SMART BELT COALITION 2022 STRATEGIC PLAN





Table of Contents

Executive Summary	Т
Who We Are	3
Our Mission	3
Introduction	4
Background	4
Purpose	4
Background Key Elements	5
Overview of the Strategic Plan	5
Part 1: Vision, Mission and Goals	6
Vision	6
Mission	6
Goals	6
Outcomes	6
Part 2: Membership, Governance and Support Structure	7
Membership	7
Governing Documents	9
Support Structure	0
Part 3: Existing Conditions and Assets	1
Geographic Reach of the Coalition	1
Highly Automated Vehicle Testing Facilities	3
Highly Automated Vehicle Testing Facilities	3 4
Highly Automated Vehicle Testing Facilities	3 4 4
Highly Automated Vehicle Testing Facilities	3 4 4 5
Highly Automated Vehicle Testing Facilities 1 Part 4: Principles and Initiatives 1 Core Principles 1 Priority Initiatives 1 Additional Initiatives and Principles 1	3 4 4 5 7
Highly Automated Vehicle Testing Facilities 1 Part 4: Principles and Initiatives 1 Core Principles 1 Priority Initiatives 1 Additional Initiatives and Principles 1 Project Development Process 1	3 4 5 7 8
Highly Automated Vehicle Testing Facilities 1 Part 4: Principles and Initiatives 1 Core Principles 1 Priority Initiatives 1 Additional Initiatives and Principles 1 Project Development Process 1 Project Organization 1	3 4 5 7 8 8
Highly Automated Vehicle Testing Facilities 1 Part 4: Principles and Initiatives 1 Core Principles 1 Priority Initiatives 1 Additional Initiatives and Principles 1 Project Development Process 1 Project Organization 1 Part 5: Strategic Support Considerations 1	3 4 5 7 8 9
Highly Automated Vehicle Testing Facilities 1 Part 4: Principles and Initiatives 1 Core Principles 1 Priority Initiatives 1 Additional Initiatives and Principles 1 Project Development Process 1 Project Organization 1 Part 5: Strategic Support Considerations 1 Outreach & Communications Plan 1	3 4 5 7 8 9 9
Highly Automated Vehicle Testing Facilities 1 Part 4: Principles and Initiatives 1 Core Principles 1 Priority Initiatives 1 Additional Initiatives and Principles 1 Project Development Process 1 Project Organization 1 Part 5: Strategic Support Considerations 1 Outreach & Communications Plan 1 Sustainability 1	3 4 5 7 8 9 9 9
Highly Automated Vehicle Testing Facilities 1 Part 4: Principles and Initiatives 1 Core Principles 1 Priority Initiatives 1 Additional Initiatives and Principles 1 Project Development Process 1 Project Organization 1 Part 5: Strategic Support Considerations 1 Outreach & Communications Plan 1 Part 6: Five-Year Implementation 2	3 4 5 7 8 8 9 9 9 1
Highly Automated Vehicle Testing Facilities 1 Part 4: Principles and Initiatives 1 Core Principles 1 Priority Initiatives 1 Additional Initiatives and Principles 1 Project Development Process 1 Project Organization 1 Part 5: Strategic Support Considerations 1 Outreach & Communications Plan 1 Sustainability 1 Part 6: Five-Year Implementation 2 Immediate Milestones 2	.3 .4 .5 .7 .8 .8 .9 .9 .9 .1 .1
Highly Automated Vehicle Testing Facilities 1 Part 4: Principles and Initiatives 1 Core Principles 1 Priority Initiatives 1 Additional Initiatives and Principles 1 Project Development Process 1 Project Organization 1 Part 5: Strategic Support Considerations 1 Outreach & Communications Plan 1 Sustainability 1 Part 6: Five-Year Implementation 2 Immediate Milestones 2 Future Milestones 2	3 4 5 7 8 8 9 9 9 1 1 1
Highly Automated Vehicle Testing Facilities 1 Part 4: Principles and Initiatives 1 Core Principles 1 Priority Initiatives 1 Additional Initiatives and Principles 1 Project Development Process 1 Project Organization 1 Part 5: Strategic Support Considerations 1 Outreach & Communications Plan 1 Sustainability 1 Part 6: Five-Year Implementation 2 Immediate Milestones 2 Future Milestones 2 Future Priorities 2	3 4 5 7 8 8 9 9 9 1 1 1 1
Highly Automated Vehicle Testing Facilities 1 Part 4: Principles and Initiatives 1 Core Principles 1 Priority Initiatives 1 Additional Initiatives and Principles 1 Project Development Process 1 Project Organization 1 Part 5: Strategic Support Considerations 1 Outreach & Communications Plan 1 Sustainability 1 Part 6: Five-Year Implementation 2 Immediate Milestones 2 Future Milestones 2 Future Priorities 2 Plan Update Cycle 2	3 4 4 5 7 8 8 9 9 9 1 1 1 1 1
Highly Automated Vehicle Testing Facilities 1 Part 4: Principles and Initiatives 1 Core Principles 1 Priority Initiatives 1 Additional Initiatives and Principles 1 Project Development Process 1 Project Organization 1 Part 5: Strategic Support Considerations 1 Outreach & Communications Plan 1 Sustainability 1 Part 6: Five-Year Implementation 2 Immediate Milestones 2 Future Milestones 2 Plan Update Cycle 2 Appendix A: Letter of Understanding 2	3 4 4 5 7 8 8 9 9 9 1 1 1 1 1 2
Highly Automated Vehicle Testing Facilities 1 Part 4: Principles and Initiatives 1 Core Principles 1 Priority Initiatives 1 Additional Initiatives and Principles 1 Project Development Process 1 Project Organization 1 Part 5: Strategic Support Considerations 1 Outreach & Communications Plan 1 Sustainability 1 Part 6: Five-Year Implementation 2 Immediate Milestones 2 Future Priorities 2 Plan Update Cycle 2 Appendix A: Letter of Understanding 2 Appendix B: SBC Participants 2	34457889991111125



Table of Figures

Figure 1: SBC Background Key Elements	5
Figure 2: Overview of the Strategic Plan	5
Figure 3: SBC Goals	6
Figure 4: SBC Members and Partners	8
Figure 5: SBC Support Structure	10
Figure 6: SBC Map	12
Figure 7: HAV Testing Facilities and Smart City Challenge Applicants	13
Figure 8: ADS Data Initiative Timeline	16
Figure 9: Systems Engineering Process	18
Figure 10: SBC Initiative Schedule	21

Table of Tables

7
11
17
20
25



Smart Belt Coalition 2022 Strategic Plan

EXECUTIVE SUMMARY

The Smart Belt Coalition (SBC) was formed in 2016 and is a strategic transportation collaborative comprised of 12 organizations, including five transportation agencies and seven research and academic institutions, located throughout Michigan, Ohio, and Pennsylvania. The mission of the SBC is to create a mechanism for transportation agencies, academic institutions, and others to collaborate on connected vehicle, automated vehicle, and vehicle electrification initiatives.



From an economic outlook, Michigan, Ohio, and Pennsylvania collectively represent a portion of the U.S. economy that rivals California and Texas, generating **\$1.8 TRILLION** in gross domestic product in 2019.



The three states are home to **34.6 MILLION RESIDENTS** and the metropolitan hubs of Philadelphia, Pittsburgh, Cincinnati, Columbus, Cleveland, and Detroit.



Collectively, the tristate region trades, or moves, more than 11% of all national goods VALUED AT MORE THAN \$3.2 TRILLION domestically and internationally. This strategic plan details the core principles and priority initiatives of the SBC over the next five years. The core principles were identified to guide future efforts and should be considered as part of every initiative agreement and charter to ensure the coalition's vision, mission and goals are met. The core principles are the following:

Community of Practice

The SBC will recognize challenges and lessons learned experienced by the coalition members and outside agencies. Identifying these challenges and building on lessons learned will promote growth and strength within the coalition and its initiatives.

Standards

Through the engagement of other entities and organizations, the SBC is positioned to assist in the coordination and development of standards through its priority initiatives.

Coalition Best Practice

Best practices involving organizational structure, executive leadership involvement, organizational and project funding, and member training are important to the Coalition and will be key aspects to evaluate.

Collaboration

The Coalition understands the benefit of collaboration in connected vehicle, automated vehicle, and vehicle electrification development. Enhanced collaboration between members of the SBC will ensure regional opportunities for competitive grants.

Through a prioritization process, the SBC identified three priority initiatives to focus on over the next few years. The priority initiatives determined by the SBC are the following:



Data Sharing

This initiative will involve coordination between the SBC members and ADS developers to identify and standardize industry data needs and available agency data.

Electrification

This initiative will focus on the dissemination of information to ensure opportunities are not missed as each SBC member progresses electrification. The sharing of information will enhance the general knowledge surrounding electrification and provide awareness of best practices and lessons learned gained from other members.

SBC Website

This initiative will involve the creation of a website to house the SBC strategic plan, background information of the SBC, and information on previous activities, reports, grants, and media. The formation of an SBC website is critical to enhancing the legitimacy of the SBC as an organization and to help create additional awareness of the Coalition.





Who We Are

The Smart Belt Coalition (SBC) is a strategic partnership comprised of transportation agencies and academic institutions throughout Michigan, Ohio, and Pennsylvania.

Our Mission

Create a mechanism for transportation agencies, academic institutions, and others to collaborate on connected vehicle, automated vehicle, and vehicle electrification initiatives.

MEMBERS				
State	Agencies	Research Affiliates		
Michigan	CONDOT Michigan Department of Transportation	American Center for Mobility Kettering		
Ohio	DriveOhio Through OHIO DEPARTMENT OF OHIO DEPARTMENT OF TRANSPORTATION	THE OHIO STATE UNIVERSITY Transportation Research Center Inc.		
Pennsylvania	pennsylvania DEPARTMENT OF TRANSPORTATION	Carnegie Mellon University PennState		



Introduction

Background

The Smart Belt Coalition (SBC) was formed in 2016 and is a strategic transportation partnership comprised of 12 organizations, including six transportation agencies and seven research and academic institutions, located throughout Michigan, Ohio, and Pennsylvania. The SBC was first initiated as a result of conversations between multiple agencies and research affiliates from Michigan, Ohio, and Pennsylvania. Recognizing the opportunity for partnership and mutual interest in establishing a forum for collaboration, the organizations planned and facilitated the inaugural SBC meeting in May 2016.

Purpose

The Coalition was organized for the safety, economic benefit, and welfare of transportation system users in the partner states. The purpose of the SBC is to foster collaboration involving research, testing, policy, standards development, deployments, outreach, and funding pursuits in the area of connected vehicle technology, automated vehicle technology, vehicle electrification, and other innovations in the transportation industry. Key activities to be undertaken by the SBC include the following:

- Provide standardization and interoperability across the agencies.
- Establish a high-profile, high-impact, and long-distance network for connected and automated driving system innovations.
- Strategize the process and requirements to identify a high-volume logistics route suitable for electrification and renewable energy infrastructure.
- Support research, testing, and deployment of various applications of connected vehicle technology, automated vehicle technology, vehicle electrification, and other innovative and emerging technologies.
- Support platforms to advance the deployment of applications (e.g., agency fleets, first responder vehicles, passenger vehicles, transit vehicles, and trucks).
- Validate innovations across a diversity of urban and rural roadways.
- Share data across agencies to support collaborative innovation.
- Leverage university research and university-led deployments of cutting-edge connected and automated vehicle technology.
- Advance cooperative deployments to achieve cost and time efficiencies and pursue partnerships with private companies.
- Capitalize on the innovative technology investments of local governments and leverage regional and state intelligent transportation system (ITS) investments and architecture.





Background Key Elements



Figure 1: SBC Background Key Elements

Overview of the Strategic Plan

This Strategic Plan focuses on six primary components:



Figure 2: Overview of the Strategic Plan





Part 1: Vision, Mission and Goals

Vision

The Smart Belt Coalition's vision is to be a multi-jurisdictional innovation network that fosters the advancement of connected vehicle technology, automated vehicle technology, vehicle electrification, and other innovative and emerging technologies.

Mission

The Smart Belt Coalition's mission is to create a mechanism for transportation agencies, academic institutions, and others to collaborate on connected vehicle, automated vehicle, and vehicle electrification initiatives.



Goals

The Coalition will foster collaboration involving research, testing, policy, standards development, deployments, outreach, and funding pursuits in the area of connected vehicle technology, automated vehicle technology, vehicle electrification, and other innovated and emerging technologies.

The ultimate goal of the Coalition is the strategic deployment of innovative technology to:



Figure 3: SBC Goals

Outcomes

By implementing the SBC's priority initiatives, the Coalition strives to work towards the overall goals of the SBC. The primary outcomes are safety and mobility, which in turn support economic competitiveness and improve quality of life. For each SBC initiative, performance measures will be established by the SBC to ensure the initiative is in alignment with the desired outcomes of the Coalition. Priority initiative performance measures are detailed in Part 4: Principles and Initiatives.





Part 2: Membership, Governance and Support Structure

Membership

Members and Partners

SBC members are transportation agencies and research affiliates that operate inside the core area and make a financial commitment to the SBC. The members vote on Coalition priorities, actions, and strategic direction. The role of the five agencies as infrastructure owners and operators is to guide research, deployment, and policy development in order to support their respective missions. The role of the transportation affiliate academic institutions and research centers is to jointly work with the agencies to identify and develop potential research topics in connected vehicle technologies, automated vehicle technologies, vehicle electrification, and other emerging technologies. SBC partners are participants that operate outside of the core area but have vested interests in either exchanging information with the SBC or participating in specific projects that the SBC heads. All SBC participants are expected to read and agree to the Partnership Guidelines, and all participants must understand and acknowledge the Letter of Understanding (LOU), with the exception of the agencies which are specifically bound by the LOU.

Table 1 outlines the roles of Coalition members and partners as they relate to SBC governance.

			Governing Documents			
Role	Туре	Responsibility	Voting Rights	Financial Commitment	LOU	Partnership Guidelines
Members	Agencies	Governance, Strategic Planning, & Deployment (state, county, local)	Yes	Member contributions & project funding	Sign	Accept
	Research Affiliates	Development Support, Data Analytics, & Evaluation	Yes	Affiliate contributions & project funding	Accept	Accept
	Public/ Non-Profit	Funding & Evaluation	No	Opportunity for grant funding	Accept	Accept
Partners	Private	Technology, Innovation, Expertise, & Pilot Investment	No	Pilot investment	Accept	Accept

Table 1: Defining the Roles of SBC Members and Partners



Current Member Organizations

The SBC members include five agencies and seven research affiliates, as shown in Figure 4.



Figure 4: SBC Members and Partners

Future Members

Freight movement, traffic flow, and transportation safety does not end at the geographic borders of any one state. Activities and initiatives that benefit the SBC will also benefit neighboring states and provinces. Likewise, activities and initiatives in neighboring states (and provinces can have a direct benefit and impact to SBC members. Pooling together resources and ideas from a larger group will help the SBC achieve their goals and initiatives.

Transportation agencies and research institutions from neighboring states to include in SBC activities are shown in Figure 4. These states, by being contiguous to the SBC, can serve as a logical extension for SBC activities.

Potential future members of the SBC will initially be invited to planned SBC meetings and activities, or as a partner for a specific initiative. To become active in the SBC, new members would be requested to sign a letter of understanding, similar to what the existing members signed upon establishment of the Coalition. New members will only be invited to the SBC if the current SBC members feel there is a specific benefit and reason to add the member.





- Enable multijurisdictional collaboration.
- Facilitate a forum for policy makers to make key transportation decisions.
- Provide access to shared transportation data and information.
- Share best practices among members.
- Offer joint funding opportunities for large scale transportation research and deployment projects.
- Improve operational coordination and customer focus.
- Stimulate economic development potential.

Expectations of <u>Members</u>

Participate in periodic SBC activities including, but not limited to, meetings, webinars, teleconferences, and peer-to-peer meetings.

- Commit staff time to develop and implement agreed upon initiatives.
- Provide prorated matching funds when applicable and acceptable to the agencies involved with a particular joint project. There is no expectation for formal agreements or payment of dues, but financial contribution should be commensurate with affiliation level (agency or research affiliate).
- Commit to working together with SBC members and affiliates.

Governing Documents

Letter of Understanding

To establish the Coalition, a LOU was fully executed in May 2017 between the Michigan Department of Transportation (MDOT), Ohio Department of Transportation (ODOT), the Ohio Turnpike and Infrastructure Commission (OTIC), Pennsylvania Department of Transportation (PennDOT), and the Pennsylvania Turnpike Commission (PTC). The LOU specifies the agencies' intent to participate in the Coalition for purposes of advancing automated and connected vehicle infrastructure technology and to enhance safety, mobility, economic competitiveness, and overall quality of life of the partner states through strategic deployment of innovative technologies. The copy of the fully executed LOU can be found in Appendix A: Letter of Understanding.

DriveOhio, an initiative through ODOT that aims to organize and accelerate smart and connected vehicle projects, joined the Coalition in January 2018 after its formation to represent ODOT in the SBC.

Membership Guidelines

The Membership Guidelines provide an overview of the SBC as well as the level of collaboration expected among members. A copy of the guidelines can be found in Appendix C: Membership Guidelines.

Strategic Plan

With multiple member organizations, it is important to have a strategic plan that makes the SBC's vision, missions, and goals clear to those involved. This Strategic Plan outlines the SBC's organizing principles and provides a roadmap for the SBC's actions for the next five years. The plan is intended to be a flexible, working document which can be modified and updated as progress is made on the SBC's vision, mission, goals, and priority initiatives.



Project Agreements

For initiatives requiring funding sources in addition to the funding partner, a template for initiative agreements or charters will be developed to facilitate the sharing of initiative details and to provide clear guidance and goals when pursuing and funding initiatives. As initiatives require cost and time commitments, members are not expected to take part in all activities led by the Coalition. Participation will be voluntary, based on individual member organization priorities. When a member does agree to participate in an initiative, it is expected that the member will participate fully and deliver on their commitment.

Support Structure

A chairperson is appointed to guide the activities of the Coalition and will be the designated lead person from the organization currently providing administrative support funding (see Table 4). This chairperson is assisted by the past chairperson from the previous funding organization. The current chairperson and

past chairperson of the Coalition are identified in Appendix B: SBC Participants.

For each initiative, a project-specific team is created to provide support and guidance for the initiative. This team could include representation from the following areas:

- Advisory
- Funding Legal
- Legislative
- Outreach & Communications
- Policy
- Procurement
- Technology
- Deployment



Meetings and Support

The SBC will meet four times a year to conduct administrative, project, and planning functions. Additional virtual meetings and webinars may be established as-needed for initiative-specific purposes, or for additional administrative functions.





Geographic Reach of the Coalition

The SBC serves a three-state area under the jurisdiction of the state department of transportations (DOT) and toll agencies in Michigan, Ohio, and Pennsylvania. The transportation systems of the DOTs and toll agencies span 173,044 lane miles and support 236.8 billion annual vehicle trips which occur on Michigan, Ohio, and Pennsylvania state-owned and toll roadways each year. From an economic outlook, Michigan, Ohio, and Pennsylvania collectively represent a portion of the U.S. economy that rivals California and Texas, generating \$1.8 trillion in gross domestic product in 2019. The three states are home to 34.6 million residents and the metropolitan hubs of Philadelphia, Pittsburgh, Cincinnati, Columbus, Cleveland, and Detroit. These cities and the surrounding suburban communities comprise a large portion of the Great Lakes Megaregion as well as a portion of the Northeast Megaregion. Connecting the two Megaregion hubs, Michigan, Ohio, and Pennsylvania each feature prominent freight corridors that are vital routes for the distribution of raw materials and finished goods to and from the Great Lakes region and some of the nation's largest consumer markets in the Northeast. Collectively, the tristate region trades, or moves, more than 11 percent of all national goods valued at more than \$3.2 trillion domestically and internationally.

	MDOT	ODOT	отіс	PennDOT	РТС	Total
Miles of Roadway (Agency maintained)	9,651	19,257	241	39,720	554	69,423
Miles of Lanes (Agency maintained)	31,141	49,682	1,285	88,329	2,553	173,044
Annual Vehicle Miles Traveled (M) (Statewide)	101,700.00	169,623.92	2,467.45	102,764.68	5,157.14	381,713.19
Toll Revenue (Annual)	\$0	\$0	\$316,900	\$0	\$1,258,811	\$1,575,711

Table 2: Road and Traffic Statistics

Updated December 2021



TEGIC PLAN

In addition, Michigan's international crossings with Canada supports international commerce and the flow of imports and exports. According to the Bureau of Transportation Statistics, the international border crossing in Detroit handles the highest volume of freight traffic of all land crossings with Canada and is the second highest international border crossing by freight volume in all of North America.



Figure 6: SBC Map





Highly Automated Vehicle Testing Facilities

Within the tri-state area, there are several Highly Automated Vehicle (HAV) testing facilities that may serve as future partners to support the mission of the SBC. In addition, the tri-state area is home to the Smart City Challenge winner (Columbus) and several Smart City Challenge applicants, who are already advancing innovative technology advancements to reshape and transform transportation operations in their respective cities. Figure 7 shows the proximity of the HAV testing facilities and Smart City Challenge applicants in the region. Prominent, SBC associated, HAV testing facilities include the following:

- [MCity] University of Michigan MCity (Ann Arbor, MI)
- [MRC] Kettering University GM Mobility Research Center (Flint, MI)
- [ACM] American Center for Mobility (Ypsilanti, MI)
- [TRC] Transportation Research Center (East Liberty, OH)
- [CAR] Center for Automotive Research (Columbus, OH)
- [NREC] National Robotics Engineering Center (Pittsburgh, PA)
- [LTI] Thomas D. Larson Transportation Institute (University Park, PA)



Figure 7: HAV Testing Facilities and Smart City Challenge Applicants





Part 4: Principles and Initiatives

The SBC cooperatively prioritized the core principles to guide Coalition activities and priority initiatives for the next two years. The process started with in-person meetings with each state's stakeholder group to brainstorm ideas and activities, followed by an online survey to cooperatively prioritize the projects and initiatives. These initiatives were assessed and reprioritized after the completion of the Truck Platooning/ADS initiative completed in the fall of 2020.

Core Principles

As the Coalition has matured, the following core principles have been identified to guide future efforts. These principles should be considered as part of every project agreement and charter to ensure the Coalition's vision, mission and goals are met.

Community of Practice

The SBC strives to create a community of practice throughout all of its efforts and projects. The community of practice will enhance the Coalition's ability to share information and provide a collaborative environment that will aide in impacting the advancement of the transportation industry.

Part of the focus of the community of practice is to recognize challenges and lessons learned experienced by Coalition members and outside agencies. Identifying these challenges and building on lessons learned will promote growth and strength within the Coalition and its initiatives.

The implementation of an information clearinghouse will promote a collaborative environment through sharing previous successes of the Coalition. The SBC will be able to use cooperative tools, such as a Coalition website, a Microsoft Teams site, and Microsoft SharePoint to easily share information and documentation between members and partners.

Standards

The states that make up the SBC are home to some of the leading entities that drive the development of emerging transportation technology and standards. Paired with the institutional knowledge and technical expertise of Coalition members, the SBC can readily serve as a means for assisting in the development and verification of standards for connected and automated vehicle technology. Organizations such as the Society of Automotive Engineers (headquartered within the geographic boundaries of the Coalition) and the Cooperative Automated Transportation Coalition could find the SBC as a willing and convenient organization for shared activities.

Through the engagement of other entities (public and private) and organizations, the SBC is positioned to assist in the coordination and development of standards through its priority initiatives. These efforts are important for the SBC to act on and to be recognized as a prominent Community of Practice within the industry.

Coalition Best Practice

The SBC recognizes that there are other long-standing, successful, multi-jurisdictional coalitions to address and enhance transportation safety, operations, and technology deployment. The Coalition will





- The Eastern Transportation Coalition (TETC)
- I-10 Corridor Coalition (I-10 Connects)
- I-81 Corridor Coalition (I-81 CC)
- Transportation Operations Coordinating Committee (TRANSCOM)
- Great Lakes Regional Transportation Operations Coalition (GLRTOC)
- Mid-America Freight Coalition (MAFC)

Best practices involving organizational structure, executive leadership involvement, organizational and project funding, and member training are important to the Coalition and will be key aspects to identify as the Coalition continues to establish its best practices.

Collaboration

To guide future efforts of the SBC, the Coalition understands the benefit of collaboration in connected vehicle, automated vehicle, and vehicle electrification development. Enhanced collaboration between members of the SBC will ensure regional opportunities for competitive grants.

Priority Initiatives

Through a prioritization process, the SBC identified potential initiatives to undertake, which are listed in the Additional Initiatives and Principles section of the Strategic Plan. Of the potential initiatives, three priority initiatives were created which encompass many of the identified potential initiatives. These priority initiatives will be a focus over the next two years, until the SBC priorities are reassessed.

Data Sharing

In October 2020, the SBC successfully conducted a demonstration of truck platooning and automated driving system (ADS) technology to test the administrative and procedural requirements necessary for a truck platooning system to operate continuously through a multi-jurisdictional environment. During the demonstration process, the SBC gleaned operational lessons learned in the platooning operations plan submission, data gathering/requests, law enforcement notification, infrastructure conditions and ADS engagement, and educational opportunity.

To expand on the success of the demonstration, the ADS data initiative will address several key lessons learned. Through the demonstration, it was unclear as to which data was necessary or provided the greatest benefit to the ADS developer to hold a successful operation. The data sets that were requested were broad and did not contain specific information as to what specifically was being asked. Additional data sets requested were unavailable to agencies, as they typically do not maintain real-time or near real-time inventories or conditions of assets or features, such as pavement marking quality, or the location of retaining walls, large trees, or where shadows are present.

This initiative will involve coordination between the SBC members and ADS developers to identify and standardize industry data needs and available agency data. Roadway features and pavement conditions that impact ADS technology would also be discussed as well as Infrastructure Owner Operator (IOO) "realities" to create a better understanding of ADS technology limitations and potential infrastructure improvements. By involving ADS developers and shippers (end users) as well as SBC members in this



initiative, the SBC will be able to better align with ADS developer and shipping company needs. This industry coordination and data standardization process would follow the timeline depicted in Figure 8.





Performance measures

Performance measures surrounding industry outreach will be determined by the project-specific team. Measures may include amount of feedback from industry or number of industry partners. Post-initiative interaction may also help measure the success of the results gained as well as final outreach/marketing.

Electrification

Each SBC agency is involved with various levels of planning for the path forward with electrification. Development has occurred in the DOTs and turnpikes with installing electric vehicle charging stations and In-road conductive charging is an area of interest for SBC members. SBC universities are currently conducting electrification research in the following areas: energy storage, AV-electrification integration, transit, charging infrastructure, grid resilience, equity in charging stations, and electric vehicle milage/efficiency.

Due to different involvement levels of electrification efforts currently being done by SBC entities, the SBC identified that electrification coordination efforts between the Coalition members is of significant importance. This initiative will focus on the dissemination and information to ensure opportunities are not missed as each SBC member progresses electrification. The sharing of information will enhance the general knowledge surrounding electrification and provide awareness of best practices and lessons learned gained from other members.

The SBC recognizes the importance of enhancing electrification throughout the SBC and may align with funding opportunities from the Infrastructure Investment and Jobs Act (IIJA), which has a focus of enhancing electric vehicle charging infrastructure and vehicle-to-grid infrastructure.

Performance Measures

Four updates must be conducted throughout the year from each agency to ensure frequent information sharing between the SBC members.

SBC Website

The formation of an SBC website is critical to enhancing the legitimacy of the SBC as an organization and to help create additional awareness of the Coalition. Through the SBC website, the Coalition will be able to share information and best practices with other entities and will allow for broader collaboration to help strengthen the mission of the Coalition.

This initiative will involve the creation of an easily accessible and simple to use website to house the SBC strategic plan, background information of the SBC, and information on previous activities, reports,





grants, and media. Current and future initiatives may also be marketed on the website to help identify potential opportunities for outside agencies, organizations, and companies and in general, raise national awareness of the SBC. A Coalition member access only component of the website may be considered by the SBC to share internal documents between SBC members.

The website may be an organization-hosted website, independent website, or joined with an existing website. Each of these hosting options has different associated costs and benefits that will be weighed by the SBC project team prior to the formation of the website. The website platform, and update frequency will be determined by the SBC project team.

Performance Measures

Data analytics must be documented and shared with the SBC to ensure value is being gained from the website.

Additional Initiatives and Principles

The initiatives identified previously by the SBC were voted upon during the April 2021 SBC meeting to decide whether they should be considered as priorities of the Coalition. Each initiative that received at least two votes by different SBC members will remain in the Strategic Plan. All initiatives that did not receive at least two votes will still be archived for potential future use. Table 3 details the result of the SBC prioritization process.

Table 3: SBC Initiative Prioritization

	Initiative
ú	V2I message profiles
ioritie	ADS infrastructure support
	Operational Metrics for Multi-state Corridors
Pr	Truck Platooning "Joint Portal"
erm	Electrification along a key freight corridor
Ē	Work Force Development
lea	Coordination with MAASTO / NASTO
~	Coordination with Professional Societies
	RESCUE-ME-Type V2I Applications
	UAS for incident management
_	Work zone mapping and identification
tior	Retro reflectivity for ADS
era	USDOT WZDx
sid	CV security
üo	AV Performance Metrics
e O	"Joint" RFI Development
fu	Work Zone Challenge
Fu	Commercialization of V2I Data
For	OBU Installation Process for Trucks
	Automated Transit Systems
	National Marketing Strategy
	Data Access



Project Development Process

All projects undertaken by the SBC will follow the Systems Engineering Process (see Figure 9). The Systems Engineering Process focuses on defining user needs and necessary functionality (i.e., system requirements) early in the project development process. After documenting project requirements, the process proceeds with design synthesis and system validation. It is expected that a lead organization, will be identified by the organizational charter, to administer the financial and contractual matters of individual projects. The charter will include the SBC members that are taking part in the project, and what their individual roles and responsibilities are. Potential funding sources for the project will be identified, as well as a process detailed for procuring the funding. This process will also include the expected funding contributions, if any, from all project team members. SBC members will jointly review and select from any submitted project proposals and will serve on project teams dedicated to each initiative.



Figure 9: Systems Engineering Process

Project Organization

Each project or program initiative will use a project management team concept, which has proven successful with other multi-agency projects across the nation. With this concept, the project organizational chart will include a lead agency as an overall project manager and a second agency fulfilling a technical management role. The other agencies and research affiliates will serve in support roles as warranted by the specific project or program initiative.





Part 5: Strategic Support Considerations

Outreach & Communications Plan

Communications

The SBC will provide some type of outward communication that still needs to be determined, but it is anticipated to be done quarterly. If a newsletter style of outreach is preferred, it could grow out of the specific projects and initiatives undertaken by the SBC and will help track the progress of the SBC's achievements and short-term goals. Coordination with SBC communications staff will be involved through the entirety of an SBC initiative to allow for staff to gain a better understanding of the project as a whole, and to identify any potential public or media relations coordination points.

Presentations and Conferences

Communicating with peers in the transportation industry is vital to the success of connected vehicle technology, automated vehicle technology, vehicle electrification, and other innovated and emerging technologies. Toward this end, the SBC will continue to coordinate with groups, agencies, and interested stakeholders to present the SBC's vision, mission, and goals, as well as to initiate a broader discussion of the SBC's priority initiatives.

Website

Launching a website for the Coalition, which is identified as a priority initiative, will help establish the organization's legitimacy and provide an online platform to easily promote the SBC and its mission. The website will also serve as an information hub for truck platooning/ADS activities through the Coalition. Outreach and communications team members will plan and coordinate how the website will be maintained and updated. Additional information regarding the SBC website is located in the Priority Initiatives section of the Strategic Plan.

Collaboration

To guide future efforts of the SBC, the Coalition understands the benefit of collaboration in connected vehicle, automated vehicle, and vehicle electrification development. Enhanced collaboration between members of the SBC will ensure regional opportunities for competitive grants.

Sustainability

Coalition Leadership

SBC members agreed that administrative responsibilities will be covered on a rotating basis. Although specific years are not tied to the administration rotation, leadership should remain equal across the organizations. The administrative rotation can be found in Table 4. New members will be integrated into the administrative structure of the Coalition.



Table 4: Administrative Rotation

YEAR	COALITION LEADERSHIP
2017 – 2018	Pennsylvania Turnpike Commission
2019 – 2020	Pennsylvania Department of Transportation
2021 – 2022 Michigan Department of Transportation	
	Ohio Turnpike Infrastructure Commission
	Ohio Department of Transportation
	Pennsylvania Turnpike Commission, or new member
	Pennsylvania Department of Transportation, or new member

Federal/National Funding Opportunities

The recently passed Infrastructure Investment and Jobs Act (IIJA) (H.R. 3684 of 2021-2022) has several provisions related to advancing vehicle electrification and connected and automated vehicle research and pilot programs. These programs and associated funds have not yet materialized, however the SBC should continue to monitor potential funding opportunities that arise through this recent legislation.

In addition to the recently passed IIJA, there are a number of federal and national funding-based programs and initiatives offered throughout each year. The majority of funding sources are centered on the various USDOT departments and their respective programs, such as:

- Surface Transportation Program Funds
- Transportation, Community, and System Preservation Program
- ITS Joint Program Office Connected Vehicle Pilot Deployments
- Transportation Investment Generating Economic Recovery Grants
- Build America Bureau Fostering Advancements in Shipping and Transportation for the Longterm Achievement of National Efficiencies (FASTLANE) Grants
- FAST ACT Grant
- ATCMTD Grant
- AID Grant
- Transportation Research Board
- Partner Pooled Fund Studies





Part 6: Five-Year Implementation

Immediate Milestones

The following initiatives are immediate milestones of the Coalition, to be focused on primarily in early 2022:

- Data Sharing initiative
- SBC Website

The electrification initiative and the SBC's Core Principles will be a continuous focus of the SBC.

Future Milestones

Figure 10 shows a preliminary schedule of future milestones for Coalition activities and strategic plan development. The future milestones of the priority initiatives are to be determined by the project-specific teams once they are created.



Figure 10: SBC Initiative Schedule

Future Priorities

Additional potential initiatives, detailed in the Additional Initiatives and Principles section of the Strategic Plan, should be considered once the priority initiatives are fully established. Potential near-term priorities include:

- V2I message profiles
- ADS infrastructure support
- Operational Metrics for Multi-state Corridors
- Truck Platooning "Joint Portal"

- Electrification along a key freight corridor
- Work Force Development
- Coordination with MAASTO / NASTO
- Coordination with Professional Societies

Plan Update Cycle

To limit time and resources allocated to updating the Strategic Plan, administrative updates will be performed each year, with an in-depth review every few years, as decided by the current SBC chairperson.



Appendix A: Letter of Understanding

MDOT NO. 2017-0383

LETTER OF UNDERSTANDING AMONG THE MEMBERS OF THE SMART BELT COALITION

This Letter of Understanding (LOU) is made as of the Effective Date by and between the Pennsylvania Department of Transportation (PENNDOT), the Pennsylvania Turnpike Commission (PATPK), the Ohio Department of Transportation (ODOT), the Ohio Turnpike and Infrastructure Commission, and the Michigan Department of Transportation (MDOT), together referred to as the Parties.

WHEREAS, transportation agencies need to be duly prepared to support emerging technology including connected and automated vehicles; and

WHEREAS, a coalition between the Parties and other affiliate members, known as the SMART Belt Coalition (Coalition), have organized to enhance safety, mobility, economic competiveness and overall quality of life of the partner states through strategic deployment of innovative technology;

WHEREAS, Section 2002(a) (7) of the Pennsylvania Administrative Code of 1929, as amended, 71 P.S. § 512(a) (7), authorizes PENNDOT to cooperate with appropriate public agencies in other states and with interested organizations in the coordination of plans and policies for the development of transportation facilities; and,

NOW THEREFORE, the Parties set forth the following terms and conditions of their full and complete understanding of this LOU for the creation of an automated vehicle infrastructure coalition.

- A. Vision and Mission
 - The Coalition's vision is an innovation network that fosters the advancement of connected and automated vehicles while growing the knowledge and economy.
 - 2. The Coalition's mission is to create a mechanism for transportation agencies, academic institutions and others to collaborate on connected and automated vehicle initiatives.
- B. Background Statement:
 - The Coalition will foster collaboration involving research, testing, policy, standards development, deployments, outreach, and funding pursuits in the area of connected and automated vehicle technology as well as other innovations in the transportation industry.
 - 2. The ultimate goal of the Coalition is the strategic deployment of innovative technology that enhances safety, mobility, economic competiveness and overall quality of life.
- C. Members
 - The membership of the Coalition consists of the Parties and the following affiliate members in Michigan, Ohio, and Pennsylvania: University of Michigan, American Center for Mobility, Kettering University, Ohio State University, Transportation Research Center, and Carnegie Mellon University.
 - 2. The role of the Parties as infrastructure owners is to guide research, deployment, and policy development that support their respective missions.
 - The role of the affiliate members as academic institutions and research centers is to jointly work with members to identify and develop potential research topics in connected and automated vehicles as well as other emerging technologies.



 The Parties may agree to add members and affiliate members as appropriate to fulfill the mission and vision of the Coalition.

D. Key Representatives

 The Parties designate the following holders, or their successors, of the listed positions to the primary points of contact for each of the Parties for general activities under this LOU:

PENNDOT

Leslie Richards PA Secretary of Transportation Keystone Building 400 North St. Harrisburg, PA 17120 (717) 787-5574

ODOT

Jerry Wray ODOT Director Director's Office 1980 West Broad St. Columbus, OH 43223 (614) 466-7170

MDOT

Kirk Steudle State Transportation Director State Transportation Building 425 W. Ottawa St. Lansing, MI 48909 (517) 373-2090

PATPK

Mark Compton Chief Executive Officer Turnpike Commission Administration Building 700 South Eisenhower Boulevard Middletown, PA 17057 (717) 831-7370

OTPK

Randy Cole Executive Director Ohio Turnpike and Infrastructure Commission 682 Prospect St. Berea, OH 44017 (440) 234-2081

The Parties will provide a listing of the individuals holding the positions listed in this section with appropriate contact information addresses to each other and will update those lists as necessary.

E. Term

The Partnership Agreement and Strategic Plan define the organizational structure, common needs and joint deployment opportunities of the Coalition.

This LOU will remain in full effect until such time that any or all Parties determine that it is no longer necessary. If one Party determines that it is in its best interest to terminate this LOU, the Party shall provide 90 days' written notice to the other Party. At that time, each Party shall coordinate efforts to complete any outstanding projects under this LOU and ensure that any data or property belonging to the other Party is returned.

F. Effect

 This LOU is not intended to and does not create and contractual rights or obligations with respect to the signatory Parties or any other parties or affiliates.



2. This LOU does not create any monetary obligations on behalf of any party.

By our signature below, we certify that our respective Boards of Directors have authorized us to enter into this LOU on behalf of our agency.

Se l 3.7.17 G Date

Leslie Richards PA Secretary of Transportation

<u>//2//7</u> Date Jerry Wras ODOT Director

5 Date

Mark Compton Date Chief Executive Officer, PA Turnpike

Randy Cole Date

Executive Director, Ohio Turnpike

2-15-17 2-23-17 1.6.8. Date

Kirk Steudle Date Michigan State Transportation Director





SBC Leadership	
2021 Chairperson	Elise Feldpausch Michigan Department of Transportation
2021 Past Chairperson	Mark Kopko Pennsylvania Department of Transportation

SBC Membership

Table 5: SBC Members

Name	Organization	Title	
Chaput, Mark	American Center for Mobility	Chief Operating Officer	
Caldwell, Stan	СМИ	Executive Director, Traffic21 Institute	
Bremer, Andrew	DriveOhio	Deputy Director, Policy & Legislative Services	
Hegemier, Nick	DriveOhio	ITS Engineer	
Jones, Cynthia	DriveOhio	Program Manager	
Garland, James	FHWA	Planning Capacity Building Team Leader	
Hoff, Craig	Kettering U	Dean of College of Engineering	
Castle, Collin	MDOT	ITS Program Manager	
Feldpausch, Elise	MDOT	CV Specialist and Program Manager	
Bergsten, Jeffrey	Michael Baker International	Vice President, Technical Services	
Seibel, Scott	Michael Baker International	Civil Associate II	
Smith, Matt	Michael Baker International	Associate Vice President, Emerging Technology	
Bonnett, Travis	Ohio Turnpike	Traffic Engineer	
Kelley, Brian	Ohio Turnpike	Chief Technology Officer	
Yacobucci, Tony	Ohio Turnpike	Chief Engineer	
Cooke, David	OSU	Sr. Associate Director, Center for Automotive Research	
Kopko, Mark	PennDOT	Director, Office of Transformational Technology	
Tobias, Kevin	PennDOT	Administrative Specialist	
Donnell, Eric	PSU	Professor of Civil Engineering	
Pack, Mike	PTC	Senior Traffic Operations Project Manager	
Scanlon, Tim	PTC	Director, Traffic Engineering and Operations	
Taylor, Bob	PTC	Chief Technology Officer	
Cunard, Richard	TRB	Engineering of Traffic & Operations	
Weimer, Maryn	TRC	Chief Stakeholder Affairs Officer	
Bouonarosa, Mary Lynn	UMTRI	Project Manager, Human Factors	
Bezzina, Deby	UofM	UMTRI Senior Program Manager	





Appendix C: Membership Guidelines

Members

The membership of the SBC consists of transportation agencies and academic institutions in Michigan, Ohio, and Pennsylvania.

	Michigan Department of Transportation
Michigan	University of Michigan
wiichigan	American Center for Mobility
	Kettering University
	Ohio Department of Transportation
	Ohio Turnpike and Infrastructure Commission
Ohio	DriveOhio, through the Ohio Department of Transportation
	The Ohio State University
	Transportation Research Center
	Pennsylvania Department of Transportation
Perseylyania	Pennsylvania Turnpike Commission
Pennsylvania	Carnegie Mellon university
	Pennsylvania State University

The role of transportation agencies as infrastructure owners is to guide research, deployment, and policy development that support their respective missions.

The role of the transportation affiliate academic institutions and research centers is to jointly work with the agencies to identify and develop potential research topics in connected vehicle technologies, automated vehicle technologies, vehicle electrification, and other emerging technologies.



- Enable multijurisdictional collaboration.
- Facilitate a forum for policy makers to make key transportation decisions.
- Provide access to shared transportation data and information.
- Share best practices among members.
- Offer joint funding opportunities for large scale transportation research and deployment projects.
- Improve operational coordination and customer focus.
- Stimulate economic development potential.



Expectations of Members

- Participate in periodic SBC activities including, but not limited to, meetings, webinars, teleconferences, and peer-to-peer meetings.
- Commit staff time to develop and implement agreed upon initiatives.
- Provide prorated matching funds when applicable and acceptable to the agencies involved with a particular joint project. There is no expectation for formal agreements or payment of dues, but financial contribution should be commensurate with affiliation level (agency or research affiliate).
- Commit to working together with SBC members and affiliates.



SMART BELT COALITION 2022 STRATEGIC PLAN

PREPARED BY:

