

## AGENDA ITEM 3—MPO MODELING CAPABILITIES

Prepared by SACOG Staff for Discussion by the Regional Targets Advisory Committee Working Group  
February 19, 2009

SAMPLE 1 (pages 1 to 6)

MORE DETAILED DATA COLLECTION/MONITORING AND MODEL DEVELOPMENT PROGRAM SELF-ASSESSMENT FORMAT

Pages 1 to 3 = Blank form, for discussion

Pages 4 to 6 = Sample form filled out by SACOG with preliminary self-assessments

SAMPLE 2:

MORE GENERALIZED POLICY ANALYSIS CAPABILITY SELF-ASSESSMENT FORMAT

Page 7 = Blank form, for discussion

Page 8 = Sample form partially filled out by SACOG with preliminary self-assessments

**REVIEW DRAFT--NOT FOR CITATION--FOR DISCUSSION ONLY**

**DATA/MODELING SELF-ASSESSMENT FOR GHG EMISSIONS AND SB375 IMPLEMENTATION  
ASSESSMENT FOR:**

- 1=No current practice on this activity; major work needed
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**Regional Monitoring & Data Collection Program (p. 1 of 3)**

Overall Objectives	Monitoring/Data Component	Definition of a "5"	Current Practice	Assessment of Current Practice	Improvements needed to fully account for factors related to greenhouse gas emissions, climate change, SB375 implementation (i.e. to get to "5" on all components)
Provide consistent, comprehensive reports and databases of land use, demographics and transportation conditions in the region, as they change over time.	Land Use				
	Demographics				
	Transportation				
	Other Areas				

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**Travel Demand Modeling Program (p. 2 of 3)**

Overall Objectives	Definition of a "5"	Modeling Component or Factor	Current Practice	Assessment of Current Practice	Improvements needed to fully account for factors related to greenhouse gas emissions, climate change, SB375 implementation (i.e. to get to "5" on all components)
Capability for portraying transportation demand for the entire region at fine level of geographic detail, and for a wide array of travel purposes and types for both urban and rural areas.					
Account for a wide range of factors influencing travel behavior, in both their current and expected future forms or levels.					

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**Land Use Modeling Program (p. 3 of 3)**

	Definition of a "5"	Modeling Component or Factor	Current Practice	Assessment of Current Practice	Improvements needed to fully account for factors related to greenhouse gas emissions, climate change, SB375 implementation (i.e. to get to "5" on all components)
<b>Overall Objectives</b> Capability for portraying land use for the entire region at fine level of geographic detail, and for a wide array of use and types for both urban and rural areas.					
Account for a wide range of factors influencing patterns of growth and development within the region.					

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Regional Monitoring & Data Collection Program (p. 1 of 3)

Overall Objectives	Monitoring/Data Component	Definition of a "5" (SACOG first cut...for review)	Current Practice	Assessment of Current Practice	Improvements needed to fully account for factors related to greenhouse gas emissions, climate change, SB375 implementation (i.e. to get to "5" on all components)
Provide consistent, comprehensive reports and databases of land use, demographics and transportation conditions in the SACOG region, as they change over time.	Land Use	Land use monitoring program rigorous, consistent, and frequent enough to allow for meaningful assessments of progress toward SCS or APS. Level of detail in monitoring program sufficient to allow for small area (i.e. sub-jurisdictional) assessments of progress toward SCS or APS.	-Annual housing monitoring (permits by parcel)	3	-Intensify annual monitoring
			-Employment inventories-InfoUSA + SACOG research, QA/QC	2	-Improve jobs, non-res. Monitoring
			-Housing, jobs, other inventory updates on 3-5 year cycle	3	-Inventory updates on 2 year cycle (min)
			-GIS parcels Annual published update	3	-More content added to GIS parcels
			-Policy/plan inventory: updates on 3-5 year cycle	2	-Inventory updates on 2 year cycle (min)
			-New: Crop/forested area inventory	tbd	-TBD
	Demographics	Activity-based models require more detailed, small area demographics. As more data are released, ACS will provide a better source for tracking demographic changes by census geography.	-Past: decennial census only	3	-Maintain level-of-effort on decennial census
			-Present/future: annual ACS (unknown)	tbd	-More intensive use of ACS
	Transportation	Consistent, reliable estimates of VMT and VMT over time is necessary for assessments of effectiveness of SCS/APS and transportation strategies. VMT estimates must be attributable to particular geographies (e.g. MPO areas). The next wave of household travel surveys statewide should include at least one site where ongoing panels are surveyed to assess transportation behavior change over time.	-GIS centerline--Annual published update	3	-Add substantial content to GIS (lanes, signals, etc.)
			-Model networks: 3-5 year base update+future TIP n/w's	3	-Updates to 2-year cycle
			-HPMS: Annual but spotty results	1	-Improve HPMS (all 3 legs--state, MPO, local)
			-Counts/volumes: 3-5 year update cycle	2	-Updates to 2-year cycle: expand count coverage: truck counts
			Transit boardings by line: 3-5 year update cycle	2	-Updates to 2-year cycle
			-Household travel surveys: approx. 10 year cycle	3	-More robust 2010 household survey, w/multi-year panel
			-On board transit surveys: approx. 5 year cycle	3	-Maintain 5 year cycle, but expand to all operators
				n/a	-Gateway (external travel) survey
				n/a	-Update airport passenger survey
				n/a	-Ped. enviro. survey (e.g. sidewalks, p/b facilities)
	n/a	-VMT by users survey (e.g. DMV or BAR data)			
Other Areas	Recent volatility in fuel prices and the global economy point to the need for tracking and monitoring of more indicators which have been shown to influence travel behavior. Fuel sales could be a crucial, additional "angle" on VMT and emissions.		3	-Add fuel price monitoring	
			1	-Add fuel sales by jurisdiction (county?)	
			2	-Add monitoring of vehicle preferences, fleets	
			1	-Add home prices/affordability	
				-Add non-residential rents, costs	

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**Travel Demand Modeling Program (p. 2 of 3)**

Overall Objectives	Definition of a "5" (SACOG first cut...for review)	Modeling Component or Factor	Current Practice	Assessment of Current Practice	Improvements needed to fully account for factors related to greenhouse gas emissions, climate change, SB375 implementation (i.e. to get to "5" on all components)
Capability for portraying transportation demand for the entire region at fine level of geographic detail, and for a wide array of travel purposes and types for both urban and rural areas.	Spatial detail should be sufficient to demonstrably capture travel behavior related to land use (i.e. 4D's, transit-oriented developments, etc.). The array of purposes/sectors modeled should be comprehensive (i.e. include the vast majority of travel) and allow for allocation of travel to purpose or sector.	Granularity/level of detail	-Parcels for DAYSIM; TAZ's for other SACSIM submodels	4	-Transition other SACSIM submodels to parcels
		Household-gen. travel	-DAYSIM = person level, activity/tour demand simulation	4	-Capacity for pricing, etc. per model devel. program
		Comm.Veh. & Freight	-Old TAZ-based, aggregate truck model	2	-Transition to comm.veh/freight simulation (a la Calgary)
		Airport Pass.Grnd.Access	-Passenger-level simulation, TAZ-based	5	n/a
		External Travel	-Fixed IX/XI, XX trips	2	-Tie to statewide model, update base yr.gateway and thru trips
Account for a wide range of factors influencing travel behavior, in both their current and expected future forms or levels.	Travel model capacity and sensitivity should demonstrably capture travel behavior differences related to the key factors listed (demographics, land use, transportation system, vehicle ownership and use, costs, and pricing). Vehicle type should be "attached" to travel forecasts.	Demographics	-DAYSIM uses representative pop.--demographics explicit	4	-Improved capability to generate pop.files
		Land Use/"4D's" Effects /1/	-DAYSIM based on parcel level land use, 4D's "built in"	4	-Expand use of parcels to other SACSIM submodels
		Transp.System	-TAZ-based highway, transit networks	3	-Microsim/DTA assignment: improved ped/bike skims /2/
		Veh.Ownership & Use	-Only ownership by household; no type or use	3	-Add veh.type, intra-household allocation of vehicles
		Costs of Travel	-Single point average auto costs, transit fares, etc.	3	-Disaggregate (e.g. auto cost based on veh.type; transit fare on person type)
		Pricing	-No current capability to model tolls, road pricing, etc.	n/a	-Develop toll/pricing capability (tolled vs. non-tolled in choices, skims, assign.)

Notes:  
 /1/ This item refers to recent research on the relationship between land use and travel behavior, including land use density, mix (or diversity), design characteristics, regional location and context (or destination). Travel models should demonstrate reasonable sensitivity of travel behavior to these land use characteristics.  
 /2/ This proposed improvement FOR SACOG includes transitioning from static, equilibrium assignment to operations simulation (or dynamic traffic assignment), and improvements to the SACSIM process for estimating parcel-to-parcel distances, especially for shorter trips which are likely to non-motorized modes.

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**Land Use Modeling Program (p. 3 of 3)**

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Capability for portraying land use for the entire region at fine level of geographic detail, and for a wide array of use and types for both urban and rural areas.	Land use scenarios should be portrayed at parcel, grid-cell or very small TAZ level. Residential land use categories should include different densities of residential. Non-residential uses should capture the range of trip generation and other travel characteristics such as truck/freight demand.	Granularity/level of detail	-iPlace3s uses current parcels plus split parcels for growth areas	5	
		iPlace3s urban use types	-iPlace3s uses 40 placetypes for portraying land use /1/	5	
		Rural (ag/forested) use types	-Rural landscape types in development	tbd	
Account for a wide range of factors influencing patterns of growth and development within the region.	In addition to current and expected future land use policies, land use projections or forecasts should take account of economic and financial factors, and affordability issues.	Current land use policy (Z/GP)	-Current Z/GP categories maintained in iPlace3s	5	
		Expected Changes to LU Pol.	-Expected changes to LU policy developed in consult w/ local agencies	3	-PECAS
		Historic Growth Trends	-See monitoring program; base year updates 3-5 year cycle	3	-Go to 2 year cycle, more rigorous inventories and base year updates
		State-sanctioned forecasts	-Used as control totals for iPlace3s scenarios	5	
		Economic factors	-Rely on CCCSE macro-economic forecasts	3	-PECAS
		Financial factors	-ROI calculations as part of iPlace3s	4	-PECAS + improvements to iPlace3s for rural ag/forested uses.

Notes:  
/1/ iPlace3s placetype includes factors such as parking, floor-area-ratio, gross-to-net land area, and other characteristics which allow for financial evaluations of future land uses.

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POLICY OR FACTOR	Assessment of Current Practice	Improvements needed to fully account for factors related to greenhouse gas emissions, climate change, SB375 implementation
<b>Potential GHG Reduction Policy</b>		
Smart Growth/4D's <<NOTE: POTENTIALLY SPLIT UP TO SEPARATE POLICIES		
Transit Investments		
Pricing		
TDM Strategies		
...Other Policies TBD...		
<b>Exogenous (But Still Important to GHG) Factors</b>		
Demographics		
Fuels and Vehicle Types		
Fuel Pricing/Travel Costs		
...Other Factors TBD...		

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<b>Potential GHG Reduction Policy</b>		
Smart Growth/4D's <<NOTE: POTENTIALLY SPLIT UP TO SEPARATE POLICIES	●	Expand use of parcel data/demand simulation to other submodels (e.g. commercial vehicles/freight)
Transit Investments	●	Transition networks from P>A to O>D format; disaggregate treatment of fares
Pricing	●	Develop toll/pricing capability (tolled vs. non-tolled in choices, skims, assign.)
TDM Strategies	TBD	TBD
...Other Policies TBD...	TBD	TBD
<b>Exogenous (But Still Important to GHG) Factors</b>		
Demographics	●	Improvements to generation of representative populations for SACSIM
Fuels and Vehicle Types	●	Improvements to vehicle acquisition/use submodel
Fuel Pricing/Travel Costs	●	Transition to disaggregate treatment of auto, transit costs
...Other Factors TBD...	TBD	TBD