Status of the
Emissions Post Processor
for the TPB Travel Model,
Version 2.1 D, Draft #50

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Ron Kirby, COG/TPB

Running Emissions Computation Process

- Emission computation is made at the network link level, by hour of the day
- Computation Sequence:
  1. Period Volumes (AM, PM, Off-Peak) from traffic assignment converted to 'initial' hourly volumes using nine observed hourly distributions (three facility types by three peaking classifications)
  2. Congested 'initial' peak volumes spread to 'shoulder' hours, resulting in 'final' hourly volumes and speeds
  3. Mobile emission rates developed based on final hourly speeds
  4. Mobile emissions computed, based on product of emission rate and link VMT

Recent Post Processor Updates

1. Period volumes (AM, PM, off-peak) from the traffic assignment step are conserved in the development of 'initial' hourly volumes. (Previously, the nine observed hourly distributions were applied to 24-hour volumes from the traffic assignment step.)
2. Relationship of speed and volume refined to better reflect operating conditions observed in TPB travel monitoring studies:
    1. Congested freeway capacities adjusted to reflect reduction in 'through-put' under congested conditions.
    2. Arterial and collector speeds decline beyond a V/C ratio of 1.0.
    3. Speed 'floors' imposed for all facilities: 17 mph for freeways, 8-16 mph for arterials.
    4. Final hourly volumes set to be consistent with final speeds.
3. Post processor being integrated into the travel model so the effects of peak-spreading are reflected in peak and off-peak volumes and speeds.

2005 Regional VMT by Hour
Before and After Volume Spreading
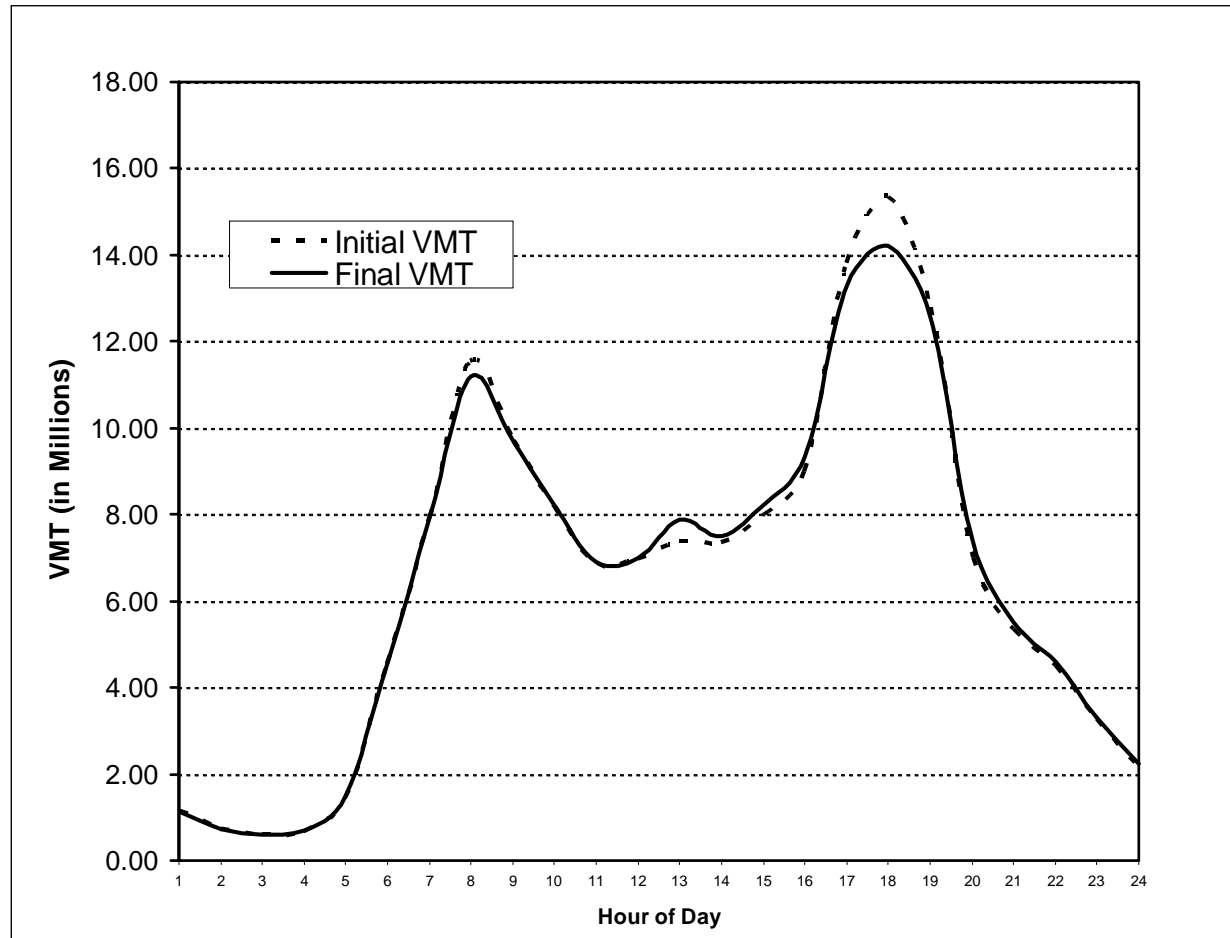
2005 Mobile Emissions Summary for the MSA (FY 2004-2009 TIP and FY 2005-2010 TIP)

		FY 2004-2009 TIP (1)	FY 2005-2010 TIP (2)	(3)	Difference (3) - (1)	Difference (3) - (2)
Mobile Emiss. Post-Processor		March 2003	March 2003	October 2004		
Mobile Model		M 6.0	M 6.2 final	M 6.2 final		
Travel Model		Version 2.1C	Version 2.1D #50	Version 2.1D #50		
Land Use		Round 6.3	Round 6.4A	Round 6.4A		
VMT		**126,453,600**	**117,389,600**	**117,389,600**	**-9,064,000**	**0**
Ave. Highway Speed (mph)		**39.3**	**39.6**	**40.9**	**1.6**	**1.3**
Avg Running Rates (gm/mi)	**HC**	**0.336**	**0.329**	**0.316**	**-0.020**	**-0.014**
	Nx	**1.450**	**1.445**	**1.438**	**-0.012**	**-0.007**
Running Emissions (tons)	**HC**	**46.813**	**42.617**	**40.854**	**-5.959**	**-1.763**
	Nx	**202.118**	**186.958**	**186.108**	**-16.010**	**-0.850**