Module 4
Using the Custom Domain Option

MOVES
Motor Vehicle Emission Simulator

EPA

Module Overview

- Relevant inputs for a custom domain run

- Using the zone and zoneroad inputs to divide activity between areas

- Exercise: run a simple custom domain for a hypothetical five-county area

Selecting a Custom Domain

Geographic Bounds Inputs

- CountyID (stateID for custom domain is always 99)
  - Usually 1 (FIPs code of 99001)

- Description (optional)

- GPA Fraction

- Barometric Pressure (low altitude = 28.9, high altitude = 24.6)

- Vapor Adjust

- Spill Adjust

Using "Zones"

- A custom domain can be dividing into one or more "zones" of unique vehicle activity
  - As an example, we'll model a custom domain with five zones representing individual counties
- VMT, starts, hotelling, and parked (evap) activity can be allocated across user-defined zones
- Meteorological conditions can also vary across zones
- Age distribution, fuels, speed distribution, ramp fraction, I/M program, and road type distribution are uniform across all zones
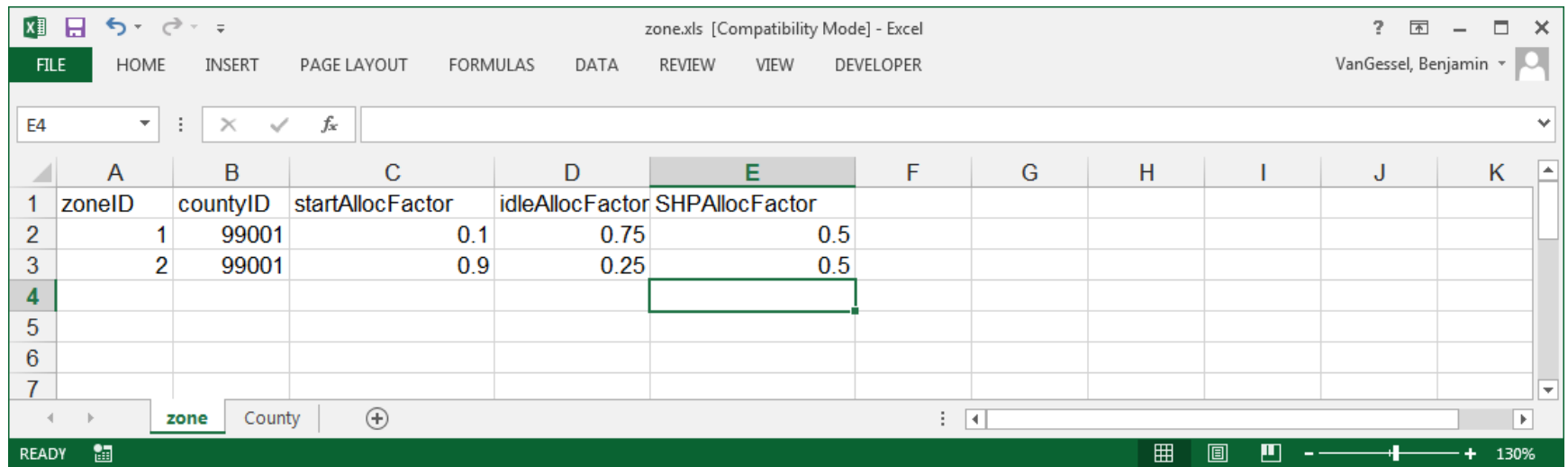
County Data Manager Inputs

- Relevant for Custom Domain
  - Zone
  - Zoneroad
  - ZoneSCC
  - Meteorology

- Plus all other inputs (VMT, fuels, ramp fraction, etc.)

Zone Input

- Used to allocate off-network activity to each zone

- User enters allocation for starts (startallocfactor), hotelling (idleallocfactor), and parking (SHPallocfactor)
  - Must sum to one for all zones

Zone Input

- The above example shows a custom domain with two zones
  - Starts are mostly occurring in zone 2, while hotelling primarily occurs in zone 1
  - Vehicle hours parked are equally divided between zones 1 and 2
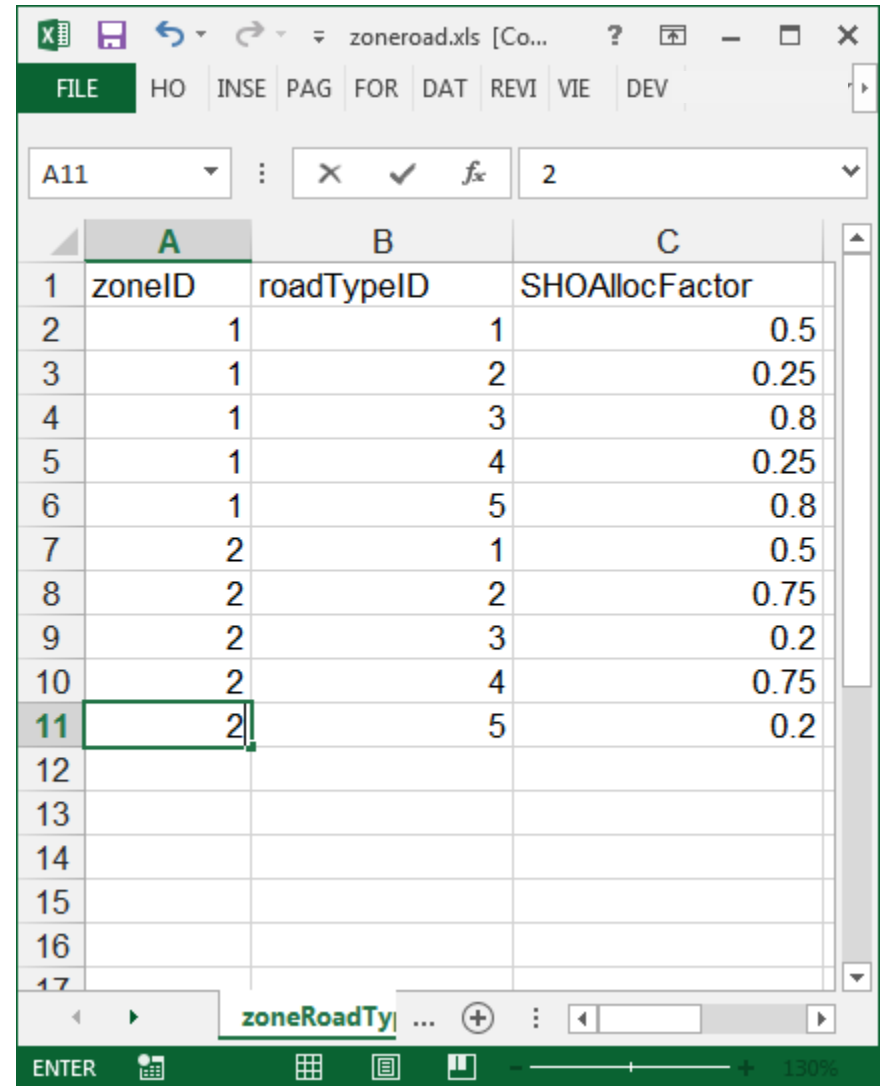
Zoneroad Input

- Used to vary on-road activity by road type and zone

- User enters source hours operating fraction (SHOallocfactor)

- Some zones may have more source hours operating (SHO)

- Also, some zones may have more highway/freeway SHO than arterial SHO

- Must sum to one for each road type

Zoneroad Input

- The example shows two zones with different distributions of SHO

- Freeway/highway SHO is mostly in zone 1 while the majority of arterial SHO occurs in zone 2

zoneID	roadTypeID	SHOAllocFactor
1	1	0.5
1	2	0.25
1	3	0.8
1	4	0.25
1	5	0.8
2	1	0.5
2	2	0.75
2	3	0.2
2	4	0.75
2	5	0.2

Using Travel Model Data to Develop Zone and Zoneroad Inputs

- Map model travel analysis zones (TAZs) to the zones used in MOVES run

- Zone input:
  - Sum trip origins for all TAZs within a MOVES zone, and calculate startAllocFactor by zone
  - Sum trip ends for all TAZs within a MOVES zone, and calculate SHPAllocFactor by zone

- Zoneroad input:
  - Map travel model road types to MOVES roadtypes
  - Sum VHT by MOVES roadtype within each MOVES zone, and then calculate SHOAllocFactor for each zone

ZoneSCC

- Used to map MOVES road types to SCC road types

- Only required when selecting SCC output in runspec

- SIP and Regional Conformity analyses should not use SCC output and therefore should skip this input

Meteorology

- Temperature and humidity can vary by zone

- Reference county inventory discussion for guidance on selecting meteorological data sources for MOVES

Meteorology

- The example shows two zones with different meteorology
- Only one hour is shown, but typically a 24-hour profile would be entered for each month, and zone being modeled

Custom Domain Exercise

- Our exercise scenario is a five county non-attainment area – custom domain with five zones
  - Area shares the same age distribution, fuels, I/M, road type distribution, ramp fraction, and speed distribution
- Four suburban counties (zones 1-4) and one urban county (zone 5)
- Significant number of trips begin and end within zone 5 – many starts, high arterial VMT
- Most freeway activity and extended idling occurs in surrounding rural counties
- Zone 1 has different temperature profile

Exercise Scenario - Geographic Orientation

Zone 1

Zone 2

Zone 5

Zone 4

Zone 3
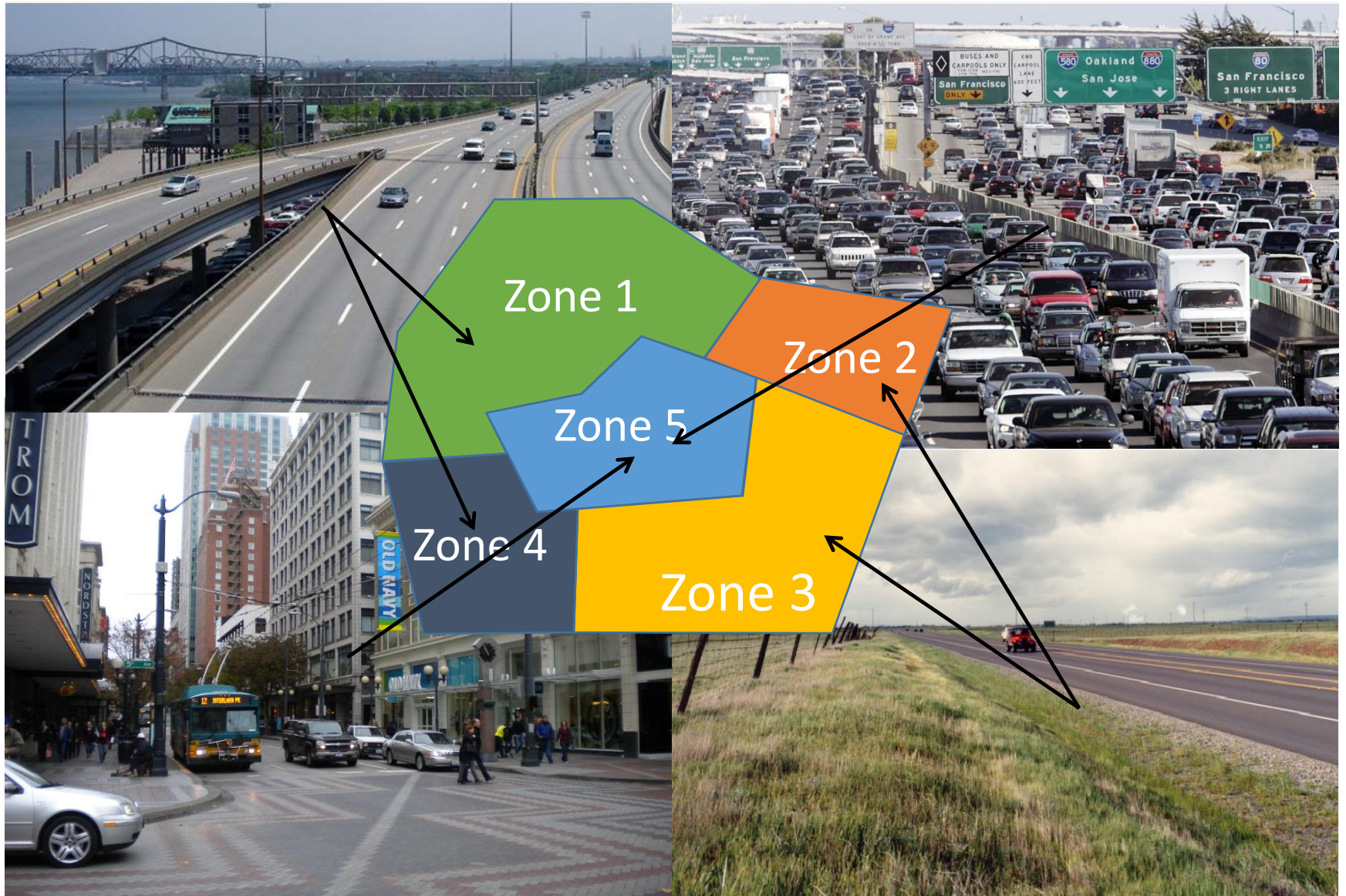
Load RunSpec

- Open Custom.mrs

- Fill out Geographic bounds panel
  - CountyID - 1
  - Description – five county area
  - GPA Fraction – 0.0
  - Barometric Pressure – 28.9
  - Vapor Adjust – 0.0
  - Spill Adjust – 0.0

- Create input database – "custom_domain_in"

- Load pre-populated input files from custom domain folder

- Export Zone and ZoneRoad templates

Populate Zone Input

- Zones 1, 2, 3, and 4
  - Suburban counties with 40% share of starts – split evenly between four zones (startallocfactor)
  - Contain 100% of hotelling– split evenly between four zones (idleallocfactor)
  - Zone 1 contains 10% of parked activity, zone 2, 3, and 4 contain 60% of activity – split evenly between three zones (SHPallocfactor)
- Zone 5
  - Urban core contains 60% of starts (startallocfactor)
  - Zero % hotelling (idleallocfactor)
  - 30% parked activity (SHPallocfactor)

Completed Zone Input

Excel spreadsheet (zone.xls [Compatibility Mode]) showing the "zone" worksheet:

	A	B	C	D	E
1	zoneID	countyID	startAllocFactor	idleAllocFactor	SHPAllocFactor
2	1	99001	0.1	0.25	0.1
3	2	99001	0.1	0.25	0.2
4	3	99001	0.1	0.25	0.2
5	4	99001	0.1	0.25	0.2
6	5	99001	0.6	0	0.3
7					

Populate ZoneRoad Input

- RoadTypeID 1 – Off-network (ignored by MOVES)
  - 20% to each zone
- RoadTypeID 2 – Rural Restricted
  - 25% to zones 1,2,3,4 and 0% to zone 5
- RoadTypeID 3 – Rural Unrestricted
  - 25% to zones 1,2,3,4 and 0% to zone 5
- RoadTypeID 4 – Urban Restricted
  - 22.5% to zones 1,2,3,4 and 10% to zone 5
- RoadTypeID 5 – Urban Unrestricted
  - 5% to zones 1,2,3,4 and 80% to zone 5

Completed ZoneRoad Input

Meteorology

- Diurnal Profiles can be varied by zoneID

- For the Custom Domain exercise, zoneID 1 has a temperature profile ~20 degree F cooler than zones 2-5

Close CDM, run MOVES, open output

Questions?