



MOVES Model

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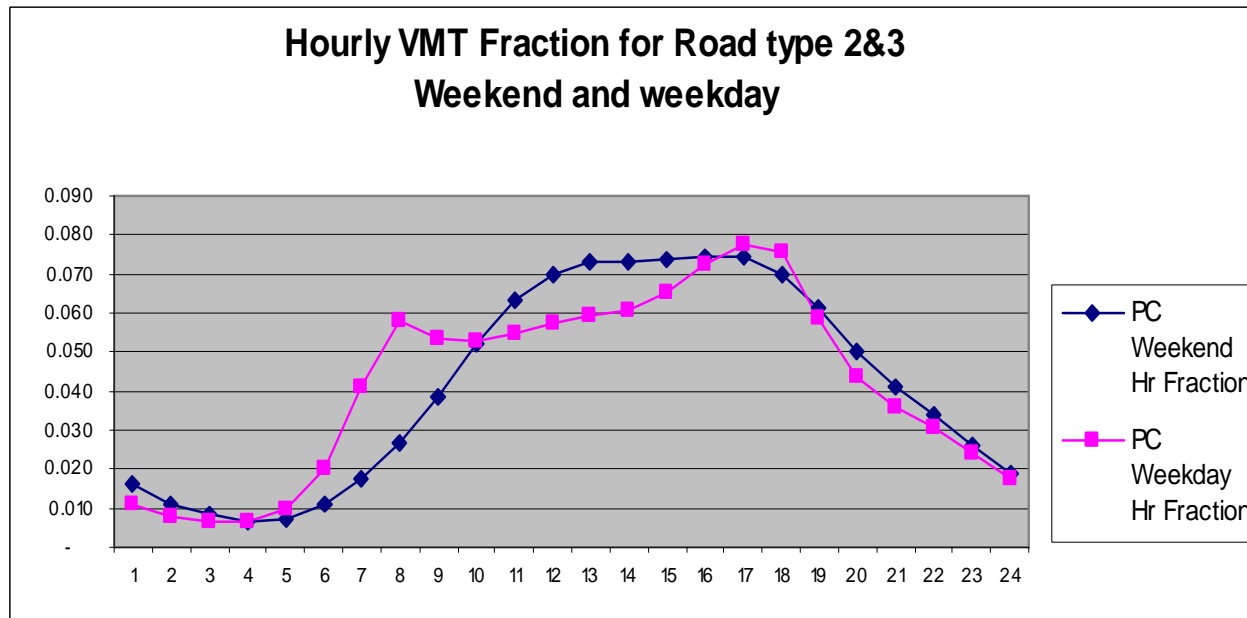
TPB

June 10, 2010

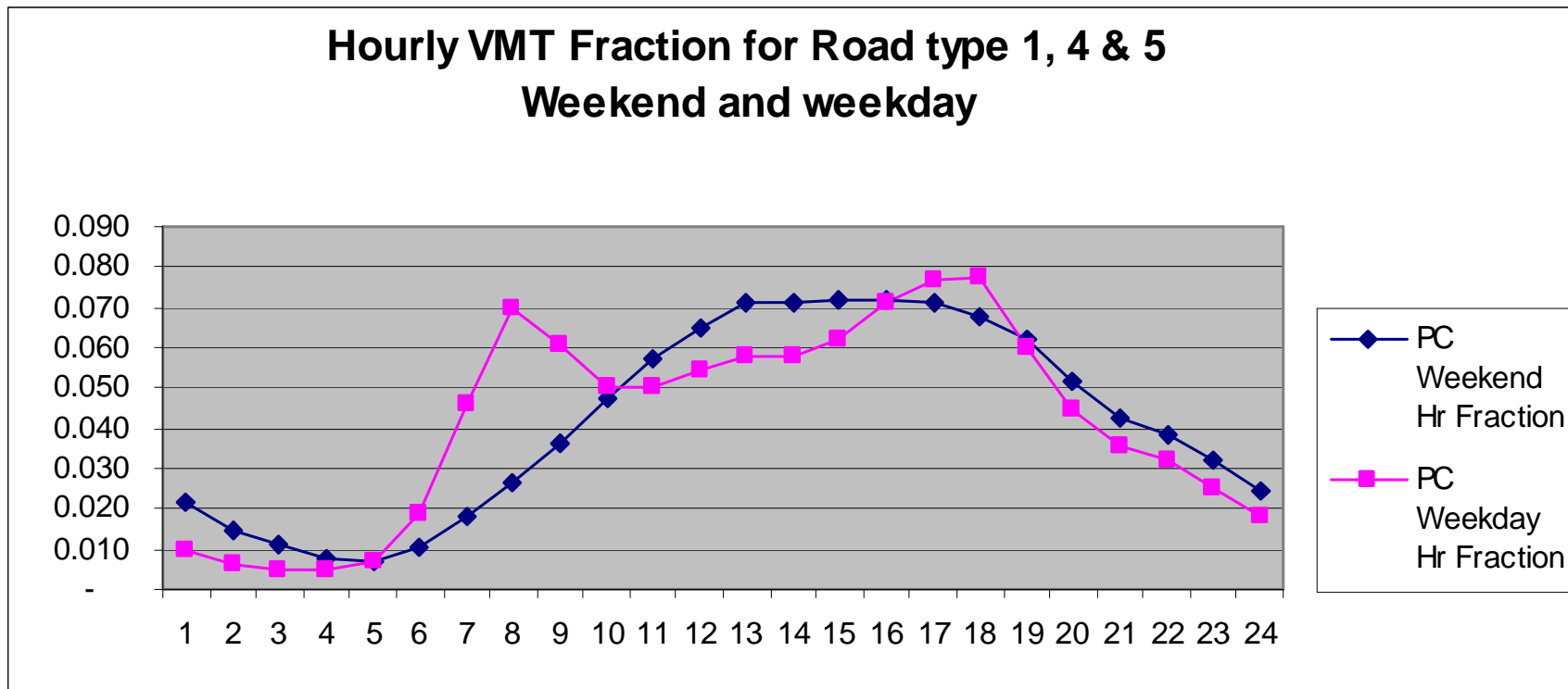
| NMIM | | | MOVES | |
|----------|-----------|--------------------------------|------------|---------------------------|
| RoadType | Area Type | Description (RoadDesc) | RoadTypeID | Description (RoadDesc) |
| 11 | Rural | Interstate | 2 | Rural restricted access |
| 13 | Rural | Other Principal Arterial | 3 | Rural unrestricted access |
| 15 | Rural | Minor Arterial | 3 | Rural unrestricted access |
| 17 | Rural | Major Collector | 3 | Rural unrestricted access |
| 19 | Rural | Minor Collector | 3 | Rural unrestricted access |
| 21 | Rural | Local | 3 | Rural unrestricted access |
| 23 | Urban | Interstate | 4 | Urban restricted access |
| 25 | Urban | Other Freeways and Expressways | 4 | Urban restricted access |
| 27 | Urban | Other Principal Arterial | 5 | Urban unrestricted access |
| 29 | Urban | Minor Arterial | 5 | Urban unrestricted access |
| 31 | Urban | Collector | 5 | Urban unrestricted access |
| 33 | Urban | Local | 5 | Urban unrestricted access |

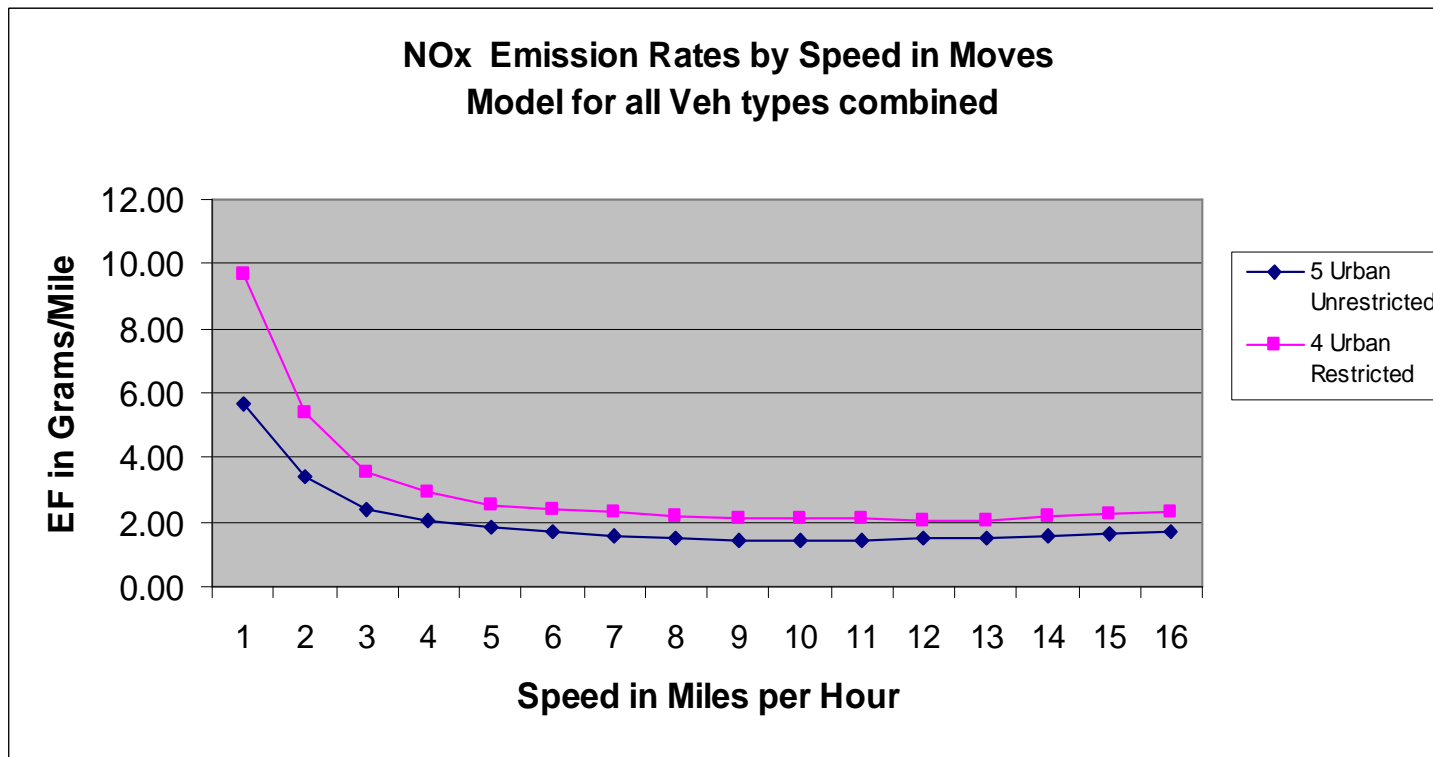
| MOBILE6 Roadway Classifications | | | MOVES RoadType | |
|---------------------------------|--------------|---|----------------|-------|
| Number | Abbreviation | Description | Rural | Urban |
| 1 | Freeway | High-Speed, Limited-Access Roadways | 2 | 4 |
| 2 | Arterial | Arterial and Collector Roadways | 3 | 5 |
| 3 | Local | Urban Local Roadways | 3 | 5 |
| 4 | Fwy Ramp | Freeway on and off ramps | 2 | 4 |
| 5 | None | Not Applicable (For start and some evaporative emissions) | | |

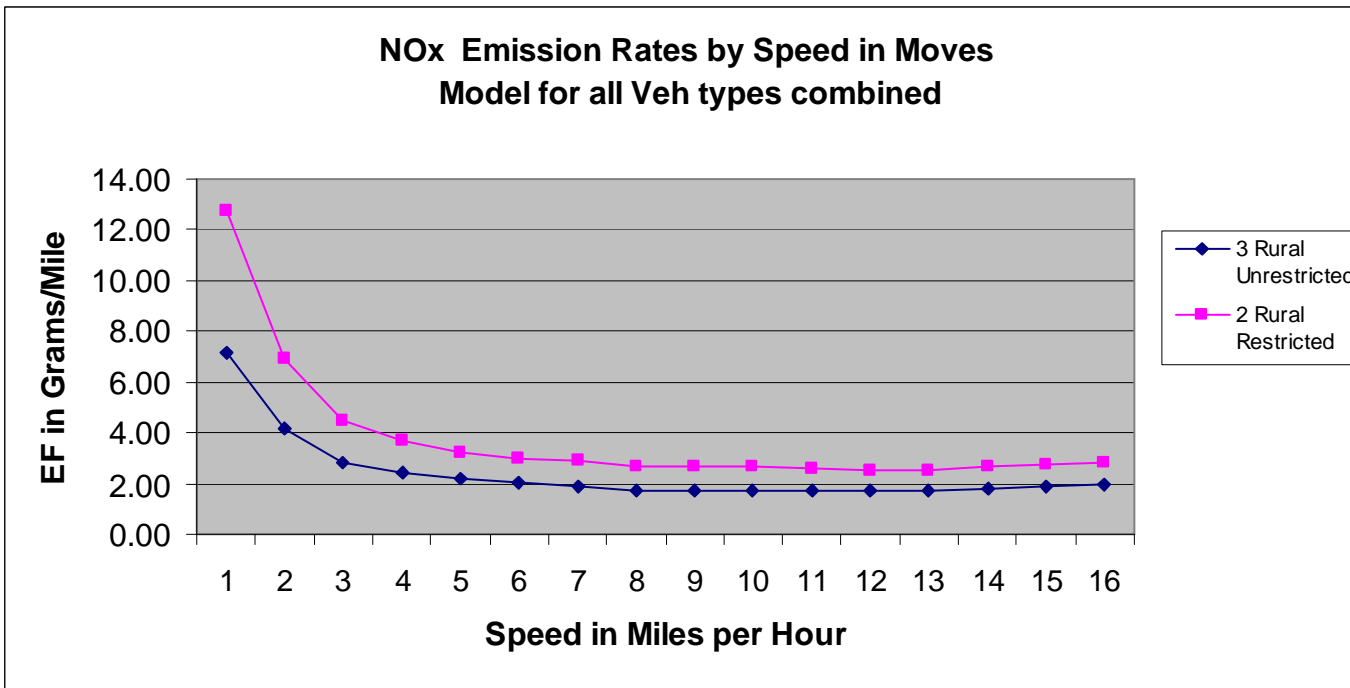
The profiles for road types 2-3 (Rural) are the same for all Vehicle types (Weekday and weekend are different)

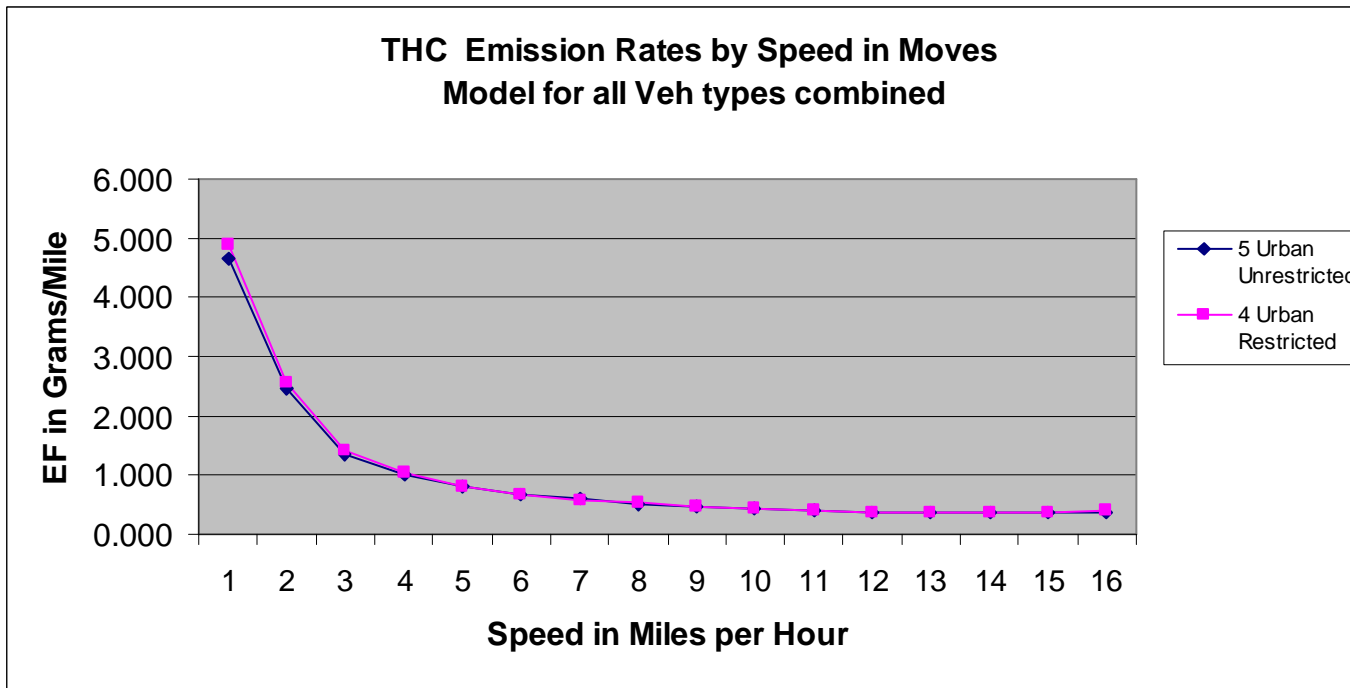


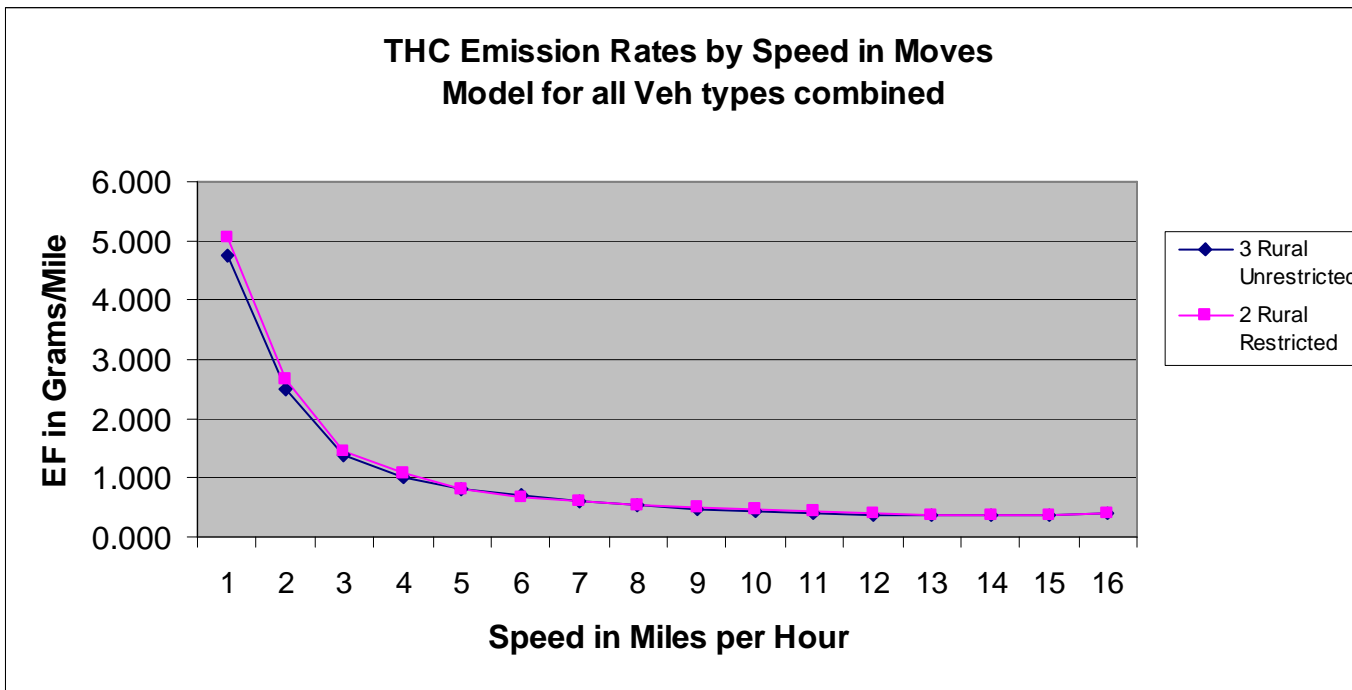
the profiles for road types 1,4 & 5 (Urban) are the same for all
Vehicle types (Weekday and weekend are different).







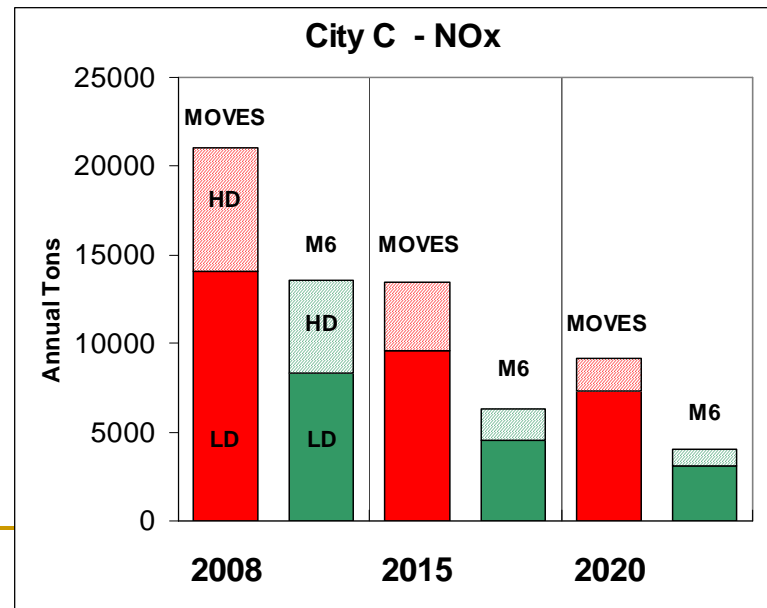
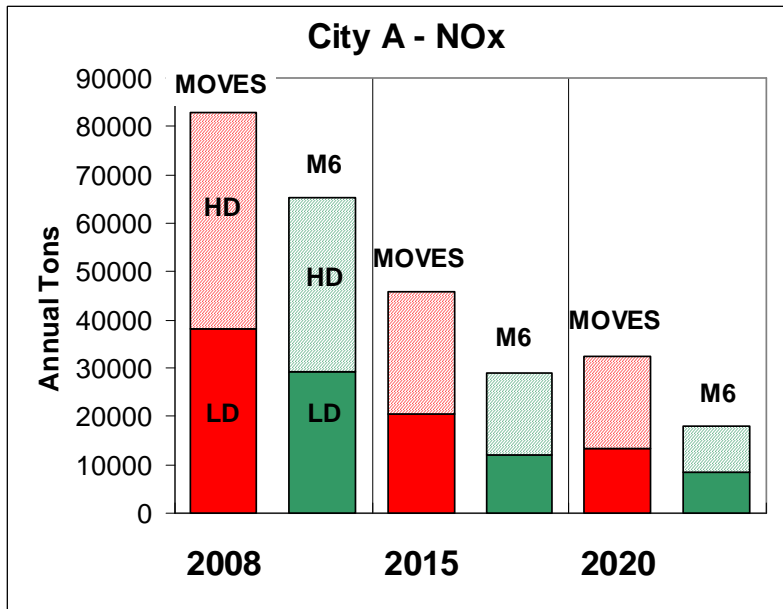
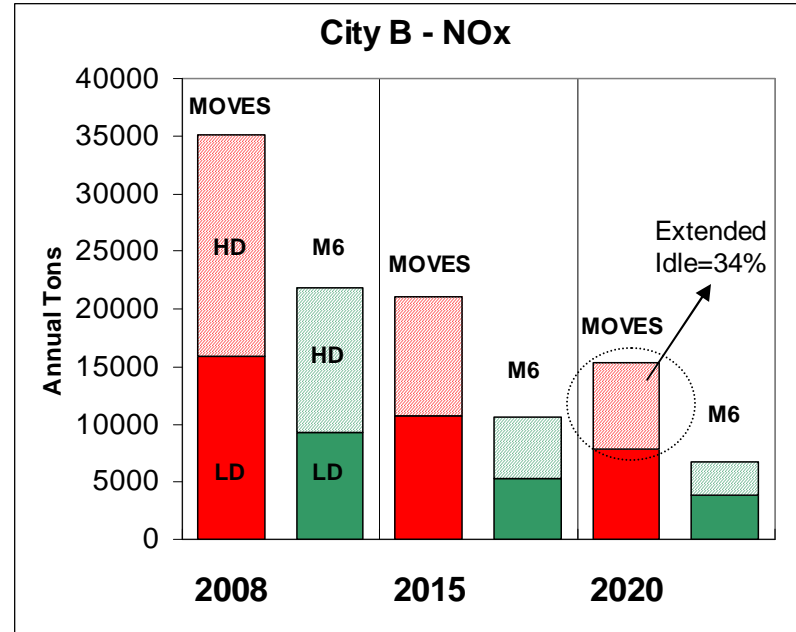






(EPA Slide)

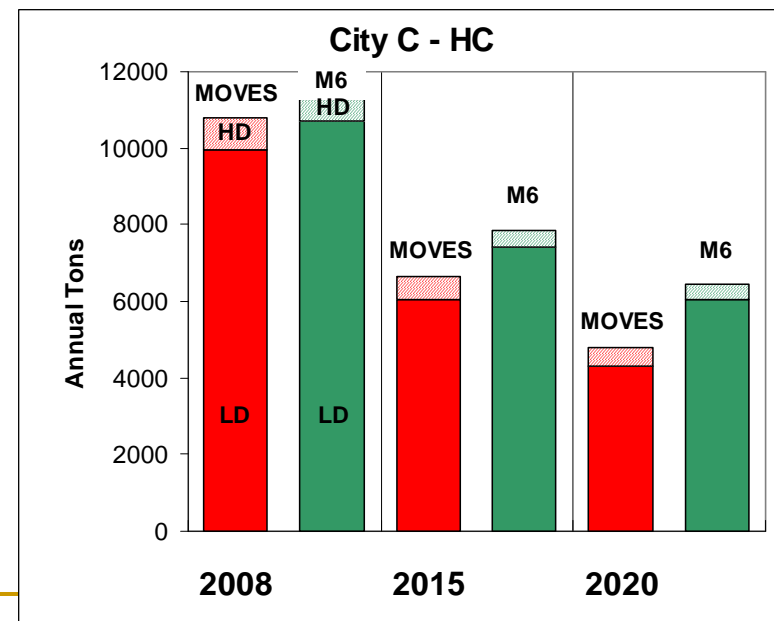
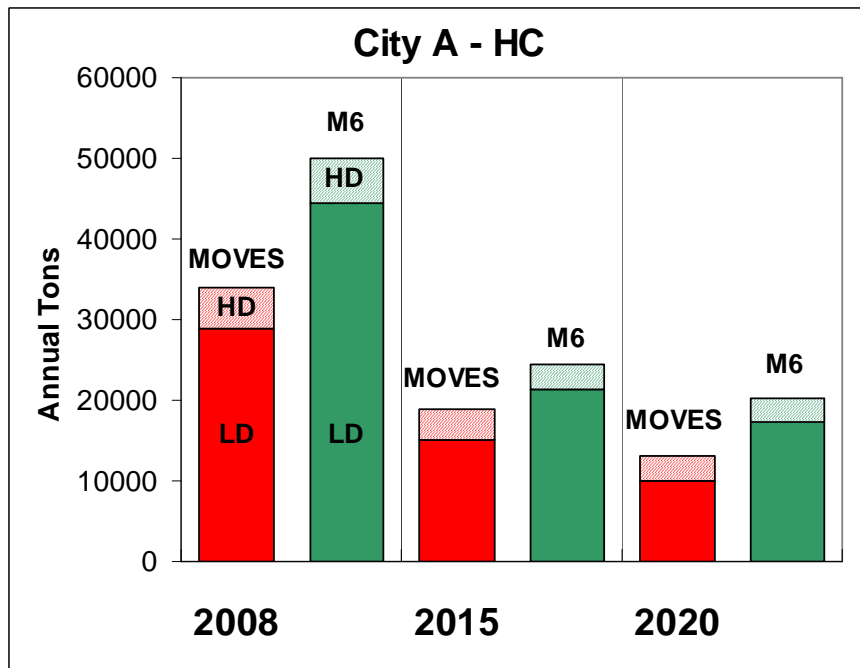
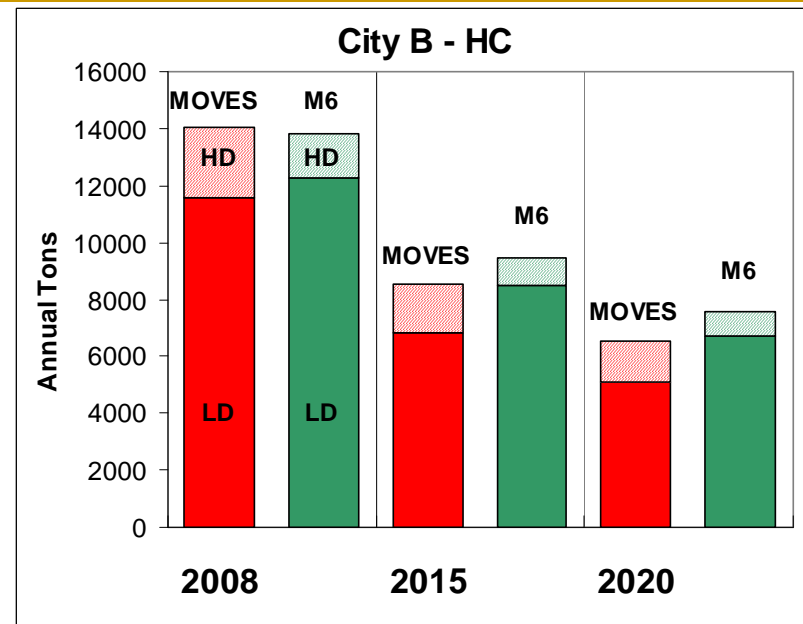
- I/M program data shows MOBILE6 underestimated NOx emissions from light trucks
- On-road data on heavy trucks shows higher emissions than MOBILE6 estimated from cert data
- Extended idle emissions become significant share of heavy-duty inventory in future



(EPA Slide)

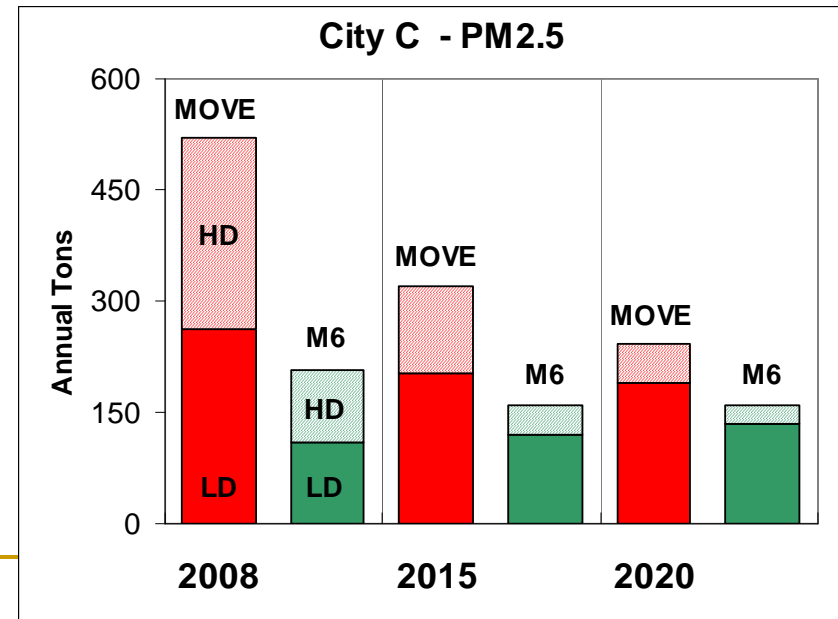
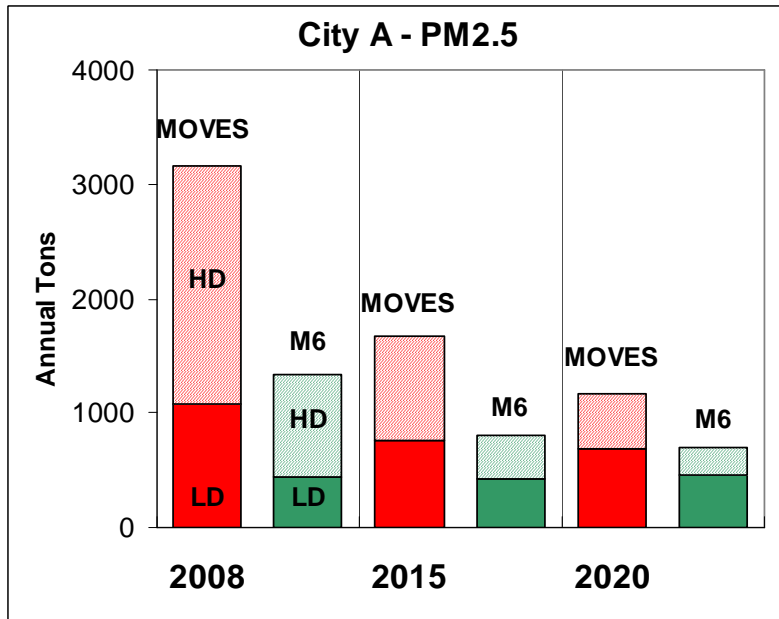
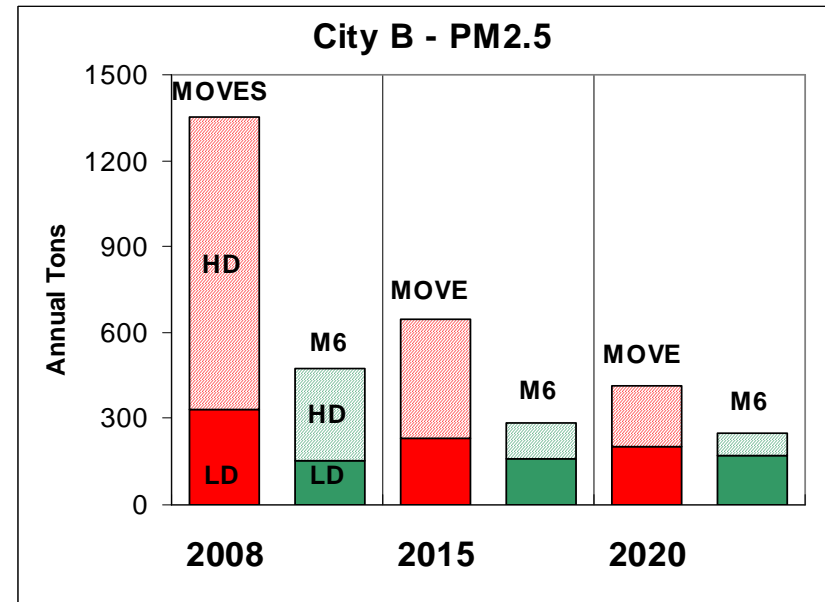
HC

- I/M program data shows MOBILE6 overestimated HC emissions from newer technology cars
- Evaporative emissions on newer technology vehicles very low; re-evaluating leak emissions for final model



PM_{2.5} (EPA Slide)

- Kansas City program found high gas PM emissions esp. at cold temps
- New data on heavy trucks shows higher deterioration than MOBILE6
- MOVES accounts for impact of vehicle speed – MOBILE did not



Percent Reduction in On-Road Emissions 2008 to 2015 (EPA Slide)

| | City A | | City B | | City C | |
|--------------|---------------|----------------|---------------|----------------|---------------|----------------|
| | MOVES | MOBILE6 | MOVES | MOBILE6 | MOVES | MOBILE6 |
| HC | 50% | 50% | 39% | 32% | 38% | 31% |
| NOx | 54% | 56% | 40% | 52% | 36% | 53% |
| PM2.5 | 57% | 40% | 52% | 40% | 38% | 23% |

What It Means (Modified EPA Slide)

- Higher NOx and PM emissions means new emission budgets developed with Moves model would be needed before the grace period is over.
- Percent reduction from base year is key to Conformity analysis
 - PM2.5 shows higher overall emissions and higher % reductions, this would help with Transportation Conformity
 - Effect on attainment demonstrations could be positive
 - NOx shows higher overall emissions but lower % reduction
 - Harder to show Conformity and attainment
 - Future NOx control measures will have a bigger impact

Who would be doing the Emission Analysis for the Future Conformity analysis?

■ MOVES

- Lookup table option for Gram/mile emissions factors (grams/time for some processes). Takes much longer to run. Could be prepared well in advance.
- Total emissions: inventories for specific areas and time periods. Much faster to run moves model this way. Need both Speed and VMT from Travel Demand model.