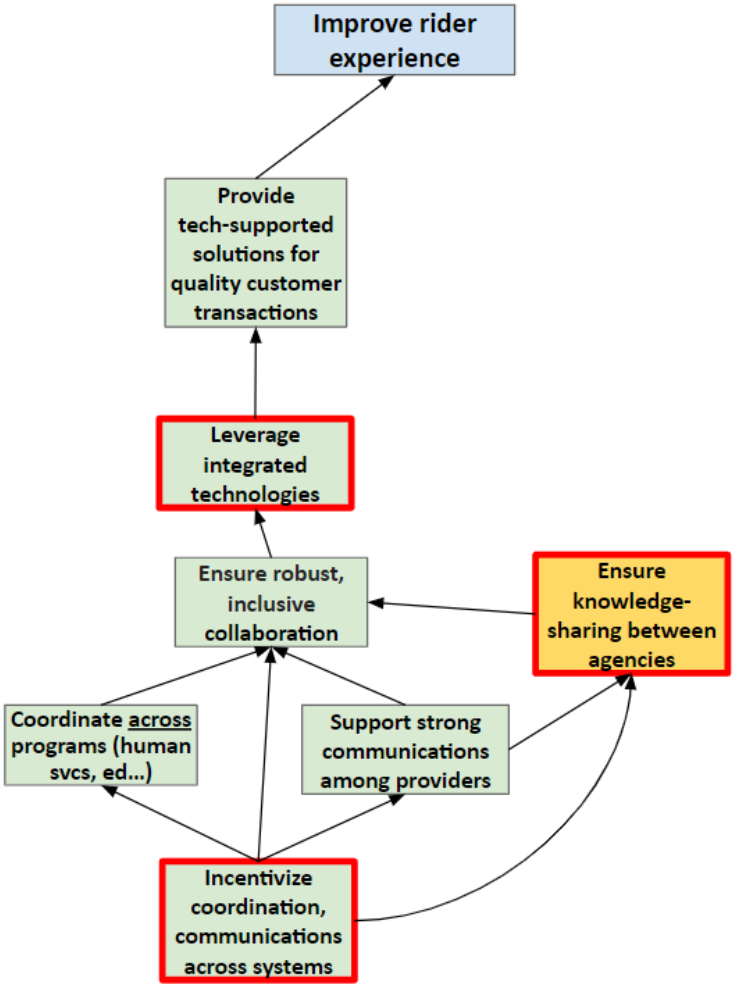


This Public Service Delivery cluster directly supports key strategies around community mobility and improving the customer experience, which in turn drive three critical goals: **Transit services are valued by their communities**, **Transit systems equitably meet people's needs across communities,** and **All riders get where they need to go, when they need to get there, for whatever reason**.

Sub-cluster: Coordination and Integration

This sub-cluster (right) begins at the bottom of the Public Service cluster and follows the middle pathway. It includes three foundational strategies (red borders): **Incentivize coordination and communications across systems**, **Leverage integrated technologies**, and **Ensure knowledge-sharing between agencies** – with the last one a critical bridge to the Operations and Decision-Making cluster.

Figure 3.4 Coordination and Integration Sub-cluster

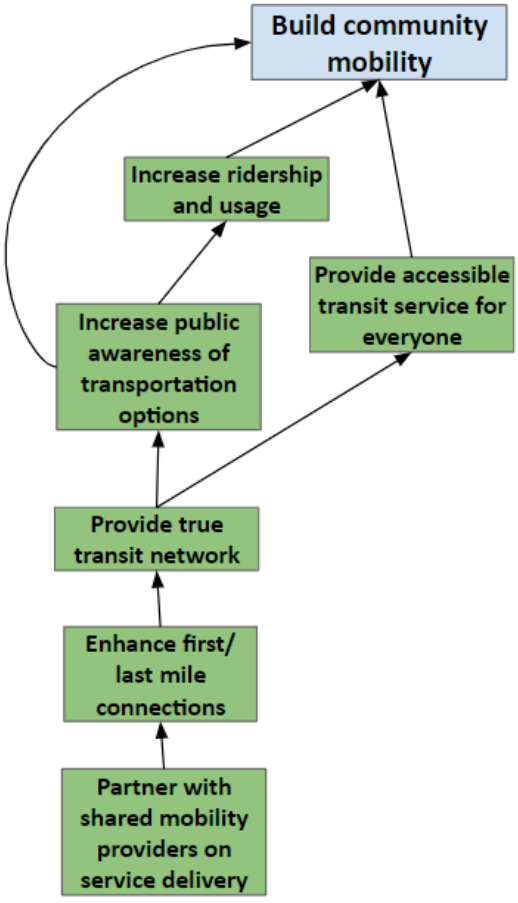


These strategies reflect the priority of coordination in other MnDOT plans and the ability of technology to enable coordination in a way that previously has been difficult to achieve. **Incentivizing coordination, communications across systems** will require attention to creating business rules agreed to by all participating agencies.

Leveraging integrated technologies is possible by utilizing existing integrated technologies and coordination tools. If technologies are not currently integrated, work is required that occurs in the strategy **Develop, refine technology integration (APIs, etc.) specifications and requirements** and moves into procurement and implementation from the operations, decision-making side of the strategy map. Once integrations are developed, it will be possible to **Partner with Share mobility providers on service delivery**, **Create a true transit network**, and **Provide tech-supported solutions for quality customer transactions**.

Sub-cluster: Mobility

Figure 3.5 Mobility Sub-cluster



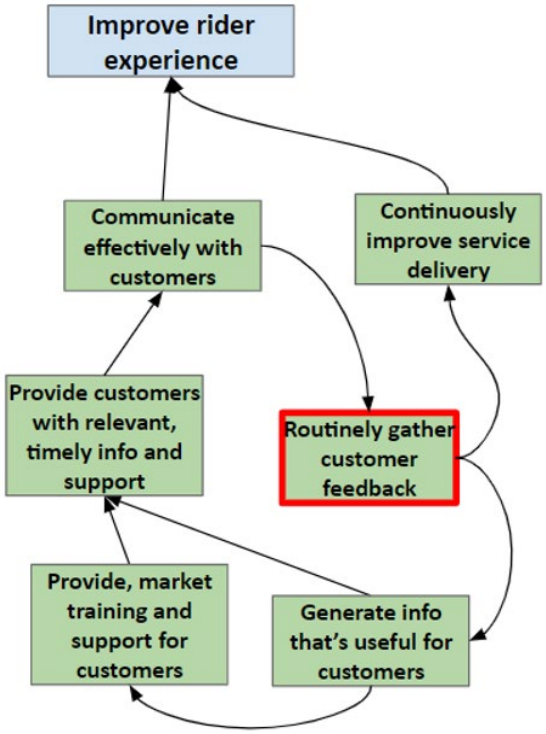
The Mobility sub-cluster (left) is grounded in strong partnerships that **Enhance first/last mile connections** and lay the foundation for **true community transit networks**. These result in **accessible transit services** along with **increased awareness or transportation options**, and **increasing ridership**, which, together, build critical community mobility.

Sub-cluster: Customer Engagement

This set of strategies in the Public Service Delivery cluster consider not only riders but the broader set of "customers" served, which includes other organizations, agencies and those acting on behalf of the rider. It centers on a foundational strategy (red border): **Routinely gather customer feedback**. Its inclusion in the strategy map reflects the importance of being responsive to customer needs. Technology supports include trip planning tools that use GTFS or GTFS-realtime information, social media, text messages for service alerts, websites, automated reminder calls, and instant surveys to gather rider opinions.

This sub-cluster of strong customer-support strategies related to useful data, training, and timely information reasonably results in effective communications and improved service delivery. Accomplishing these strategies will certainly help improve the rider experience, which in turn directly supports essential goals around transit equity and community value.

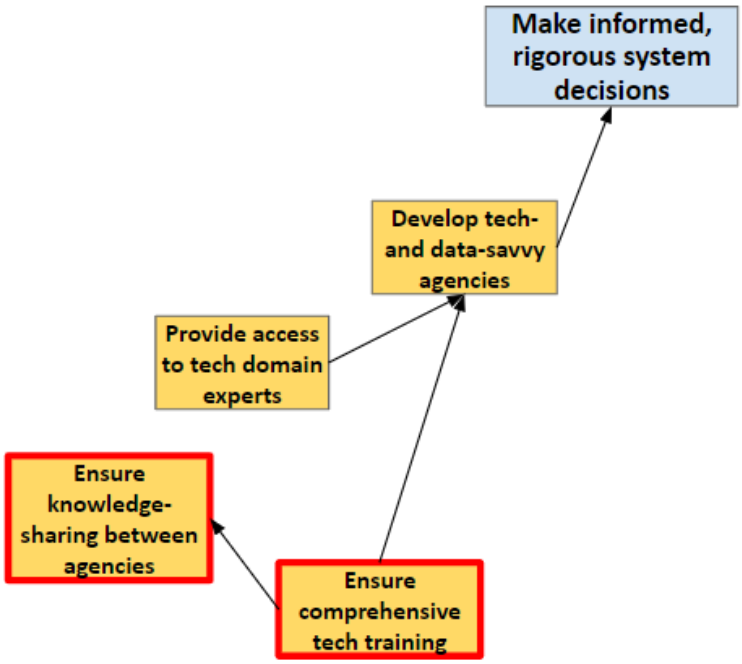
Figure 3.6 Customer Engagement Sub-cluster



Sub-cluster: Knowledge Acquisition

This small but mighty sub-cluster addresses the critical need for agencies to acquire the knowledge and skills necessary to make informed and rigorous system decisions.

Figure 3.7 Knowledge Acquisition Sub-cluster



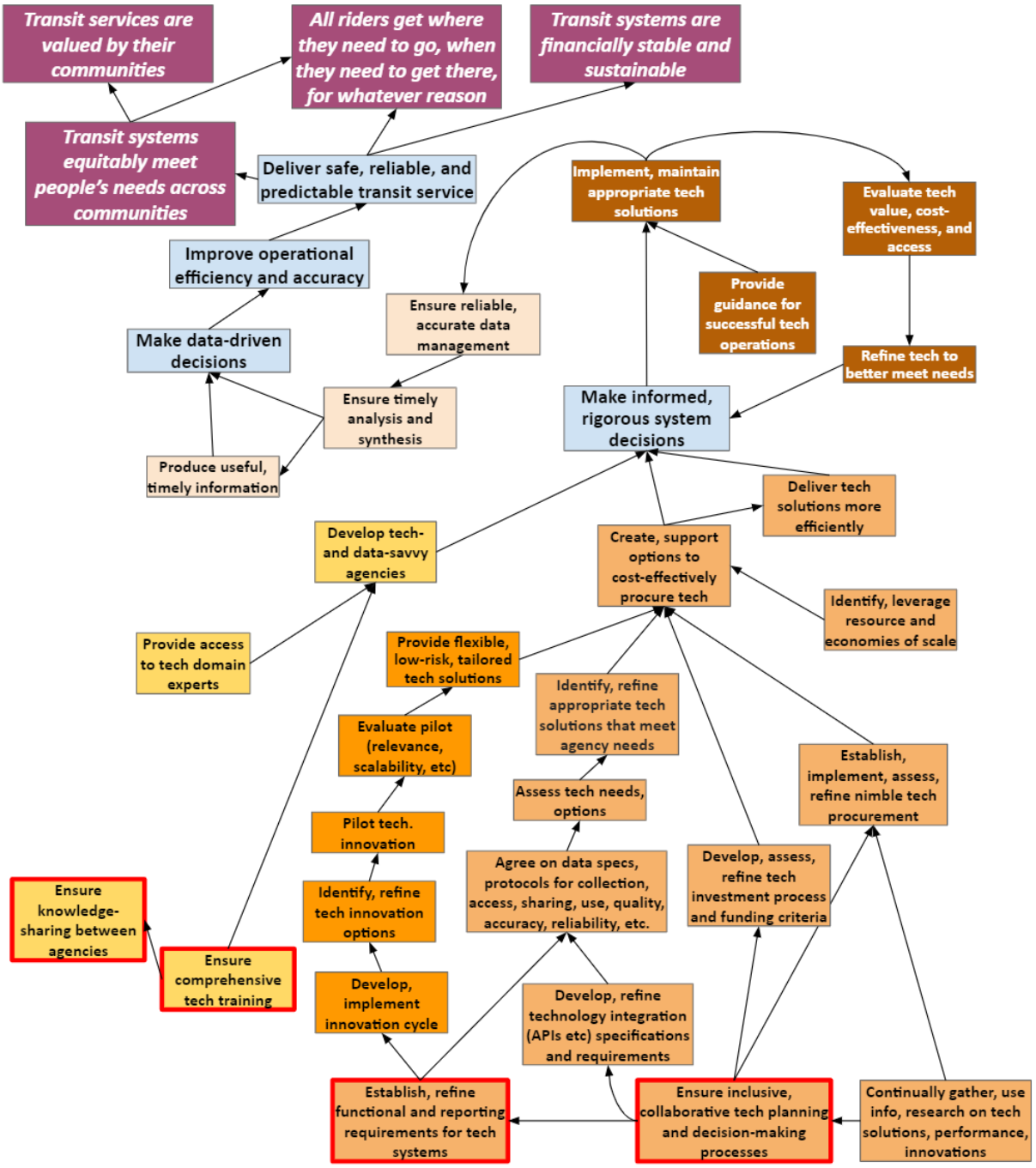
It begins with two foundational strategies, one to **Ensure comprehensive technology training** is available where and when it is needed, and the other that explicitly calls out the tremendous value and benefits of **agencies learning from each other**. Also note that this knowledge-sharing strategy is a critical "bridge" between the entire Operations and Decision-Making cluster where it resides, and the Public Service Delivery cluster, where it provides the same important boost to strategies coordination, communication, and integration.

This sub-cluster also calls out the importance of ensuring **access to technology domain experts** from a variety of sources, and together with **knowledge sharing** and **training** results in **tech- and data-savvy agencies** that are much better prepared to make informed and rigorous system decisions.

Strategy cluster: Operations and decision making

This robust, detailed Operations and Decision-Making cluster explicitly applies to MnDOT and transit agencies, and directly supports key strategies around rigorous system decisions, data-driven decisions, operational efficiency and accuracy, and safe, reliable, and predictable transit services. These in turn drive all four critical goals: **Transit systems are financially stable and sustainable, Transit services are valued by their communities**, **Transit systems equitably meet people's needs across communities,** and **All riders get where they need to go, when they need to get there, for whatever reason**.

Figure 3.8 Operations and Decision Making Cluster



Sub-cluster: Procurement and investment

This set of strategies challenges MnDOT and transit agencies to collaboratively plan and implement various processes and actions in order to yield informed and rigorous system-level decisions. This sub-cluster also holds two foundational strategies (red borders). The first insists on inclusive technology planning and decisions, such as through a standing statewide advisory committee, routine consultations and feedback loops with transit agencies and other key players, and similar. The other foundational strategy around technology system requirements results from creating such a collaborative structure, plus an ongoing commitment to gather and incorporate the most current technology information and research into the work being done.

The left pathways build directly from quality information and collaboration to assertively detail actions needed to develop specifications and requirements. Two strategies necessary to make significant progress in many areas are: **Develop, refine technology integration (APIs, etc.) specifications and requirements** and **Agree on data specs, protocols for collection, access, sharing, use, quality, accuracy, reliability, etc.** These are the strategies that will result in technology that is able to interoperate so agencies can obtain tailored solutions and increase coordination.

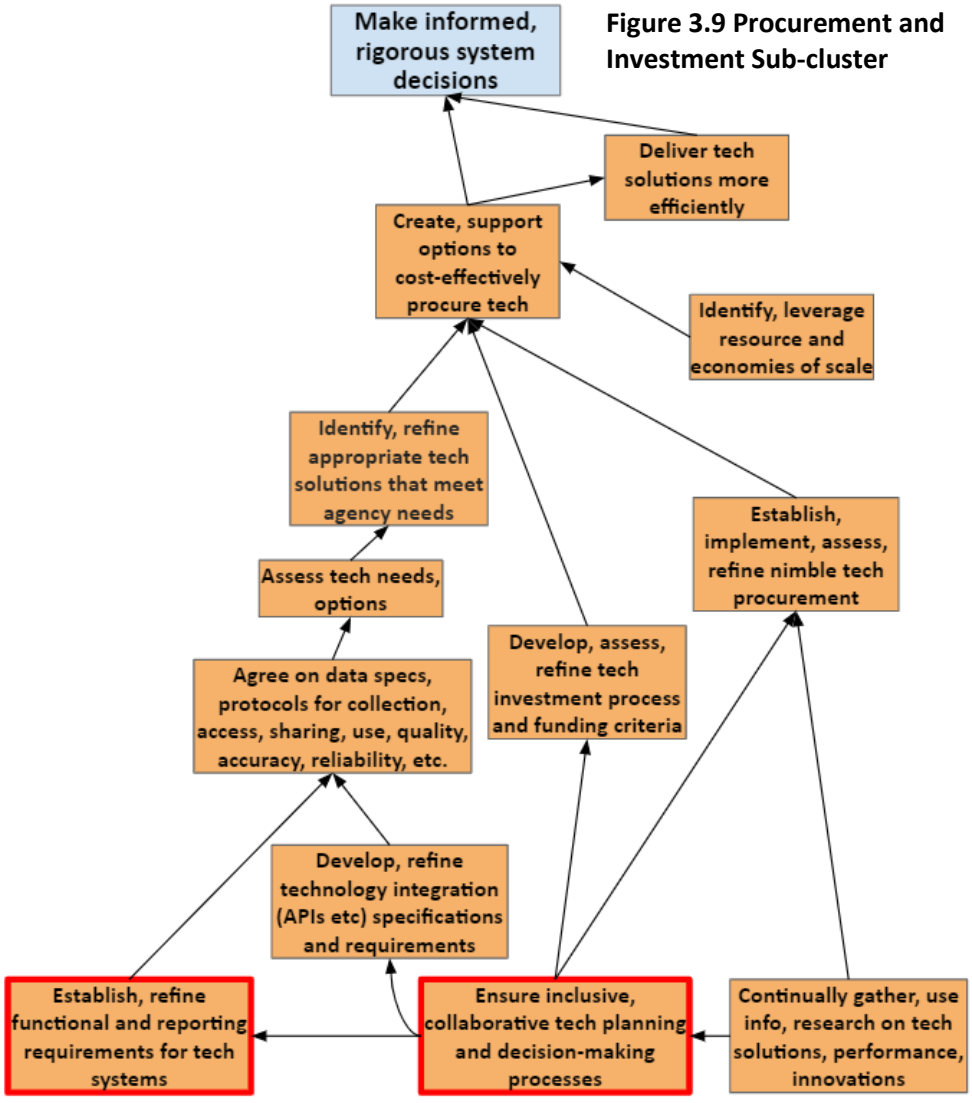


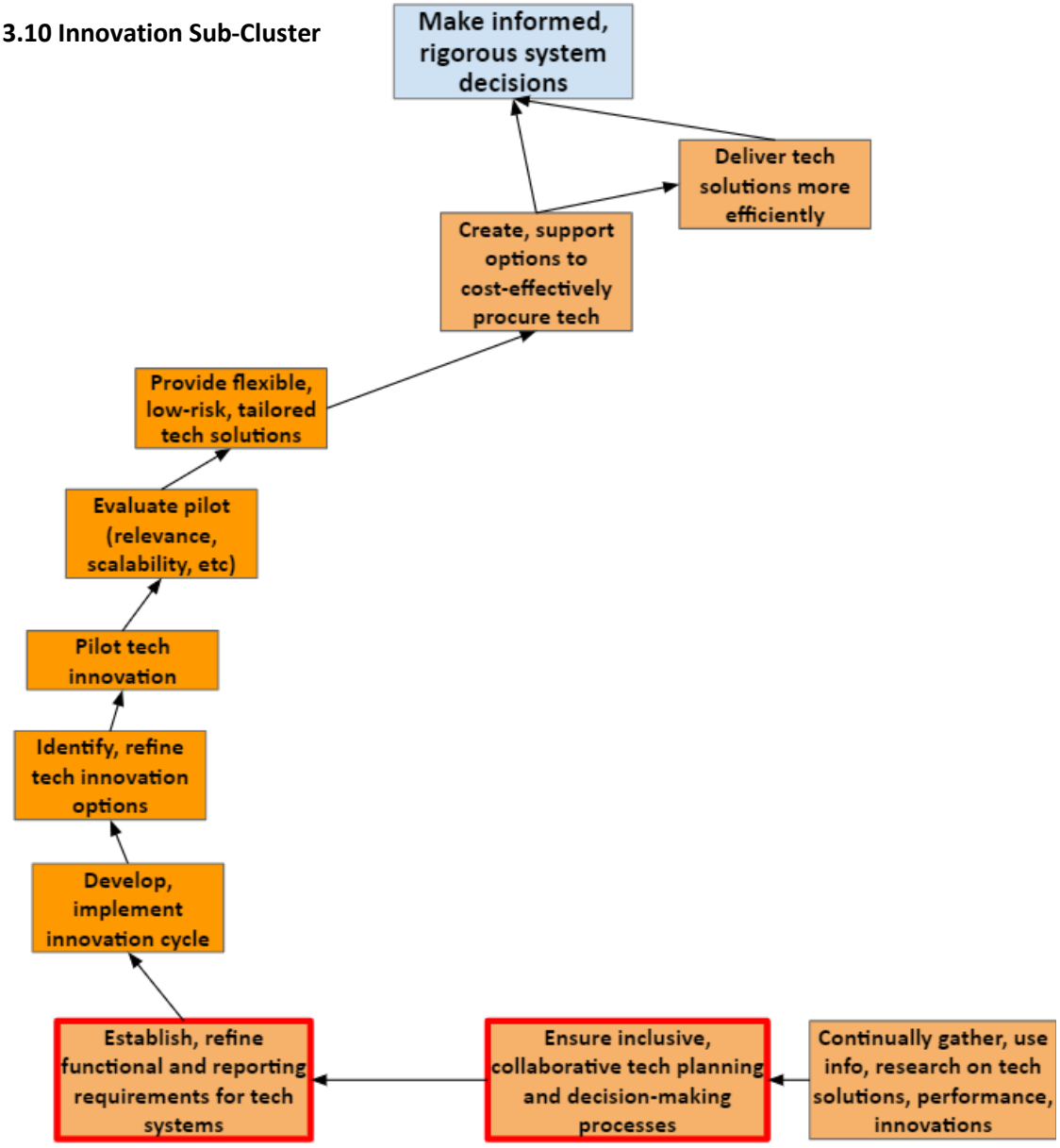
Figure 3.9 Procurement and Investment Sub-cluster

Combined with the essential strategies around a **technology investment process and funding criteria**, along with **a "nimble" procurement process**, results in cost-effective procurement and substantiated system decisions.

Finally, on the top right note the important strategies that seek additional resources to support these technology investments (such as Federal grant funding) and ways to leverage economies of scale, further supporting both cost-effective and efficient technology solutions. Communication of the procurement tools, procurement process and funding opportunities help ensure appropriate technology solutions are equitable acquired by Greater MN transit agencies.

Sub-cluster: Innovation

Figure 3.10 Innovation Sub-Cluster



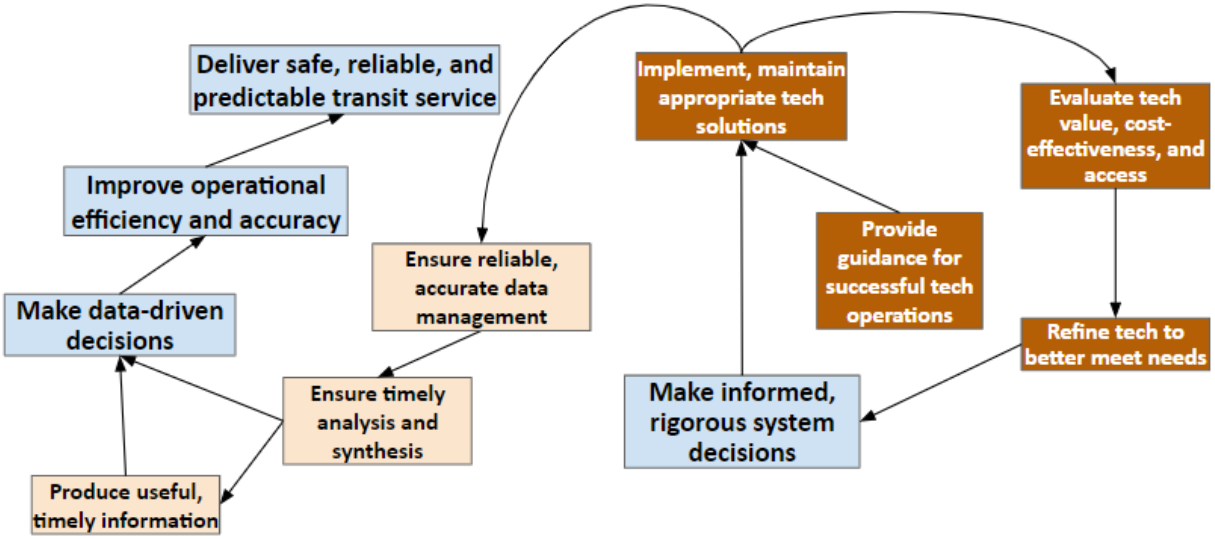
Innovation projects are an important way to try new technology solutions and/or improve operations in a less risky manner. Numerous funding opportunities exist to ease innovation projects and allow other agencies to learn from the success and challenges of the projects.

The innovation pathway ensures greater Minnesota transit services stay current on and have access to technology that benefits the people they serve. The strategies put in place explicit processes to explore, pilot, and evaluate options, and then help make the best choices accessible.

Sharing the information learned from this project will help other transit agencies learn and advance their technology knowledge and ability to apply it faster.

Sub-clusters: Implementation/Evaluation and Data

Figure 3.11 Implementation/Evaluation and Data Sub-cluster



The two sub-clusters in the top right of the overall goal-strategy map (implementation/evaluation at right and data at left) are presented together because of the tight causal links that drive all four key strategies in this cluster (blue), and in turn support all four long-term goals: **Transit systems are financially stable and sustainable, Transit services are valued by their communities**, **Transit systems equitably meet people's needs across communities,** and **All riders get where they need to go, when they need to get there, for whatever reason**.

As a result of **making informed, rigorous system decisions**, note that the strategy map calls out the technology implementation and maintenance strategy, and highlights that these are "appropriate" – which is legitimate given the diverse mix of transit agencies and service levels. With the addition of a strategy to ensure agencies have the guidance they need for successful technology operations, this is the beginning of a "virtuous cycle" of **evaluation, refinement, decision making, and implementation** that measurably strengthens operations, internal processes, and results.

The implementation and maintenance strategy and evaluation loop also prepares organizations to deliver on a pathway around reliable and accurate data management, analysis/synthesis, and useful information. Emerging from the key strategy of informed and rigorous system decisions and the numerous, strong strategies underlying it, these strategies together yield the key strategies (blue) around data-driven decisions, operational efficiency and accuracy, and safe, reliable, predictable transit service.

Conclusion

The strategy map describes the critical work necessary to thoughtfully and efficiently integrate technology into transit planning, management, and operations. It will take time to adapt the existing planning, funding, management, and operations of transit agencies to include the technology considerations described in the strategy map and to increase the rigor of the transit technology efforts.