

Transit Cooperative Research Program

Fiscal Year 2024

July 2024

Announcement of TCRP J-07: Synthesis Topics

The Transit Cooperative Research Program (TCRP) undertakes research and other technical activities in response to the needs of the public transportation industry on a variety of problems involving operations, service configuration, engineering, maintenance, human resources, administration, policy, and planning. The TCRP is a partnership of the Federal Transit Administration (FTA); the National Academies of Sciences, Engineering, and Medicine, acting through the Transportation Research Board (TRB); and the Transit Development Corporation, Inc. (TDC), a non-profit educational and research organization established by the American Public Transportation Association (APTA). The TCRP Oversight and Project Selection (TOPS) Commission, the governing board for the program, recently selected Synthesis projects for the Fiscal Year 2024 program. This announcement is to inform the research community of these projects and to solicit project panel nominations and consultants' letters of interest.

TCRP synthesis reports on various practices, making recommendations where appropriate. Each document is a compendium of the best knowledge available on measures found to be successful in resolving specific problems. To develop these syntheses in a comprehensive manner and to ensure inclusion of significant knowledge, TRB hires a consultant with expertise in the topic area to gather and analyze available information assembled from numerous sources including a large number of transit agencies, and write a summary report. A topic panel of experts in the subject area is established to guide the researcher and to review the synthesis report. For each topic, the project objectives are (1) to locate and assemble documented information; (2) to learn what practice has been used for solving or alleviating problems; (3) to identify all ongoing research; (4) to learn what problems remain largely unsolved; and (5) to organize, evaluate, and document the useful information that is acquired.

Nominations of others and self-nominations for panel members should be submitted online on the TRB website by August 30, 2024, at the MyTRB portal at this link: [Online Panel Nominations](#)

You will be asked to login to MyTRB. If you do not already have an account, you will be asked to quickly create one using your email and a password. To ensure proper consideration of nominations, please provide all of the information requested. A current resume is necessary to determine relevant knowledge and experience.

Communication to determine an individual's interest and availability in serving will be made from this office only after we have matched available expertise (e.g., knowledge and experience as presented in the resume) with that required by the nature of the project.

TCRP is also looking for consultants to perform as synthesis principal investigators. To formally express interest in authoring a topic, a two-page cover letter and professional resume or CV is required. Fixed fee is \$55,000. Please submit letters of interest to the [Letters of Interest Submission Portal](#).

A cover letter and resume or CV should provide a panel of topic experts with a concise idea of your knowledge of the topic and a list of work accomplished in the subject area. **The deadline for letters of interest is August 30, 2024.** The first topic panel meetings are anticipated during September and October 2024. During the meetings, scopes of work will be finalized and principal investigators will be chosen.

**Transit Cooperative Research Program Synthesis Topics for
Fiscal Year 2024 Program**

(Click on topic number and title to go directly to the topic description)

TCRP J-07/Topic SA-63: How Transit Operator Health and Wellbeing Affects Workforce Strength

TCRP J-07/Topic SA-64: Transit Scheduling and Dispatch Practice that Increase Operator Quality of Life

TCRP J-07/Topic SB-43: Transit Agency Responses to Serving Individuals with Intellectual and Developmental Disabilities on ADA Paratransit

TCRP J-07/Topic SB-44: The State of Art in Transit

TCRP J-07/Topic SB-45: Synthesis of Transit Agency Customer Experience Programs

TCRP J-07/Topic SE-08: Defining and Measuring “State of Good Repair” for Public Transit Assets and Infrastructure

TCRP J-07/Topic SH-25: Building Safe, Quality Access to Bus Stops for Rural and Exurban Communities

TCRP J-07/Topic SA-63: How Transit Operator Health and Wellbeing Affects Workforce Strength

TCRP Staff Responsibility: Jamaal Schoby

Background

Public transit agencies across the United States are facing significant bus and rail operator workforce shortages. While the crisis started prior to the COVID-19 pandemic, as the nation rebounds, the APTA [Transit Workforce Shortage Report \(2022\)](#) found agencies are more than ever struggling to attract and retain these frontline employees. At the same time, the transit industry has an aging workforce, and TCRP Research Report 240: [Bus Operator Workforce Management: Practitioner's Guide \(2023\)](#) found that more than 50% of the industry's workforce is estimated to retire during the next 10 years. The lower-than-normal hiring and retention rates, coupled with high retiring rates and an increasing number of stressors affecting operators' physical and mental health contributing the workforce shortage problem.

Existing research finds that transit operators experience adverse impacts on health and wellbeing because of the demands and stresses of the occupation. There are documented direct impacts on [physical health](#) (i.e. obesity, diabetes, and hypertension) and [mental health](#) (i.e. trauma from passenger assaults). Increased probabilities of poor health outcomes for transit operators may be tied to the larger social issue of racial health disparities, as many transit operators are Black, indigenous, or people of color (BIPOC)—groups that disproportionately experience health issues such as diabetes and heart disease. Among women operators, and especially those who are BIPOC, the likelihood of poor health outcomes is even higher. These factors are contributing to the workforce shortage phenomenon. To address the operator workforce shortage, transit agencies are starting to pilot innovative approaches aimed at reducing the stresses associated with the role.

A few examples include alternative scheduling approaches, new classifications of leave time that allow for recovery following trauma exposure, and material benefits such as childcare supports. While these approaches are in a novel stage, there is limited research exploring the relationship between operator health and workforce challenges. Transit agencies need to better understand how operators' health and health concerns relate to attitudes about employment and identify meaningful solutions to address the workforce challenges. If the known (or presumed) health risks of being an operator are impeding the desire to pursue employment as a transit operator or stay in that role, questions for consideration are:

- What does that mean for the success of recruitment and retention in the long term?
- What would it take to design workforce interventions or initiatives that directly respond to known health issues for operators and potential risks for future operators, especially those whose race or gender put them at even higher risk for poor health outcomes, including diabetes and heart disease?

Synthesis Objective

The purpose of this synthesis is to examine emerging experiences of transit systems to better understand the relationship(s) between operator health, the health risks associated with being a transit operator, the desirability of the role, and how actual or proposed workforce solutions consider these issues. The synthesis shall also examine the state of practice for monitoring and addressing operator health as part of agencies' strategies to overcome persistent recruitment and retention challenges. Lastly, the synthesis shall identify, how agencies currently collect and link data about, at a minimum:

- Operator health and wellbeing (on-the-job injury claims, short-term disability leave, health insurance claims, job satisfaction, stress, and mental health indicators)
- Workforce strength (recruitment, retention, vacancy, etc.).

This synthesis will provide insight on the relationship between operator health measures and workforce measures, and the extent to which agencies are tracking the potential relationship. The synthesis will provide a better understanding can provide transit agencies and the industry implement workforce solutions that protect operators' health and do not exacerbate negative health outcomes, especially among BIPOC operators and those who identify as women.

Information to be Gathered

At a minimum, the contractor shall gather the following information:

- Demographic information of operators, including race/ethnicity, age, and gender.
- Human resource data around operator seniority and tenure, employee classification, and leave data that can be linked to demographic data.
- Transit agencies' current practices related to tracking or monitoring operator health data (data availability, how data are used, privacy concerns, etc.).
- Transit agencies' current practices related to examining operator health data in conjunction with workforce data.
- Analyses to understand how operator health data are linked to workforce shortages.

- Partnerships and/or programs that involve transit agencies and unions that address operator health and workforce strength.

How the Information will be Gathered

- Literature Review
- Survey of transit public transit agencies
- Case examples (a minimum of five, identified from the surveys)

TCRP J-07/Topic SA-64: Transit Scheduling and Dispatch Practice that Increase Operator Quality of Life

TCRP Staff Responsibility: Jamaal Schoby

Background

Hiring and retaining bus and rail operators has become increasingly challenging and the COVID-19 pandemic exacerbated problem. According to the [Transit Workforce Center Transit Workforce Data Dashboard](#), frontline employees account for approximately 80% of the public transit industry's workforce and are essential to agency's daily operations¹. In a complementary study, TCRP Research Report 240: [Bus Operator Workforce Management: Practitioner's Guide \(2023\)](#) found that more than 50% of the industry's workforce is estimated to retire during the next 10 years.

While transit agencies are struggling to attract and retain operations personnel, applicants and current employees are demanding more employer-based incentives. As a result of the privileges afforded based on seniority, new operators have less desirable work schedules (i.e. fewer straight shifts and consecutive days off). This limits access to desirable shifts for new hires, which has implications for attraction to the role. In more recent years, there has been an emergence of competitive industries and roles (i.e. driving for Transportation Network Companies and Amazon) that offer more flexible work schedules. Gaining momentum is the work-home balance phenomenon, especially from employees with young children and elder-care responsibilities. In addition, job induced stresses to include fatigue, assaults from customers, adherence to the published timetable, limited break opportunities, and access to restroom and break facilities affect operator's quality of life.

Addressing these challenges requires a review of the structure of vehicle and operator assignments, including the selection and assignment for operators, and the daily markup and dispatch of operators. Transit agencies have historically prioritized the overall efficiency and reliability of service in their scheduling and dispatching process. Now, operator satisfaction must also be prioritized to maintain necessary staffing levels. Transit agencies need to understand the work assignment factors that attract younger workers to a career in transit, as well as the factors that can attract veteran operators to take difficult work assignments that require more experience.

While the techniques and strategies to maximize the efficiency of operator schedules are well-documented, in particular through the work of computerized optimization tools that specialize in this area, there is minimal research on the

¹ Data for the dashboard is compiled from the U.S. Bureau of Labor Statistics, Lightcast Occupation, and the National Transit Database.

effectiveness of different scheduling and dispatch approaches on service reliability and, to an even greater extent, employee satisfaction and retention. During this period of workforce shortage challenges, public transit agencies and the industry need to better understand the factors that influence the ability of transit providers to attract and retain bus and rail operators.

Synthesis Objective

The purpose of this synthesis is to identify the current strategies, practices, and results of transit agency efforts to increase operator retention through schedule design and assignment. This synthesis will identify the factors that can potentially increase transit operator job satisfaction and retention within the first years of employment and during a full career in the transit industry.

This synthesis should consider the following questions:

- What sequence of activities and what revisions to labor contract provisions are necessary to develop vehicle and operator work assignments that will attract and retain personnel?
- What incentives are necessary to encourage experienced operators to take more difficult assignments?
- What scheduling practices are available, which of those are easy to implement and which would require new labor agreements?
- What other possible adjustments to labor agreements, and labor relations overall, related to scheduling and dispatch, have an effect on employee quality of life?

Information to be Gathered

At a minimum, the contractor shall gather the following information:

- Information gathered by transit agencies on the factors that influence operator satisfaction through (i.e. employee surveys and interviews and correlations of rates of job applications or resignation letters with triggering events such as changes in wages, work rules, expiration of government benefits, or layoffs in the jurisdiction).
- Analyses conducted by transit agencies into operator preferences for shift hours, days off, types of service, incidents reported by route, derived from analysis of the order that work is selected and absence or attrition rates by service type and shift, which can be attributed to operator satisfaction with work assignments.

- Information on scheduling and dispatching initiatives and practices used or being explored by transit agencies intended to increase operator quality of life.
- Data and or information on the availability of data about:
 - Transit agency bus and rail operator workforce size, hiring rates, and retention rates
 - Local workforce size and unemployment rates
 - Local comparable job labor characteristics (job competitiveness) such as working conditions and pay levels of comparable 'driving jobs'

How the Information will be Gathered

- Literature Review
- Survey of transit public transit agencies
- Case examples (a minimum of five, identified from the surveys)

TCRP J-07/Topic SB-43: Transit Agency Responses to Serving Individuals with Intellectual and Developmental Disabilities on ADA Paratransit

TCRP Staff Responsibility: Jamaal Schoby

The [American with Disabilities Act of 1990](#) mandates public transportation agencies to transport persons with Intellectual and Developmental Disabilities (IDD). The [U.S. Department of Health and Human Services](#) define IDD as differences that are usually present at birth and that uniquely affect the trajectory of the individual's physical, intellectual, and/or emotional development.

Transportation access to essential services is important for persons with IDD, and many public transit agencies are struggling with supplying adequate ADA paratransit services. Moreover, this demographic requires accommodations above ADA paratransit minimum requirements. Several public transit agencies across that nation have undertaken a variety of approaches to enhance safety procedures for when transporting persons with IDD between their place of residence and essential destinations. While some transit agencies have provided hand-to-hand connections, sometimes with a fare surcharge, others have taken approaches that provide a separate service more tailored to the needs of individuals with IDD.

There is no research identifying the extent to which IDD and HCBS trips are served by ADA paratransit services; the challenges that public transit agencies encounter in serving these types of trips; the shortcomings of ADA paratransit's delivery of these trips; and how transit agencies have responded to the shortcomings.

Synthesis Objective

The purpose of this synthesis is to document the successes and challenges of public transit agencies serving IDD customers with ADA paratransit service. At a minimum this synthesis should:

- Provide examples of ADA paratransit accommodations within the ADA paratransit service structure.
- Provide examples of premium, tailored services separate from the ADA paratransit structure to include the service/program design, scheduling/dispatching parameters and driver vetting/training needs.
- Document customer/caregiver/human service agency awareness and education of service expectations and responsibilities.
- Present implications for ADA paratransit fleet mix.
- Identify the benefits of these service models and programs.

This research will provide ADA paratransit managers with an eye-opening and, hopefully, will trigger their own deep-dive into how their ADA paratransit service is accommodating – or not -- the needs of this sub-population of their ADA paratransit eligible riders.

Information to be Gathered

At a minimum, the contractor shall gather on the needs, challenges and best practices associated with serving HCBS/IDD individuals.

How the Information will be Gathered

- Literature review and internet research
- Survey of transit systems
- Case examples (minimum of five of the surveyed transit systems)

TCRP J-07/Topic SB-44: The State of Art in Transit

TCRP Staff Responsibility: Emily Griswold

Background

Public art invigorates public spaces while also adding a sense of safety, collective ownership, and belonging to the citizens that gather in those spaces. Along with other public spaces such as parks, playgrounds, libraries, and even [airports](#), many transit systems across the United States and Canada display art at transit facilities and on transit vehicles. For example, the Washington Metropolitan Area Transit Authority (WMATA) utilizes an [Art in Transit Program \(AIT\)](#) that “incorporates visual and performing arts into the Metrorail system to enhance the experience of customers, the communities it serves, and the Capital region at large.” The AIT program of WMATA exposes its customers to a variety of different art styles and allows for a wide range of local artists to present their work in a new light.

Synthesis Objective

There is little to no information on what benefits art in transit systems create for the users of those systems or what programs exist to include art at and around transit stations. The objective of this synthesis will be to document the use of art (permanent artwork, rotating installations, visual and performing art, etc.) in transit systems around the United States and Canada. This synthesis will document what types of programs exist and explore the reasons why agencies utilize art in their transit systems.

Information to be Gathered

The information that will be gathered for this synthesis should:

- Document the types of art in transit programs that exist.
- Document partnerships and/or programs that assist transit agencies in funding an Art in Transit program.
- Explore why transit agencies use art in their systems.
- Examine how transit agencies determine what type of art will be included in their systems.
- Discover what benefits do transit agencies and their customers receive from including art in transit systems.

How the Information will be Gathered

This information will be gathered through a literature review, an online survey of transit agencies, and at least five case examples [spanning from small, medium, and large transit systems as defined by American Public Transportation Association (APTA)] that highlight innovative and effective programs of art in transit systems.”

TCRP J-07/Topic SB-45: Synthesis of Transit Agency Customer Experience Programs

TCRP Staff Responsibility: Emily Griswold

Background

More than two dozen US transit agencies have established formal Customer Experience (CX) programs in recent years to elevate rider voices and customer-centricity. These CX programs are central to agency efforts to provide equitable and dignified services to underserved populations that have limited transportation choices, and to build transit use among choice riders. This is particularly important in the context of post-pandemic ridership declines.

US transit agencies that have established, or are establishing, CX program include the likes of LA Metro in Southern California and Trinity Metro in Fort Worth, Texas. LA Metro established its CX program in 2020 to “[sharpen its focus on customers](#)” (transitcx.org, 2024). LA Metro also hopes to utilize its CX program to create a smooth transit experience as it will receive a lot of attention leading up to, and including, the 2028 Summer Olympic Games. [Trinity Metro](#) has Community Outreach and Transit ENVOY teams that provide education, support, and training to assist its customers in navigating the system.

Synthesis Objective

Currently there are no standards for transit CX programs, so with the rapid growth of CX organizational structures, program objectives, and methods currently vary widely. The synthesis would be useful in documenting the different models for transit agencies to consider developing and refine CX programs.

The objective is to document emerging practices in transit CX programs. In particular, the **synthesis would gather the following information** to meet this objective:

- **Customer Experience program objectives** – this would include mission and vision statements for each agency’s program.
- **Scope** – this would document how each agency defines “Customer” and “Experience.” What “customers” does the program address: riders, potential riders, contractors, community members? Does the program include Employee Experience (EX) initiatives to address obstacles employees face and make it easier for employees to deliver CX improvements to riders? And what “experiences” are covered? Do programs cover all pain points that customers experience, or are they limited to just certain aspects of the customer experience like passenger information or fare payment? Do programs include

User Experience (UX) design and testing of smartphone apps, websites, fare collection interfaces, transit vehicle interior designs, and other products used by customers?

- **Organizational structure** – where in the organization is each CX program situated, and how does it interrelate with other departments? What responsibilities and authorities does each program have?
- **Listening posts** – what listening posts are used to bring the voice of the customer into agency decision making, to build a holistic understanding of customer wants and needs, and to identify customer pain points? Do agencies gather insights from employee or rider focus groups, comments received at community and Board meetings, journey mapping, and complaints/compliments received by customer service agents and via social media? To what degree is analysis of the various listening posts unified to provide coherent guidance to guide agency priorities?
- **Key Experience Indicators (KEI's)** – this would document CX program KEI's and how these interrelated with agency Key Performance Indicators (KPI's), as well as Diversity, Equity, and Inclusion programs.
- **Culture** – what initiatives are underway to create a customer centric culture, and what are the measures of effectiveness?
- **Institutionalization of Customer Experience** – what changes are being made to agency policies, procedures, and practices to create a permanent, sustained focus on improving customer experiences? How is customer experience considered when creating objectives and budgets, setting service and facility standards, or conducting performance appraisals, for example?
- **Staffing and resources to deliver the program** – the synthesis would collect and analyze organization charts to document how Customer Experience programs are staffed, and information on the cost to establish and nurture various types of Customer Experience programs. It will also inventory tools agencies might use to advance CX including CRM (Customer Relationship Management) systems, data analysis software, and AI (Artificial Intelligence).
- **Tangible improvements to customers** – what tangible improvements have transit customers enjoyed as a result of transit agency CX programs?

The synthesis would utilize:

- A survey of agencies.
- Follow-up interviews with selected agencies (case examples).
- A review of Customer Experience Plans and/or websites of selected agencies (literature review).
- Identification of knowledge gaps, and suggestions for research to address gaps.

TCRP J-07/Topic SE-08: Defining and Measuring “State of Good Repair” for Public Transit Assets and Infrastructure

TCRP Staff Responsibility: Jamaal Schoby

Background

Public transit agencies across the United States are facing significant challenges in maintaining assets and infrastructure in an adequate operational condition. With limited funding and aging assets, many agencies are struggling to keep pace with growing reinvestment needs. A key obstacle is the lack of a consistent, industry-wide definition and set of measures for what constitutes an acceptable "state of good repair."

Without clear guidelines, agencies employ varying approaches to defining, assessing, and prioritizing the state of good repair for their assets. This inconsistency makes it difficult to benchmark performance, justify funding requests, and ensure effective stewardship of public resources across the transit industry. There is a critical need to establish a common framework and language for discussing the state of good repair that accounts for the diverse modes, asset portfolios, and operating environments of different transit agencies. By documenting current practices, this synthesis can provide a foundation for developing more uniform state of good repair policies, performance targets, and decision-support tools to optimize lifecycle management of transit capital assets.

Synthesis Objective

The objective of this synthesis is to document the current practices employed by public transit agencies to define, assess, and manage the "state of good repair" for their capital assets and infrastructure. Specifically, the synthesis shall capture how agencies interpret and operationalize the concept of the state of good repair across different asset categories such as revenue vehicles, facilities, guideway elements, systems, and stations. In addition, the synthesis shall examine the methodologies, data sources, and performance metrics used to evaluate asset condition and remaining useful life. The synthesis shall also explore agency policies, prioritization frameworks, and decision-making processes for programming the state of good repair projects into capital plans. Lastly, the synthesis shall investigate funding strategies, accounting treatments, and reporting approaches related to state of good repair expenditures and targets. By synthesizing these current practices, the effort aims to provide a common language and framework for discussing the state of good repair challenges faced by the transit industry.

Information To Be Gathered

At a minimum, the contractor shall gather the following information:

- Agency definitions and terminology used for "state of good repair" across different asset classes (e.g. vehicles, facilities, guideway, systems).
- Condition rating systems and criteria employed to inspect and assess asset state of repair.
- Data sources and collection methods used to populate asset inventories and condition assessments.
- Methodologies and models for forecasting asset remaining useful life and decay curves.
- Performance measures and metrics calculated to track and report on the state of good repair.
- Asset management systems, software tools, and databases used for state of good repair analysis.
- Decision support processes for prioritizing state of good repair projects and investments.
- Capital programming procedures to incorporate state of good repair needs into agency plans.
- Accounting structures and financial reporting approaches for state of good repair expenditures
- Funding sources and financing mechanisms utilized for state of good repair initiatives.
- State of good repair targets, benchmarks or performance standards established by agencies.
- State of good repair policies, strategic plans, or governing legislation and regulations.

The focus will be on gathering information about the specific practices, tools, and frameworks agencies currently use related to defining, measuring, and managing the state of good repair for their transit assets.

How the Information will be Gathered

- Literature Review
- Survey of transit public transit agencies
- Case examples (a minimum of five, identified from the surveys)

TCRP J-07/Topic SH-25: Building Safe, Quality Access to Bus Stops for Rural and Exurban Communities

TCRP Staff Responsibility: Emily Griswold

Background

Transit bus service routinely operates through suburban and rural communities with legacy infrastructure not consistent with current design standards. As a result, many legacy bus stops in rural communities are inaccessible and/or hazardous to access. This outcome may be a result of any number of causes including insufficient coordination between the transit agency and the local jurisdiction or misaligned incentives among transit and owner agencies. This is especially true during roadway modification projects tied to routine maintenance, safety, capacity, or new site development.

The volume of research addressing the causality, patterns, and appropriate design countermeasures associated with vulnerable road user safety near bus stops gives decision-makers and technicians a full toolbox to dramatically improve safety and comfort for pedestrians, cyclists, and persons with disabilities accessing transit. There is an urgent need, however, to develop specific guidance and protocols regarding the roles, responsibilities, and oversight of design and construction, particularly within the context of the “first and last mile.” This is as much a land use and urban design problem as it is a transit problem. Given that so many pedestrian and cyclist fatalities occur at mid-block locations along high-speed arterial facilities, providing more effective policies and implementation guidance in this respect can improve the conditions for users who most often access bus networks via walking or cycling. Additionally, with growing emphasis on transit route optimization, complete streets, vision zero, context-based design, this provides an opportunity for more effective integration of first and last mile safety as a regular order of business.

Collaboration also is critical to improve safety and accessibility to/from and at bus stops; no single agency or organization can accomplish this on its own. Transit agencies do not control the street or sidewalk network around bus stops. Cities and counties usually do not make transit routing and facility placement choices, rather MPOs/TPOs/TPAs are the local entities with the capacity and mandate to identify and plan for long-range transportation opportunities and needs at the local and regional scale. The same holds true when it comes to funding for bus stops and other transit infrastructure as it typically comes from multiple sources, which contributes to the inconsistent or lack of quality implementation.

Synthesis Objective

This synthesis will cover issues of screening/triggers for identifying rural and exurban bus stop locations, jurisdictional authority, coordination, and funding/maintenance agreements necessary to improve the conditions of these bus stops, as well as:

- Expand on above and provide a synthesis of best practice or examples of coordination and trigger processes that exist to provide safe and accessible bus stops in suburban or rural contexts. Incorporate relevant information and gaps based on a scan of the sources below.
- Ensuring a mutual understanding of the collective roles and responsibilities and improving the culture of collaboration, including public attitudes, around transit infrastructure needs.
- Deploying standard coordination and review capacities and procedures with respect to “stop influence area” infrastructure needs.
- Proactive bus stop influence area screening and trigger mechanisms to identify locations and needs in advance of routine roadway maintenance, driveway permitting, and/or other competing transportation needs.

This synthesis will gather the following information to meet the stated objectives:

- Current strategies for coordination, screening/identification of bus stop upgrade needs, evolving stop accessibility criteria, and improvement/maintenance agreements among transit and road agencies.
- Transit-inclusive development review and permitting processes.
- Context Classification reviews and GIS screening tools- to screen for access and stop needs, and support proactive, interagency dialogue and coordination around bus stop accommodations. Various GIS tools can enable the quick display of area demographic profiles, ridership, big box/convenience store uses, and land use context measures that help indicate transit propensity and provide a useful, data-driven, warrant at the beginning of the development review process to ensure that safe and accessible transit features are planned and integrated into construction documents well before site development, driveway permits, and roadway improvements are implemented.

The information will be assembled based on the following:

- A literature review, starting with the sources identified below.
- A follow-up survey of transit agencies for the development of case examples.
- Identification of knowledge gaps and suggestions for research to address those gaps.