VI. Transportation Model Application and Results

Seven scenarios were defined by selectively assigning the 2011, 2014, 2015, 2018, 2025, 2035, and 2040 trip tables described in Section IV to the transportation networks defined in Section III. The highway and transit assignment results were used to develop an emission level for each scenario. The seven scenarios included:

1. Existing Year (2011 network, 2011 trips)
2. TIP Build Year (2014 network, 2014 trips)
3. For Consistency with Johnstown $PM_{2.5}$ Analysis (2015 network, 2015 trips)
4 Ozone Budget Year (2018 network, 2018 trips)
5. Interim Year #1 (2025 network, 2025 trips)
6. Interim Year #2 (2035 network, 2035 trips)
7. Long Range Plan (2040 network, 2040 trips)

Highway and transit assignments for each scenario were produced using the methodology described in Section IV. For each scenario, highway assignment summaries were developed and stratified by county and functional class. Separate summaries were developed for each nonattainment area. These summaries include vehicle miles of travel (VMT) and weighted average speed. For purposes of the conformity process, assignment summaries for the network centroid connectors served as a partial surrogate for local (non-network) travel characteristics. An estimate of intrazonal travel was also developed from each highway assignment. The intrazonal estimate was included in the local travel summary. Transit assignment summaries were used to estimate bus vehicle miles and average speed for peak and off-peak conditions. Peak and off-peak vehicle miles and speed of automobile trips to park-and-ride facilities were also estimated from transit assignments. Assignment summaries by county and functional class appear in Appendix D for each $PM_{2.5}$ and 8-hour ozone nonattainment and maintenance area.

Based on the analysis month, average speed, roadway type, and whether the county is included in the I/M program, appropriate emission factors are derived for each bus route, park-and-ride facility or roadway functional class/county stratification. VMT for each stratification is then multiplied by its emission factor to produce VOC, $PM_{2.5}$ and NOx emissions within each stratification.

Two adjustments were made to the network VMT that was output from highway assignments. First, an estimate of the VMT reduction potential of various Travel Demand Management (TDM) strategies included in the TIP and Plan was developed through use of a TDM evaluation model. Second, VMT was seasonally adjusted to appropriately represent a typical day for each analysis month.

Implementation of the TDM strategies defined in Figure 2 can produce modest reductions (3-5 percent) in forecasted regional VMT. Funding for these TDM strategies is included as a line item in the 2040 Plan under the Traffic Operations and Safety Investment Strategy.

Funding in the 2011-2014 TIP has been programmed for the specific TDM projects listed below:

- Transportation Management Association Funding –ACTA, OTMA, PDP $2,400,000 (MPMS#69837)
- Ride Rack & Roll Program – PAAC $250,000 (MPMS#71558)
- Bike/Ped Marketing Program – City of Pgh $100,000 (MPMS#28366)
- WalkPittsburgh.org – ACTA, OTMA, PDP $192,896 (MPMS#88426)
- Pittsburgh Rapid Bus Shelters – PAAC $700,000 (MPMS#28501)
- Route 528 Park-n-Ride Lot Expansion Phase-2 – BTA $3,140,000 (MPMS#75957 & 83837)
- Cranberry Area Transfer Center – BTA $1,707,500 (MPMS#83835)
- CommuteInfo/TMA Outreach – SPC, ACTA, OTMA, PDP $1,300,000 (MPMS#77094)
- CommuteInfo Mobility Management – SPC $900,000 (MPMS#90501)
- Butler Multimodal Center – BTA $2,875,000 (MPMS#88989)
- New Transit Service – Butler to Pittsburgh – BTA $1,000,000 (MPMS#88990)
- McConnell's Mills Park-n-Ride Lot – PennDOT 10-0 $103,000 (MPMS#89353)
- Intermodal Transit Center and /Park-n-Ride Facility – City of Washington $2,613,901 (MPMS#86780)
- California University. Intermodal Facility – MMVTA $425,000 (MPMS#90062)
- Pa 51 Park-n-Ride Lot (Uniontown) – Pa Turnpike Commission $250,000 (MPMS#90359)

The total cost identified in the 2011-2014 TIP for these fifteen projects is $17,958,000. A similar level of funding for TDM projects is expected to be available for programming on future TIPs from the Traffic Operations and Safety line item in the Long Range Plan.

To evaluate the effect of the TDM strategies on VMT, SPC utilized a microcomputer software package known as the TDM Evaluation Model. That model is an analytic tool that supports the quantitative evaluation of TDM programs. The model was developed with the support of the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA).

The input data includes information about the package of TDM strategies to be implemented, the marketing and educational activities to promote the benefits of the strategies, and the expected level of participation by employers and individuals within identified target markets.

The TDM strategies in Figure 2 defined by SPC for this conformity assessment include regional transit and ridesharing promotional programs, compressed work week and telecommuting, as well as direct subsidies by employers to employees who commute by transit, carpool or vanpool. It was not presumed that any of the elements of the TDM packages would be mandated by law. An active ongoing marketing and public relations effort was defined as part of the model inputs. A "base" or current level of implementation for TDM strategies was included as model inputs for both the 2014 (TIP) and 2040 (Plan) scenarios.

The model was run for the 2014 and 2040 scenarios. Results for 2015, 2018, 2025, and 2035 were interpolated from the 2014 and 2040 outputs. Estimated VMT reductions as a result of the modeled TDM strategies ranged from around 254,000 vehicle miles in 2014 to about 2.1 million in 2040. Input and output summary reports generated by the TDM model, as well as employer participation rates, appear in Appendix F.

Information from SPC's travel model was used to calculate emissions for each nonattainment and maintenance area for each analysis year. The resulting VMT, average speed, and emissions are presented in Section VII (Tables 13 through 21). Values shown on those tables for 2002 and

2008 were developed in previous conformity assessments. They were not changed for this analysis.

Travel Demand Management Strategies

Strategy	Definition
Increased efforts to promote ridesharing and transit	- Ride matching services - Preferential (more convenient) parking - Flexible work schedules
Programs to deter single occupant vehicle work trips	- Programs such as "TransitChek" for carpools, vanpools, and transit
Flexible Work Hours, Staggered Work Hours, Compressed Work Weeks	- Aggressive promotion with region's employers
Telecommuting	- Work with employers and government agencies to promote concept and infrastructure
Intelligent Transportation Systems (ITS)	- Work to implement projects that provide transportation system users with better information on existing system conditions, congestion and travel choices

Figure 2 **SPC May 2011**