CONNECTING US

61st ANNUAL FALL CONFERENCE & EXPO

presented by accenture

The Intelligent Fleet

How StanRTA integrated predictive AI into everyday transit operations

Simon Herrera
Director of Operations and Planning, StanRTA

Roland Fecteau
Transit Analyst, StanRTA

Siddharth Singh
Chief Revenue Officer, Intangles

29 October 2026 · Monterey

Ride the S

INTANGLES® A DIGITAL TWIN COMPANY

The Challenge

Maintenance information often arrives too late

Every day, transit agencies make maintenance decisions using information that arrives after a component has already begun to fail.

Unplanned breakdowns



Emergency repairs



Service disruptions



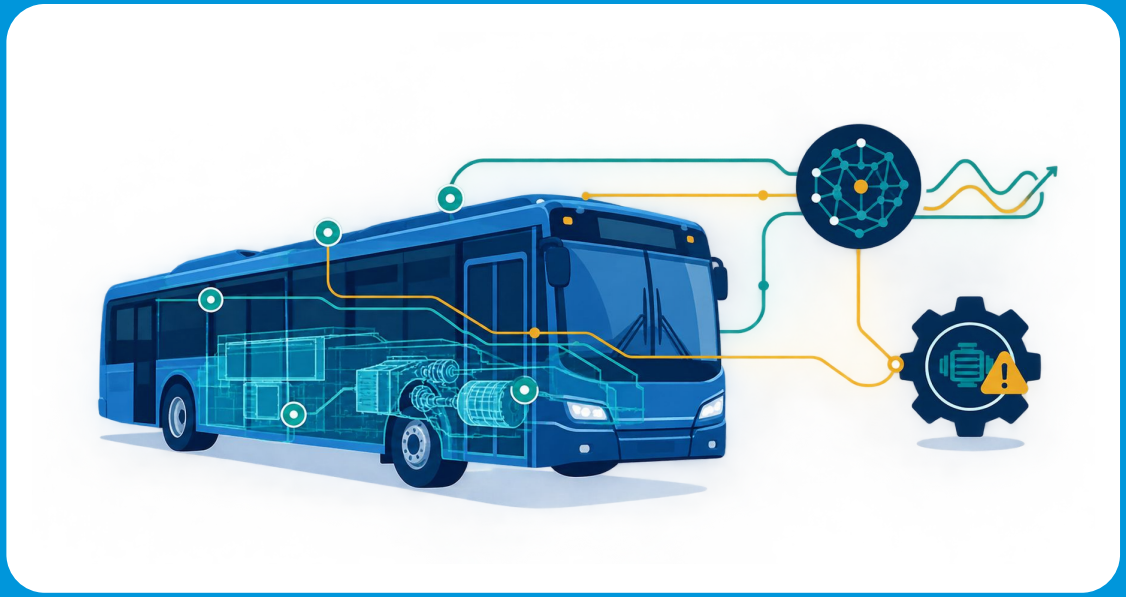
Higher operating costs



All of which ultimately affect riders.

StanRTA's Question

Could artificial intelligence help predict failures before they occur?



Rather than accept breakdowns as the industry norm, StanRTA set out to find out.

The Program

Pilot, validate, then expand

01



Pilot

StanRTA partnered with Intangles to pilot an AI-powered Digital Twin predictive maintenance platform.

02



Validate

Predictive alerts were checked against maintenance records and diagnostic history.

03



Expand

Deployment extended across 102 diesel and gasoline buses, with a parallel CNG cohort evaluated.

What It Watches

Real-time telemetry from critical vehicle systems

- **Engine cooling**
- **Air intake & boost pressure**
- **Fuel delivery**
- **Electrical systems**
- **HVAC & door systems**
- **Diesel aftertreatment**

Unlike programs that rely on scheduled inspections or fault codes, the platform analyses these systems continuously.

How It Works

Digital Twin modelling plus predictive AI

01

Monitor

Continuous real-time telemetry

02

Model

Digital Twin of each vehicle

03

Detect

Patterns of component degradation

04

Act

Prioritised alerts, probable root causes, recommended corrective actions

Developing mechanical issues are identified **before traditional diagnostic trouble codes appear.**

People First

Technology strengthens technician expertise

Rather than replacing technician expertise, the technology strengthens maintenance decision-making.

StanRTA validated predictive alerts against maintenance records and diagnostic history before incorporating them into routine maintenance planning — keeping decisions grounded in engineering judgment while building confidence in the platform.



Results

Within 18 months: seeing failures coming

~3,000
predictive alerts generated

296
events validated against actual diagnostic trouble codes

~6
days earlier than conventional diagnostics, on average

~23
major or critical failures caught early enough to intervene

PREDICTION QUALITY

87%
positive prediction rate
alerts raised before any DTC or work order

28%
of all predictive alerts flagged Major

Where Major alerts concentrate



- Engine coolant temperature **40%**
- Soot load high & DPF **30%**
- Fuel rail pressure, air intake & battery–alternator **30%**

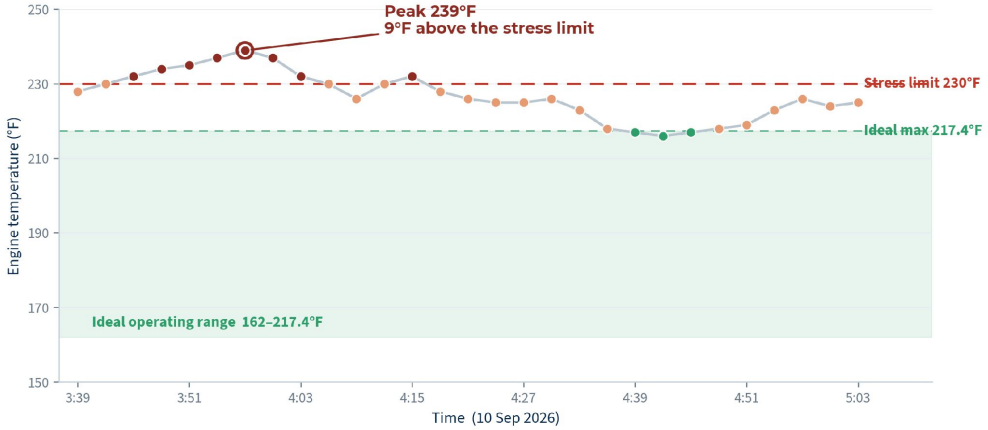
In Practice

One predictive alert turned a possible breakdown and a hidden 20% fuel drain into a planned repair

At 239°F the engine was running 9°F above its 230°F stress limit — the AI flagged a likely cooling-system fault before it became an in-service failure.

Engine temperature during the event

10 Sep 2026, 3:39–5:03 PM, one vehicle in revenue service



Vehicle: Ford E450 cutaway van, 6.8L Triton V10 (305 hp). **Source:** Intangles Digital Twin platform alert, 10 Sep 2026; StanRTA maintenance records.

From signal to fix

1. **The signal** MAJOR

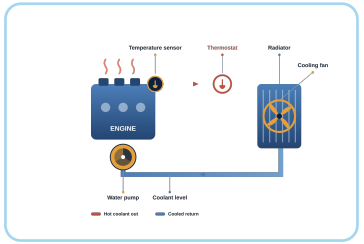
   "Major" alert — Engine Operating Temperature High. 239°F vs a 161.6–217.4°F ideal; 230°F stress limit.

2. **The likely cause**

   Cooling-system fault — guided repair flagged the water pump, coolant level, radiator, cooling fan, or temperature sensor.

3. **The fix**

   Repaired before an in-service failure, and before any more fuel was lost.



≈20%

IMPACT ON THE VEHICLE

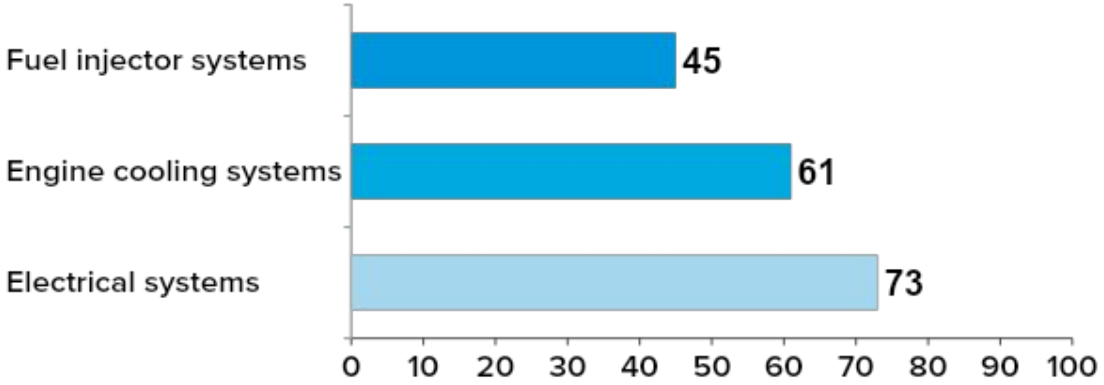
Reduction in this vehicle's fuel economy, traced to the overheating

Reliability

Mean Distance Between Failures increased

Intangles data pinpointed the recurring issues behind most failures — and StanRTA built the fixes into its maintenance schedules.

MDBF INCREASE BY SYSTEM



These three recurring issues are now built into StanRTA's **PM check points.**

Why it matters

Longer distances between failures mean improved reliability, greater vehicle availability, and fewer unexpected disruptions.

Why MDBF increased (positive trend)

Intangles data pinpointed the most common recurring issues — fuel injection, engine cooling and electrical. StanRTA worked each one and added check points to its PM schedules.

NEXT FOCUS

HVAC

16%
of vehicle DTCs

The biggest outlier. Intangles and StanRTA co-developed a new HVAC module to surface its recurring issues — the target of the next phase.

Operations

Within 18 months: fewer surprises, better fuel economy

15–20%

reduction in unscheduled service events

6–8%

improvement in fuel economy on targeted operating corridors

Together: improved fleet availability, less emergency maintenance, and more reliable service for riders.

Beyond Diagnostics

Fleet analytics found hidden fuel waste

What was found

Hundreds of extended idling events, including excessive idling during operator shift changes.

What supervisors did

Targeted operational improvements that reduced unnecessary fuel consumption and vehicle wear.

Why it matters

Lower fuel use, better efficiency, and support for sustainability objectives.

Idling ratio: before

8.1%



Idling ratio: after

5.4%

33% reduction in idling

The Operating Model

Maintenance planning: before and now

BEFORE

- Responding primarily to failures
- Scheduled inspections and fault codes
- Emergency repair activity

NOW

- Each day starts with prioritised vehicle health information
- Better coordination between maintenance and operations
- Optimised labour and parts, more confident scheduling

For Other Agencies

These challenges are common across the industry

Predictive maintenance can be integrated into existing programs without replacing preventive maintenance or significant organisational restructuring.

Predictive analytics complement established processes by giving earlier visibility into developing issues, so teams can prioritise inspections and repairs before failures affect service.

Highly Adaptable

Implemented across a mixed-fuel fleet



Diesel



Gasoline

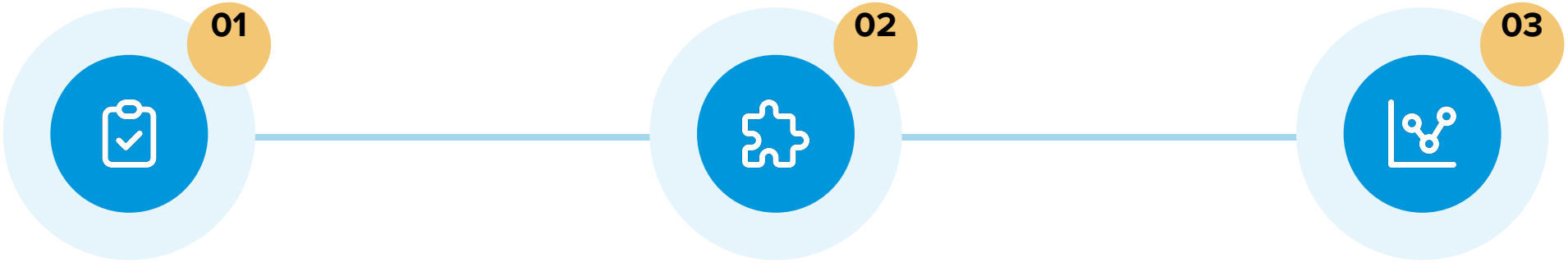


CNG

Because the Digital Twin platform analyses vehicle behaviour rather than relying on a specific manufacturer or propulsion type, the methodology can be applied across diverse fleets — regardless of size, geography, climate or operating environment.

A Practical Roadmap

What other agencies can adapt



Start with validation

Check alerts against maintenance records and technician expertise.

Build into planning

Fold validated insights into routine maintenance scheduling.

Extend the value

Use the same data for fuel, sustainability, workforce and asset decisions.

Industry Goals

Supporting a stronger state of good repair

Safety

Fewer roadside breakdowns; repairs under controlled shop conditions

Reliability

Earlier intervention, fewer service disruptions

Asset management

Condition-based decisions that extend asset life

Sustainability

Lower fuel use, reduced emissions and wear

Responsible AI

Human oversight preserved throughout

“

Innovation is not simply about adopting new technology.

It is about using data to deliver better public transportation.

STANISLAUS REGIONAL TRANSIT AUTHORITY

Thank You!

Questions?

Simon Herrera

Director of Operations and Planning, Stanislaus Regional Transit Authority

Your Speakers

Simon Herrera & Roland Fecteau



Simon Herrera

Director of Operations and Planning
Stanislaus Regional Transit Authority

TRANSIT LEADERSHIP

- StanRTA — Operations and Planning
- Modesto Area Express — Transit Manager
- Fairbanks North Star Borough — Transportation Manager



Roland Fecteau

Transit Analyst
Stanislaus Regional Transit Authority

EDUCATION AND DEVELOPMENT

StanRTA — Transit Analyst