

**Relationships Among Organic Gas Terms**  
**Used in the Emission Inventory**

**MOTOR VEHICLES:**

$$\begin{array}{lclcl} 1. & \text{NMHC} & + & \text{methane} & = & \text{HC} & & [\text{or } \text{THC}] \\ & (\text{non-methane} & & & & (\text{hydrocarbons}) & & \text{total hydrocarbons}] \\ & \text{hydrocarbons}) & & & & & & \end{array}$$

- NMHC and HC (THC) contain only hydrocarbons (not oxygenated compounds like aldehydes) due to GC-FID measurement technique
- NMHC and HC must be adjusted for the oxygenated compounds to get NMOG

$$\begin{array}{lcl} 2. & \text{NMHC} & \text{----->} & \text{NMOG} \\ & (\text{non-methane} & \text{adjust to add} & (\text{non-methane organic gas}) \\ & \text{hydrocarbons}) & \text{oxygenated cmpds} & \end{array}$$

$$\begin{array}{lclcl} 3. & \text{NMOG} & + & \text{methane} & = & \sim \text{TOG} \\ & (\text{non-methane} & & & & \text{approximately Total Organic Gas} \\ & \text{organic gas}) & & & & \end{array}$$

**OVERALL INVENTORY:**

$$\begin{array}{lclcl} 4. & \text{TOG} & \times & \text{FROG} & = & \text{ROG} \\ & & & (\text{Fraction of Reactive Organic Gas}) & & (\text{Reactive Organic Gas}) \end{array}$$

$$\begin{array}{lclcl} 5. & \text{TOG} & \times & \text{FR\_VOC} & = & \text{VOC} \\ & & & (\text{Fraction of Volatile Organic Cmpds}) & & (\text{Volatile Organic Cmpds}) \end{array}$$

--AVOC@is U.S. EPA term -- uses a separate federal list of exempted cmpds

$$\begin{array}{lclcl} 6. & \text{TOG} & - & \text{Exempt cmpds} & = & \text{ROG} \\ & & & [\text{ ARB list of methane,} & & \\ & & & \text{ethane, CFCs, etc.}] & & \end{array}$$