# NextSense Truck Intelligence

## Integrated Monitoring for Fuel, Location, Vehicle Load, Driver, and Fleet Performance

Real-Time Monitoring • Operational Alerts • Fleet Analytics • Actionable Insights



# Keterbatasan Visibilitas Menyebabkan Inefisiensi Operasional

NextSense

## Permasalahan yang umum terjadi:



1. Posisi dan status kendaraan tidak selalu dapat diketahui secara real-time.
2. Pengisian, penggunaan, dan kehilangan BBM sulit diverifikasi.
3. Berat muatan kendaraan baru diketahui saat melewati jembatan timbang.
4. Overload meningkatkan risiko keselamatan dan kerusakan kendaraan.
5. Muatan di bawah target menurunkan produktivitas angkutan.
6. Idling, speeding, dan cara mengemudi memengaruhi konsumsi BBM.
7. Data GPS, BBM, muatan, dan kendaraan berada di sistem yang berbeda.
8. Laporan operasional masih dikumpulkan secara manual.
9. Management terlambat mengetahui penyimpangan di lapangan.

**Tanpa data yang terintegrasi, keputusan operasional cenderung bersifat reaktif, bukan preventif.**

# SOLUTION OVERVIEW

## Satu Platform Terintegrasi untuk Operasional Truck

### 01 MONITORING BBM

**Fuel Monitoring**

- Level dan estimasi volume BBM.
- Pengisian BBM.
- Penggunaan BBM.
- Indikasi kehilangan atau fuel draining.
- Analisis efisiensi BBM.



### 02 GPS & FLEET TRACKING

- Posisi kendaraan secara real-time.
- Histori perjalanan.
- Geofence dan route monitoring.
- Kecepatan, berhenti, dan idling.
- Status kendaraan online atau offline.

### 03 MONITORING MUATAN KENDARAAN

**On-Board Weighing System**

- Berat muatan aktual.
- Kendaraan kosong atau bermuatan.
- Overload dan muatan di bawah target.
- Muatan per perjalanan.
- Total tonase yang diangkut.

### 04 DRIVER & VEHICLE MONITORING

- Perilaku pengemudi.
- Driver score.
- Ignition dan engine hours.
- Data CAN/J1939 jika tersedia.
- Kondisi operasional kendaraan.

**NextSense mengintegrasikan sensor kendaraan, on-board devices, konektivitas, dashboard, alerts, analytics, dan reports dalam satu tampilan operasional.**

# Dari Data Kendaraan Menjadi Operational Intelligence

1. Sensor & Vehicle Data
2. On-Board Controller
3. Vehicle IoT Gateway
4. 4G / Wi-Fi
5. Intelligence Platform
6. Dashboard, Alerts & Reports

## Sensor & Vehicle Data

- Fuel-level sensor.
- Load cell, strain sensor, atau suspension pressure sensor.
- GPS/GNSS.
- Ignition dan digital input.
- CAN/J1939.
- Accelerometer atau IMU.
- Optional DMS/ADAS camera.

## On-Board Controller

- Unit pengolah penimbangan.
- Fuel-sensor converter apabila diperlukan.
- CAN interface.
- Power-protection dan signal-conditioning module.

## Vehicle IoT Gateway

- Mengumpulkan data seluruh perangkat.
- Menyediakan koneksi GPS dan 4G.
- Menyimpan data sementara ketika jaringan terputus.
- Mengirim kembali data setelah jaringan tersedia.
- Meneruskan data ke intelligence platform.

# ON-VEHICLE ARCHITECTURE

## Integrasi Perangkat di Setiap Truck




## SISTEM KELISTRIKAN & DATA RELIABILITY

- Aki Kendaraan 12/24 VDC
- Fuse, Surge & Voltage Protection
- Protected Power Distribution
- Automotive-Grade Cable & Connector
- Local Buffering saat Sinyal 4G Terputus

# CRITICAL MONITORING POINTS

## Titik Monitoring Utama pada Kendaraan

### 01 TANGKI BBM

Level, volume, pengisian, penurunan abnormal

**Sumber:** Capacitive/ultrasonic fuel sensor

### 02 LOKASI KENDARAAN

Posisi, arah, kecepatan, histori rute

**Sumber:** GPS/GNSS

### 04 PENGEMUDI

Speeding, harsh braking, acceleration, cornering

**Sumber:** GPS, IMU, dan CAN

### 05 OPERASIONAL KENDARAAN

Ignition, engine hours, RPM, odometer

**Sumber:** Digital input atau CAN/J1939



### 03 MUATAN KENDARAAN

Berat muatan, overload, proses muat dan bongkar

**Sumber:** Load sensors + weighing controller

### 06 AKTIVITAS ANGKUTAN

Trip, waktu tunggu, loading, hauling, unloading

**Sumber:** Operational Analytics

### 07 KESELAMATAN TAMBAHAN

Fatigue, distraction, collision warning

**Sumber:** Optional DMS/ADAS

# FUEL MONITORING

Monitor Level, Pengisian, Penggunaan, dan Kehilangan BBM

## INFORMASI YANG DITAMPILKAN

### LEVEL & CAPACITY

- Current fuel level
- Estimasi volume BBM dalam liter
- Persentase kapasitas tangki

### REFUELING

- Waktu dan lokasi pengisian
- Estimasi jumlah BBM yang diisi
- Low-fuel warning



### FUEL LOSS

- Penurunan BBM secara mendadak
- Indikasi fuel draining
- Estimasi penggunaan BBM per perjalanan

### FUEL EFFICIENCY

- Penggunaan BBM per kilometer
- Penggunaan BBM per engine hour
- Perbandingan antar truck, rute, dan driver

### CATATAN TEKNIS

01 Bentuk tangki harus dikalibrasi untuk mengubah level menjadi volume.

02 Pergerakan, kemiringan, dan getaran kendaraan harus difilter oleh sistem.

03 Sensor level cocok untuk monitoring level, pengisian, dan kehilangan BBM.

04 Untuk akurasi konsumsi mesin yang lebih tinggi, gunakan data CAN/ECU atau fuel flowmeter.

# GPS and Fleet Tracking

## Real-Time Visibility of Every Vehicle




### Operational Status

| | |
|---|---|
| Moving | 12 |
| Idling | 5 |
| Stopped | 3 |
| Offline | 2 |
| Alert | 1 |

### Fungsi utama

- Real-time vehicle location
- Route and trip history
- Current speed and travel direction
- Ignition ON/OFF status
- Moving, idling, stopped, and offline status
- Distance traveled
- Engine and operational hours
- Geofence entry and exit
- Route deviation
- Unauthorized vehicle movement
- Long-stop and abnormal-idling detection

### Visual dashboard

- Fleet map
- Vehicle marker with operational status
- Route playback
- Site and restricted-area geofences

# On-Board Weighing

## Real-Time Payload Visibility Without Waiting for the Weighbridge

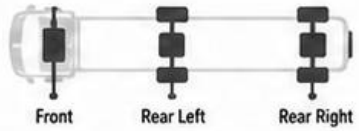



**PAYLOAD**
**18.6 t**

**GVW**
**31.2 t**

**LOAD DISTRIBUTION PER AXLE**

| | | |
|---|---|---|
| Front Axle | 8.4 t | 27% |
| Rear Axle (Left) | 11.4 t | 36% |
| Rear Axle (Right) | 11.4 t | 37% |




STATUS NORMAL UNDERLOAD OVERLOAD

### Fungsi Utama

1. Current payload
2. Gross vehicle weight estimation
3. Load distribution per axle or measurement point
4. Underload and overload detection
5. Load and unload event detection
6. Payload per trip
7. Total transported tonnage
8. Comparison with weighbridge results
9. Productivity per truck, driver, shift, and route

### Load / Pressure Sensors



Measure load / pressure at axle or suspension measurement points.

### VD2 Weighing Main Unit




Calculates payload, GVW and load distribution from sensor signals.

### CAN / RS232 / RS485



Transmits calculated weight and data from VD2 to EG8200.

### EG8200



Collects (receives) the calculated weight from VD2 and forwards to the cloud.

### NextSense

Cloud platform for storage, analytics, reporting, and integration.

**IMPORTANT** | EG8200 collects the calculated weight from the weighing controller; it does not replace the weighing controller.

# Weighing Technology Options

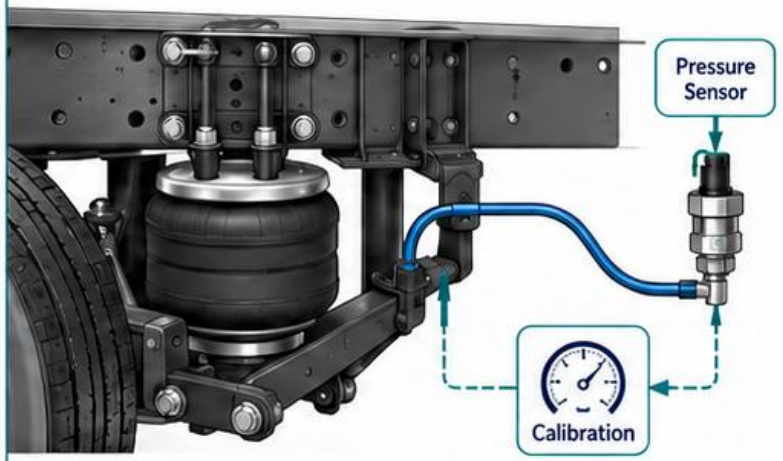
## Selected According to Vehicle and Suspension Configuration

### Load Cell-Based Measurement



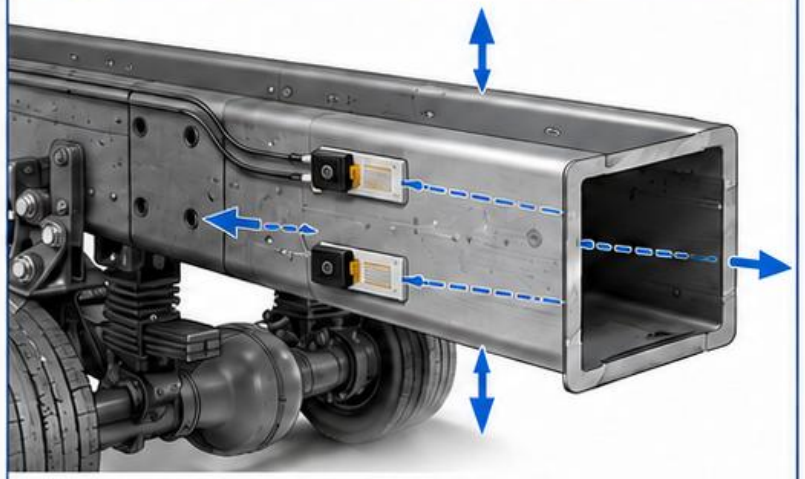
- Installed at selected structural points.
- Suitable when mounting points can safely transfer the vehicle load.
- Requires mechanical engineering and installation survey.

### Suspension Pressure Measurement




- Uses air-pressure or hydraulic-pressure signals.
- Suitable for vehicles with supported pneumatic or hydraulic suspension.
- Calibration is required under actual loading conditions.

### Strain-Based Measurement



- Measures structural deformation on chassis or axle.
- Installation and calibration are vehicle-specific.

**ENGINEERING NOTE** | Final sensor type, quantity, installation position, and expected accuracy must be confirmed through vehicle inspection and calibration trials.

# Driver Behavior Monitoring

## Promote Safer and More Efficient Driving



### BASIC PARAMETERS

- Speeding
- Harsh acceleration
- Harsh braking
- Harsh cornering
- Excessive idling
- Rapid speed changes
- Route deviation
- Unauthorized operation
- Driving outside permitted hours
- Extended driving duration

### OUTPUT

| Driver score | Safety score | Fuel-efficiency score |
|---|---|---|
| 86 / 100 | 91 / 100 | 82 / 100 |

**Driver behavior event timeline**




**Ranking by driver, vehicle, site, or shift**

| Rank | Driver | Vehicle | Site | Shift | Score |
|---|---|---|---|---|---|
| 1 | Alex Morgan | TRK-102 | Site A | Day | 92 |
| 2 | Brian Lee | TRK-118 | Site A | Night | 87 |
| 3 | Carlos Patel | TRK-107 | Site B | Day | 84 |
| 4 | David Kim | TRK-105 | Site B | Night | 79 |
| 5 | Ethan Walker | TRK-121 | Site C | Day | 72 |

# VEHICLE AND ENGINE MONITORING

Combine Operational and Vehicle Data




## CAN / J1939 DATA — IF AVAILABLE

- Engine RPM
- Vehicle speed
- Odometer
- Engine hours
- Engine coolant temperature
- Battery voltage
- Fuel-consumption information
- Accelerator position
- Engine load
- Diagnostic trouble codes
- Selected warning inficatiors

## EXTERNAL I/O DATA

- Ignition status
- PTO status
- Hydraulic system status
- Door or hatch status
- Tipping-body position
- External alarm or emergency input

### RPM




2,150 rpm

### SPEED




48 km/h

### COOLANT TEMP.




88 °C

### BATTERY VOLTAGE




13.6 V

### ENGINE LOAD




62 %

### DIAGNOSTIC ALERT

No Active Faults

AVAILABLE PARAMETERS DEPEND ON THE VEHICLE MODEL, ECU, CAN PROTOCOL, AND DATA-ACCESS PERMISSION.

# UNIFIED FLEET DASHBOARD

One Dashboard for the Entire Truck Operation

| Site | Fleet Group | Vehicle Type | Truck | Driver | Shift | Route | Date & Time |
|---|---|---|---|---|---|---|---|
| North Quarry | All Groups | Conventional Dump Truck | All Trucks | All Drivers | Day Shift | All Routes | May 15, 2025 08:30 |

## FLEET STATUS SUMMARY

| Total Vehicles | Active | Idle | Stopped | Offline |
|---|---|---|---|---|
| 128 | 82 | 16 | 22 | 8 |

| Loaded | Empty |
|---|---|
| 46 | 36 |

| Payload Today | Average Fuel Level | Fuel Used Today |
|---|---|---|
| 4,860 t | 67% | 8,420 L |

| Active Fuel Alerts | Overloaded Vehicles | Driver Violations |
|---|---|---|
| 4 | 3 | 12 |

## FLEET MAP




## Distance Traveled

12,640 km

## Fleet Utilization




## Average Driver Score




## CRITICAL OPERATIONAL ALERTS

5

| | | | | |
|---|---|---|---|---|
| CRITICAL | 08:28 | Truck TRK-107 overloaded (Payload: 36.2 t) | TRK-107 | Pit 3 – Haul Road |
| CRITICAL | 08:24 | Fuel level critically low (8%) | TRK-054 | Loading Zone A |
| WARNING | 08:21 | High engine temperature detected | TRK-089 | Haul Road C |
| WARNING | 08:18 | Speeding violation (78 km/h) | TRK-063 | Haul Road B |
| CRITICAL | 08:15 | Truck stopped for over 15 minutes | TRK-022 | Pit 2 – Dump Point |

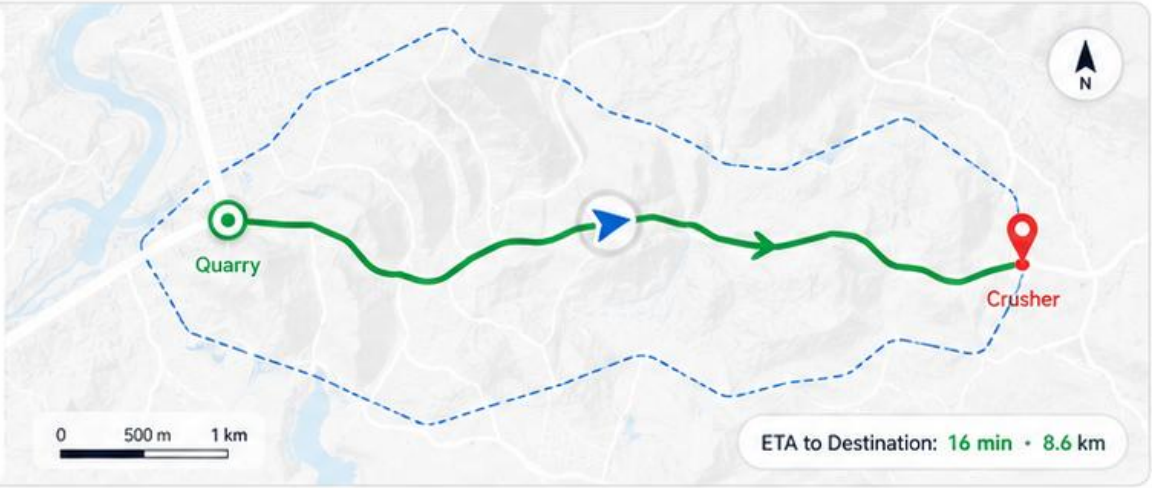
# TRUCK DETAIL DASHBOARD

Complete Operational View for Each Vehicle

**DT-024 • ACTIVE**

## ROUTE & LOCATION

- Current Location: 1.23456° S, 116.78901° E
- Route
- Start (Quarry): 08:15
- End (Crusher): 16:30 (ETA)
- Geofence: Site Boundary



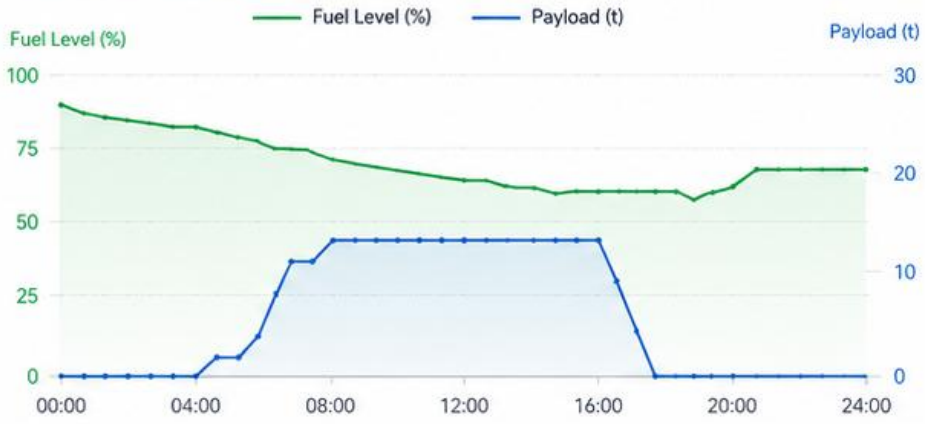

## VEHICLE OVERVIEW

| | |
|---|---|
| Vehicle ID | DT-024 |
| Vehicle Type | Dump Truck |
| Make / Model | Volvo FMX 460 |
| Year | 2022 |
| VIN | YV2XK20C7NA123456 |
| Plate No. | B 9246 KZ |
| Driver | R. Pratama |
| Assignment | Quarry to Crusher |
| Status | ACTIVE |
| Last Update | 10:24:30 |



| VEHICLE STATUS | IGNITION | ENGINE | SPEED | FUEL LEVEL | CURRENT PAYLOAD | DRIVER SCORE | TODAY'S DISTANCE | ENGINE HOURS |
|---|---|---|---|---|---|---|---|---|
| ACTIVE | ON | RUNNING | 42 km/h | 68% | 18.6 t | 92 | 146 km | 7.8 h |

## FUEL & PAYLOAD TREND




## RECENT TRIP HISTORY

| Time | Route | Distance | Payload |
|---|---|---|---|
| 08:15 – 08:47 | Quarry → Crusher | 8.6 km | 18.6 t |
| 07:25 – 07:56 | Crusher → Quarry | 8.5 km | 0 t |
| 06:35 – 07:06 | Quarry → Crusher | 8.6 km | 17.8 t |

View All Trips ›

## RECENT ALERTS

| | | |
|---|---|---|
| 10:18 | High Engine Coolant Temperature | CRITICAL |
| 10:05 | Payload Approaching Limit (22 t) | WARNING |

## DEVICE & SENSOR HEALTH

| | |
|---|---|
| GPS/GNSS | ONLINE |
| Fuel Sensor | ONLINE |
| Weighing Controller | ONLINE |
| CAN/J1939 | ONLINE |
| Gateway | ONLINE |

# Alerts and Notifications

## Notify the Right Person at the Right Time

### FUEL

- Sudden fuel decrease
- Unauthorized refueling
- Low-fuel level
- Excessive fuel consumption

### PAYLOAD

- Overload
- Underload
- Unloading outside authorized area
- Abnormal load-sensor reading

### LOCATION

- Geofence violation
- Route deviation
- Unauthorized movement
- Long stop or excessive idling

### DRIVER AND VEHICLE

- Speeding
- Harsh driving
- Fatigue or distraction, if DMS is installed
- High engine temperature
- Low battery voltage
- Device offline or sensor fault

### NOTIFICATION CHANNELS

- NextSense Dashboard
- Mobile Notification
- WhatsApp
- Telegram
- Email



**Critical events are delivered to the right operational team through the appropriate channel.**

# Analytics and Reports

## Transform Vehicle Data into Operational Decisions

### Operational Reports

- Daily fleet-operation report
- Trip and cycle report
- Fuel-consumption report
- Refueling and suspected fuel-loss report
- Payload and overload report
- Driver behavior and score report
- Vehicle utilization report
- Idling report
- Geofence and route-violation report
- Sensor and device-health report

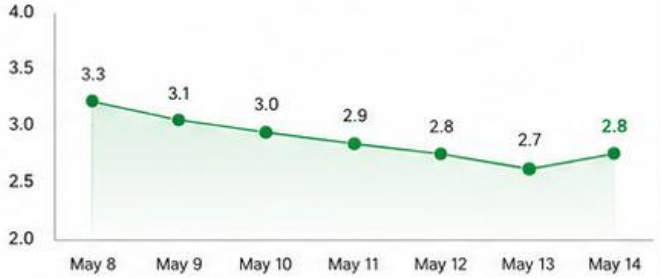
### Advanced KPI Analytics

**Liter per kilometer**
2.8 L/km — ↓ 8% vs last 7 days

**Liter per engine hour**
12.4 L/engine hr — ↓ 6% vs last 7 days

**Liter per transported ton**
0.19 L/ton — ↓ 7% vs last 7 days

**Fuel Efficiency Trend (L/km)**




**Ton per trip**
14.6 ton/trip — ↑ 5% vs last 7 days

**Ton-kilometer**
2,860 ton-km — ↑ 7% vs last 7 days

**Trips per shift**
8.4 trips/shift — ↑ 6% vs last 7 days

**Average cycle time**
42 min — ↓ 10% vs last 7 days

**Idle time percentage**
13% — ↑ 2% vs last 7 days

**Payload utilization**
87% — ↑ 4% vs last 7 days

**Transported Tonnage by Shift (ton)**




**Fleet Availability**




**Fuel Cost per transported ton**
$1.28 /ton — ↓ 6% vs last 7 days




**Raw Vehicle Data**
Telematics, sensors and device data collected in real time

**Operational Analysis**
KPIs, trends and insights generated from data

**Management Decisions**
Actionable intelligence to improve performance and reduce cost

# Flexible Solution Packages

## Start with the Required Modules and Expand Gradually

### 1 Package 1 — Fleet Visibility



- GPS Tracking
- Trip History
- Ignition Monitoring
- Geofence
- Speed & Idling Alert
- Basic Driver Behavior

### 2 Package 2 — Fuel Intelligence




- Fuel-Level Sensor
- Refueling Detection
- Fuel-Loss Detection
- Consumption Analytics
- Fuel Reports

### 3 Package 3 — Payload Intelligence




- Load Sensors
- Weighing Main Unit
- Payload & Overload Monitoring
- Load-Cycle Analytics
- Payload Productivity Reports

### 4 Package 4 — Advanced Truck Intelligence




- CAN/J1939 Integration
- Driver Score
- DMS/ADAS
- Vehicle Health
- Advanced Analytics & Integration

### Choose Modules Gradually — or Deploy an Integrated Package

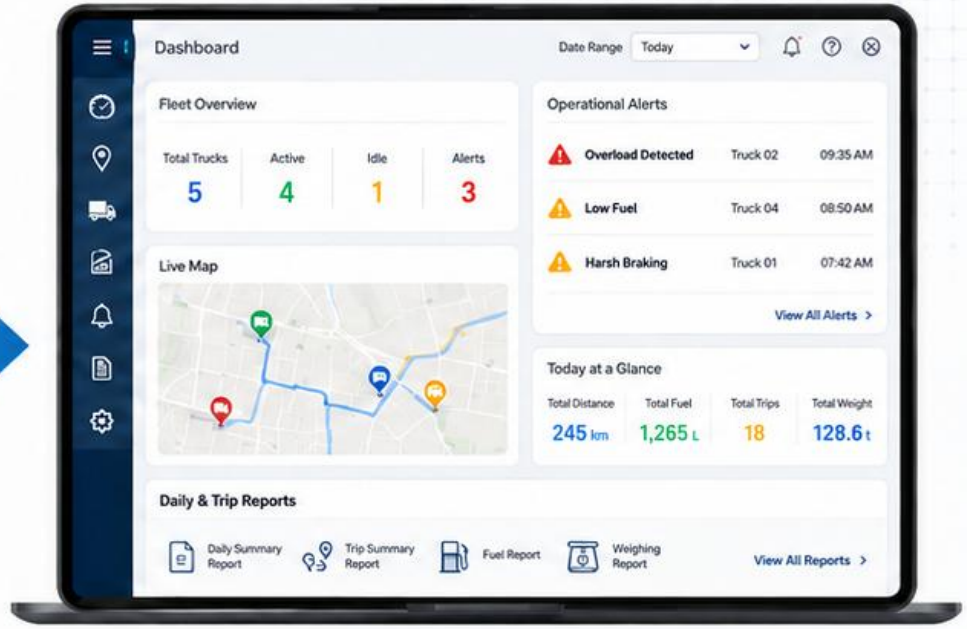
Customer dapat memilih modul secara bertahap atau menggunakan paket terintegrasi.



# Recommended Pilot Scope

Validate the Technology on Representative Vehicles




## Pilot Configuration

- 3–5 Representative Trucks
- Start with One Truck Type / Model
- GPS & Vehicle IoT Gateway
- Ignition Monitoring
- Fuel-Level Sensor
- On-Board Weighing System
- Basic Driver Behavior
- 4G Connectivity
- NextSense Dashboard
- Operational Alerts
- Daily & Trip Reports

## Validation Stages

1. Vehicle & Electrical Survey
2. Sensor Mounting Assessment
3. Fuel-Tank Calibration
4. Weighing Calibration
   *Using known loads or weighbridge*
5. CAN/J1939 Compatibility Check
6. Road & Operational Testing
7. Dashboard & Alert Validation
8. Performance Evaluation

# Pilot Success Criteria

## Measure Technical Reliability and Operational Value




### 1 CONNECTIVITY & AVAILABILITY

- GPS and data availability
- Device connectivity uptime

### 2 FUEL MEASUREMENT

- Fuel-level reading stability
- Refueling-event detection accuracy
- Abnormal fuel-decrease detection

### 3 PAYLOAD & OPERATIONS

- Payload accuracy vs. weighbridge
- Load and unload event accuracy
- Geofence and trip detection

### 4 SYSTEM PERFORMANCE

- Driver-event detection consistency
- Dashboard and alert response time

### 5 OPERATIONAL ADOPTION

- User adoption by operation and fleet teams

**IMPORTANT:** Target accuracy will be agreed after vehicle survey, installation-method selection, and calibration testing.

# Why NextSense and Next Steps

## WHY NEXTSENSE

### End-to-End Integration

Sensors, on-board devices, connectivity, dashboard, alerts, analytics, and reports.

### Multi-Vendor Compatibility

Fuel sensors, weighing systems, gateways, CAN devices, and cameras.

### Customizable Dashboard

Adapted to fleet, route, site, shift, and operational process.

### Edge and Cloud Capability

Local data buffering with centralized cloud visibility.

### Local Engineering and Support

Survey, installation, calibration, commissioning, training, and after-sales support.

### Scalable Implementation

Start with selected vehicles and expand across the fleet.

## NEXT STEPS

1. Identify priority operational problems
2. Confirm vehicle type and fleet composition
3. Conduct vehicle and electrical surveys
4. Define required monitoring modules
5. Select pilot vehicles and acceptance criteria
6. Install, calibrate, and validate
7. Evaluate results and scale



**Schedule a Vehicle Survey and Live NextSense Dashboard Demonstration**

**NextSense Truck Intelligence is designed around the complete truck operation—not merely as a GPS tracking system.**