System Operations Advisory

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Construction Congestion Cost (CO3) Software

Since the implementation of MDOT's Work Zone Safety and Mobility policy for the 2008 construction season, there has been an increased use of the Construction Congestion Cost (CO3) software by all MDOT staff. CO3 is a tool to help ensure that safety and mobility of our customers is planned from project inception through delivery. The majority of input values that CO3 requires are variable, based on region, route, work type, staging and the temporary traffic control plan. After numerous statewide Safety and Mobility Peer Team reviews, there appears to be a need to provide guidance on several input values when analyzing freeway segments.

1. CO3 users should use Traffic and Safety Note 901 and the appropriate average adjustment factors when selecting maximum hourly capacity thresholds for work zones for the volume capacity spreadsheet cells.

2. User delay calculations using CO3 should utilize the current 2010 cost values shown below. Local or regional cost adjustments may be appropriate where information can be documented. Metropolitan Planning Organizations may be able to provide adjustment factors or hourly cost factors for specific geographical areas.

CO3 Cost Value	**Cars**	**Trucks**
User Cost per Hour ($/Veh hour)	$16.30	$28.75
User Cost per Mile ($/Veh mile)	$0.50	$1.69

The User Cost per Hour values above are based on the Federal Highway Administration (FHWA) publication number, FHWA-SA-98-079, "*Life-Cycle Cost Analysis in Pavement Design".* Currently, MDOT updates these costs yearly using the Consumer Price Index (CPI), which follows the same methodology as detailed in the FHWA publication, with the above costs being based on the 2009 annual CPI value. These values can be revised more often if necessary.

The User Cost per Mile value for cars is the latest operating cost value published by the Internal Revenue Service. This value should be updated based on the release of new values, historically every six to twelve months. For trucks, an operating cost value was calculated from the 2003 Motor Carrier Annual Report (the latest available data), and indexed into 2009 dollars based on the CPI. **Current values will be maintained under the "Links" section on the Work Zone Safety and Mobility web site which should be checked before running the CO3 analysis.**
http://www.michigan.gov/mdot/0,1607,7-151-9625_54944-227053--,00.html

3. The value for the line item titled **speed (when D~0)(mph)** in the speed delay section should be the active work zone speed as posted or observed.

4. There has been inconsistency when interpolating Figure II-22, 1990, AASHTO "*A Policy on Geometric Design of Highways and Streets*", for the volume (demand) approaching capacity value. This value provides the associated speed value for the line item titled **speed (when D=C)(mph)** in the speed delay section. The values below should be used when the volume is approaching capacity.

Speed when Demand is Low (D~0) (mph)	Speed when Demand is Approaching Capacity (D=C) (mph)
30	25
35	28
40	31
45	34
50	35
55	36
60	37
65	38
70	38

When traffic volume will not approach capacity on a given freeway segment, an interpolated value should be used based on Figure II-22, 1990, AASHTO "*A Policy on Geometric Design of Highways and Streets*".