ILLINOIS PERMITTING
USING THE
RATING TOOL API

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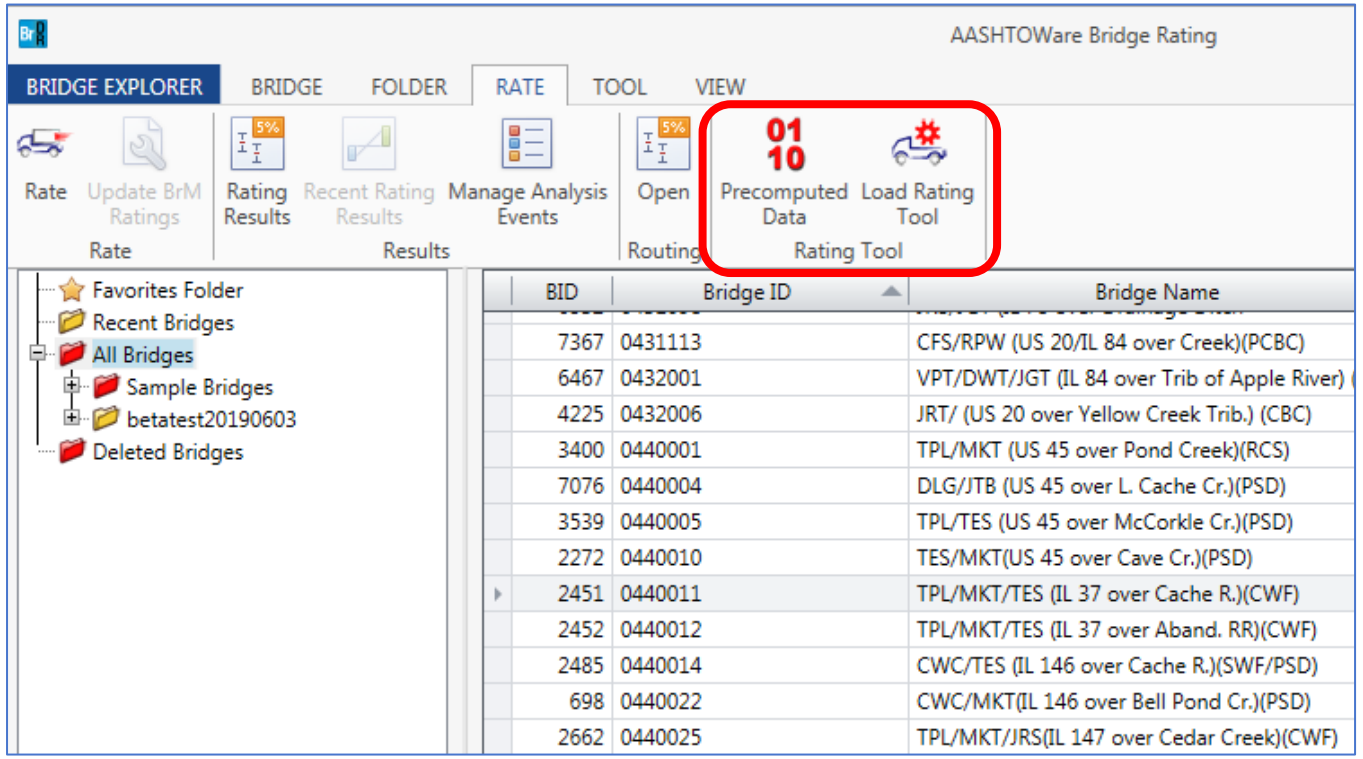
AASHTOWare BrR
2024 RADBUG

OVERVIEW

- AASHTOWare Load Rating Tool
  - BrR User Interface
    - How to set it up
    - How to use it
  - API Example
    - Out of the box
    - Customized

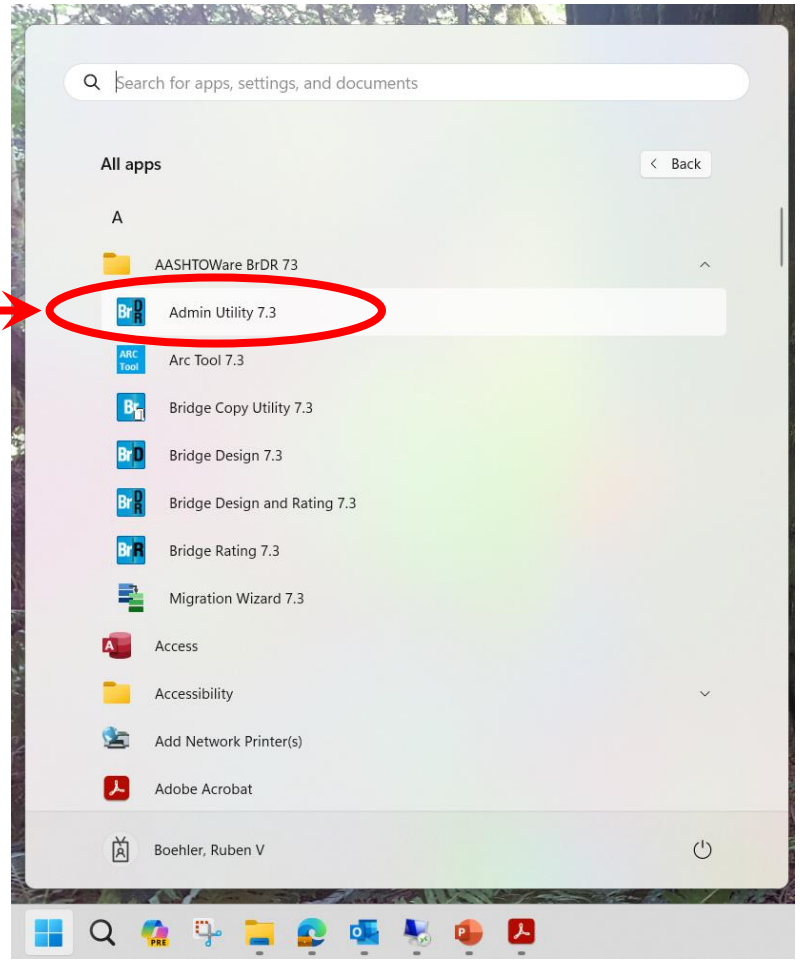
LOAD RATING TOOL

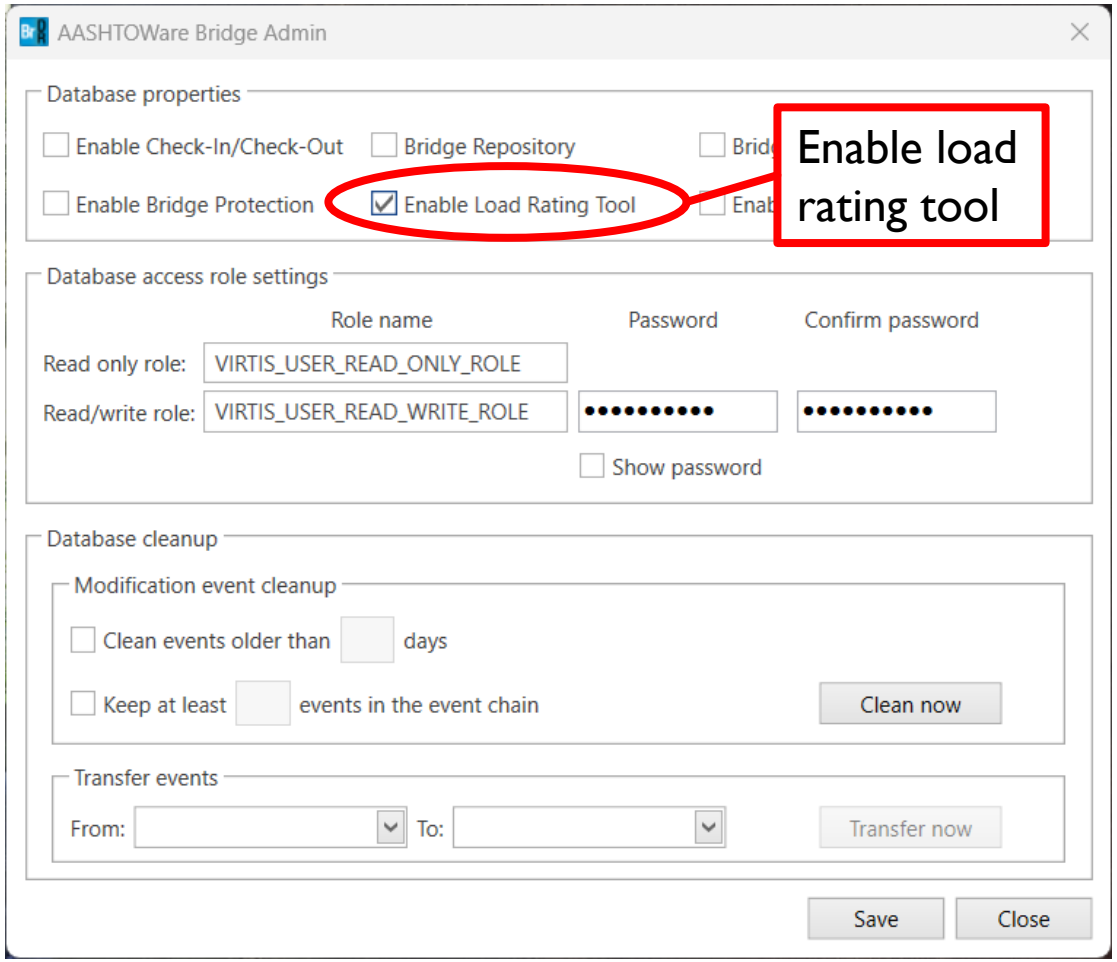
- BrR User Interface
  - manage precomputed data
  - analyze permit loads



STEP 1 – CONFIGURE

- AASHTOWare Bridge Admin. Utility





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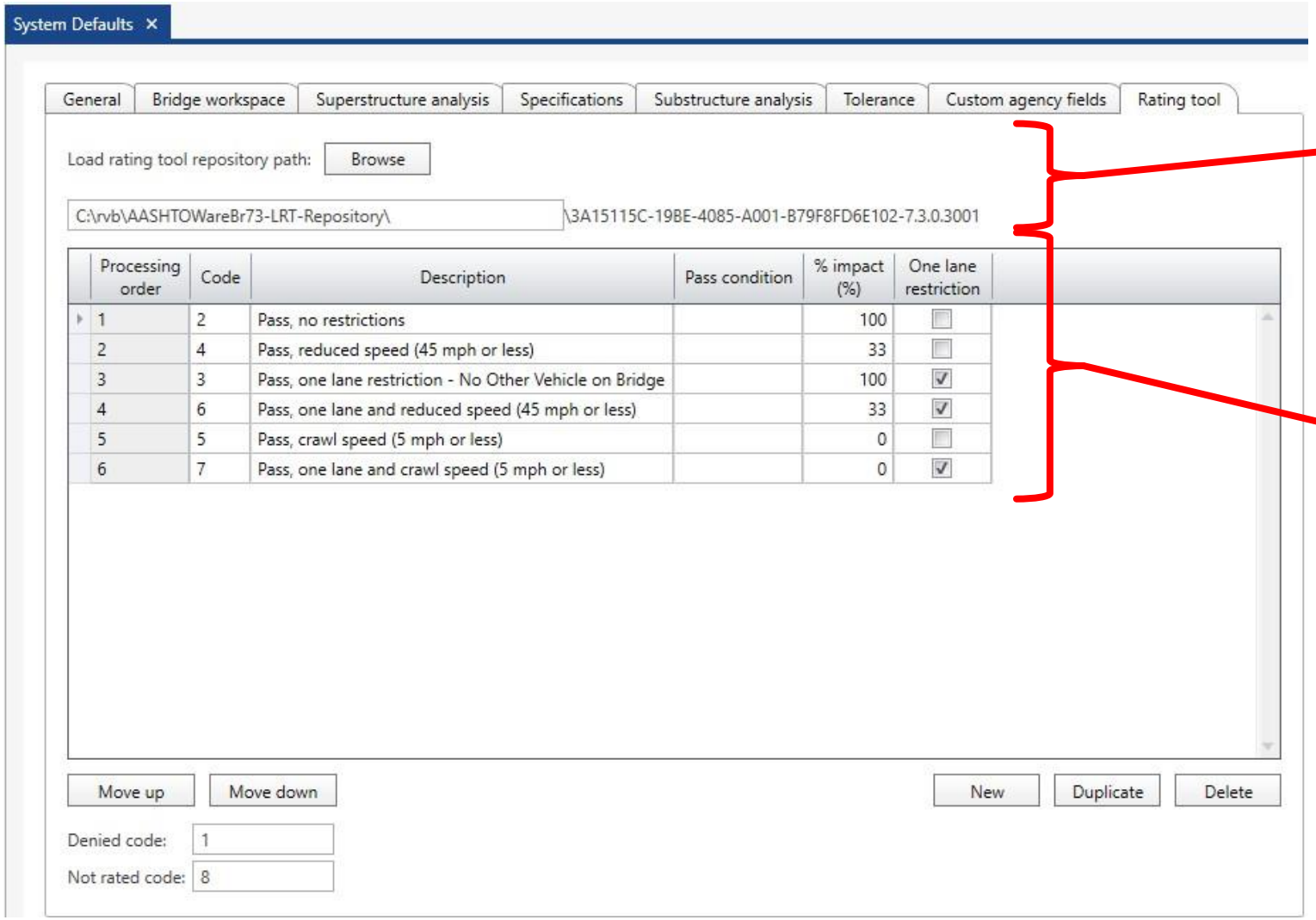


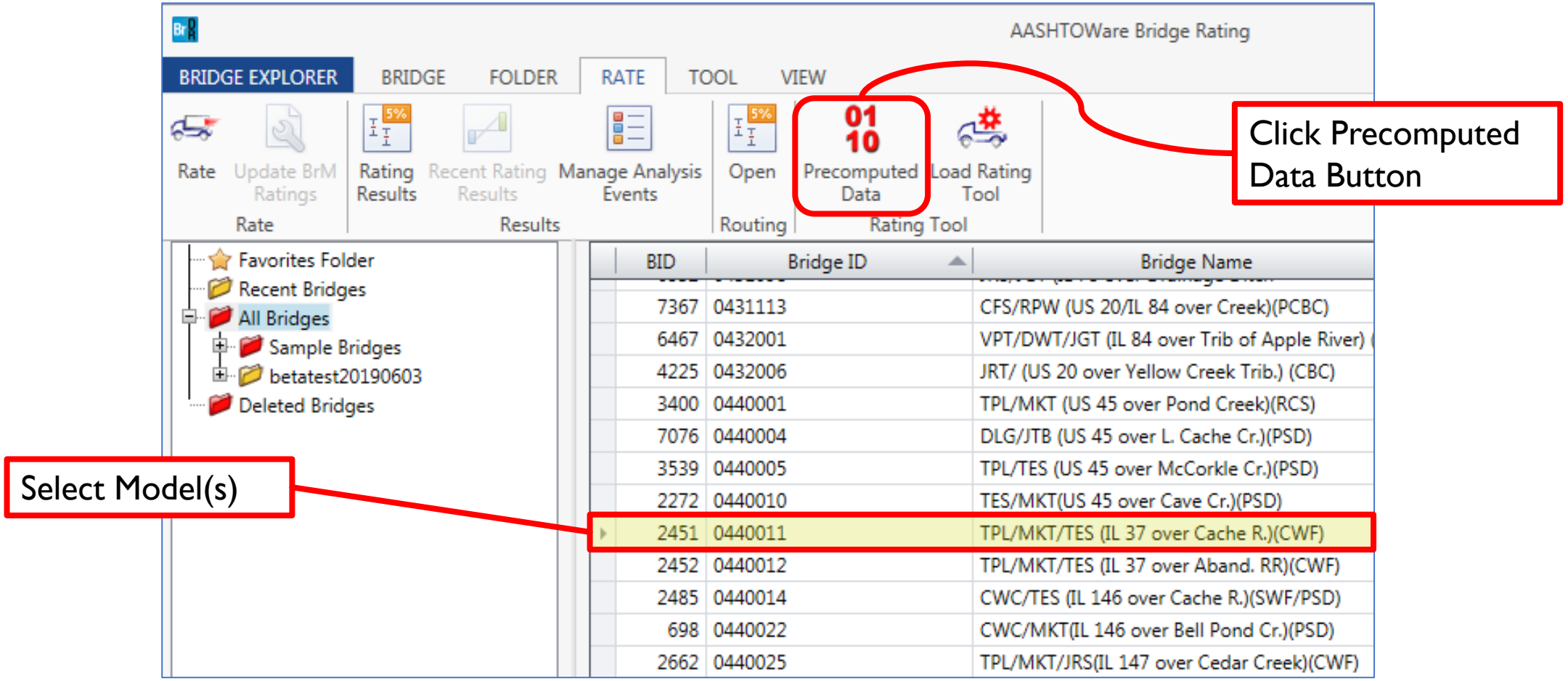
Specify were to save Precomputed Data Files

Specify:
Processing Order
Code to Return
% of Impact
Lane Restrictions

STEP 1 – CONFIGURE

- Configuration has been Completed
- Only need to do this once
- Ready to Create Precomputed Data Files

STEP 2 – GENERATE PRECOMPUTED DATA



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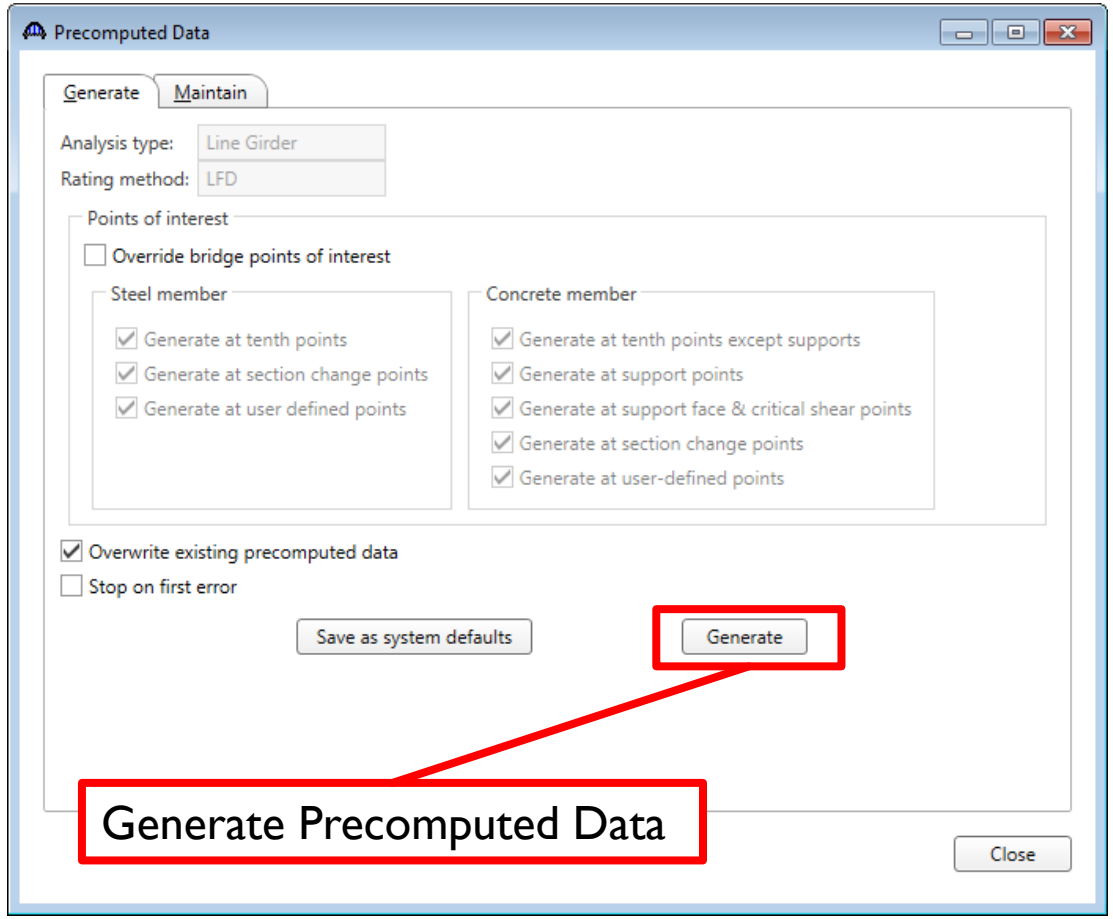

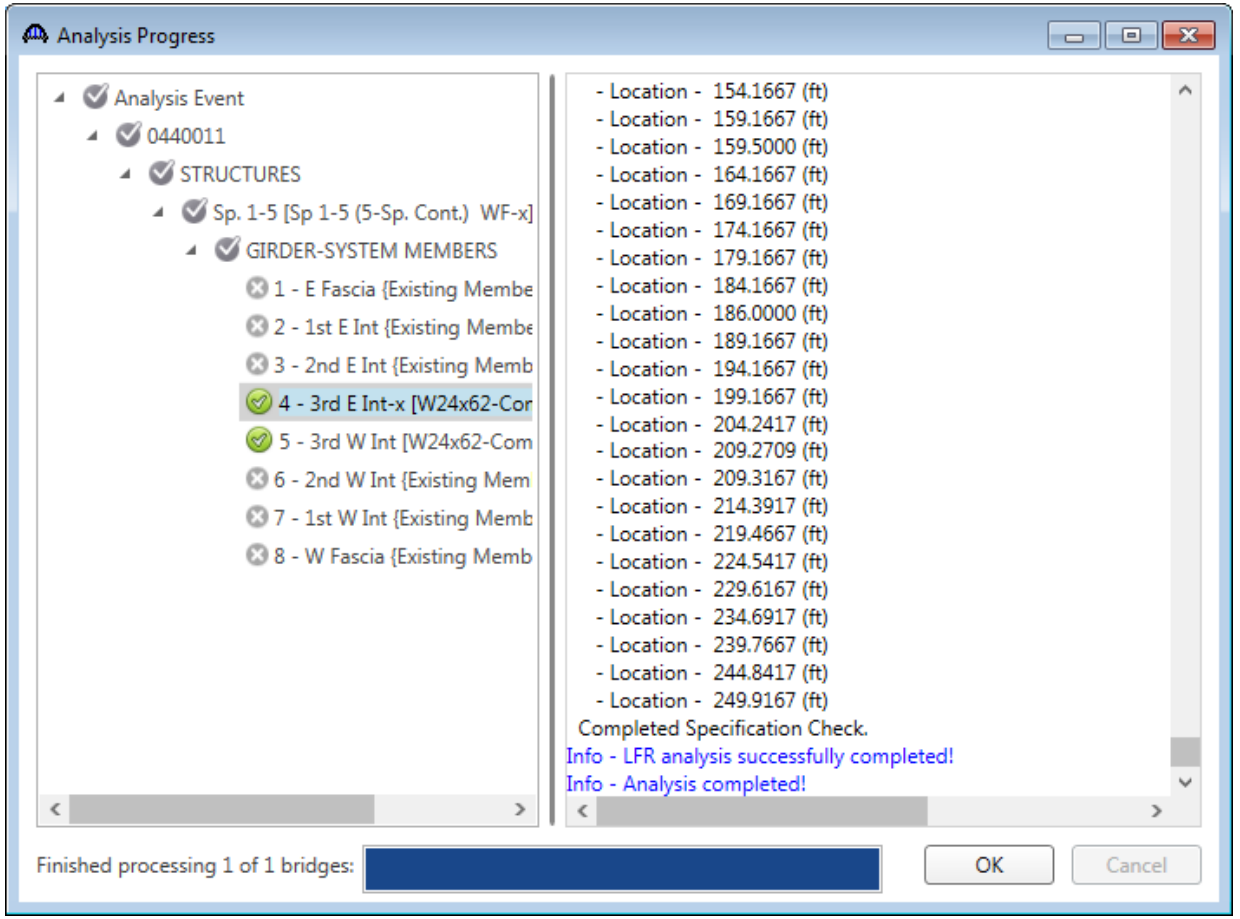

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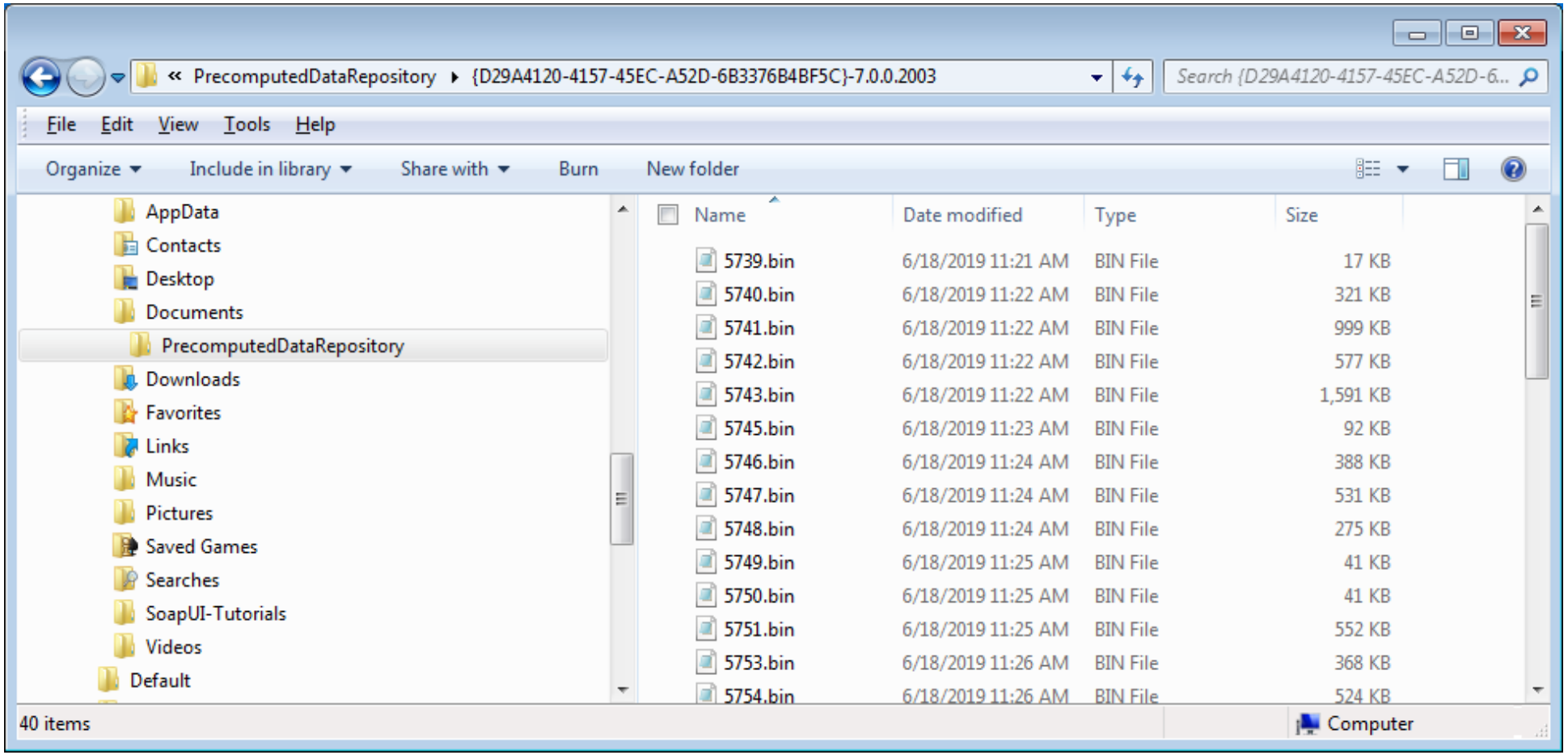
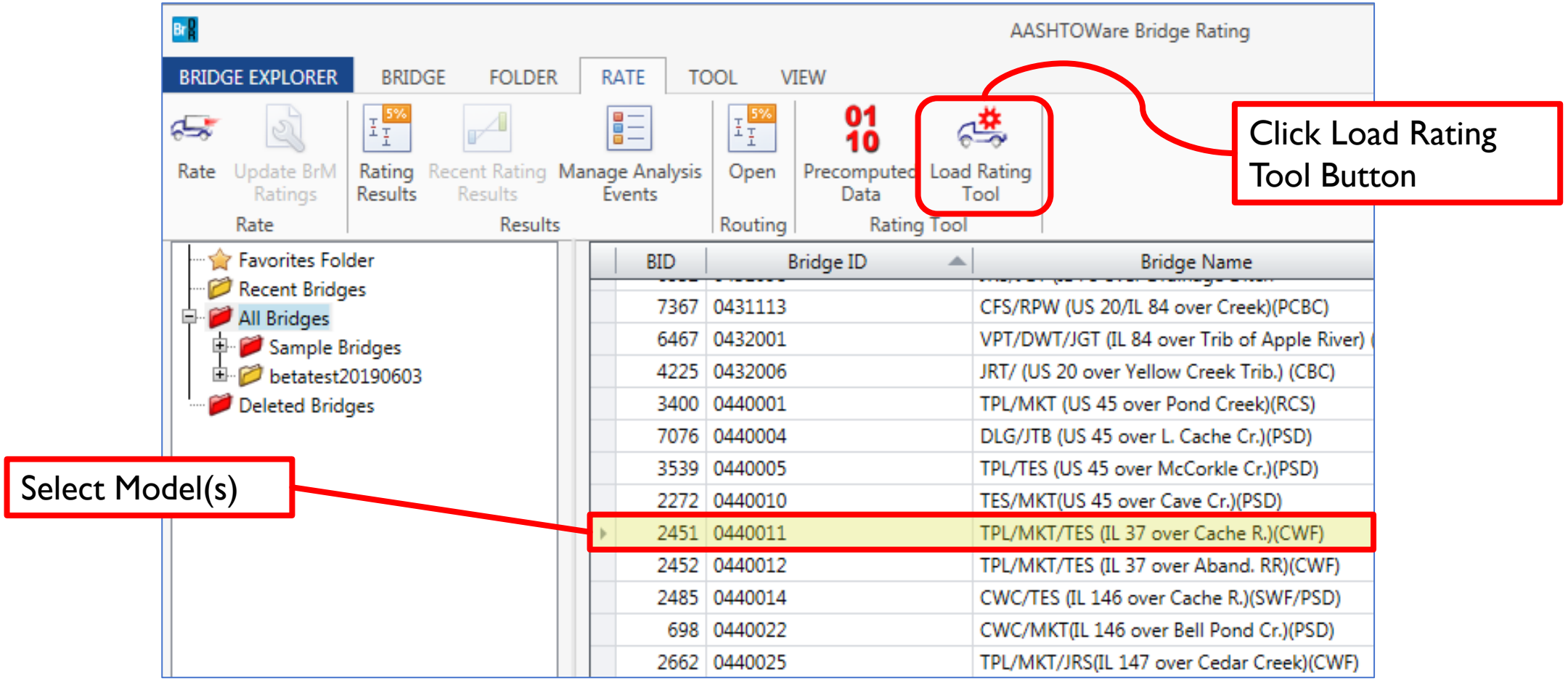


STEP 3 – ANALYZE PERMIT VEHICLE

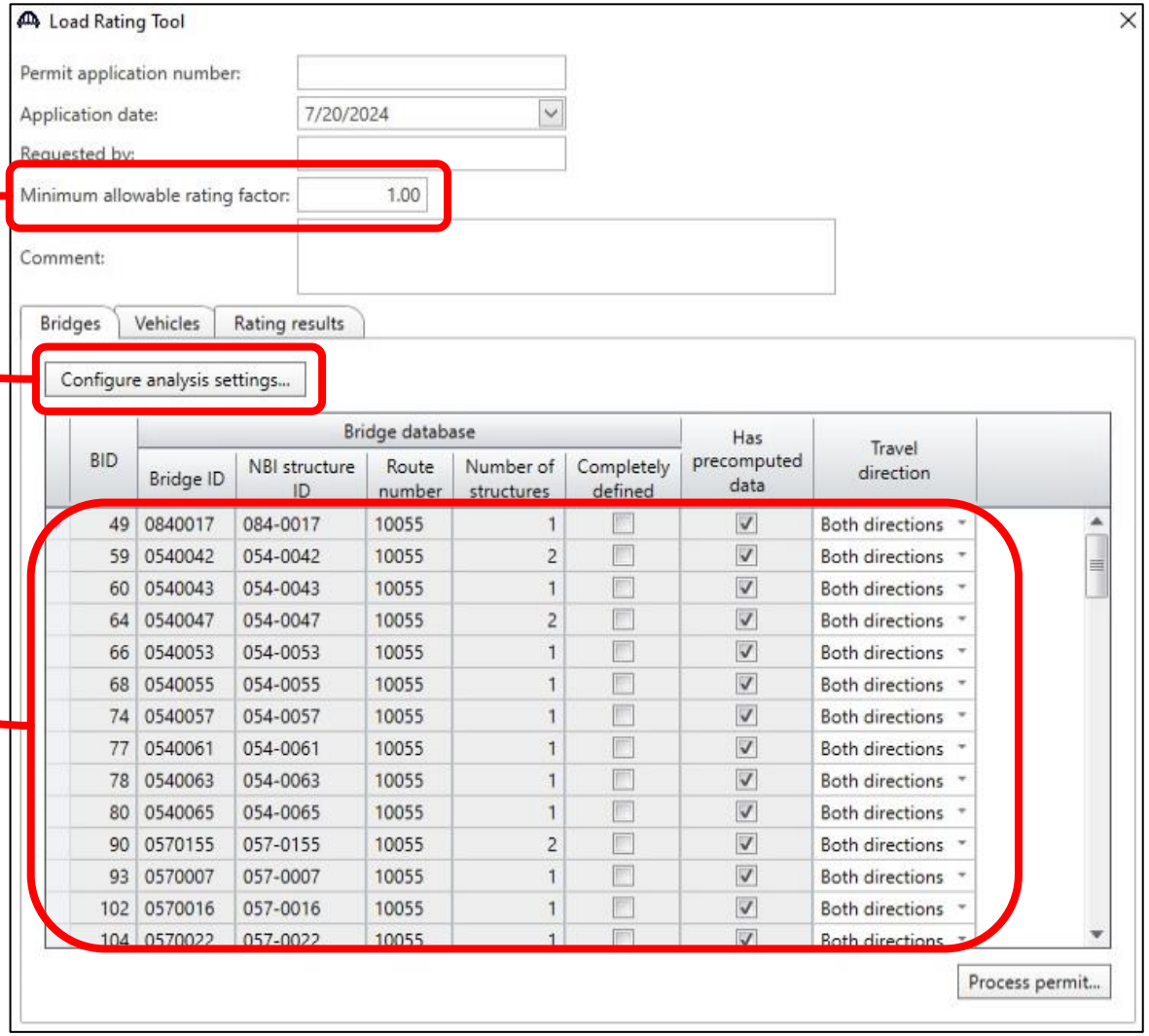


STEP 3 – ANALYZE PERMIT VEHICLE

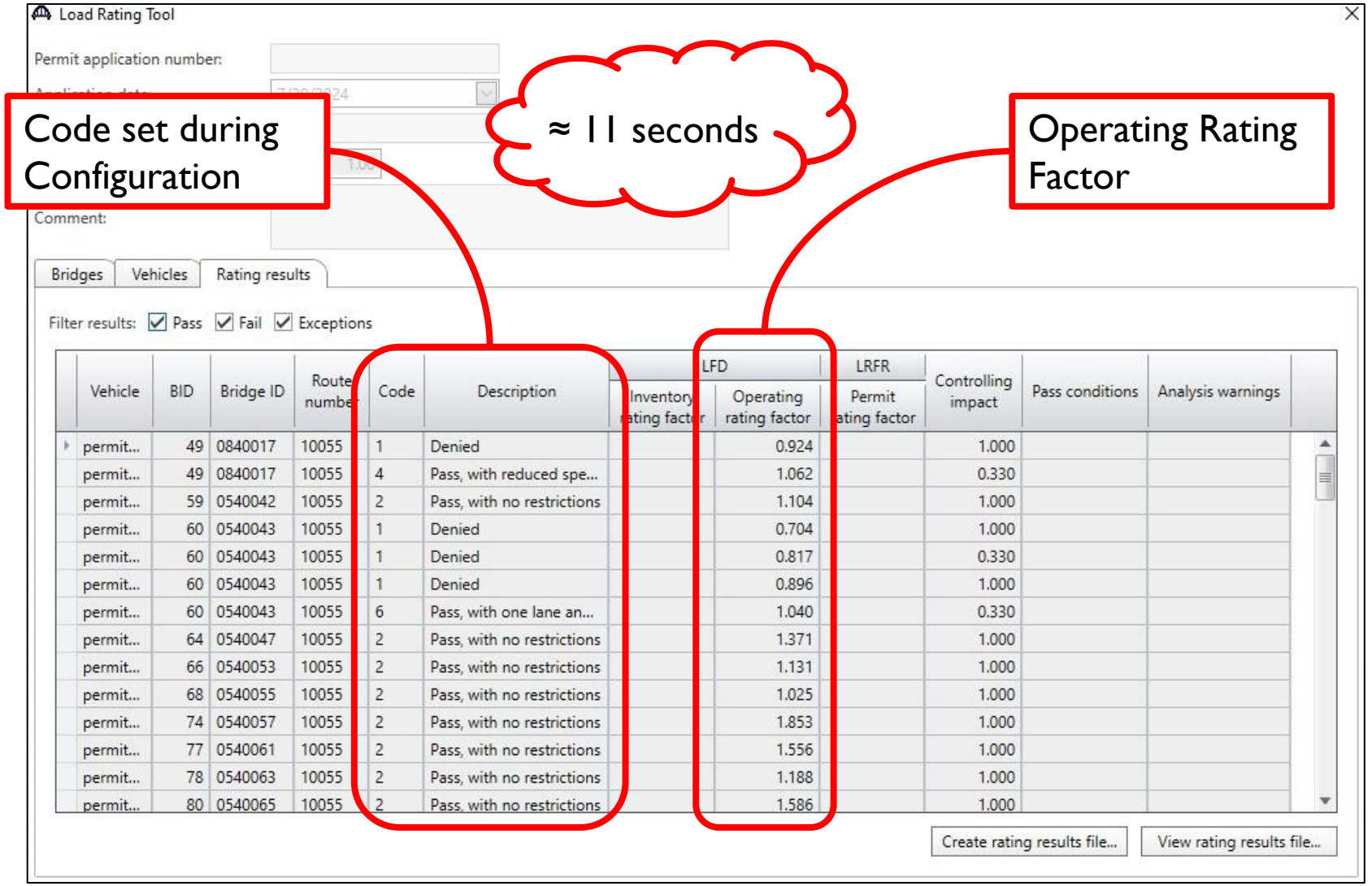
Minimum Allowable Rating Factor

Select Permit Vehicle

List of Bridges to be Analyzed



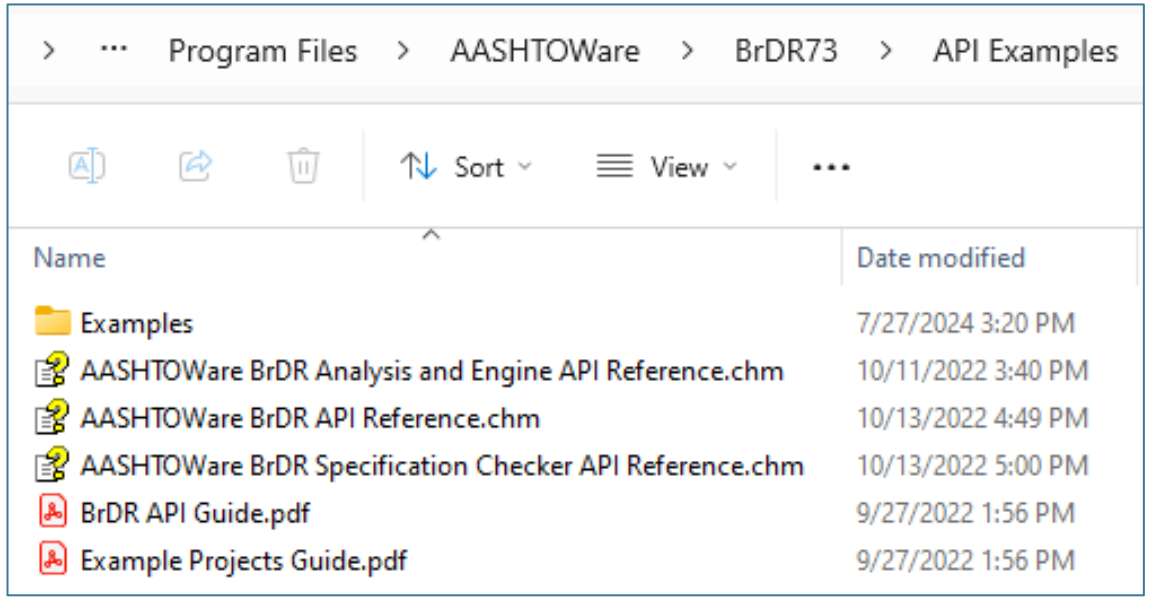
STEP 3 – ANALYZE PERMIT VEHICLE

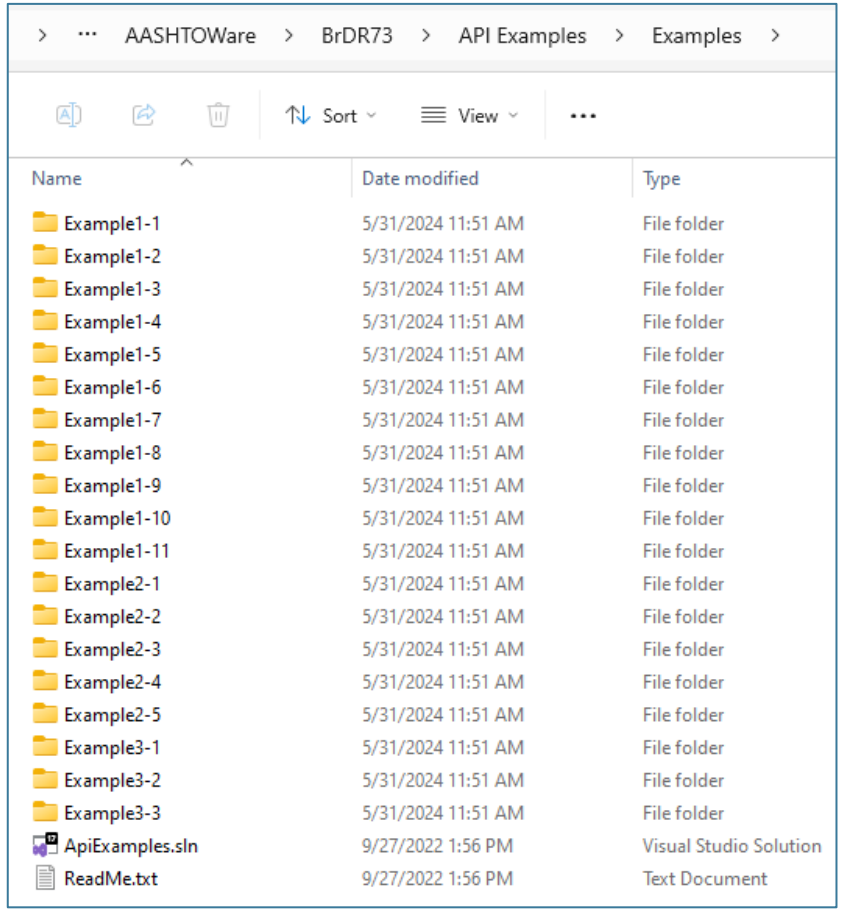


Vehicle	BID	Bridge ID	Route number	Code	Description	LFD Inventory rating factor	LFD Operating rating factor	LRFR Permit rating factor	Controlling impact	Pass conditions	Analysis warnings
permit...	49	0840017	10055	1	Denied		0.924		1.000		
permit...	49	0840017	10055	4	Pass, with reduced spe...		1.062		0.330		
permit...	59	0540042	10055	2	Pass, with no restrictions		1.104		1.000		
permit...	60	0540043	10055	1	Denied		0.704		1.000		
permit...	60	0540043	10055	1	Denied		0.817		0.330		
permit...	60	0540043	10055	1	Denied		0.896		1.000		
permit...	60	0540043	10055	6	Pass, with one lane an...		1.040		0.330		
permit...	64	0540047	10055	2	Pass, with no restrictions		1.371		1.000		
permit...	66	0540053	10055	2	Pass, with no restrictions		1.131		1.000		
permit...	68	0540055	10055	2	Pass, with no restrictions		1.025		1.000		
permit...	74	0540057	10055	2	Pass, with no restrictions		1.853		1.000		
permit...	77	0540061	10055	2	Pass, with no restrictions		1.556		1.000		
permit...	78	0540063	10055	2	Pass, with no restrictions		1.188		1.000		
permit...	80	0540065	10055	2	Pass, with no restrictions		1.586		1.000		

BrDR – API EXAMPLES

- C:\Program Files\AASHTOWare\BrDR73\API Examples
- 3 References and 2 Guides
- 19 Code Examples





BrDR – API EXAMPLES

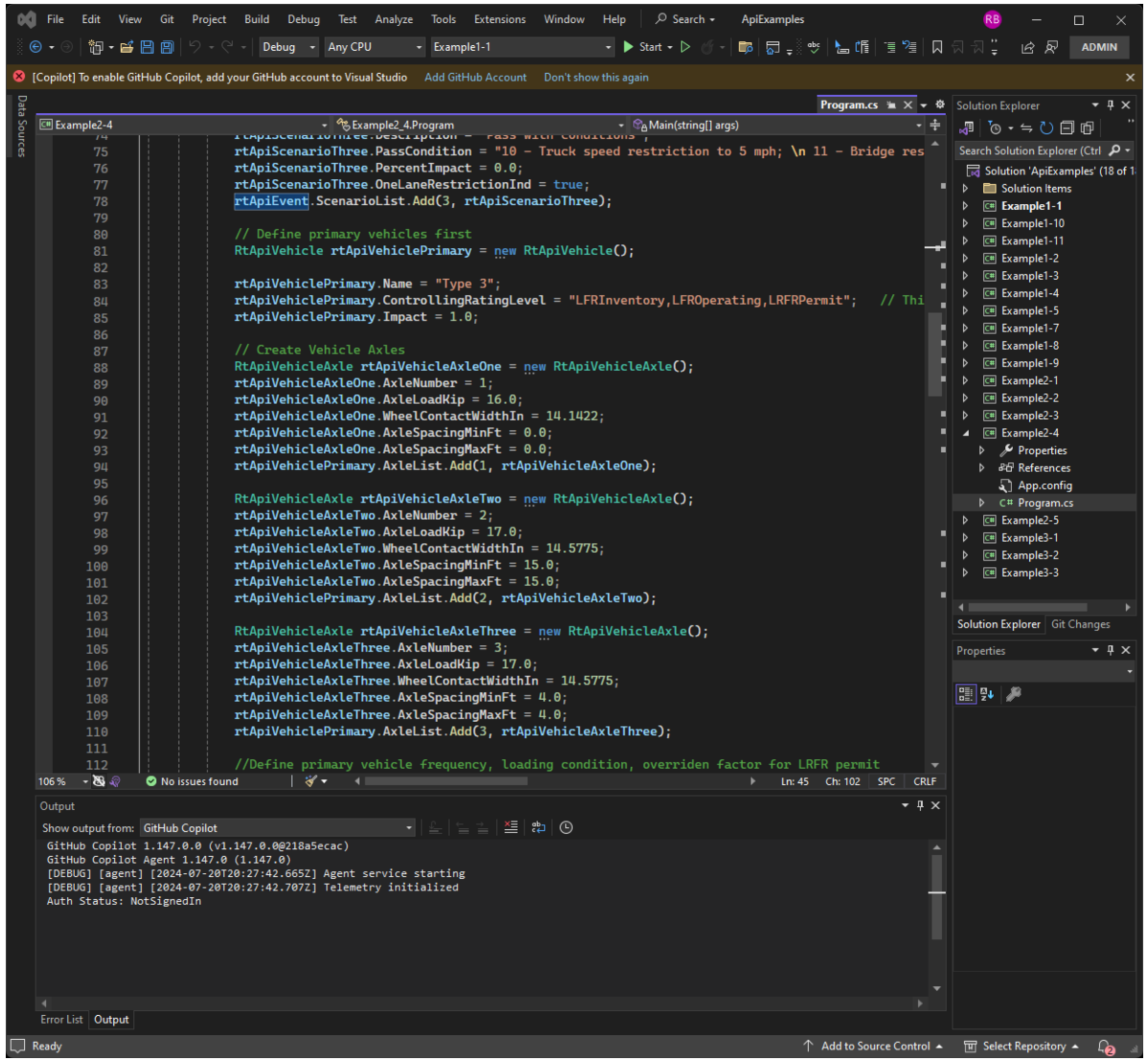
- 19 Examples

```
1 Basic API Operations

1.1 Object retrieve examples
1.2 Object CRUD examples
1.3 Summary object examples
1.4 Retrieving reinforced concrete cross sections
1.5 Retrieving prestressed beam spans
1.6 C++ Object retrieve example (a subset of Example 1.1) [Not in solution]
1.7 Calculating Steel Cross-Sectional Area
1.8 Create and save bridge example
1.9 Import Utility example
1.10 Licensing example
1.11 IFC bridge import/export example
```

```
2 Analysis Examples

2.1 Analysis API
2.2 Simplified Analysis API (LFD)
2.3 XML-based Analysis API
2.4 Rating Tool API
2.5 Simplified Analysis API (LRFR)


3 Engine

3.1 Creating a 3rd-party engine
3.2 Creating a 3rd-party engine properties UI window
3.3 Retrieve Engine Properties from Bridge Object
```

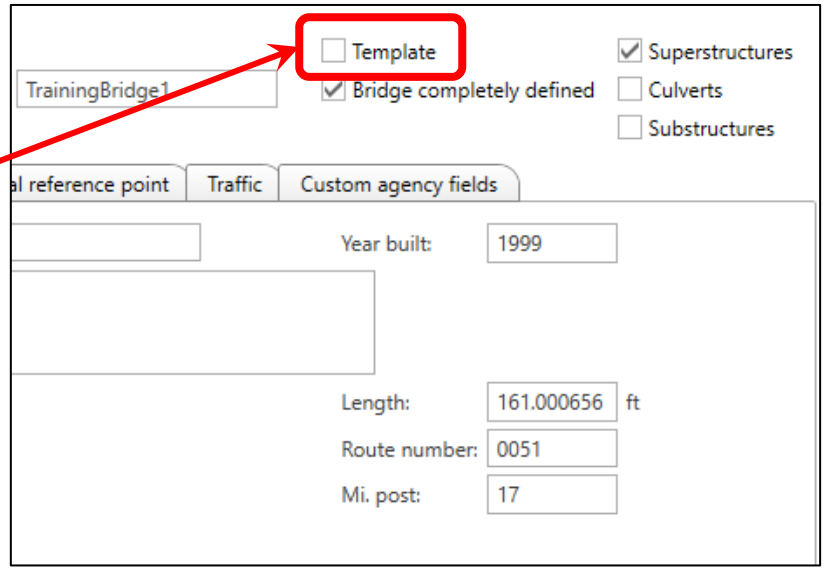
RATING TOOL - API EXAMPLE

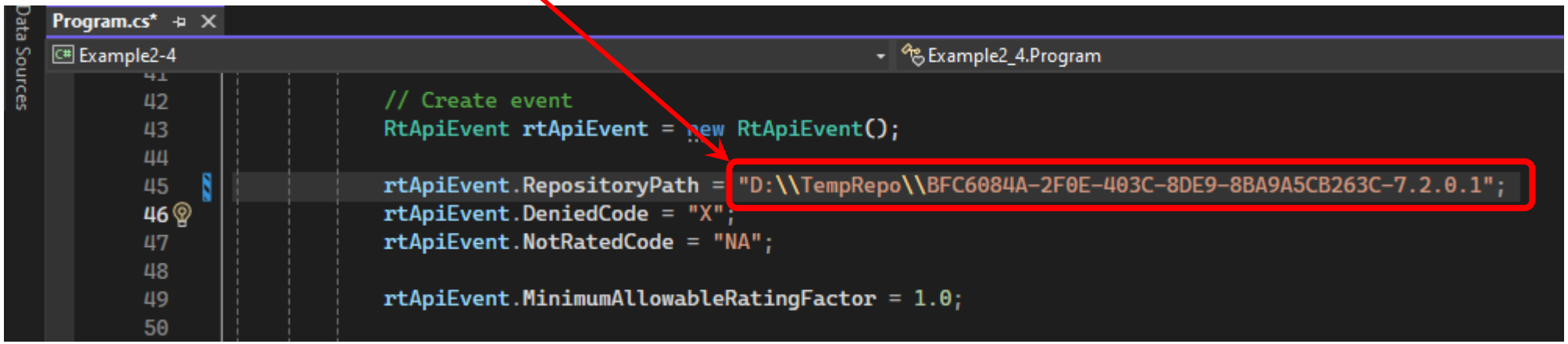
- Example 2-4
- .NET Framework 4.8
- C#
- Default Scenarios
- Type 3 and EV2 Vehicles
- Set-up to work with Default Bridge Models



RATING TOOL - API EXAMPLE

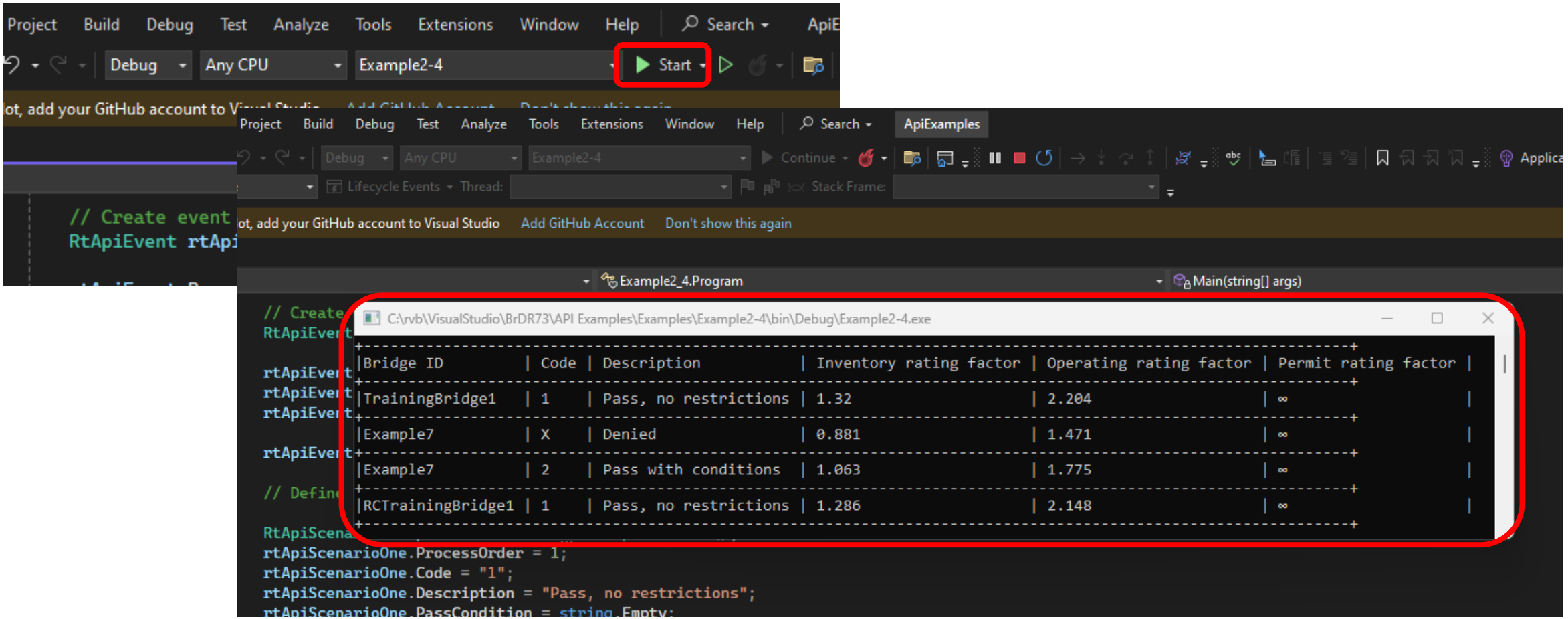
- Before Running
  - Create Precomputed Data files for
    - Must uncheck "Template" toggle in model
    - TrainingBridge1
    - Example7
    - RCTrainingBridge1
  - Change Repository Path in Code





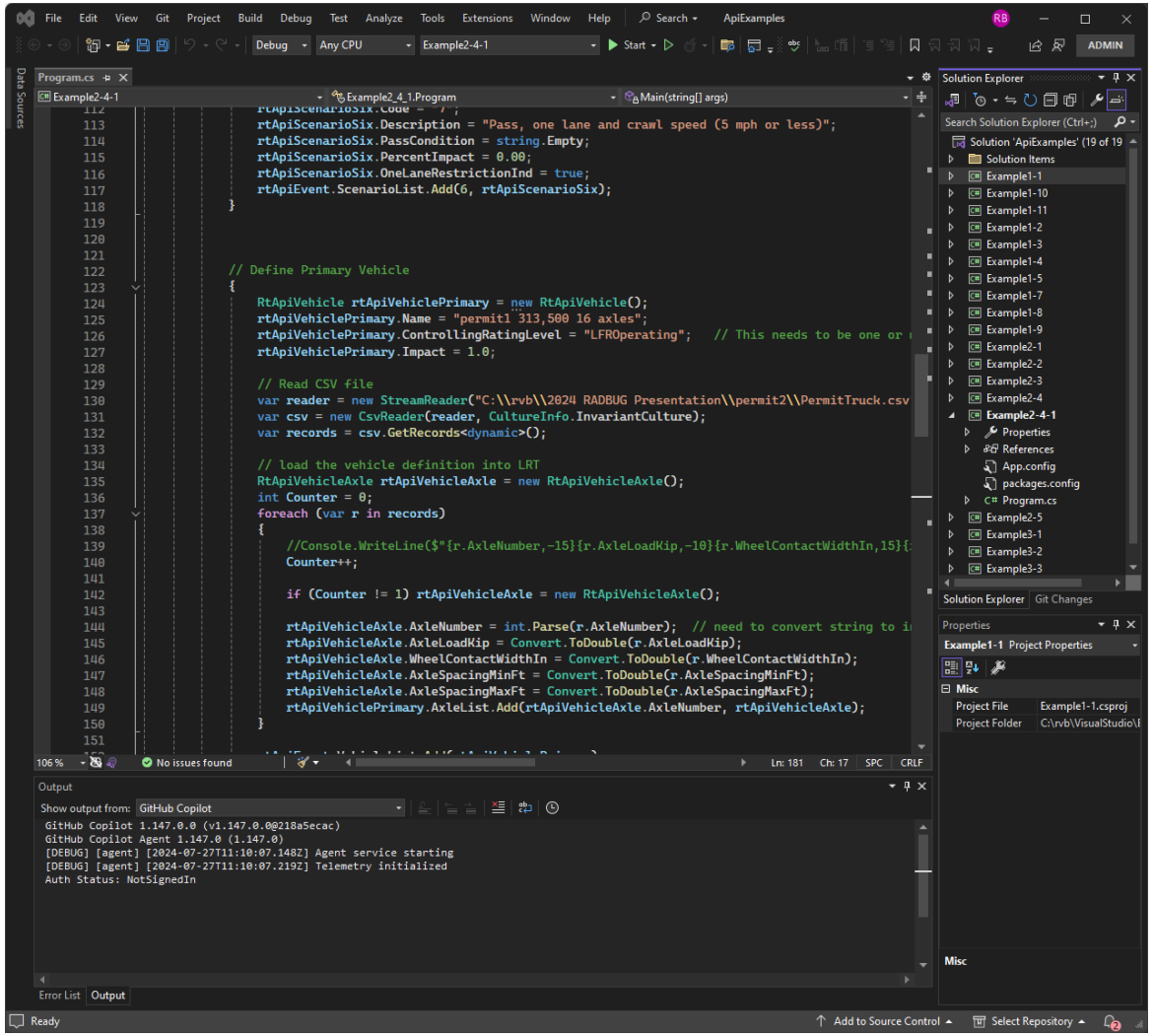
RATING TOOL - API EXAMPLE

- Run API



RATING TOOL - API EXAMPLE - CUSTOMIZED

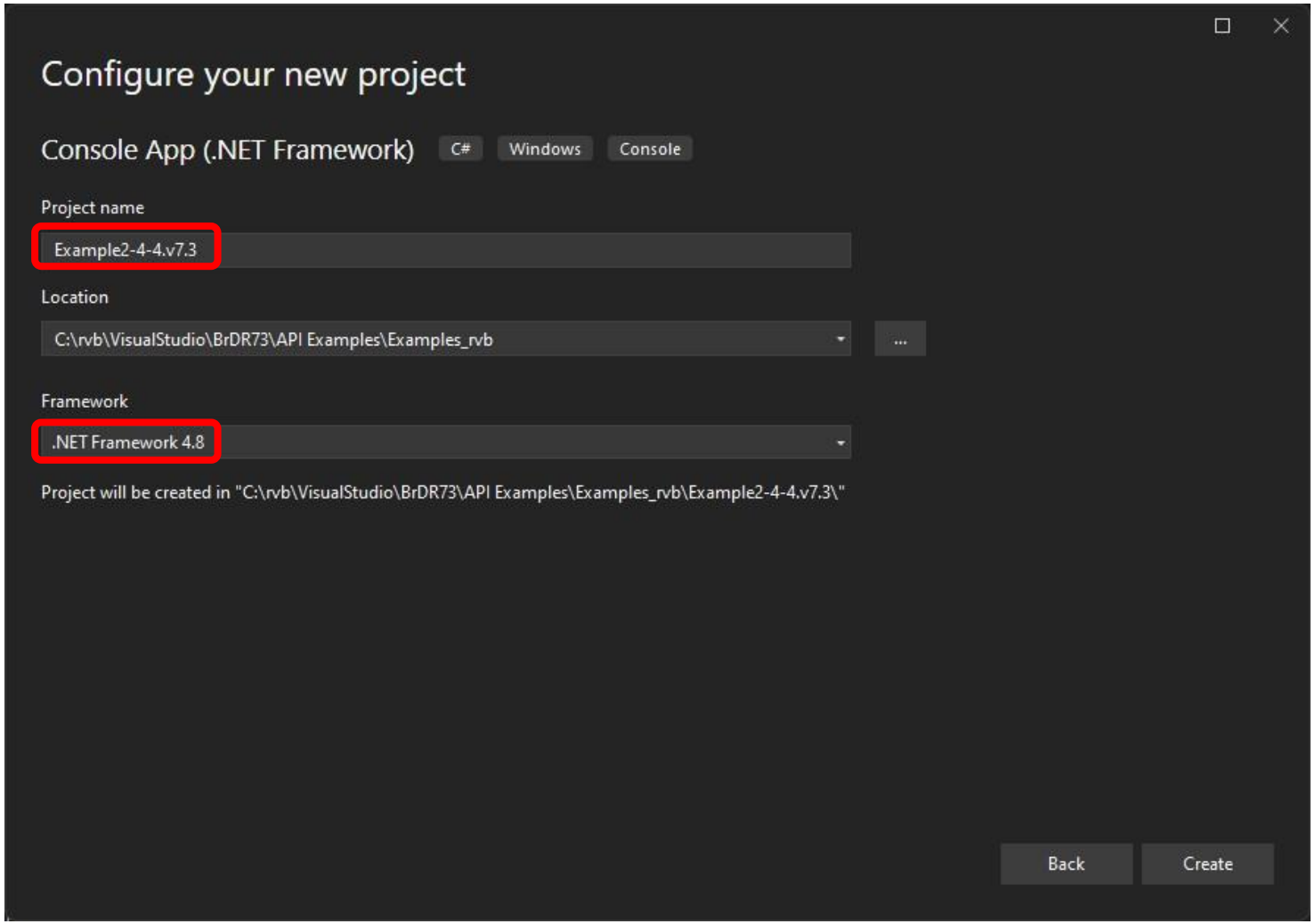
- Modify Example
- .NET Framework 4.8
- C#
- Custom Scenarios
- Custom Vehicle
- Custom List of Bridges



RATING TOOL - API EXAMPLE - CUSTOMIZED

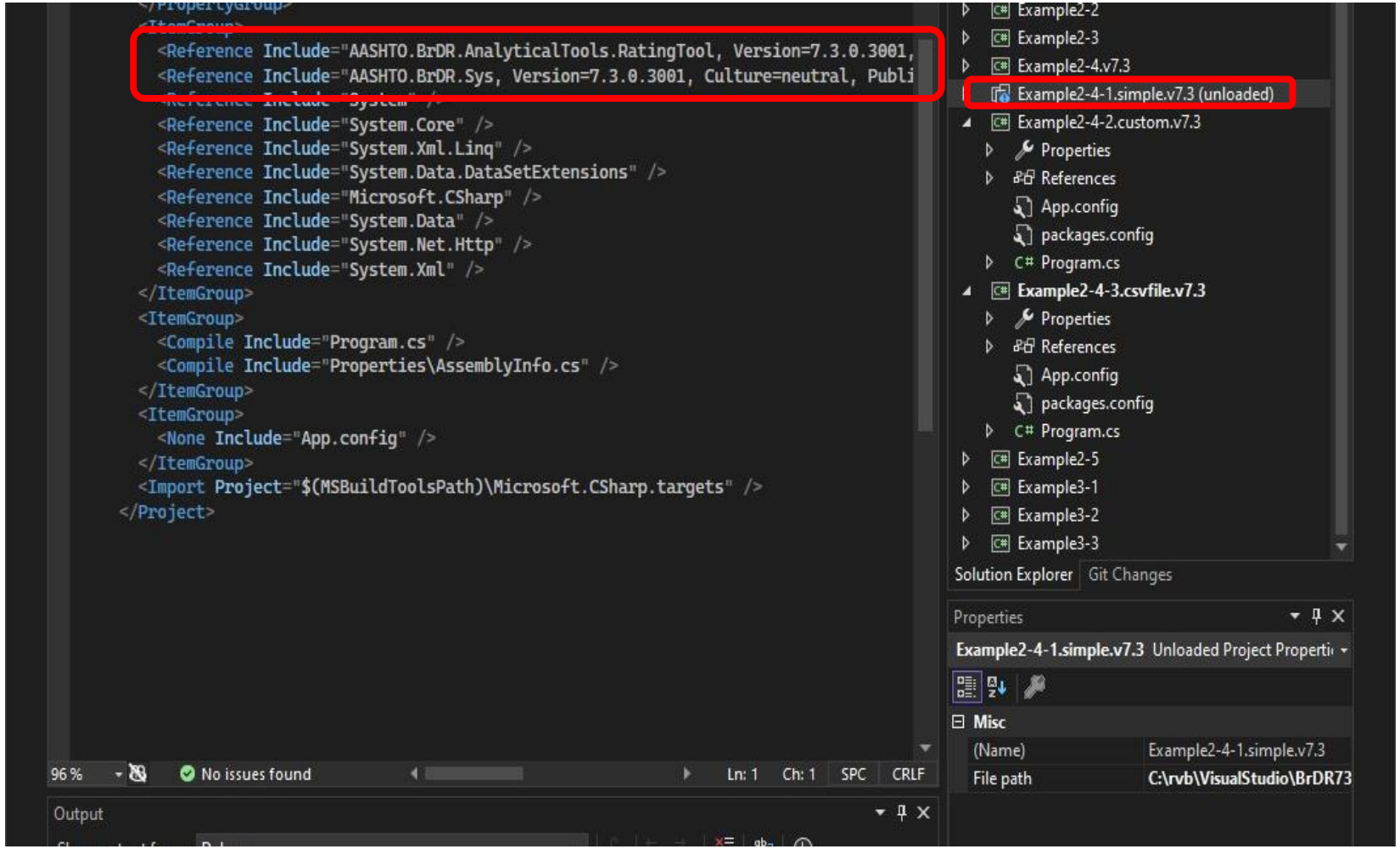
Create a New Project

1. Right click on Solution
   >> Add
   >> New Project…
2. Console App (.NET Framework 4.8)
3. Use Unique Project Name



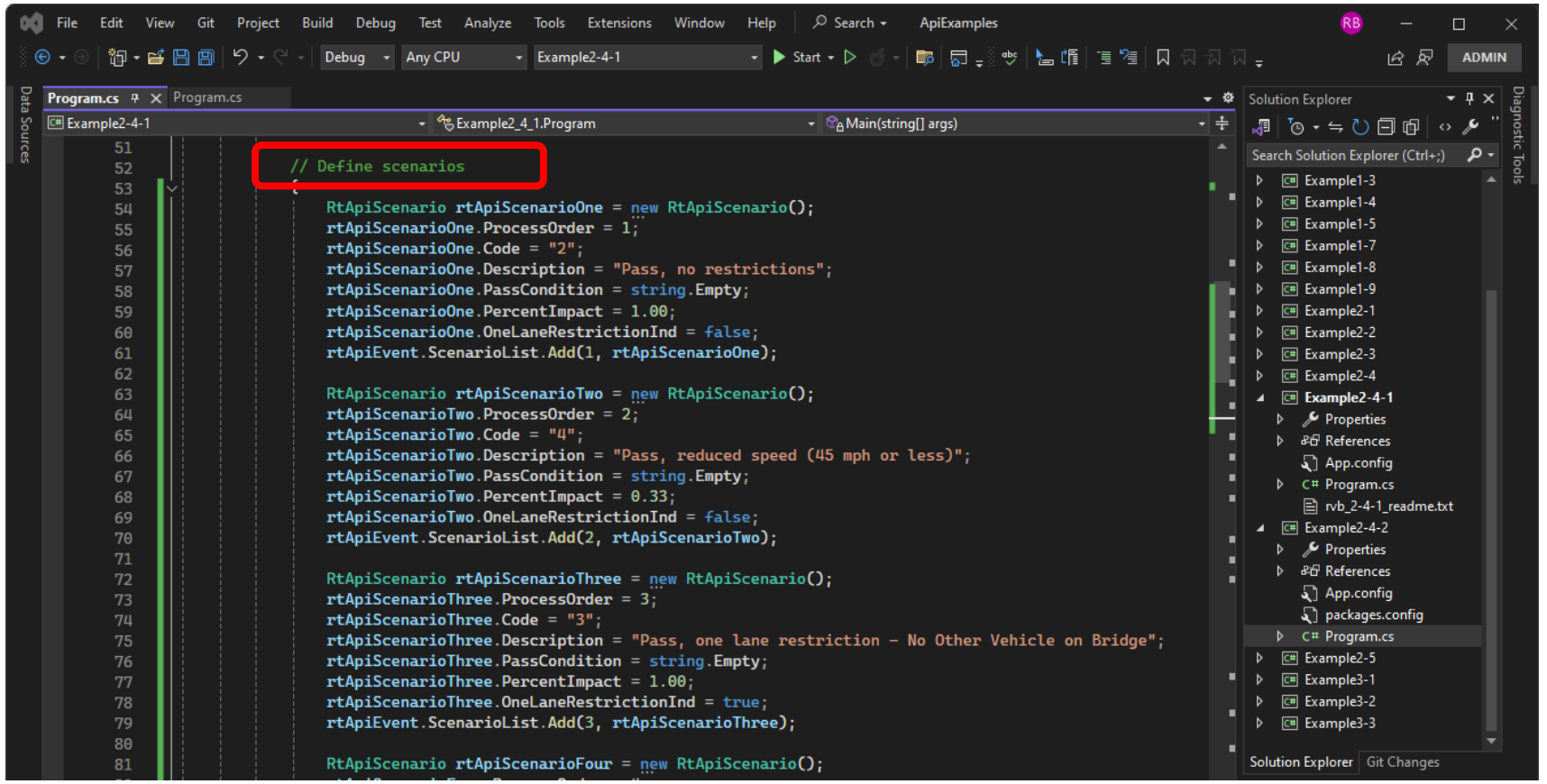
RATING TOOL - API EXAMPLE - CUSTOMIZED

4. Right click on the new Project and >>Unload Project
5. Copy AASHTO.BrDR References
6. Right click on the new Project and >>Reload Project
7. Copy code from example



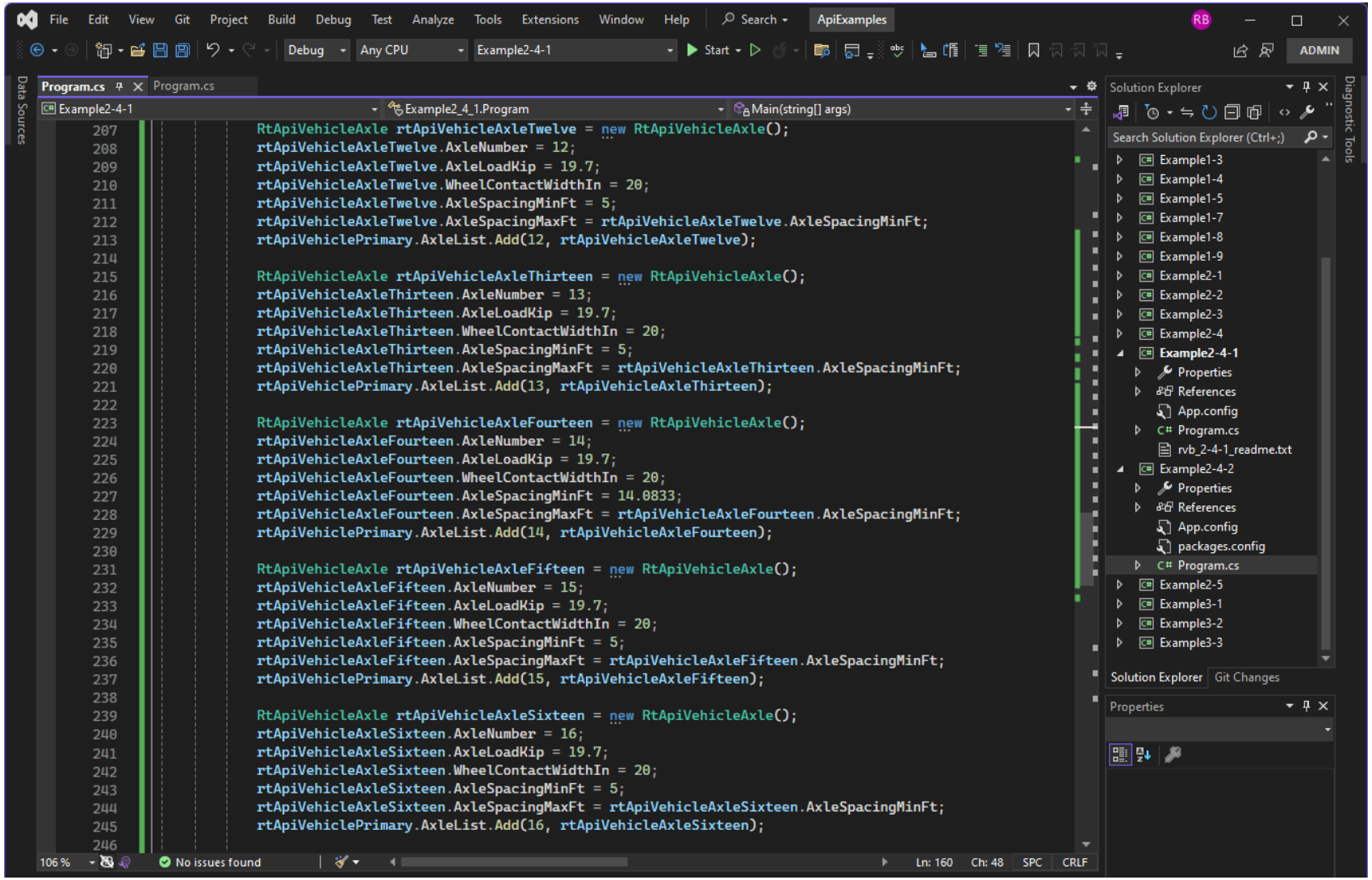
RATING TOOL - API EXAMPLE - CUSTOMIZED

- Customize Scenarios to match IDOT's



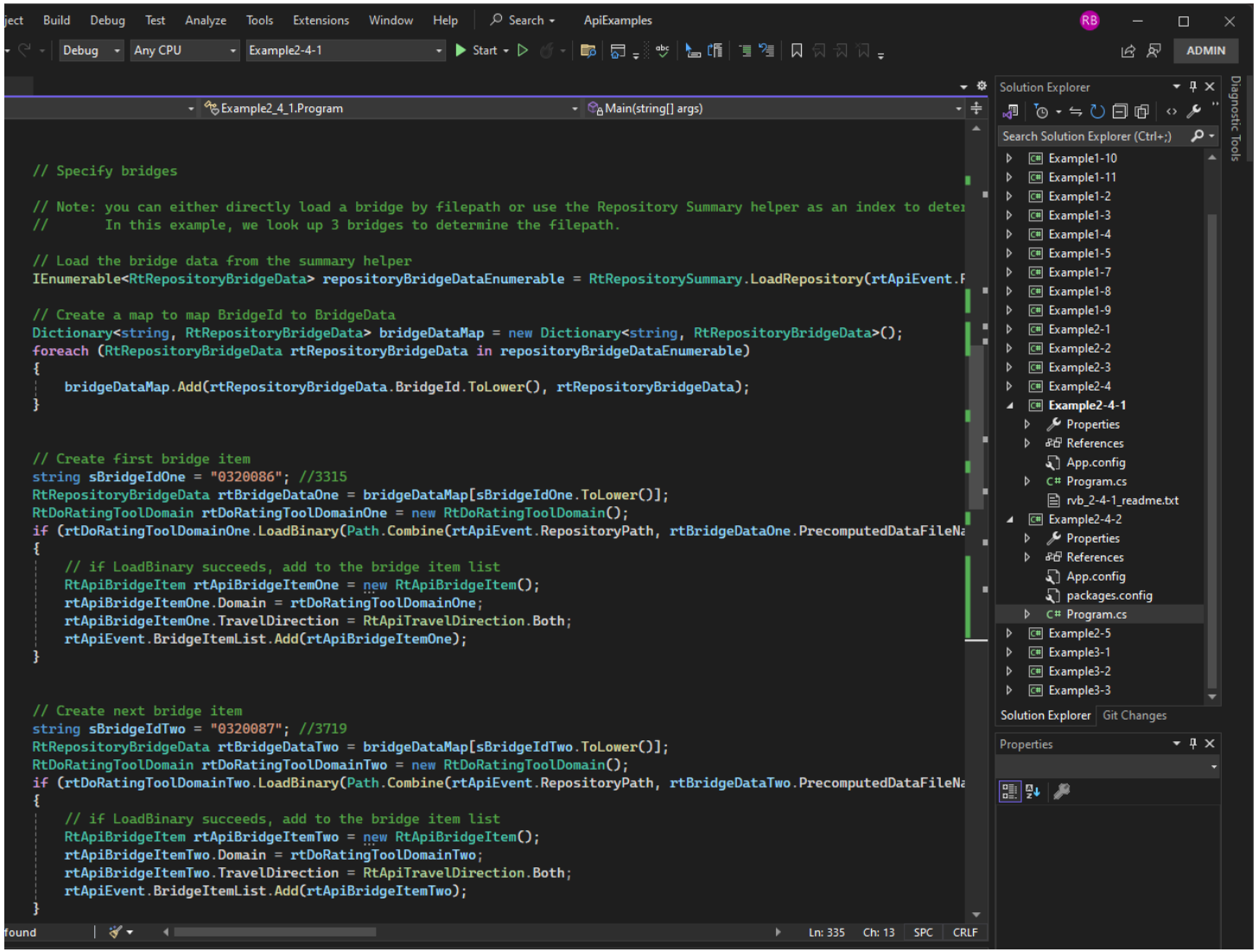
RATING TOOL - API EXAMPLE - CUSTOMIZED

- Custom Permit Vehicle
- 16 Axles
- 313,500 lbs
- 128’



RATING TOOL - API EXAMPLE - CUSTOMIZED

- Custom List of Bridges
- 84 Bridges
- 8,916 PCDF's
  - 6.3 GB
- 42 seconds if Mapping 'Bridge ID' to 'BID'
- 2 seconds if Directly Loaded by File Name



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