

MOVES2014 Project Level for Experienced Users



October 2014

Office of Transportation and Air Quality
US Environmental Protection Agency



Webinar Logistics

- Webinar slides are available at:
www.epa.gov/otaq/models/moves/training.htm
- Please use the **Q & A pod** within Adobe Connect to send questions. We will try to respond to as many as possible throughout the webinar

NOTE: Please ensure that your computer's volume is properly adjusted

Outline

- Updates
- Under-the-hood improvements to the MOVES project-level
- Changes to the Graphical User Interface (GUI)
- Database converter
- New input options
- MySQL Workbench

Updates

- MOVES2014 October Release – posted October 23, 2014
- *Federal Register* notice October 7, 2014
 - MOVES2014 approved for SIP and conformity purposes
 - A two year grace period applies before MOVES2014 must be used in conformity
 - Until October 7, 2016, for project-level conformity, use either MOVES2010a/b, or MOVES2014

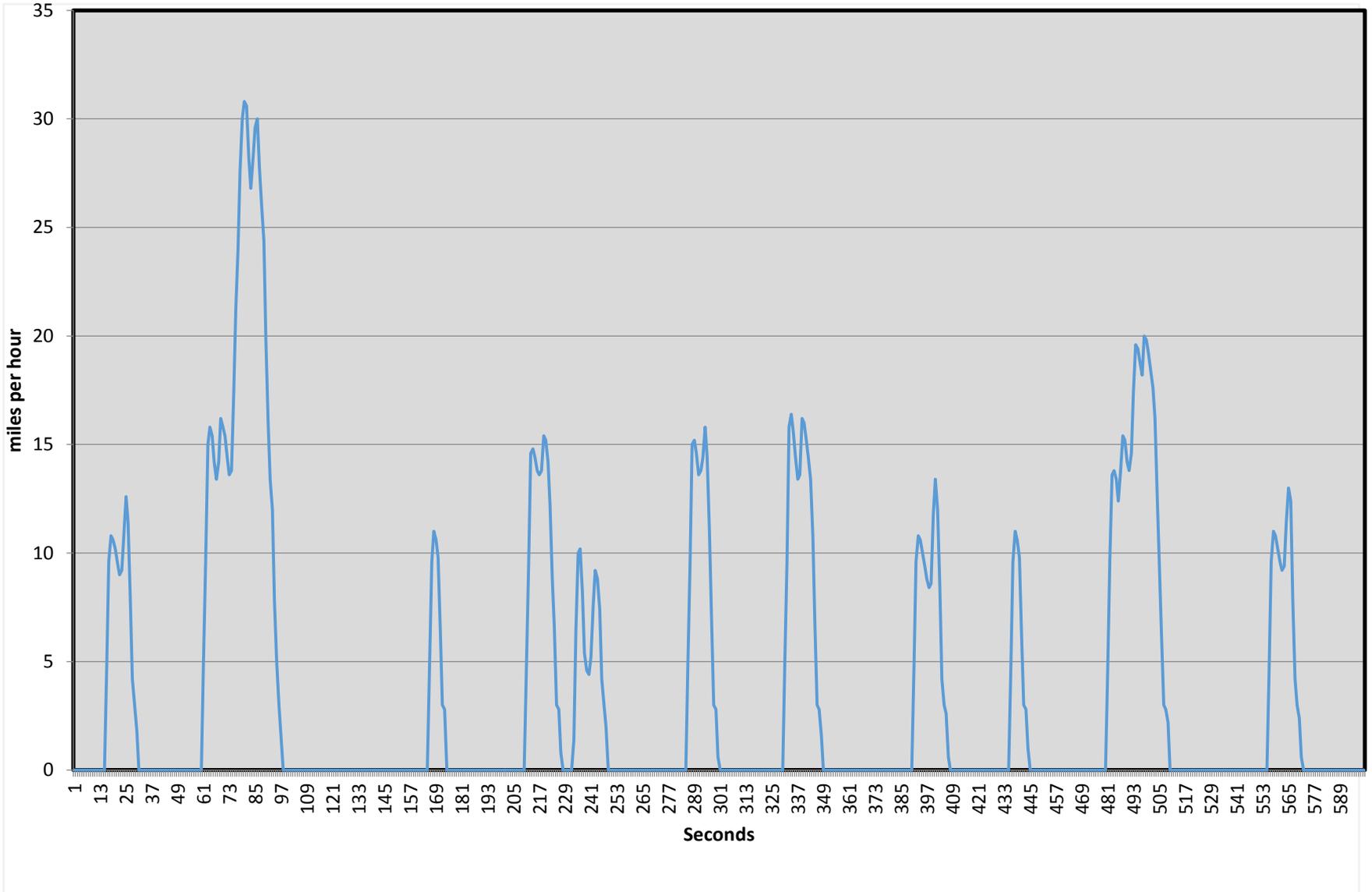
Under-the-hood Improvements



New Drive Cycles Added

- New York City Bus Cycle (avg speed = 3.7 mph)
- Washington Metro Area Transit Authority Bus Cycle (8.3 mph)
- Modified HHDDT Creep Mode Cycle (1.8 mph)
- Modified EPA HD High Speed Freeway Driving Schedule (76.7 mph)
- Modified EPA MD High Speed Freeway Driving Schedule (77.8 mph)

New York City Bus Cycle (3.69 mph)



MOVES2014 Drive Cycle Map

Source	Min Speed (mph)	0	2.5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
Type	Max Speed (mph)	2.5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	100
11	Motorcycle	X				X		X	X			X			X		X	X
21	Passenger Car	X				X		X	X			X			X		X	X
31	Passenger Truck	X				X		X	X			X			X		X	X
32	Light Commercial Truck	X				X		X	X			X			X		X	X
41	Intercity Bus				X	X	X		X		X			X	X		X	
42	Transit Bus				X			X				X		X	X		X	
43	School Bus				X			X				X		X	X		X	
51	Refuse Truck	X			X	X		X	X			X	X	X			X	
52	Single Unit Short-haul Truck		X		X	X	X		X		X			X	X		X	
53	Single Unit Long-haul Truck		X		X	X	X		X		X			X	X		X	
54	Motor Home		X		X	X	X		X		X			X	X		X	
61	Combination Short-haul Truck			X	X	X		X	X			X	X	X			X	
62	Combination Long-haul Truck			X	X	X		X	X			X	X	X			X	

White boxes with X have existing driving schedules in MOVES
 Blue boxes indicate new schedules added for MOVES2014
 Gray boxes require interpolation between explicit schedules

Updates to PM rates

- Lower running PM emission rates in MOVES2014 (esp. for cold weather climates)
 - Running temperature sensitivity removed for Tier 2 and newer vehicles
 - MOVES2014 retains running temperature sensitivity for Tier 1 and older vehicles
- 2011 in-house EPA study validated cold start sensitivity seen in Kansas City PM study

Updates to PM rates

- Exhaust and crankcase $PM_{10}/PM_{2.5}$ ratios
 - Gasoline changed from 1.086 to 1.13
 - Also applied gasoline ratio to CNG emissions
 - Diesel changed from 1.0309 to 1.087
 - Ratios updated based on citable data
- Brakewear and Tirewear $PM_{10}/PM_{2.5}$ ratios
 - Brakewear changed from 3.82 to 8
 - Tirewear changed from 4.17 to 6.667

Updates to CO rates

- CO start rates for new vehicles were lowered
 - Based on EPA cold start study
- No temperature sensitivity for running emissions (same as MOVES2010)

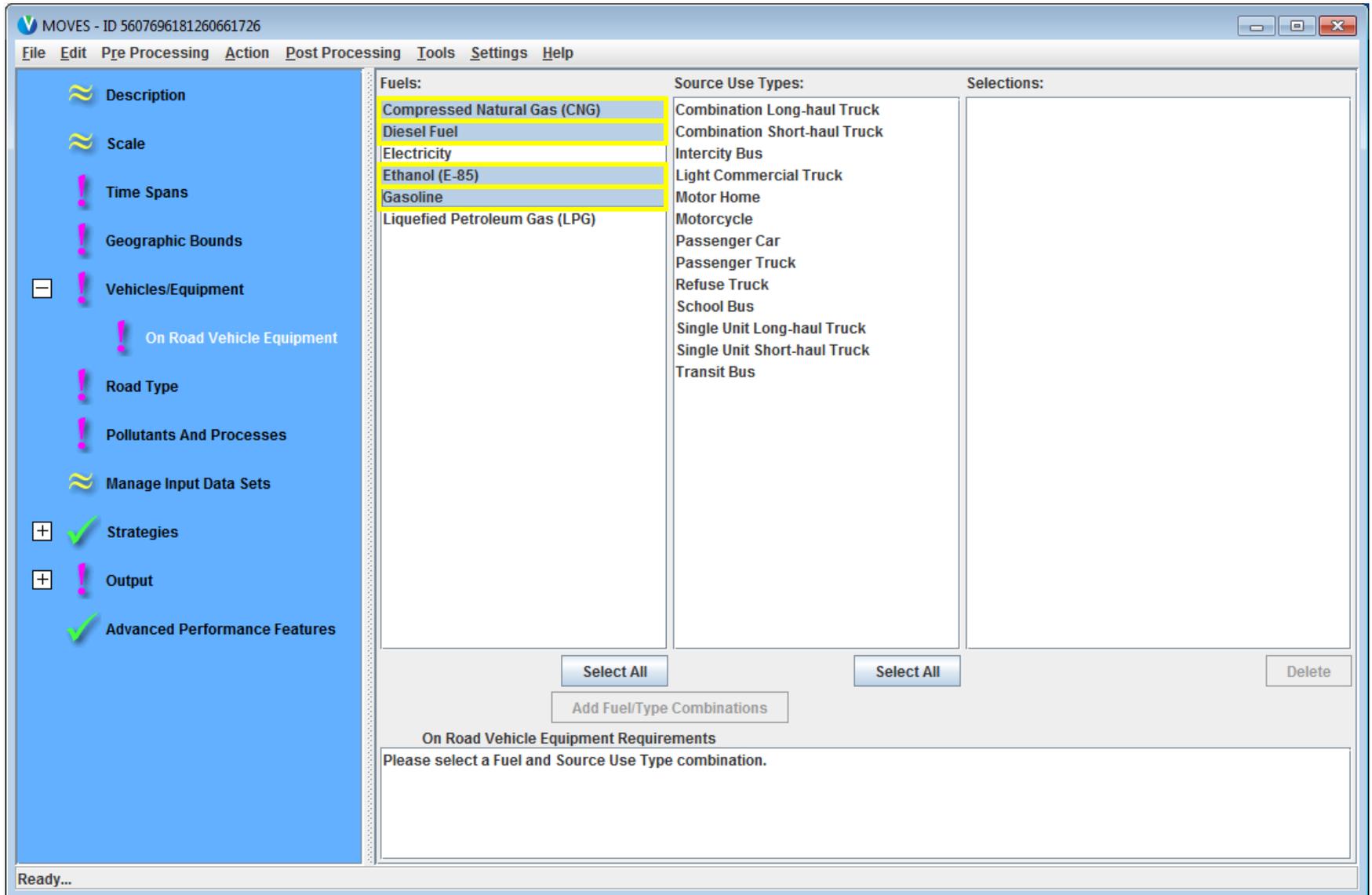
Changes to the Graphical User Interface



GUI Changes – Ethanol

- EPA has added ethanol (E-85) to the model
- To obtain emissions for an entire fleet, ethanol should be selected, along with gasoline, diesel, and CNG
- If no ethanol exists in your county, the new **fuelusage** input table can be used to specify this (covered later)

GUI Changes – Ethanol



GUI Changes – Pollutants and Processes

- PM speciation was added for CMAQ AQ modeling
- PM hot-spot analysis should use “Primary Exhaust PM2.5 – Total” and prerequisites

GUI Changes – Pollutants and Processes

MOVES - ID 5607696181260661726

File Edit Pre Processing Action Post Processing Tools Settings Help

-  Description
-  Scale
-  Time Spans
-  Geographic Bounds
-  Vehicles/Equipment
-  Road Type
-  Pollutants And Processes
-  Manage Input Data Sets
-  Strategies
-  Output
-  Advanced Performance Features

	Running Exhaust	Start Exhaust	Brakewear	Tirewear	Evap Permeation	Evap Fuel Vapor
<input checked="" type="checkbox"/> Primary Exhaust PM2.5 - Total	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
<input checked="" type="checkbox"/> [-] Primary Exhaust PM2.5 - Species	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
<input type="checkbox"/> Aluminum	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> Ammonium (NH4)	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> Calcium	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> Chloride	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> CMAQ5.0 Unspeciated (PMOTHR)	<input type="checkbox"/>	<input type="checkbox"/>				
<input checked="" type="checkbox"/> Composite - NonECPM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
<input checked="" type="checkbox"/> Elemental Carbon	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
<input checked="" type="checkbox"/> H2O (aerosol)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
<input type="checkbox"/> Iron	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> Magnesium	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> Manganese Compounds	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> Nitrate (NO3)	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> Non-carbon Organic Matter (NCOM)	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> Organic Carbon	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> Potassium	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> Silicon	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> Sodium	<input type="checkbox"/>	<input type="checkbox"/>				
<input checked="" type="checkbox"/> Sulfate Particulate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
<input type="checkbox"/> Titanium	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> Primary PM2.5 - Brakewear Particulate			<input type="checkbox"/>			
<input type="checkbox"/> Primary PM2.5 - Tirewear Particulate				<input type="checkbox"/>		
<input type="checkbox"/> Primary Exhaust PM10 - Total	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> Primary PM10 - Brakewear Particulate			<input type="checkbox"/>			
<input type="checkbox"/> Primary PM10 - Tirewear Particulate				<input type="checkbox"/>		
<input type="checkbox"/> Sulfur Dioxide (SO2)	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> Total Energy Consumption	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/> Relative Energy Consumption	<input type="checkbox"/>	<input type="checkbox"/>				

Running Exhaust requires a non-offnetwork road to be selected

Select Prerequisites

Clear All

Ready...

MOVES2014 Database Converter



Database Converter

- Converts MOVES2010b project database into MOVES2014 compatible database
 - Adds fuel region to fuel supply table
- Converter has limitations for use in regulatory modeling (e.g., PM hot-spot analysis)
 - Once a MOVES2010b db has been converted, additional steps are necessary:
 - Need to update database with default MOVES2014 fuels
 - Need to update any other MOVES2010 defaults to MOVES2014

Database Converter

MOVES - ID 1215676868787638180

File Edit Pre Processing Action Post Processing Tools Settings Help

Multiple Run Spec Creator
Process DONE Files
Convert MOVES2010B County or Project input to MOVES2014
Convert MOVES2010A County or Project input to MOVES2010B

Output Database

Server: Refresh

Database: Create Database...

Units

Mass Units:

Energy Units:

Distance Units:

Use scripts to convert 2010B CDM and PDM databases

Database Converter

Convert Database

Instructions

This tool converts MOVES 2010B County Domain and Project Domain databases into the MOVES2014 format.

Use the "Browse" button to select a database conversion script file, such as the standard file Convert2010B_CDM_PDM.sql located in the database/ConversionScripts directory.

Select a MOVES 2010B County Domain or Project Domain database as the "Input Database". This database must be on the same server as the MOVES 2014 default database in order for the script to copy required data.

Enter the name of a new database to receive the converted data as the "New Database".

Use the "Convert Database" button to execute the script file. When you've converted all the databases you care to, click "Done".

Conversion Script

File: Convert2010B_CDM_PDM.sql

Databases

Server: localhost

Input Database: MOVES2010b_atlanta_2024_in

New Database: MOVES2014_atlanta_2024_in

Messages:

Steps:

- Select the existing 2010b database from dropdown menu
- Give the new converted database a unique name
- See pg 50 of the MOVES2014 User Interface Manual for instruction on batch conversion:

<http://www.epa.gov/otaq/models/moves/documents/420b14057.pdf>

Database Converter

countyID	fuelYearID	monthGroupID	fuelFormulati...	marketShare	marketShareCV
13121	2012	1	20011	1	0.5
13121	2012	1	3836	1	0.5
13121	2012	7	20011	1	0.5
13121	2012	7	3847	1	0.5



fuelRegionID	fuelYearID	monthGroupID	fuelFormulati...	marketShare	marketShareCV
170000000	2012	1	20011	1	0.5
170000000	2012	1	3836	1	0.5
170000000	2012	7	20011	1	0.5
170000000	2012	7	3847	1	0.5

- Default fuel data are provided by the EPA for fuel region
- Fuel supply tables must now be by fuelregionID

Database Converter – Additional Steps

- Update the fuel tables in a converted database by exporting default fuel tables in MOVES2014, review, and re-import
 - Because fuel supply/fuel formulation information has been substantially changed in MOVES2014; MOVES2010b fuel tables should not be used
- Update any other MOVES2010b defaults used in the database to MOVES2014 defaults
 - Most other default activity and fleet information has been updated in MOVES2014; MOVES2010b defaults should not be used

New Input Options



New Input Options – Fuels

MOVES Data Importer

Vehicle Type VMT | Hotelling | I/M Programs | Retrofit Data | Generic | Tools

Ramp Fraction | Road Type Distribution | Source Type Population | Starts

Run Spec Summary | Database | Age Distribution | Average Speed Distribution | **Fuel** | Meteorology Data

Description of Imported Data:

Fuels Wizard

FuelSupply Data Source:

File: (please select a file) [Browse...]

[Clear Imported Data] [Create Template...]

FuelFormulation Data Source:

File: (please select a file) [Browse...]

[Import]

Messages:

[Export Default Data] [Export Imported Data]

Fuel

[Done]

- Update fuel supply/formulation information has been provided for every county in the country... now organized by “fuelregionID”
- Ethanol (E-85) added to default fuels

New Input Options – FuelUsageFraction

countyID	fuelYearID	modelYearGroupID	sourceBinFuelTypeID	fuelSupply	usageFraction
13121	2024	0	1	1	1
13121	2024	0	2	2	1
13121	2024	0	3	3	1
13121	2024	0	5	1	0.792421
13121	2024	0	5	5	0.207579

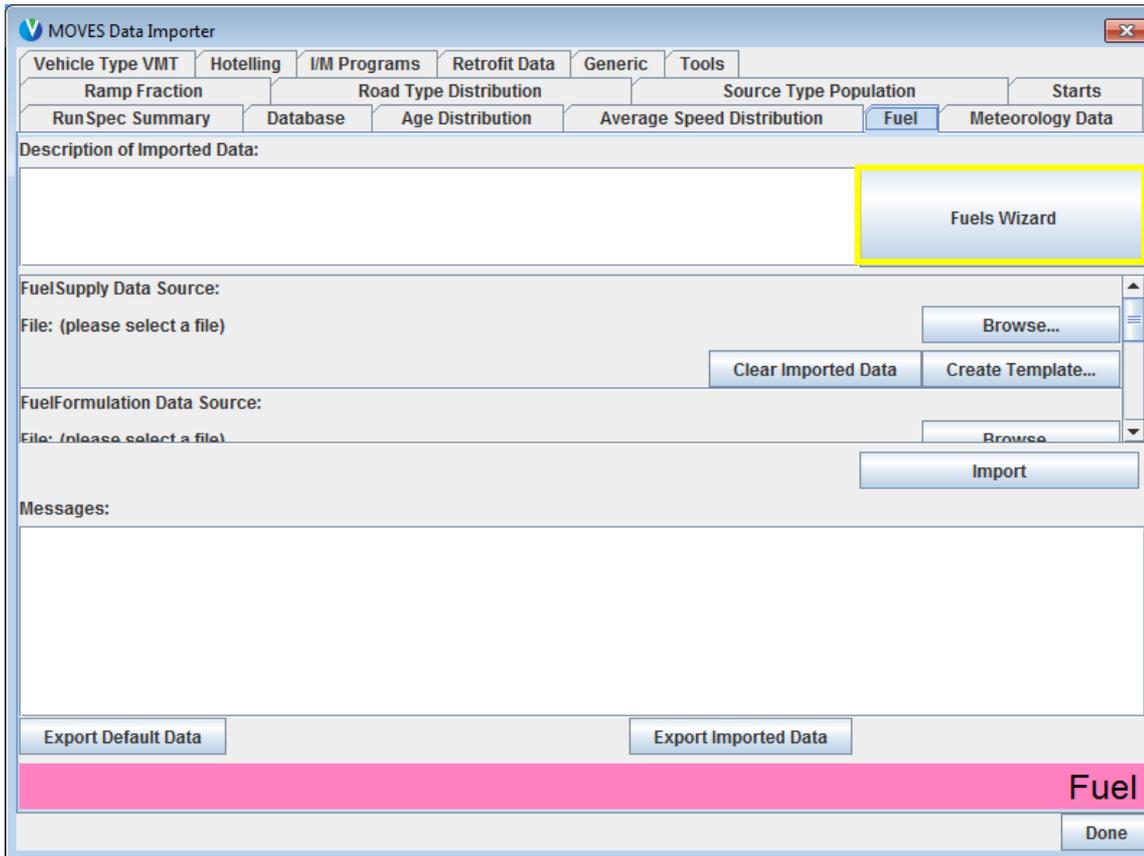
- Fuelusagefraction specifies the fraction of E-85 capable vehicles that use E-85 (sourcebinfueltypeid 5) vs. conventional gasoline
- Defaults are available, but this table is required for all MOVES runs
- The example table (above) shows that 79.2% of E-85 capable vehicles use conventional gasoline and 20.8% use E-85 for Fulton County, Georgia in the MOVES default
- Fractions of 1 are also required for sourcebinfueltypeid 1, 2, and 3 (gas, diesel, and CNG fuel types)

New Input Options – FuelUsageFraction

countyID	fuelYearID	modelYearGroupID	sourceBinFuelTypeID	fuelSupply	usageFraction
13121	2024	0	1	1	1
13121	2024	0	2	2	1
13121	2024	0	3	3	1
13121	2024	0	5	1	0.792421
13121	2024	0	5	5	0.207579

- What if your project’s fleet does not use E-85? How should this table be changed?
 - Fuelusagefraction: the fraction of E-85 capable vehicles that use E-85 (sourcebinfueltypeid = 5) vs. conventional gasoline
 - If your project’s fleet does not use E-85, then:
 - 100% of E-85 capable vehicles use conventional gasoline; change 0.792421 to “1”
 - 0% of E-85 capable vehicles use E-85; change 0.207579 to “0”

New Input Options – “Fuels Wizard”



- The Fuels Wizard allows the user to customize a fuel for their area based on known fuel properties
- Usually, you should begin with the default fuel and edit the known properties (e.g., RVP). The Fuels Wizard will automatically adjust other unknown fuel properties consistent with the known fuel properties
- The adjustments are based on EPA refinery modeling

New Input Options – “Fuels Wizard”

Fuels Wizard

Select fuels to modify

Select	Region	Fuel ...	Mo...	Fu...	RVP	Sul...	Eth...	T50	T90	Aroma...	Olefi...	Benz...	E200	E300	Bio...	Cet...	PAH	MTBE	ETBE	TAME
<input type="checkbox"/>	170000000	2024	1	3	0.0	8	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0.00	0.00	0.00
<input checked="" type="checkbox"/>	170000000	2024	1	1	11.8	10	10	189.39	324.68	17.63	9.33	0.61	55.11	84.04	0	0	0	0.00	0.00	0.00
<input type="checkbox"/>	170000000	2024	1	1	10.8	10	15	176.68	322.54	15.59	8.13	0.61	61.34	84.51	0	0	0	0.00	0.00	0.00
<input type="checkbox"/>	170000000	2024	1	2	0.0	15	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5	0	0	0.00	0.00	0.00
<input type="checkbox"/>	170000000	2024	1	5	10.5	8	74	200.00	300.00	0.00	0.00	0.00	49.90	89.50	0	0	0	0.00	0.00	0.00

Change RVP to 7 psi

Done Calculate >

- Select desired fuel, and change fuel property – in this example, RVP is changed from 11.8 to 7... click “Calculate”

Fuels Wizard

Changes

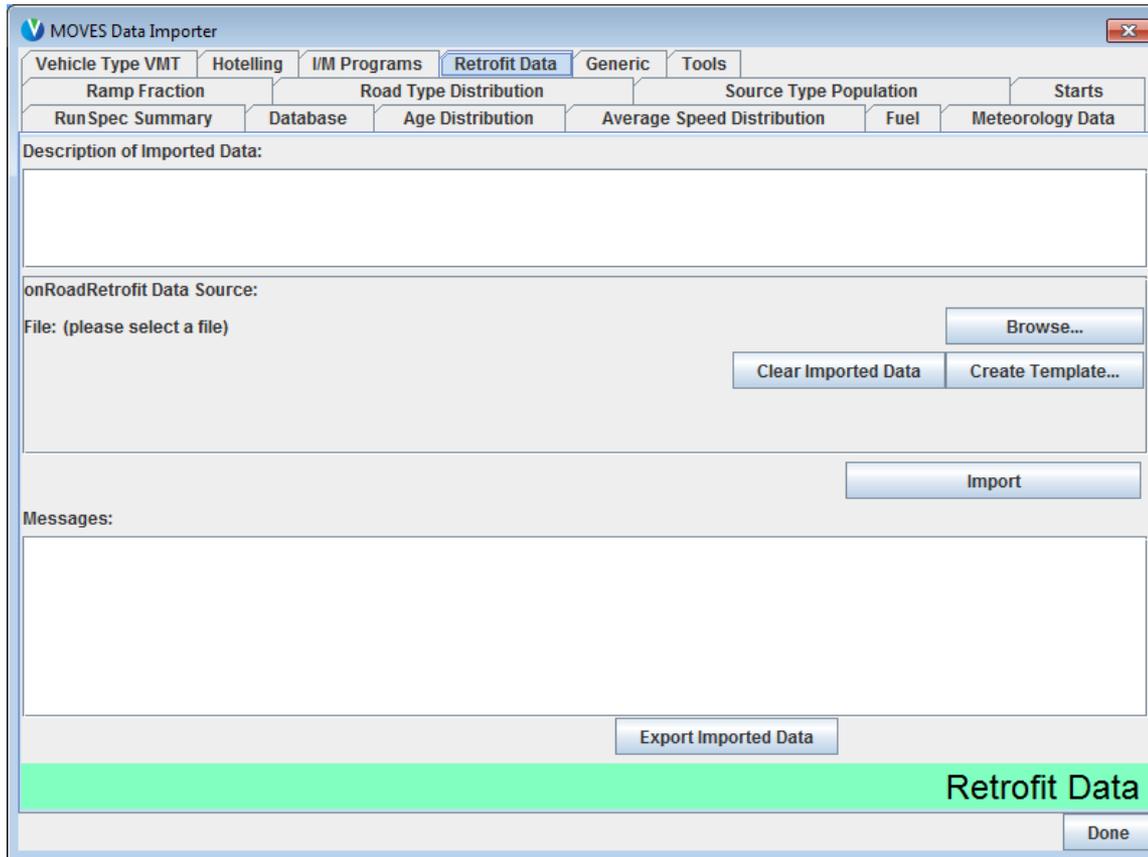
Select	Region	Fuel ...	Mo...	Fu...	RVP	Sul...	Eth...	T50	T90	Aroma...	Olefi...	Benz...	E200	E300	Bio...	Cet...	PAH	MTBE	ETBE	TAME
Old	170000000	2024	1	1	11.8	10	10	189.39	324.68	17.63	9.33	0.61	55.11	84.04	0	0	0	0.00	0.00	0.00
New	170000000	2024	1	1	7.0	10	10	188.26	323.69	17.63	9.33	0.61	55.66	84.26	0	0	0	0.00	0.00	0.00

Messages

Calculations complete.

< Reject Accept >

New Input Options – Retrofit



- The retrofit importer (formerly in the runspec of MOVES2010b) is now located in the PDM
- Retrofit programs can be modeled using the retrofit importer
- This is an optional input
- Consult EPA guidance material for more information on when to use this input

New Input Options – Retrofit

pollutantID	processID	fuelTypeID	sourceTypeID	retrofitYearID	beginModelYear	endModelYearID	cumFractionRetrofit	retrofitEffectiveFraction
3	1	2	62	2024	2020	2024	0.5	0.3

- The example above shows a program applying to diesel combination long-haul trucks, for running NOx emissions
- The retrofitYearID should always be equal to the analysis year
- This example shows a retrofit program applying to model years 2020 through 2024, and 50% of all vehicles in that MY range being retrofitted
- The retrofitEffectiveFraction specifies how effective the retrofit technology is: 0.3 indicates a 30% reduction in emissions

New Input Options – Hotelling

The screenshot shows the MOVES Data Importer application window. The 'Hotelling' tab is selected in the top menu. Below the menu, there are several sub-tabs: Ramp Fraction, Road Type Distribution, Source Type Population, Starts, RunSpec Summary, Database, Age Distribution, Average Speed Distribution, Fuel, and Meteorology Data. The main area contains a 'Description of Imported Data' text box, followed by two sections for data sources: 'hotellingActivityDistribution Data Source' and 'hotellingHours Data Source'. Each section has a 'File: (please select a file)' label, a 'Browse...' button, and 'Clear Imported Data' and 'Create Template...' buttons. An 'Import' button is located below the second section. At the bottom, there are 'Export Default Data' and 'Export Imported Data' buttons, a red bar with the text 'Hotelling', and a 'Done' button.

- The Hotelling input allows users to describe long-haul combination truck hotelling behavior
- This input is optional – however, if you are modeling hotelling activity, defaults will be used if no information is entered

New Input Options – Hotelling

- The **hotellingactivitydistribution** table is used to define the fraction of trucks in each of four modes of hotelling activity:
- 200 – Extended Idling
- 201 – Auxiliary Power Units (APUs)
- 203 – Battery Power
- 204 – Engine Off
- The example shows the national default fractions

beginModelYearID	endModelYearID	opModelID	opModeFraction
1960	2009	200	1
1960	2009	201	0
1960	2009	203	0
1960	2009	204	0
2010	2050	200	0.7
2010	2050	201	0.3
2010	2050	203	0
2010	2050	204	0

Hotelling: Updating OpModeDistribution

- If modeling hotelling activity, an Opmode distribution table is still required with fractions of 1 for each hotelling OpModeID used (200, 201, 202, and/or 203)

sourceTypeID	hourDayID	linkID	polProcessID	opModeID	opModeFraction
62	15	1	290	200	1
62	15	1	291	201	1

Viewing Output in MySQL Workbench



MySQL Workbench – Basics

- MySQL Workbench is Oracle's new integrated environment featuring:

- Database administration (replacing MySQL Administrator), and
- SQL development (replacing MySQL Query Browser).

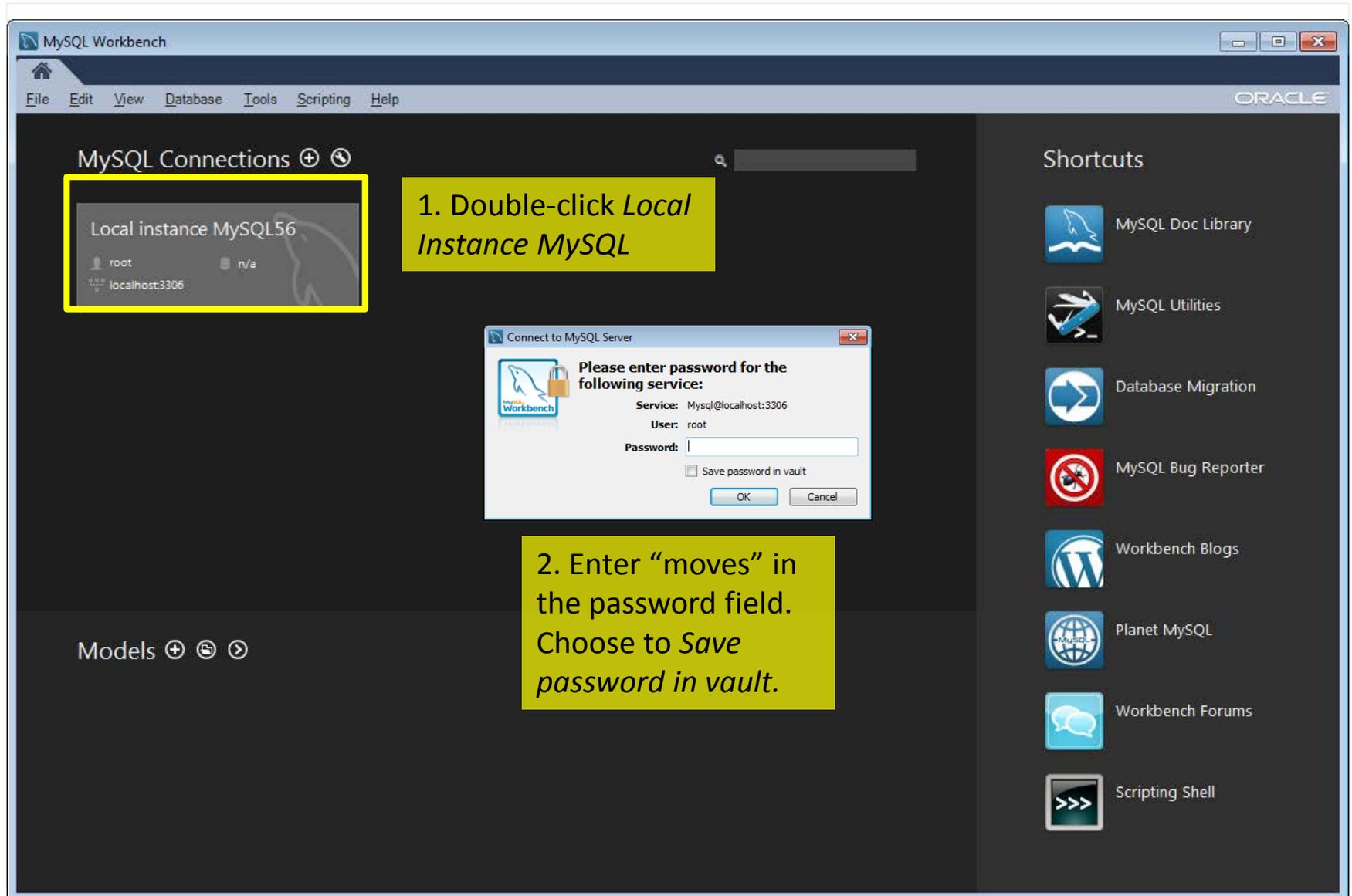
NOTE: Query Browser still works with MOVES2014 but is no longer supported by Oracle.

- MySQL Workbench release notes:

- Current stable release: MySQL Workbench 6.1.7
- MOVES2014 release version: MySQL Workbench 5.6.x

NOTE: The following processes and screenshots may not match your experience.

MySQL Workbench – Basics: Input Password



The screenshot shows the MySQL Workbench application window. The title bar reads "MySQL Workbench". The menu bar includes "File", "Edit", "View", "Database", "Tools", "Scripting", and "Help". The "ORACLE" logo is in the top right corner. The main area is divided into three sections: "MySQL Connections" on the left, "Shortcuts" on the right, and a central workspace. In the "MySQL Connections" section, a connection named "Local instance MySQL56" is highlighted with a yellow box. A yellow callout box with the text "1. Double-click *Local Instance MySQL*" points to this connection. In the center workspace, a "Connect to MySQL Server" dialog box is open. It contains the text "Please enter password for the following service:" and lists "Service: Mysql@localhost:3306" and "User: root". There is a "Password:" field with the text "moves" entered. Below the password field is a checkbox labeled "Save password in vault" which is checked. "OK" and "Cancel" buttons are at the bottom of the dialog. A second yellow callout box with the text "2. Enter 'moves' in the password field. Choose to *Save password in vault*." points to the password field and the "Save password in vault" checkbox. The "Shortcuts" section on the right lists several items: "MySQL Doc Library", "MySQL Utilities", "Database Migration", "MySQL Bug Reporter", "Workbench Blogs", "Planet MySQL", "Workbench Forums", and "Scripting Shell". At the bottom left, there is a "Models" section with expand/collapse icons.

MySQL Connections

Local instance MySQL56

root n/a

localhost:3306

1. Double-click *Local Instance MySQL*

Connect to MySQL Server

Please enter password for the following service:

Service: Mysql@localhost:3306

User: root

Password: moves

Save password in vault

OK Cancel

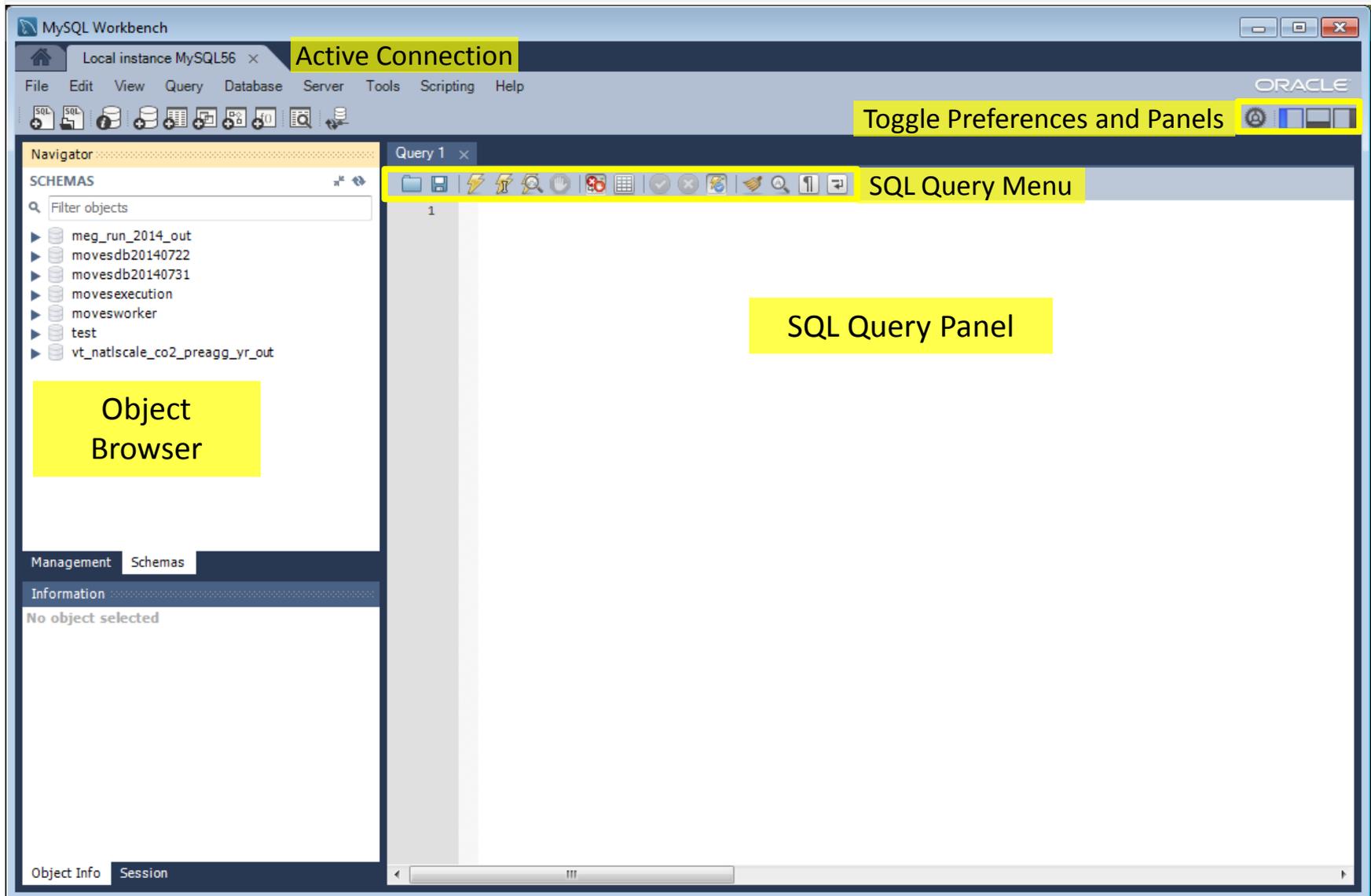
2. Enter "moves" in the password field. Choose to *Save password in vault*.

Shortcuts

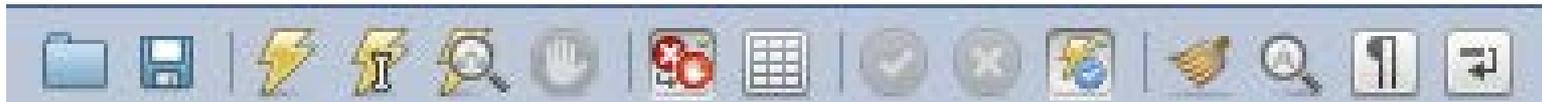
- MySQL Doc Library
- MySQL Utilities
- Database Migration
- MySQL Bug Reporter
- Workbench Blogs
- Planet MySQL
- Workbench Forums
- Scripting Shell

Models

MySQL Workbench – Basics: Layout



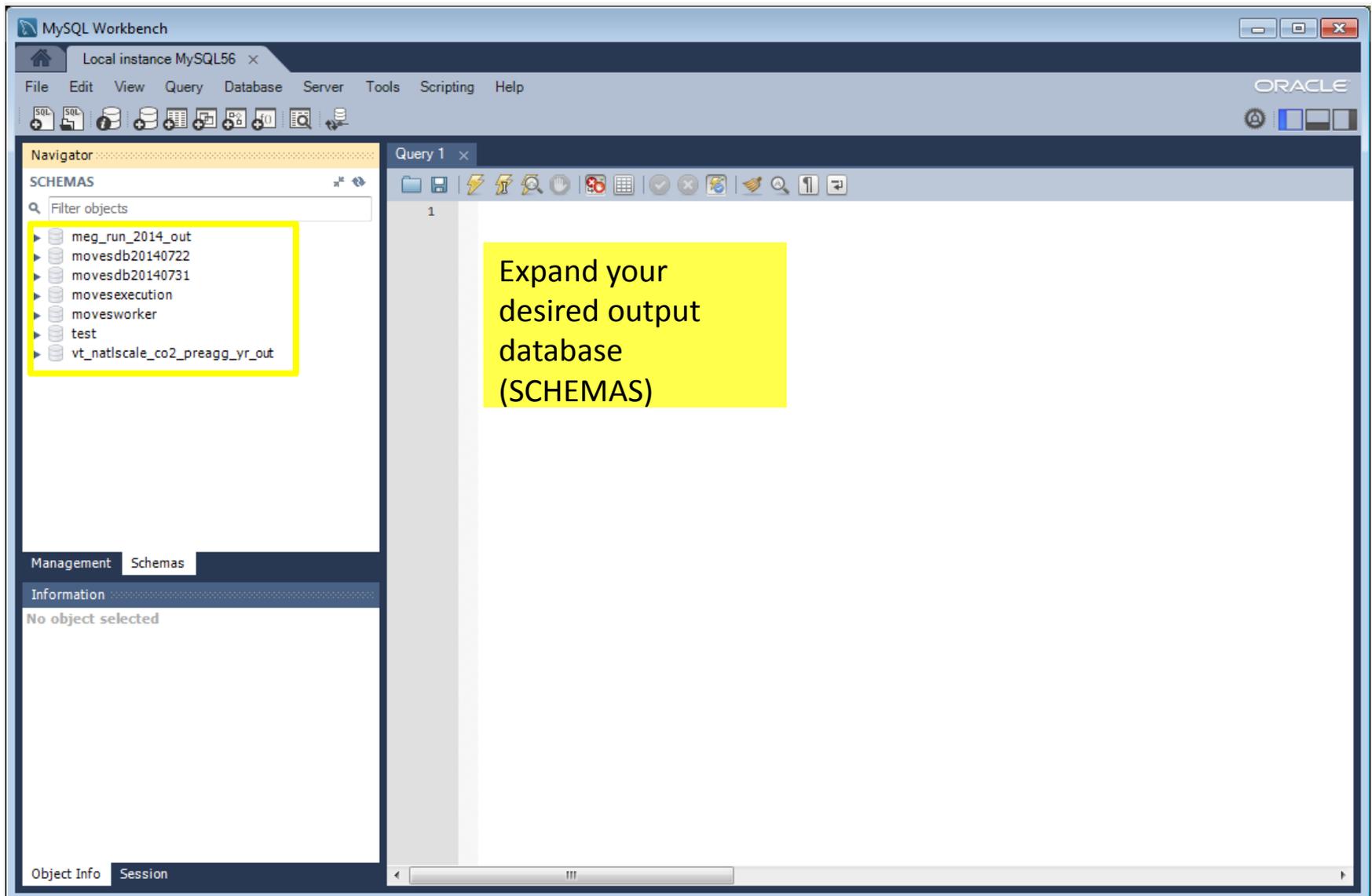
MySQL Workbench – Basics: SQL Query Menu



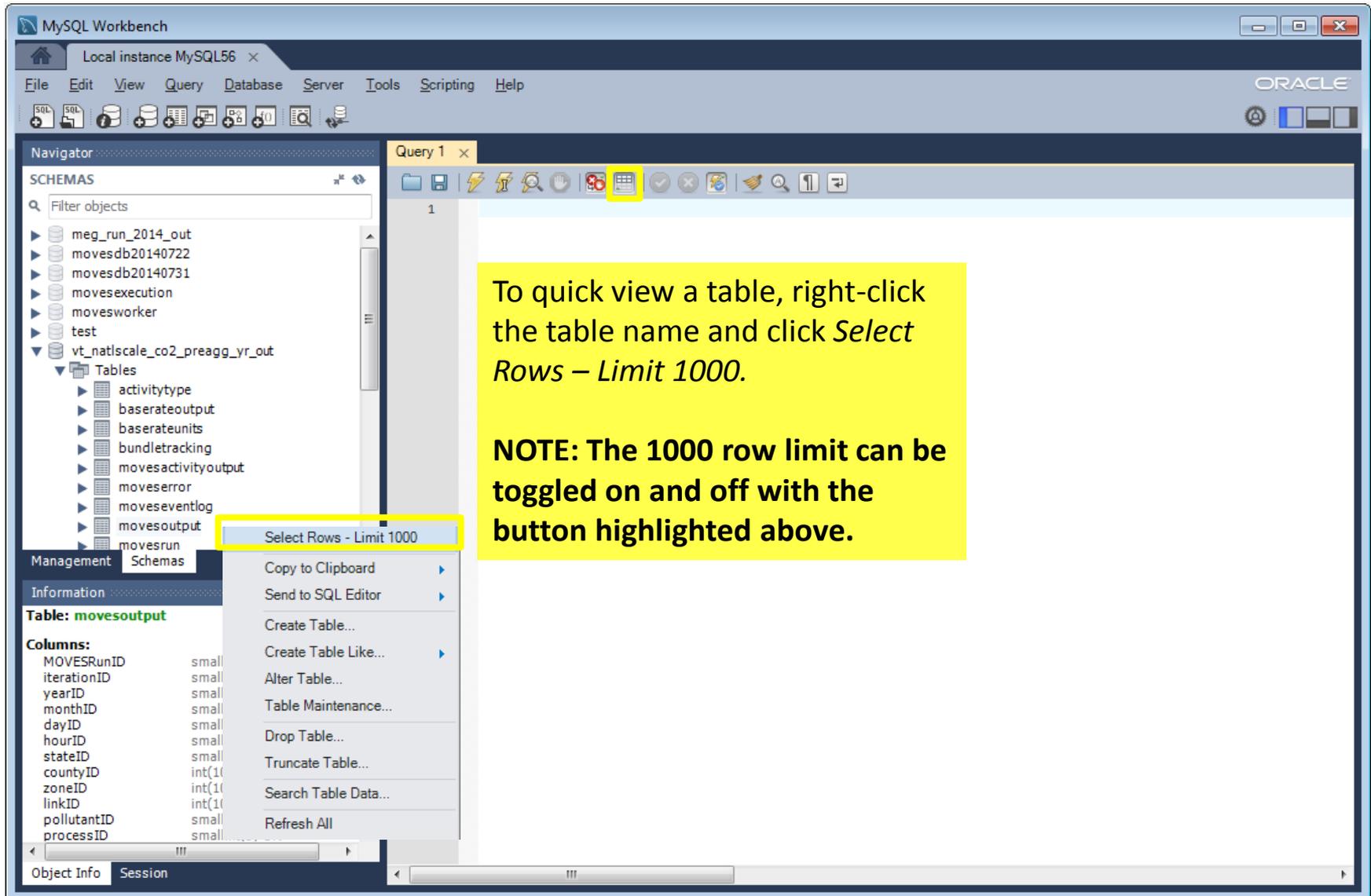
From left to right, these buttons are:

- **Open a SQL Script File:** Loads a saved SQL script to be ready for execution.
- **Save SQL Script to File:** Saves the current SQL script to a specified file.
- **Execute SQL Script:** Executes the selected portion of the query, or the entire query if nothing is selected.
- **Execute Current SQL script:** Execute the statement under the keyboard cursor.
- **Explain:** Execute the **EXPLAIN** command on the query after the keyboard cursor.
- **Stop the query being executed:** Halts execution of the currently executing SQL script.
- **Toggle whether execution of SQL script should continue after failed statements:** If the red “breakpoint” circle is displayed, the script terminates on a statement that fails. If the button is depressed so that the green arrow is displayed, execution continues past the failed code, possibly generating additional result sets. In either case, any error generated from attempting to execute the faulty statement is recorded in the Output tab sheet.
- **Toggle Row limit:** Turns on and off the result set row limit.
- **Commit:** Commits the current transaction. Note: All query tabs in the same connection share the same transactions. To have independent transactions, a new connection must be opened.
- **Rollback:** Rolls back the current transaction. Note: All query tabs in the same connection share the same transactions. To have independent transactions, a new connection must be opened.
- **Toggle Auto-Commit Mode:** If selected, each statement will be committed independently. Note: All query tabs in the same connection share the same transactions. To have independent transactions, a new connection must be opened.
- **Beautify SQL:** Beautify/reformat the SQL script.
- **Find panel:** Show the Find panel for the editor.
- **Invisible characters:** Toggle display of invisible characters, such as newlines, tabs or spaces.
- **Wrapping:** Toggles the wrapping of long lines in the SQL editor window.

MySQL Workbench – Basics



MySQL Workbench – Basics



The screenshot shows the MySQL Workbench interface. On the left, the Navigator pane displays a tree view of schemas, with the 'Tables' folder expanded under the 'vt_natscale_co2_preagg_yr_out' schema. The 'movesoutput' table is selected. A context menu is open over the 'movesoutput' table, with the 'Select Rows - Limit 1000' option highlighted in yellow. The main query editor window is titled 'Query 1' and contains a single line of text: '1'. A yellow callout box on the right contains the following text:

To quick view a table, right-click the table name and click *Select Rows – Limit 1000*.

NOTE: The 1000 row limit can be toggled on and off with the button highlighted above.

The bottom of the interface shows the 'Object Info' and 'Session' tabs.

MySQL Workbench – Basics

The screenshot displays the MySQL Workbench interface. The top menu bar includes File, Edit, View, Query, Database, Server, Tools, Scripting, and Help. The Navigator pane on the left shows a tree view of schemas, with 'vt_natlscale_co2_preagg_yr_out' expanded to show tables like 'movesoutput'. The main query editor shows the following SQL query highlighted in yellow:

```
SELECT * FROM vt_natlscale_co2_preagg_yr_out.movesoutput;
```

A yellow callout box with the text "Or simply write and run a query" is positioned over the query editor. Below the query editor, the Result Set Filter is empty, and the results are displayed in a table with 11 columns: MOVESRunID, iterationID, yearID, monthID, dayID, hourID, stateID, countyID, zoneID, linkID, and pollutantID. The table contains 10 rows of data, all with values of 1 for MOVESRunID, iterationID, yearID, monthID, dayID, hourID, stateID, countyID, zoneID, linkID, and pollutantID.

MOVESRunID	iterationID	yearID	monthID	dayID	hourID	stateID	countyID	zoneID	linkID	polluta
1	1	2010	NULL	NULL	NULL	50	NULL	NULL	NULL	91
1	1	2010	NULL	NULL	NULL	50	NULL	NULL	NULL	91
1	1	2010	NULL	NULL	NULL	50	NULL	NULL	NULL	91
1	1	2010	NULL	NULL	NULL	50	NULL	NULL	NULL	91
1	1	2010	NULL	NULL	NULL	50	NULL	NULL	NULL	91
1	1	2010	NULL	NULL	NULL	50	NULL	NULL	NULL	91
1	1	2010	NULL	NULL	NULL	50	NULL	NULL	NULL	91
1	1	2010	NULL	NULL	NULL	50	NULL	NULL	NULL	91
1	1	2010	NULL	NULL	NULL	50	NULL	NULL	NULL	91
1	1	2010	NULL	NULL	NULL	50	NULL	NULL	NULL	91

MySQL Workbench – Basics

The screenshot displays the MySQL Workbench interface. The main window shows a query window titled "Query 1" with the following SQL statement:

```
SELECT * FROM vt_natlscale_co2_preagg_yr_out.movesoutput;
```

A "Save SQL Script" dialog box is open, showing the "Documents library" and a list of folders: "Custom Office Templates", "moves-2-day-course", and "USEPA Tools". The "File name" field is empty, and the "Save as type" is set to "SQL Files (*.sql)".

A yellow callout box on the right contains the text: "You may save or load query script using the icons highlighted above." The icons in the query window toolbar, specifically the save and load icons, are highlighted in yellow.

The "Navigator" pane on the left shows the "Schemas" tree with the following structure:

- meg_run_2014_out
- movesdb20140722
- movesdb20140731
- movesexecution
- movesworker
- test
- vt_natlscale_co2_preagg_yr_out
 - Tables
 - activitytype
 - baserateoutput
 - baserateunits
 - bundletracking
 - movesactivityoutput
 - moveserror
 - moveseventlog
 - movesoutput
 - movesrun

The "Information" pane at the bottom left shows the table structure for "movesoutput":

Column	Type
MOVESRunID	smallint(5) UN
iterationID	smallint(5) UN
yearID	smallint(5) UN
monthID	smallint(5) UN
dayID	smallint(5) UN
hourID	smallint(5) UN
stateID	smallint(5) UN
countyID	int(10) UN
zoneID	int(10) UN
linkID	int(10) UN
pollutantID	smallint(5) UN
processID	smallint(5) UN

The "Results" pane at the bottom right shows the following data:

countyID	zoneID	linkID	polluta
NULL	NULL	NULL	91
NULL	NULL	NULL	91
NULL	NULL	NULL	91
NULL	NULL	NULL	91
NULL	NULL	NULL	91
NULL	NULL	NULL	91
NULL	NULL	NULL	91
NULL	NULL	NULL	91
NULL	NULL	NULL	91
NULL	NULL	NULL	91
1	1	2010	50
1	1	2010	50
1	1	2010	50
1	1	2010	50

MySQL Workbench – Basics

The screenshot displays the MySQL Workbench interface. The top menu bar includes File, Edit, View, Query, Database, Server, Tools, Scripting, and Help. The main window is titled 'Local instance MySQL56'. The left sidebar shows the 'Navigator' pane with a tree view of schemas, including 'vt_natlscale_co2_preagg_yr_out' and its tables. The central pane shows 'Query 1' with the SQL statement: `SELECT * FROM vt_natlscale_co2_preagg_yr_out.movesoutput;`. Below the query, the 'Result Set Filter' and 'Export' options are visible. The main area displays a table with columns: MOVESRunID, iterationID, yearID, monthID, dayID, hourID, and stateID. The table contains 20 rows of data. The bottom right corner shows the 'SQL Additions' pane with a 'My Snippets' dropdown and a 'Snippets' button highlighted in yellow.

Or you may save parts of query scripts using Snippets tab and Snippets Pallet

MOVESRunID	iterationID	yearID	monthID	dayID	hourID	stateID
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50
1	1	2010	NULL	NULL	NULL	50

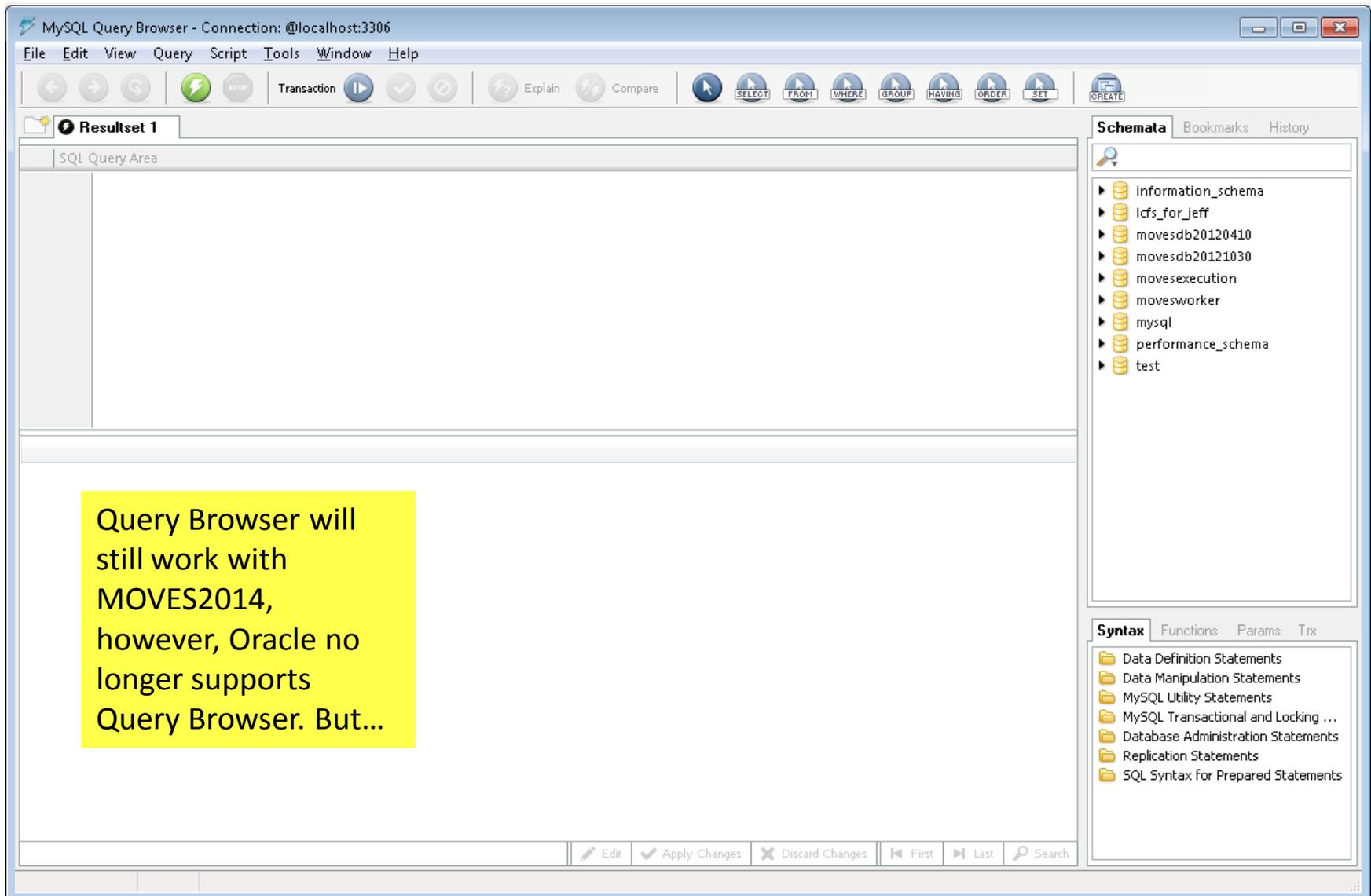
MySQL Workbench – Basics

The screenshot shows the MySQL Workbench interface. The main window displays a query result set for the query: `SELECT * FROM vt_natlscale_co2_preagg_yr_out.movesoutput`. The result set is a table with columns: `monthID`, `dayID`, `hourID`, `stateID`, `countyID`, `zoneID`, `linkID`, and `pollutantID`. The data rows show values for these columns, with `stateID` being 50, `countyID` being NULL, `zoneID` being NULL, `linkID` being NULL, and `pollutantID` being 91.

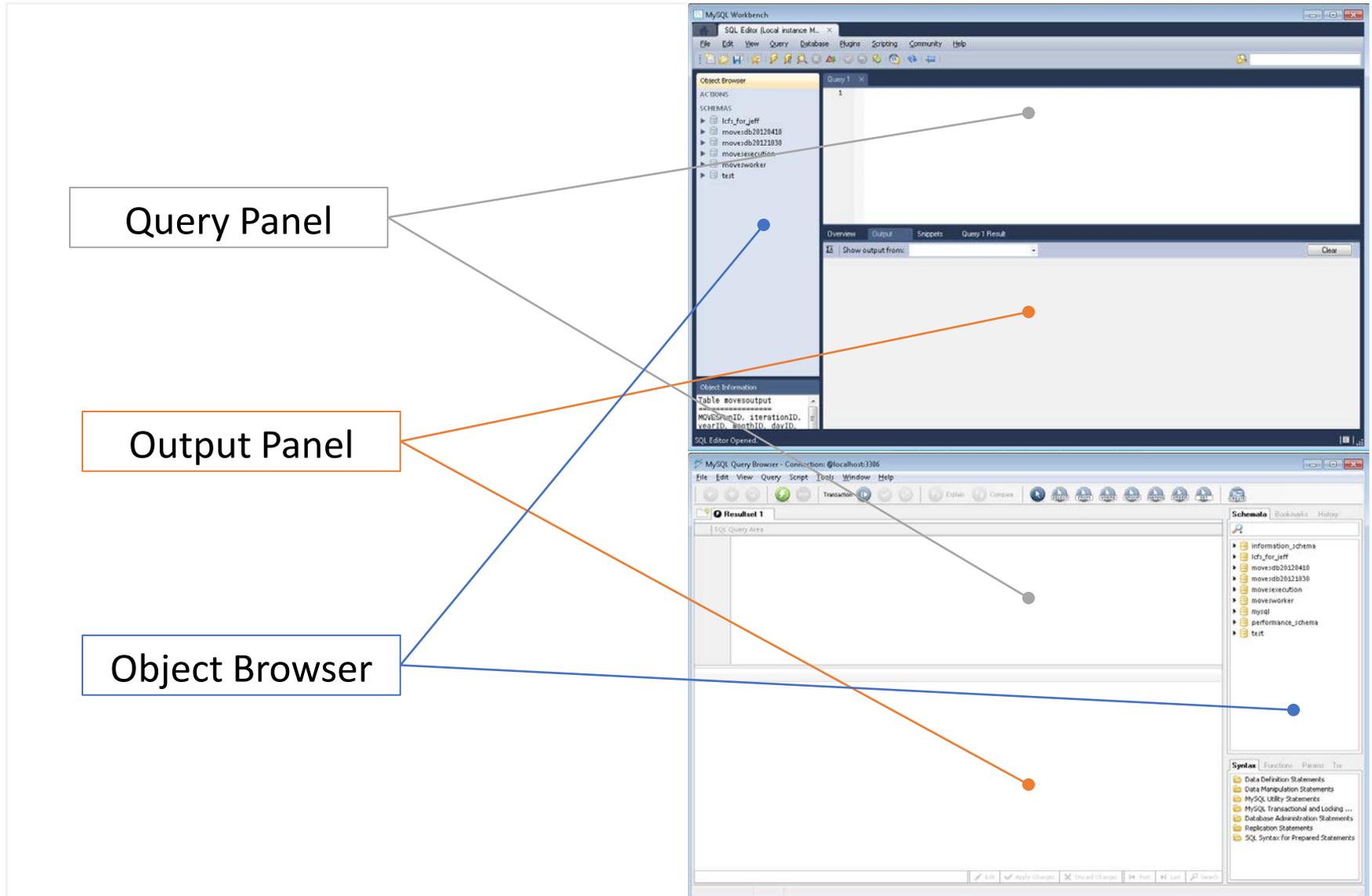
An "Export Resultset" dialog box is open, showing the file name `Meg_Run_2014_ActivityOUT.csv` and the save type `CSV (*.csv)`. The dialog is set to save to the `Removable Disk (E:)` drive.

The "Export" icon in the toolbar is highlighted with a yellow box. A yellow callout box contains the text: "Click the 'Export' icon to export the current output set." Another yellow callout box contains the text: "NOTE: Uncheck the *Select Rows – Limit 1000* button if your table is greater than 1000 rows to export the entire output set."

MySQL Query Browser



Same Parts, New Box



Summary

- Under-the-hood improvements to MOVES
- Changes to the Graphical User Interface (GUI)
- Database converter
- New input options

Questions?



Thank You

Please send follow-up questions or feedback about this webinar to mobile@epa.gov

Coming Soon!

- MOVES2014 Hands-On Training Course for New Users
- PM Hot-spot guidance for transportation conformity
- MOVES CO project-level guidance
- 3-day training for PM-hot-spot analyses

- See the MOVES webpage for updates and additional reference materials www.epa.gov/otaq/models/moves/
- Conformity updates will be posted here: <http://www.epa.gov/otaq/stateresources/transconf/projectlevel-hotspot.htm>