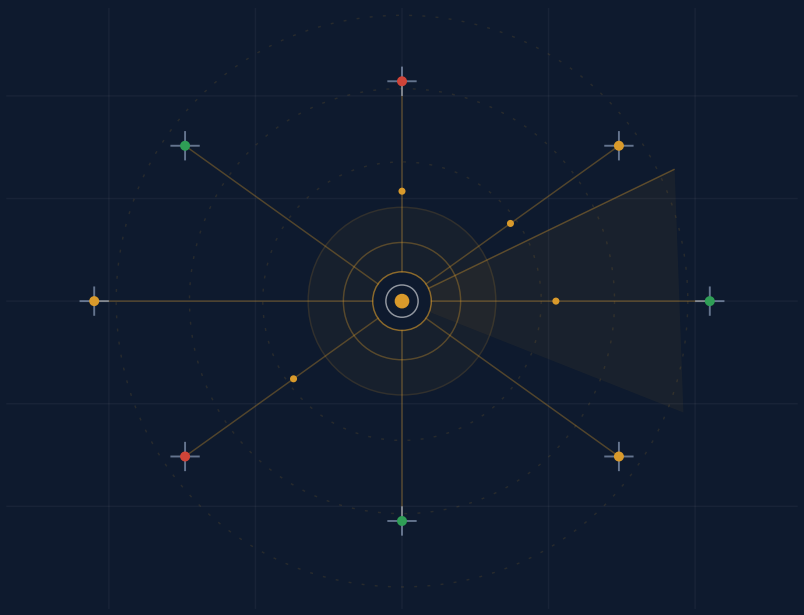
SINYAL



INTELLIGENT INTERSECTION MANAGEMENT PLATFORM · 2026

ROTA

See the city,
direct the flow.

01 PLATFORM Overview

ROTA is a web-based **monitoring, management and analysis platform** that connects centrally to the intersection controllers running a city's traffic signals. Over the standard NTCIP protocol it reaches every intersection in the field, streams its status to the operator's screen in real time, and enables these intersections to be configured remotely. From a single pedestrian crossing to a metropolitan-scale signal network, it brings every intersection into one center.

Monitoring, remote configuration, coordination, analysis and alarms come together in the same interface. Without leaving their desk, the operator sees, understands and directs the city's traffic — going to the field only when truly necessary. ROTA is not a desktop program but a multi-user web platform: accessible from anywhere with a browser, within each user's permissions.

Citywide MONITORED FROM ONE CENTER	Real-time LIVE STATUS STREAM	Zero trips REMOTE CONFIGURATION
NTCIP 1202 DEVICE COMPATIBILITY	TR / EN / RO MULTILINGUAL · 12 THEMES	24 / 7 CONTINUOUS MONITORING + ALARMS

WHY ROTA

ROTA turns an infrastructure managed with scattered tools, site visits and guesswork into a proactive operation run from a single screen. It brings different-brand devices that run the NTCIP standard into one interface, delivering visibility, remote control, foresight and accountability together.

SINGLE SCREEN

02 Live Monitoring

The operator sees every detail of the selected intersection on a live, fluid dashboard. Whatever color the lights are in the field, they are the same in ROTA — without delay. Phase and channel status, timers, detectors, faults, preemption status, the intersection map and the camera feed all come together on one screen.

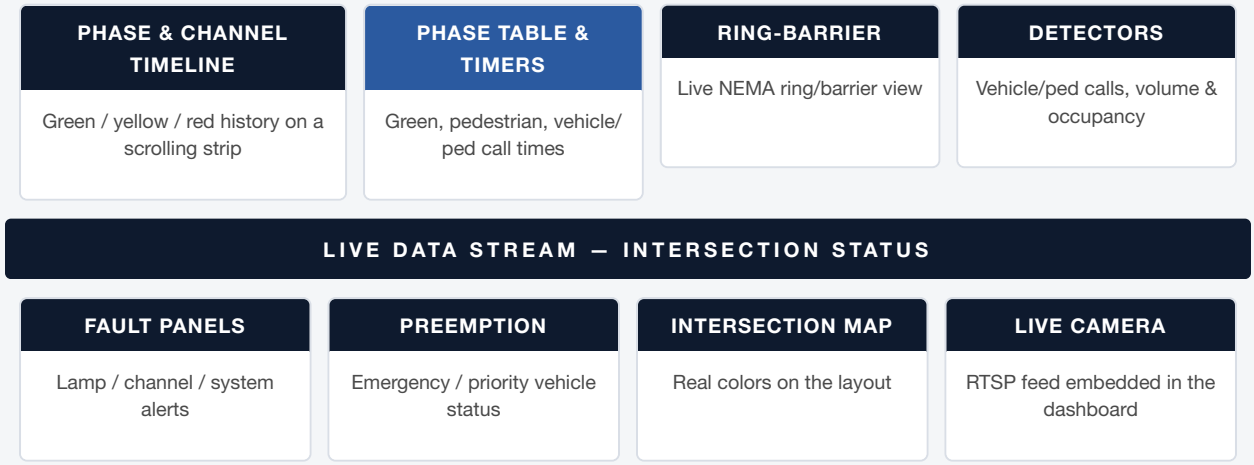


FIG. 01 — SINGLE-SCREEN INTERSECTION MONITORING LAYOUT

Clear even during dropouts

If the connection stalls for a moment the screen does not freeze; the last valid state is kept. When a device is genuinely offline it says so clearly — the operator never mistakes an old frame for live data. Coordination and device-info panels update at the same time.

You choose the visibility

Panels can be shown or hidden; the operator builds their own layout. A raw data-log view for watching the incoming stream is always at hand for troubleshooting and verification.

CITY SCALE

03 Central Map & Intersection Planner

Every intersection is gathered on a single interactive map at its real location. Each intersection's color tells its instant status. The operator sees the whole city at a glance; if there is a problem, they immediately know where it is.

- **Green** — Online and healthy
- **Red** — Offline
- **Yellow** — Alarm state

- **One-click drill-down:** Click an intersection on the map and its entire live dashboard opens instantly — without changing pages.
- **Several intersections on one screen:** The live panels, cameras and layouts of several intersections open at once as floating windows over the map; the operator watches them side by side on a single screen.
- **Bulk management:** Intersections are grouped as regions and corridors; configuration packages are imported in bulk and group operations are applied across them.
- **Intersection planner:** Intersection geometry is drawn onto the map — signal lines, turn and movement arrows, signal heads, detector regions (ROI), **pedestrian buttons** and the controller.
- **Fleet summary and filtering:** Controller and detector states are gathered in one automatically updated list, filtered and searched by intersection, operating state, region and name.
- **Live matching:** The drawn layout is matched with live signal data; movements are colored in real time.
- **Regional view:** Intersections are split into regions; large networks are broken into manageable parts.

BUILT FOR THE OPERATIONS CENTER

ROTA's map screen works with the same integrity everywhere — from a traffic management center's video wall to the operator's desktop. The city's pulse in a single view: where there is congestion, where there is a fault, where intervention is needed.

WITHOUT SITE VISITS

04 Remote Configuration

ROTA's most valuable capability is changing intersection settings from your desk, without going to the field. When you update a value it is written to the device instantly and the result is verified on screen. Every configuration module talks directly to the device.

CONFIGURATION MODULE	WHAT IT PROVIDES
Light Timings (Phase & Ring)	Min. green, yellow, red clearance and pedestrian (walk / don't-walk) times, phase plans, ring/barrier structure and the active program
Signal Groups & Overlaps	The intersection's signal groups and the definition of concurrently running (overlapping) movements
Detector Settings	Vehicle and pedestrian detectors; sensing type (inductive loop · radar · camera · magnetometer) and a clear name for each
Coordination	Inter-intersection harmony and green wave via coordinated phase, offset and split tables
Time Management	Day plans, weekly schedules, holiday and special-day calendars
Device & Operating Mode	Basic device parameters and changing the device-wide operating mode remotely
Preemption Control	The live state of each preempt input, and switching that input on or off remotely from the center — emergency and transit priority

Expert access

For the advanced user, the MIB browser makes it possible to navigate the device's entire parameter tree and read or write any value. Full control via the NTCIP table viewer and bit-mask editor.

Safe changes

Every write is permission-bound and recorded. Who changed which parameter, and when — all of it is tracked; a wrong setting is documented in a reversible way.

BUSINESS VALUE

Every remote adjustment eliminates a site visit — saving fuel, staff hours, vehicles and traffic-safety risk. The change is made in minutes and its result is verified on screen instantly.

SMART SETUP

05 AI-Assisted Wizard

Adding a new intersection to the system is done with a step-by-step wizard in ROTA: from location and topology to phase sequencing, from timing parameters to the program table. And it goes one step further — describe the intersection in your own words, and let the AI configure it for you.

Describe it in plain language

Sentences such as "give the main artery priority in the morning peak, keep pedestrian times at least 7 seconds" are enough to describe the intersection.

Let ROTA prepare it

The phase structure is proposed, times are computed, validated against NEMA / NTCIP rules, and presented as a preview before being applied.

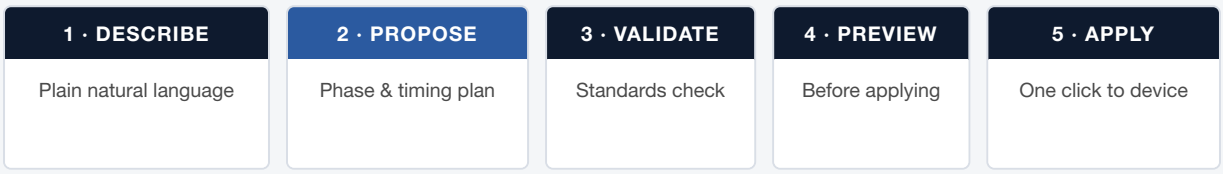


FIG. 02 — AI-ASSISTED SETUP FLOW

THE DIFFERENCE

It turns a technical setup that used to require expertise into something as simple as writing a sentence. Work that took hours drops to minutes; the margin for error falls and consistency rises. For the experienced engineer, every step can still be fine-tuned by hand.

FLOW MANAGEMENT

06 Coordination & Green Wave

A driver catching consecutive greens along an artery — the "green wave" — is both monitored and designed in ROTA. Inter-intersection harmony is built on the device's real coordination data; it relies on the field reality, not an estimate.



FIG. 03 — GREEN WAVE / TIME-SPACE DIAGRAM

- **Coordination screen:** The harmony status, coordinated phase and timing of multiple intersections on one screen.
- **Green-wave diagram:** "The vehicle passes without stopping" bands are drawn visually for the selected corridor.
- **Easy adjustment:** The timing offset between intersections is set with a visual dial; it is computed from real split data.
- **Adaptive coordination:** The green wave is preserved and monitored from the center even as the cycle length changes with traffic; it can **work alongside centralised adaptive systems such as SCOOT/SCATS**. The decision is distributed — if the link to the center drops, the intersection keeps running adaptively on its own detectors.
- **Multi-intersection and area control:** Not one intersection but a whole artery or area is managed together; a corridor is defined and its intersections are bound to it.
- **Plan selection driven by external conditions:** When a threshold from an external system such as an air-quality station is crossed, the signal plan changes automatically; the operator defines the rule.
- **Real-time time-space diagram:** The intersections along a green-wave axis are followed live on the same diagram.

ONE MODE IS NOT ENOUGH

07 Operating Modes

The aim of urban traffic control is to minimise queues, time stopped at signals and exhaust emissions — and no single way of running achieves that. ROTA and the controllers attached to it work in **seven distinct modes**; which intersection runs in which mode is decided per region and per hour.

OPERATING MODE	HOW IT WORKS
Fully adaptive	Green and cycle times are continuously adapted to the traffic volume measured in real time
Plan selection on real-time data	The plan changes according to values from the intersection's own detectors or from measurement points
Time-based plan selection	Time of day, day of week, holidays and special days, school hours — driven from the calendar
Plan selection on external conditions	The plan changes when a threshold from an external system such as an air-quality station is crossed
Manual command	The operator changes the plan or the operating mode instantly from the center
Local micro-regulation	The intersection extends or ends the green with its own detectors; gap, passage and maximum times are set from the center
Interconnection with the priority application	A priority request for a late transit vehicle or an emergency vehicle takes effect

THE MODE IS THE OPERATOR'S CHOICE

An intersection does not have to run in the same mode all day: adaptive in the morning peak, on a time-based plan overnight, under manual command during an incident. The mode is changed from the center, applied on the device immediately, and **who changed it and when** is recorded. The system reacts to sudden changes in traffic without delay and, when required, runs **fully automatically without operator intervention**.

FORESIGHT

08 Analysis, Performance & Reporting

ROTA does not only show "the now"; it also records the past at high resolution and turns it into meaningful information. Phase events and parameter changes are stored with timestamps and become periodic summaries and performance metrics.

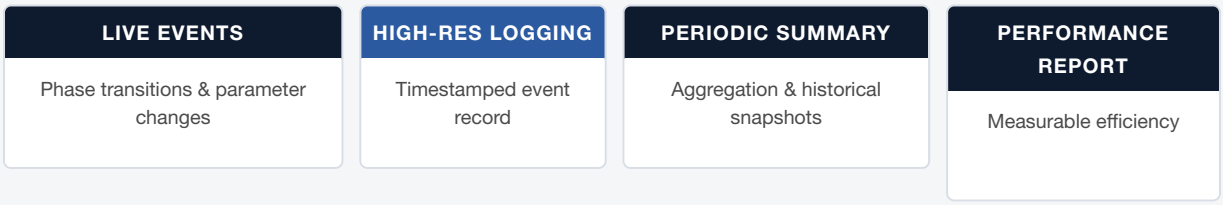


FIG. 04 — FROM EVENT TO REPORT

- **High-resolution event log:** Phase transitions and changes are stored with timestamps.
- **Historical snapshots:** Intersection state is archived periodically.
- **Measurement per detector:** Traffic values are shown both at intersection level and for each physical detector — counts and occupancy.
- **Ready-made reports:** Controller status, detector status and an alarm listing are produced as reports.
- **Signal performance reports:** The efficiency of the signalization becomes measurable.
- **Prediction:** Historical profiles combine with live measurement to anticipate when congestion will build; typical peak hours and chronic bottlenecks are ranked.
- **Self-learning:** Week-hour demand profiles are built from the system's own measurement and continuously updated; change in the field flows into the profile by itself, with no yearly re-survey.
- **Healthy archive:** With an automatic retention policy the system stays orderly for years.

DECISION SUPPORT

"When does the evening peak start at this intersection?", "Is this artery slower than last month?" — these questions are now answered with data, not intuition. Improvement decisions rest on evidence, and results are verified by measurement.

PROACTIVE

09 Alarms & Notifications

When something goes wrong in the field, you don't wait for a citizen complaint to find out — ROTA tells you. A fault is on the screen and in the relevant team's inbox within its very first minute.



FIG. 05 — ALARM LIFECYCLE

- **Automatic alarms:** An intersection going offline, a lamp/channel fault and an unhealthy connection instantly become alarms.
- **Rule-based routing:** You decide which alarm goes to whom; it is delivered on the chosen channel, with duplicates de-duplicated.
- **Alarm history:** A filterable, searchable record of all alarms; deliveries and escalation are tracked.
- **Fault management — from ownership to resolution:** Every alarm follows a lifecycle: **active** → **acknowledged** → **resolved**. Who took it, when they took it and when it was closed are all recorded; no fault is left unowned.
- **Three notification channels:** An alarm is delivered by e-mail, webhook and WhatsApp group; the operator decides which rule goes to which channel.
- **Severity and rule matching:** Every alarm carries one of four severities — **low · medium · high · critical**. Rules match on type, severity and region, so a critical fault and an informational warning need not reach the same person.
- **Automatic resolution:** When the condition in the field clears, the alarm resolves by itself and the closing moment is recorded — no manual closing, no dead entries in the open list.
- **No duplicate delivery:** A second notification for the same alarm never goes to the same channel, and every delivery is logged with who, which channel and when.
- **Thirty alarm types, one list:** Intersection offline, controller · detector · lamp fault, suspect phase and channel data, power loss, magnetometer, sign, plate camera and cabinet health — all one lifecycle.

SAFE TRIAL

10 Simulation & Scenario Testing

ROTA lets you safely try changes before applying them in the field. With scenario testing and traffic-simulation integration you can see the behavior of a timing plan or coordination setting in advance — without putting the real intersection and traffic at risk.

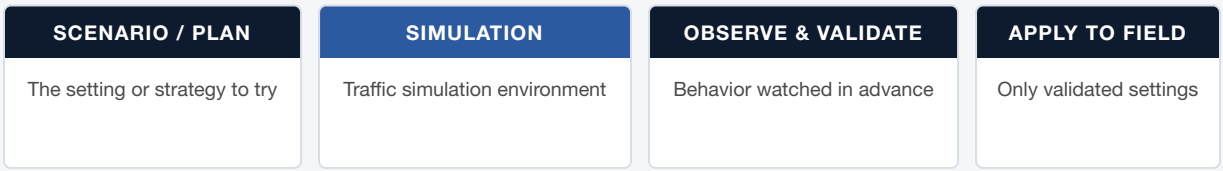


FIG. 06 — SAFE CHANGE CYCLE

- **Scenario testing:** Try specific situations and "what if?" scenarios in a controlled way.
- **Traffic simulation:** Plan behavior can be observed in a simulation environment even without a real device.
- **Safe rollout:** A tried and validated setting is only then applied to the field device.

REDUCES RISK

A new timing or coordination strategy is tested before it goes live. This minimizes the congestion, safety risk and reputational cost that faulty settings could cause. Change management settles into a try–observe–apply cycle.

SEES AND RECOGNISES

11 Plate Recognition & Violation Cameras

ROTA sees not only the signal but the traffic passing through it. Plate-recognition cameras attached to intersections read the vehicles going by, and that reading turns into three separate kinds of value: **a searchable record**, **an instant alarm** and **a statistic a traffic engineer can use**.



FIG. 07 — FROM PLATE TO DECISION: THE LPR DATA FLOW

- **Wanted-plate list:** a listed plate raises an alarm the moment it is seen in the field.
- **Vehicle description rules:** even with an unknown plate, "white van" becomes an alarm rule.
- **Search in plain language:** written as a sentence — date, intersection, colour and make together.
- **Operator-approved priority:** a priority vehicle raises a time-limited request, and the decision is recorded.
- **Remote camera maintenance:** clock/NTP, capture zone and relay settings from the center.
- **Capture statistics:** counts, spot speed and make/colour distribution — a capture count, not raw volume.

Violation, enforcement and weighing sites

Red-light, speed and radar cameras are watched from the same center, vendor-neutrally. **Weight-in-motion** sites are integrated too: plate matched with weight, record stored, site on live video.

The camera's own health

Disk filling up, CPU load, a drifting clock, a device restart and a stopped capture are each their own alarm type — a camera never goes quietly blind.

PERSONAL-DATA DISCIPLINE

Plate text and capture image have **separate retention windows** and are deleted by two independent sweeps. The statistics layer never reads a single plate, and an individual record needs its own permission.

A WORD TO THE DRIVER

12 Variable Message Signs

ROTA decides what the roadside sign will say and manages the sign itself. Message design, rule-based automation, reconciliation with the device and sign faults all come together in one place — the sign is no longer a board someone types on, but a screen that speaks with live data.

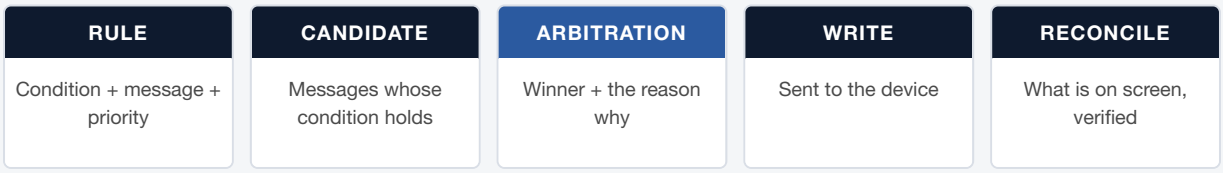


FIG. 08 — THE SIGN AUTOMATION CHAIN

- **Device-independent designer:** text, pictograms, multi-page messages and effects.
- **A 134-piece pictogram library** plus region-specific operator uploads.
- **Travel time:** the current measured time for a defined A→B route — "airport 18 min".
- **Queue length:** once the per-approach queue crosses its threshold, drivers are sent another way.
- **The operator lock wins:** automation never touches a message posted by hand, for any reason.
- **A stale source posts nothing:** if the feeding data falls silent, "road closed" does not stay on the sign.
- **Bad-pixel map:** the faulty LEDs the device reports are drawn at the sign's own resolution.
- **Traffic incident:** an accident, closure or roadworks, with the incident's road and description.

WHY ARBITRATION

More than one rule can be right at the same moment: a queue warning on one side, an accident notice on the other. ROTA picks the winner by priority and **records its decision with the reason** — "why was this message showing?" can always be answered. The sign's alarms are separate too: offline, device fault, pixel fault and degraded automation are never conflated.

BEYOND THE SIGNAL

13 Live Traffic, Queue & Level of Service

Seeing what the signal does is not enough; you also need to see what the traffic does. ROTA brings live flow data, per-approach queues, incidents on the road and corridor performance onto the same map — an intersection is no longer judged alone, but together with the flow it sits in.

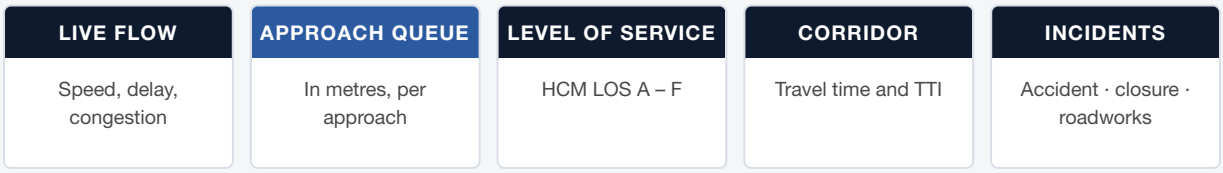


FIG. 09 — FROM INTERSECTION TO NETWORK: TRAFFIC PERFORMANCE LAYERS

- **Live congestion on the map:** every intersection is coloured by its instant flow state. When data goes stale it keeps its colour but is clearly marked stale — never producing the illusion that "the congestion cleared".
- **Per-approach queue:** queue length, delay and number of stops for each approach. The link between an approach and a signal channel is established by **operator approval**, not by guesswork.
- **Level of service (LOS A–F):** derived from average control delay per vehicle against the HCM table and marked "approximate"; it does not replace a formal engineering report.
- **The cause of the congestion:** whether it is recurring (signal/demand) or non-recurring (an accident, a closure) is separated automatically. Intervention starts with that distinction.
- **Historical queue profiles:** week-hour profiles, typical peak hours and a ranking of chronic bottlenecks — for planning decisions.
- **Estimated CO_2:** estimated tailpipe emissions at intersection and fleet level; not a measurement but an estimate derived from the COPERT 5 urban method, and marked as such.

BEFORE / AFTER: IT PROVES THE IMPROVEMENT

When an intersection moves from fixed-time signalling to adaptive control, saying "it got better" is not enough. ROTA proves the improvement **with numbers and honestly**: the unit of analysis is the independent day, every metric carries an absolute value + a percentage + a **95% confidence interval**, only the same day type and the same hour buckets are compared, and an improvement is claimed **only if it is statistically significant**. It tells you not just how much better, but how sure you can be of that result.

ASK, DON'T SCAN

14 AI Assistant, Diagnosis & Automatic Reporting

Instead of hunting for an answer across dozens of screens, ask the question directly. ROTA's assistant is wired to live intersection data: it reads status, summarises alarms, compares queues and corridors — from inside the panel, or from WhatsApp on your phone.

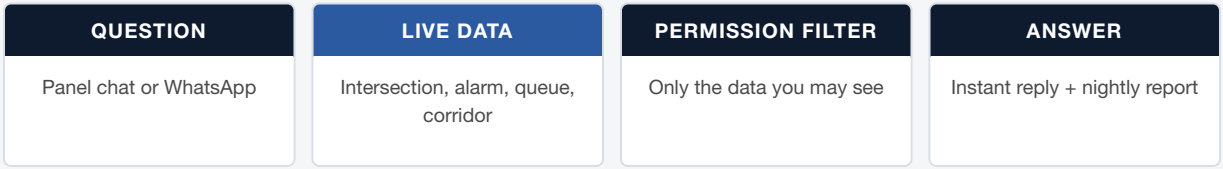


FIG. 10 — FROM QUESTION TO ANSWER: THE ASSISTANT FLOW

Two channels, one brain

The in-panel chat and the WhatsApp assistant share the same core: the field asks from a phone, the center from the screen, and the answer comes from the same live data.

Permission lives inside the assistant

The assistant cannot pull up an intersection the user is not entitled to see, not even by name; the scope boundary is enforced in the data layer. And the assistant is **read-only** — it changes no device setting.

- **Nightly traffic report:** a summary of the last 24 hours goes to the relevant WhatsApp group every night; each region gets its own data, in its own time zone and language.
- **AI diagnosis:** phase performance indicators are correlated with delay data to produce likely causes and per-phase findings. Recommendations are **advisory** — none is applied to a device on its own.
- **Self-calibration:** the diagnosis says per phase which parameter is mis-set; the recommendation carries a confidence level, the operator decides, and the effect is verified by the before/after measurement.
- **Verification by image:** on a congestion alarm a frame is taken from the intersection camera and checked — "is there really a queue?" — and the result is attached to the alarm.
- **AI in search too:** the map and plate search boxes understand a free sentence; there is no need to fill in filters one by one.

PRIVACY AND AUDIT

That an assistant query was made is recorded; the content of the question is not, and device passwords and service keys are scrubbed from the answers. The AI is a shortcut, not a gap in authorisation.

EYE AND PULSE

15 Camera, PTZ & Field Health

Measuring is one half; seeing is the other. ROTA brings the intersection camera into the panel, steers that camera itself according to the flow of the signal, and watches the cabinet's own health on the same screen.



FIG. 11 — SEEING THE FIELD AND MEASURING THE FIELD

- **Camera and PTZ:** live video inside the panel; pan, zoom and stored presets are driven from the center.
- **Integration with the recording system:** video is recorded continuously and kept for **30 days**; live stream and archive are reached from the same screen.
- **Auto-follow:** the camera turns by itself to the leg the intersection is currently serving. The server issues the command, so five operators watching still send one command — and the follow continues when nobody is watching.
- **Cabinet system health:** the cabinet's temperature, CPU load and frequency, memory, disk and network interfaces are read; a metric over its threshold becomes an alarm.
- **Every detector type supported:** inductive loop, radar, camera and wireless magnetometer — each a detector of the controller; ROTA sets the sensing type on the device and watches it live.
- **Power and sensors:** loss of grid power is its own alarm; a magnetometer sensor fault and a lost link are reported separately.
- **A named fault:** the controller's alarm registers and detector fault bytes are decoded bit by bit. The screen does not say "controller fault" — it says **"Local Flash"**, **"Coordination Alarm"**, **"Open Loop"**, **"No Activity"**.

IT DOES NOT MANUFACTURE FALSE ALARMS

A controller's alarm registers carry more than faults: they also carry normal operating information — coordination active, priority running, cycle started. ROTA does not count these as faults, so every warning on the operator's screen genuinely needs attention.

ONE INSTALL, MANY CUSTOMERS

16 Regional Structure & Secure Field Access

ROTA serves a single municipality just as well as a center hosting dozens of customers. Intersections are divided into regions; every user sees only their own region, and that boundary is not an interface preference but a rule enforced in the data layer.

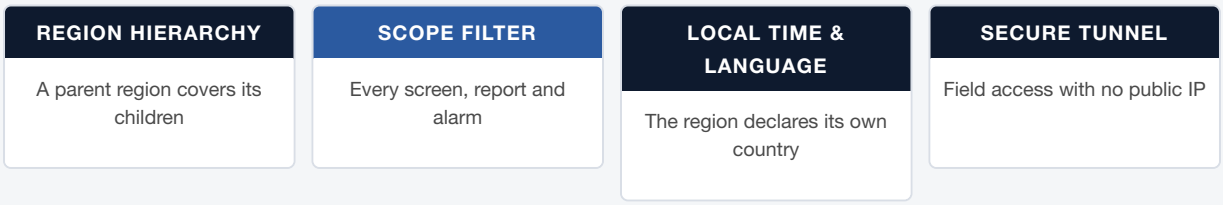


FIG. 12 — REGIONAL SCOPE AND FIELD ACCESS

- **Region hierarchy:** regions are defined inside one another and visibility is inherited downward — a user entitled to a parent region also sees all of its child regions, with no need to assign them one by one.
- **Regional localisation:** each region declares its own country, time zone and language; a field left undeclared is inherited from the parent. The holiday calendar, the hour the nightly report goes out and the notification language all follow from this.
- **Notifications and reports are region-bound too:** each customer's WhatsApp group receives the report for its own intersections only; data never mixes between customers.
- **Regional administrator:** sees and manages only the intersections, users and audit records of their own region.
- **Secure field access:** field devices are reached over an encrypted virtual network with ZeroTier or a corporate tunnel with FortiVPN — the controller never needs a publicly reachable address.
- **Bulk setup:** intersection configuration is exported and imported as a package; configuration changes while the measurement history is preserved.

VENDOR AND CUSTOMER IN THE SAME SYSTEM

One install can serve several customers at once: the customer sees only their own region, while the system provider manages the whole fleet from one center. Adding a new district, a new municipality or a new customer is not a new installation — it is a new region.

FLEET AND SCHEDULE

17 Public Transport Fleet Management

Before a bus can be given priority it has to be known: where it is, which service it belongs to and whether it is **running late** against its timetable. The fleet-management layer produces those answers, and traffic management bases its decision on them.

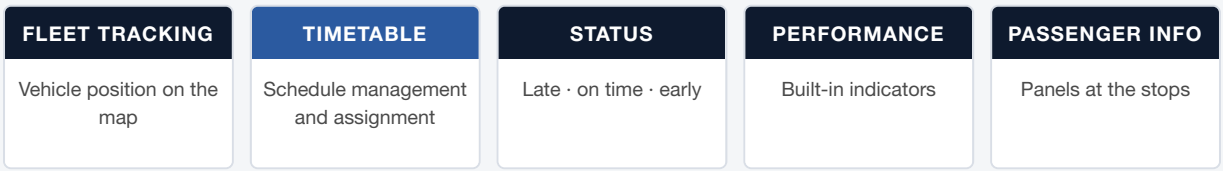


FIG. 13 — FROM FLEET TO SERVICE: THE TRANSPORT MANAGEMENT CHAIN

- **Real-time fleet tracking:** the position of vehicles along their route is shown live on the map.
- **Timetable management:** the schedule is defined, the fleet is assigned to services and each vehicle is marked **late · on time · early**.
- **Multiple operators:** several transport operators are registered in the same system and reported separately.
- **Built-in performance indicators:** connection rate, tracking latency, prediction reliability, commercial and operational speed, dwell index, travel time, punctuality and regularity at terminals.
- **Smart stops and passenger information:** an interface to the smart-stop system carries arrival information, vehicle position and the **traffic congestion map** to the panels through the central information flow.
- **Self-learning:** algorithms working on data collected in service improve the arrival prediction; micro and macro regulation are supported.

NATIVE INTEGRATION WITH TRAFFIC MANAGEMENT

Fleet management is not a monitoring tool on its own: the moment a late vehicle is detected, the **priority request passes to the traffic management system** and the intersection acts on it. The two layers share the same data — one knows where the vehicle is and how late it is, the other adapts the signal.

THE PRIORITY VEHICLE

18 Public Transport Priority & Preemption

Some vehicles in a city should not wait. ROTA handles that with **two separate mechanisms** and never conflates them: **preemption** is an emergency vehicle taking the intersection over; **public transport priority** speeds a bus through without breaking the flow — and not every bus, only one running late against its timetable.



FIG. 14 — FROM A LATE VEHICLE TO A PRIORITY PASSAGE

- **Preemption — absolute priority:** the intersection is taken over for a responding vehicle; each preempt input is switched on or off remotely from the center and its live state is watched.
- **Transit priority (TSP):** a separate transit signal group is defined at the intersection; ROTA configures that group on the device and monitors it live.
- **Conditional priority:** priority goes not to every vehicle but to one **running late** against its timetable — an on-time bus does not disturb the flow.
- **Interface with fleet management:** vehicle position and delay come from the transit control center, and the priority decision is triggered by that information.
- **Emergency corridor:** for **ambulance, fire, police** and **VIP convoys**, successive priority along the route builds a continuous green wave.
- **Every priority is recorded:** which intersection, which input, by whom and when — all in the audit trail.

PRIORITY IS NOT WITHOUT RULES

Priority never shortens the safety intervals: pedestrian crossing time, yellow and red clearance are all preserved, and the intersection returns to its normal cycle in a controlled way afterwards. Priority is therefore not "forcing the light green" but a **planned and reversible intervention** — it works without compromising safety in the field, and it leaves a trace at the center.

NOT A CLOSED BOX

19 Integration & Open Interfaces

ROTA is not a system closed in on itself: field devices connect over standard protocols and the organisation's other software over signed interfaces. Data flows into ROTA and out of it.

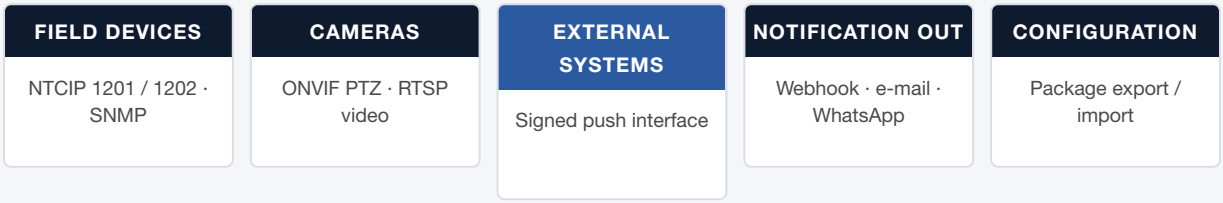


FIG. 15 — DATA INTO ROTA AND OUT OF IT

- **IRIS video-detection module:** ROTA is **fully integrated** with IRIS — the camera appears as a detector on ROTA's own screens.
- **What IRIS provides: vehicle & pedestrian detection and detector usage via NTCIP**, vehicle counting and density, vehicle-type detection with counting by type, bicycle counting, pedestrian counting and **red-light violation** detection.
- **All subsystems, one center:** traffic management, transit priority, video, LPR, red-light and radar cameras and weight-in-motion are all integrated and monitored here.
- **Notifications going out:** alarms reach the organisation by webhook, e-mail and WhatsApp.
- **TomTom integration:** live flow data (**Flow Segment Data**), traffic incidents, junction analytics, route travel time and map tiles are consumed; each product has its own monthly budget.
- **Camera standards:** PTZ control over ONVIF, live video over RTSP.
- **Standard field protocols:** SNMP v1 · v2c · v3 over NTCIP 1201 / 1202; controllers of different brands in one center.
- **Portable configuration:** intersection configuration is exported and imported as a versioned package; measurement history is preserved.

DATA COMING FROM OUTSIDE IS VERIFIED TOO

Every request an external system posts to ROTA is **signed with HMAC-SHA256**; a timestamp window stops replay and the signature covers the camera identity, so one site's data cannot be sent in another's name.

ENTERPRISE

20 Users, Access & Security

ROTA is multi-user and provides the access structure an enterprise system requires. Each user sees only the screens and operations they are authorized for; the trace of every critical operation is kept.

ROLE-BASED ACCESS	REGION AUTHORITY	FULL AUDIT LOG
A user sees only the screens and actions they are authorized for	Intersections are split into regions; access is limited by region	Who changed which setting, and when — all logged

- **Secure sessions:** Authentication is cookie-based; session information is protected securely.
- **Protection against unauthorized access:** Login attempts are rate-limited; brute-force attacks are blocked.
- **SNMP operation log:** Every write made to a device is additionally recorded.

ACCOUNTABILITY

Behind every change there is a user and a timestamp. This meets both cyber-security and corporate audit requirements, and makes responsibility clear.

21 VALUE & COMPATIBILITY
Why ROTA?

TRADITIONAL APPROACH	WITH ROTA
Going to the field for every adjustment	Instant remote adjustment from your desk
Learning of a fault from a citizen complaint	Instant alarm; e-mail, webhook and WhatsApp notification
A separate software and screen per brand	All NTCIP-compatible intersections in one center
Desktop program installed on a single PC	Web-based — from anywhere, multi-user
Long setup requiring expertise	AI-assisted setup by sentence
Trying a change directly in the field	Simulation and scenario testing first
No historical data kept	Logging, performance reports and analysis
Plate data living in a separate system	Plate recognition on the same screen as signal data
Typing every roadside sign message by hand	Rule-based sign automation fed by live data
Estimating queue length by eye in the field	Live per-approach queue and level of service (LOS)
Assuming an improvement worked	Before/after comparison with confidence intervals
Scanning dozens of screens for an answer	Ask the assistant; the nightly report arrives on its own

Compatibility & Standards



COMPATIBLE WITH INTERSECTION CONTROLLERS RUNNING THE NTCIP STANDARD

ROTA

Sees the city. Directs the flow.

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