



Regional
Transportation
Demand
Management
(TDM)

2019

Strategic Action Plan

Submitted to: Southwestern Pennsylvania Commission
Submitted by: ICF

Special thanks to the members of the Steering Committee and stakeholders who guided the development of this plan:

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- Allegheny County Economic Development
- Butler County Department of Planning and Development
- City of Pittsburgh Department of Mobility and Infrastructure
- CommuteInfo, Southwestern Pennsylvania Commission
- Fayette County Planning, Zoning, and Community Development
- Federal Highway Administration–Pennsylvania Division
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- Lawrence County Planning Department
- Oakland Transportation Management Association
- PA Department of Transportation, Center for Program Development and Management
- PA Department of Transportation, Engineering District 10-0
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- PA Department of Transportation, Planning and Contract Management Division
- Pittsburgh Downtown Partnership
- Washington County Planning Commission
- Westmoreland County Department of Planning and Development

Additional Stakeholders

- Allegheny Conference on Community Development
- Allegheny County Health Department
- Alliance for Nonprofit Resources
- BikePGH
- Carnegie Mellon University
- City of Pittsburgh Department of City Planning
- City of Pittsburgh Nighttime Economy Coordinator
- Duquesne Light Corporation
- Duquesne University
- Enterprise
- FedEx
- Friends of the Riverfront
- Green Building Alliance
- Lark Enterprises
- Marshall Township
- Michael Baker
- Moon Township
- Oakland Planning & Development Corporation
- Penn State Extension
- Pittsburgh Community Reinvestment Group (PCRG)
- Pittsburgh Department of City Planning
- Pittsburghers for Public Transit
- Port Authority of Allegheny County

- Presbyterian Senior Care Network
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- Smart Growth Partnership of Westmoreland County
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- United Way of Southwestern Pennsylvania
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EXECUTIVE SUMMARY

Transportation Demand Management (TDM) provides a flexible and cost-effective approach to advance mobility for all, maximize the efficiency of existing infrastructure, improve transportation system operations, safety, sustainability, as well as economic and community vitality. TDM is about **expanding travel choices** beyond driving alone and operates at the intersection of behavior change and systems optimization. Southwestern Pennsylvania has already achieved a variety of successful TDM programs and activities, but there is a need to better integrate TDM into transportation planning and project development. Strengthening the integration of TDM into regional planning, project development, and system operations supports a wide array of public benefits related to accessibility, mobility, system reliability, safety, economic development, quality of life, and cost-effective use of public funds. To this end, the Southwestern Pennsylvania Commission (SPC) has led the development of a Regional Transportation Demand Management Strategic Action Plan. This planning initiative facilitated collaboration between SPC, the Pennsylvania Department of Transportation (PennDOT), the Pennsylvania Division Office of the Federal Highway Administration (FHWA) and other TDM stakeholders in Southwestern Pennsylvania to create a regional transportation demand management planning framework.

The purpose of the Regional TDM Strategic Action Plan is to inform, support, and implement expansion of transportation options in the Southwestern Pennsylvania region. Building on the initial efforts of a Federal Highway Administration (FHWA) TDM Workshop in 2017, this Action Plan guides the SPC and partners to bring TDM to the next level of implementation, coinciding with the adoption of the SPC's long range plan update *Smart Moves for a Changing Region*. The Action Plan defines an outcome-driven, performance-based regional approach for TDM strategies and for integrating those strategies into SPC's existing short and long-range planning efforts and programs.

Plan Development Process

The existing conditions analysis inventoried TDM initiatives underway and modal travel patterns in Southwestern Pennsylvania. This analysis consisted of four primary activities: review of travel patterns; review of policies, plans, and programs; a stakeholder survey; and employer and program interviews. Concurrent with the research on existing regional conditions, a best practices review was conducted for integrating TDM into regional planning processes, as well as other examples of effective regional TDM Action Plans, based on national research and peer interviews with other metropolitan planning organizations (MPOs). Stakeholder engagement was accomplished through a TDM Steering Committee assembled to advise plan development, as well as through a project website and two stakeholder workshops for Visioning and Priority-Setting.

Action Plan Vision, Goals, and Priorities

Based upon the foundational ideas generated during the existing conditions analysis, best practices review, and stakeholder engagement, a clearly defined vision and set of goals for the TDM plan were developed.



Desired outcomes of the TDM Vision Statement include:

- Reduced dependence on driving alone
- Increased access to a variety of affordable, effective travel choices
- Improved access to jobs
- Reduced time spent in traffic delays
- Equitable access to destinations for all population groups
- Enhanced community livability (walkable, bikeable places)
- Improved environmental conditions (reduced air pollution, greenhouse gases)
- Improved health and safety

Goals and priorities are described below. Specific actions recommended for each priority are detailed in the body of the Plan.

GOAL: Enhance the Ease of Use, Connectivity, and Effectiveness of Transit and Shared Mobility Options as well as Bicycling and Walking.

Regional priorities include:

- Coordinate connections among transit providers
- Adopt new service models for transit and shared mobility services that can effectively increase their geographic coverage and frequency.
- Reduce transit and high-occupancy vehicle (HOV) travel times in a cost-effective manner
- Improve access to, and quality of, transit hubs and stations
- Incentivize use of travel options and park and rides through discounts and rewards for transit, carpooling, walking, and biking
- Improve pedestrian and bicycle network connectivity, including connections to other modes
- Improve pedestrian and cyclist safety through enforcement, infrastructure, and technology



GOAL: Increase Employer Involvement to Improve Workforce Access to Jobs.

Regional priorities include:

- Establish cost-sharing arrangements between employers and transit
- Expand employer participation in supporting commuting options



GOAL: Increase Awareness of Travel Options and Services.

Regional priorities include:

- Develop resources for travelers to navigate regional options
- Improve signage for travel options and services
- Use marketing campaigns to increase awareness of travel options and services
- Provide school-based education about available travel option



GOAL: Promote Location-Efficient Development.

Regional priorities include:

- Improve access to existing development
- Encourage residents to live in locations that reduce driving needs
- Modify policies and land use plans to promote smart growth, as well as zoning, subdivision, and development regulations to promote TDM-supportive site design
- Establish development of incentive programs for TOD and for incorporating TDM
- Manage the development of parking supply
- Facilitate private-sector investment in travel options and location-efficient development



GOAL: Target Opportunities Beyond Work Trips and to Address Non-Recurring Sources of Delay.

Regional priorities include:

- Encourage and educate travelers to reduce driving for diverse trip types
- Enhance transit services and tools to better serve non-work trips, including special events
- Integrate demand management strategies into construction and work zone management
- Integrate demand management into incident management and emergency management
- Manage transportation system impacts of freight and deliveries



IMPLEMENTATION AND MONITORING

To implement recommended actions to advance priorities and achieve regional goals, it is vital that demand management strategies be integrated into on-going planning and project development at the regional and local levels. Performance measurement is critical for monitoring the effectiveness of actions toward meeting regional goals and integrating performance considerations into decision making. These measures will help the SPC to track progress over time, make adjustments, and communicate results in terms that are meaningful.

Integrating Demand Management in Planning and Project Development

Integrating demand management into planning and project development underlies the implementation process. **Short-term actions serve as next steps** for implementing the Regional TDM Strategic Action Plan, as they provide a foundation for all other recommended goals, priorities, and actions. These next steps are listed below.

Integrating TDM into regional planning and policy

- Establish a regional TDM Committee to advise the SPC Board, which includes representation from SPC, PennDOT, municipalities, educational institutions (including researchers), transit operators, transportation management associations (TMAs), parking operators, emergency responders, and more.
 - Potential activities of the TDM Committee include:
 - Evaluate expansion of TMA models to other parts of the region without existing TMAs.
 - Examine current and past TMA activities to expand reach of programs.
 - Evaluate sources and responsibilities for updating TDM performance measures.
- Develop key TDM performance measures and ensure they are integrated with SPCs overall performance management program.

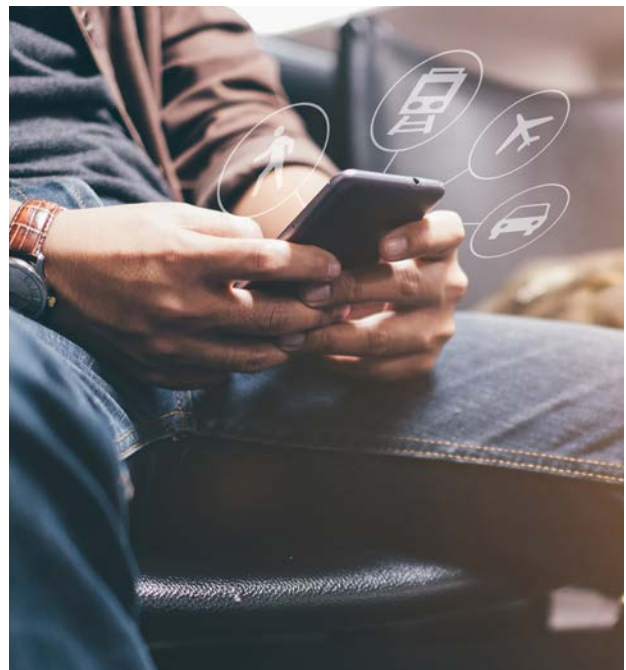
- Leverage PennDOT Connects to encourage local municipalities and citizen groups to participate in meetings at the grassroots level to address community needs.

Integrating TDM into local planning and project development

- Emphasize neighborhood-level TDM initiatives as the starting point for larger-scale programs.
- Support municipalities in using Safe Routes to Schools principles and implementation tools.

Integrating TDM into transportation project selection and programming

- Conduct an assessment of SPC TIP against smart growth goals.



PERFORMANCE MEASUREMENT

Recommended performance measures are listed below and were developed through consideration of best practices, available data sources, and existing performance measures identified in the SPC’s transportation planning and programming documents.

Awareness

- Awareness of travel options/CommuterInfo

Activities

- Number of employers offering commuter benefits
- Travelers served by CommuterInfo services
- Number of vanpools operating
- % of regional bus routes with real-time tracking
- Special events and work zone management

Outputs

- Transit ridership (system-level or route-based)
- Non-single occupant vehicle (non-SOV) work mode share
- Mode share for non-work trips
- Park & ride lot utilization
- Number of jobs within ½ mile of regional transit routes
- Number of households within ½ mile of regional transit routes

Outcomes

- Vehicle miles traveled (VMT) daily per capita (regional or sub-regional scale) or VMT reduced (program evaluation)
- Cost savings (program evaluation)
- Emissions reduced (program evaluation)
- Cost effectiveness (program evaluation)

Effective performance management requires accountability for 1) on-going tracking of performance measures, 2) sharing performance with stakeholders and the general public, and 3) linking observed changes in performance with planning and programming of TDM activities. To ensure that performance measurement provides meaningful insight on the impacts of TDM activities over time, SPC staff should be assigned responsibility for tracking key performance measures, most of which can be tracked on an annual or biennial basis in tandem with the SPC’s overall performance management program.

A TDM Advisory Committee should provide guidance in reviewing the results, advising on communication, and assessing implications in terms of future program and funding priorities.

I. INTRODUCTION AND PURPOSE

Transportation demand management (TDM) is recognized as one of the most flexible and cost-effective strategies for improving regional mobility. Evolving from traditional carpool and vanpool programs of the past, TDM now encompasses a growing inventory of innovations that increase travel choices. These choices include alternatives to driving alone, the time of travel, the route taken, and even whether to take a trip or instead telecommute, engage in e-commerce, chain trips, or receive services online (e.g. tele-medicine). Recent and emerging technologies have created a dynamic landscape for both public and private sector TDM implementation, including shared mobility options and use of real-time travel information to support more efficient and effective travel. This rapid change in the market creates both challenges and opportunities for public agencies to advance regional visions and goals for mobility while benefiting from emerging innovations. A significant challenge for advancing regional goals related to mobility is that in the past, TDM implementation has often been limited to stand-alone programs focused on commuting.

In contrast to stand-alone TDM programming, integrating TDM strategies into regional planning, project-level planning, and transportation systems management and operations (TSMO) maximizes community benefits and enhances performance. To achieve this, the Southwestern Pennsylvania Commission (SPC) has led the development of a regional TDM Strategic Action Plan. This planning initiative facilitated collaboration between SPC, the Pennsylvania Department of Transportation (PennDOT), the Pennsylvania Division Office of the Federal Highway Administration (FHWA), and other TDM stakeholders in Southwestern Pennsylvania to create a regional transportation demand management planning framework.

Southwestern Pennsylvania has a wide range of stakeholders that are already planning and implementing TDM actions at the regional and local scales, including, transportation management associations (TMAs), the Port Authority of Allegheny County, local governments, and PennDOT. These players have identified a significant list of regional goals and potential strategies that have the potential to benefit from TDM. Additionally, the Regional TDM Strategic Action Plan coincides with the adoption of the SPC's long-range transportation plan update, *Smart Moves for a Changing Region*. The region-wide transportation network envisioned in *Smart Moves* provides a range of travel options that meet universal expectations, while supporting the health, mobility, activity, and participation of individuals across the lifespan. As the *Smart Moves* plan highlights Connected Mobility as one of its three core themes, SPC and its partners are at a unique opportunity point for developing a regional TDM Strategic Action Plan to maximize these benefits.

The purpose of this plan is to develop a regional vision and common direction, to identify the balance of existing and emerging actions, and to identify the most effective implementation approach that will optimize the impact of TDM investments and activities across multiple agencies' desired outcomes.



II. PLAN DEVELOPMENT PROCESS

The dynamic plan development process involved existing conditions analysis, best practices review, and stakeholder engagement to identify the priorities and actions for TDM planning and implementation in Southwestern Pennsylvania. The existing conditions analysis provided a foundation for the planning process by articulating an understanding of existing travel patterns, regional strengths, opportunities, and challenges, employer and program perspectives, as well as stakeholder attitudes about local and regional TDM needs and priorities. Through national research and interviews with peer metropolitan planning organizations (MPOs), the best practices review affirmed the SPC's existing approach while identifying potential innovations to improve coordination and effectiveness of TDM initiatives. Based on the findings of the existing conditions analysis and best practices review, a broad set of TDM stakeholders guided the selection of vision concepts, goals, strategic priorities, and actions for the Regional TDM Strategic Action Plan. A large group of over 50 stakeholders provided input through workshops for visioning and priority setting, while a steering committee provided more targeted guidance and review of plan deliverables.

1. Existing Conditions Analysis

To establish a foundational understanding of the TDM initiatives in Southwestern Pennsylvania, an analysis of existing conditions in four key focus areas was conducted, including a review of travel patterns; a review of plans, studies, and initiatives for regional strengths, opportunities, and challenges; and a stakeholder survey. The results of the analysis are summarized in this section.

1.1 Review of Travel Patterns

Review of travel patterns and forecasted socio-economic conditions provided a basis for understanding the mobility needs and opportunities for residents in the region. This section summarizes the data sources, methodology, and main findings for this portion of the existing conditions analysis.

Location of Jobs: Job location data was obtained from the Census Bureau's On the Map - Longitudinal Employer- Household Dynamics (LEHD) tool for the latest year (2015).¹ The analysis showed that in addition to Allegheny County (including Pittsburgh), jobs are clustered around major transportation corridors, including Route 119 in Fayette, Westmoreland, and Indiana Counties, Route 422 across the northeastern counties, Route 51 in Beaver County, and I-79 in Washington and Greene Counties.

Commuting Patterns: Commuting flow data was obtained at the county level from the American Community Survey (ACS) for home (place of residence) to work (primary place for work) representing the years 2009-2013. In the SPC region, the majority (79%) of the workers commute within the same county for work and the largest group (46%) both live and work in Allegheny County. For those who work in a different county, the largest flows were observed from Westmoreland to Allegheny County (43,000 workers), followed by Washington, Butler, and Beaver Counties to Allegheny County.

Regional Growth Forecasts: The SPC's 2040 forecasts for county-level jobs, population, and households (based on 2015 data) were mapped to visualize intraregional variation. Overall, growth in population (13%) and households (16%) is anticipated to outpace growth in jobs (13%), and household size is expected to decrease. Growth through 2040 is expected to be highest in Washington County followed by Allegheny County. None of the ten counties are forecasted to experience population or household decline, though jobs are forecasted to decline in Armstrong and Greene Counties.

¹ <https://onthemap.ces.census.gov/>

Average Weekday Vehicle Miles Travelled (VMT):

Data on average weekday vehicle miles travelled (VMT) was obtained from the Bureau of Transportation Statistics’ (BTS) 2017 Local Area Transportation Characteristics for Households (LATCH)¹. The BTS uses a model to produce census tract level estimates for various travel characteristics such as average daily person miles, person trips, vehicle miles, and vehicle trips based on the National Household Travel Survey² and ACS data. The census tract level travel estimates for the SPC region were mapped and also aggregated to the county level. This analysis showed that the central areas in Pittsburgh have the lowest average daily vehicle miles traveled, while some of the suburban areas in Allegheny, Westmoreland, and Butler Counties have the highest figures. The average person miles and vehicle miles for Allegheny County were lower compared to the other counties of the region, due to shorter trip lengths, as well as higher non-driving mode shares.

Mode Share: The travel model shares for the SPC region were obtained from the 2013-2017 ACS representing workers 16 years and over commuting to work (including work at home). At the county level, drive alone commute mode shares range from 72% (Allegheny) to 84.6% (Butler). Compared to other outlying counties, Indiana has a relatively low drive alone mode share of 79.6% and a high walking mode share (5.2%) that even surpasses the rate of walking in Allegheny (4.2%). In addition to the ACS data, the 2018 Make My Trip County Survey conducted by the Green Building Alliance provided more localized mode share data on commuters travelling to Downtown Pittsburgh, Oakland, and other core neighborhoods. This survey showed much higher use of alternative transportation, with over 40% using public transportation to Downtown and 27% using public transportation to Oakland.

Commute Times: The average commute times for the SPC region were obtained from the 2013-2017 ACS Means of Transportation to Work by Travel Time to Work, which reports on travel times (5-minute bins) for workers 16 years and over who did not work at home. Regionwide, just under 40% of commuters travel more than 30 minutes to work. In Allegheny County, 40.6% had commutes longer than 30 minutes and 9.8 % had commutes shorter than 10 minutes. Given the relatively short trip distances, this indicates that traffic congestion, higher use of transit, and higher density of traffic signals increase travel times in the region’s most populated area. Indiana County residents had the shortest commutes; about 21.3% of them had commutes below 10 minutes.

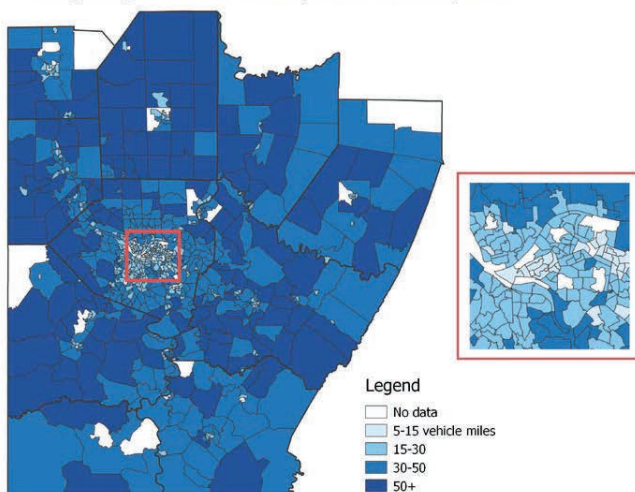


Figure 1: Average Daily Vehicle Miles Travelled for Census Tracts in the SPC Region (Source: 2017 BTS LATCH)

² <https://www.bts.gov/statistical-products/surveys/local-area-transportation-characteristics-households-latch-survey>

³ The National Household Transportation Survey (NHTS) gathers data on daily personal travel, including information on household and demographic characteristics, employment status, vehicle ownership, trips taken, modal choice, and other related transportation data pertinent to U.S. households

Congestion: Several measures were used for congestion analysis (Person-Hours of Delay, Vehicle Hours of Delay, and Cost of Delay) using the Regional Integrated Transportation Information System (RITIS) platform and the National Performance Management Research Data Set (NPMRMDS) User Delay Cost Analysis Tool. The tool determines delays on the specified set of roadways over a selected time period using observed speed probe data as well as data from the national Highway Performance Monitoring System (HPMS) including volume, speed limit, and percentage of Commercial vehicles. In the SPC region for the year 2018, the delay measured was over 46 Million Person-Hours and 37 Million Vehicle-Hours, including over one trillion dollars in cost.



1.2 Regional Strengths, Opportunities, and Challenges

In the SPC region, particularly in Allegheny County and the urban core of Pittsburgh, there are a variety of multimodal services, infrastructure, planning commitments, and development policies to support travelers in using alternative transportation with leadership from employers, government agencies, TMAs, nonprofits, and universities. However, this focus on the dense urban core results in a relative lack of engagement with TDM by stakeholders in outlying counties, which struggle with jobs-housing mismatch and lack of mobility options. The concept of “mobility” rather than “demand management” is a need that unifies the region, and advancing regional mobility motivates stakeholders in rural and suburban areas to engage.

The PennDOT Connects policy provides a framework for interagency coordination and for integrating TDM into the planning, project development, and delivery processes, however it is underutilized. At the regional level, counties share priorities of enhancing transit, supporting walking and biking, and several outlying counties support transit-oriented development, though there is a lack of commitment and reliable funding sources to advance these priorities. The CommuteInfo program provides core services and support, including employer and community outreach, Emergency Ride Home, ride-matching, and vanpool subsidies. However, there are opportunities to improve the reach and effectiveness of these initiatives. Enhancing the CommuteInfo program into a regional “umbrella” program and “one-stop shop” for traveler information could attract more users and strengthen stakeholder engagement with TDM through the CommuteInfo Partners Forum.

1.3 Employer and Program Interviews

The research team conducted employer interviews representing locations across the 10-county region, with special focus on locations outside of Allegheny County to ensure inclusion of suburban and rural employers’ perspectives. The research team also interviewed the Program Manager of CommuteInfo as well as a transit planning consultant for Heritage Community Initiatives Transportation, a nonprofit, fixed-route public transportation provider. The interviews covered employees’ existing transportation and access needs, how the employer’s leadership hears about these challenges, impacts to the employer’s bottom line, commuter benefits offered, recent changes in employee transportation patterns, awareness of CommuteInfo, and interest in additional support with effectively getting employees to work. The following entities were interviewed:

- University Pittsburgh Medical Center (UMPC) (Regional)
- Westinghouse Electric Company (Cranberry, Butler County)
- Grocery Store Chain (Regional)
- FedEx Ground (Corporate HQ in Moon, Allegheny County, with field facilities in Westmoreland and Butler Counties)
- CommuteInfo
- Heritage Community Initiatives Transportation

As a younger demographic enters the workforce, employers noted the need to maintain a competitive working environment and are considering TDM-related initiatives to do this through flexible scheduling and teleworking. While use of transit is highest among younger workers, use of alternative transportation is starting to move up the leadership chain in the urban core. In suburban and rural areas where transit is less available, employers are seeking ways to minimize parking pressures and improve jobs access by partnering with rideshare programs like CommuteInfo to promote carpooling and vanpooling through preferred parking incentives and promoting the regional emergency ride home benefit. Some employers addressed alternative transpor-

tation for employees primarily through corporate sustainability initiatives, while others were primarily concerned with recruiting and retaining workers to fill open positions. One employer noted the opportunity for the CommuteInfo program to integrate mobility options beyond carpooling and vanpooling as well as more online tools (such as a trip tracker) that employers could leverage and.

1.4 Stakeholder Survey

The SPC administered a regional transportation demand management (TDM) survey to stakeholders. The purpose of the survey was to collect stakeholders’ perspectives on TDM locally and regionally and thereby understand existing transportation conditions and initiatives, as well as ongoing efforts to influence transportation demand. The survey was programmed in Survey Monkey and the link was first distributed to TDM stakeholders in March 2019, then to a broader list of contacts in municipal planning departments in April.

The survey generated 117 responses and its questions addressed basic organization demographics, perceptions of demand management locally and regionally, challenges, strengths, opportunities, organizational efforts to impact TDM, awareness of TDM programs and outreach efforts (including CommuteInfo), prioritizing TDM strategies, and general feedback. Some of the important lessons learned from the survey include respondents’ perceptions on the quality of regional and local TDM, TDM priorities, challenges, strengths and opportunities, and awareness and feedback on CommuteInfo. Overall, the survey provided clarity on different needs between the City of Pittsburgh and Allegheny County versus other counties in the SPC region. The quality of TDM was generally viewed more favorable at the local level compared to the regional level. Notable challenges included long commute distances, prioritization of single occupancy vehicles, and limited transit service in outlying areas. These findings informed the existing conditions analysis and the best practices review to develop goals and priorities for the Regional TDM Strategic Action Plan.

2. Best Practices Review

A review of national best practices was conducted to highlight effective strategies that have been applied in regions around the country through web-based research and peer interviews with three metropolitan planning organizations (MPOs) to provide in-depth insight about their regional TDM efforts. These MPOs included the Atlanta Regional Commission (ARC), the Denver Regional Council of Governments (DRCOG), and the Mid-American Regional Council (MARC).

2.1 National Research

The national research of best practices analyzed long-standing demand management strategies like carpooling and vanpooling, as well as new and emerging strategies such as advances in shared mobility options, integration of TDM within active transportation system management, and application of technology to support “Mobility on Demand”. The research findings produced an extensive list of best practices for TDM, categorized into the following:

- Broadening the role of TDM beyond traffic management
- Targeting demand management strategies to specific populations
- Making connections to land use and parking
- Integrating TDM in regional planning and processes
- Corridor-focused initiatives and integrated corridor management (ICM)
- Integrating TDM into ongoing system management and operations
- Transportation improvements and technology applications
- Marketing, outreach, and incentives
- Accelerating TDM strategy implementation through pilot projects and partnerships with private sector mobility service providers

The national review found that best practices for TDM strategies have increasingly expanded beyond the traditional focus on commuter traffic management during peak periods to include more travel markets, such as special events, weekend recreational trips, highway work zones, and freight, as well as the impacts of non-recurring events and sources of delay beyond day-to-day travel conditions. Further, alternative modes have expanded beyond more traditional carpools and vanpools to focus on emerging shared mobility options and strategies to make transit more appealing to users, such as fare integration, signal priority to increase reliability and speed, and options for first mile and last mile connections.

Many agencies identified in the review acknowledged the need for policy changes to support successful implementation of TDM strategies, such as development requirements influencing land use and parking, as well as pricing policies for parking, commuter benefits, and to manage congestion. Many MPOs recognized the need to integrate TDM into regional plans and processes in order to prioritize TDM strategies and make policy changes needed to achieve travel demand and traffic management goals. Utilizing emerging and advancing technologies to improve active demand management such as dynamic ridesharing, dynamic pricing and fare reduction, and predictive and real time traveler information was a growing best practice that effectively mitigates congestion before travelers make decisions (demand management) and once travelers are on their way (traffic management).

2.2 Metropolitan Planning Organization (MPO) Peer Interviews

Peer interviews were conducted with three MPOs to understand best practices for regional TDM partnership models, products and services, and performance measurement. These MPOs include the Atlanta Regional Commission (ARC), the Denver Regional Council of Governments (DRCOG), and the Mid-American Regional Council (MARC). The interviews were structured around the policies, procedures, and challenges of MPOs’ partnership models for TDM services (which agencies operated which services); approaches for TDM across the region, including within the urban core and outlying suburban or rural areas; and performance metrics related to TDM programs and strategies.



Dallas US-75 ICM with HOV lane and light rail (Source: FHWA).



PTSA staff demonstrates use of the agency’s Direct Connect program. Source: PTSA.

3. Stakeholder Engagement

TDM goals and priorities were developed through the existing conditions analysis, best practices review, and through engagement with stakeholders and the TDM Steering Committee for the Regional TDM Strategic Action Plan:

- Project website at www.spcmobility.org, where project materials and scheduled workshops were posted.
- Stakeholder Visioning Workshop, held 4/5/2019 at the SPC.
- TDM Steering Committee Conference Call, held 4/30/2019 via webinar.
- Stakeholder Priority-Setting Workshop, held 5/14/2019 at the SPC.
- TDM Steering Committee Conference Call, held 5/28/2019 via webinar.
- TDM Steering Committee Conference Call, held 6/11/2019 via webinar.

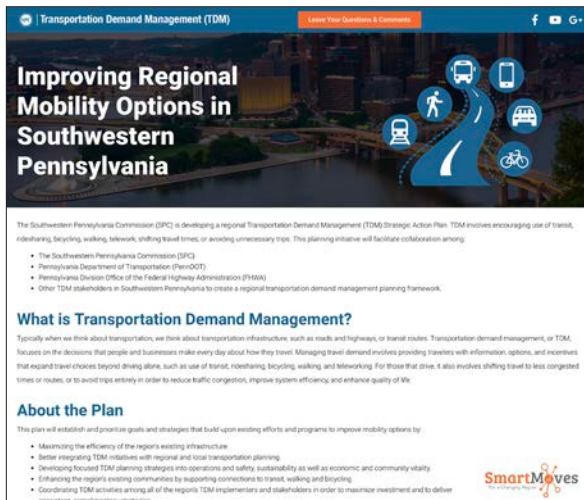


Figure 2: TDM Plan Project Website

3.1 Project Website

A project website was developed at spcmobility.org to facilitate engagement with the stakeholders. The website provided information about the project, links to working drafts of deliverables, a calendar with workshop dates, as well as a comment form for stakeholders to submit feedback or questions. A screenshot of the website is shown in Figure 1.

3.2 Visioning Workshop

During the April 5th Visioning Workshop, the consultant team provided an Introduction and Planning Context presentation, including highlights from the existing conditions analysis, initial stakeholder survey response, best practices review, as well as a draft vision statement. Attendees broke into three groups to discuss opportunities, challenges, and potential goals for TDM in geographic settings across the region: 1) the urban core, 2) the suburbs, and 3) rural areas and small towns. There were 58 attendees representing municipalities, counties, nonprofits, the private sector, service operators, SPC, and PennDOT.

3.3 Priority-Setting Workshop

During the May 14th Priority-Setting Workshop, stakeholders generated specific actions for each of the goals through facilitated group discussion. Stakeholders were broken into three groups and rotated between goals, building on each other's ideas. Stakeholders developed specific actions using SMART worksheets that outlined the **S**pecific action, **M**easure, **A**ctors (leads and supporters), **R**esources (potential costs and sources), **T**imeframe, as well as next steps. After the workshop, these actions were consolidated into a set of recommended priorities addressing each goal.

3.4 Steering Committee Review

To advise on the development of the TDM Strategic Action Plan, the SPC assembled a TDM Steering Committee comprised of representatives from municipal and county planning offices, PennDOT Districts, the FHWA Pennsylvania Division, transportation management associations, and SPC staff. The Steering Committee was first convened at the SPC on February 28, 2019 to kick off the project and establish the study methodology. The TDM Steering Committee was convened via a webinar conference call to review draft vision statements, goals, priorities, and actions based on preceding tasks and input from the Workshops.

IV. ACTION PLAN VISION AND GOALS

The TDM Vision Statement describes the ideal future conditions that priorities and activities in the Action Plan are working towards. The TDM Vision encompasses a variety of local perspectives while supporting the overall Regional Vision articulated in the long-range plan *Smart Moves for a Changing Region*,

which is “a world-class, safe, and well maintained, integrated transportation system that provides mobility for all, enables resilient communities, and supports a globally competitive economy.” Based on the regional vision, existing conditions analysis, and stakeholder input provided through the online survey and workshops, the TDM Vision highlights the role of demand management with respect to core values of equity, choice, health, environmental sustainability, and reducing dependence on driving alone.



Improved health and safety



Reduced dependence on driving alone



Reduced time spent in traffic delays



Improved access to jobs



Increased access to a variety of affordable, effective travel choices

The Vision Statement for the Regional TDM Strategic Action Plan is:

All travelers across the Southwestern Pennsylvania region have access to, and are motivated to choose, healthy, sustainable, and effective travel options that reduce stress on the transportation network.



Enhanced community livability (walkable, bikeable places)



Equitable access to destinations for all population groups



Improved environmental conditions (reduced air pollution, greenhouse gases)

To achieve this Vision, a set of recommended regional TDM goals were developed. Compared to the Vision, the Goals are more concrete; they provide actionable targets that serve as mile posts along the way to the Vision, which is the desired destination. Stakeholders developed TDM goals using the SMART framework, i.e., Specific, Measurable, Achievable, Relevant, and Time-Bound.

The five goals for the TDM Action Plan are listed below.



1. Enhance the ease of use, connectivity, and effectiveness of **transit and shared mobility** options as well as **bicycling and walking**.



2. Increase **employer involvement** to improve workforce access to jobs



3. Increase **public awareness** of travel options and services



4. Promote **location-efficient development and design**



5. Target opportunities **beyond work trips** and to address **non-recurring sources of delay** (special events, work zones, weather, and incidents)

V. REGIONAL STRATEGIC TDM PRIORITIES & ACTIONS

TDM priorities serve as objectives that align regional goals and performance measures with local and regional implementation. Priorities were established through the Stakeholder Priority-Setting Workshop and refined with input from the TDM Steering Committee.

Priorities are differentiated by the setting(s) in the region to which they apply: the urban core, the suburbs, and small cities and rural areas as described below and shown in Figure 5.



Urban Core: The urban core is defined as the City of Pittsburgh, which serves as the regional hub for employment, education, and entertainment.



Suburbs: The suburbs are defined as urbanized areas outside of the City of Pittsburgh. An urbanized area as defined by the Census Bureau is a continuously built-up area with a population of 50,000 or more, which comprises one or more central places and the adjacent urban fringe.



Small Cities and Rural Areas: Small cities are urban clusters that contain less than 50,000 people while rural areas are outside of urbanized areas or clusters (with 2,500 people or less).



This section describes recommended actions for each priority and TDM goal. Actions were selected by alignment with priorities and goals as well as feasibility and stakeholder support. Actions were differentiated by implementation timeframes, which include short-term (one to five years), medium-term (five to ten years), and long-term (over at least a ten-year period).

Secondary goals addressed by each action are noted using icons presented in Section V for each of the TDM Action Plan goals.

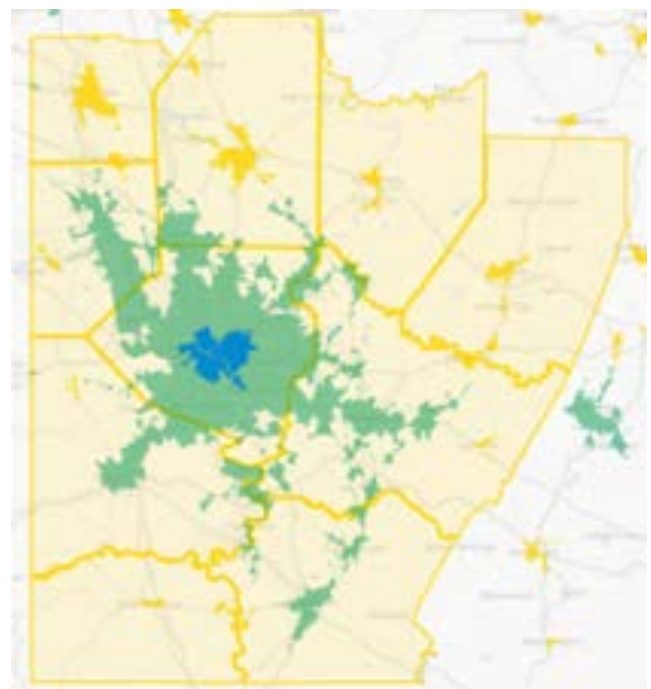


Figure 5: Map of urban core (blue), suburbs (green), and small cities and rural areas (yellow) in Southwestern Pennsylvania



1. Goal: Enhance the Ease of Use, Connectivity, and Effectiveness of Transit and Shared Mobility Options as well as Bicycling and Walking.



This goal addresses the need to improve the quality of the travel experience for pedestrians, cyclists, and riders of transit and other shared mobility options. These improvements encompass connectivity between travel modes and destinations, ease of use through safe infrastructure, education, enforcement, and incentives, as well as effectiveness by reducing travel times and increasing availability and frequency of shared mobility services. We cannot build our way out of congestion. Roadway improvements should explore options for improved transit, bicycle and pedestrian facilities to increase the capacity of our streets to move more people, not necessarily more cars.



1.1 Priority: Coordinate connections among transit providers



Transit agencies can coordinate connections across the region by sharing software for transit scheduling and trip planning for fixed route as well as for paratransit service. Rabbit Transit in York County is running a pilot project with Geisinger Hospital, where multiple counties are coordinating mobility management using Ecolane, which is paratransit software used by all transit agencies in the region for paratransit except for Port Authority's ACCESS. In the pilot, mobility managers can reserve rides using Ecolane on any service in the surrounding counties, which is an important step toward interagency coordination. The SPC's Transit Operators Committee can lead efforts to coordinate service planning between agencies to optimize service based on regional travel flows.

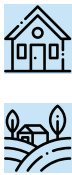
Fare payment is an important point of coordination among transit providers because it affects time, ease of access, and convenience for riders. The ConnectCard system has been a first step toward fare integration that currently works across six out of ten transit providers in the SPC region. In 2020, the Port Authority plans to introduce smartphone payments and home ticket printing, as well as expanded options to purchase tickets at retail outlets. Over the long-term, integrating payment for other transit providers into the suite of fare media options (mobile, smart card, and printed ticket) will improve regional transit connections.

- Coordinate transit schedules and trip planning between counties in shared software. *Medium-term.*
- Better coordinate commuter transit trips from suburbs to core and vice versa (through transfers at hubs or regionalized service) to improve suburban and rural transit providers' abilities to serve local travel needs. *Medium-term.*

- Establish integrated transit fare payment with contactless credit/debit card that encompasses all regional transit operators, last-mile shuttles and other travel modes, including rideshare and bikeshare. This could potentially be an expansion of ConnectCard. *Long-term.*

Implementation Partners: Public Transportation Providers, Mobility Service Providers, SPC Transit Operators Committee, County Governments.

1.2 Priority: Adopt new service models for transit and shared mobility services that can effectively increase their geographic coverage and frequency



The ubiquity of mobile communication devices (95% of Americans owned a cellphone and 77% owned a smartphone in 2018.⁴) and the growing popularity of transportation network companies provide opportunities to deploy transit service models that better fit lower-density suburban and rural areas compared to fixed-route transit. On-demand and flexible-route services like RideACTA can fill gaps and improve access to fixed-route public transportation. PA Section 1513 program as available funding source for first/last mile services like RideACTA. It is important to note that while fixed route public transportation providers in suburban and rural areas lack the density and ridership of the urban core, their smaller scale and lack of interdependency between routes and schedules provides more flexibility and the ability to adapt to changing needs. This has been demonstrated by Heritage Community Initiatives Transportation, which operates across 15 municipalities east of Pittsburgh.

Existing transit options for single seat (no transfer) reverse commute needs are limited. There are some existing transit routes serving reverse commute needs, such as the Mid Mon Valley Transit CAL Commuter connecting Downtown Pittsburgh with destinations in California such as California University of Pennsylvania. Among the approximately fifty

vanpools operating in the SPC region on the CommuteInfo platform, only one serves reverse commute needs from the City of Pittsburgh to Boyers. CommuteInfo outreach to employers and suburban and rural areas could highlight vanpool and other emerging shared mobility options to improve access for workers from the urban core.

- Identify priority areas with limited fixed-route transit service to improve first/last mile, city-to-suburb (reverse commute) and suburb-to-suburb travel. *Short-term.*
- Increase interaction and communication between transportation network companies and public transit agencies to explore mobility on demand solutions. *Short-term.*
- Develop more options for single-seat (no transfer) reverse commute by transit from the urban core to suburban and rural areas. *Medium-term.*
- Expand the scope of shared mobility options such as bikeshare and e-scooters at transit stops to provide last-mile solutions. *Long-term.*

Implementation Partners: Public Transportation Providers, Transportation Network Companies, Mobility Service Providers, Universities, SPC.

Best Practice Example: New Transit Service Models

RideACTA is an on-demand last mile shuttle service that provides shared-ride, flex-route rides between the Port Authority's IKEA Super Stop and local businesses. In early 2019, a mobile app was launched through which users can request rides. RideACTA is operated by the Airport Corridor Transportation Association (ACTA), a transportation management association that covers four airport townships and 75,000 jobs.

⁴ Pew Research Center (2019). Mobile Fact Sheet. Retrieved from <https://www.pewinternet.org/fact-sheet/mobile/>

1.3 Priority: Reduce transit and high-occupancy vehicle (HOV) travel times in a cost-effective manner



Along with fare cost, travel time is one of the primary factors that affects demand for transit. Reducing transit travel times requires investment in either infrastructure that prioritizes transit vehicle movement through congested corridors or in new and express (limited stop) service that provides more direct routes between significant activity centers. Service planning is undertaken by transit operators. SPC can conduct corridor studies and advise on funding options along with PennDOT in coordination with municipal and county planning offices.

- Develop a metric for competitive project selection processes that reflects transit travel times relative to automobile travel times. The SPC’s travel demand model can provide these travel time estimates at the corridor level. *Short-term.*
- Extend high-occupancy vehicle (HOV) lanes through congested expressways in the urban core. *Long-term.*
- Extend dedicated bus lanes and transit signal priority through congested areas. *Long-term.*
- Increase express, limited stop transit service to the suburbs. *Long-term.*
- Increase cross-town transit service to provide direct routes between destinations outside the urban core. *Long-term.*

Implementation Partners: Public Transportation Providers, SPC, PennDOT, Municipal and County Governments.

1.4 Priority: Improve access to, and quality of, facilities for shared and active modes of transportation



To improve access to transit hubs and stations in the short-term, expanding the network and capacity of park & ride lots is a valuable strategy, particularly in lower-density suburban and rural areas. The SPC region currently has 108 park and ride lots, 91 of which are served by transit, and over half of the lots are located in Allegheny County. Transit operators and municipalities can partner with shopping centers and other property owners with large parking lots whose peak demand does not coincide with typical peak commuting hours.

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- Identify strategic opportunities for additional park and ride locations or for expanding the capacity of existing park and ride lots, such as satellite lots at town perimeters and sections of shopping center lots. *Short-term.*

- Work with shared-use mobility providers, including car-share, bike-share, and scooter-share to design hubs that are user-friendly and place them in locations that are accessible. *Medium-term.*
- Enhance infrastructure for walking and biking to access transit facilities and for crossing bus and rail right-of-way. *Medium-term.*
- Improve sidewalk connectivity to bus stops in suburban and rural areas. *Long-term.*
- Improve amenities at bus stops along high-traffic corridors, including seating, shelter, and lighting. *Long-term.*
- Optimize placement of bus stops in suburban areas by local employment centers and multi-family residential development. *Long-term.*

Implementation Partners: Public Transportation Providers, Municipal Governments, SPC, PennDOT.

1.5 Priority: Incentivize use of travel options and park and rides through discounts and rewards for transit, carpooling, walking, and biking



Incentives can motivate travelers to choose options beyond driving alone while providing a mechanism for data collection to evaluate performance of TDM initiatives. The Walk Pittsburgh program and mobile app provides the groundwork for a multi-modal incentives program, as it features a pedometer that tracks individual walking metrics, displays total statistics by neighborhood, and the overall results from all walkers in the program. Similarly, the Sustainable Pittsburgh Challenge engages commuters through their employers, universities, and institutions, and includes an employee transportation survey to establish an organization’s transportation baseline and track progress towards goals. The SPC can engage transit operators to develop bulk discount programs for employers (such as the Port Authority’s Job Perks program) and assist operators with outreach and promotion of discount programs to employers.

Reducing or eliminating the cost of transit is a powerful incentive to encourage travelers to choose transit over driving. The Pittsburgh Light Rail provides a fare free zone in Downtown Pittsburgh which include six stations between the North Shore and First Avenue Station. Chapel Hill Transit in North Carolina became fare free in 2002, and annual ridership increased from three million to seven million. Fares are funded by the University of North Carolina for faculty and staff, while the two municipalities served by the system contribute revenue from property taxes and vehicle registration fees.

- Develop a regional incentive program tied to trip tracking, where commuters earn rewards by logging trips by alternative transportation. *Short-term.*
- Work with transit operators to provide businesses with bulk discount options on purchasing transit passes for employees. *Short-term.*
- Develop fare-free transit programs for specific locations or for low-income riders to improve equity and access. *Medium-term.*

Implementation Partners: Public Transportation Providers, Municipal and County Governments, Nonprofits, SPC.

1.6 Priority: Improve pedestrian and bicycle network connectivity, including connections to other modes



In the short-term, promoting trails and trailhead parking for bicycle commuting may be beneficial in suburban and rural areas where routes between destinations might be limited to highways or other high-speed, high-volume arterials that are not bicycle-friendly. This is line with the Active Transportation Plan’s Trail Functional Classifications that identify regional, community, and local trail connections. Over the medium- and long-term, SPC can provide technical assistance and resources to municipalities and counties to adopt policies and

ordinances that support the quality of the bicycle and pedestrian network. For example, SPC could develop an incentive for PennDOT and local bureaus of transportation to incorporate sidewalks into roadway projects.

- Promote trailhead parking to encourage more travel by bicycle. *Short-term.*
- Develop a policy directive and technical guidance for incorporating appropriate transit, pedestrian, and bicycle infrastructure into roadway projects including any Intelligent Transportation Program (ITP) project and major corridor reconstruction projects (Rt. 30, 22, 65). *Medium-term.*
- Encourage agencies to adopt Complete Streets Policies and multimodal design standards for urban arterials and commercial corridors. *Medium-term.*
- Provide incentives to municipalities to institute sidewalk ordinances and ensure that all roadway projects in these municipalities include sidewalks that adhere to ordinances. *Medium-term.*
- Retrofit car-centric development by adding pedestrian infrastructure to old shopping strip malls and connecting to nearby residential neighborhoods. *Long-term.*
- Require trail expansion with development and road building to create a connected and integrated regional trail network. *Long-term.*
- Expand last-mile solutions between transit stops and activity centers with connective sidewalks and bicycle facilities. *Long-term.*

Implementation Partners: SPC, PennDOT, Municipal and County Governments, Developers.

1.7 Priority: Improve pedestrian and cyclist safety through enforcement, infrastructure, and technology



In the short-term, enforcement and education are the most effective strategies to improve pedestrian and cyclist safety. Municipal law enforcement provides the front line of enforcing controls on motorist behavior to improve pedestrian and cyclist safety. For education, the Traffic Safety Education Project provides free traffic safety services to individuals and community groups in Allegheny, Beaver, and Lawrence counties. This program and others are funded through PennDOT’s Community Traffic Safety Grant Program, which provides funding for traffic safety education to local governments, higher education institutions, and nonprofit organizations. Another short-term opportunity to improve safety for pedestrians and cyclists is through the SPC’s road safety audit program, which was developed as a service to the SPC’s planning partners. While the SPC’s methodology for the road safety audit is based on the 8-step process developed by the Federal Highway Administration, the methodology could be amended to include review of pedestrian and cyclist amenities.

- Improve safety of walkable and bikeable places through enforcement and educational campaigns targeted toward motorists to reduce unsafe behavior such as speeding and illegal parking on sidewalks or bicycle facilities. *Short-term.*
- Add review of pedestrian and cyclist amenities to the SPC’s road safety audit methodology. *Short-term.*
- Deploy smart traffic signals that coordinate with movement of pedestrians and cyclists. *Medium-term.*
- Provide project sponsors with bicycle facility design guidelines that accommodate all ages and abilities to create an inclusive and accessible bicycle network. *Medium-term.*
- Separate pedestrian movement from bicycle movement to prevent collisions. *Long-term.*

Implementation Partners: PennDOT, SPC, SPC Planning Partners, Law Enforcement, Nonprofits.

2. **Goal:** Increase Employer Involvement to Improve Workforce access to jobs.



Employer involvement with TDM is critical for amplifying public traveler resources and providing commuters with benefits that support meaningful access by shared and active modes of transportation. However, employers’ motivations for engaging with TDM vary significantly across Southwestern Pennsylvania: ranging from parking pressure in urban core environments to workforce access issues in peripheral areas. Employers have a strong influence over traveler mode choice for work trips through location decisions, scheduling policies, onsite amenities, provision of parking, and commuter benefits such as pre-tax or subsidized transit passes. To involve employers, SPC and partner agencies can expand existing programs to encourage businesses to engage with TDM strategies and facilitate cost-sharing arrangements to fill gaps in existing transportation networks and thereby improve jobs access.

What Does ENCOURAGEMENT Look Like?

Encouraging employers, developers, and other stakeholders to support TDM encompasses a wide range of actions that can be carried out by TMAs, the CommuteInfo program, professional membership organizations, municipalities, and nonprofits. These actions include:

- Providing technical assistance, including commute management and consulting services, that address site access issues.
- Presenting the business case for TDM to educate organizations that are unaware.
- Administering designation programs or challenges for alternative commuting that align with corporate social responsibility goals, such as sustainability or wellness.
- Providing incentives to employers or developers to implement TDM strategies. Incentives could be additional services, amenities, recognition, or development bonuses.

2.1 Priority: Establish cost-sharing arrangements between employers and transit



To facilitate cost-sharing arrangements between employers and transit providers, chambers of commerce and municipalities can administer community-level surveys to identify jobs clusters that are lacking connections to transit hubs. These job clusters may present opportunities to convene employers to partner, invest in amenities for transit, pedestrians, and cyclists, coordinate shift schedules, and share the costs of a shuttle similar to RideACTA with public transportation providers or private mobility service providers. In the urban core, there may be opportunity to streamline private shuttle service that is redundant with public transportation service, including shuttles for staff and students provided by the University of Pittsburgh Medical Center

(UPMC), Carnegie Mellon University, University at Pittsburgh, and Chatham University (in Oakland, Allegheny County). SPC could advise on potential funding sources beyond existing operating budgets of transit providers to pursue new cost-sharing arrangements with employers.

- Encourage employers to jointly provide low cost/free transportation from main transit hubs (i.e. last mile shuttle sharing and circulator systems). This can start with community-level surveys to identify partnership opportunities. Short-term.
- Establish fund for employers to pay for transit operations, last-mile infrastructure, and bus shelters around their worksites, and/or to increase weekend and evening transit service. Medium-term.
- Redeploy institutional shuttles for first/last mile connections to transit. Funding for private employer shuttles and University shuttles could instead be redirected to pay into public transit. Medium-term.

Implementation Partners: Transportation Management Associations, Chambers of Commerce, Universities, Municipal and County Governments, SPC.

2.2 Priority: Expand employer participation in supporting commuting options



Encouraging employers to support commuting options is a powerful strategy to normalize alternative transportation. However, encouragement requires a multifaceted approach because the impacts of employee transportation on organizational turnover, absenteeism, and productivity are not clear to most employers. Encouragement should therefore establish a compelling business case for TDM through outreach and communication in partnership with private sector leaders, highlighting conditions such as the region’s low unemployment rate. Public agencies can lead by example with their own employees, as shown by the Smart Commute Rewards pilot program for City of Austin, Texas, which provides vacation time rewards for employees that use sustainable commuting options. developing bulk discount or incentive programs for employers to support transit over parking, and employer recognition programs like Sustainable Pittsburgh.

- Develop a business-to-business outreach toolkit to demonstrate the business case for TDM to employers and developers in urban, suburban, and rural settings. Toolkit materials could include pamphlets, a program catalog, and other printed materials, as well as digital media such as videos, webinars, or original articles published in regional industry newsletters. *Short-term.* 🗺️
- Increase education and outreach to employers on the available transportation options and the benefits of alternatives through expansion of regional and local commute-focused programs, including CommuteInfo, TMAs and local government efforts. *Short-term.* 🗺️
- Offer technical assistance to municipalities, business districts and major employers who may benefit from a transportation management association. *Short-term.*
- Encourage major employers to use existing employer programs such as the Port Authority’s Job Perks, and to follow Pitt/CMU/Chatham leads on providing passes at discounted rates to employees, students, and clients. *Short-term.*
- Encourage employers to provide bicycle parking and amenities for cyclists, including showers, lockers, repair stations, etc. Also, encourage employers to provide bikeshare and carshare memberships to employees. *Short-term.* 🗺️
- Leverage employer recognition programs such as Sustainable Pittsburgh, Best Workplaces for Commuters, and Bicycle Friendly Business certifications to motivate employers to implement TDM. *Short-term.* 🧑

- Engage with employers and health insurance providers to incorporate active commuting into wellness programs and incentives. *Medium-term.* 🗺️
- Foster connections between municipalities and employers to educate employees about available travel options. *Medium-term.* 🧑
- Encourage employers to provide or subsidize transit passes instead of parking passes. *Medium-term.* 🗺️
- Disincentivize parking: Phase out prepaid monthly parking leases. Require daily parking payment and/or parking cash-out. *Long-term.* 🏠
- Develop Live Near Work Programs that work directly with employers to incentivize employees to purchase or rent homes in neighborhoods that are accessible to employment by non-SOV modes. *Long-term.* 🏠

Implementation Partners: Municipal Governments, Chambers of Commerce, SPC, Transportation Management Associations, Universities, Parking Operators, Public Transportation Providers, Mobility Service Providers.

3. Goal: Increase Public Awareness of Travel Options and Services



Increasing awareness of travel options and services is an important first step in reducing demand for driving alone, as travelers must first be aware of available mobility options before they change their behavior. This is especially true in regions like Southwestern Pennsylvania where driving alone is the dominant and default travel mode. Additionally, increasing awareness of the benefits of shared and active travel options and services (including environmental, health, and financial) will improve the motivation of travelers to use those options.

What Does Awareness Look Like?

Awareness takes on a variety of forms, including:

- Recognition of existing travel programs and services such as CommuteInfo and their applicability.
- Interaction with resources and tools that provide information on travel options.
- Understanding of the personal and societal benefits of shared and active modes of transportation.
- Contemplation of using existing travel options and services.

Awareness is typically measured through surveys, program enrollment, or web traffic analytics. Strategies for increasing public awareness of travel options and services include regional marketing to travelers and employers, targeted marketing to activity centers and corridors, digital outreach, and incentives.

3.1 Priority: Develop resources for travelers to navigate regional options



The SPC can develop resources of a regional scope for travelers to navigate their options. The CommuteInfo website currently provides ride-matching services for the region's vanpools, carpools, and bikepools as well as online tools like a park and ride lot map and commute cost calculator. The CommuteInfo website could be expanded to include more online tools and mobility options, as well as a trip tracker. An online, interactive regional transit map would be a particularly valuable addition to the CommuteInfo website that the SPC could lead in coordination with the Transit Operators Committee.

- Develop CommuteInfo online platform through the SPC into a one-stop shop for travel options that integrates all mobility services in ride-matching, trip planning, and trip tracking. *Short-term.*
- Develop a regional transit map through the SPC along with a coordinated public relations campaign to increase awareness of transit options. *Short-term.*

Implementation Partners: SPC Staff, SPC Transit Operators Committee, Public Transportation Providers, Mobility Service Providers.



3.2 Priority: Improve signage for travel options and services



Signage oriented toward pedestrians supports their wayfinding and access on foot within activity centers across the region (including the urban core, suburbs, and village centers). Pedestrian wayfinding systems can enhance community character and encourage individuals to walk rather than drive.



Municipalities, business improvement districts, and other special districts can provide the resources to plan and implement a coordinated pedestrian wayfinding system. Conversely, signage along highways and other high-traffic corridors will reach large numbers of drivers.

- Implement pedestrian wayfinding systems where population density exists. *Short-term.*
- Implement signage along major roadways that advertises transit and carpooling by promoting CommuteInfo. *Medium-term.*

Implementation Partners: Municipal Governments, PennDOT, SPC, Business Improvement Districts.

3.3 Priority: Use marketing campaigns to increase awareness of travel options and services



Marketing campaigns (both mass and differentiated to target populations) can be a fast and effective strategy to increase awareness of travel options and services among a large group of people. The CommuteInfo website was recently redesigned as a part of a broader marketing campaign targeting individual commuters through radio, television, outdoor, and online advertising. The results of this campaign can inform future marketing efforts by the SPC for the CommuteInfo program. Identifying a media partner would help to develop a broader message about travel options that resonates with a general regional audience. Meanwhile, partnering with stakeholders to promote TDM would provide more targeted marketing to reach individuals and networks based on partners' missions. Transit agencies could promote and incentivize transit by designating special events that offer fare-free rides or encourage riders to teach others how to use transit.

- Refine mass/social media campaigns that alert the public to travel mode options, benefits, and tools on the CommuteInfo platform. *Short-term.*
- Identify media partner and broader message to communicate benefits of commuting alternatives. *Short-term.*
- Partner with organizations to promote TDM with respect to specific mission-driven outcomes, such as environmental sustainability, reducing carbon footprint and greenhouse gas emissions, physical health, work-life balance, and financial well-being. *Short-term.*
- Designate recurring day(s) to promote and incentivize transit, such as “teach your friend how to ride the bus day”, free transit, and/or “give transit a try” days. *Short-term.*

Implementation Partners: SPC, Media, Nonprofits, Public Transportation Providers.

Best Practice Example: TDM Marketing and Outreach Campaigns

Marketing and outreach campaigns are essential to raise awareness of travel options and promote the benefits of shared and active modes of transportation. In the Pittsburgh region, the SPC's CommuteInfo program and TMAs already conduct marketing and outreach activities, primarily to employers. Targeting employers and commuters within specific subareas, particularly through digital outreach and social media marketing has proven effective by the 511NY Rideshare Program, Clean Air New York, and Oregon DOT. To incentivize transit, the Butler County Transit Authority and New Castle Area Transit have coordinated on a promotion called “Week 3 is Free”, which gives free commuter transit trips to Pittsburgh during the third week of June, July, and August.

3.4 Priority: Provide school-based education about available travel options



Developing school-based educational programs about travel options is a broad strategy to reach young people before they have formed their own travel habits. The City of Pittsburgh school district already provides education to students about travel options and safety. PennDOT has developed lesson plans, guides and other evaluation tools for safe routes to school, as well as training materials for bicycle education and cross guards. The National Center for Safe Routes to School also provides materials and trainings for school-based education. The SPC has contacted every school district in the region and could connect schools outside of the Pittsburgh district to these resources to help standardize and mainstream school-based education about travel options in the region.

- Support local communities in establishing new Safe Routes to School programs and in sustaining and enhancing existing efforts. *Short-term.*
- Implement school-based educational program on walking, biking, and transit. *Medium-term.*

Implementation Providers: School Districts, SPC, PennDOT, National Center for Safe Routes to School.



4. Goal: Promote Location-Efficient Development and Design

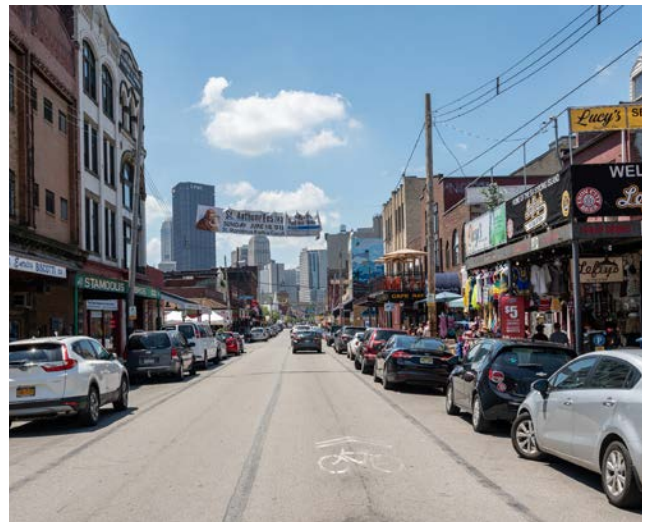


Location-efficient development refers to new or rehabilitated land development projects that are sited near public transportation (transit-oriented development or TOD), existing amenities, services, and activity centers to improve access by shared and active modes of transportation. In addition to the surrounding context, location-efficient development is characterized by mixed-use design and features that accommodates pedestrians, cyclists, and transit riders in order to reduce dependency on driving.

4.1 Priority: Improve access to existing development



Existing suburban retail development across the country and in the SPC region is experiencing higher vacancy and undergoing redevelopment due to the rise of e-commerce and shifting consumer preferences. This presents an opportunity to retrofit suburban shopping centers into new developments that better fit community needs, including mixed-use activity centers that support access by alternative transportation. Additionally, industrial and office parks can partner to establish connections and amenities for pedestrians and transit to create vibrant campuses that help to attract and retain workers. Municipalities support redevelopment through planning documents, zoning ordinances, and development incentives. Private landowners, industrial development agencies, and chambers of commerce can help to connect businesses with redevelopment opportunities and resources.



- Promote existing Complete Streets and Safe Routes to School programs (e.g. by the City of Pittsburgh) to municipalities and developers to encourage access improvements to location-efficient development. *Short-term.*
- Establish partnerships between industrial and office parks to promote connectivity and design as a walking campus. *Medium-term.*
- Identify alternate uses and retrofits for rural/suburban shopping centers to add pedestrian infrastructure & improve transit service. *Long-term.*

Implementation Partners: Municipal Governments, Developers, Chambers of Commerce, Industrial Development Agencies.

4.2 Priority: Encourage residents to live in locations that reduce driving needs



Live Near Work programs incentivize residents to live in areas that are accessible by alternative transportation, often in core urban neighborhoods that have historically struggled with disinvestment. Financial assistance for purchasing, renting, or improving the exterior of a home is provided by nonprofit housing programs or municipalities, which generally require employers to contribute a match to offer financial incentives to their employees. Some Live Near Work programs across the country are funded primarily by philanthropic foundations.



- Encourage new residents to live near their employment through Live Near Work programs. *Long-term.*

Implementation Partners: Municipal Governments, Nonprofit Housing Programs, Employers, Philanthropic Foundations.

4.3 Priority: Modify policies and land use plans to promote smart growth, as well as zoning, subdivision, and development regulations to promote TDM-supportive site design



Municipalities and counties have the authority to regulate land use and development through plans, policies, and ordinances to promote smart growth and TDM-supportive site design. The SPC can influence municipal and county planning decisions through subarea studies, guidance, and educating consultants preparing municipal plans that contact the SPC for data such as growth factors. The SPC has already led programs and education at the municipal level such as the Water Resource Center and the Regional Traffic Signal Program.

- Educate municipalities about economic resilience of mixed-use developments, how to generate a resilient tax base, and how developments can be better connected with the needs of communities. *Short-term.*
- Encourage collaboration among localities to reduce competition for development and tax revenues, which can lead to poorly placed development. *Short-term.*
- Encourage counties to adopt comprehensive plans that include higher-density development near transit. *Medium-term.*
- Encourage municipalities to plan neighborhoods around employment centers. *Medium-term.*
- Provide technical assistance to municipalities to revise zoning ordinances or to implement comprehensive planning efforts around transit stations, such as “Transit Station Access” or “Last Mile” plans. *Medium-term.*
- Encourage municipalities to require transit-oriented development (TOD) along any transit line carrying more than one million riders per year, as well as along busways and light rail. *Medium-term.*

- Encourage municipalities to incorporate smart growth principles into zoning and development regulations to avoid greenfield development and create infill and higher-density development near transit, existing infrastructure, and walkable shopping districts. *Medium-term.*
- Change traffic impact analysis requirement to require new development to implement TDM strategies and promote all modes, including offering incentives such as free or discounted transit passes. *Medium-term.*
- Revitalize historic walkable towns and neighborhoods. *Long-term.*
- In rural areas, locate employment near village centers so that jobs are more accessible to rural residents. *Long-term.*

Implementation Partners: SPC, Municipal and County Governments, Developers, Chambers of Commerce.

Best Practice Example: TDM Ordinances

Some municipalities have passed TDM ordinances that require new developments to estimate travel demand, establish trip reduction targets, and commit to implementing TDM strategies, then report on performance. Municipalities that have done this include: Arlington County, VA; Cambridge, MA; Contra Costa County, CA; Alexandria, VA; Montgomery County, MD; Rockville, MD; Buffalo, NY; and San Francisco, CA. The City of Pittsburgh requires TDM plans for developments that are within certain zones or meet specific trip generation criteria.

4.4 Priority: Establish development incentive programs for TOD and for incorporating TDM



Development incentive programs would reward projects that incorporate TDM with density bonuses, tax credits, tax abatements, cash grants, forgivable loans, and permitting fee waivers. Taxing and land development control authorities including municipalities and counties can offer development incentive programs. The SPC and regional partners such as the Green Building Alliance and Sustainable Pittsburgh could showcase best practices and development recognition programs to developers via county and municipal planning offices.

- Establish developer density bonus for location-efficient development, including transit-oriented development. *Short-term.*
- Establish incentives for creating affordable housing near transit. *Short-term.*
- Leverage existing development recognition programs, including the Green Building Alliance and Leadership in Energy and Environmental Design (LEED), to motivate developments to implement TDM strategies. *Short-term.*

Implementation Partners: Municipal and County Governments, Developers, Nonprofits, SPC.

4.5 Priority: Manage the development of parking supply



Municipal zoning ordinances that include minimum parking requirements can cause new developments to oversupply parking. The City of Pittsburgh has developed TDM Guidelines that proposed developments submitting traffic impact studies must adhere to in order to pass site plan review. The CommuteInfo program has worked with employers such as UPMC and FedEx to manage parking supply by designating spaces for high-occupancy vehicles.

- Encourage municipalities to reform parking requirements: eliminate parking minimums for new developments, to reduce parking requirement for developments located near transit connections, to replace development parking requirements with comprehensive TDM plans, or to require developments to undertake and report regular parking occupancy counts. *Short-term.*
- Encourage developments, employers, and institutions to provide preferred high-occupancy vehicle (HOV) parking spaces as an incentive for ridesharing. *Short-term.*
- Where appropriate, encourage “parking district” planning when parking can be managed, priced and shared between times of day and different users. *Long-term.*

Implementation Partners: Municipal Governments, SPC, Developers, Transportation Management Associations, Parking Operators.

4.6 Priority: Facilitate private-sector investment in travel options and location-efficient development and design



To facilitate private sector investment in travel options and location-efficient development, municipalities should connect potential investors with location-efficient available properties and transit agencies to align with smart growth planning and policy goals early in the development process. This may involve development regulations or educating the private sector about the long-term financial returns of location efficiency in the SPC region, as many investors select locations based on low land costs without considering accessibility.

- Establish cost-sharing arrangement between development and transit to expand scope of transit, such as providing developments that build less parking with more transit service if development contributes a percentage of savings from reduced parking costs towards transit operations or amenities. *Long-term.*
- Connect businesses with transit while in the development stage so that employment can locate employment in transit-rich, mixed-use areas. *Long-term.*

Implementation Partners: Municipal Governments, Developers, Employers, Investors, Transit Agencies.



5. Goal: Target Opportunities Beyond Work Trips and to Address Non-Recurring Sources of Delay

Work trips are the largest single category of trips, though they make up less than one-third of all travel—comprising on average 31% of weekday trips across the nation. There is need to manage demand for the remaining 69% of trips and non-recurring sources of delay. While TDM traditionally focused on the journey to work and peak period congestion, demand management is increasingly used to address other travel purposes, including personal trips, special events, weekend recreational trips, emergencies and incidents, as well as travelers in highway work zones. Because demand for these travel purposes are not predictable or recurring to the degree that work trips are, addressing them requires different TDM strategies and communication mechanisms.

5.1 Priority: Encourage and educate travelers to reduce driving for diverse trip types



To connect travelers to alternative travel options for errands, recreation, and other personal trip types, there is need for community-based outreach and marketing. Reaching population groups such as the elderly and disabled about free or discounted transportation options available to them requires partnership with human services organizations. The Allegheny A to B Transportation Planner is a resource developed by Age-Friendly Greater Pittsburgh that connects residents with accessible transportation options based on their needs and eligibility for specific programs. Transit agencies in outlying counties such as Westmoreland, Fayette, and Indiana provide free or reduced fare shared rides for seniors over 65. Transit agencies in outlying countiesThe SPC could partner with organizations like Bike Pittsburgh, Walk Pittsburgh, and chambers of commerce to promote walking and biking to everyday amenities within neighborhoods as well as living and aging in place. Another strategy to reduce driving for a range of travel needs is through “trip chaining”. Trip chaining is when travelers link

together a series of trips between two main destinations such as home and work, combining trips together to reduce vehicle miles traveled (VMT). For example, on the way to work from home, stops could be made at a daycare and a coffee shop. Trip chaining is most effective with long commutes and within areas that have poor transit access or no transit access, because any automobile trip can become part of a trip chain. Employers and organizations can encourage trip chaining in a manner similar to how they encourage carpooling, but trip chaining works best when there are less restrictive policies open to supporting more individual needs.

- Connect elderly and disabled individuals to free ride services for medical/other needed travel (groceries, etc.). *Short-term.*
- Encourage walking and biking to every day shops/services. *Short-term.*
- Encourage trip chaining for all commute trips and as a part of everyday life. *Short-term.*

Implementation Partners: SPC, Human Services Providers, Public Transportation Providers, Walk Pittsburgh, Bike Pittsburgh, Business Improvement Districts.

Best Practice Example: Alternative Transportation encouragement programs

In Australia, the TravelSmart program works to encourage voluntary changes in travel behavior. One of their programs works to decrease automobile reliance for school trips by promoting transit alternatives through education. This effort was shown to reduce car use by 4-15% and increase non-motorized travel in the process. In Portland, SmartTrips works to promote alternatives to driving alone and targets specific areas of Portland with individualized marketing and outreach. Every year, a new area is added and through the program a 13% reduction in drive alone trips from the 7,400 participating households was observed.

5.2 Priority: Enhance transit services and tools to better serve non-work trips, including special events



To enhance services and tools for non-work trips, the SPC could provide technical assistance to transit operators to enhance service beyond peak hour commute trips to the urban core. The SPC could provide dynamic ride-matching software on the CommuteInfo platform to better serve individual, ad-hoc trips rather than recurring commutes. Alternatively, the SPC could promote a third-party ride-matching app like Waze Carpool on the CommuteInfo website. Enhanced transit tools could build off existing technology, such as the Mid Mon Valley Transit Authority’s bus tracker TraXster, which provides real-time information by online map, phone, scan, or text. In addition to providing technical assistance to employers, CommuteInfo outreach staff could work with entertainment venues to develop TDM strategies for special events, including promoting travel options, improving transit service, and providing discounts to attendees.

- Develop methodology for measuring transportation system impacts of special events and work zone construction using available real-time data such as *Streetlight Insight* and other vehicle probe sources. *Short-term.*
- Provide or promote dynamic ride-matching software that allows travelers to find rideshares for non-recurring trips, such as shopping or recreation. *Short-term.*
- Facilitate partnerships between hosts of special events to promote multiple events, and possibly offer discounts to attend multiple events to disperse traffic. *Short-term.*
- Encourage operators of special events to provide information about travel options (including transit) with online ticket purchase, email or reservation notification, and potentially provide discounts for using non-SOV modes. *Short-term.*
- Implement “take transit” and “park & ride” promotions for special events through signage, radio ads, paid media. *Short-term.*

- Partner with entertainment venues to improve transit service to the urban core during special events, evenings, and weekends. *Medium-term.*
- Provide technical assistance for transit operators to expand/enhance transit service beyond peak trips to and from the core, including weekend and/or night transit service (past 2 am) as well as crosstown service. *Long-term.*

Implementation Partners: SPC, Entertainment Venues, Special Events Operators, Public Transportation Providers, Mobility Service Providers, Media.

5.3 Priority: Integrate demand management strategies into construction and work zone management



PennDOT District offices can coordinate alerts about construction projects along significant regional corridors with transit agencies, transportation management associations, and CommuteInfo to promote transit, carpooling, use of park & ride lots, and alternative routes to avoid delay.

- Coordinate communication about construction activity and promote non-SOV modes along corridors under construction. *Short-term.*
- Enhance TMA construction alerts to include robust modal options. Provide alerts well in advance of detour. *Short-term.*
- Implement “take transit” and “park & ride” promotions for construction and traffic detours through signage, radio ads, paid media. *Short-term.*
- Establish more efficient construction flow procedures. *Medium-term.*

Implementation Partners: PennDOT, SPC, Public Transportation Providers, Transportation Management Associations, Media.

5.4 Priority: Integrate demand management into incident management and emergency management



To integrate TDM into incident management, the SPC Traffic Incident Management Steering Committee could coordinate with Traffic Management Centers and public safety communicators to incorporate messages about TDM into traveler alerts and message boards. In the medium-term, Pennsylvania law requires each municipality to maintain a disaster emergency management plan to prevent and minimize damage, coordinate effective response, and provide relief and recovery. The SPC could provide technical assistance to municipal planning offices preparing emergency management plans to incorporate TDM strategies and regional resources.

- Encourage alternate work hours in bad weather. *Short-term.*
- Integrate TDM into emergency preparedness planning. *Medium-term.*

Implementation Partners: SPC Traffic Incident Management Committee, SPC Staff, Traffic Management Centers, Public Safety Communicators, Municipal Governments.

Best Practice Example: Integrating TDM into incident and emergency management

The Walt Disney Company, NYSDOT, the University of Arizona, VDOT, Seattle DOT, and CDOT have implemented TDM strategies for emergency preparedness, special events, and facility construction and closures. These strategies ensure commuters can telework and get home when transit is down due to emergencies, provide assistance with navigation and carpooling during special events, and minimize interruptions during facility construction or closure.

5.5 Priority: Manage transportation system impacts of freight and deliveries



Consumer package deliveries are increasing in frequency due to the growing popularity of e-commerce. In addition to generating emissions and congestion, large delivery trucks can also obstruct urban streets and may block access to bicycle lanes.^{5,6,7} To reduce the number of delivery locations and truck idling times, logistics companies have made agreements with retail chains such as convenience stores, grocery stores, and others to install secure storage lockers, which guard packages until claimed by the consumer. These lockers benefit consumers by reducing theft, they reduce costs for logistics companies, and they also benefit the businesses that host them. In 2018, Whole Foods benefited from Amazon lockers as it observed an 11 percent increase in micro visits in stores containing Amazon lockers. Cities have also explored the concept of flexible curbside uses or flex zones in response to curbside space being needed for more than parking.⁸ Flexible curbside spaces or flex zones are typically present in urban areas that lack space for designated loading zones. Curb use can be set on an hourly schedule to switch from freight loading to hosting vendors, a market, and public seating while infrastructure and delivery lockers are installed on a more permanent basis. Finally, the curbside area can serve as a pick-up/drop-off zone and transit stop for the entire day.

⁵ SmartCitiesDive. 2018. Managing the curbside in the age of e-commerce and congestion. Retrieved from <https://www.smartcitiesdive.com/news/curbside-ecosystem-e-commerce-congestion-ups/517347/>

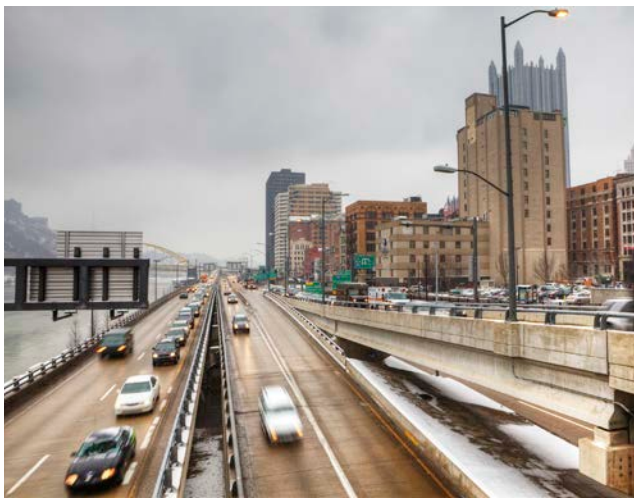
⁶ Logistics Management. 2018. UPS announces Seattle-based cargo eBike pilot program. Retrieved from <https://www.logisticsmgmt.com/article/ups-announces-seattle-based-cargo-ebike-pilot-program>

⁷ Streetsblog USA. 2017. UPS Kicks Off Year-Round E-Trike Delivery Service in Pittsburgh. Retrieved from <https://usa.streetsblog.org/2017/11/13/ups-kicks-off-year-round-e-trike-delivery-service-in-pittsburgh/>

- Encourage businesses (particularly retail in urban and suburban areas) to incorporate secure storage locker facilities into their stores. *Short-term.*
- Expand existing partnerships and create new partnerships with logistics companies to use e-bikes as a delivery method over trucks where applicable in urban areas. *Short-term.*
- Establish curbside management programs to manage truck deliveries with other needs. *Medium-term.*

Best Practice Example: Managing Impacts of Freight and Deliveries

UPS and the city of Seattle are testing out a pedal-assist cargo e-bike and customized modular trailer partnership to deliver packages to select areas around Seattle. The pilot is expected to reduce emissions, traffic congestion, and noise. The e-bikes will also be able to take more direct routes than trucks because of their access to bike lanes and sidewalks in restricted urban areas and won't need to idle on streets or double park. The City of Pittsburgh also started a similar program with UPS in 2017. Additionally, the City of Fort Lauderdale has implemented a curbside management program that includes daytime delivery zones and bike lanes (most are protected) to discourage double parking, unloading in travel lanes, and to support the UPS e-trike pilot program. Some of the delivery zone spots become parking overnight.



⁸ National Association of City Transportation Officials (NACTO). 2017. Blueprint for Autonomous Urbanism. Retrieved from https://ladot.io/wp-content/uploads/2019/01/BAU_Mod1_raster-sm.pdf

VI. IMPLEMENTATION AND MONITORING

The foundation for implementing the priorities and actions to achieve regional goals outlined in the preceding section of the Strategic Action Plan are is to establish mechanisms for integrating demand management in planning and project development. This initially emerged from the Visioning Workshop and Steering Committee review as a regional goal in line with the others presented in this plan. However, because integrating TDM into planning and project development underlies all recommended activities in the plan, this goal (along with its priorities and actions) were adapted into the following guidance for implementation. Monitoring implementation through performance measurement of TDM activities in coordination with the SPC’s overall performance management process will ensure that the region is making progress toward its goals. This section provides recommendations for implementing TDM through planning and project development as well as monitoring TDM activities through performance measurement.

1. Integrating Demand Management in Planning and Project Development

Integrating demand management into planning and project development was initially identified as a regional goal during the stakeholder visioning workshop. Because integration relates to the implementation process rather than outcomes of TDM, the priorities and actions are described in this section, separate from the preceding core goals. **Short-term actions serve as next steps** for implementing the Regional TDM Strategic Action Plan, as they provide a foundation for all other recommended goals, priorities, and actions.

1.1 Integrating TDM into regional planning and policy

As the Metropolitan Planning Organization for Southwestern Pennsylvania, the SPC plays a central role in TDM planning and policy at the regional level through the metropolitan planning process and short-range programming of federal transportation funds. In the short-term, the SPC can establish a regional TDM Committee to oversee implementation of the TDM Action Plan and advise the SPC Board on applicable priorities and actions. The SPC currently convenes a group of stakeholders engaged in TDM through the CommuteInfo Partners Forum, which could evolve into the TDM Committee. The TDM Committee can support PennDOT District offices to leverage the PennDOT Connects policy to engage with municipal planning offices and citizens groups in the early phases of transportation project development.

The SPC’s long range transportation plan *Smart Moves for a Changing Region* identifies “Prioritize and Streamline” as a key strategy to advance the regional goal of Connected Mobility. This strategy employs holistic planning for mobility and accessibility when developing and prioritizing projects and make transportation improvements fit community context and enhance local quality of life. To facilitate coordination, SPC could serve as a clearinghouse for plans and information about projects, helping to ensure that potential partners connect while projects are in the planning and design phases.

Recommended actions to integrate TDM into regional planning and policy include:

- Establish a regional TDM Committee to advise the SPC Board, which includes representation from SPC, PennDOT, municipalities, educational institutions (including researchers), transit operators, transportation management associations (TMAs), parking operators, emergency responders, and more. *Short-term.*

Potential activities of the TDM Committee include:

- Evaluate expansion of TMA models to other parts of the region without existing TMAs.
- Examine current and past TMA activities to expand reach of programs.
- Evaluate sources and responsibilities for updating TDM performance measures.
- Develop key TDM performance measures and ensure they are integrated with SPCs overall performance management program. *Short-term.*
- Leverage PennDOT Connects to encourage local municipalities and citizen groups to participate in meetings at the grassroots level to address community needs. *Short-term.*
- Coordinate regional transportation funding priorities to support travel options. *Medium-term.*
- Influence counties to adopt land use policies that generate more sustainable development. *Long-term.*
- Prepare a *State of the Region* report (modeled after the Forces of Change report) published semi-regularly with a dashboard to compare travel and demographics trends that can also be used to filter at the municipalities. *Long-term.*
- Advocate for regional commute trip reduction ordinance that requires employers above a certain size to implement TDM strategies and report on results. *Long-term.*

1.2 Integrating TDM into local planning and project development



Integrating TDM into local planning and project development relies on the authorities of municipalities and counties to regulate land use. In the short-term, local governments, institutions, and place-based nonprofits can support neighborhood-level TDM initiatives by connecting them with resources (including funding, tools, and partnership opportunities) to sustain operations and potentially scale up. For example, the nonprofit organization Bike Pittsburgh started in 2002 as a neighborhood-level initiative that grew to serve the Greater Pittsburgh area through partnership with Sustainable Pittsburgh, the Pittsburgh Downtown Partnership, the City of Pittsburgh, and philanthropic funders.

The SPC could work with counties to establish incentives such as special grant programs for municipalities to develop land use regulations and ordinances that support accessible transportation networks and encourage development that is linked to or drives transportation access.

Recommended actions to integrate TDM into local planning and project development include:



- Emphasize neighborhood-level TDM initiatives as the starting point for larger-scale programs. *Short-term.*
- Support municipalities in using Safe Routes to Schools principles and implementation tools. *Short-term.*
- Establish incentives for mixed-use zoning and sidewalk ordinances. *Medium-term.*
- Encourage municipalities to integrate TDM into the planning and permitting process for developments to accommodate transportation impacts and provide mechanisms for implementation. *Long-term.*
- Provide technical assistance to municipalities in preparing TDM plans to ensure consistency across the region, particularly with respect of survey methodology, metrics, and reporting. *Long-term.*

1.3 Integrating TDM into transportation project selection and programming

Translating goals from planning to project selection and programming can be difficult, and this applies to TDM. The SPC's Transportation Improvement Program (TIP) is the primary mechanism by which transportation projects in the SPC region are selected to receive federal program funds. In the short-term, auditing the TIP for TDM-supportive principles like smart growth will help regional stakeholders to understand how the current project selection and programming process aligns with regional TDM goals.

Long-term actions to integrate TDM into transportation project selection and programming modify funding programs and the project development process. An ongoing initiative that advances this priority is the SPC's Livability through Smart Transportation Program (SMART), established in 2014. The SMART program sets aside Surface Transportation Program (STP) funding to encourage project sponsors (municipalities in the 10-County region) to plan and implement approaches that link transportation improvements with appropriate land use development strategies.

Recommended actions to integrate TDM into transportation project selection and programming include:

- Conduct an assessment of SPC TIP against smart growth goals. *Short-term.* 
- Program funds and select projects through the lens of TDM to optimize the transportation system. Use federal programs like NHS funds that are not specifically targeted to TDM like CMAQ/TAP. *Long-term.*
- Re-evaluate major corridor (re)construction projects and plans through the lens of mode shift rather than level of service (LOS). *Long-term.*
- Prioritize transportation investments in regional activity centers. *Long-term.* 

2. Performance Measurement

Performance measurement of TDM is critical for the SPC to track the implementation and effectiveness of actions toward meeting regional goals. The Performance Measurement Memorandum recommends a set of performance measures that are summarized in Table 1 in relation to each of the TDM Strategic Action Plan goals as well as the implementation objective to integrate TDM into planning and project development. It is important to recognize that while many of these measures can be used at the regional scale, many of the measures are also targeted for use at a subarea, corridor, or localized scale, and can be used in relation to specific program activities (for instance, to assess the benefits of a targeted marketing campaign along a specific corridor).

2.1 Performance Data Sources and Analysis Approaches

Performance data may reflect direct observations (e.g., counts of travelers). In other cases, particularly in order to assess the impacts of TDM strategies on outcomes, surveys may be needed to understand shifts in behavior or travel patterns. Data availability is essential to on-going performance measurement, though can be costly to obtain and manage. Therefore, the SPC should minimize the number of surveys or additional data needed for TDM performance measurement. Additionally, the SPC should leverage existing data sources to assess performance impacts at varying scales, including local street networks, corridors, and regionally. Recommended data sources include:

- Data available through the CommuteInfo platform
- The SPC's *Streetlight Insight* subscription
- Data on travel time and speed from vehicle probe
- Federal and State data sources

2.2 Recommended Performance Measures

Recommended performance measures were developed through consideration of best practices, available data sources, and existing performance measures identified in the SPC’s transportation planning and programming documents. Performance measures generally address a typology of:



Awareness (e.g., awareness of travel options, travel information);



Activities (e.g., participation in a vanpool program, number of ride matches);



Outputs (e.g., mode shifts, increases in average vehicle occupancy); and



Outcomes (e.g., reduced vehicle miles traveled, reduced travel time, reduced emissions, cost savings).



Awareness

Awareness of travel options/CommutelInfo: Due to the dominance of digital media over other channels, public awareness of travel options and the CommuteInfo program would be best measured through web traffic analytics and social media engagements. Potential measures include:

- Unique visitors to CommuteInfo.org website
- Unique visitors to TMA websites
- Engagements on social media

General public awareness and employer awareness using a measure such as the “share of population that has heard messages about commute options” could also be assessed through a regional survey.

Goals Addressed:

- Increase Employer Involvement to Improve Workforce access to jobs.
- Increase Awareness of Travel Options and Services.



Activities

Number of employers offering commuter benefits: While there is no regional data source on commuter benefits offered by employers, the regional TDM partners can contribute to a dataset through employer engagement efforts. CommuteInfo outreach staff and partners of CommuteInfo, including TMAs, could track information on commuter benefits offered by employers through a Customer Relationship Management (CRM) system. Alternatively, TDM stakeholders could distribute an employer survey about commuter benefits on biannual basis.

Goals Addressed:

- Increase Employer Involvement to Improve Workforce Access to Jobs.

Travelers served by CommuteInfo services: This includes Commute Options Reports submitted and registrants for Emergency Ride Home.

Goals Addressed:

- Enhance the Ease of Use, Connectivity, and Effectiveness of Transit and Shared Mobility Options as well as Bicycling and Walking.
- Increase Employer Involvement to Improve Workforce access to Jobs.
- Increase Awareness of Travel Options and Services.

Number of vanpools operating: The CommuteInfo program already tracks the number of vanpools operating in the region.

Goals Addressed:

- Enhance the Ease of Use, Connectivity, and Effectiveness of Transit and Shared Mobility Options as well as Bicycling and Walking.
- Increase Employer Involvement to Improve Workforce access to Jobs.

Percentage of regional bus routes with real-time tracking: Bus services can provide this information; in addition, supplemental measures like the number of bus riders accessing real-time travel information can be tracked.

Goals Addressed:

- Enhance the Ease of Use, Connectivity, and Effectiveness of Transit and Shared Mobility Options as well as Bicycling and Walking.
- Increase Awareness of Travel Options and Services.

Special events and work zone management: Initiatives to manage demand during planned special events as well as work zone efforts, such as transit promotions, shuttles, or water taxis, can be tracked by the estimated share of total attendance to which special travel or access options were utilized, or based on the number of travelers utilizing these services. Timestamped traffic data from Streetlight Insight and other vehicle probe sources could be used to evaluate transportation system impacts of special events and work zones.

Goals Addressed:

- Enhance the Ease of Use, Connectivity, and Effectiveness of Transit and Shared Mobility Options as well as Bicycling and Walking.
- Increase Awareness of Travel Options and Services.
- Target Opportunities Beyond Work Trips and to Address Non-Recurring Sources of Delay.

Outputs

Transit ridership (system-level or route-based):

The SPC's annual Regional Transit Profile compiles metrics for each transit agency in the SPC region. Additional measures are available through the National Transit Database.

- Average annual weekday ridership.
- Annual ridership
- Total passengers

Goals Addressed:

- Enhance the Ease of Use, Connectivity, and Effectiveness of Transit and Shared Mobility Options as well as Bicycling and Walking.
- Increase Employer Involvement to Improve Workforce access to Jobs.
- Increase Awareness of Travel Options and Services.
- Promote Location-Efficient Development.

Non-single occupant vehicle (non-SOV) work mode share:

This measure is a federal requirement for Systems Performance Measurement and can be obtained through the American Community Survey (ACS) on an annual basis. *Streetlight Insight* data on trips by mode (including transit, biking, and walking) can validate the non-SOV mode share for both work and non-work trips and can be used for sub-regional and corridor analysis.

Goals Addressed:

- Enhance the Ease of Use, Connectivity, and Effectiveness of Transit and Shared Mobility Options as well as Bicycling and Walking.
- Increase Employer Involvement to Improve Workforce access to Jobs.
- Increase Awareness of Travel Options and Services.
- Promote Location-Efficient Development.

Mode share for non-work trips: Since work trips account for only 25% of travel in the SPC region, it is valuable to measure mode share for personal trips beyond commuting. Data on non-work trips can be obtained from *Streetlight Insight*. The National Household Travel Survey (NHTS), conducted every five to seven years, provides mode share data on non-work trips, however the sample size is generally not sufficient for regional analysis without the NHTS Add-on Program. This program combines the NHTS random national samples with additional samples collected in the Add-on area (such as an MPO service area) for analysis.

Goals Addressed:

- Enhance the Ease of Use, Connectivity, and Effectiveness of Transit and Shared Mobility Options as well as Bicycling and Walking.
- Increase Awareness of Travel Options and Services.
- Promote Location-Efficient Development.
- Target Opportunities Beyond Work Trips and to Address Non-Recurring Sources of Delay.

Park & ride lot utilization: Utilization of park & ride lots across the region reflect levels of carpooling and transit use. Data can be obtained through counts on a quarterly basis at each lot.

Goals Addressed:

- Enhance the Ease of Use, Connectivity, and Effectiveness of Transit and Shared Mobility Options as well as Bicycling and Walking.
- Increase Employer Involvement to Improve Workforce access to Jobs.
- Increase Awareness of Travel Options and Services.

Number of jobs within ½ mile of regional transit routes: This measure reflects changes in both transit service and land use patterns. Data are available through the AllTransit™ Metrics tool, an initiative of the Center for Neighborhood Technology.⁹ Data are available at numerous geographic scales, including Census block and tract, city, county, metro area, and MPO service area. Data is sourced from the General Transit Feed Specification (GTFS) as well as the Longitudinal Employer-Household Dynamics (LEHD) dataset.

⁹ Available at <https://alltransit.cnt.org/metrics/>

Goals Addressed:

- Enhance the Ease of Use, Connectivity, and Effectiveness of Transit and Shared Mobility Options as well as Bicycling and Walkin
- Promote Location-Efficient Development.

Number of households within ½ mile of regional transit routes: This measure reflects changes in both transit service and land use patterns. Data are available through the AllTransit™ Metrics tool, an initiative of the Center for Neighborhood Technology.¹⁰ Data are available at numerous geographic scales, including Census block and tract, city, county, metro area, and MPO service area. Data is sourced from the General Transit Feed Specification (GTFS) as well as the Longitudinal Employer-Household Dynamics (LEHD) dataset.

Goals Addressed:

- Enhance the Ease of Use, Connectivity, and Effectiveness of Transit and Shared Mobility Options as well as Bicycling and Walkin
- Promote Location-Efficient Development.

Outcomes

Vehicle miles traveled (VMT) daily per capita (regional or sub-regional scale) or VMT reduced (program evaluation): VMT per capita is a valuable measure of performance because it is understandable and reflects the outcome of TDM efforts targeted toward encouraging travel options; when divided by population, the measure is standardized in a way that enables tracking over time as population levels change. For TDM program evaluation, VMT reduction can be estimated and is a useful measure to assess the effectiveness of specific strategies, such as marketing promotions, incentives, and new services. VMT data are available through the User Delay Cost Analysis from the National Performance Management Research Data Set (NPMRDS), though it is limited in coverage. These data can be obtained at the region, county, or corridor levels within the NPRMDS by making the appropriate selection. Alternatively, the SPC can use travel surveys and results from the regional Travel Demand Model to estimate VMT at multiple levels. VMT reductions can be calculated for specific activities based on travel behavior and factors such as average trip lengths and average vehicle occupancies.

¹⁰ Available at <https://alltransit.cnt.org/metrics/>

Goals Addressed:

- Enhance the Ease of Use, Connectivity, and Effectiveness of Transit and Shared Mobility Options as well as Bicycling and Walking.
- Increase Employer Involvement to Improve Workforce access to Jobs.
- Increase Awareness of Travel Options and Services.
- Promote Location-Efficient Development.
- Target Opportunities Beyond Work Trips and to Address Non-Recurring Sources of Delay.

Cost savings (program evaluation): VMT reduction can be translated into cost savings. Existing research collected in the Trip Reduction Impacts of Mobility Management Strategies (TRIMMS) Model monetizes VMT in terms of direct and societal costs such as road maintenance, noise, fuel, emissions, fatalities and injuries, as well as delay.¹¹

Goals Addressed:

- Enhance the Ease of Use, Connectivity, and Effectiveness of Transit and Shared Mobility Options as well as Bicycling and Walking.
- Increase Employer Involvement to Improve Workforce access to Jobs.
- Increase Awareness of Travel Options and Services.
- Promote Location-Efficient Development.
- Target Opportunities Beyond Work Trips and to Address Non-Recurring Sources of Delay.

Emissions reduced (program evaluation): VMT reduction can be translated into emissions reductions by applying emissions factors from the Motor Vehicle Emissions Simulator (MOVES) model used as part of regional emissions analysis. It is important to note that the level of sophistication of analysis can vary, from simply multiplying VMT reduced by an emissions factor, to conducting more complex analyses accounting for changes in vehicle speeds and travel conditions. Emissions can be calculated with respect to criteria pollutants, VOC, NOX, PM2.5, PM10, and CO, as well as greenhouse gas emissions. Other simplified tools that can be used also include the TRIMMS Model and the Environmental Protection Agency’s Local Greenhouse Gas Inventory Tool.¹²

¹¹ Retrieved from <http://trimms.com/>

¹² Available at <https://www.epa.gov/statelocalenergy/local-greenhouse-gas-inventory-tool>

Goals Addressed:

- Enhance the Ease of Use, Connectivity, and Effectiveness of Transit and Shared Mobility Options as well as Bicycling and Walking.
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- Promote Location-Efficient Development.
- Target Opportunities Beyond Work Trips and to Address Non-Recurring Sources of Delay.


Cost effectiveness (program evaluation): Cost effectiveness compares the cost of implementing TDM strategies with total impacts, for example, the cost per VMT reduced. Tools exist to go beyond cost effectiveness and monetize the value of TDM outcomes (such as VMT reductions) to estimate return on investment (ROI). FHWA's TDM ROI Calculator.¹³ is a tool that monetizes the direct and social benefits of existing TDM strategies at the regional and sub-regional level. The calculator can analyze a single TDM service or bundle of TDM services together, and can be applied to the entire region, activity center, county, local jurisdiction, or highway corridor. While this tool is the most comprehensive available for calculating ROI on TDM, it does not account for several significant TDM-related costs and benefits, including costs savings from parking or vehicle ownership, improved mobility for those who do not drive, and health benefits. For this reason, it is recommended that the SPC use cost effectiveness rather than ROI.

2.3 Performance Management

Implementation of effective performance management requires accountability for 1) tracking and updating measures every two years, 2) sharing performance with stakeholders and the general public, and 3) linking observed changes in performance with planning and programming of TDM activities. To ensure that performance measurement provides meaningful insight on the impacts of TDM activities over time, SPC staff should be assigned responsibility for tracking key performance measures, most of which can be tracked on an annual or biennial basis. The TDM Advisory Committee should advise on the selection of performance measures and methodologies. These measures and methodologies can evolve if needed, but they demonstrate progress most effectively when kept consistent across review cycles. A TDM Advisory Committee should provide guidance in reviewing the results, advising on communication, and assessing implications in terms of future program and funding priorities. Finally, the TDM Advisory Committee should ensure that reports on TDM performance are shared with the SPC Board and key measures such as VMT per capita are integrated with SPCs overall performance management program to inform long-range planning and project programming.

¹³ Available at <https://mobilitylab.org/calculators/download-tdm-roi-calculator/>

Table 1: Summary of Recommended TDM Performance Measures for SPC Regional TDM Strategic Action Plan

 REGIONAL TDM STRATEGIC ACTION PLAN GOALS 								
Performance Measure	Federal Requirement	Regional Ops Plan	Enhance the Ease, Connectivity, and Effectiveness of Travel Options	Increase Employer Involvement	Increase Awareness of Travel Options	Location-Efficient Development	Target Opportunities Beyond Commute / Non-recurring Delay	Integrate TDM into Planning & Projects
 Awareness of travel options/ CommuteInfo				●	●			
 Number of employers with commuter benefits				●				
 Travelers served by CommuteInfo			●	●	●			
 Number of vanpools operating regionwide			●	●				
 % of regional bus routes with real-time tracking		●	●		●			
 Special events management							●	
 Transit ridership (Route-based or system)		●	●	●	●	●		
 Non-SOV mode share for work trips	●		●	●	●	●		
 Non-SOV mode share for non-work trips			●		●	●	●	
 Park & ride lot utilization			●	●	●			
 Number of jobs within 1/2 mile of regional transit routes			●			●		
 Number of households within 1/2 mile of regional transit routes			●			●		
 Vehicle miles traveled (VMT) per capita / VMT reduced			●	●	●	●	●	●
 Cost savings			●	●	●	●	●	●
 Emissions reduction*	●		●	●	●	●	●	●
 Cost effectiveness			●	●	●	●	●	●

*Note that the Federal emissions reduction measure addresses CMAQ projects generally.