



# *Situational Awareness Apps: Adding Eyes and AI to Public Works Toolbox*

Thomas J. Bamonte, NCTCOG Transportation

Public Works Roundup | 9.13.2022

# Situational Awareness Apps

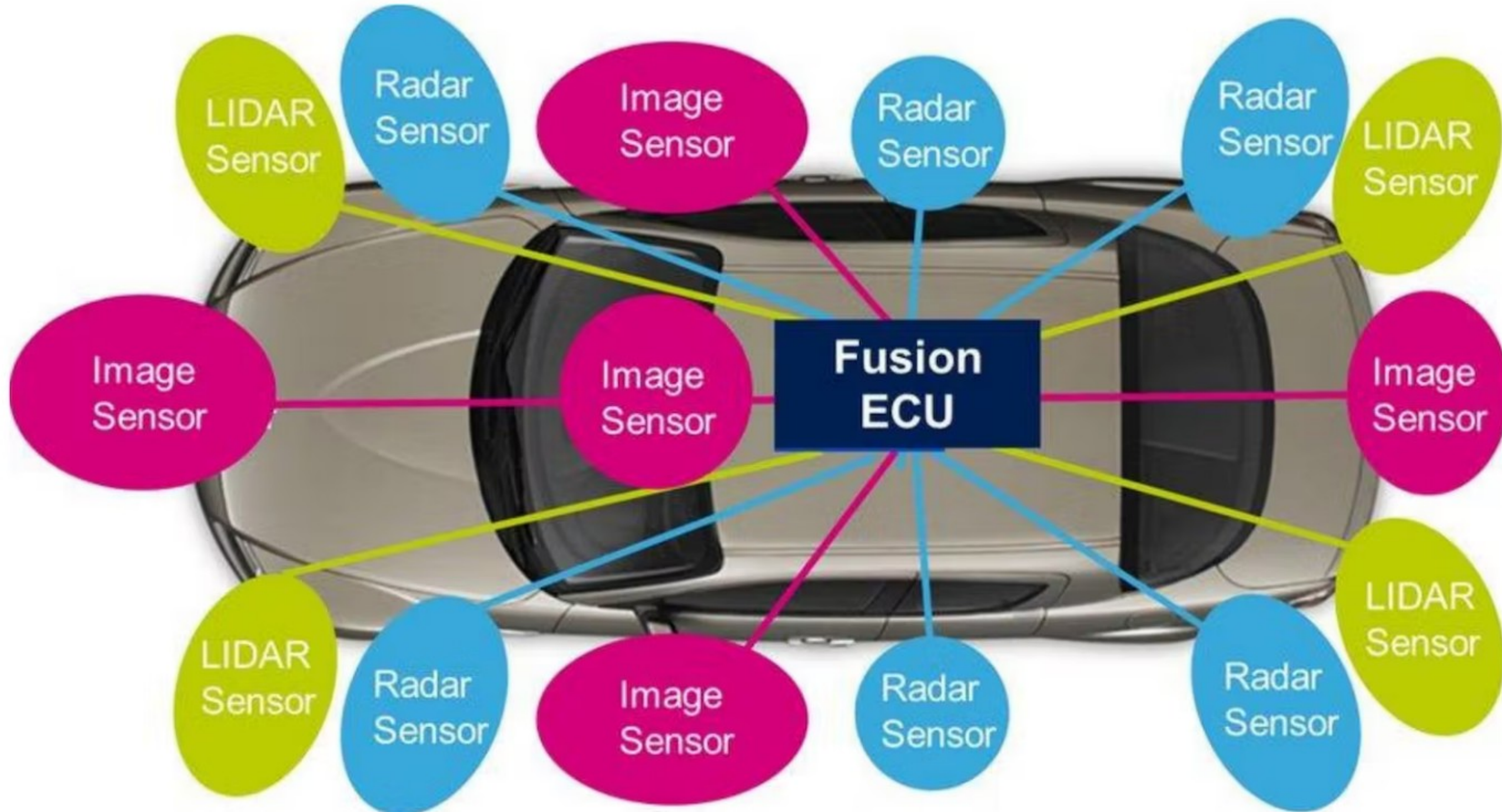


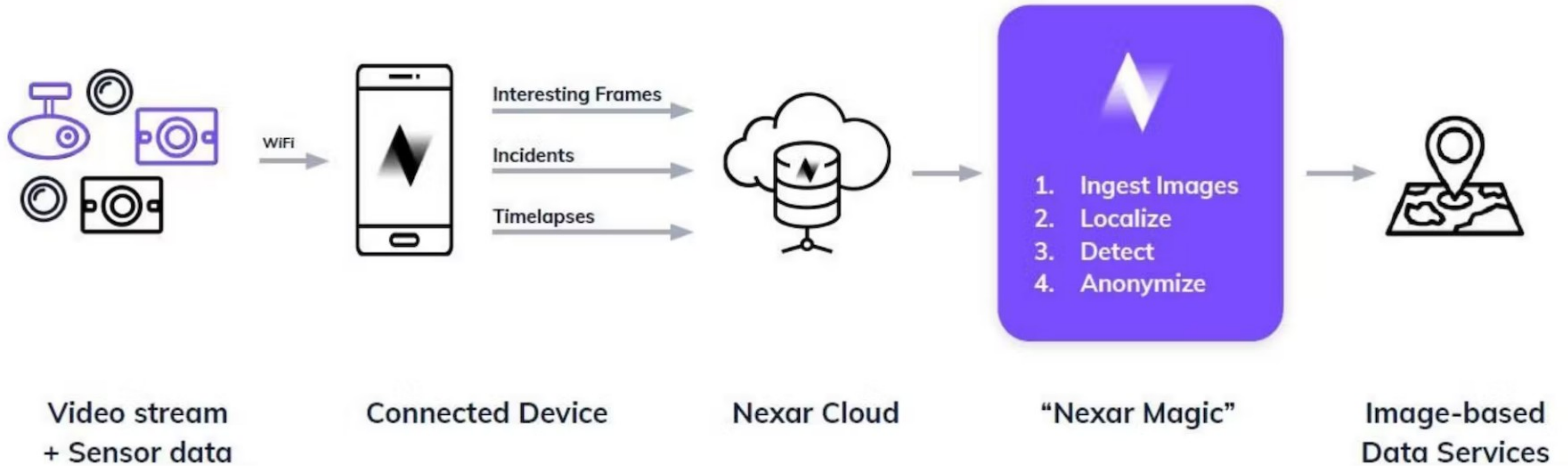
Use crowdsourced  
connected vehicle video

Public Works and  
Transportation get better  
awareness of wide range of  
roadway conditions

No field equipment or IT  
investment needed

# Vehicles = Rolling Data Probes





# If you can see it, so can Payver.

+300k daily active drivers using dash cameras mounted to their windshields in the US totaling over 15M miles of seen roadway in the US everyday.



US Highway Network

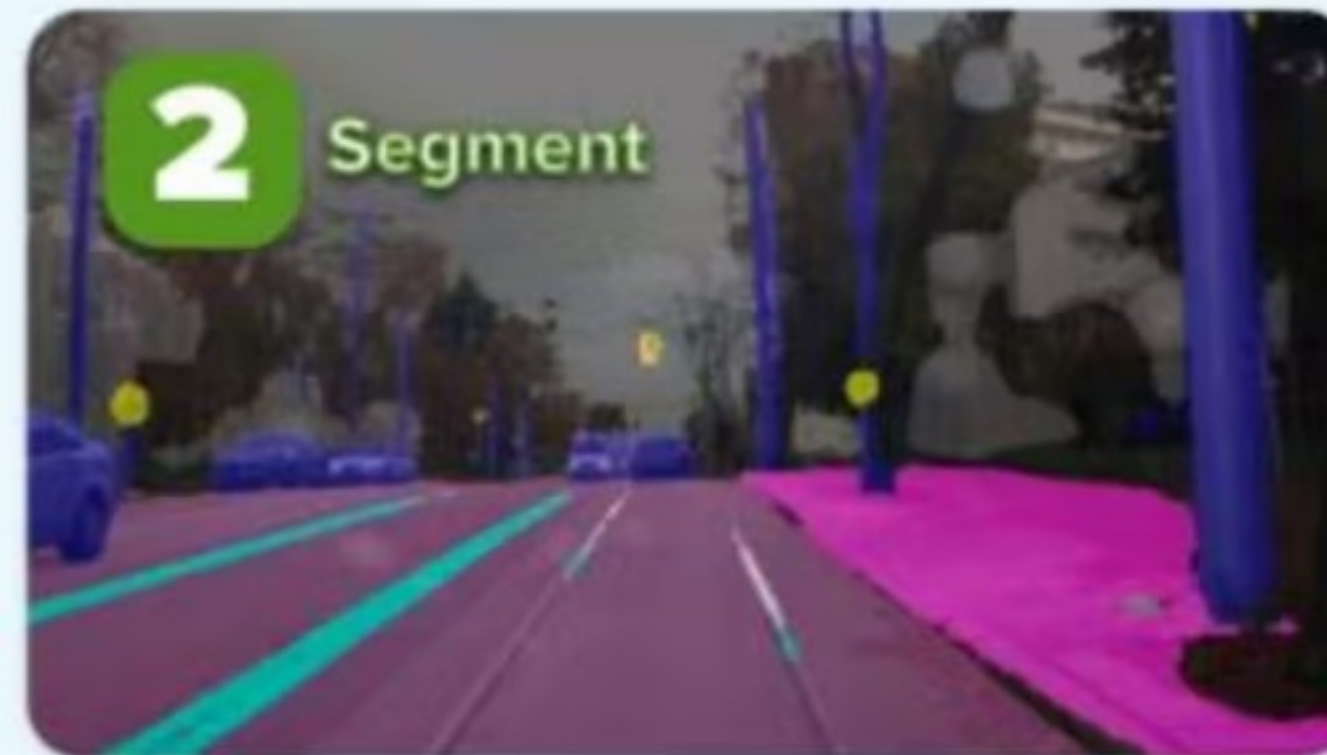


Local Roads

# What is AI Vision?

AI vision sees the roadway in full detail. Think google street view but updated everyday with in depth understanding and notification ability.

◆ Imagery is collected through cameras that are already on and around your roadways.



◆ Payver highlights segments that are valuable to you and provides near real-time insights

◆ Just like your eyes see the roadways as you drive, so does Payver

# NCTCOGTrans Plan: Situational Awareness Apps

1. Assessment [in progress]
2. Procurement
3. Support: DFW partners—e.g., Public Works, Transportation--get access to the tools(s) via regional license(s)
4. Tools allow data download into agency databases (e.g., work orders)



Search for locations

Explore map data

Upload

DATA SETS (1) Remove All

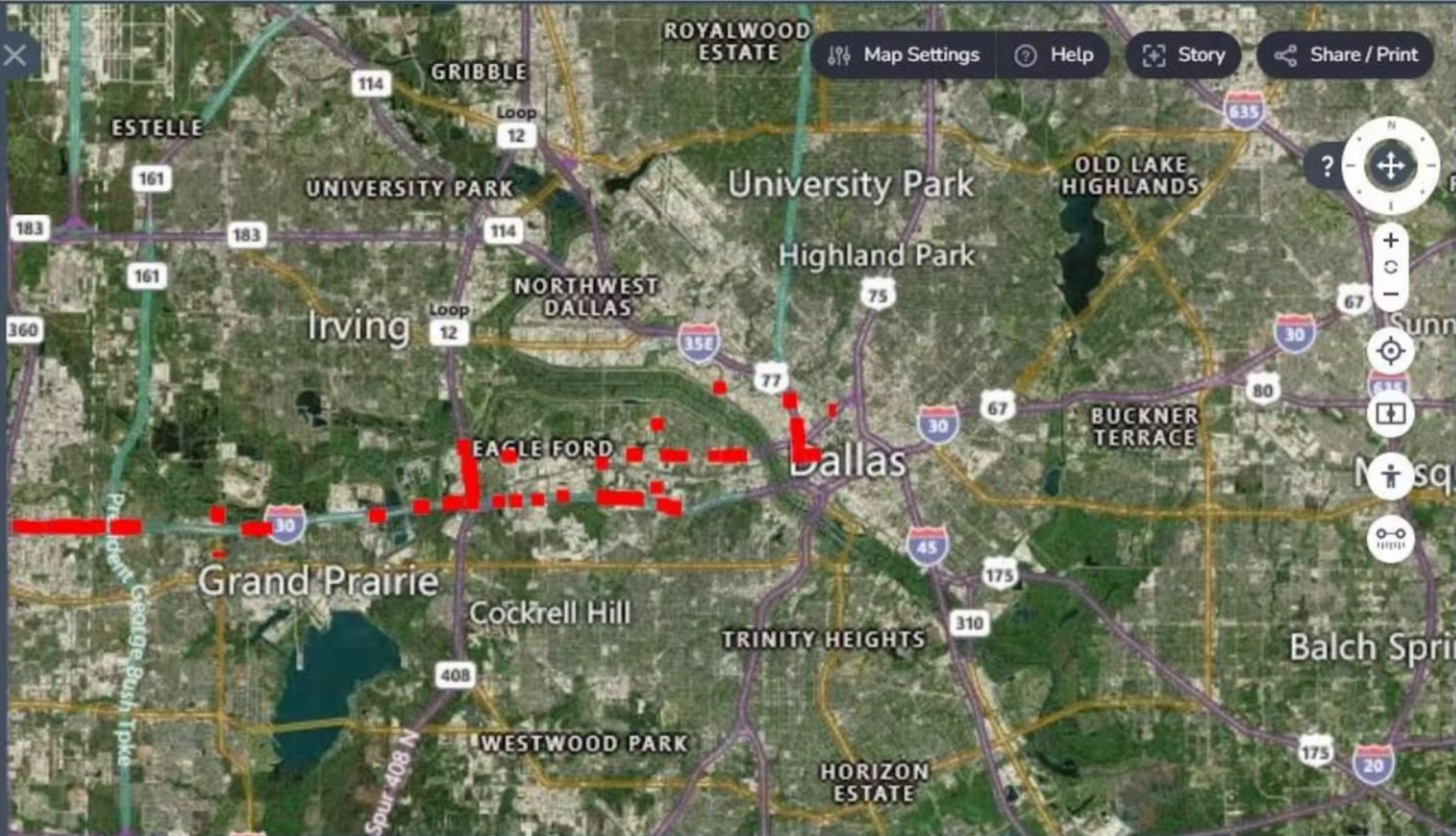
August Construction Barrels (8/7/2022)

ZOOM TO REMOVE

Opacity: 97 %

Styles: Default style

Red Square point





payver  
BY BLYNCSY

Search for locations

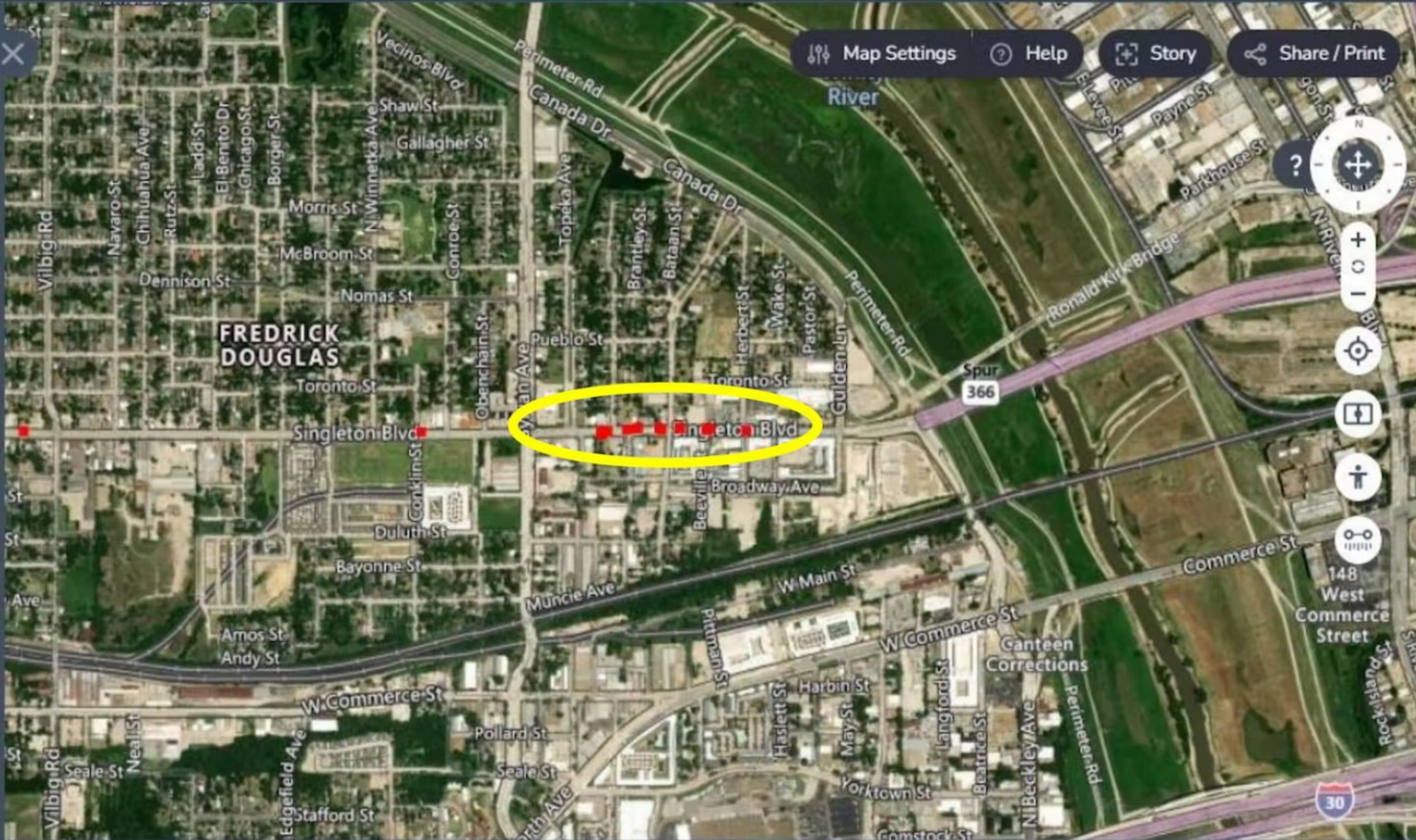
Explore map data

Upload

DATA SETS (1)

Remove All

August Construction Barrels (8/7/2022)



terria CESIUM ion Copyright Blynscsy, Inc 2022

Lat 32.78735°N Lon 96.84662°W

300 m

Map Settings Help Story Share / Print

Feature Information

August Construction Barrels (8/7/2022) - Site Data

Date: 5:40 PM, 07/18/2022 UTC Download this Table

+ Additional Information +

August Construction Barrels (8/7/2022) - Site Data

August Construction Barrels (8/7/2022) - Site Data

Lat / Lon 65.09386° S, 18.21314° W

terria CESIUM ion Copyright Blynscy, Inc 2022





blynCSY™



**payver**  
BY BLYNCSY

Search for locations

Explore map data Upload

DATA SETS (2) Remove All

- August Paintline Samples (All) (8/7/2022)  
ZOOM TO REMOVE Opacity: 80 % Styles: Default style
- August Paintline Samples (All) (8/14/2022)  
ZOOM TO REMOVE

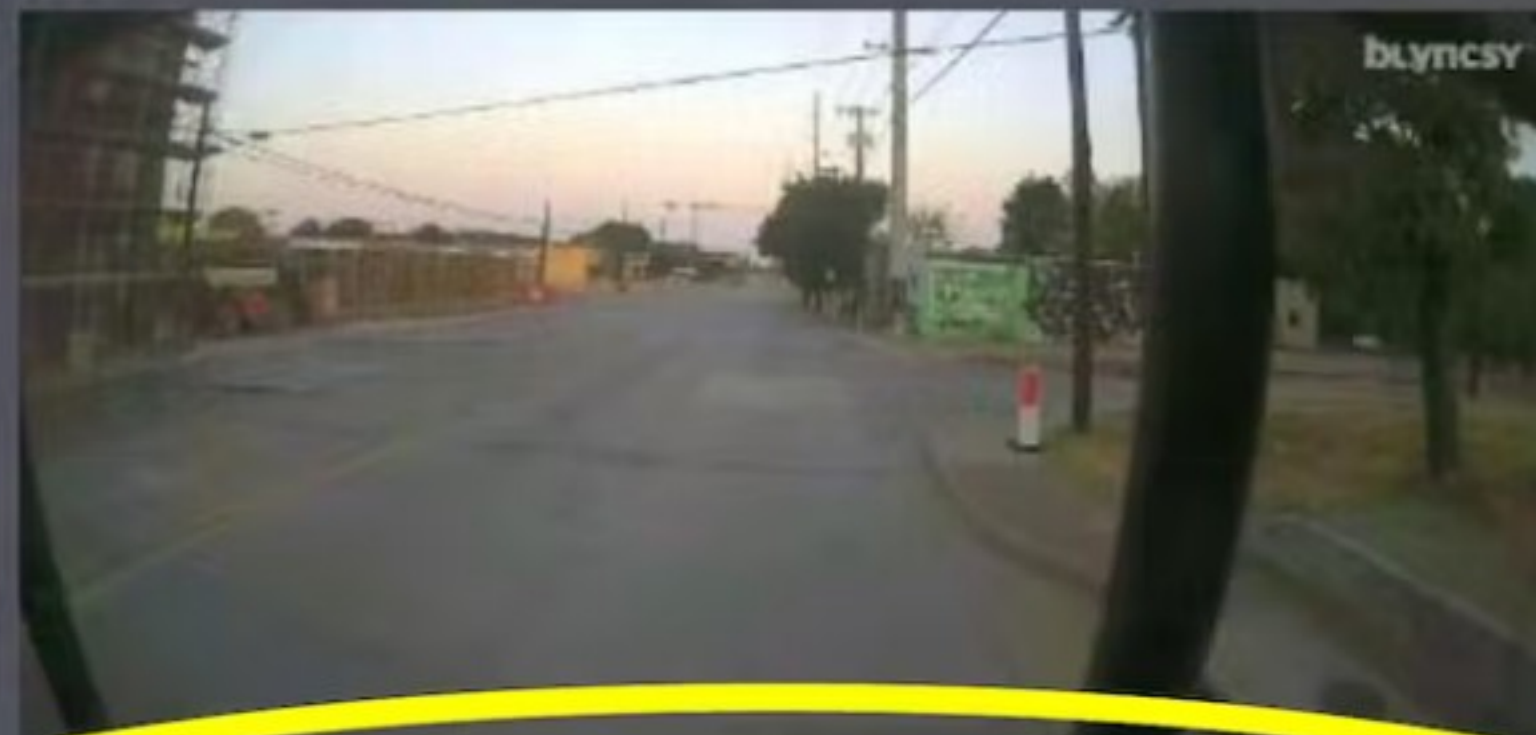
Map Settings Help Story Share / Print

### Feature Information

More than 100 August Paintline Samples (All) (8/7/2022) features were found. The first 100 are shown below.


August Paintline Samples (All) (8/7/2022) - Site Data

Date: 6:51 AM, 08/06/2022 Download this Table



**Expert Correction** ?

Scoring Guidelines\*



terria CESIUM ion Copyright Blynscsy, Inc 2022 Lat 32.79057°N Lon 96.84647°W 300 m

blynCSY™



**payver**  
BY BLYNCSY

Search for locations

Explore map data Upload

DATA SETS (1) Remove All

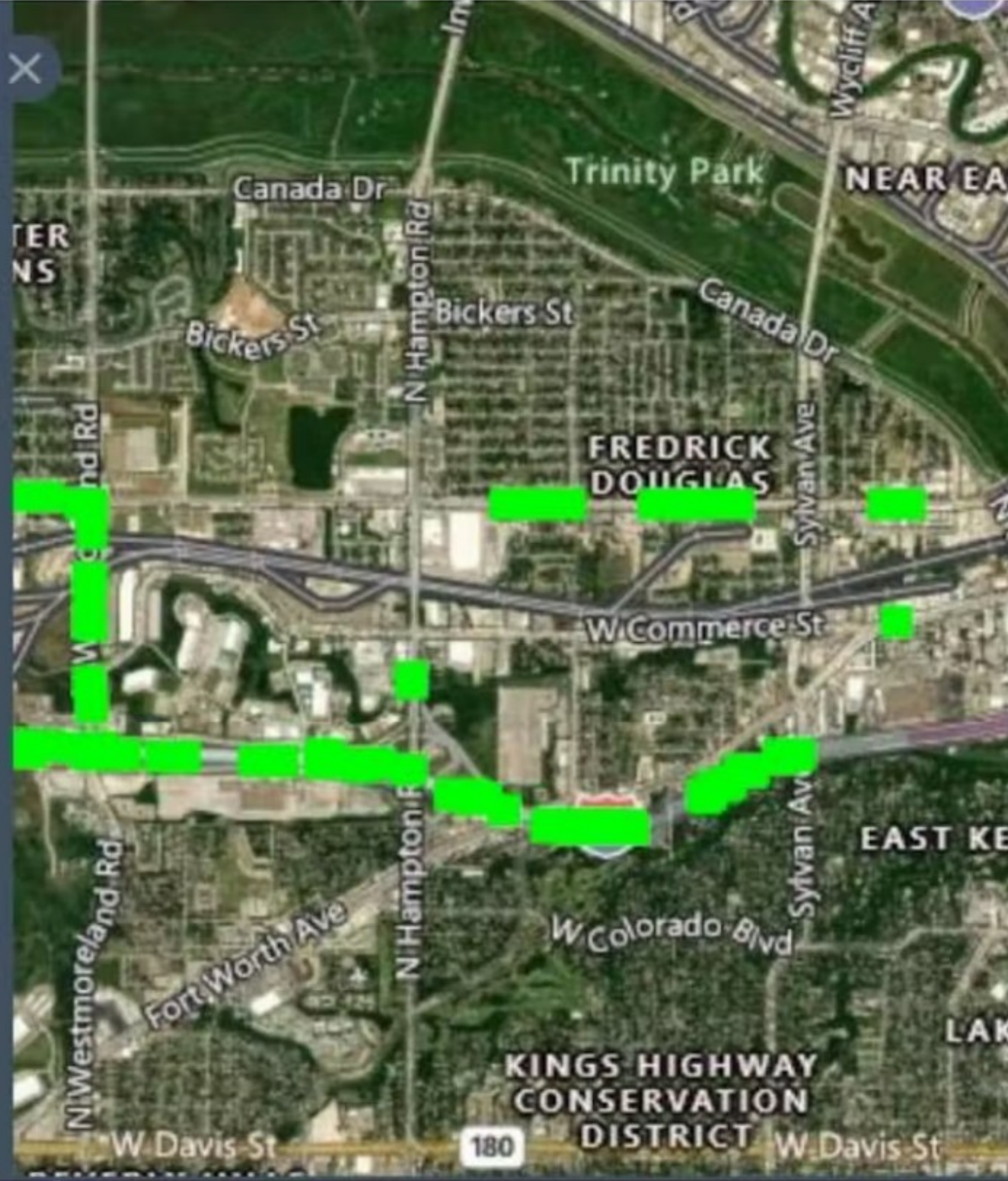
**August Streetlights**

ZOOM TO REMOVE

Opacity: 100 %

Styles:  
Default style

- Light On
- Light Off



Map Settings Help Story Share / Print

Feature Information

August Streetlights - Site Data

Date: 3:27 AM, 07/03/2022 Download this Table

+ Additional Information +

Lat / Lon 86.44582°S, 113.27275°W





**payver**  
BY BLYNC SY

Search for locations

Explore map data Upload

DATA SETS (1) Remove All

August Crosswalk Scores

ZOOM TO REMOVE

Opacity: 80 %

Styles: Default style


- No Data
- Good: 0-1
- Score of 1 - 1.5
- Score of 1.5 - 2
- Score of 2-3
- Score of 3-4

Map Settings Help Story Share / Print

Feature Information

August Crosswalk Scores - Site Data

Date: 4:09 PM, 09/06/2022 UTC Download this Table



+ Additional Information +

Lat / Lon 85.12179°S, 99.47637°W

terria CESIUM ion Copyright Blyncsy, Inc 2022 Lat 32.78231°N Lon 96.83538°W 100 m

blynCSY™



blynCSY™



**payver**  
BY BLYNCSY

Search for locations

Explore map data Upload

DATA SETS (1) Remove All

August Crack Detections (8/21/2022)

ZOOM TO REMOVE

Opacity: 80 %

Styles:  
Default style

Red Square point



Map Settings Help Story Share / Print

Feature Information

August Crack Detections (8/21/2022) - Site Data

Date: 7:21 AM, 08/20/2022 Download this Table

+ Additional Information +

August Crack Detections (8/21/2022) - Site Data

Lat / Lon 86.44582°S, 81.97440°E

Lat 32.78234°N Lon 96.83543°W 100 m

blynCSY



# Detections



# Payver Detection Menu

## Roadway detections

- Striping
- Striping Visibility
- Pavement Condition/Paser
- Pavement Distress
- Road Smoothness
- Pot Hole
- Curb detection
- Road inventory
- Sidewalk inventory
- Bike Lane Striping
- Crosswalk striping
- Ped Crossing Striping
- Culvert detection
- Continuous Sidewalk
- Snow road visibility
- Curb/gutter presence
- Raised Pavement Marker
- Missing RPMs
- Tree down on road

## Impact Attenuator

- Location
- Damage

## Construction Zones

- Barrel/ Vertical/ Cones
- Arrow/ Message boards
- Triangle/ Diamond Signs
- MOT(traffic control) vs Plan
- Barricades

## Signs

- Stop Sign
- Yield Sign
- Construction Sign
- Stop Sign
- Construction Sign
- MUTCD Sign Library
- Non- Department Sign in ROW
- Ped Crossing Sign
- Ped Crossing Sign Damage

## Guardrail

- Guardrail presence
- Guardrail damage
- Guardrail size est
- Cable barrier damage

## Sign/Lighting

- Streetlight out night
- Streetlight on day
- Signal head out

## Vegetation

- Vegetation Encroachment
- Grass height est
- Power Line
- Vegetation encroaching Power Line

## Debris

- Debris by size
- Animal carcass
- Debris in lane
- Trash bag (orange/white)

## Other

- Right of way encroachment
- Standing water
- Fire Hydrant
- Bridge Weight limit signs
- High Res Satellite Imagery on Demand
- Bus Stops





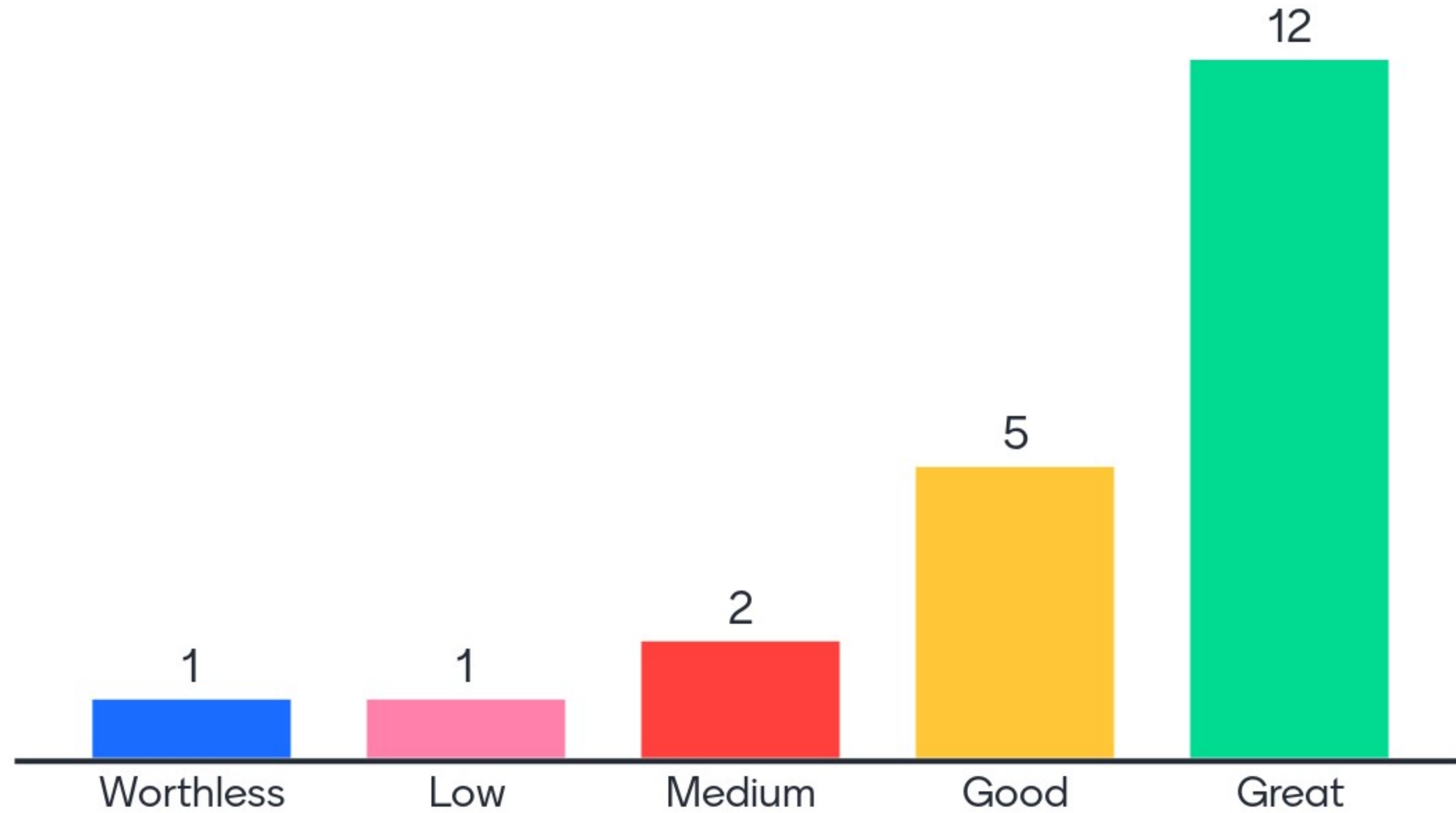
# Lane Markings: Visibility and Grading

**Striping** - Detect road striping and grade visibility, as well as track historical change over time with a degradation curve. Includes notifications of areas of road where striping quality is the worst for proactive maintenance

**Striping Nighttime Reflectivity/Luminosity** - Using only nighttime imagery, lane markings will be graded on a general reflectivity/luminosity. Highlighting sections of roadway with low reflectivity.

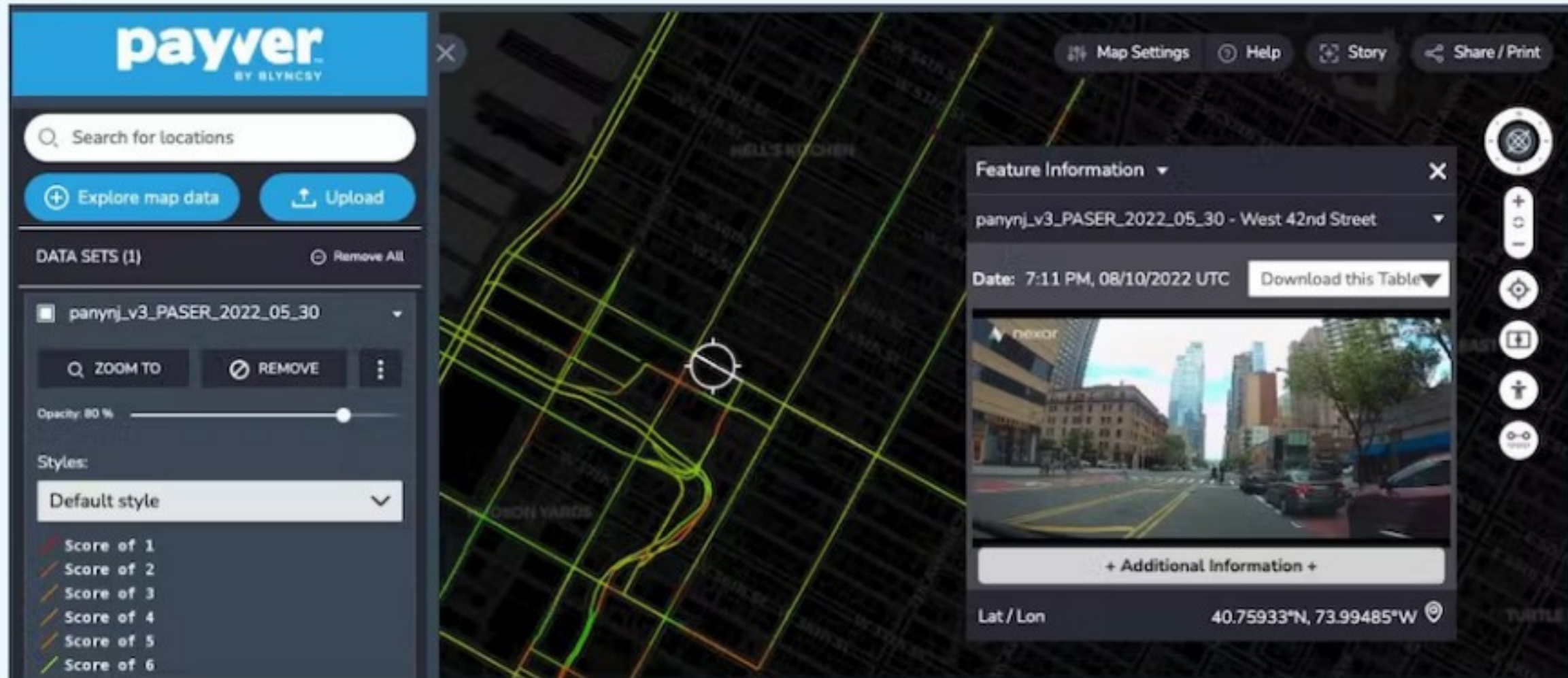
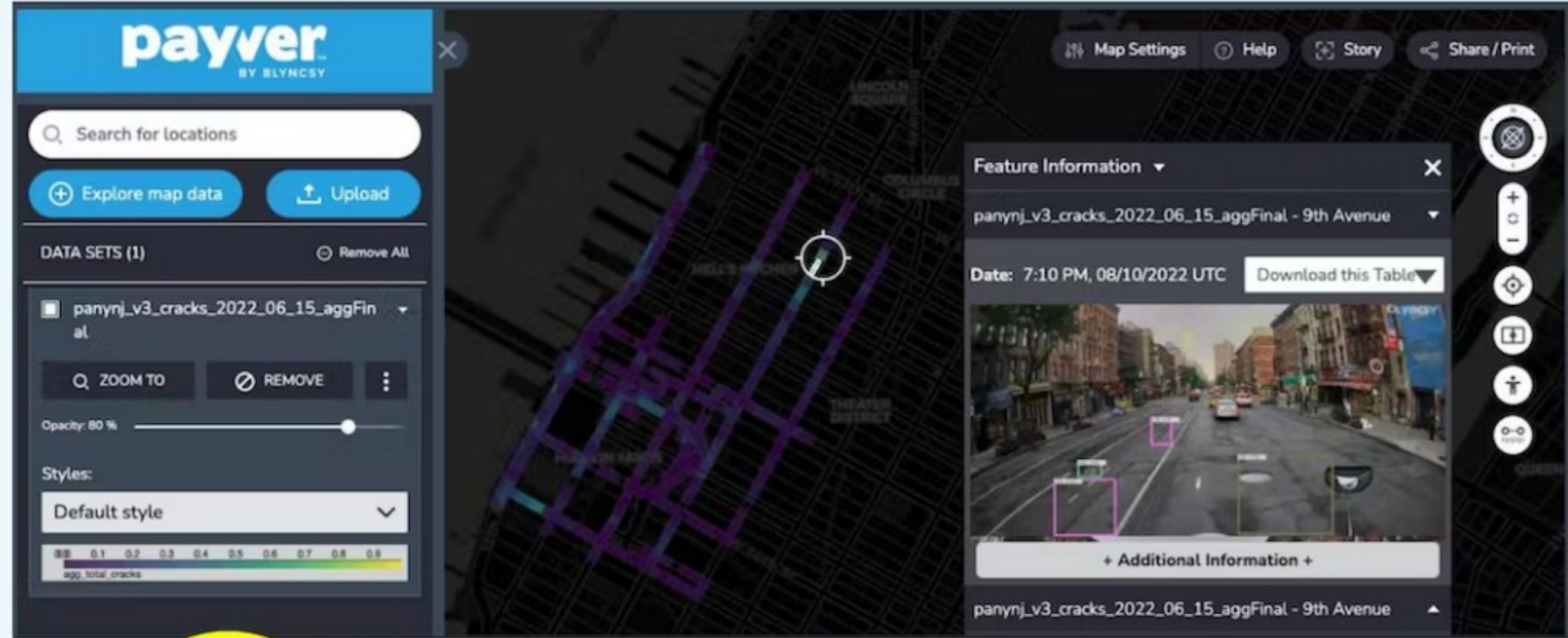


# How useful is regular detection of lane striping quality/reflectivity?



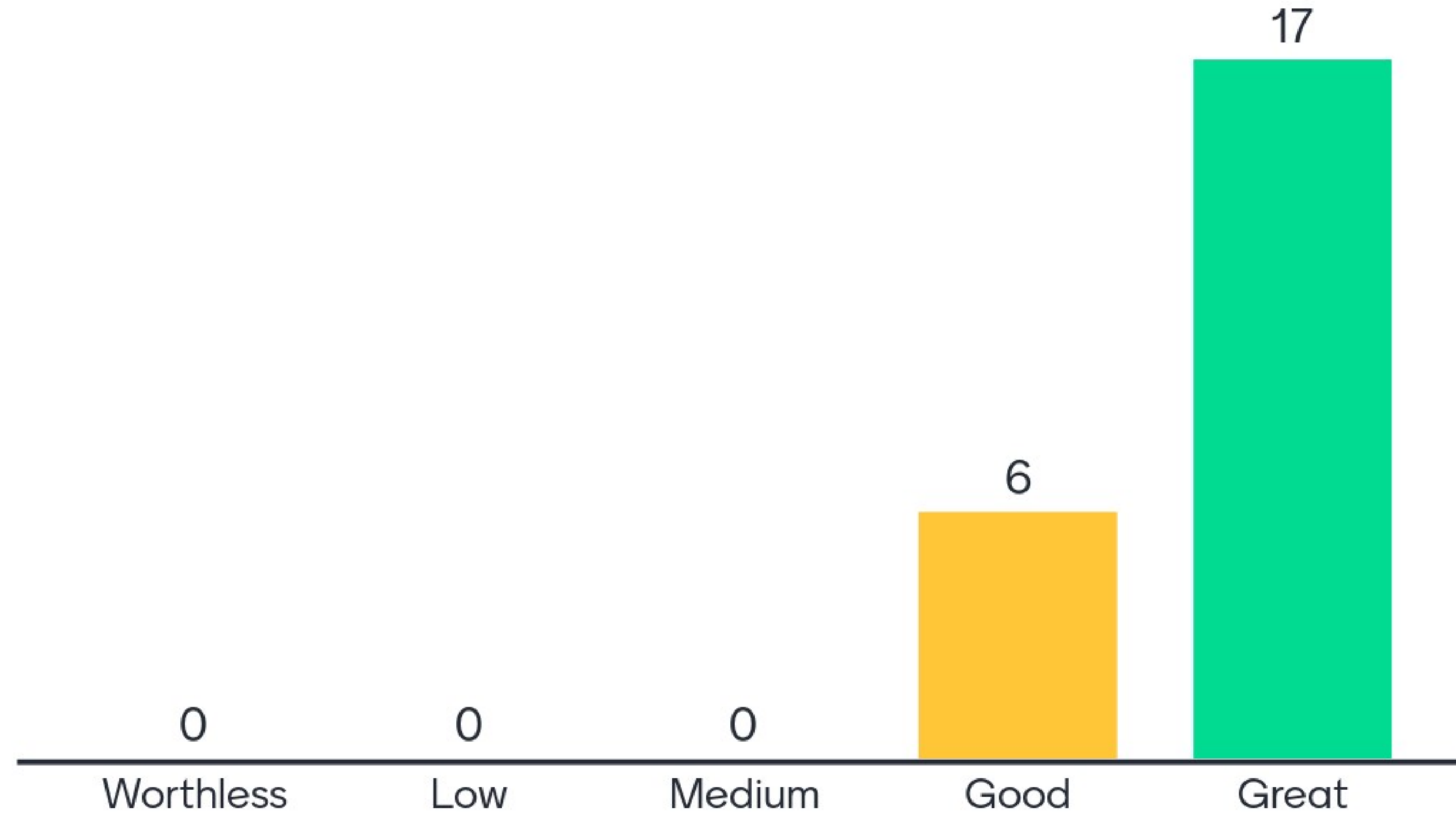
# Pavement Condition

**Cracking** - Detects cracks and potholes with a probability of accuracy including estimate of size.



**PASER** - Remote Pavement Surface Evaluation and Rating.

# How useful is regular monitoring of pavement condition?



# Crosswalks

Detect quality and fading of crosswalks.



payver  
BY BLYNCSY

Search for locations

Explore map data Upload

DATA SETS (1) Remove All

August Crosswalk Scores

ZOOM TO REMOVE

Opacity: 80%

Styles: Default style

- No Data
- Good: 0-1
- Score of 1 - 1.5
- Score of 1.5 - 2
- Score of 2-3
- Score of 3-4

Map Settings Help Story Share / Print

Feature Information

- August Crosswalk Scores - Site Data
- August Crosswalk Scores - Site Data
- August Crosswalk Scores - Site Data
- August Crosswalk Scores - Site Data

Date: 7:05 PM, 08/10/2022 UTC Download this Table

+ Additional Information +

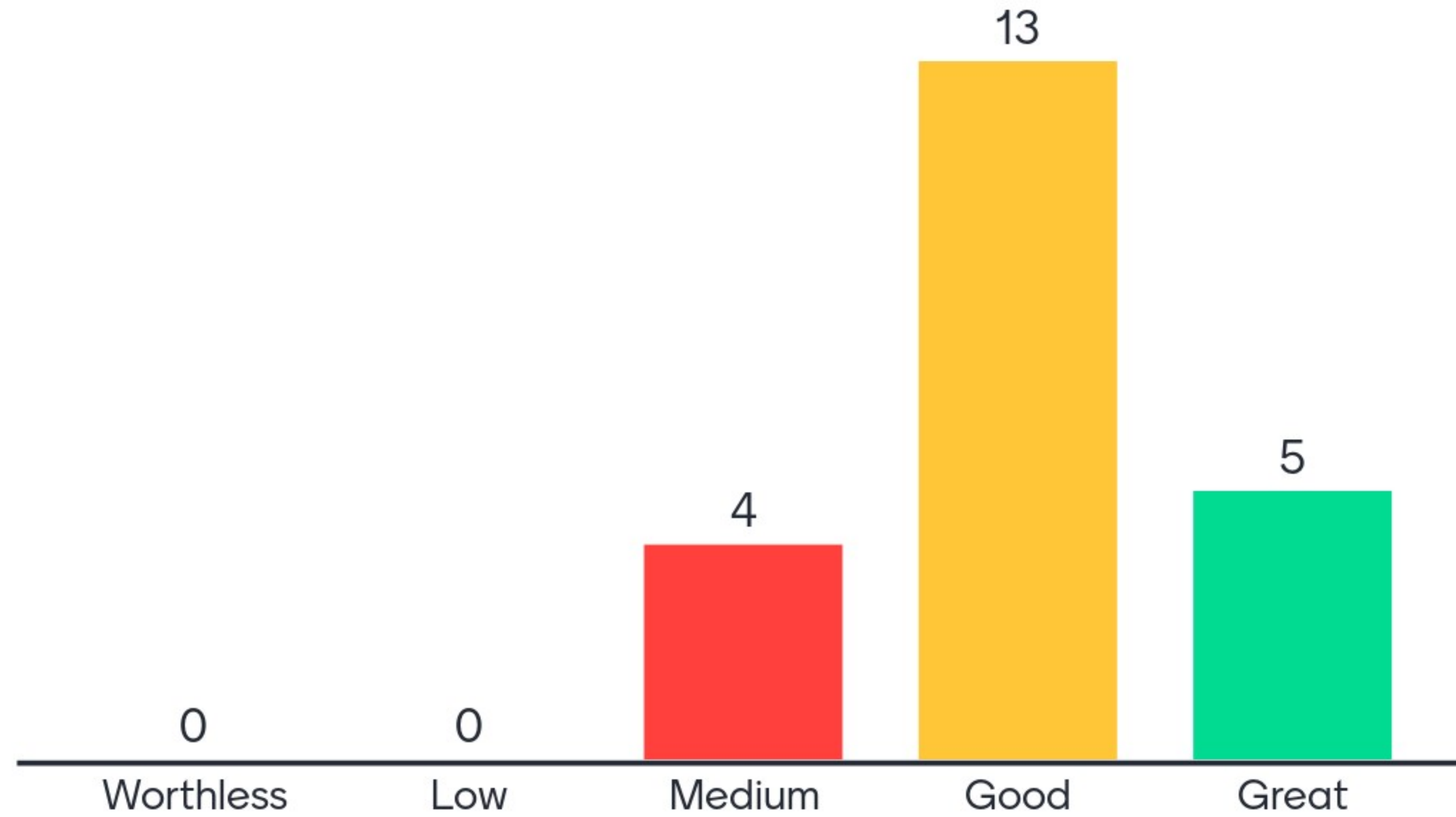
August Crosswalk Scores - Site Data

August Crosswalk Scores - Site Data

No Data

- Good: 0-1
- Score of 1 - 1.5
- Score of 1.5 - 2
- Score of 2-3
- Score of 3-4

# How useful is regular detection of crosswalk quality?



# Work Zone Detection

Detect and locate barrels and other work zone signage  
Work Zone Data Exchange (WZDx) detection data



**payver**  
BY BLYNCSY

Search for locations

Explore map data Upload

DATA SETS (1) Remove All

August Construction Barrels

ZOOM TO REMOVE

Opacity: 80 %

Styles:  
Default style

Red Square point

Map Settings Help Story Share / Print

Feature Information

August Construction Barrels - Site Data

Date: 4:18 PM, 06/29/2022 UTC Download this Table

+ Additional Information +

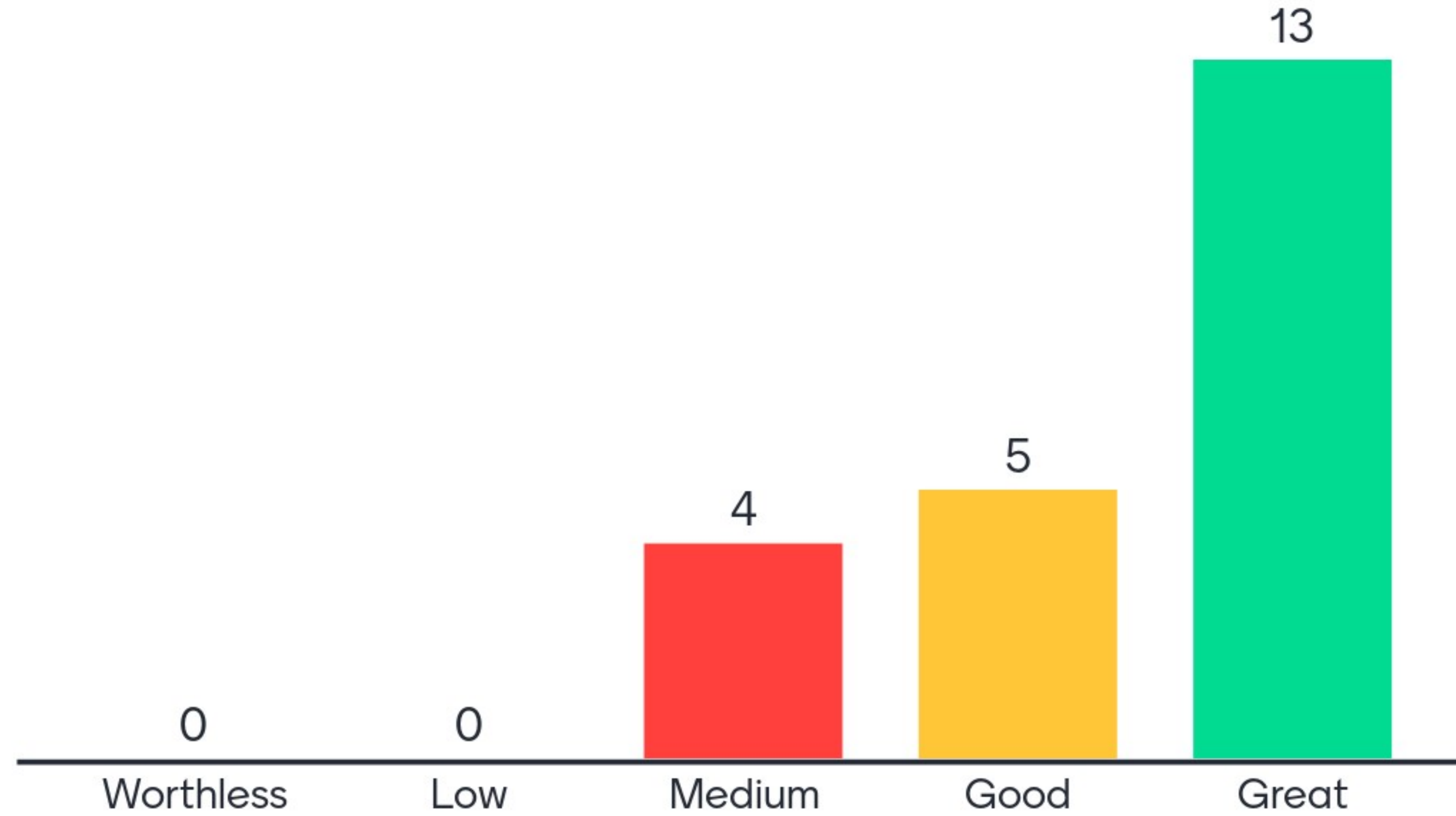
August Construction Barrels - Site Data

August Construction Barrels - Site Data

August Construction Barrels - Site Data



# How useful is regular monitoring/reporting of work zones?

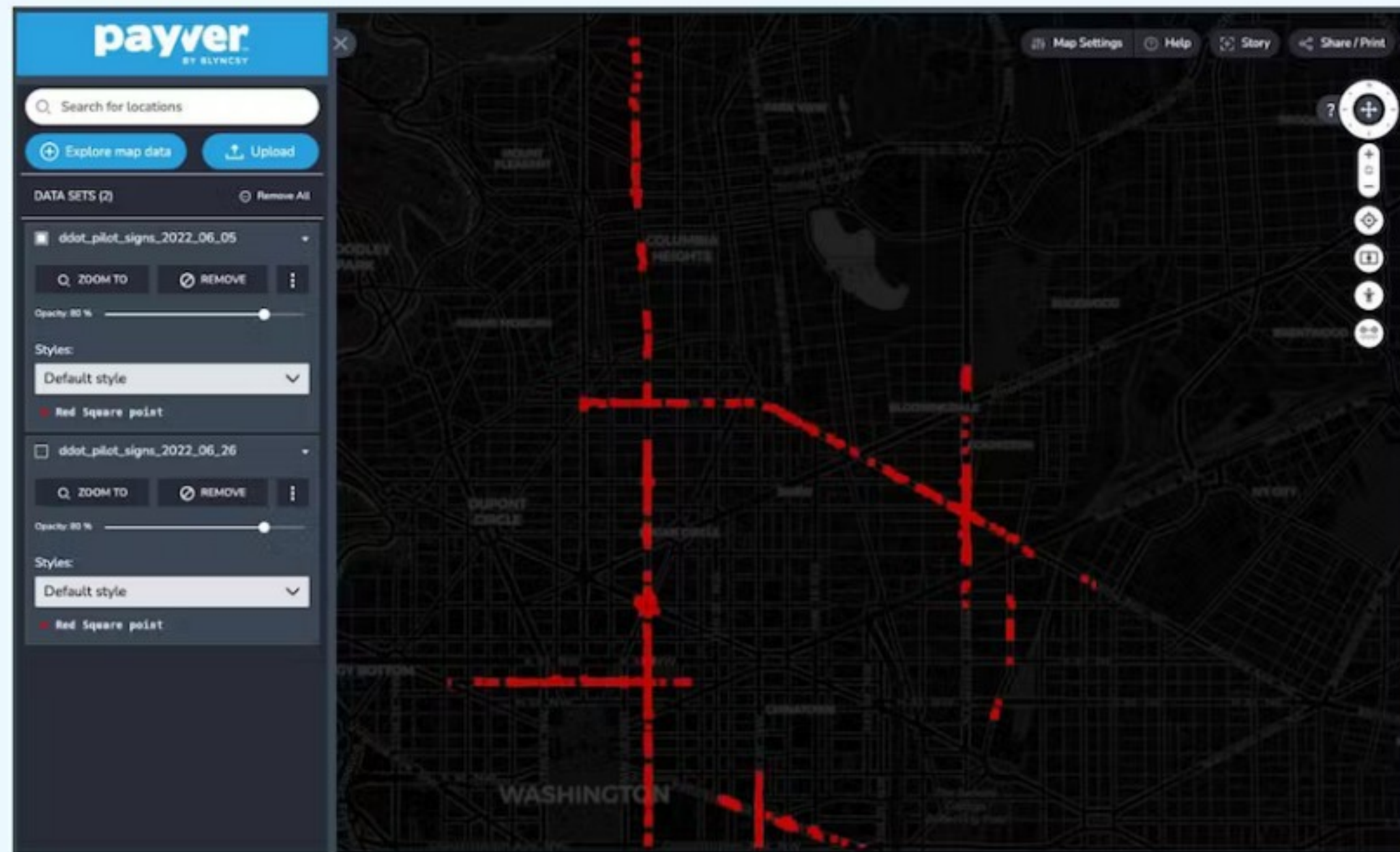


# Roadway Assets Inventory/Monitoring

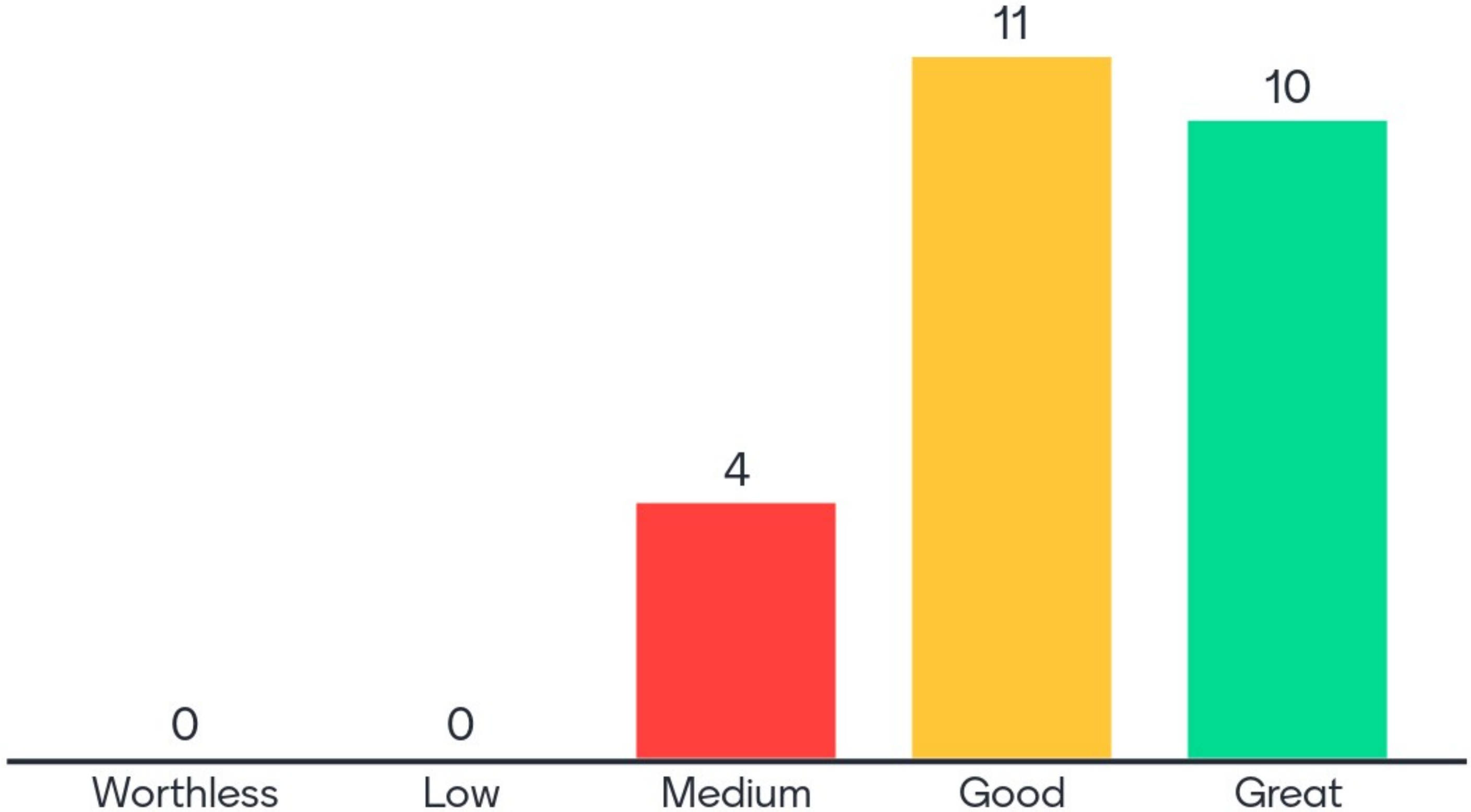
Inventory for road assets—e.g., signs:

Sign Detection - Locates and records sign type

Sign Reflectivity - Using only night time imagery, signs will be graded on a general reflectivity/luminosity. Quality grade of good/fair/poor given to each sign.



# How useful is regular inventorying and monitoring of signage?



# Lights: Street lights

Detects whether street lights are on or off at night or on during the day.



**payver**  
BY BLYNCSY

Search for locations

Explore map data Upload

DATA SETS (1) Remove All

August Streetlights

ZOOM TO REMOVE

Opacity: 80 %

Styles: Default style

- Light On
- Light Off

Map Settings Help Story Share / Print

Feature Information

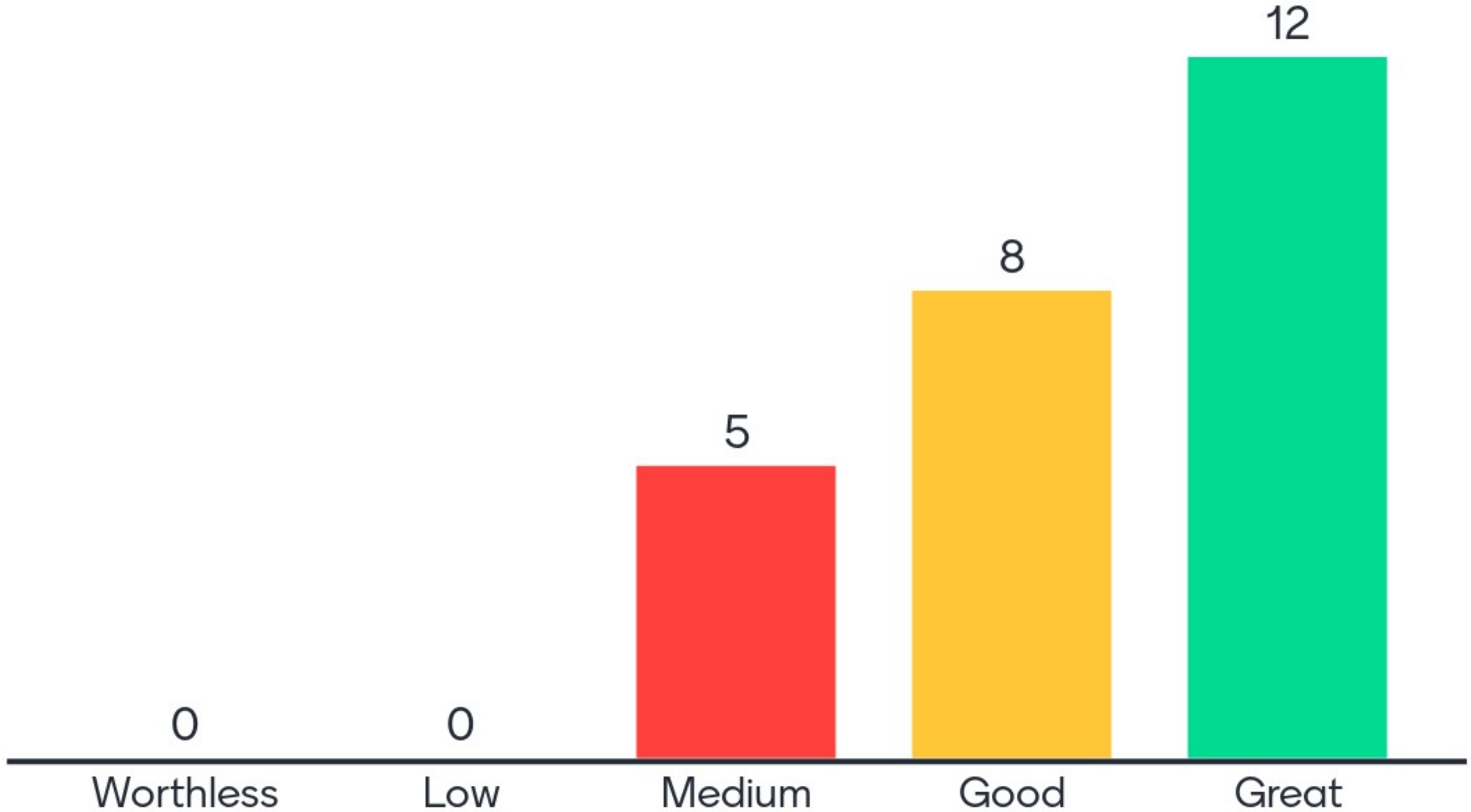
August Streetlights - Site Data

Date: 12:45 AM, 07/29/2022 Download this Table

+ Additional Information +

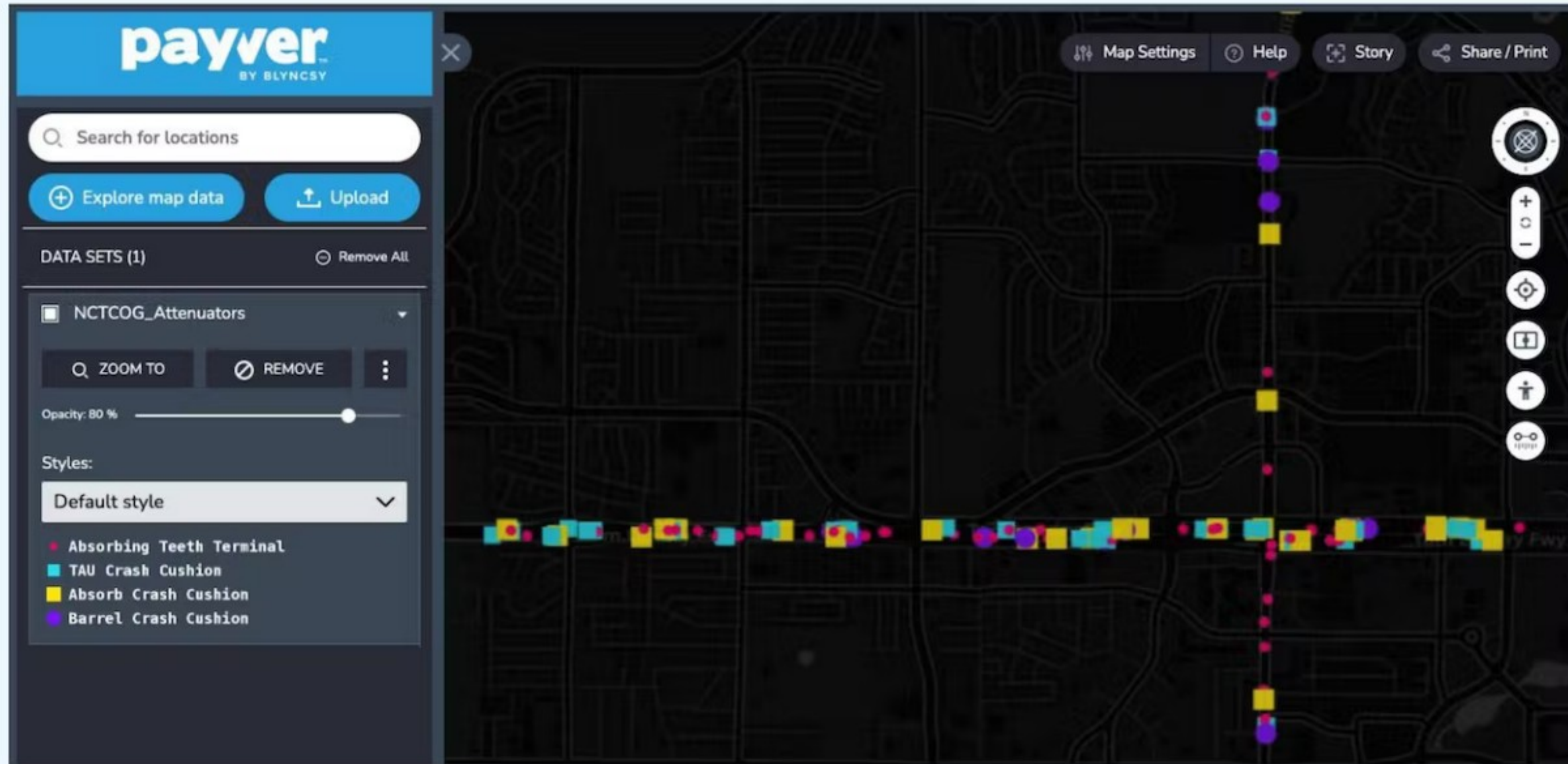
Lat / Lon 88.91829°S, 150.65114°W

# How useful is regular inventorying of whether streetlights are working?

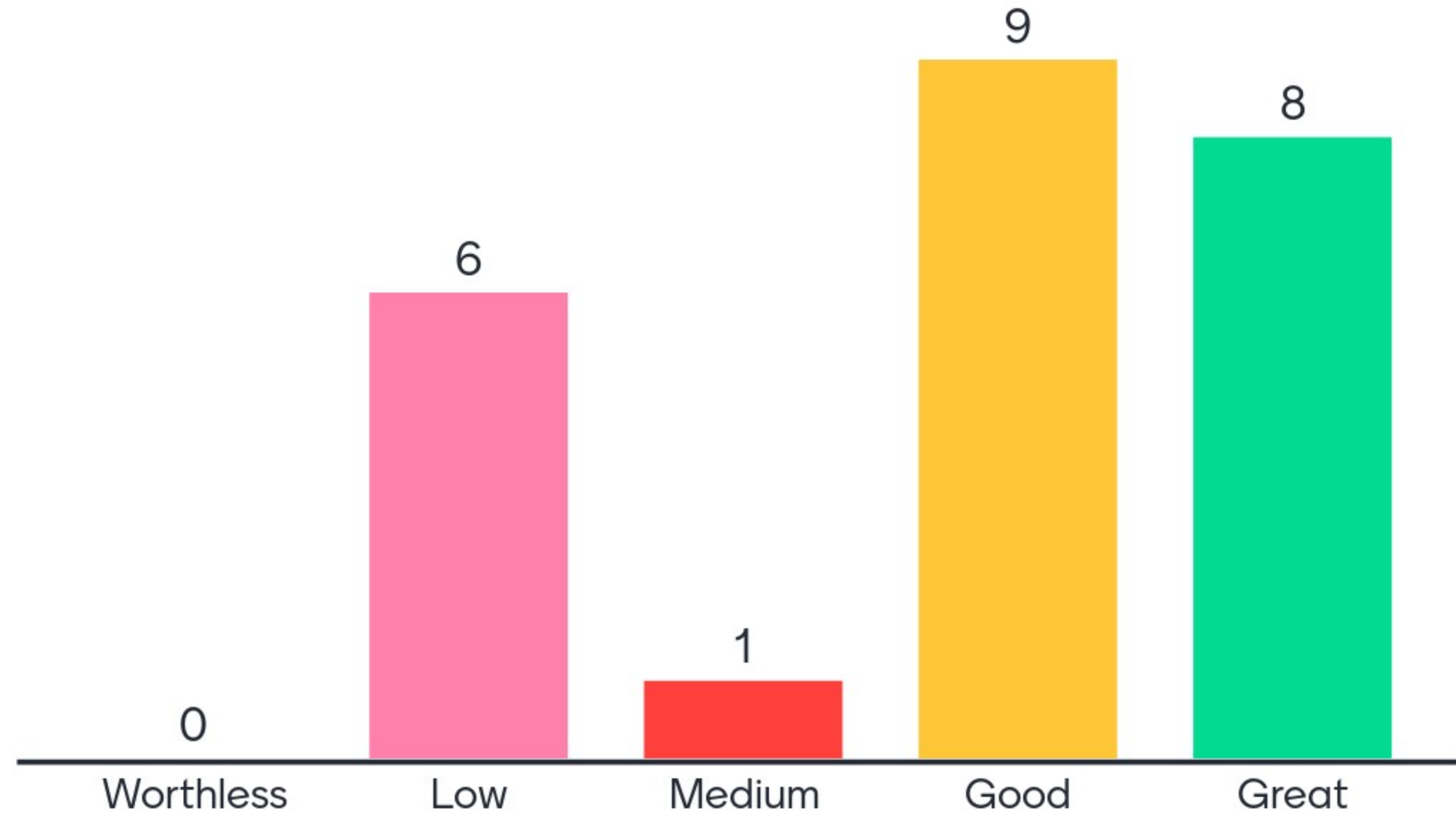


# Highway Infrastructure: Impact Attenuator

Automated detection and notifications of damaged attenuators.



# How useful is real-time alerts of damaged attenuators?



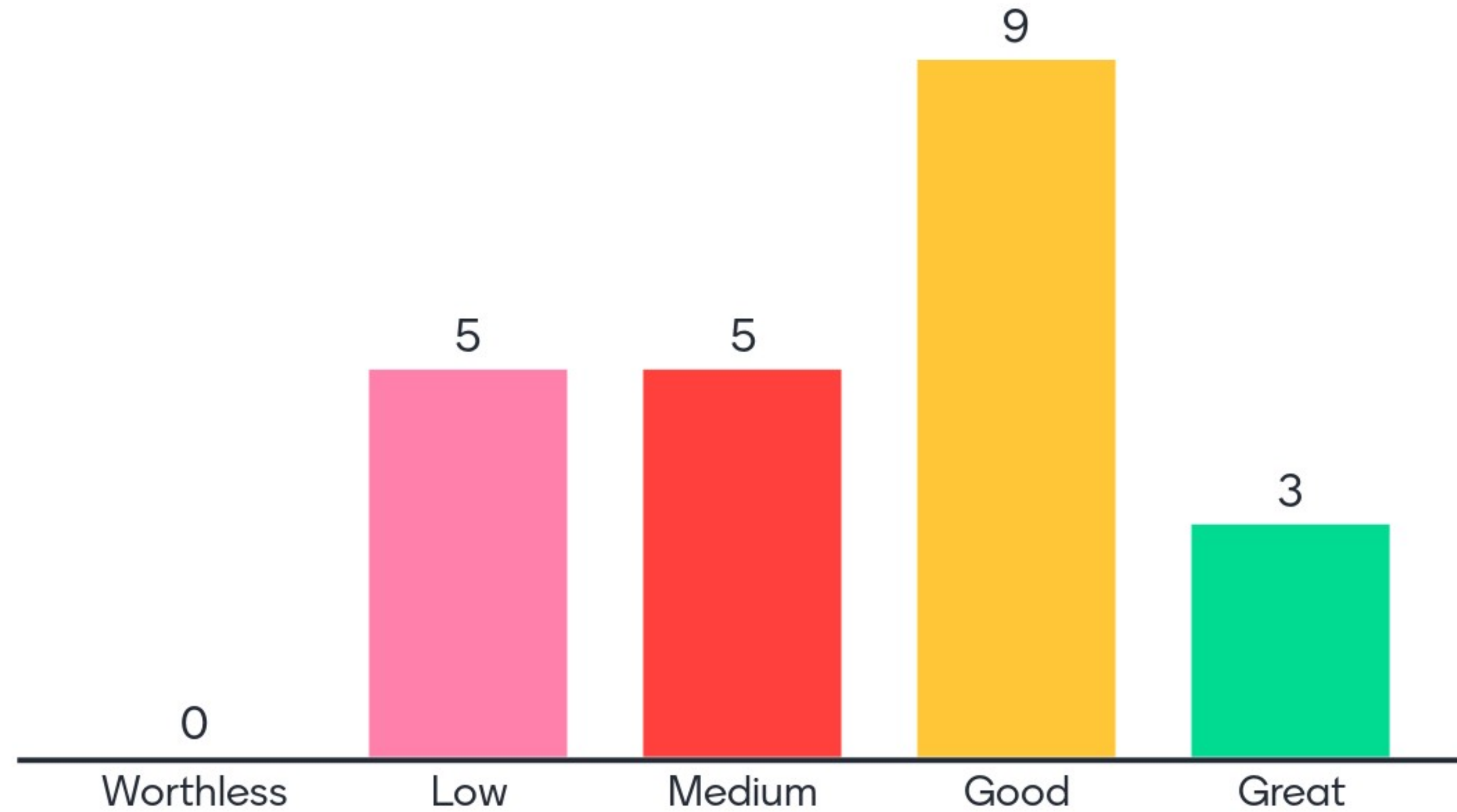
# Transit: Bus Stops

Detects bus stops damage, graffiti, night lights working, and trash build up.  
(approximately 50 bus stops)





# How useful is regular monitoring of bus stops/street furniture?



What do you believe would be the most important use cases for this kind of video detection/AI tool?

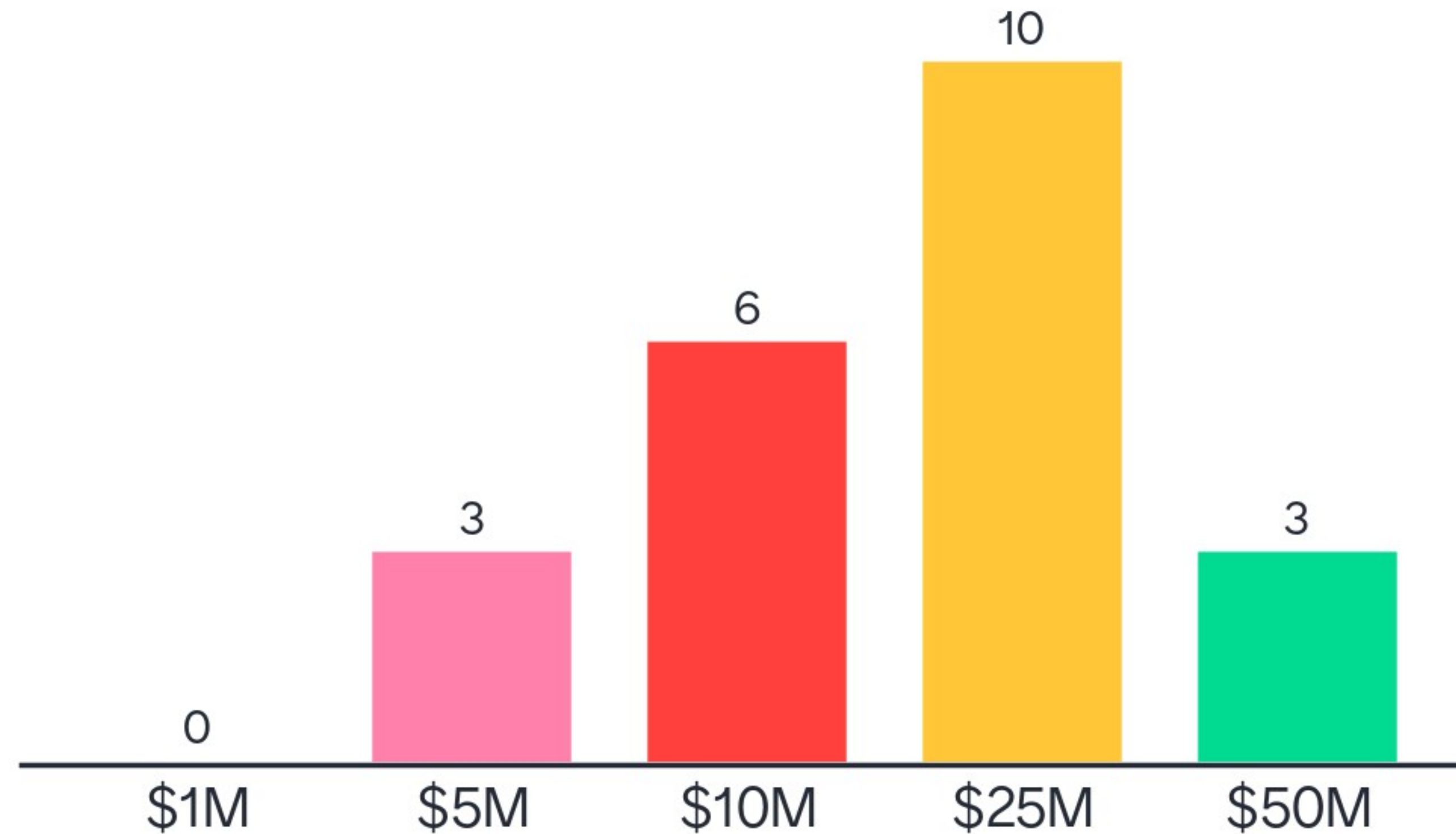
data

time

# Implications/Opportunities

1. Tech will improve
2. Big players (e.g., OEMs) will enter market
3. Fuller coverage
4. More use cases
5. Highly competitive w/existing infrastructure-based ITS

Reasonable maximum amount/yr. to put situational awareness tools in hands of all roadway operators/public works depts. in DFW (8m population)?



# Contact

Thomas Bamonte

Senior Program Manager

Transportation Technology & Innovation

North Central Texas Council of Governments

[tbamonte@nctcog.org](mailto:tbamonte@nctcog.org)

469-600-0524

Twitter: [@TomBamonte](https://twitter.com/TomBamonte)