

Meeting of Predictive Model Working Group

August 2, 1999

California Air Resources Board

Agenda

- Introductions and Opening Comments
- Discussion Topics
 - Current Model
 - New Data Sets
 - Permeation
 - Carbon Monoxide
 - Statistical Techniques
 - Emissions Inventory
 - Other Topics
- Presentation by Others
- Open Discussion
- Closing Remarks

Current Predictive Model

- Developed in 1999 in response to Governor's Executive Order for the phase-out of MTBE.
- Models for THC, NOx, and Potency Weighted-Toxics
- Three Technology Groups
- Adjustments for Permeation and CO
- Uses Mixed-Model approach to estimate regression coefficients
- Weighted by EMFAC emission proportions

New Data Sets

- Toyota Data – Effects of Ethanol on Emissions of Gasoline LDVs
- AAM/AIAM/Oil Industry Low Sulfur and Oxygenate Test Program
- CRC E-67 Evaporative and Exhaust Emissions from Ethanol/Gasoline Blend Fueled Vehicles (Not Yet Available)

Permeation

- Permeation is when compounds in motor vehicle fuel migrate through soft fuel-system components.
- CRC E-65 demonstrated that ethanol increases permeation emission by about 65%
- Mobile Source Emissions Inventory group is estimating the statewide increase in emissions.
- Expect estimates of increase in evaporative emissions
- Second state of E-65 underway, expected testing to finish by end of year. Final Report???

Carbon Monoxide

- **VOC Permeation/CO Protocol**
 - "Protocol for Assessing the Ozone Impact of Permeation VOCs Relative to Carbon Monoxide"
 - Website
<http://www.arb.ca.gov/research/reactivity/reactivity.htm>

Statistical Techniques

- Term Inclusion
- Log functions –vs- quadratics
- Prediction errors
- Non-linear modeling
- New Tech Groupings – Tech 6 and Tech 2

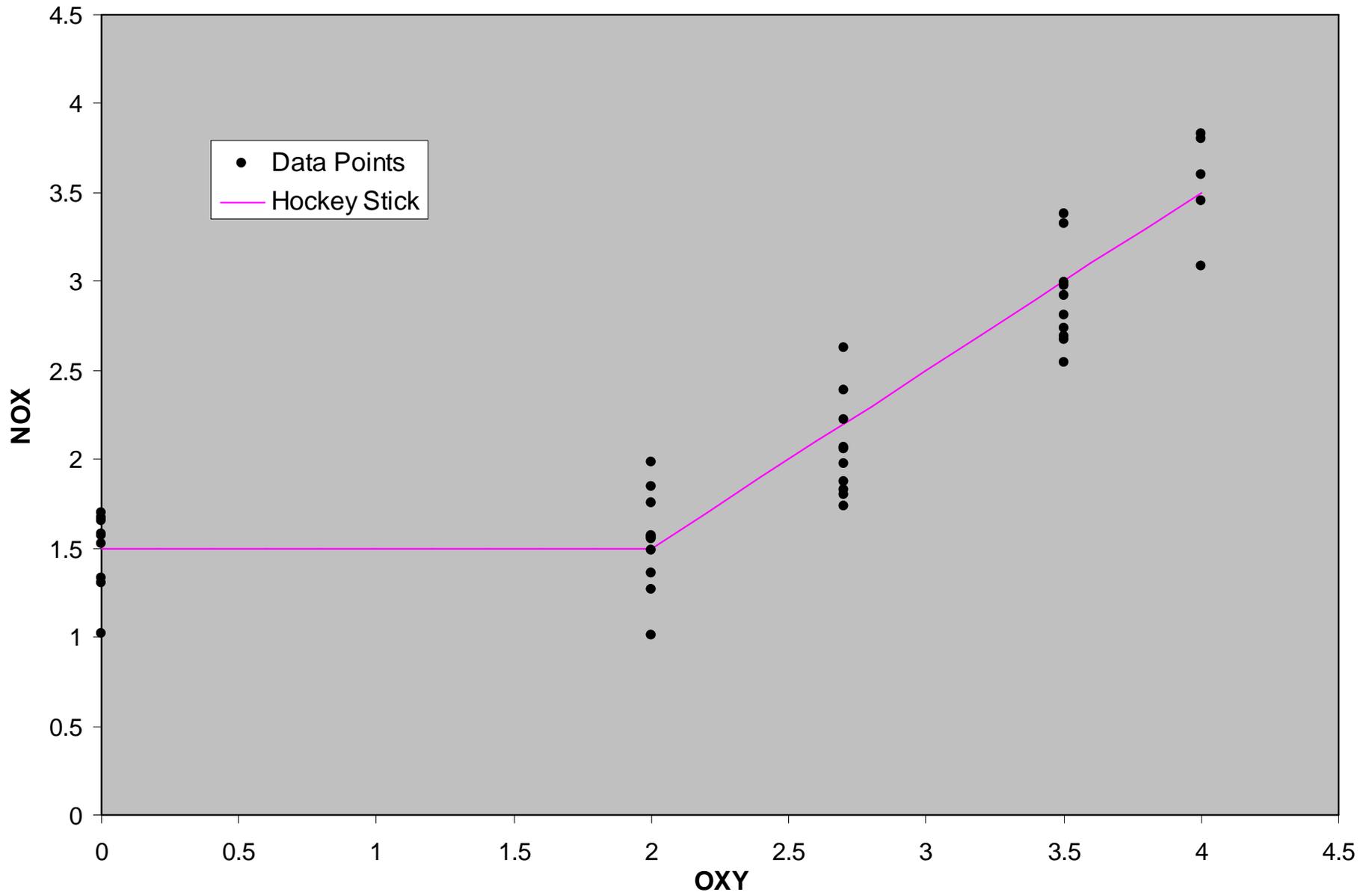
Tech 4 SAS CORR Procedure Results

	NOX	AR	OL	OX	RV	SU	T5	T9
NOX		-0.06792 0.3429	<u>0.24937</u> 0.0004	<u>0.29348</u> <.0001	-0.10548 0.1402	<u>0.33965</u> <.0001	<u>-0.27034</u> 0.0001	0.04510 0.5291
AR	-0.06792 0.3429		0.08719 0.2231	<u>-0.27992</u> <.0001	0.10949 0.1256	0.01633 0.8198	<u>0.37834</u> <.0001	<u>0.40380</u> <.0001
OL	<u>0.24937</u> 0.0004	0.08719 0.2231		<u>0.19112</u> 0.0071	-0.16304 0.0221	<u>0.22424</u> 0.0015	<u>-0.19787</u> 0.0053	0.15764 0.0269
OX	<u>0.29348</u> <.0001	<u>-0.27992</u> <.0001	<u>0.19112</u> 0.0071		<u>-0.37747</u> <.0001	0.12137 0.0893	<u>-0.55516</u> <.0001	-0.08705 0.2239
RV	-0.10548 0.1402	0.10949 0.1256	-0.16304 0.0221	<u>-0.37747</u> <.0001		-0.12159 0.0887	<u>0.25587</u> 0.0003	-0.03357 0.6396
SU	<u>0.33965</u> <.0001	0.01633 0.8198	<u>0.22424</u> 0.0015	0.12137 0.0893	-0.12159 0.0887		<u>-0.21055</u> 0.0030	<u>0.23907</u> 0.0007
T5	<u>-0.27034</u> 0.0001	<u>0.37834</u> <.0001	<u>-0.19787</u> 0.0053	<u>-0.55516</u> <.0001	<u>0.25587</u> 0.0003	<u>-0.21055</u> 0.0030		<u>0.38002</u> <.0001
T9	0.04510 0.5291	<u>0.40380</u> <.0001	0.15764 0.0269	-0.08705 0.2239	-0.03357 0.6396	<u>0.23907</u> 0.0007	<u>0.38002</u> <.0001	

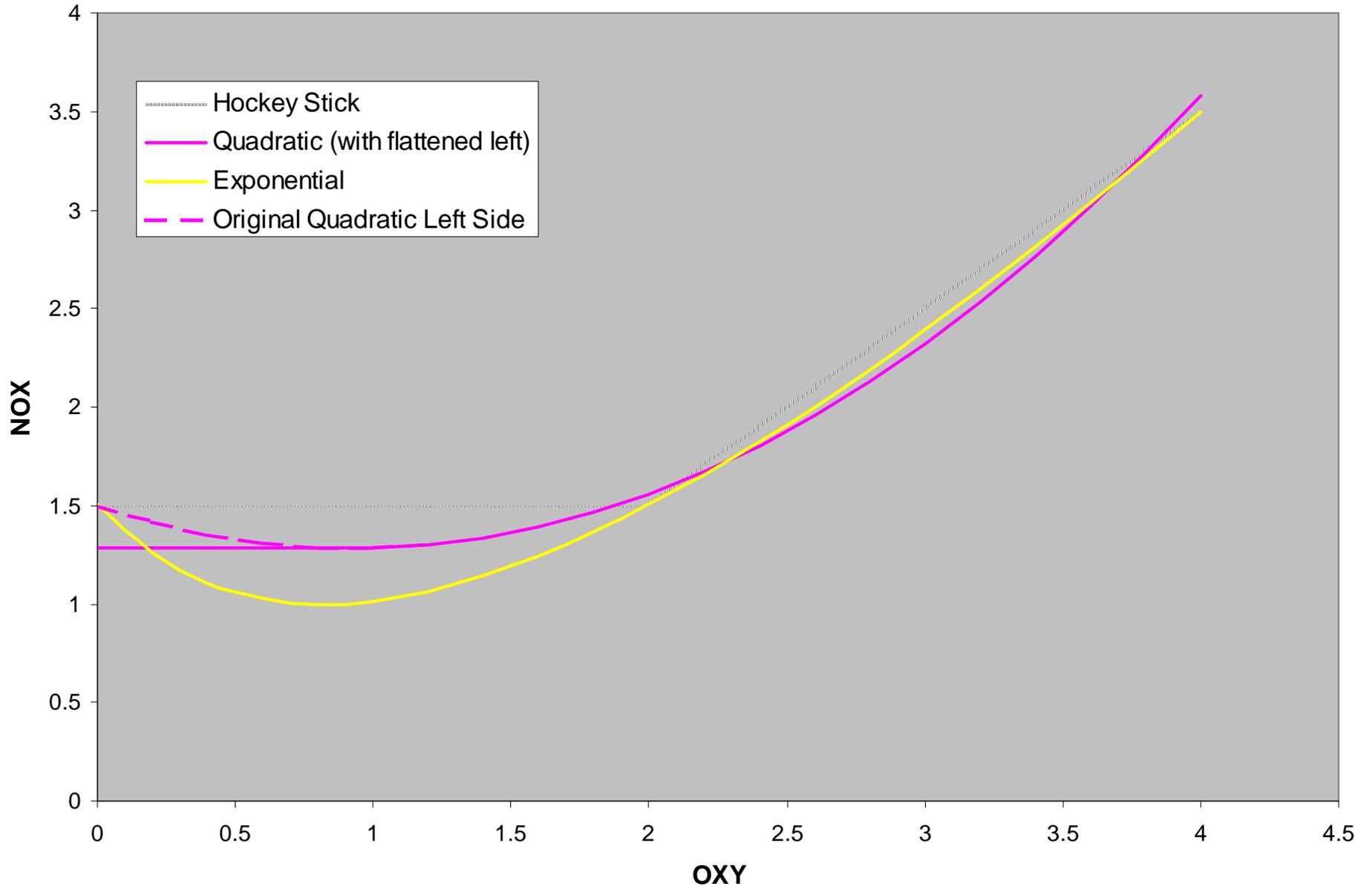
Tech 4 SAS CORR Procedure Partial versus Non-Partial for Certain Variables

		PARTIAL	REGULAR
OXY	RVP	<u>-0.26606</u>	<u>-0.37747</u>
		0.0002	<.0001
OXY	T50	<u>-0.46291</u>	<u>-0.55516</u>
		<.0001	<.0001
T50	RVP	0.06390	<u>0.25587</u>
		0.3786	0.0003

Data Points and Hockey Stick Fit



Three Data Fits



Emissions Inventory

- The updates are necessary to support the development of the 2007 and 2008 State Implementation Plans (SIPs) for the federal ozone and particulate matter standards.
 - Permeation
 - Commingling
 - Vehicle count
 - Fuels composition
- Emissions Inventory Website
<http://www.arb.ca.gov/msei/msei.htm>

Presentations by Others

Open Discussion

Closing Remarks