

VE-RSPM Training Workshop

March 13th and 14th, 2019



Agenda: Day #1

Training staff

- OSA – Brian Gregor
- RSG – Ben Stabler
- Jacobs – Brooke Jordan (coordination)

Attendees

- ODOT ▪ Eugene/LCOG ▪ Albany/AAMPO ▪ WSDOT ▪ Atlanta/ARC ▪ Philadelphia/DVRPC
- VE Pooled fund (FHWA/Volpe) ▪ Consultants (WSP/Cambridge Systematics, RSG)

Time	Item	Lead
8:00	Welcome and Introductions	Tara Weidner, ODOT
8:10	VE-RSPM Design Considerations	Brian Gregor, OSA
8:40	Using the Tool	Ben Stabler, RSG
9:05	Review VESimHouseholds	Brian Gregor, OSA
9:50	BREAK	ALL
10:10	Review VELandUse	Brian Gregor, OSA
10:55	Review VETransportSupply	Brian Gregor, OSA
11:45	Next Steps and Adjourn	Tara Weidner, ODOT



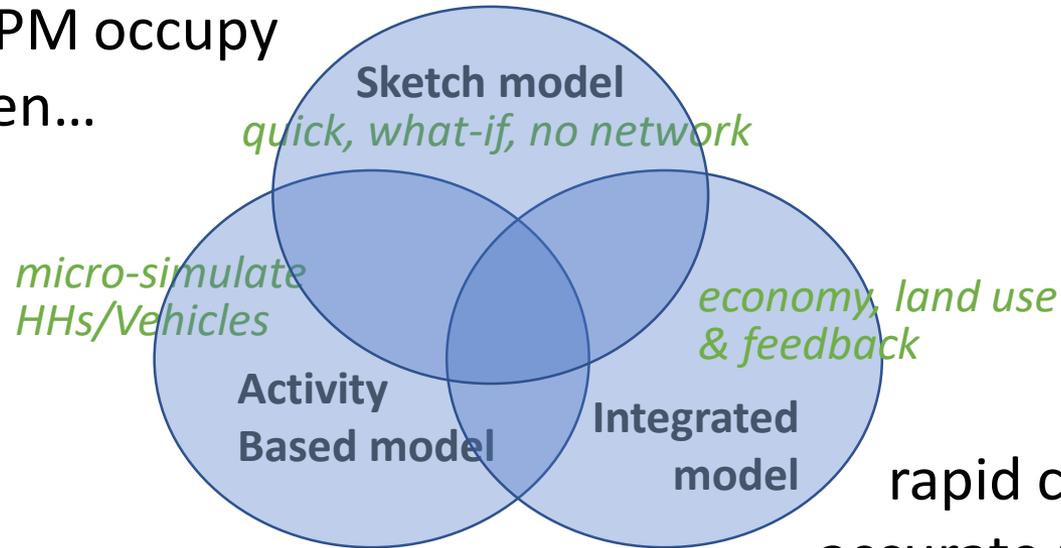
VisionEval Training Overview

OregonDOT-hosted training for the [VisionEval Strategic Planning Models](#).

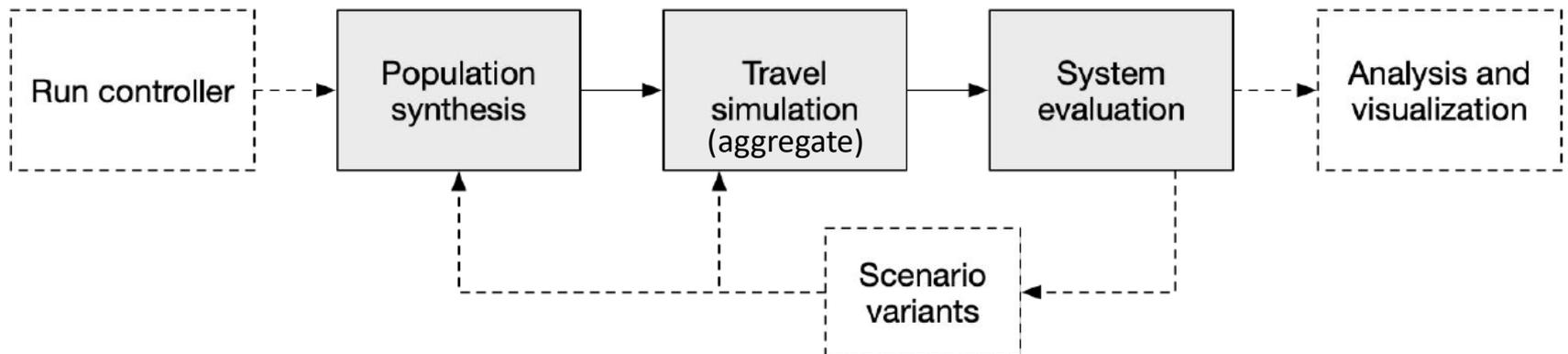
Training objectives:

- Educate for early applications of metropolitan (VE-RSPM) & statewide (VE-State) models.
- Summarize at a high-level the main model components (packages) and key concepts to assist in developing model inputs and evaluating outputs.
- Supplement Github resources.
- NOT hands-on installation/running of the model.

GreenSTEP/RSPM occupy
a niche between...



...balancing
rapid computation &
accurate representation



VE-RSPM Design Considerations

Brian Gregor, Oregon System Analytics

- Support strategic modeling
 - Broad scope
 - Fast – run many scenarios
- Modular
 - Share components between models
 - Can be modified and extended
- Open science approach
 - Reproducible – data and source code included
 - Open source licensing
- Customizable
- Built-in error checking
 - Detailed specifications for all data
 - Check model and user inputs prior to running model

- Modules are building blocks of models, e.g.:
 - Predict number of drivers in household
 - Predict number of vehicles owned by household
- Modules are contained in R packages
 - A package groups together related modules, e.g.:
 - VESimHouseholds package has modules which create simulated households and their characteristics
- Models like VE-RSPM are composed of
 - A script that identifies the order of execution of modules
 - A set of input files
 - Several model definition files
- Model data is saved in a central datastore

- VisionEval is implemented entirely in the R programming language
- R is a premier language for data science
- Multi-OS (Windows, Apple, Linux)
- Packages are structured containers for code and data
 - Hierarchical set of folders having defined structures
 - Several required files
 - Standard approach for organizing code, data, documentation

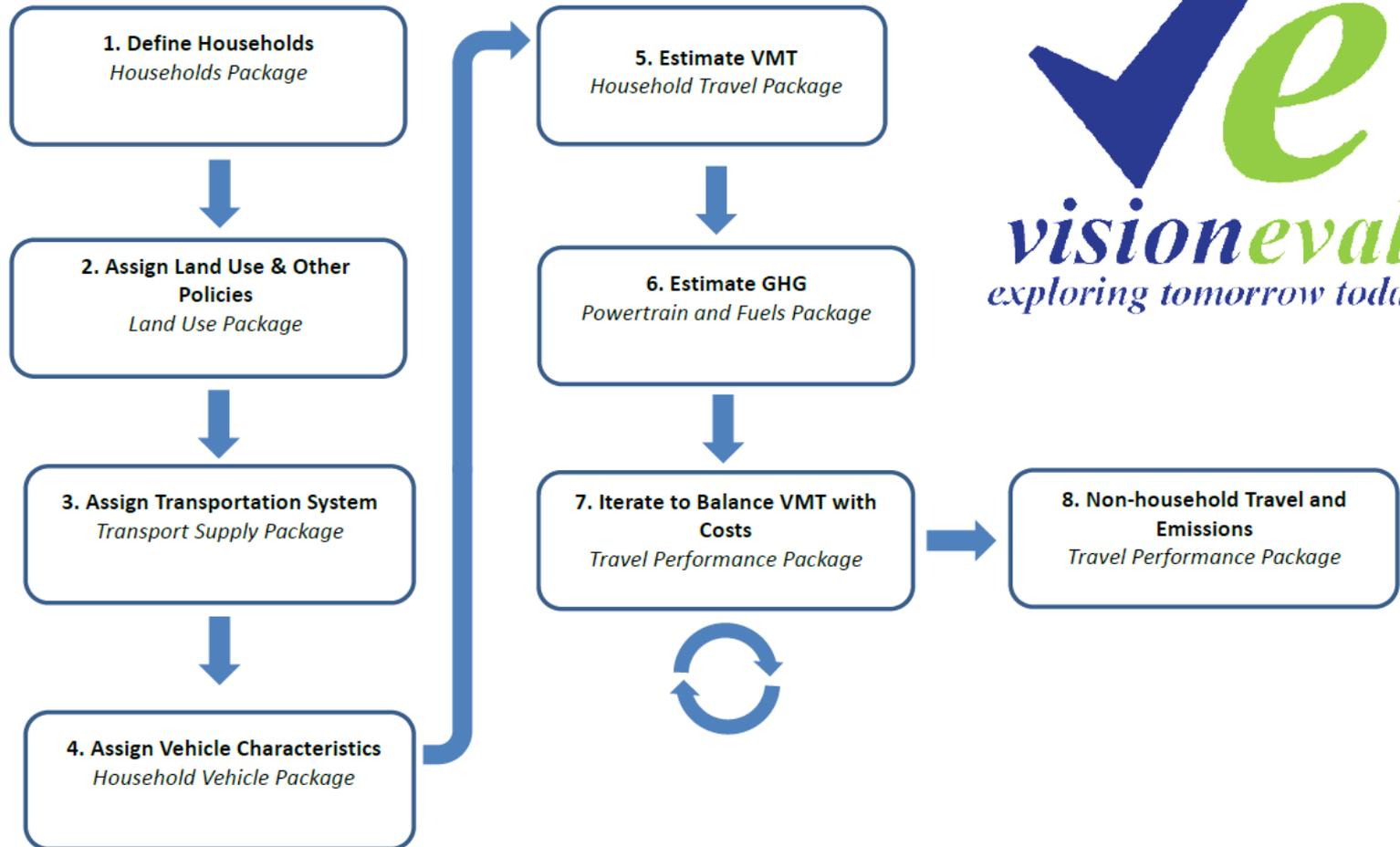
Key Terms:

- **Source Package**
 - Contains source code (i.e. human readable)
 - Can modify the source package to customize modules
 - Is built (installed) before it can be used
 - *Example*
- **Installed Package**
 - Building a package runs the source code and saves data and functions
 - Includes documentation of the data and functions
 - Is ready to be used in programs
 - *Example*

- Standard module documentation describes
 - Model estimation
 - How the module works
 - Module inputs
 - Data the module uses
 - Data the module produces
- *Demo of module documentation*
 - *Where to find*
 - *How to read*
 - *Index to module documentation on Wiki*

- **Region:** the model area such as metropolitan area or state
- **Azone:** large-scale zones such as cities, counties, or PUMAS
- **Bzones:** divisions of Azones representing neighborhoods (census block groups) – can be synthesized
- **Marea:** groups of Azones that are associated with a common urbanized area
- **Location Type:** not a geography but identifies whether households are urban/town/rural
- **Place Type:** not a geography but defines the level of urbanization (area type) and mixing of jobs and housing (development type)

VisionEval Model Schematic





VE-RSPM Packages & Modules

CreateHouseholds
PredictWorkers
AssignLifeCycle
PredictIncome

VESimHouseholds Package

CalculateHouseholdDvmt
CalculateAltModeTrips
CalculateVehicleTrips
DivertSovTravel

VEHouseholdTravel Package

PredictHousing
LocateEmployment
AssignLocTypes
Calculate4DMeasures
CalculateUrbanMixMeasure
AssignParkingRestrictions
AssignDemandManagement
AssignCarSvcAvailability

VELandUse Package

CalculateCarbonIntensity
AssignHhVehiclePowertrain

VEPowertrainsAndFuels Package

AssignTransitService
AssignRoadMiles

VETransportSupply Package

Iterate X Times
CalculateRoadDvmt
CalculateRoadPerformance
CalculateMpgMpkwhAdjustments
AdjustHhVehicleMpgMpkwh
CalculateVehicleOperatingCost
BudgetHouseholdDvmt

VETravelPerformance Package

AssignDrivers
AssignVehicleOwnership
AssignVehicleType
AssignVehicleTable
AssignVehicleAge
CalculateVehicleOwnCost
AdjustVehicleOwnership

VEHouseholdVehicles Package

End Iteration
CalculateComEnergyAndEmissions
CalculatePtranEnergyAndEmissions



VE-State Packages & Modules

CreateHouseholds
PredictWorkers
AssignLifeCycle
PredictIncome

VESimHouseholds Package

CalculateHouseholdDvmt
CalculateAltModeTrips
CalculateVehicleTrips
DivertSovTravel

VEHouseholdTravel Package

CreateSimBzones
SimulateHousing
SimulateEmployment
Simulate4DMeasures
SimulateUrbanMixMeasure
AssignParkingRestrictions
AssignDemandManagement
AssignCarSvcAvailability

VESimLandUse Package

CalculateCarbonIntensity
AssignHhVehiclePowertrain

VEPowertrainsAndFuels Package

SimulateTransitService
SimulateRoadMiles

VESimTransportSupply Package

Iterate X Times

VETravelPerformance Package

CalculateRoadDvmt
CalculateRoadPerformance
CalculateMpgMpkwhAdjustments
AdjustHhVehicleMpgMpkwh
CalculateVehicleOperatingCost
BudgetHouseholdDvmt
BalanceRoadCostsAndRevenues

End Iteration

CalculateComEnergyAndEmissions
CalculatePtranEnergyAndEmissions

AssignDrivers
AssignVehicleOwnership
AssignVehicleType
AssignVehicleTable
AssignVehicleAge
CalculateVehicleOwnCost
AdjustVehicleOwnership

VEHouseholdVehicles Package

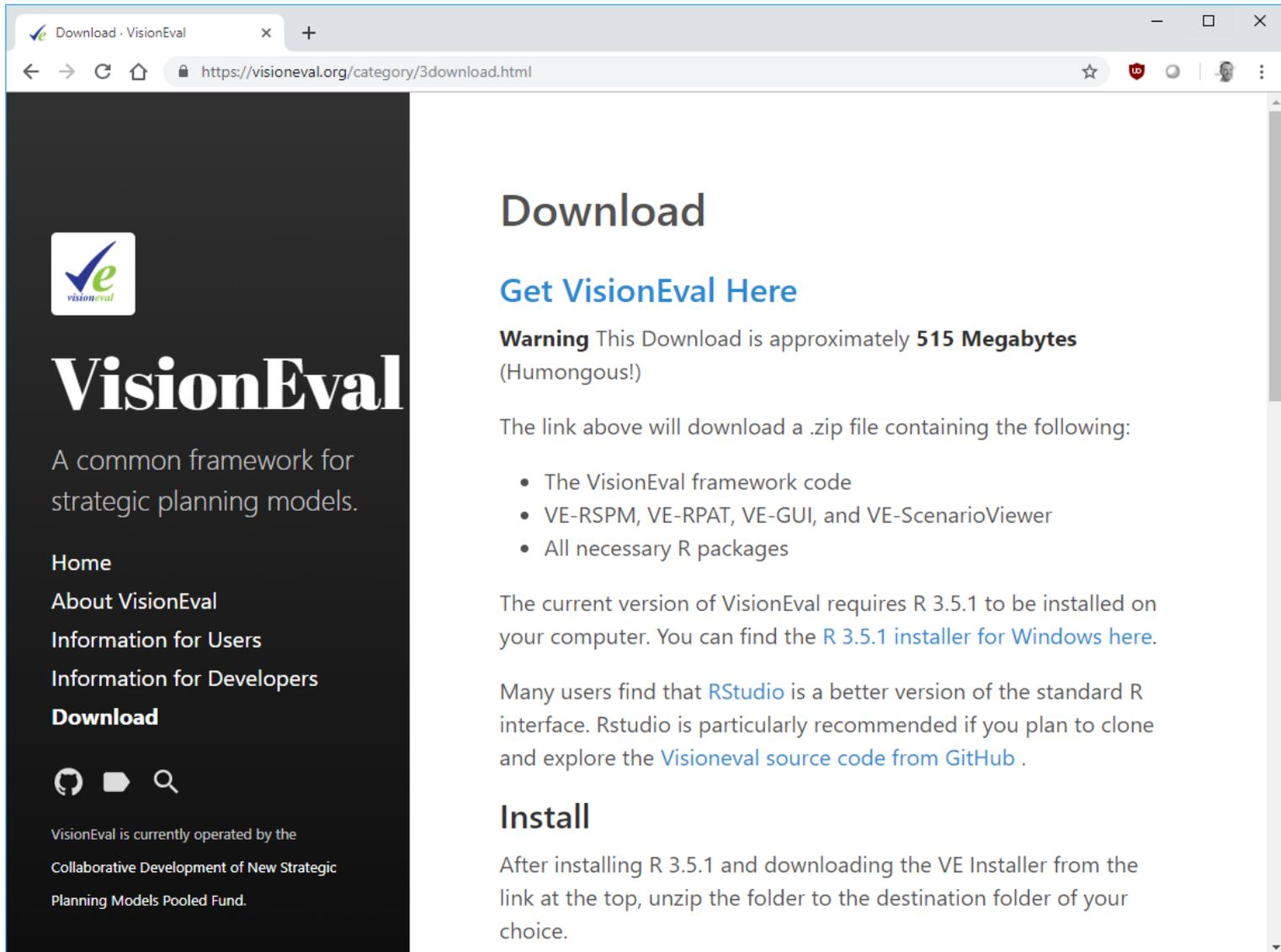
- Models like VE-RSPM are composed of:
 - A model run script which initializes the model and identifies the order of execution of modules
 - A set of input files
 - Several model definition files
- Model run script is readable even if you are not a programmer
 - *Example*

- **run_parameters.json** defines parameters that control the model run - *example*
- **model_parameters.json** defines global model parameters (e.g. value of time) - *example*
- **geo.csv** defines Azones, Bzones, Mareas and their relationships - *example*
- **units.csv** defines units for storing standard data types in the data store - *example*
- **deflators.csv** defines deflators used for converting money inputs (e.g. fuel price) for current and past years to base year values - *example*

- All input files are csv-formatted text files
- Names of files identify the data geography
- Files have headers identifying dataset names. Also:
 - Must have **Year** field when inputs vary by model year
 - Must have **Geo** field when inputs vary by geography
- Field names can have modifiers
 - Year that money values are denominated in (e.g. 2010)
 - Magnitude multiplier for large numbers (e.g. 1e3)
- Things to watch out for
 - Need values for every combination of year and geography
 - Column names must exactly match specifications
 - No data for years other than model run years
 - No data for areas other than those defined in geo.csv file

Using the Tool

Ben Stabler, RSG



Download · VisionEval

https://visioneval.org/category/3download.html



VisionEval

A common framework for strategic planning models.

Home

About VisionEval

Information for Users

Information for Developers

Download

VisionEval is currently operated by the Collaborative Development of New Strategic Planning Models Pooled Fund.

Download

Get VisionEval Here

Warning This Download is approximately **515 Megabytes** (Humongous!)

The link above will download a .zip file containing the following:

- The VisionEval framework code
- VE-RSPM, VE-RPAT, VE-GUI, and VE-ScenarioViewer
- All necessary R packages

The current version of VisionEval requires R 3.5.1 to be installed on your computer. You can find the [R 3.5.1 installer for Windows here](#).

Many users find that [RStudio](#) is a better version of the standard R interface. Rstudio is particularly recommended if you plan to clone and explore the [Visioneval source code from GitHub](#) .

Install

After installing R 3.5.1 and downloading the VE Installer from the link at the top, unzip the folder to the destination folder of your choice.

- `verpat()` for the VERPAT example model
- `verspm()` for the VERSPM example model

- `verspm(scenarios=TRUE)` to run multiple scenarios
- `verpat(scenarios=TRUE)` to run multiple scenarios

- `vegui()` to start the GUI
 - navigate to your destination folder to find the model run scripts

- `VisionEval.bat` to start the R VisionEval session again

vegui() to start the GUI

- navigate to your destination folder to find the model run scripts

Run

- Runs the model

Model Runner

Scenario Settings Inputs **Run** Outputs

Select scenario run scri... Copy scenario...

Run script

E:\projects\clients\odot-visioneval\VE-installer-windows-R3.5.2\models\VERPAT\run_model.R

Modules in model

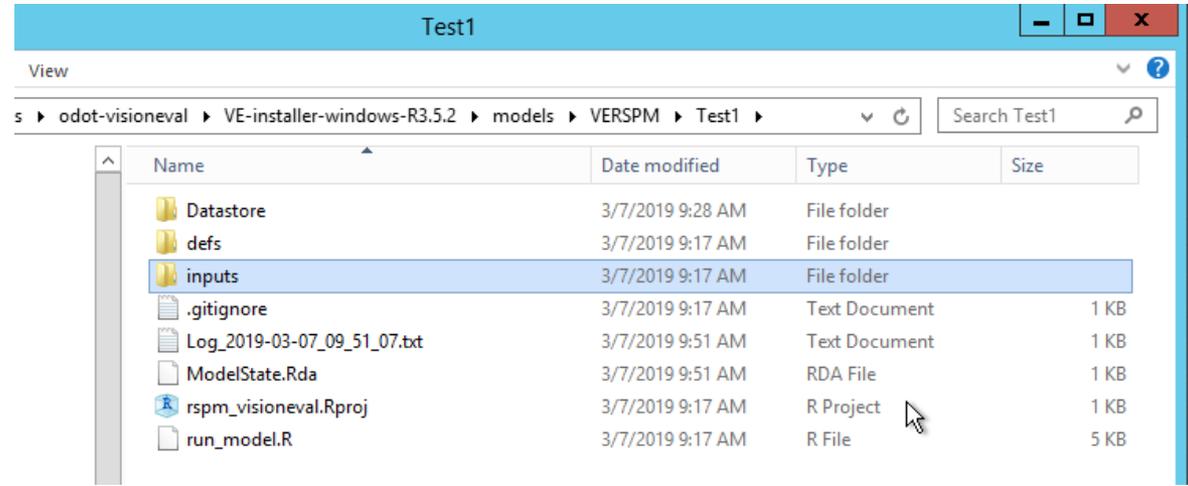
	ModuleName	PackageName	RunFor	Year
1	CreateHouseholds	VESimHouseholds	AllYears	Year
2	PredictWorkers	VESimHouseholds	AllYears	Year
3	PredictIncome	VESimHouseholds	AllYears	Year
4	CreateBaseSyntheticFirms	VESyntheticFirms	BaseYear	Year
5	CreateFutureSyntheticFirms	VESyntheticFirms	NotBaseYear	Year
6	CalculateBasePlaceTypes	VELandUse	BaseYear	Year
7	CalculateFuturePlaceTypes	VELandUse	NotBaseYear	Year
8	CreateBaseAccessibility	VETransportSupply	NotBaseYear	Year
9	AssignVehicleFeatures	VEHouseholdVehicles	NotBaseYear	Year
10	CalculateTravelDemand	VEHouseholdTravel	NotBaseYear	Year

Showing 1 to 10 of 19 entries

Previous 1 2 Next

Using the Tools – Folder setup

- Model folder
 - run_model.R
- defs folder
 - Definitions / parameters
- Inputs folder
 - Input *.CSV files
- Outputs – Datastore
 - Output *.RDA R binary files
 - Use readDatastoreTables() helper function to read into R

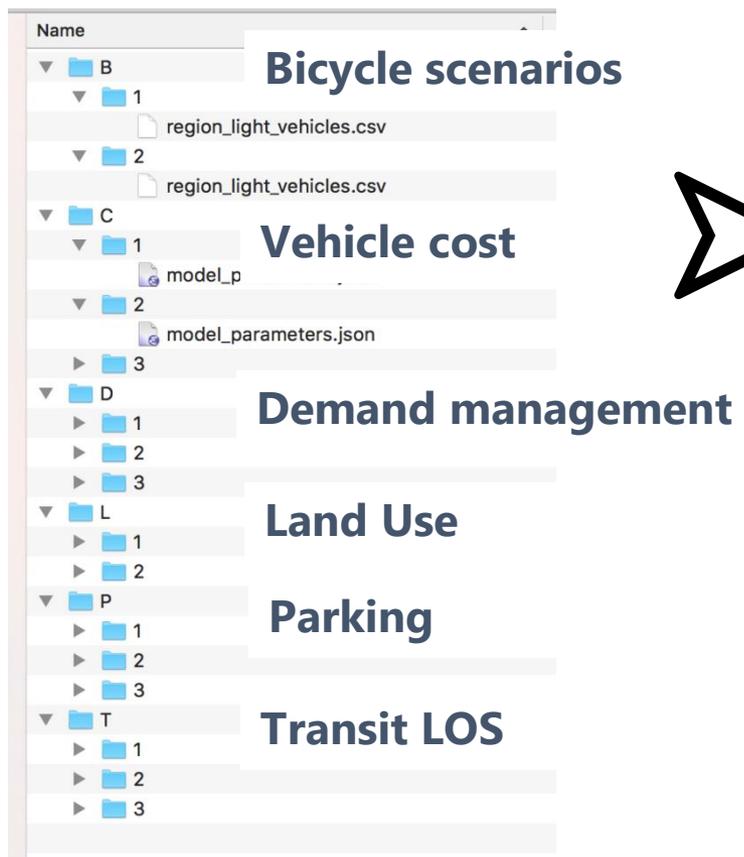


readDatastoreTables() example

```
library(visioneval)
readDatastoreTables(
  Tables_Is = list(Vehicle=c("Type", "MPG")),
  Group = "2038",
  DstoreLocs_ = c("Datastore"),
  DstoreType = "RD"
)
```

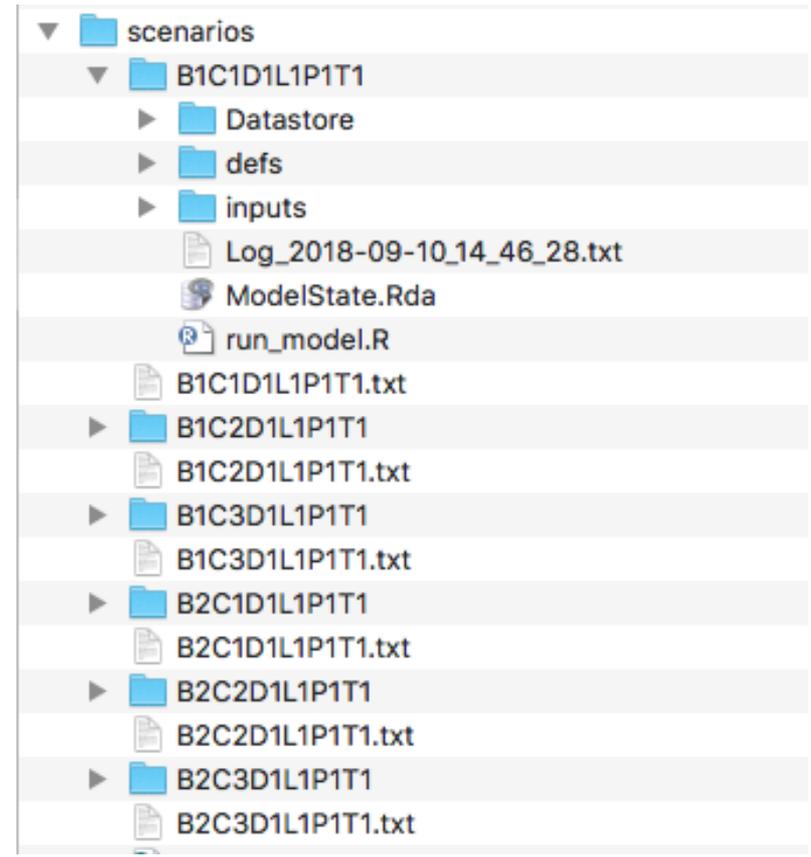
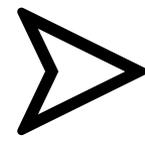
Using the Tools – Multiple Scenarios

- Sensitivity testing of the relationship between inputs and outputs
- Model every combination of input dimensions



Bicycle scenarios

- B
 - 1
 - region_light_vehicles.csv
 - 2
 - region_light_vehicles.csv
- C
 - 1
 - model_p
 - 2
 - model_parameters.json
 - 3
- D
 - 1
 - 2
 - 3
- L
 - 1
 - 2
- P
 - 1
 - 2
 - 3
- T
 - 1
 - 2
 - 3



scenarios

- B1C1D1L1P1T1
 - Datastore
 - defs
 - inputs
 - Log_2018-09-10_14_46_28.txt
 - ModelState.Rda
 - run_model.R
 - B1C1D1L1P1T1.txt
- B1C2D1L1P1T1
 - B1C2D1L1P1T1.txt
- B1C3D1L1P1T1
 - B1C3D1L1P1T1.txt
- B2C1D1L1P1T1
 - B2C1D1L1P1T1.txt
- B2C2D1L1P1T1
 - B2C2D1L1P1T1.txt
- B2C3D1L1P1T1
 - B2C3D1L1P1T1.txt

Using the Tools – Scenario Viewer

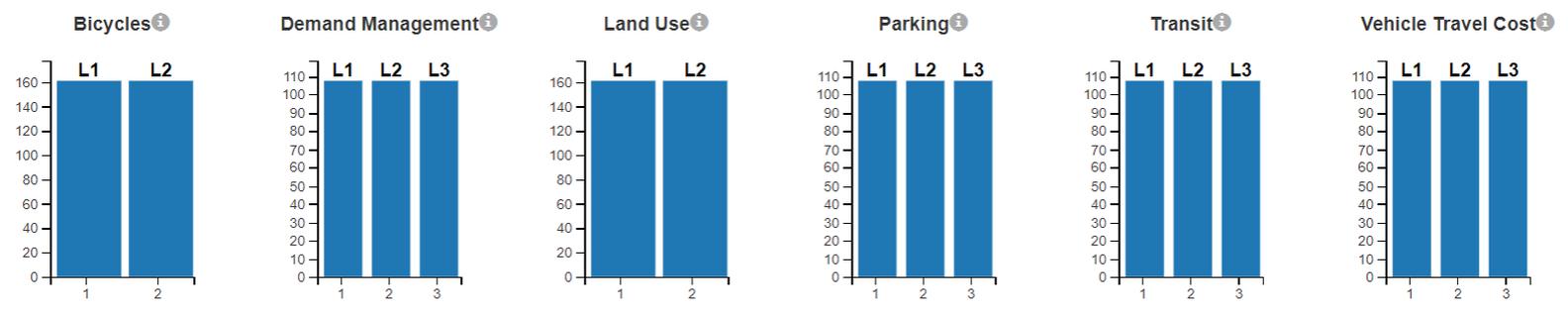
- Example Results in 324 Model Runs (2*3*3*2*3*3)
[VEScenarioViewer/verpat.html](#) and [VEScenarioViewer/verspm.html](#)



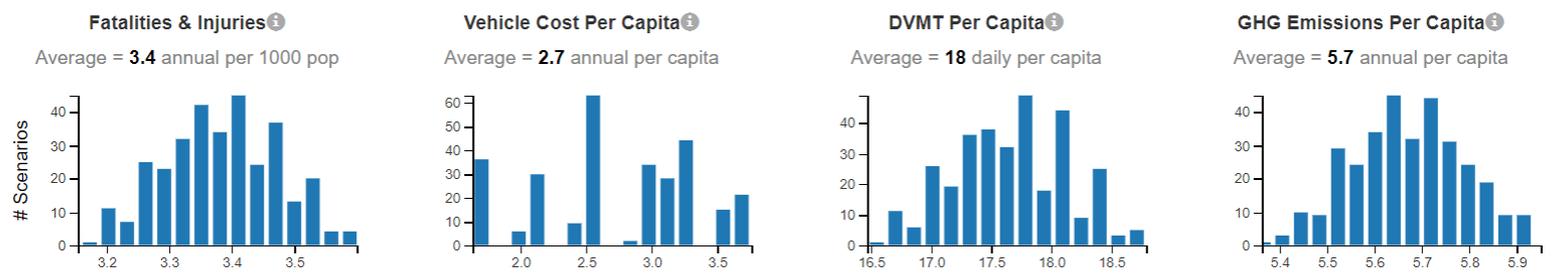
VERPAT Scenario Viewer

- About
- Quick Start
- Detailed Instructions

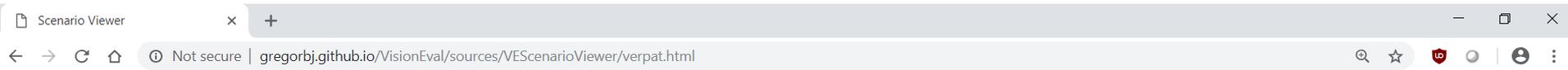
Scenario Input Levels | [Clear All Selections](#)



Model Outputs: 324 scenarios selected out of 324 scenarios | [Clear All Selections](#)



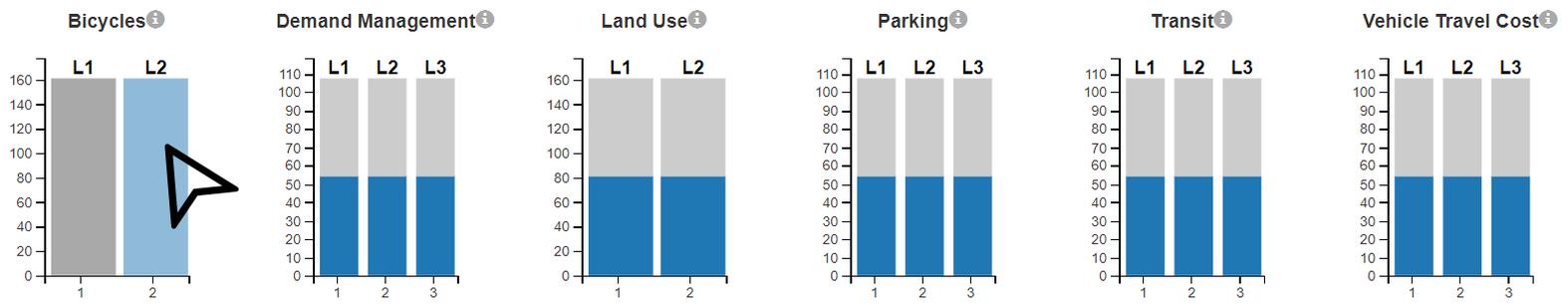
- Filter Outputs by Selected Scenarios



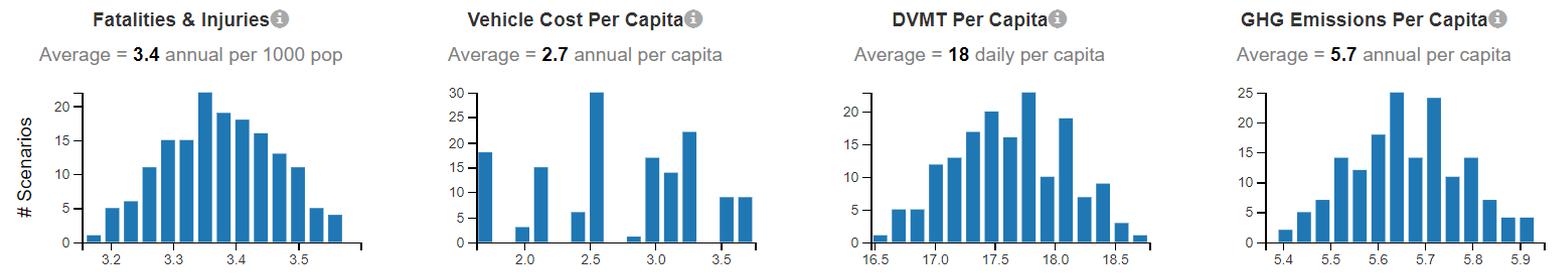
VERPAT Scenario Viewer

- About
- Quick Start
- Detailed Instructions

Scenario Input Levels | [Clear All Selections](#)



Model Outputs: 162 scenarios selected out of 324 scenarios | [Clear All Selections](#)



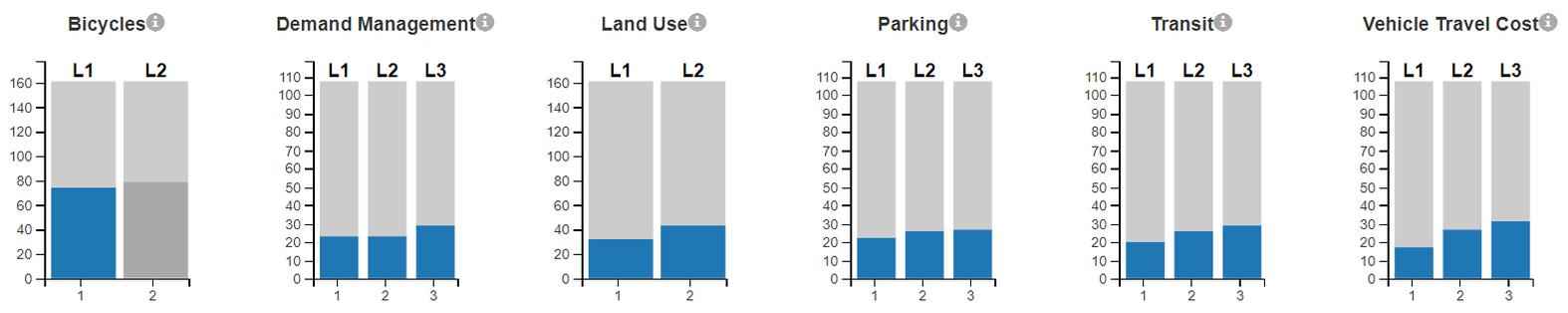
- Filter Inputs by Desired Outcomes



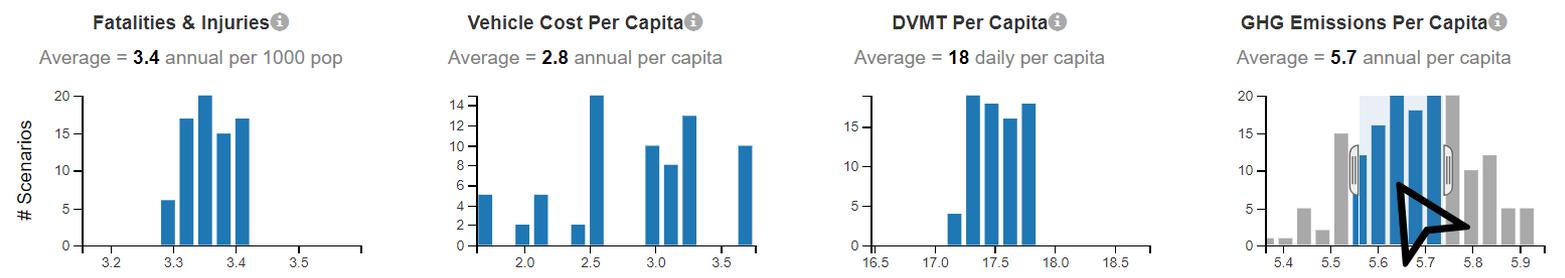
VERPAT Scenario Viewer

- About
- Quick Start
- Detailed Instructions

Scenario Input Levels | [Clear All Selections](#)



Model Outputs: 75 scenarios selected out of 324 scenarios | [Clear All Selections](#)



- Getting started
 - <https://github.com/gregorbj/VisionEval/wiki/Getting-Started>
- Tutorials
 - VERSPM inputs, outputs, modules, etc.:
<https://github.com/VisionEval/VisionEval-Dev/blob/readme-dev/docs/tutorials/verspm/Main.md>
 - VERPAT covers common GUI, multi-scenarios & scenario viewer:
<https://github.com/gregorbj/VisionEval/wiki/VERPAT-Tutorial-Overview>
- Example module documentation
 - https://github.com/gregorbj/VisionEval/blob/master/sources/modules/VEHouseholdTravel/inst/module_docs/CalculateVehicleTrips.md
- VisionEval system design
 - https://github.com/gregorbj/VisionEval/blob/master/api/model_system_design.md

VE-RSPM packages

Brian Gregor, Oregon System Analytics

See Talking points by package here:

https://github.com/gregorbj/VisionEval/blob/develop/api/VE_Training_March_13-14_2019/VE_Training.md

Day #1 Wrap-up

Tara Weidner, ODOT Transportation
Planning Analysis Unit



Agenda: Day #2

Time	Item	Lead
8:00	Welcome and Introductions	Tara Weidner, ODOT
8:10	Review VEHouseholdVehicles	Brian Gregor, OSA
8:55	Review VEHouseholdTravel	Brian Gregor, OSA
9:40	BREAK	ALL
10:00	Review VEPowerTrainsAndFuels	Brian Gregor, OSA
10:00	Review VETravelPerformance	Brian Gregor, OSA
11:30	Applications/Resources and Adjourn	Tara Weidner, ODOT

VE-RSPM Packages, Continued

Brian Gregor, Oregon System Analytics

See Talking points by package here:

https://github.com/gregorbj/VisionEval/blob/develop/api/VE_Training_March_13-14_2019/VE_Training.md

Vehicle & Fuel Options

VisionEval Vehicle & Fuels Options by Vehicle Group							
	Vehicle Group						
	LDV-HH	LDV-CarSvc	LDV-ComSvc	HD Trucks	Transit-Van	Transit-Bus	Transit-Rail
VEHICLE OPTIONS							
Gas/internal combustion (ICE)	***	%	%	%	%	%	%
Hybrid Electric (HEV)	***	%	%	%	%	%	%
Plug-in Hybrid (PHEV)	***	NA	NA	NA	NA	NA	NA
Full Electric (EV)	***	%	%	%	%	%	%
FUEL OPTIONS							
Gasoline & Ethanol	%	%	%	%	%	%	%
Diesel & Biodiesel	%	%	%	%	%	%	%
Natural gas (CNG, LNG) & RNG/biogas	CNG	CNG	CNG	LNG	CNG	CNG	NA
*** For LDV HHs, options are provided for sales mix, adjusted by user inputs on Veh age and %LtTrk inputs based on Federal CAFÉ, CA ZEV (Oregon Reference), and STS-Vision							

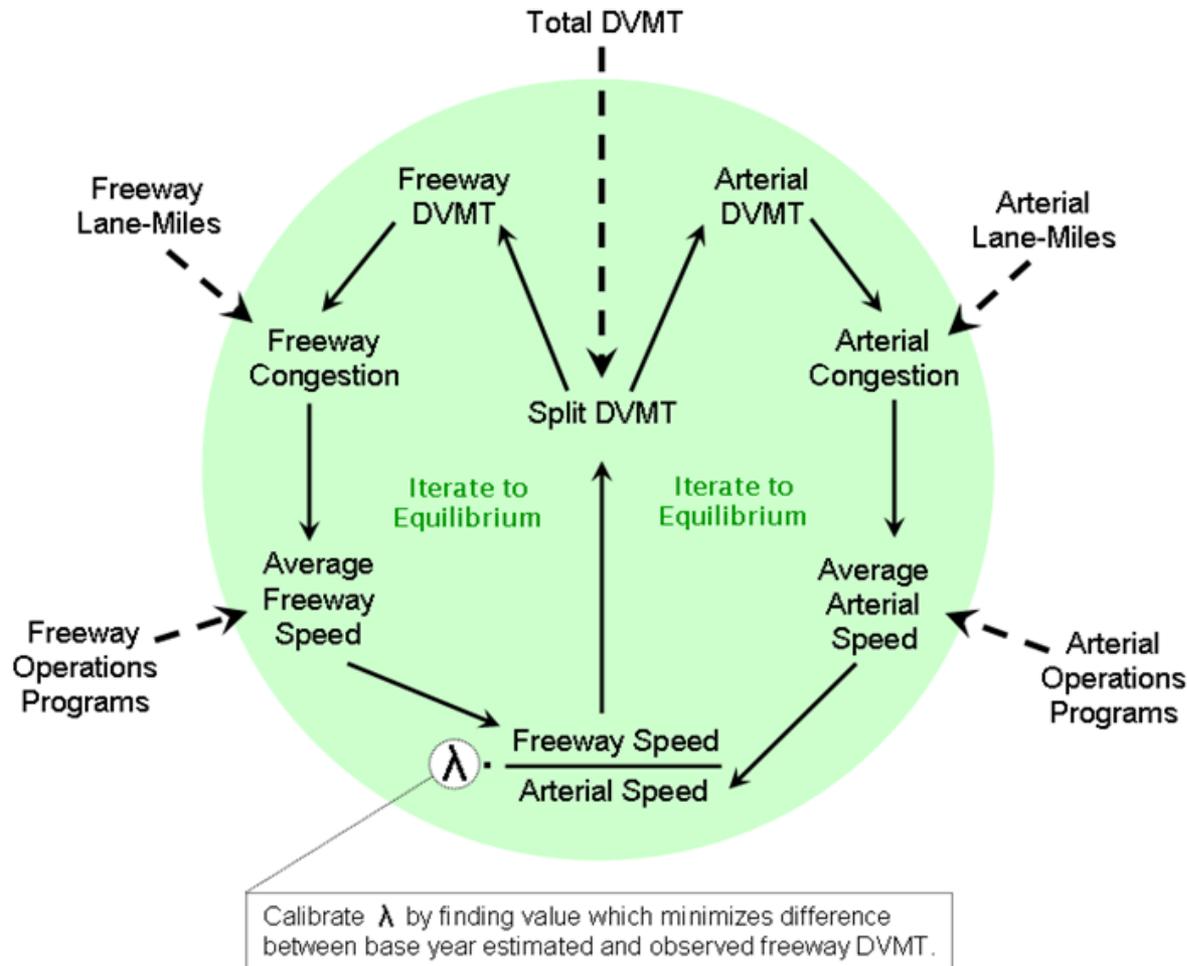
Oregon Vehicle & Fuels Input choices

VE provides default values for Vehicles and fuels and optional scenario inputs that are used instead if available. Some terms:

- **Vehicle Groups** - 3 light duty vehicles (households, Car Service, Commercial service), 3 public transit vehicles (vans, buses, rail). Only the household vehicles are modeled in full--using vehicle sales mix assumptions by year, impacting travel costs and VMT--other vehicle group model simpler fleet-wide attributes (on-road vehicles in each year) which are applied to VMT estimates.
- **Vehicle Powertrains** - 4 types: gas/internal combustion (ICE), hybrid (HEV), plug-in hybrid (PHEV), and full electric (EV). Default characteristics of each type include fuel efficiency (MPG, MPK) and battery range.
- **Vehicle inputs** - User provides by vehicle group: Powertrain mix, %light truck (LDV only), vehicle age
- **Fuel & biofuel choices** - Gasoline & Ethanol, Diesel & Biodiesel, Natural gas (CNG, LNG) & RNG/biogas, Electricity. Default carbon intensity of each type is provided.
- **Fuel inputs** - Explicitly specify mix of all fuel choices or combine into a single average carbon intensity value (composite) by vehicle group, which enables policies that specify a percent reduction over a set of years.

VisionEval Congestion Model

FIGURE 78. SCHEMATIC OF AGGREGATE TRAFFIC EQUILIBRIUM MODEL



Next Steps

Tara Weidner, ODOT Transportation
Planning Analysis Unit

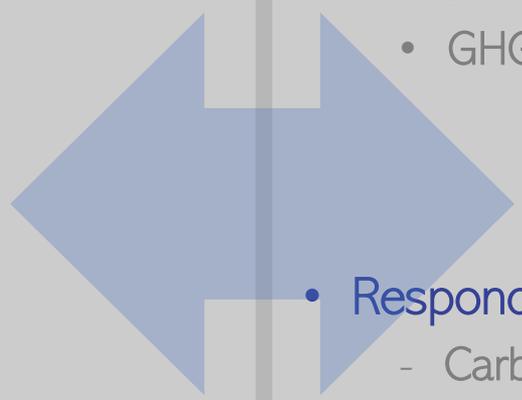
Oregon VisionEval Applications

Statewide Tool (VE-State)

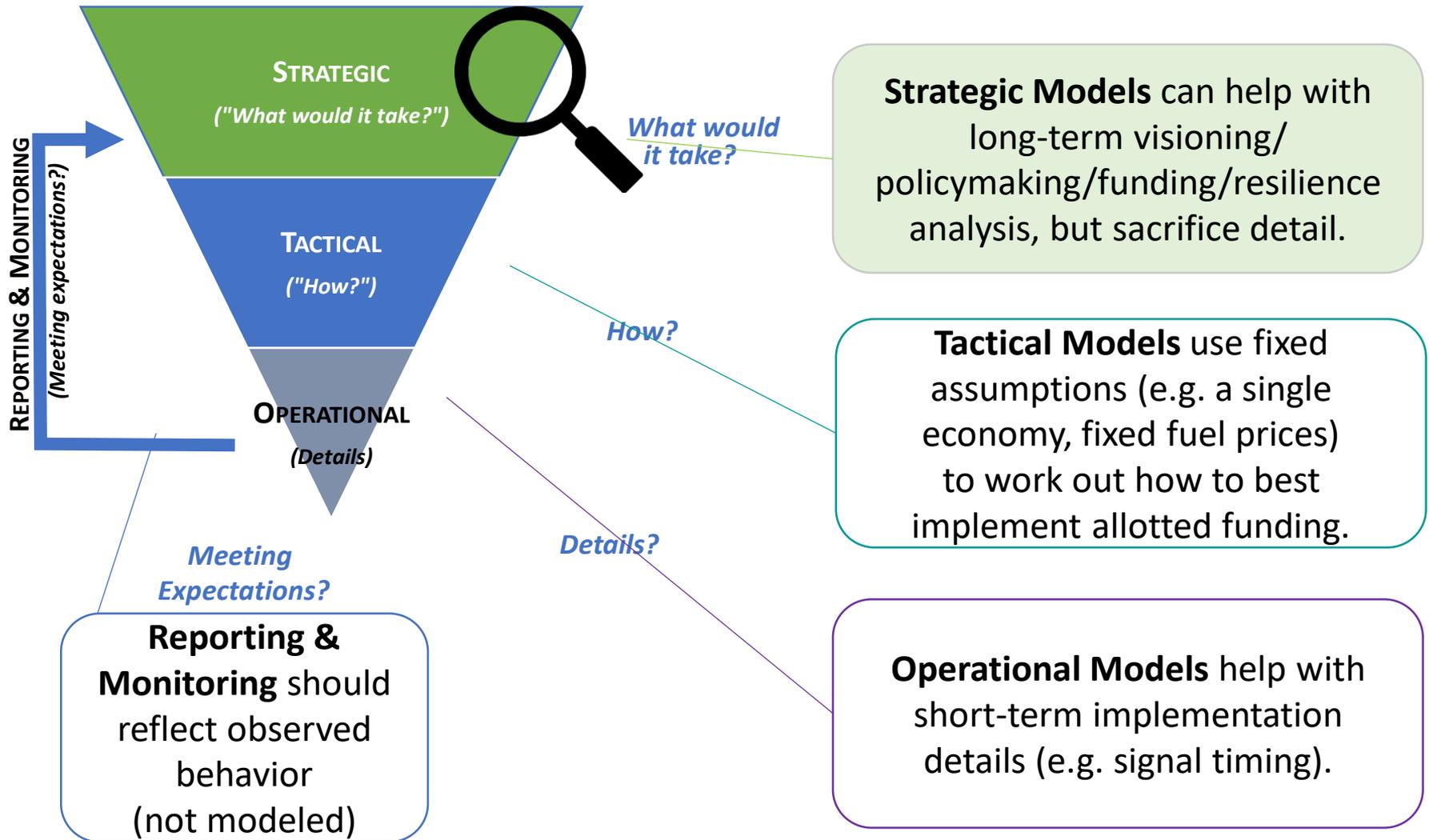
- Statewide Transportation Strategy (STS)
 - Vision & Monitoring
 - for GHG targets
- Statewide Modal Plans
 - Transportation Plan
 - Oregon Highway Plan
- Respond to Qs
 - Emerging Tech
 - DOT Revenue Impacts

MPO Tools (VE-RSPM)

- Strategic Assessment / Scenario Planning
 - RTP Vision & Monitoring
 - GHG/other metrics
- Respond to Qs
 - Carbon Footprint
 - Climate Action Plans



ODOT's S-T-O-R-M Analysis Toolkit



MPO Strategic Assessment Project

Planning Track...

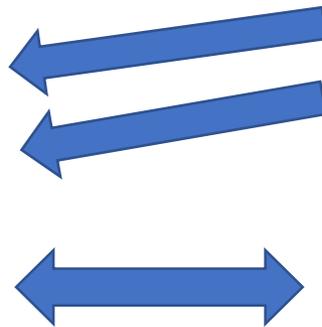
- Kickoff
- Key policies/outcomes
- Data Collection
 - Reference review
 - Alt Scenarios

Technical Tool Track...

- VisionEval 101/Training
- Adopted RTP data
- Prep for Input Review
 - Place Type (maps)
 - Transport inputs (tables)

- Results-Reference
- Results-Sens Tests
- Key Paths
 - Criteria
 - Local Agreement
- Link to Plans

- Calibrate/Validate
- Run Reference Scenario
- Run Sensitivity Tests
 - 1-off, combinations
 - Resilience, relative impact
- Key Paths (filter to meet criteria)
- Documentation



Data collection/input review

Regional Context	Local Actions		Collaborative Actions	
	Community Design	Marketing & Incentives	Vehicles & Fuels	Pricing
<ul style="list-style-type: none"> • Demographics • Income Growth • Fuel Price 	<ul style="list-style-type: none"> • Future Housing (Single- & Multi-Family) • Parking Fees • Transit Service • Biking 	<ul style="list-style-type: none"> • TDM (home & work-based) • Car Sharing • Education on Driving Efficiency • Intelligent Transportation Systems 	<ul style="list-style-type: none"> • Vehicle Fuel Economy (mpg) • Fuels • Commercial Fleets 	<ul style="list-style-type: none"> • Pay-As-You-Drive Insurance • Gas Taxes • Road User Fee

Populate with statewide model values, review with locals

- Local Actions
 - Community Design (Place Types)
 - Local Actions – Transportation (input tables)
- Statewide defaults
 - Collaborative/State-led Actions
 - Regional Context variables

Local Land Use Input (via Place Types)

For each year modeled:

Place Types used to organize inputs & communicate to planners

- Regional Travel Model TAZ Data
 - Population & Households
 - Employment by type
- Built Form Data (TAZ)
 - Unprotected Land Area (GIS minus water, parks)
 - Local input on – Design D & Transit D

Add Census Data (BZone)

- Dwelling units – SF/MF Type shares (=HHs)
- Dwelling units – Income quartile shares
- Average HH size, %1-person HHs

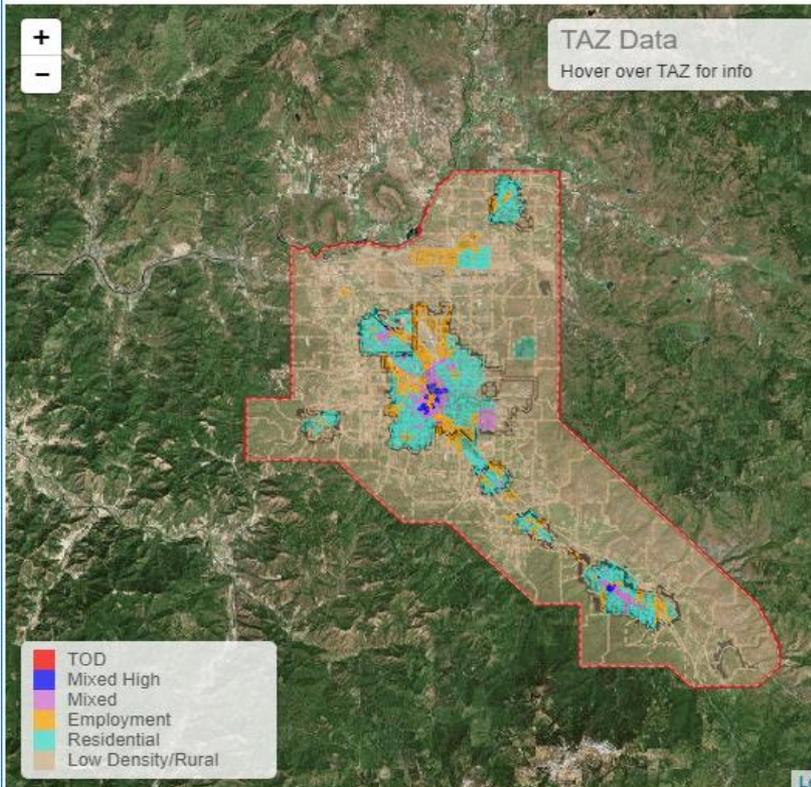
After Local review, aggregate to Bzones

Place Types (pop, emp, 5Ds, etc.)

RVMPO 2010 Place Types (V5)

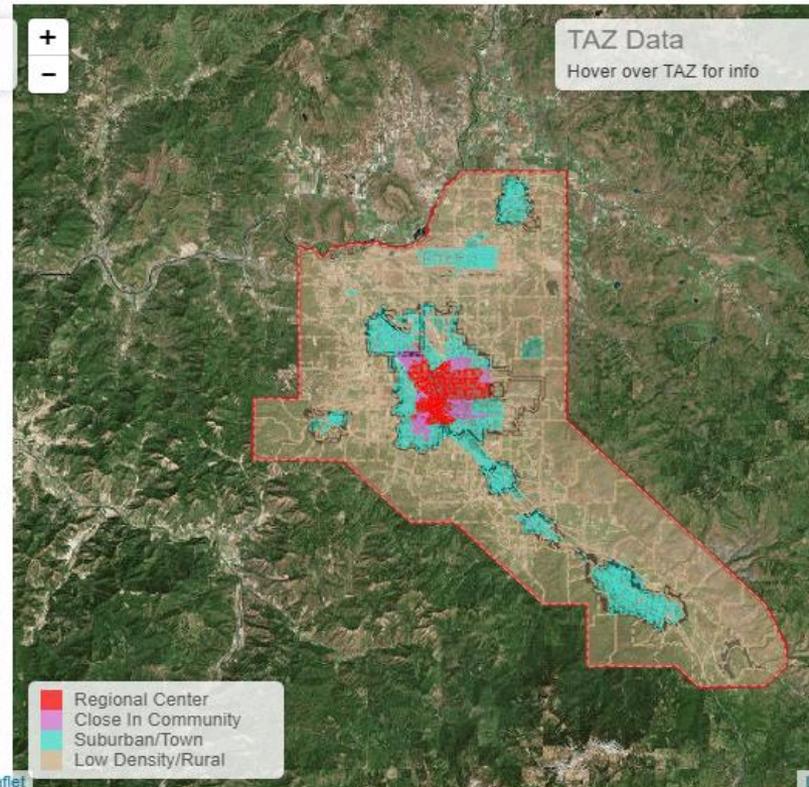
Instructions

Neighborhood Character (Development Types)



Background Map Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, UPR-EGP, and the GIS User Community

Regional Role (Area Types)



Background Map Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, UPR-EGP, and the GIS User Community

Local Transportation Input (Tables/Maps)

Strategic Assessment Data Gathering- VisionEval Central Lane MPO 2019

Pricing

Household travel costs are influential on the amount of travel. They are calculated from the amounts of miles driven combined with fuel/electricity consumed, fuel and operating costs, fuel taxes and fees, PAYD insurance, and other external costs. Gas taxes, annual vehicle fees, OreGo and additional VMT fees are used to reduce or recover indirect social costs of

Input	Units
State & Local Road Fees	
<ul style="list-style-type: none"> Gas tax Annual Vehicle Fees 	\$/gallon, \$/vehicle/yr.
Congestion charge	
<ul style="list-style-type: none"> Cost % Freeway/Arterial miles covered 	\$/mile % coverage
Pay as you drive (PAYD Insurance)	% HHs using
VMT fees (beyond OreGo)	\$/mile

Input	
State & Local Gas Tax	Ref. Fed Low
State & Local Annual Veh Fees	Ref. L
Congestion Charge	S F A
PAYD Insurance	50% 0%
VMT Fees	5% 0%

Strategic Assessment Data Gathering- VisionEval Central Lane MPO 2019

Transportation Options

Bicycle and light vehicle utilization is represented as the share of single occupancy vehicle trips that are diverted to active modes. Households are identified as participating in a car-sharing program (with adjustments to auto ownership), based on the characteristics of the household and the extent of available car-sharing programs. Households and workers are designated as participating in a number of TDM (transportation demand management) programs based on program deployment and household characteristics.

Input	Units	Geography	Base Year Source	Forecast Source	Considerations
Bike/Light Vehicle Diversion	% Single Occupancy Vehicle trips diverted	Division	2010 OHAS survey, local data	MPO (planned goal)	
TNC Deployment					
<ul style="list-style-type: none"> Service Coverage by Level Average TNC Vehicle Age 	High/Low Svc Level years	District Division	(MPO or Place Type VE-State default)	MPO (planned goal)	
Workplace TDM Programs	% of HHs engaged in high quality program	District	(MPO or Place Type VE-State default)	MPO (planned goal)	
Home-based TDM Programs	% of HHs engaged in high quality program	District	(MPO or Place Type VE-State default)	MPO (planned goal)	

Input	2005	2010	2035	Source
Bike/Light Vehicle Diversion (% diversion by TAZ/District)	Eug/Spr/Cob 5%/1%/0%	Eug/Spr/Cob 8%/2.2%/0%	Eug/Spr/Cob 24%/6%/1%	ETSP
TNC Deployment Coverage- High service (TAZ/District s)	map	map	map	ETSP
Ave TNC Veh Age	Eug/Spr/Cob 7/7/7	Eug/Spr/Cob 7/7/7	Eug/Spr/Cob 5/5/5	VE State
Workplace TDM Programs (% participation by TAZ/District)	map	map	map	ETSP
Home-Based TDM Programs (% participation by TAZ/District)	map	map	map	ETSP

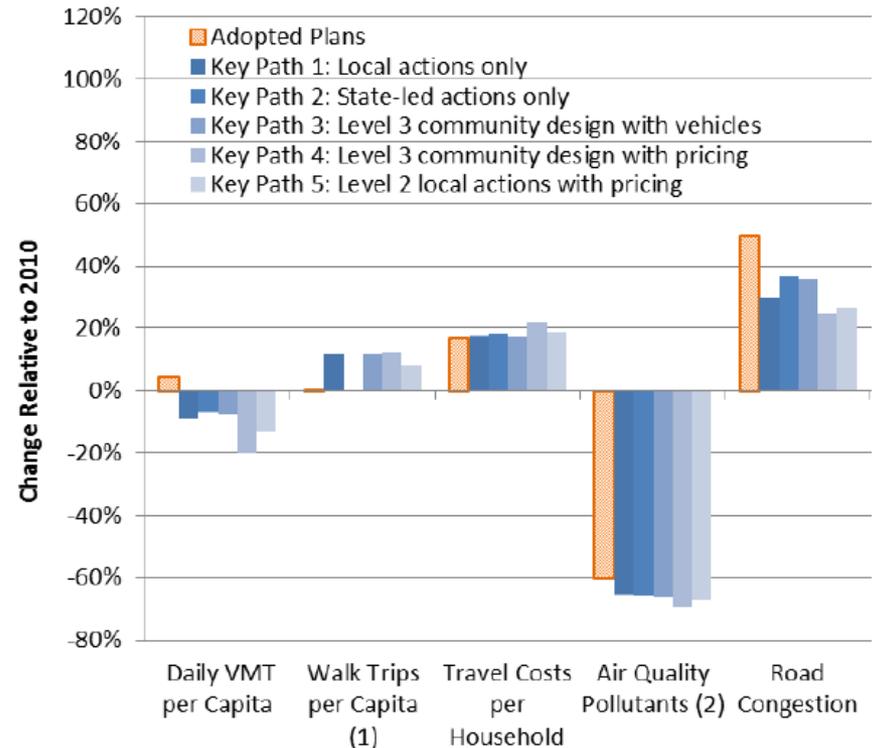
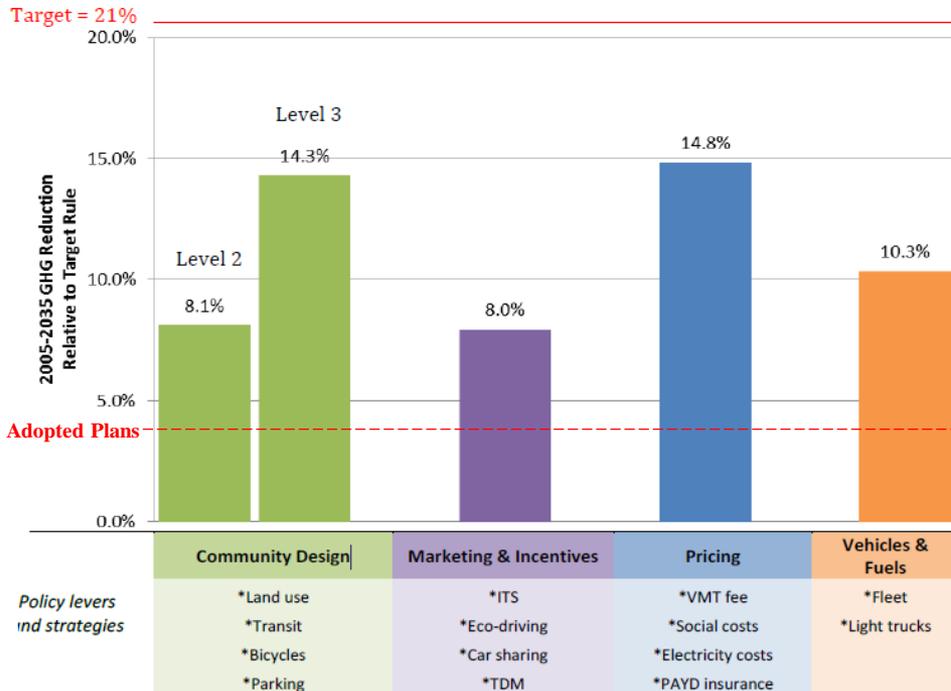
Annotated
VE-State default input

Outputs - MPO Strategic Assessment

RSPM Inputs:

Regional Context	Local Actions		Collaborative Actions	
	Community Design	Marketing & Incentives	Vehicles & Fuels	Pricing
<ul style="list-style-type: none"> • Demographics • Income Growth • Fuel Price 	<ul style="list-style-type: none"> • Future Housing (Single- & Multi-Family) • Parking Fees • Transit Service • Biking 	<ul style="list-style-type: none"> • TDM (home & work-based) • Car Sharing • Education on Driving Efficiency • Intelligent Transportation Systems 	<ul style="list-style-type: none"> • Vehicle Fuel Economy (mpg) • Fuels • Commercial Fleets 	<ul style="list-style-type: none"> • Pay-As-You-Drive Insurance • Gas Taxes • Road User Fee

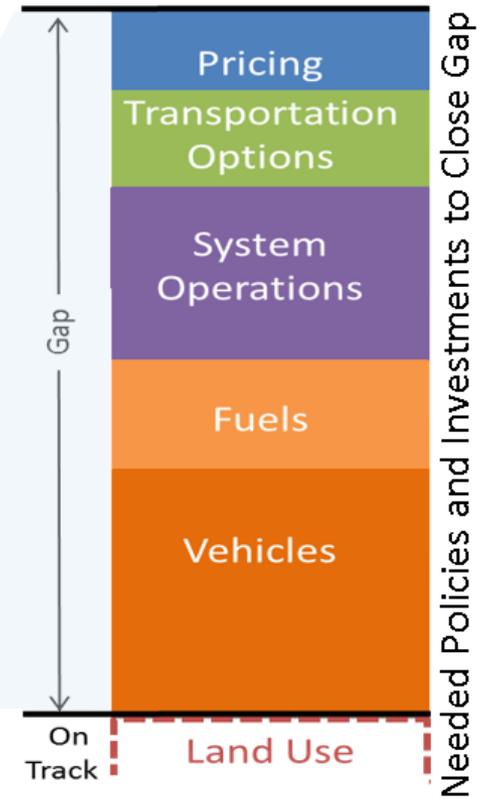
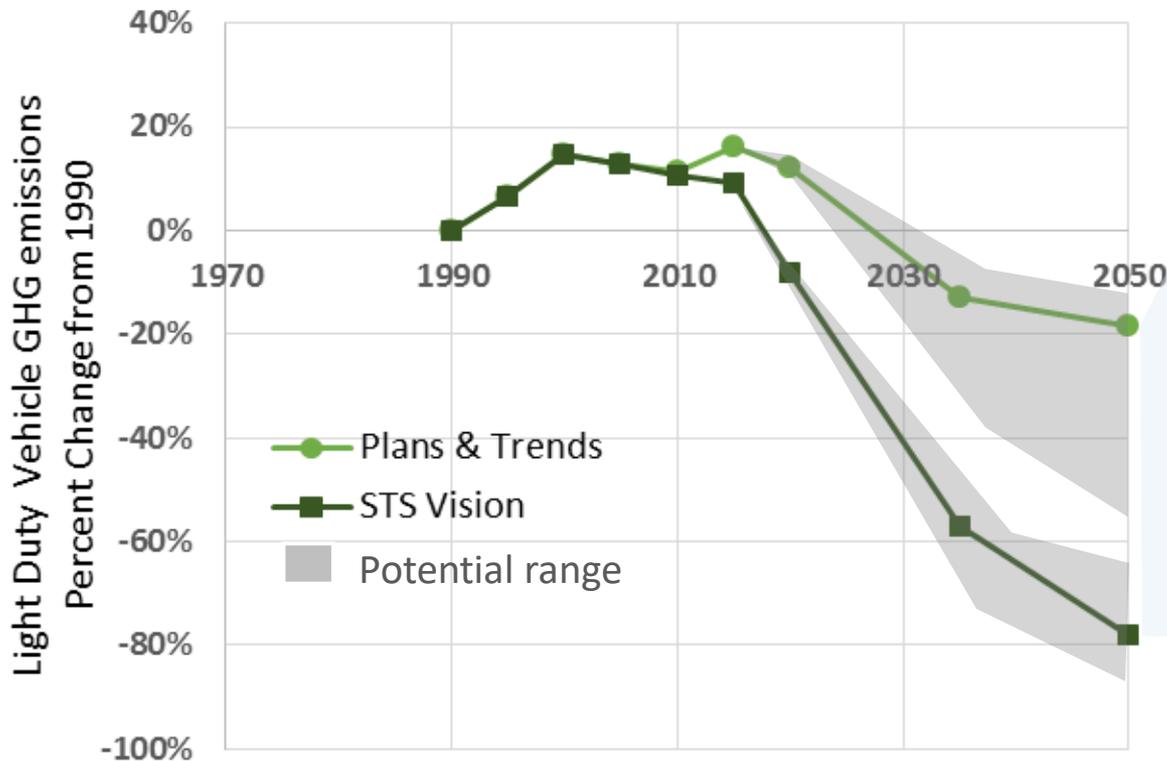
Corvallis Area MPO Results:



Outputs – Gap to Vision & Relative impact

Projected GHG Emissions

Light Duty Vehicle CO₂e Percent Change from 1990



Outputs – Multiruns/Scenario Viewer

Corvallis Metropolitan Planning Area Scenario Viewer

[About This Effort](#)
[Quick Start](#)
[Detailed Instructions](#)

Scenario Input Levels | [Clear All Selections](#)



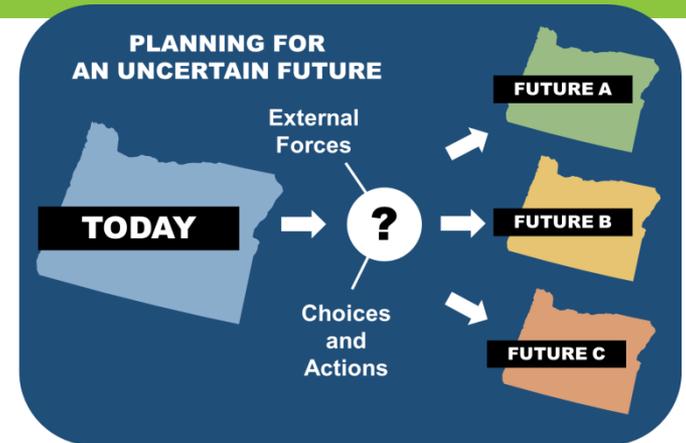
Model Outputs: 32 scenarios selected out of 288 scenarios | [Clear All Selections](#)



RESOURCES

Oregon Applications

- VisionEval
 - OSTI Oregon Scenario Planning [website](#), and [RSPM brochure](#)
 - OSTI Strategic Assessment [1-pager](#)
- Broader Tools
 - [OSTI GHG Tools Overview](#) - high-level background on various current analysis tools and their capabilities/limitations for GHG analysis and reporting. How Strategic Models fit into analysis toolkit.



RESOURCES

Case Studies

- Oregon
 - ODOT [Statewide Transportation Strategy](#) (2012) and [STS monitoring report](#) (2018)
 - Portland Metro's [Climate Smart Strategy](#) (2014) and Monitoring report [Appendix J to the RTP](#) (2018)
 - Other VisionEval MPO [Scenario Planning](#) in Oregon
- National
 - VisionEval Tool Applications [case study reports](#)

Thank You!

- Feedback on Training: Brooke or Tara
- Qs on Install/getting model to run: Jeremy
- Qs on Oregon Application: OSTI (Tara, Brian H, Cody)

June 2, 2019 VE Training Workshop (1.5-hrs)
@ TRB Planning Applications Training in Portland



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