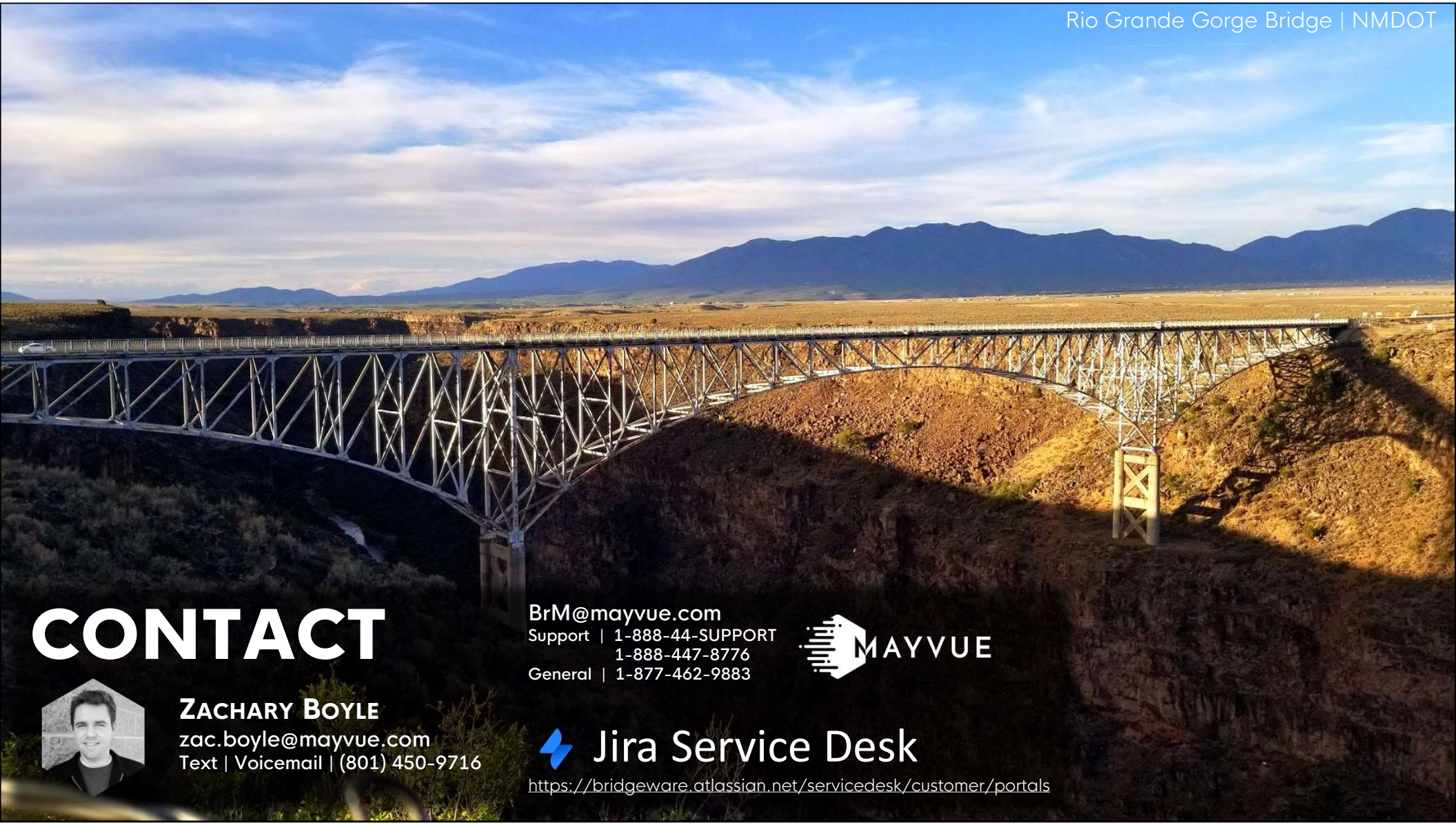
0 to 60 on Optimization

User Group Meeting September 17, 2019 | Louisville, Kentucky

Getting up to running the first optimization is not the end of a long process, it's really the first step. We'll demonstrate that here.



CONTACT

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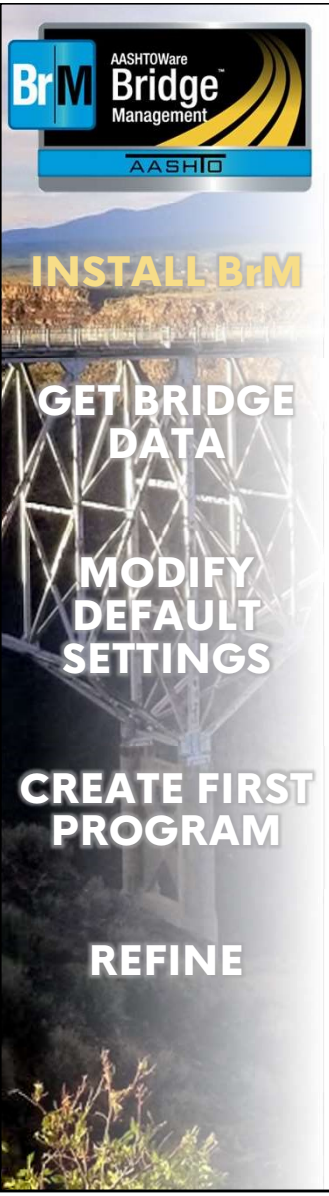
1-888-447-8776
General | 1-877-462-9883

MAYVUE

Jira Service Desk
https://bridgeware.atlassian.net/servicedesk/customer/portals


AASHTOWare
Bridge
Management
AASHTO
INSTALL BrM
GET BRIDGE DATA
MODIFY DEFAULT SETTINGS
CREATE FIRST PROGRAM
REFINE

INSTALL BrM

INSTALL BrM

INSTALL BrM

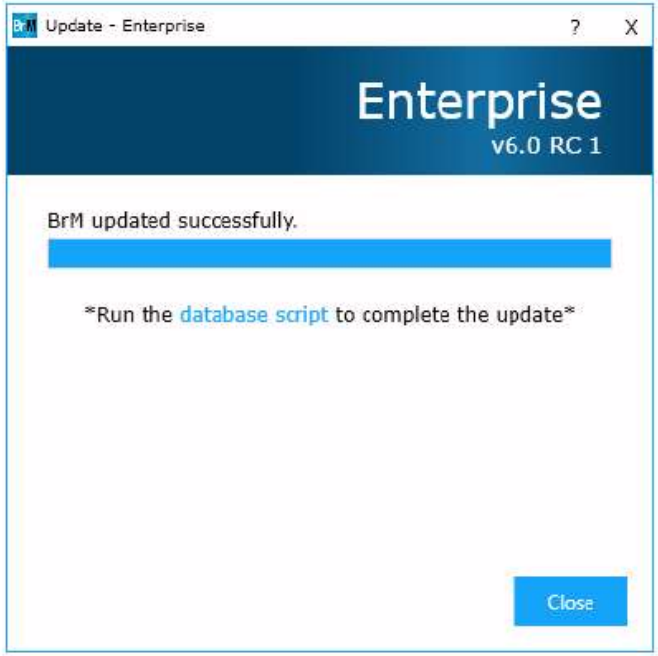
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

CREATE FIRST PROGRAM

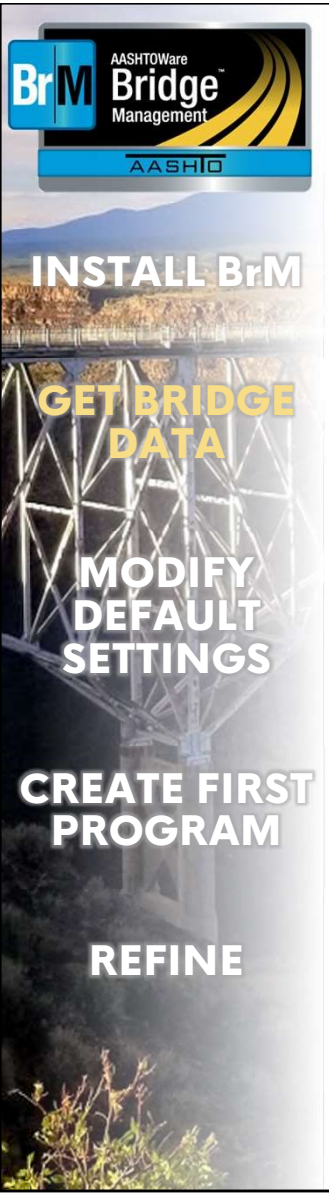
REFINE

0. Install BrM, or get it hosted



MAYVUE HOSTING

Step 0: Get BrM up. Whether you install it, or have us host a site for you. Get BrM.



GET BRIDGE DATA

GET BRIDGE DATA

INSTALL BrM

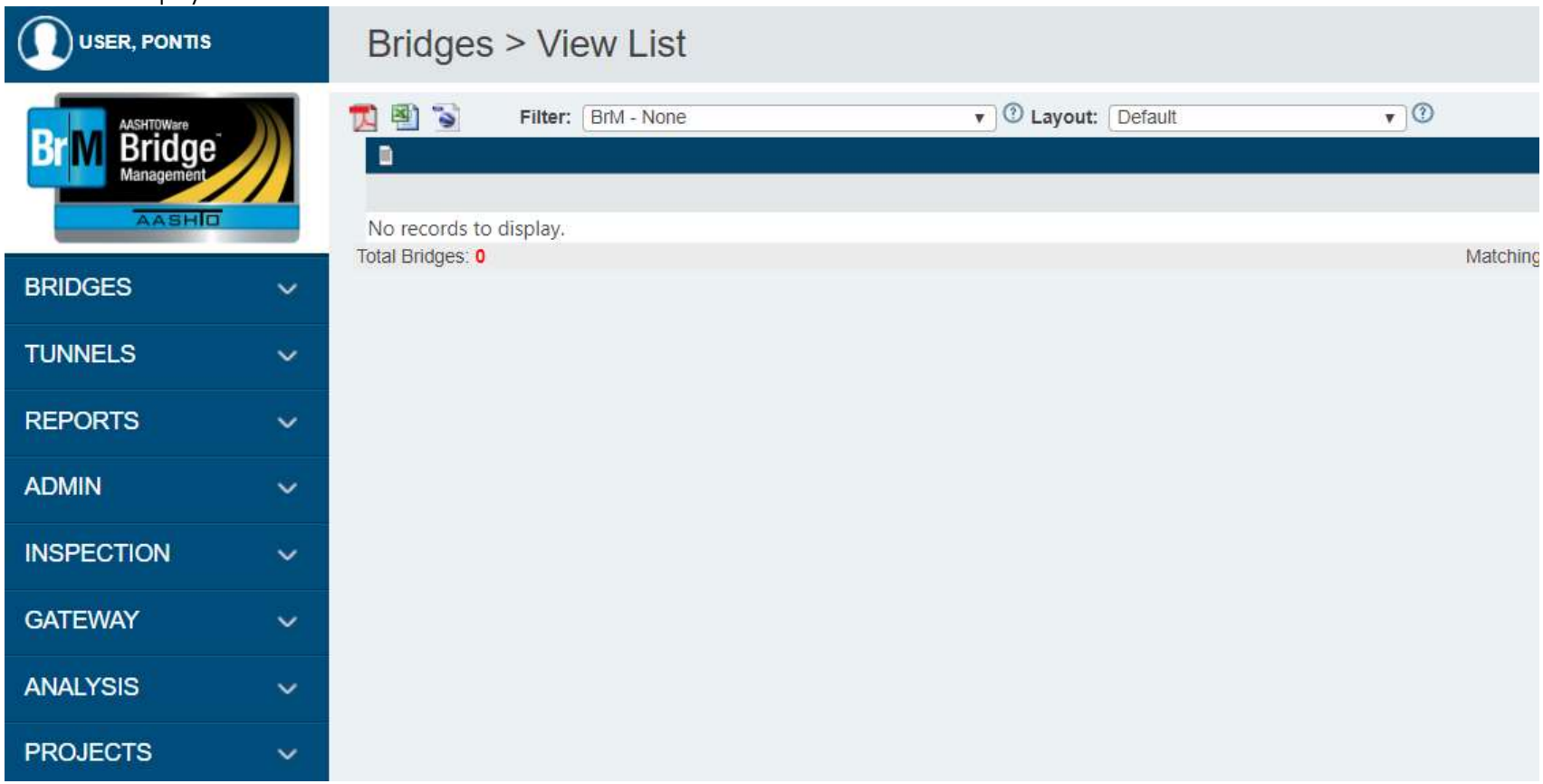
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

CREATE FIRST PROGRAM

REFINE

1. Download your data from FHWA if you don't already have it
    1. Empty db



Step 1: if you do not collect data in BrM, then you need to get your data. Here I will show you how you can get it from the Fed file. But if you use InspectTech, InspectX, or a custom collector, get your data in. See Paul's presentation on webservices if needed.

GET BRIDGE DATA

INSTALL BrM

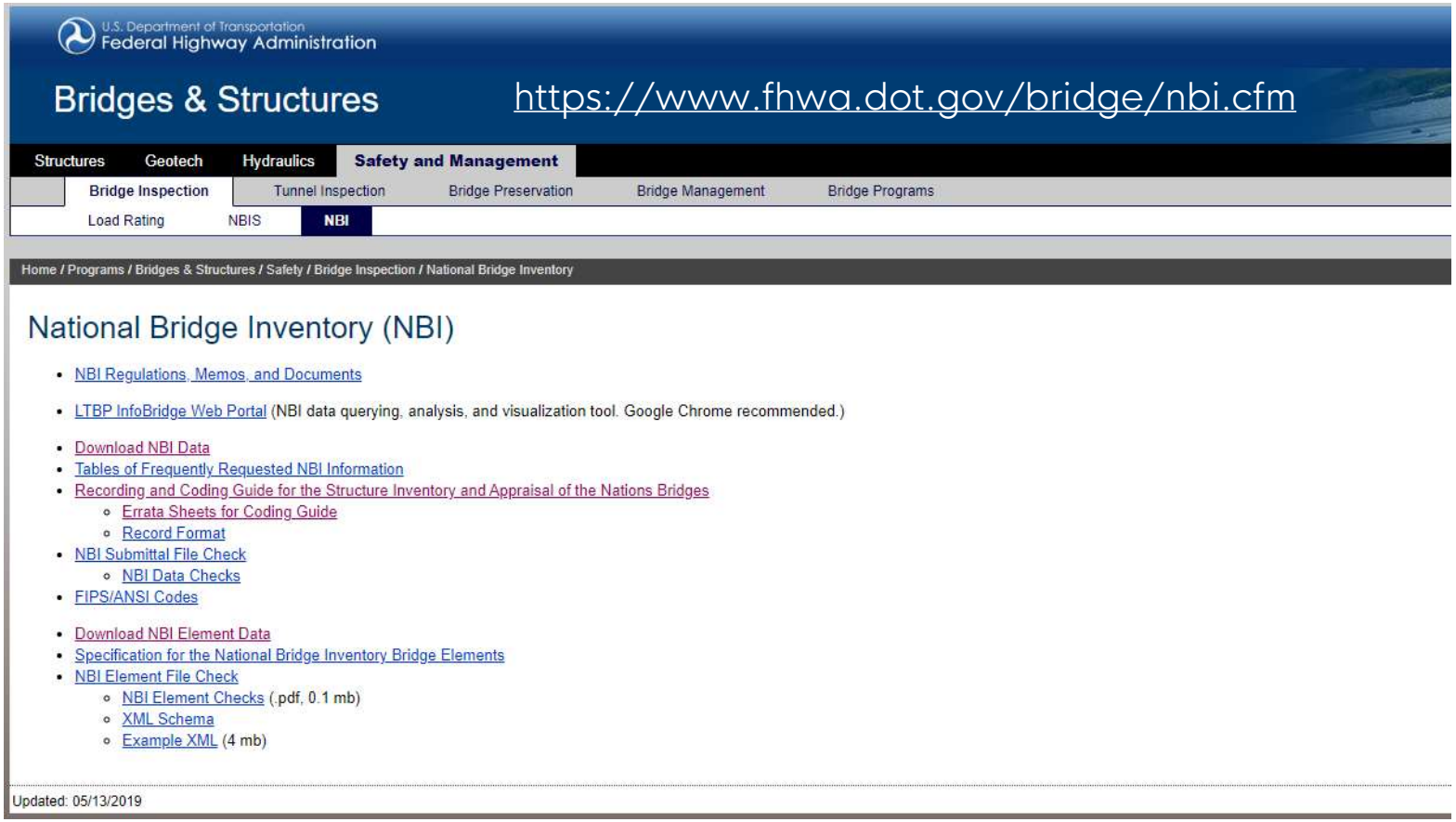
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

CREATE FIRST PROGRAM

REFINE

2. Download NBI & NBE



In this case I'm going to go get the FHWA file for a state. This won't have custom elements, and I won't be able to use NBI deterioration (because I won't have the NBI history), but this will run it the first time.

GET BRIDGE DATA

INSTALL BrM

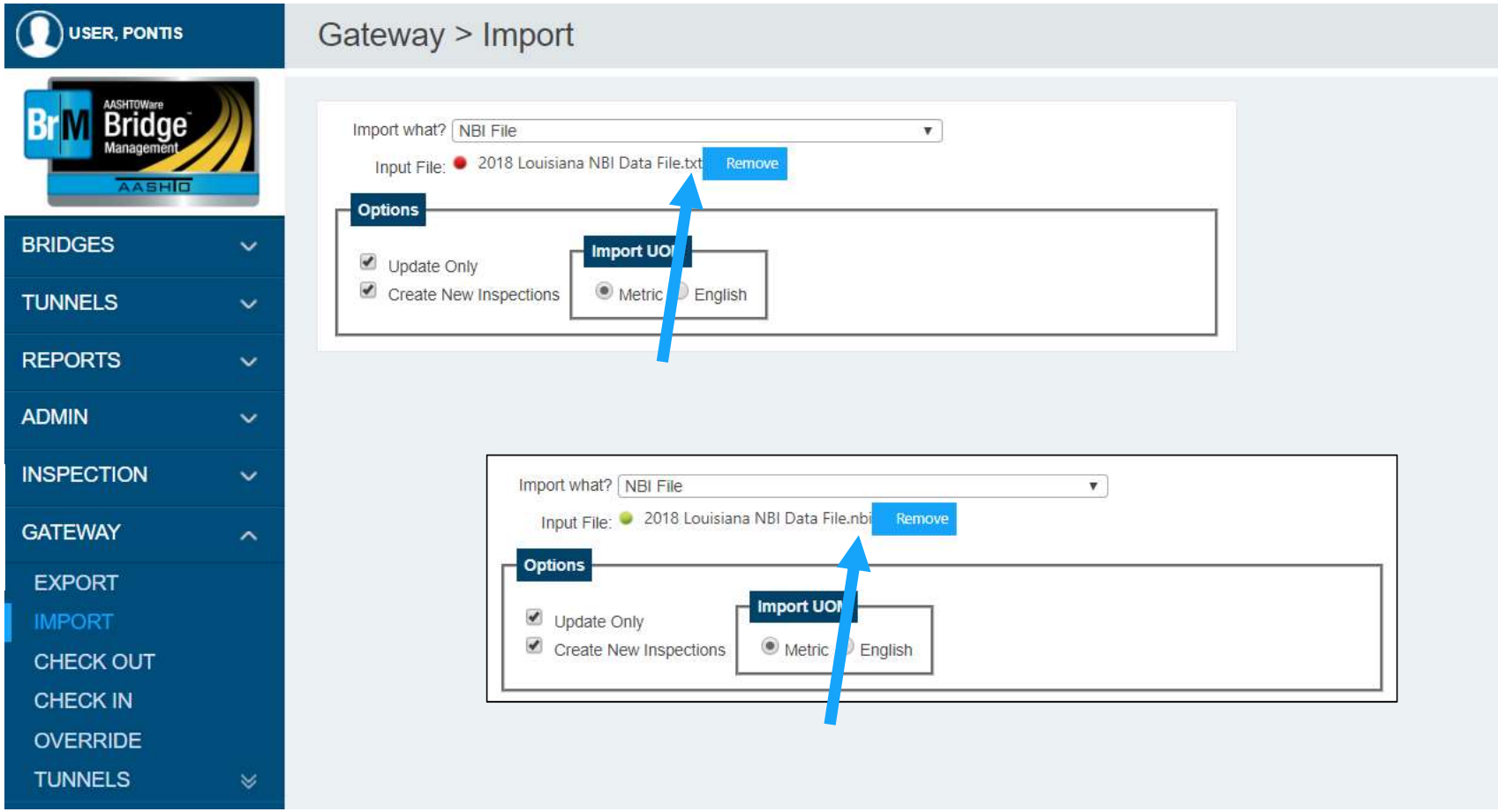
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

CREATE FIRST PROGRAM

REFINE

3. Import NBI & NBE



The file you download is a .txt file but BrM expects it as .nbi. So change the file extension.

GET BRIDGE DATA

INSTALL BrM

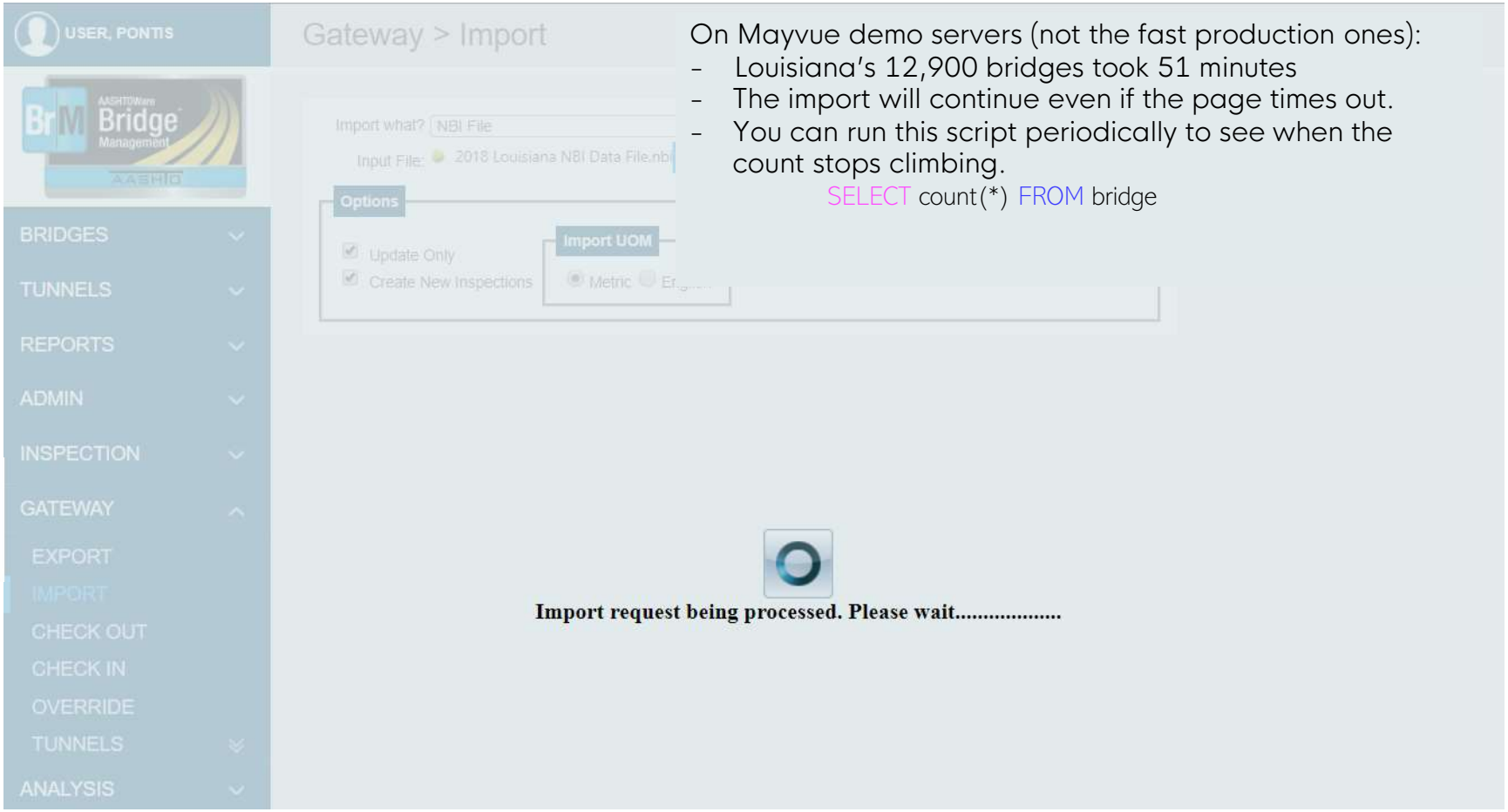
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

CREATE FIRST PROGRAM

REFINE

3. Import NBI & NBE



On Mayvue demo servers (not the fast production ones):

- Louisiana's 12,900 bridges took 51 minutes
- The import will continue even if the page times out.
- You can run this script periodically to see when the count stops climbing.

```
SELECT count(*) FROM bridge
```

This will take a while, as you can see.

GET BRIDGE DATA

3. Import NBI & NBE

```
1  <?xml version="1.0"
2  <FHWAELEMENT>
3    <FHWAED>
4      <STATE>22</STAT
5      <STRUCNUM>02260
6      <EN>38</EN>
7      <TOTALQTY>12250
8      <CS1>12250</CS1
9      <CS2>0</CS2>
10     <CS3>0</CS3>
11     <CS4>0</CS4>
```

```
1  <?xml version="1.0" standalone="yes"?>
2  <FHWAElement>
3    <FHWAED>
4      <STATE>22</STATE>
5      <STRUCNUM>022600000020029</STRUCNUM>
6      <EN>38</EN>
7      <TOTALQTY>12250</TOTALQTY>
8      <CS1>12250</CS1>
9      <CS2>0</CS2>
10     <CS3>0</CS3>
11     <CS4>0</CS4>
```

FHWA NBE files don't follow the FHWA NBE standard, remember to change the first and last line to have element in lower case.

The NBE file needs the capitals changed to lower case.

GET BRIDGE DATA

INSTALL BrM

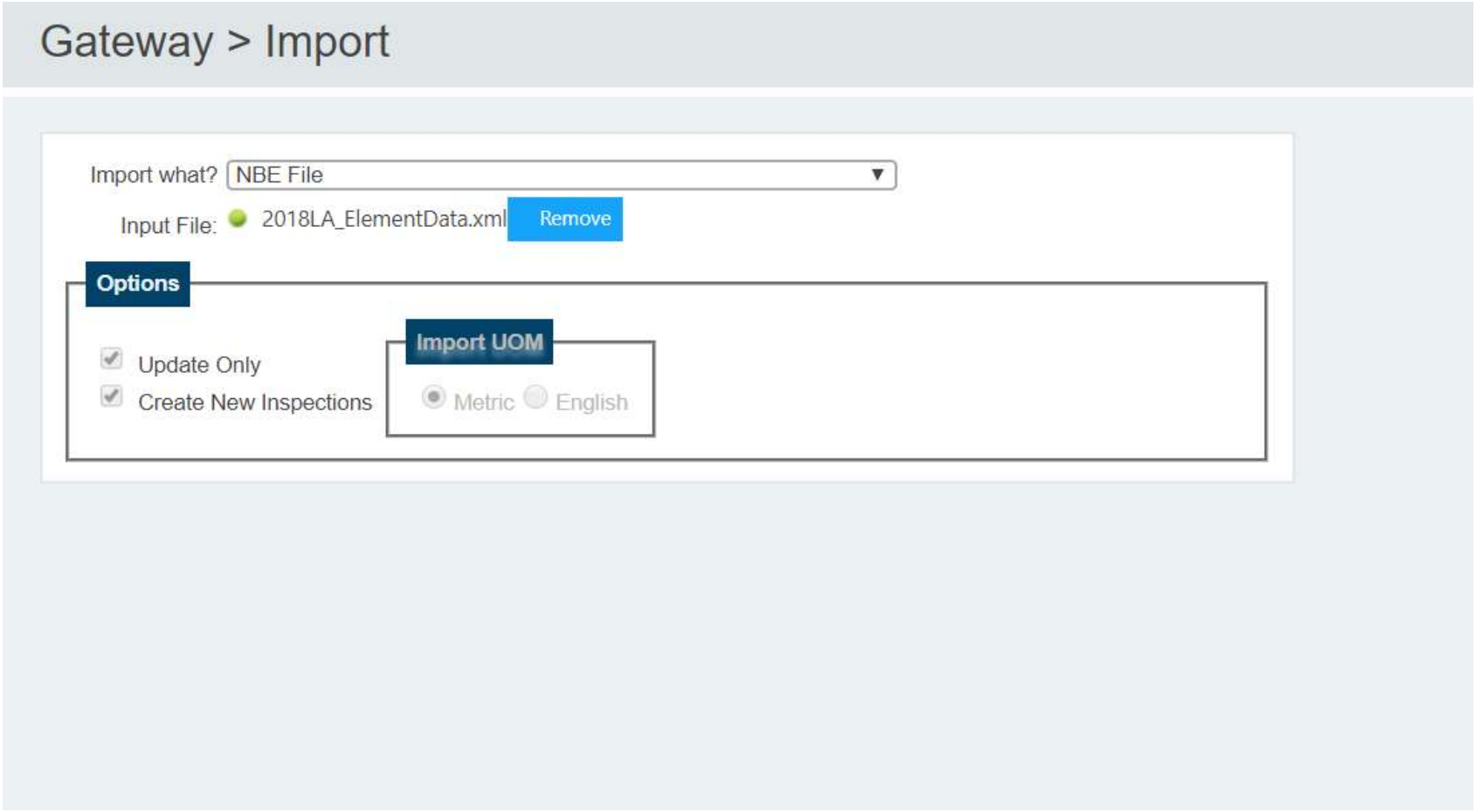
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

CREATE FIRST PROGRAM

REFINE

3. Import NBI & NBE



Then import it too. Because the NBE file doesn't have a date – the results will attach to or overwrite the latest inspection in BrM (and in our case, those will have been made by the NBI file import).

GET BRIDGE DATA

INSTALL BrM

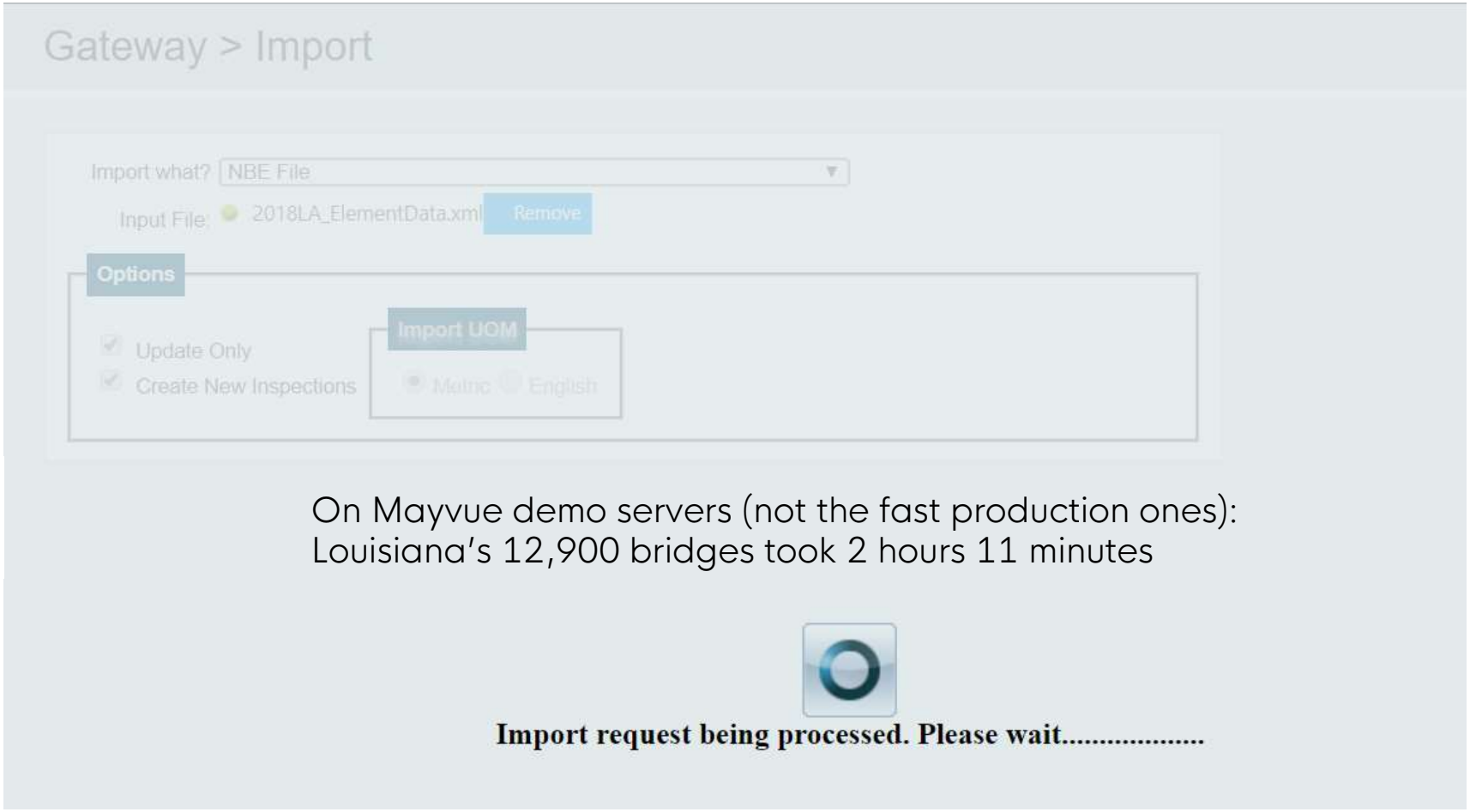
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

CREATE FIRST PROGRAM

REFINE

3. Import NBI & NBE



Give it some time.

GET BRIDGE DATA

4. Populate Deck Area, Check NBI and Elem Insp

```
UPDATE bridge
SET deck_area= CASE WHEN length <=0 THEN NULL
                    WHEN deckwidth > 0 THEN length * deckwidth
                    WHEN (SELECT  x.roadway_gd FROM roadway x WHERE
                       x.bridge_gd= bridge.bridge_gd and x.on_under='1') IS NULL THEN NULL
                    WHEN (SELECT  x.aroadwidth FROM roadway x WHERE
                       x.bridge_gd= bridge.bridge_gd and x.on_under='1') <= 0 THEN NULL
                    ELSE (length * (SELECT x.aroadwidth FROM roadway x WHERE
              x.bridge_gd = bridge.bridge_gd and x.on_under='1'))
                    END
UPDATE bridge SET deck_area = (ROUND(deck_area, 1));

UPDATE inspevnt SET nbiinspdone = 1;

UPDATE inspevnt SET elinspdone = 1;
```

Populate the deck area and check some boxes.

GET BRIDGE DATA

INSTALL BrM

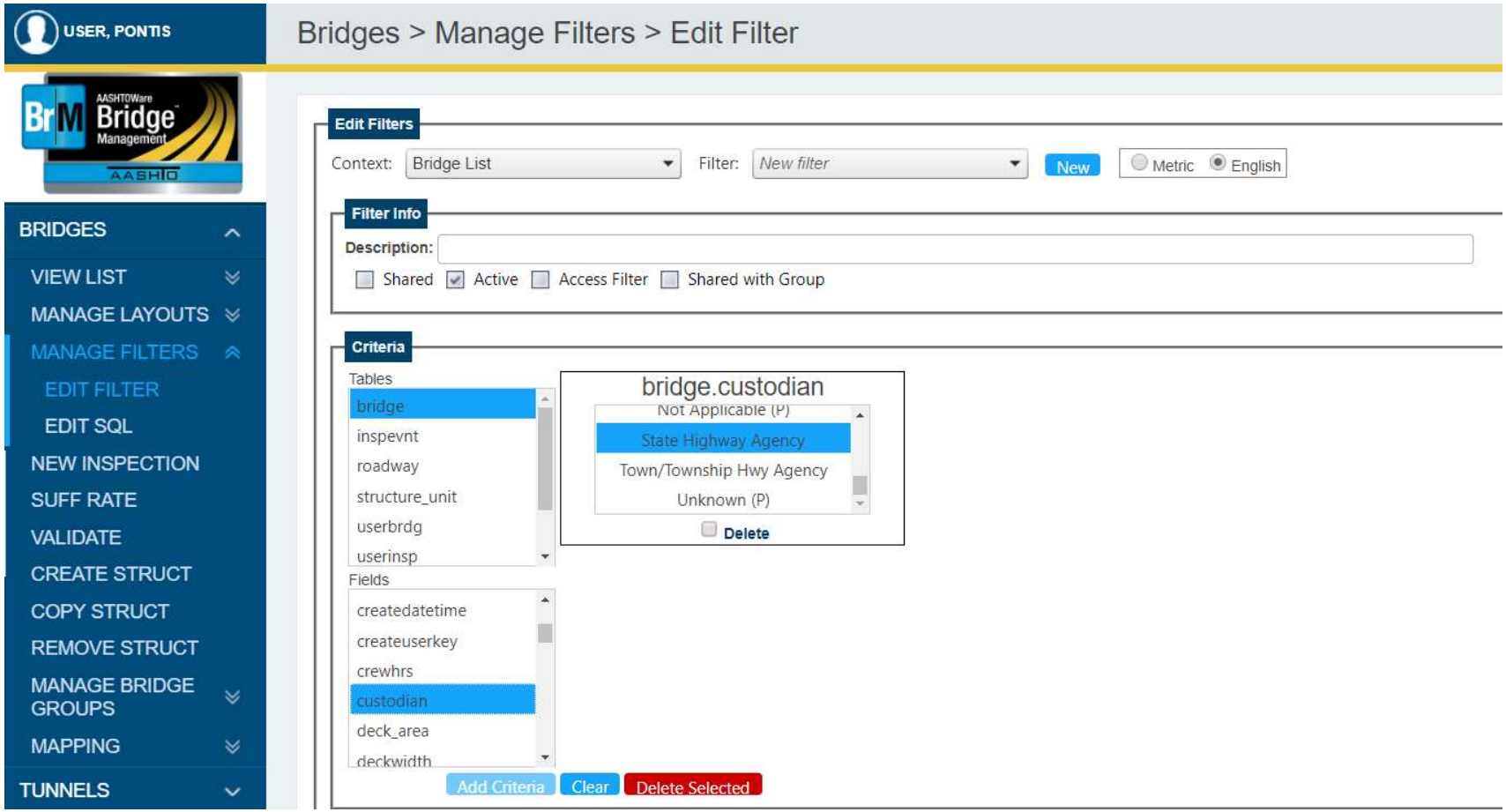
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

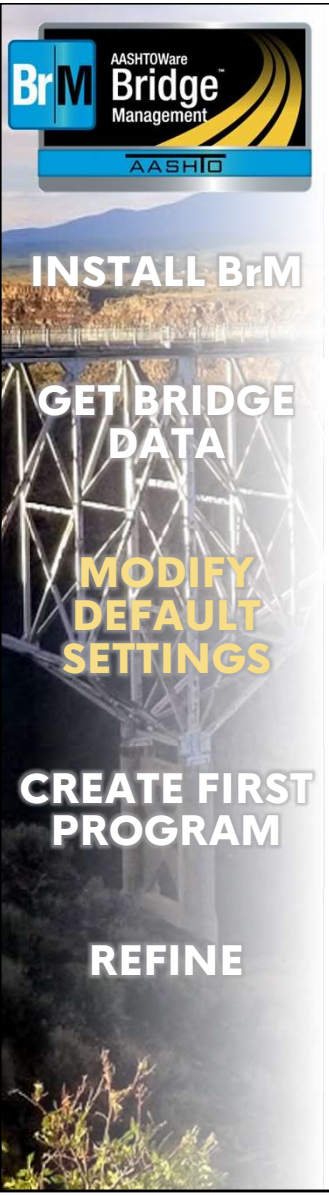
CREATE FIRST PROGRAM

REFINE

5. Create Filter for state maintained bridges



Now I'm making a filter for bridges which are state owned (exclude forest, military and Indian affairs bridges). You could filter to NHS bridges too if you'd like.



MODIFY DEFAULT SETTINGS

MODIFY DEFAULT SETTINGS

INSTALL BrM

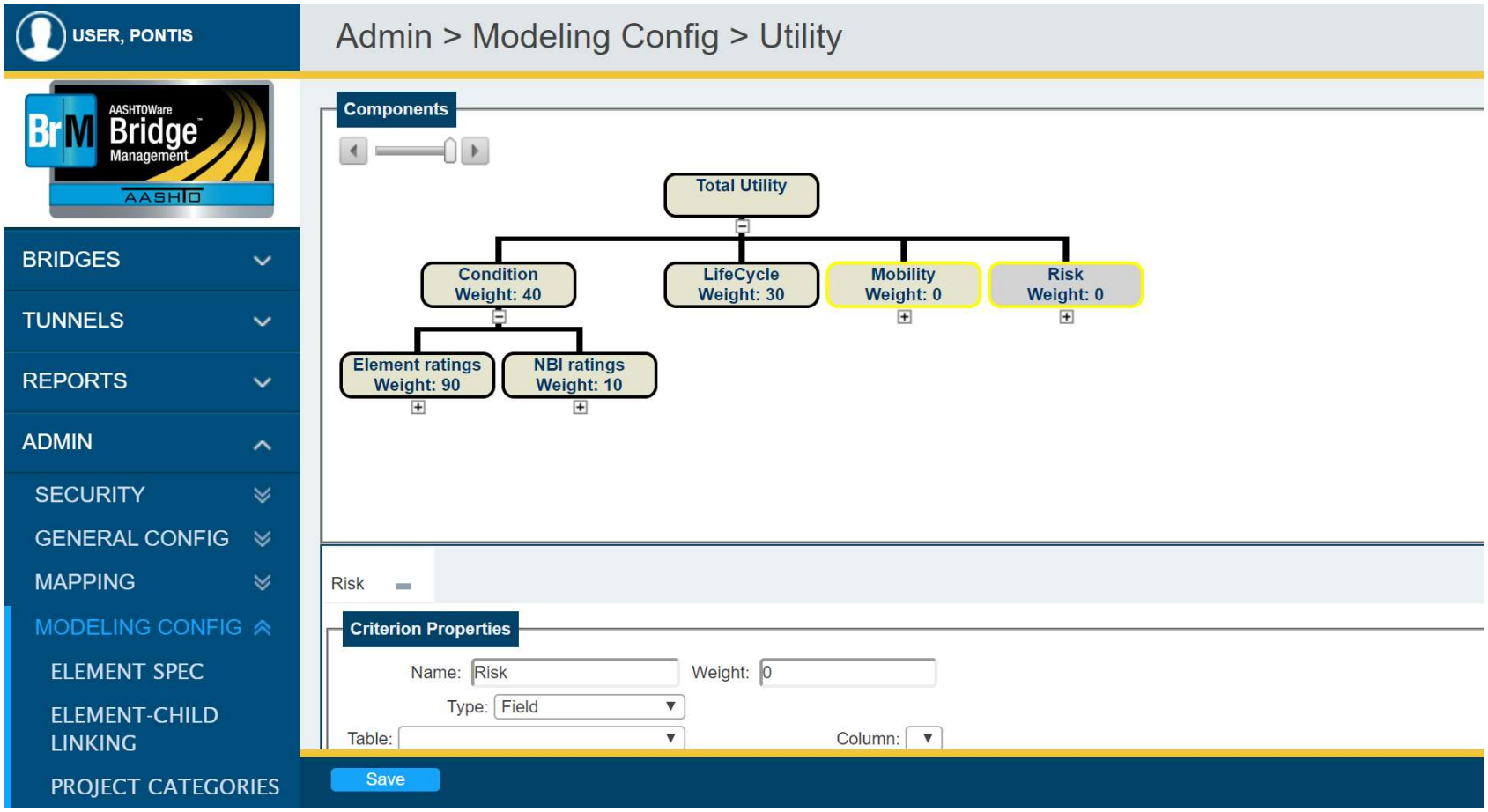
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

CREATE FIRST PROGRAM

REFINE

1. Give mobility and risk 0 weight



These tweaks are not necessary, I just want to show that you can do it if you'd like. A lot of states like to work with condition first and come back to mobility and risk later when they're ready to set it up.

MODIFY DEFAULT SETTINGS

INSTALL BrM

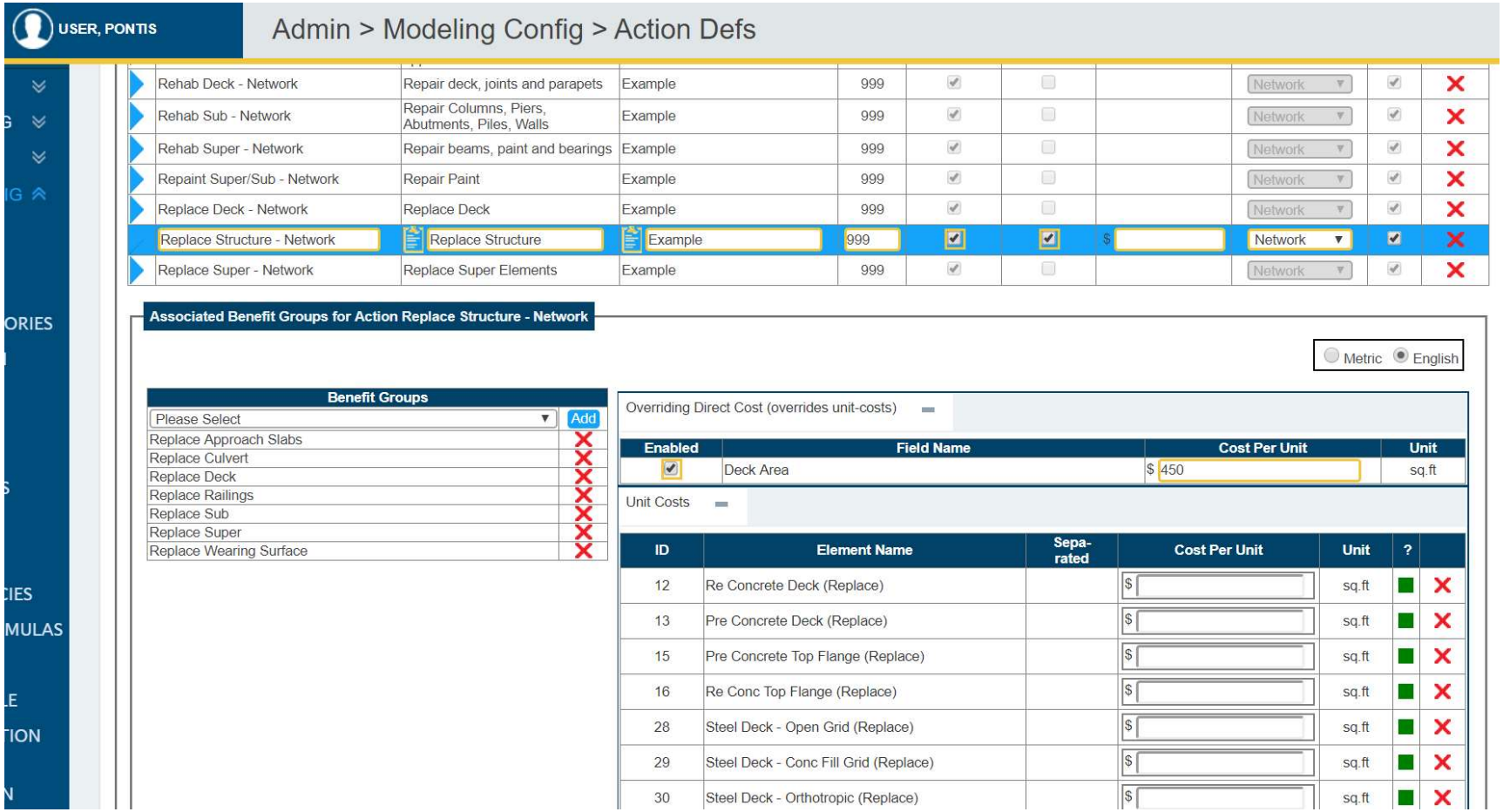
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

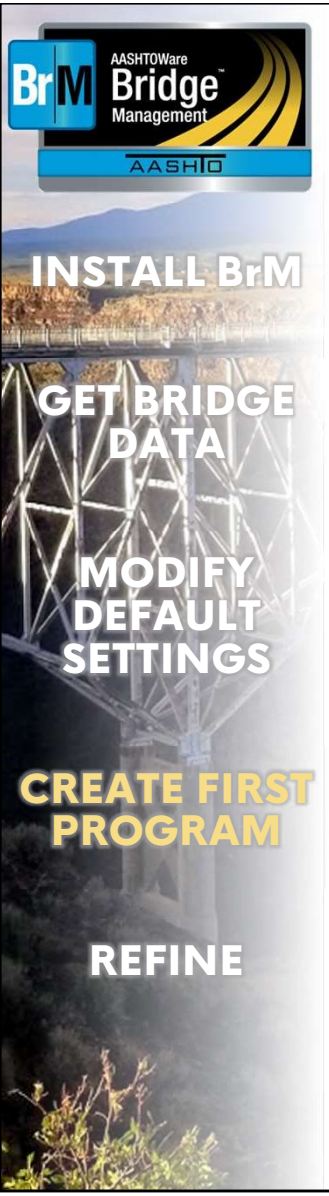
CREATE FIRST PROGRAM

REFINE

2. Increase Replacement Cost from $400/sqft to $450/sqft



The most sensitive cost is the cost of bridge replacement. $200/sqft in Kanas to $600/sqft in Alaska, set this value before your first run to just get a little bit closer.



CREATE FIRST PROGRAM

CREATE FIRST PROGRAM

INSTALL BrM

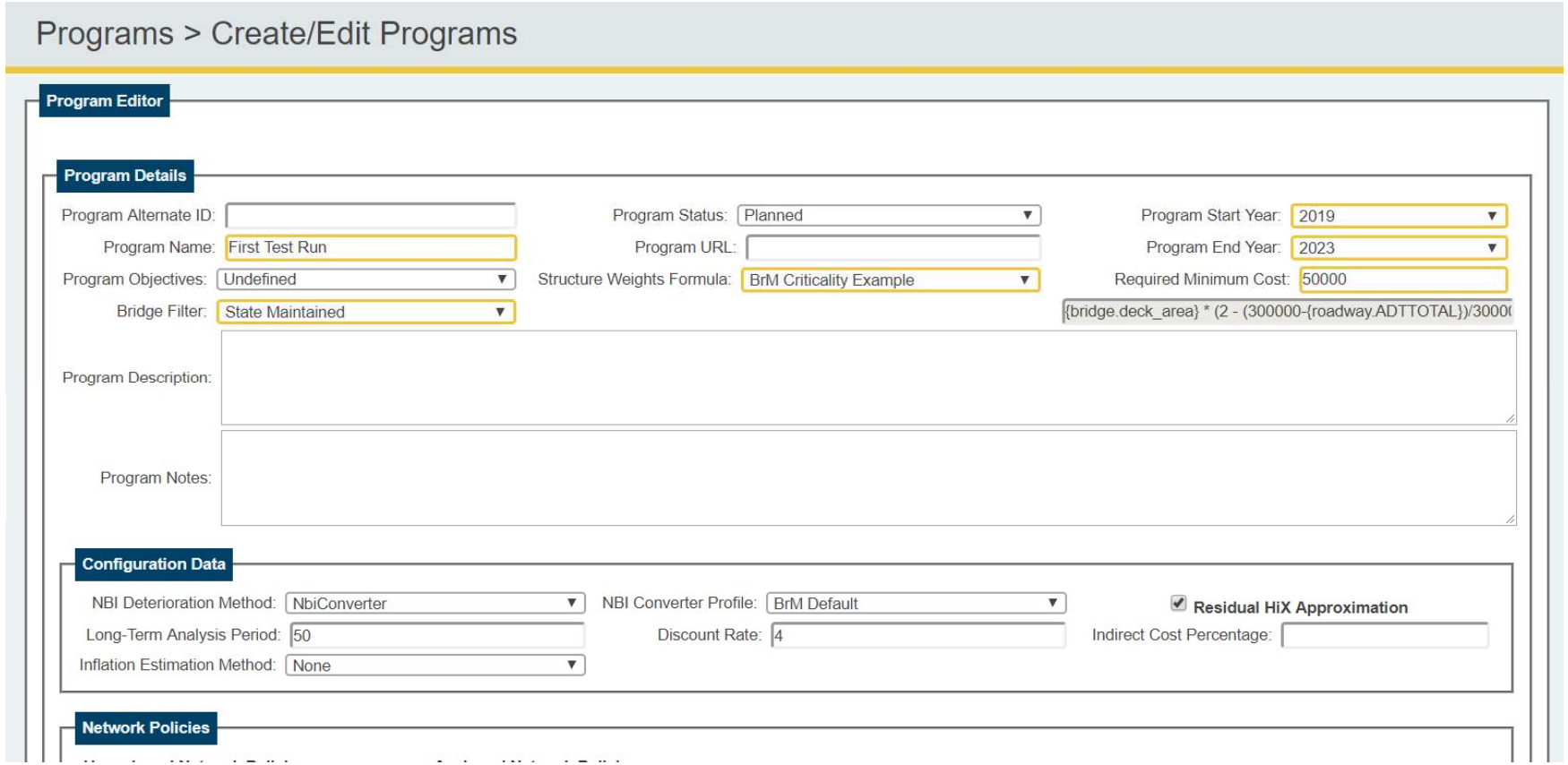
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

CREATE FIRST PROGRAM

REFINE

3. Create and Run a Program
    1. Create a program
    2. 3 or 4 year optimization



Make your first program. See the yellow-highlighted fields.

Create First Program

INSTALL BrM

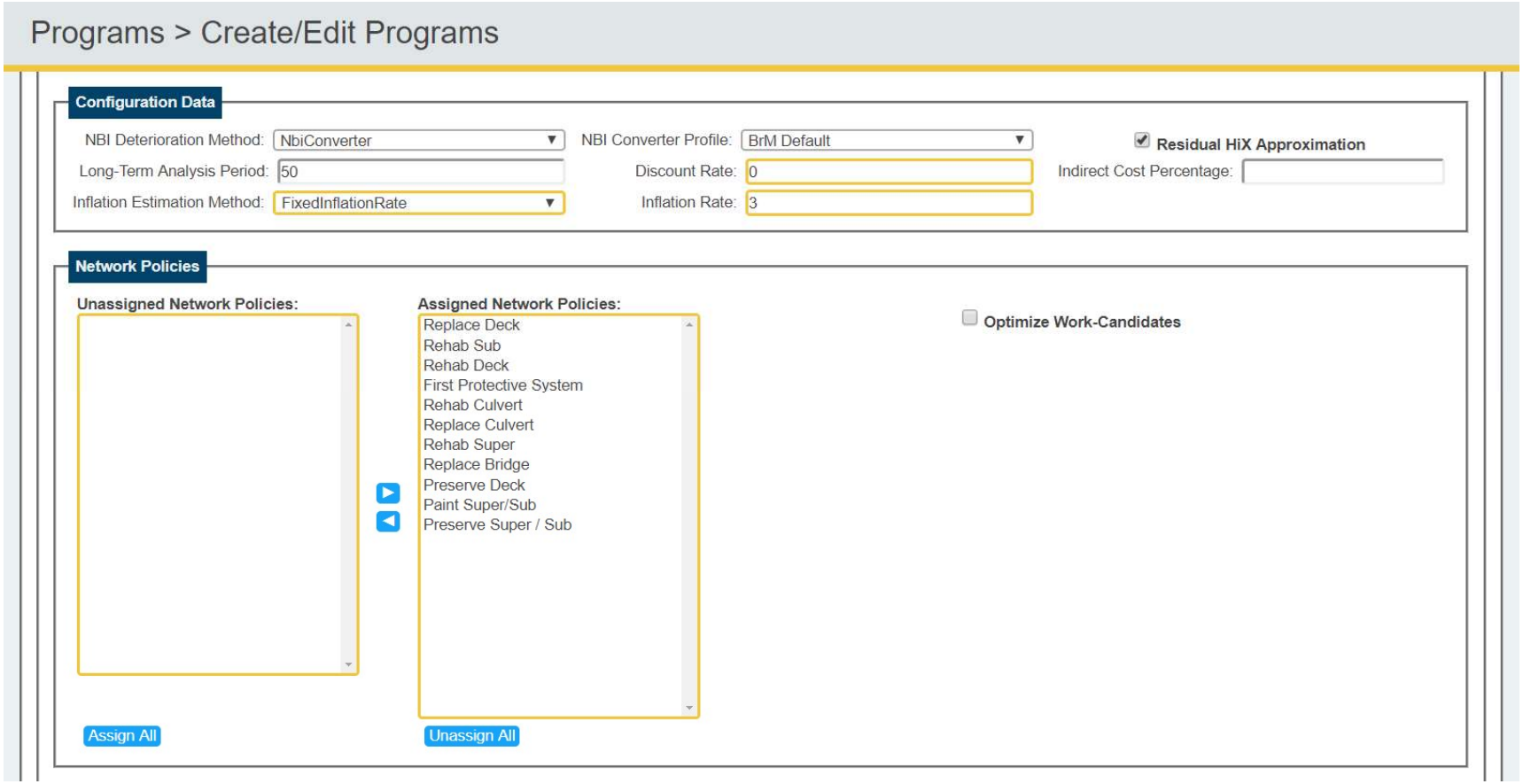
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

CREATE FIRST PROGRAM

REFINE

Pick between Discount and Inflation
Run with all default actions at first.



These are the default settings, but a good thing to work with out of the box.

Create First Program

INSTALL BrM

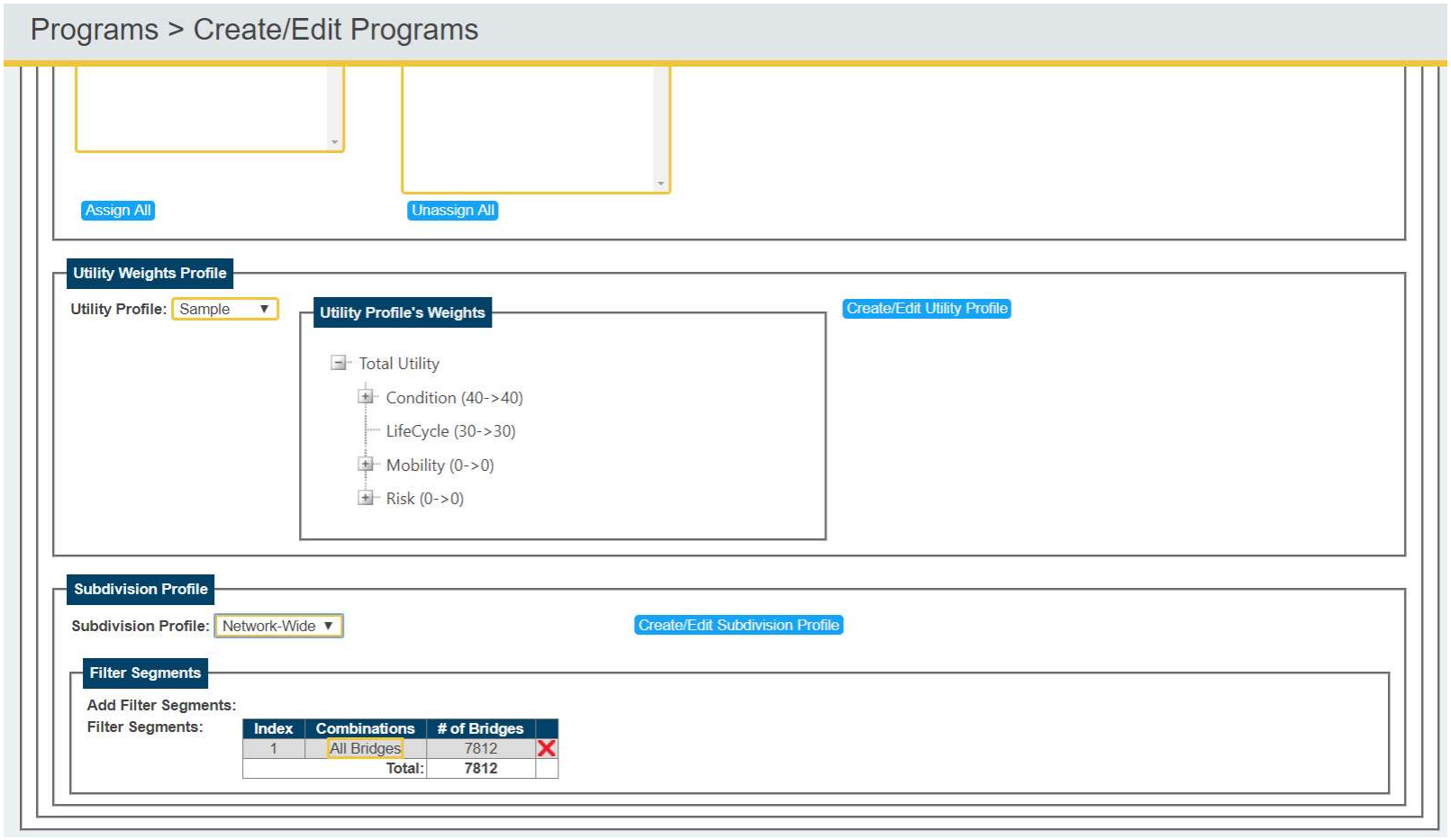
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

CREATE FIRST PROGRAM

REFINE

Default Utility, all of the state maintained bridges in one subdivision.



7800 bridges, it will take a little while to run.

Create First Program

INSTALL BrM

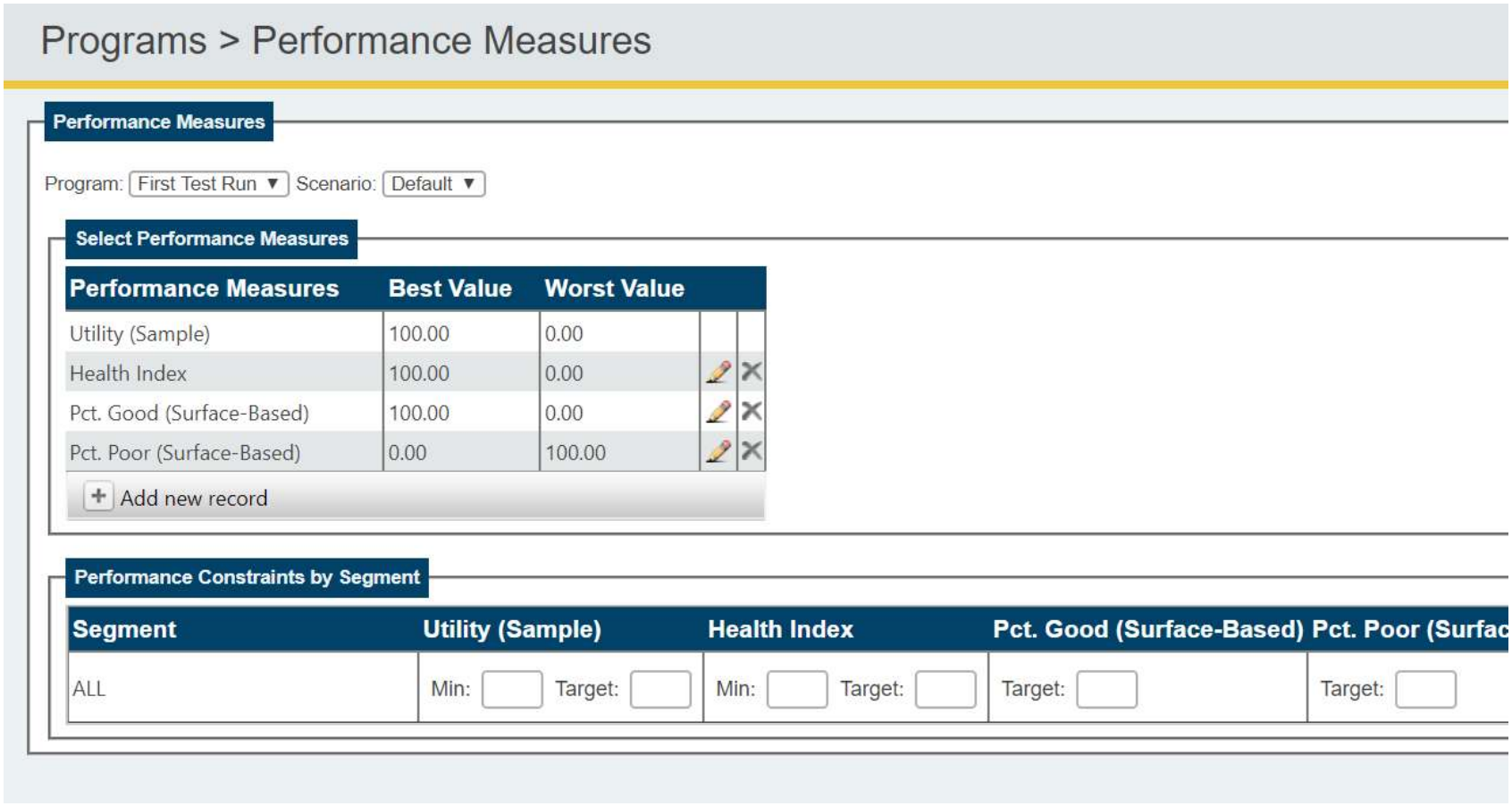
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

CREATE FIRST PROGRAM

REFINE

Add the typical performance measures of Pct Good and Pct Poor.



Percent Good and Poor by surface area are the most common performance measures.

Create First Program

INSTALL BrM

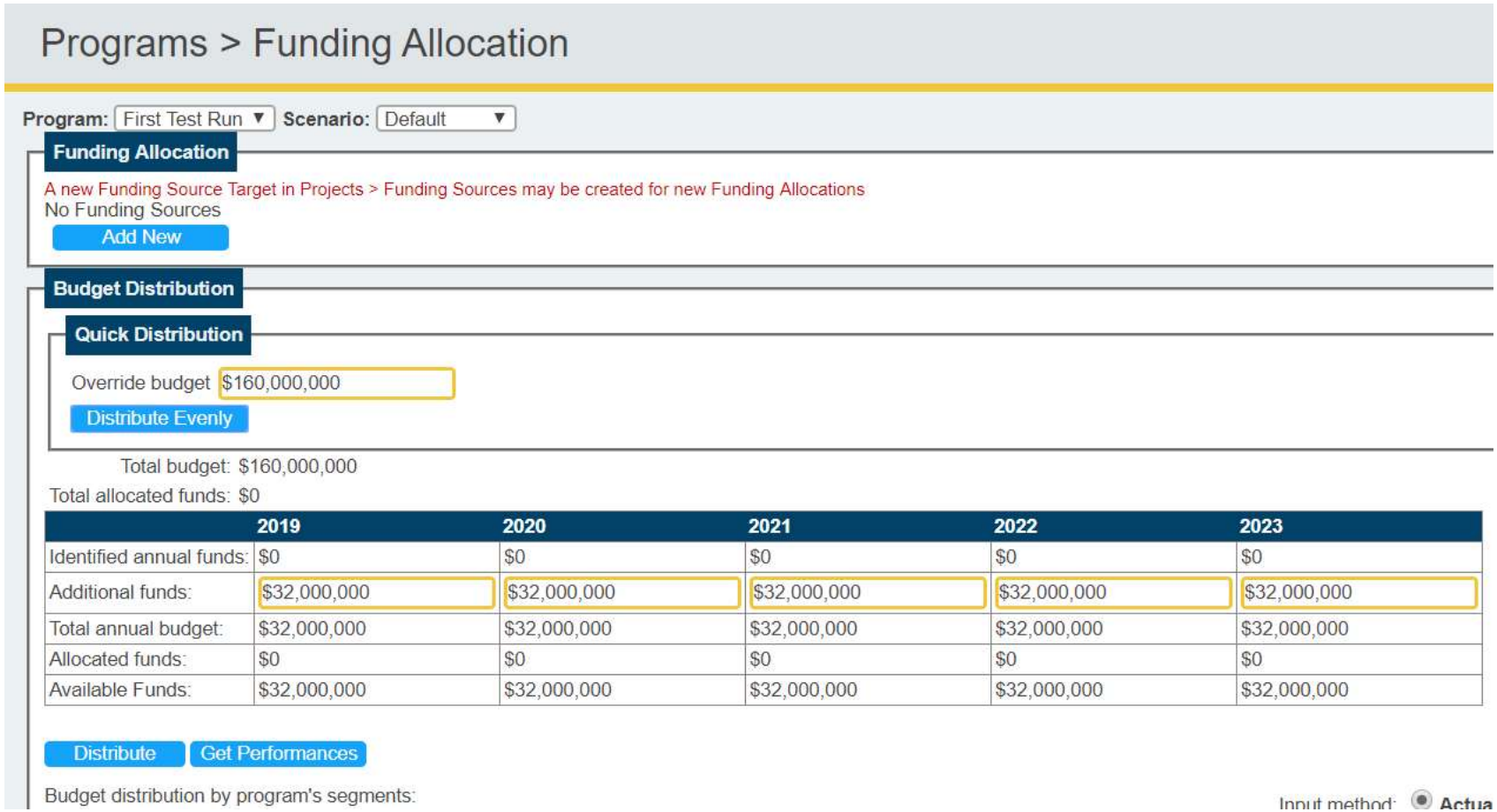
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

CREATE FIRST PROGRAM

REFINE

Distribute a budget.



	2019	2020	2021	2022	2023
Identified annual funds:	$0	$0	$0	$0	$0
Additional funds:	$32,000,000	$32,000,000	$32,000,000	$32,000,000	$32,000,000
Total annual budget:	$32,000,000	$32,000,000	$32,000,000	$32,000,000	$32,000,000
Allocated funds:	$0	$0	$0	$0	$0
Available Funds:	$32,000,000	$32,000,000	$32,000,000	$32,000,000	$32,000,000

We give it a budget.

Create First Program

INSTALL BrM

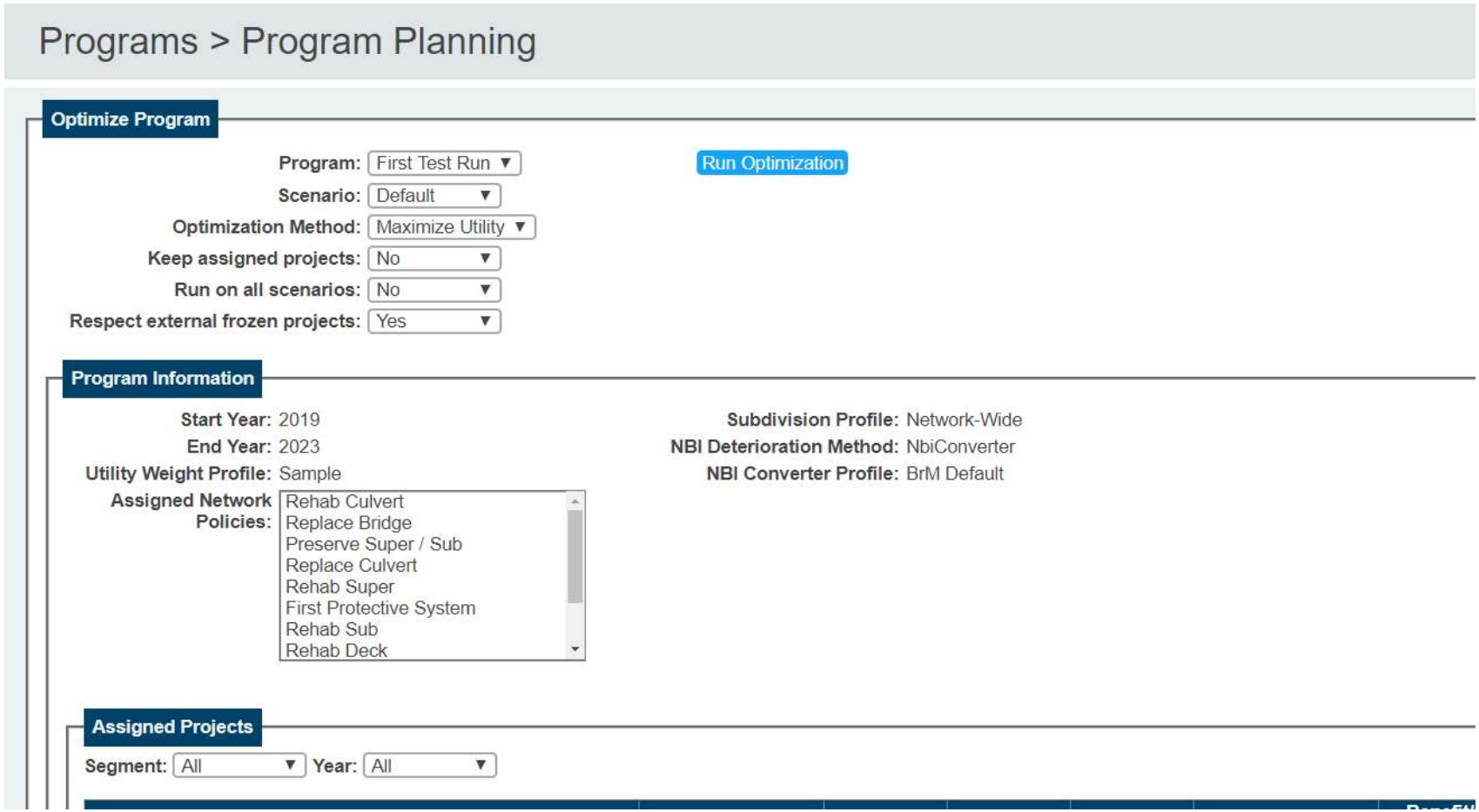
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

CREATE FIRST PROGRAM

REFINE

Run your first optimization.



And then we click run.

Create First Program

INSTALL BrM

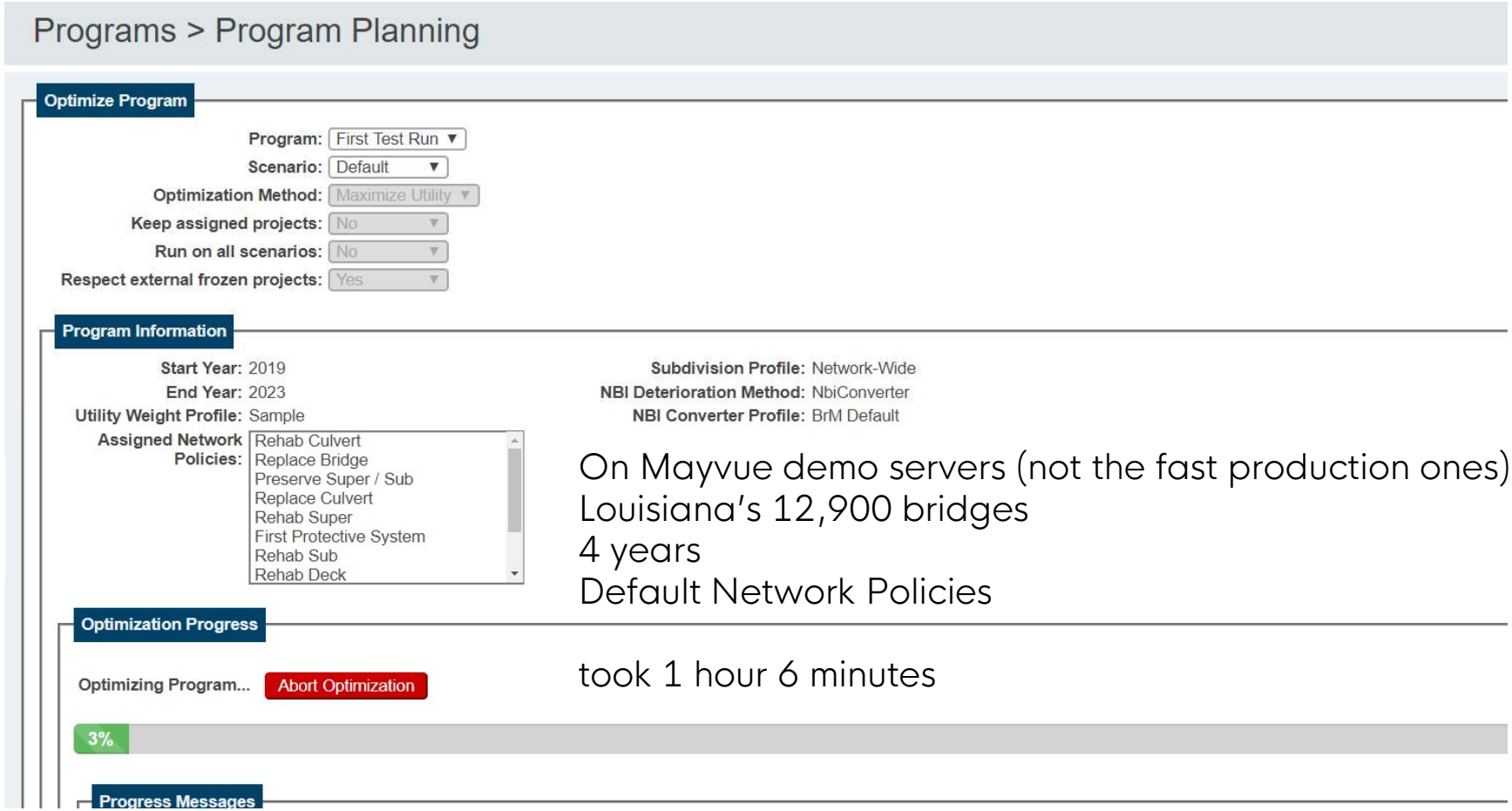
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

CREATE FIRST PROGRAM

REFINE

Run your first optimization.



On Mayvue demo servers (not the fast production ones):
Louisiana's 12,900 bridges
4 years
Default Network Policies

took 1 hour 6 minutes

If it doesn't move in the first 5 minutes, then the optimizer is likely listening to the wrong database. Let us know and we can get you on the right path quickly.

Create First Program

INSTALL BrM

GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

CREATE FIRST PROGRAM

REFINE

Review.

Programs > Program Planning

Optimization Progress

Complete!

Progress Messages

Initializing Program Optimization...	9/6/2019 10:22:24 AM
Processing Scenario 'Default'.	9/6/2019 10:23:12 AM
Getting Action Sequences	9/6/2019 10:23:12 AM
Getting Utility Tree	9/6/2019 10:23:14 AM
Processing Segments...	9/6/2019 10:23:14 AM
Retrieving Budgets	9/6/2019 10:23:14 AM
Estimating initial conditions of all segments	9/6/2019 10:23:14 AM
Getting inspections for ALL	9/6/2019 10:23:14 AM
Running deterioration modeling for ALL	9/6/2019 10:23:33 AM
Running deterioration modeling for ALL - 12.8%	9/6/2019 10:23:38 AM
Running deterioration modeling for ALL - 25.6%	9/6/2019 10:23:40 AM
Running deterioration modeling for ALL - 38.4%	9/6/2019 10:23:41 AM

Assigned Projects

Segment: All Year: All

Project Name	Category	Automatic	Cost	Utility	Utility Benefit	Benefit/Cost ($k)	Cost ($k) / Benefit	Year	Frozen	Status
611700000610323(Preserve Deck, Paint Super)	Preservation Work	Yes	$71,264	96.18	6.23	0.0874	$11.44	2019	No	Proposed
023604509012232(Preserve Deck)	No Category	Yes	$71,500	93.87	11.59	0.1621	$6.17	2019	No	Proposed
023600060600001(Preserve Deck)	No Category	Yes	$65,280	90.42	2.41	0.0369	$27.09	2019	No	Proposed
581500000580150(Preserve Deck)	No Category	Yes	$69,040	98.76	6.79	0.0983	$10.17	2019	No	Proposed
612402300309551(Rehab Deck)	No Category	Yes	$159,196	64.78	14.85	0.0933	$10.72	2019	No	Proposed
614700650700391(Rehab Deck)	No Category	Yes	$213,707	80.65	20.85	0.0976	$10.25	2019	No	Proposed
611702530201191(Preserve Deck)	No Category	Yes	$98,600	95.96	14.99	0.152	$6.58	2019	No	Proposed
624804501305152(Rehab Deck)	No Category	Yes	$263,865	90.4	2.57	0.0097	$102.67	2019	No	Proposed
071000310400701(Preserve Deck)	No Category	Yes	$84,175	84.25	3.68	0.0437	$22.87	2019	No	Proposed
035004500605851(Rehab Deck)	No Category	Yes	$198,119	89.72	16.48	0.0832	$12.02	2019	No	Proposed
613908390501891(Rehab Deck, Repaint Super/Sub)	No Category	Yes	$68,068	69.17	16.93	0.2487	$4.02	2019	No	Proposed
023600000020468(Preserve Deck)	No Category	Yes	$56,030	81.37	0.26	0.0046	$215.50	2019	No	Proposed
035100050105491(Replace Deck)	No Category	Yes	$104,120	66.25	12.98	0.1247	$8.02	2019	No	Proposed
035030037913641(Rehab Deck)	No Category	Yes	$262,480	80.75	34.21	0.1303	$7.67	2019	No	Proposed
611702530300731(Rehab Deck, Rehab Sub)	No Category	Yes	$410,916	77.22	16.37	0.0398	$25.10	2019	No	Proposed

First Previous 1 2 3 Next Last Items per page: 15

And then you have your first list of projects. It won't be customized, it won't be reflective of what you would do, but you will at least have had the model run once.

Create First Program

INSTALL BrM

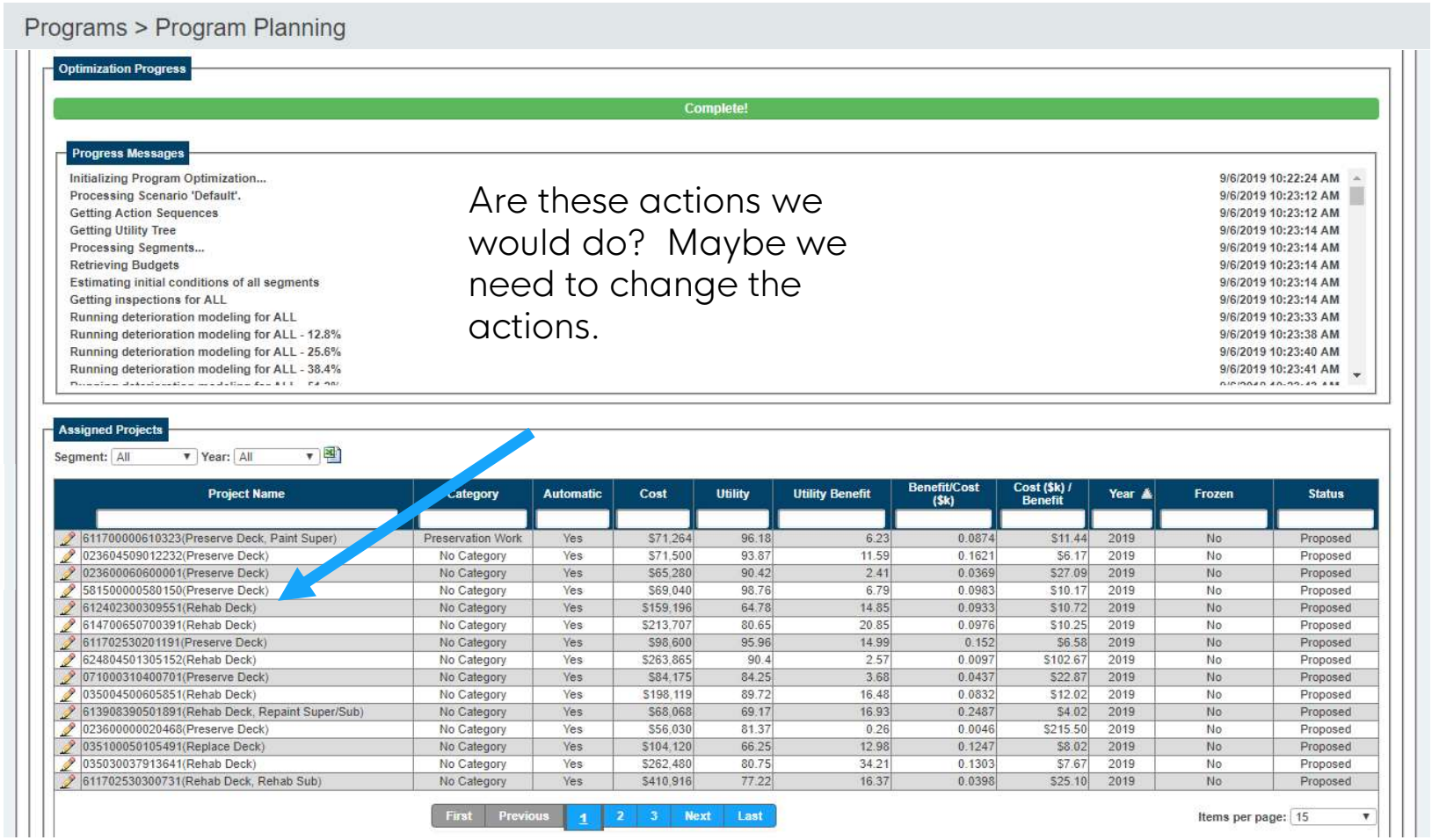
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

CREATE FIRST PROGRAM

REFINE

Review.



Are these actions we would do? Maybe we need to change the actions.

Create First Program

INSTALL BrM

GET BRIDGE DATA

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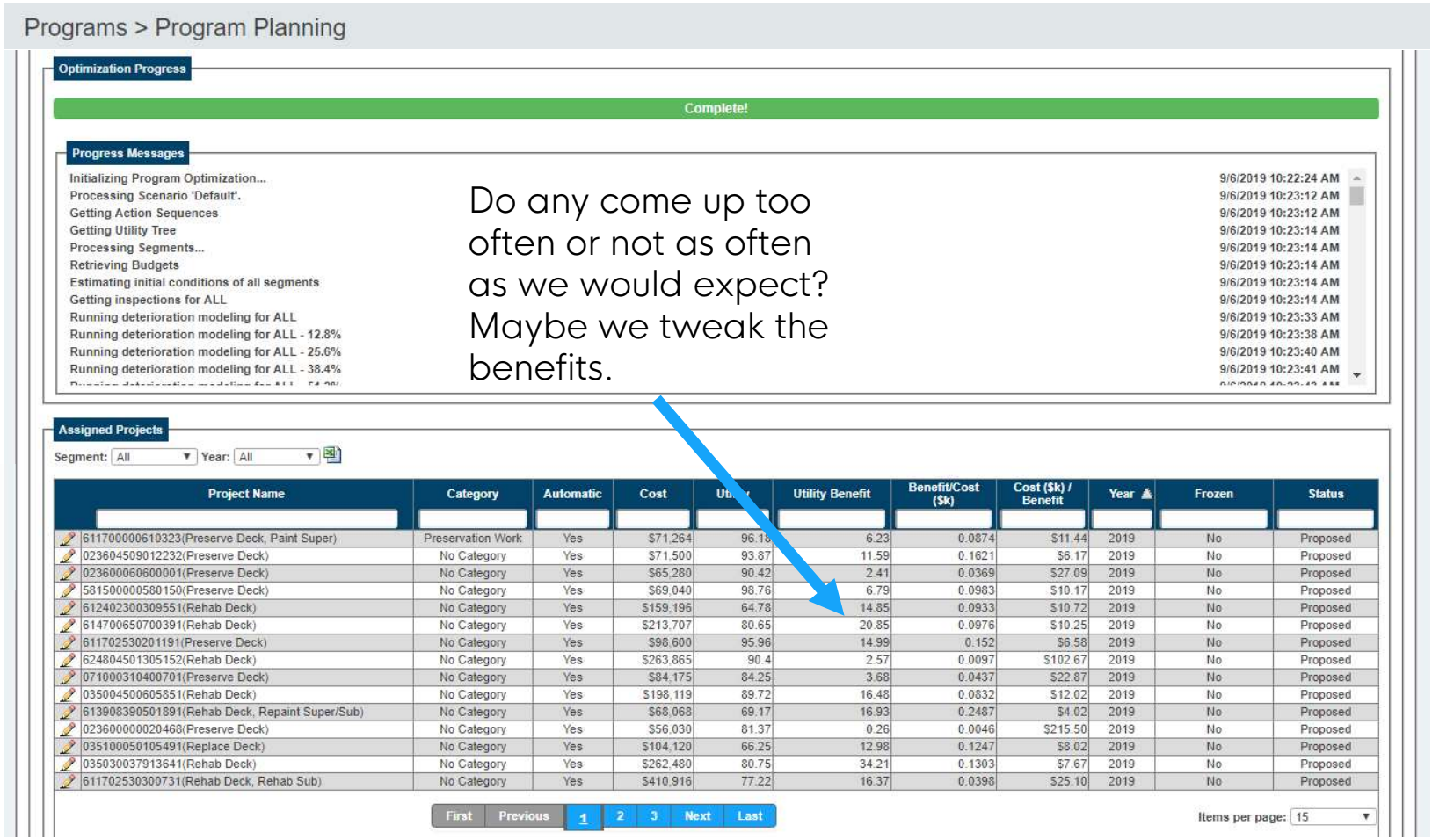
REFINE

Review.



Do any come up too often or not as often as we would expect? Maybe we tweak the benefits.

Create First Program

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Review.

Programs > Program Planning

Optimization Progress

Complete!

Progress Messages

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Running deterioration modeling for ALL - 25.6%	9/6/2019 10:23:40 AM
Running deterioration modeling for ALL - 38.4%	9/6/2019 10:23:41 AM

Are the costs close to realistic?

Assigned Projects

Segment: All Year: All

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023600000020468(Preserve Deck)	No Category	Yes	$56,030	81.37	0.26	0.0046	$215.50	2019	No	Proposed
035100050105491(Replace Deck)	No Category	Yes	$104,120	66.25	12.98	0.1247	$8.02	2019	No	Proposed
035030037913641(Rehab Deck)	No Category	Yes	$262,480	80.75	34.21	0.1303	$7.67	2019	No	Proposed
611702530300731(Rehab Deck, Rehab Sub)	No Category	Yes	$410,916	77.22	16.37	0.0398	$25.10	2019	No	Proposed

First Previous 1 2 3 Next Last

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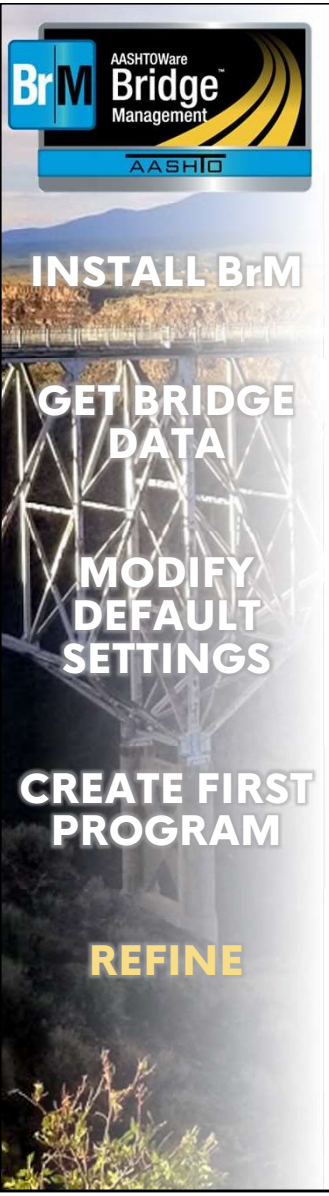

AASHTOWare
Bridge
Management
AASHTO
INSTALL BrM
GET BRIDGE DATA
MODIFY DEFAULT SETTINGS
CREATE FIRST PROGRAM
REFINE

REFINE

Refine.

INSTALL BrM

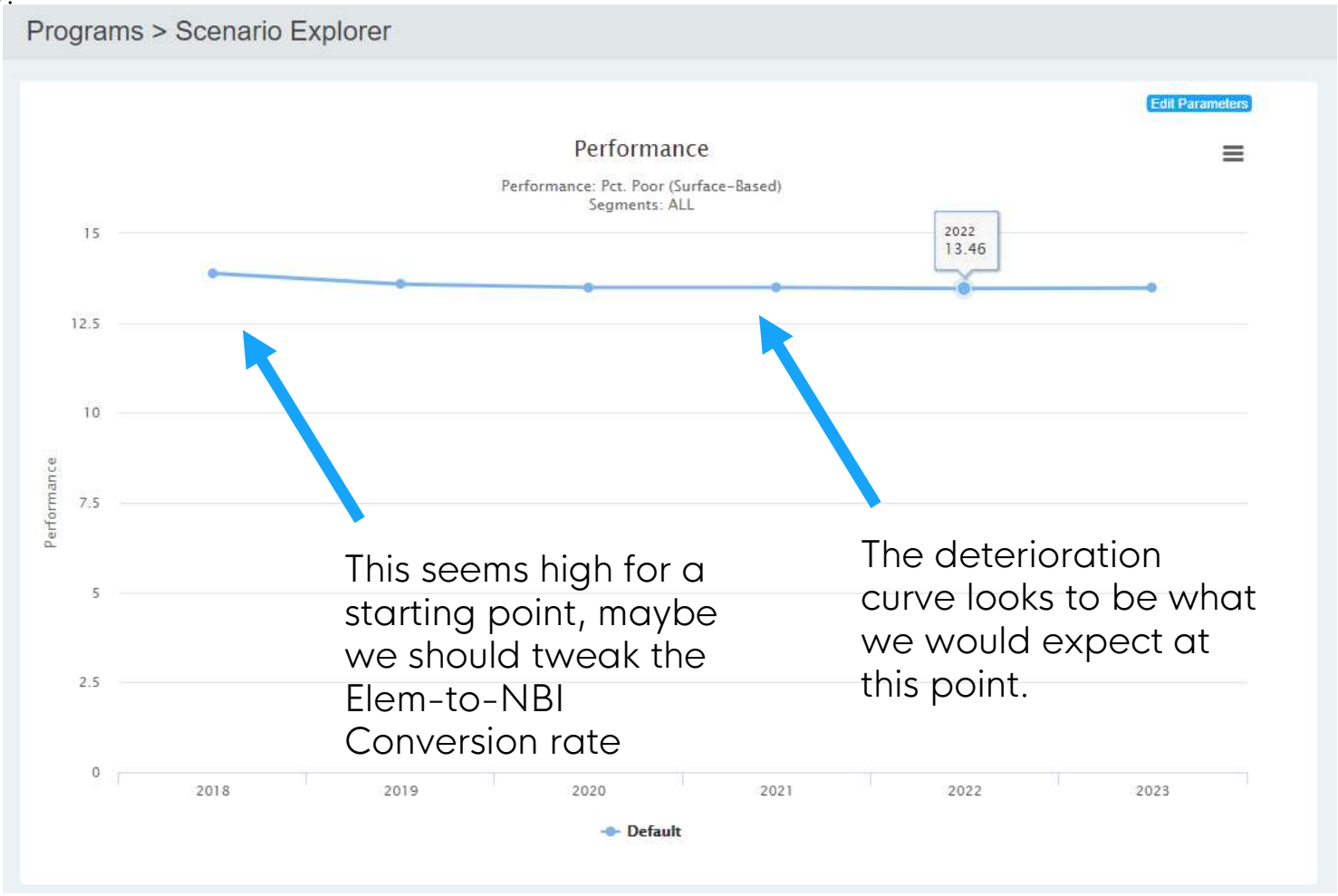
GET BRIDGE DATA

MODIFY DEFAULT SETTINGS

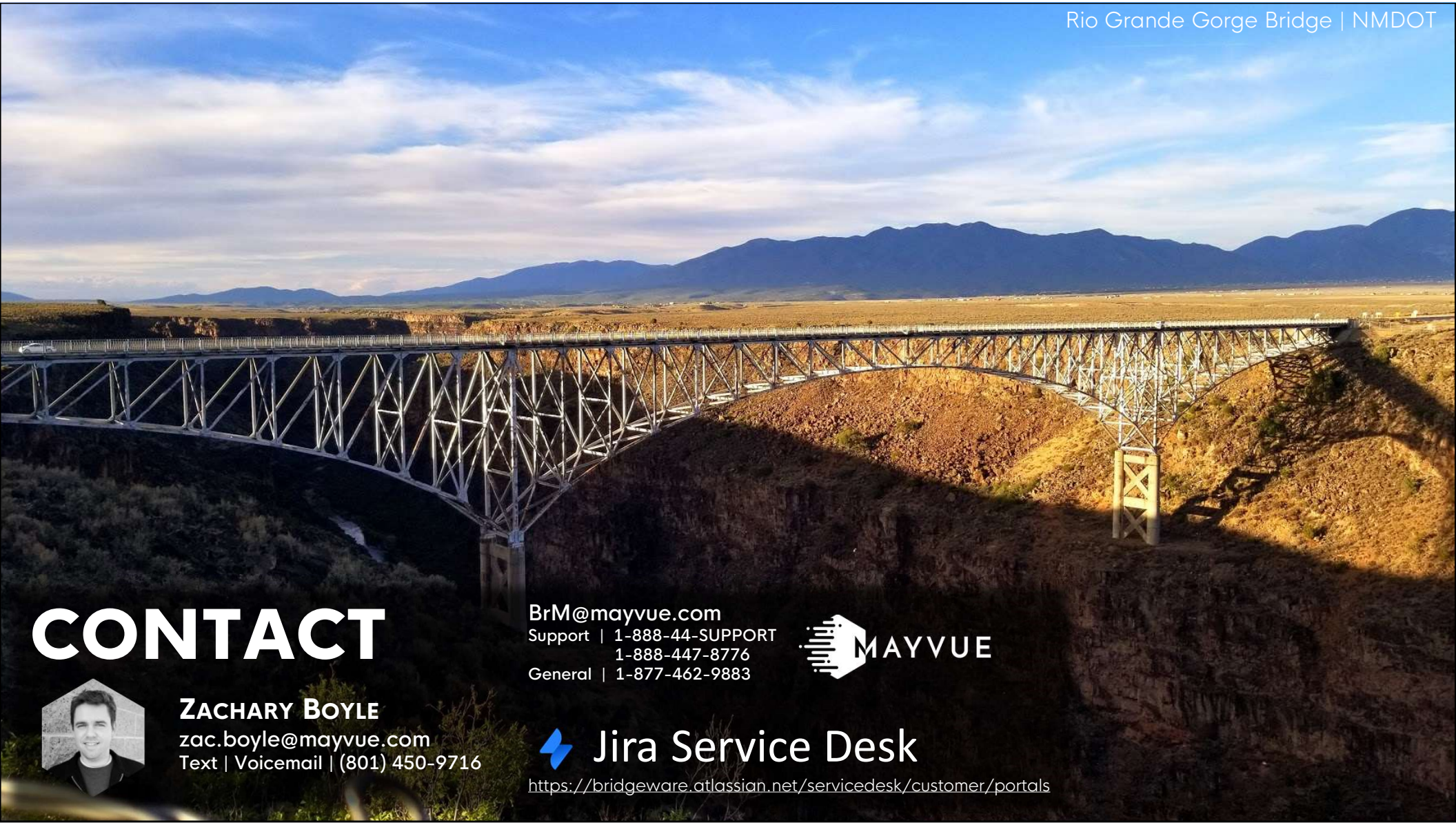
CREATE FIRST PROGRAM

REFINE

Review.



And from here, you are off to the races. Refine your setup, and run it again. Compare notes with other states. Ask Mayvue for suggestions.



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Jira Service Desk
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