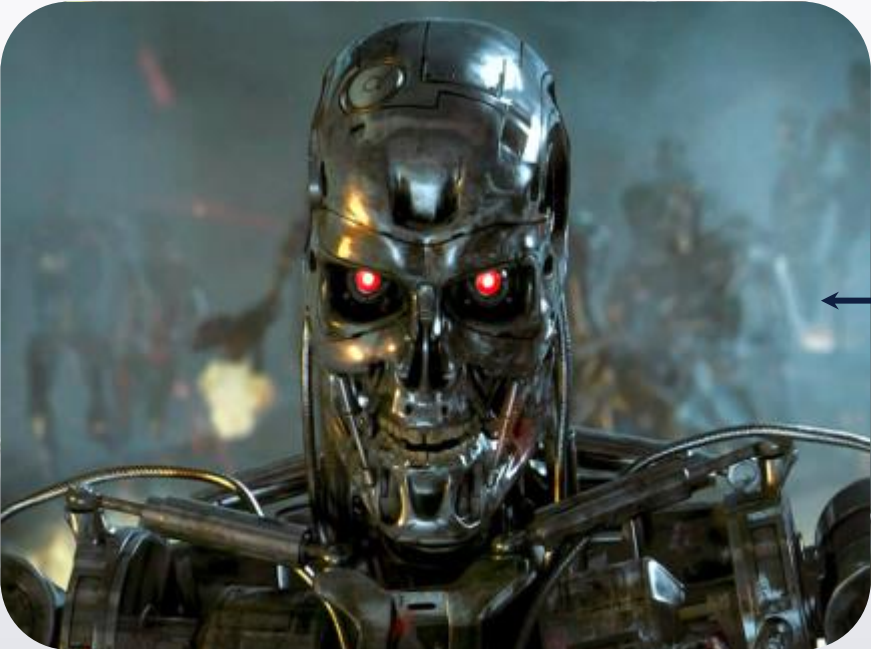# DYNAMIC INFRASTRUCTURE

AI Supporting Daily Tasks For County Engineers – Use Cases

John Tkachenko

OCTOBER, 2023

TACERA

What is AI?

OR

What does AI do for us?
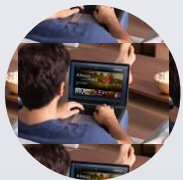## Siri, Alexa, On-star, Netflix, Spotify, Google Map/Waze

They are all AI technologies that deliver tailored information for specific needs

"Recent", "Liked"

We don't personally filter millions of songs in Spotify

We don't pay consultants to order Netflix.

We don't hire interns to tell us when Google Maps shows that the road is closed.

No AI technology can replace us as humans or engineers in making decisions or planning.
Can such technologies help us minimize tedious work, make the best decisions, categorize, and provide a second opinion on the data we've collected?

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INFRASTRUCTURE
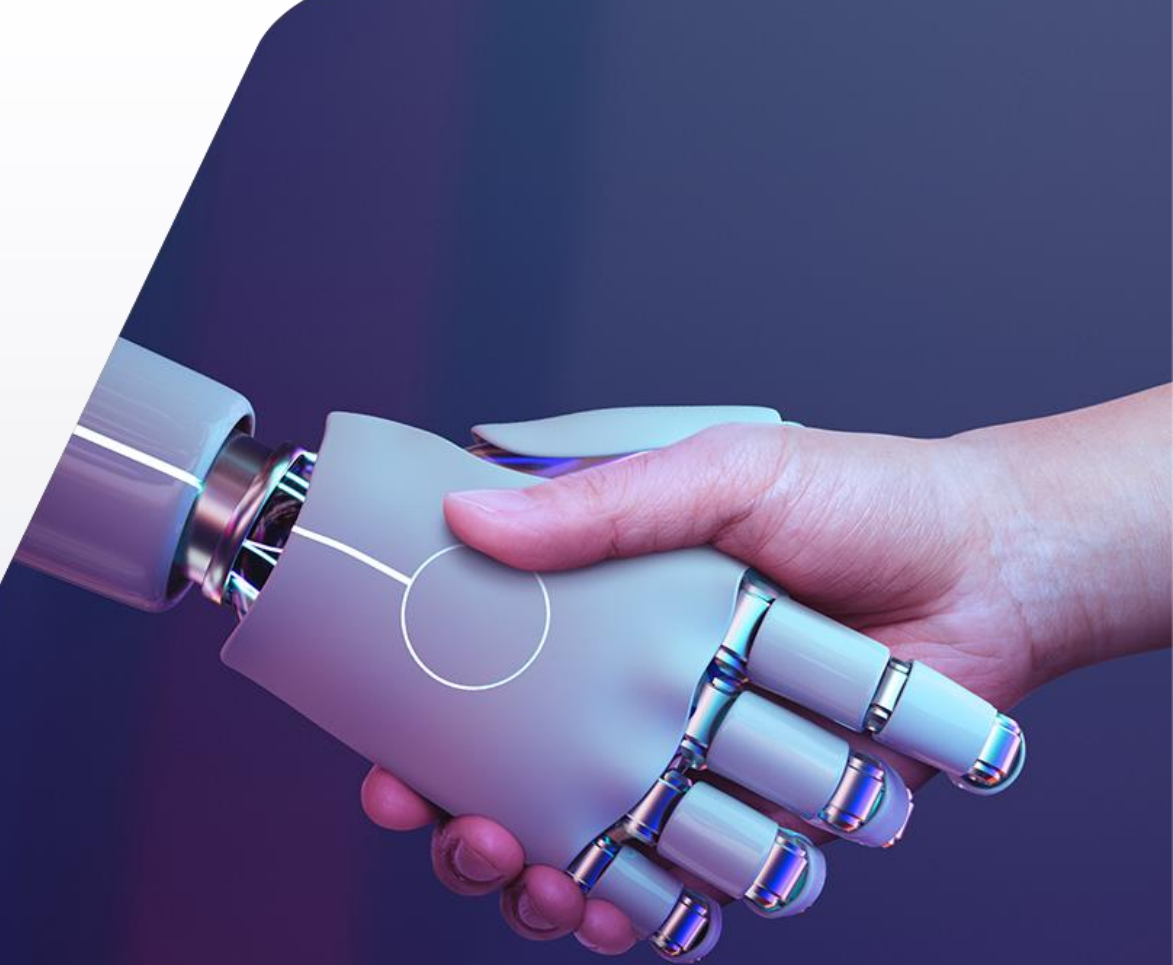
What AI technology thinks about AI and Civil Engineering

Task	Category
Structural Inspection and Assessment	Engineer Task
Data Collection and Analysis	Computer Task
Defect Detection	Computer Task
Risk Assessment	Computer Task
Maintenance Planning	Engineer Task
Budgeting and Resource Allocation	Engineer Task
Contract Management	Engineer Task
Regulatory Compliance	Engineer Task
Emergency Response	Engineer Task
Documentation and Reporting	Computer Task
Training and Knowledge Transfer	Engineer Task
Stakeholder Communication	Engineer Task
Technology Evaluation	Engineer Task

Dynamic Infrastructure - Who we are?

Yes, we are an AI technology company built to meet the needs of engineers in counties.
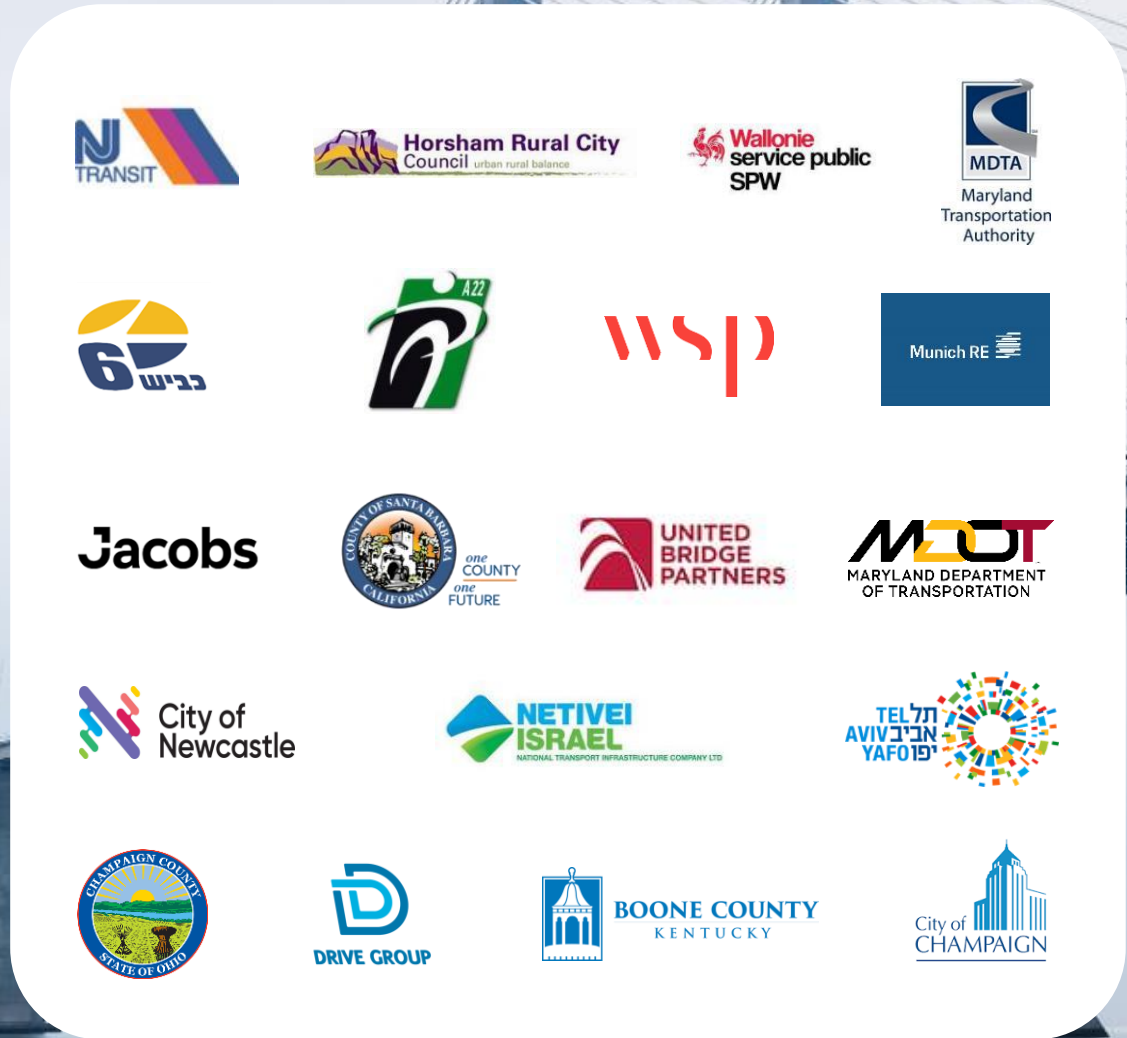
Founded **2019**

By **Civil Engineers** & **Transportation experts**

Deployed over **2400 assets**

County Engineers

WHAT DO YOU NEED? WHAT DO YOU WANT?

› More budget
› More money for bridge replacement, not bridge maintenance
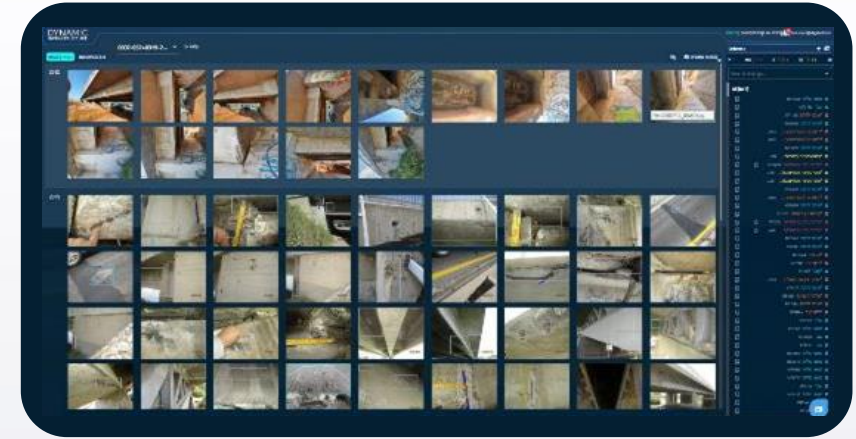› More time
› More manpower

WHAT MATTERS TO YOU?

› Public Safety
› Taxpayer responsibility
› Newer infrastructure
› Not wasting time
› Doing a good job
› Reputation/Leaving a legacy

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How it works?

Upload

Existing inspection reports, smartphones, drones

Detect & Analyze

› Every defect and anomalies
› Track severity over the years,
› Build "medical" timeline

Deliver

› Allocate your budgets for future maintenance and repairs.
› Customized reporting.

DYNAMIC INFRASTRUCTURE

Our Guiding Principles

› Use data/info the client already paid for

› Respect existing processes and budget

› Engineers' time is valuable – minimize non-engineering efforts

CRACK
Delta +20%
since 2018

CORROSION
Delta +18%
since 2015

SPALL
Delta +12%
since 2020

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USE CASE:
Delivering 21st century data organization and visibility for every stakeholder

County-
uploading available current and past inspections, photos

Dynamic Infrastructure-
automated organization and analysis

Used by-
All of our customers

USE CASE:
Gaining control over Culverts and under 20-foot assets

County-
Collecting photos by nonqualified engineers and using existing inspections

Dynamic Infrastructure-
Analysis, filtering and prioritizing based on clients need

Deliver-
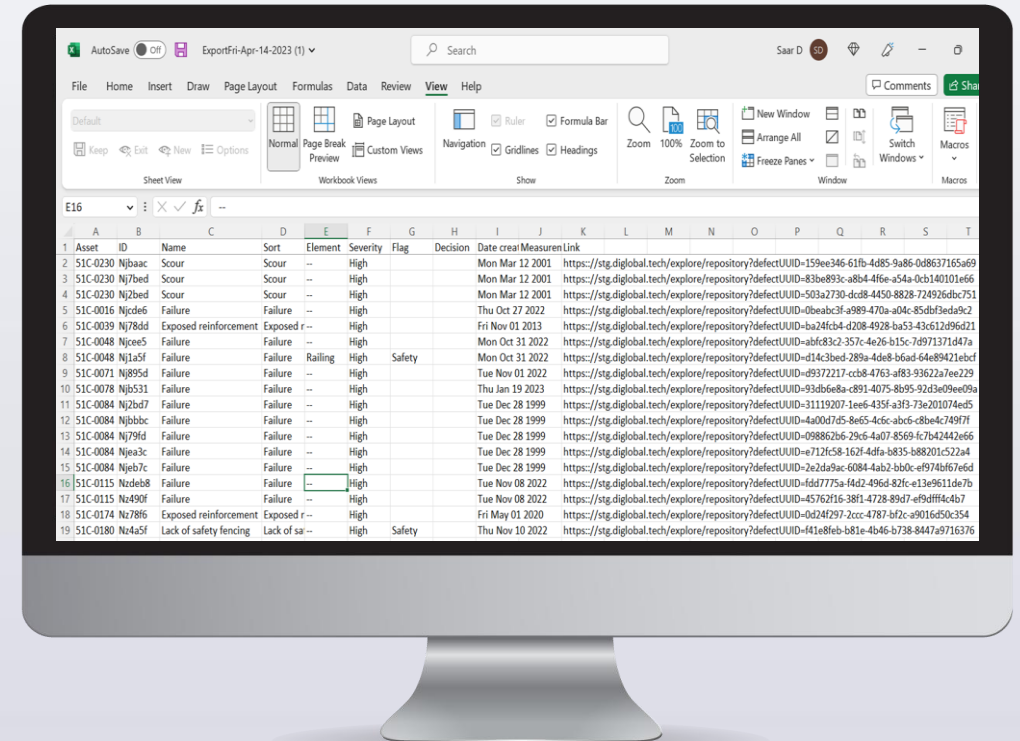Severity / Safety Excel, smart browsing

Used by-
Horsham, Tel-Aviv municipality

USE CASE:
Estimated Repair Cost – By Element, By severity, By defect or repair

County-
Choosing required defect or severity, provide local index for repairs
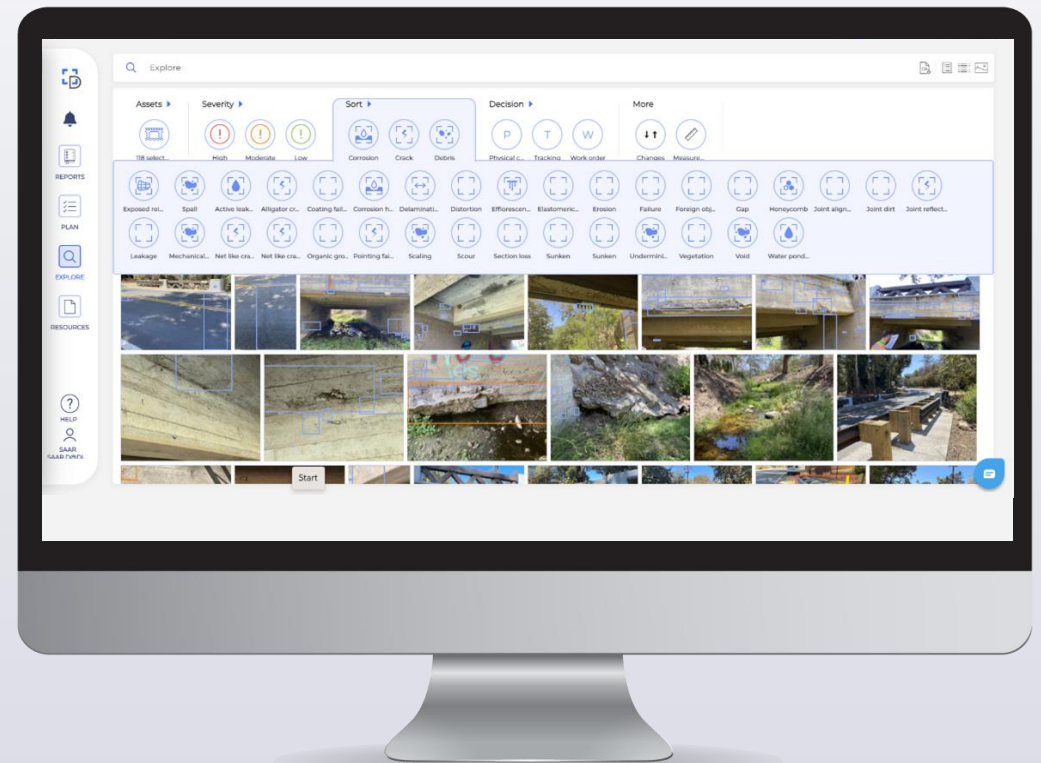
Dynamic Infrastructure-
Analyze, group and calculate using repair index

Deliver-
Spreadsheet, pdf reports

Used by-
Santa Barbara, United Bridge Partners, Drive group

Santa Barbara cost estimation report - 51C-0046 - Tuesday, May 9, 2023

Sort	Severity	Element	Size	Repair	RepairCost	Cost
Crack	Moderate	Girder	60	Roadway Excavation	14.29	857.4
Crack	Moderate	Span	680	Bar Reinforcing Steel	2.01	1366.8
Crack	Moderate	Span	680	Cement Concrete (Pa	545.23	370756.4
Crack	Moderate	Girder	60	Structural Steel	5.54	332.4
Crack	Moderate	Joint	10	Structural Steel	5.54	55.4
Crack	Moderate	Girder	60	Structural Steel	5.54	332.4
Crack	Moderate	Girder	60	Roadway Excavation	14.29	857.4
Crack	Moderate	Railing	2	bhalt Concrete Pavem	144.68	289.36
Crack	Moderate	Abutment	60	Bar Reinforcing Steel	2.01	120.6
Crack	Moderate	Abutment	60	Bar Reinforcing Steel	2.01	120.6
Crack	Moderate	Girder	60	Bar Reinforcing Steel	2.01	120.6

USE CASE:
Understanding Damage Lifetime and Size

County-
uploading available current and past inspections, photos
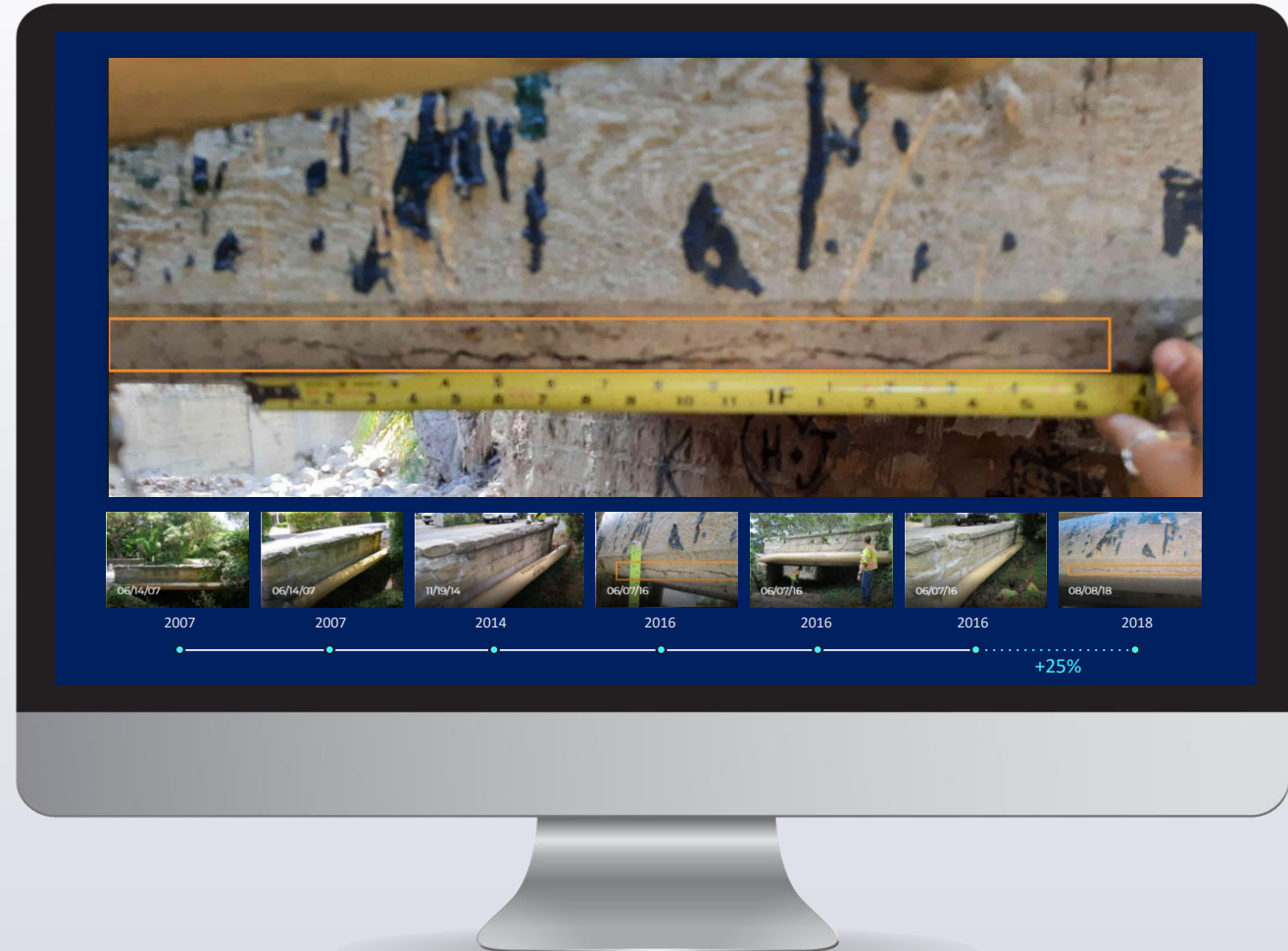
Dynamic Infrastructure-
Automatic defect timeline-based analysis

Deliver-
Reports, Excel, visual browsing

Used by-
Tel-Aviv, Carmel Tunnels, Jacobs, WSP

USE CASE:
Consistent Objective Monitoring

County-
uploading available current and past inspections, photos
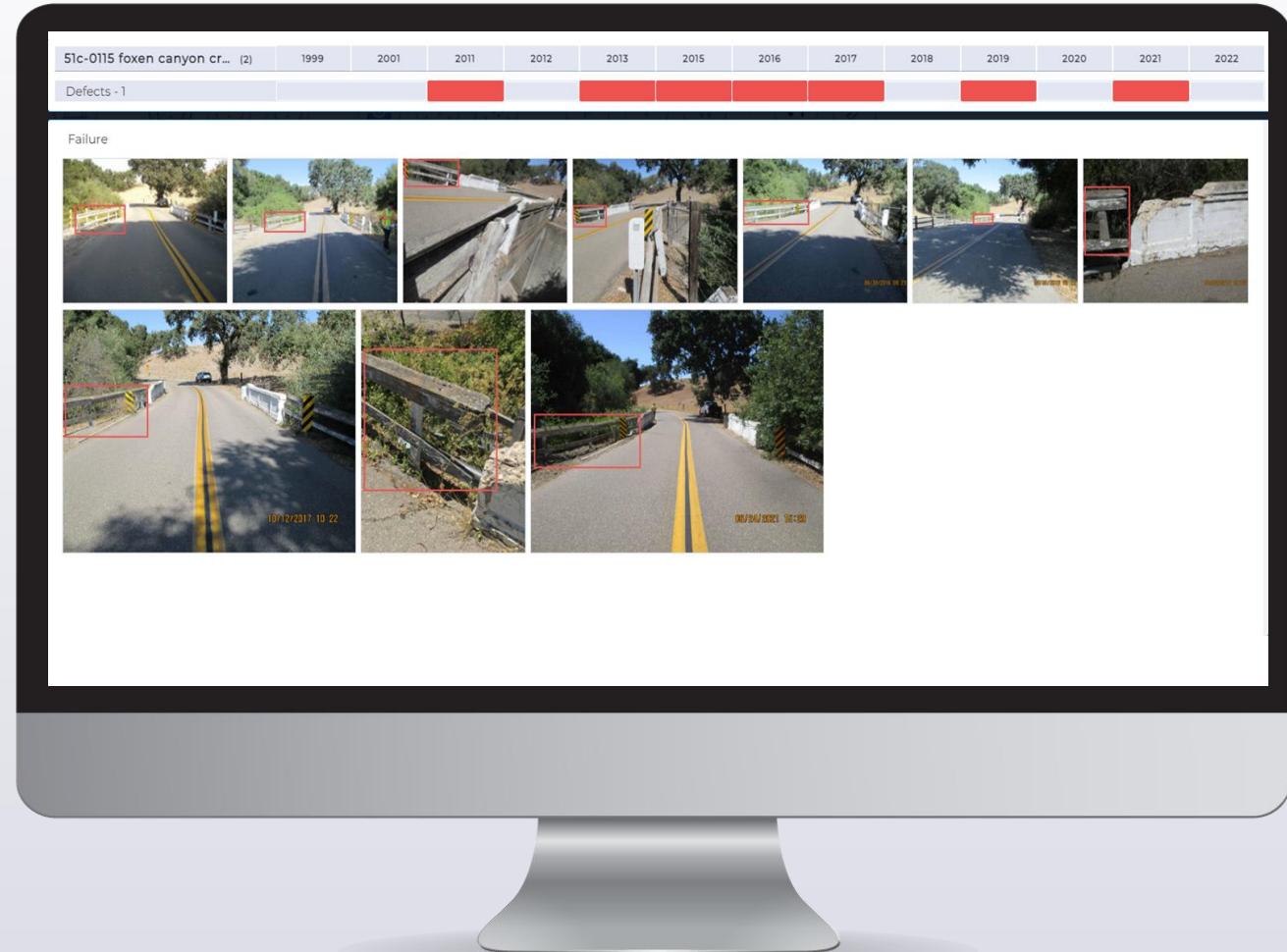
Dynamic Infrastructure-
Automatic defect timeline-based analysis

Deliver-
Reports, Excel, visual browsing

Used by-
Jacobs, WSP, Tel-Aviv, New-Castle, Carmel Tunnels

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Upcoming product releases 2024

ROAD DEFECT DETECTION

NATURAL DISASTERS

Credit: Hindawi Article ID 9221211

Have your opinions changed?

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Stakeholder Communication	Engineer Task
Technology Evaluation	Engineer Task

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What is relevant for you?

THANK YOU

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