



ASURA

TECHNOLOGIES

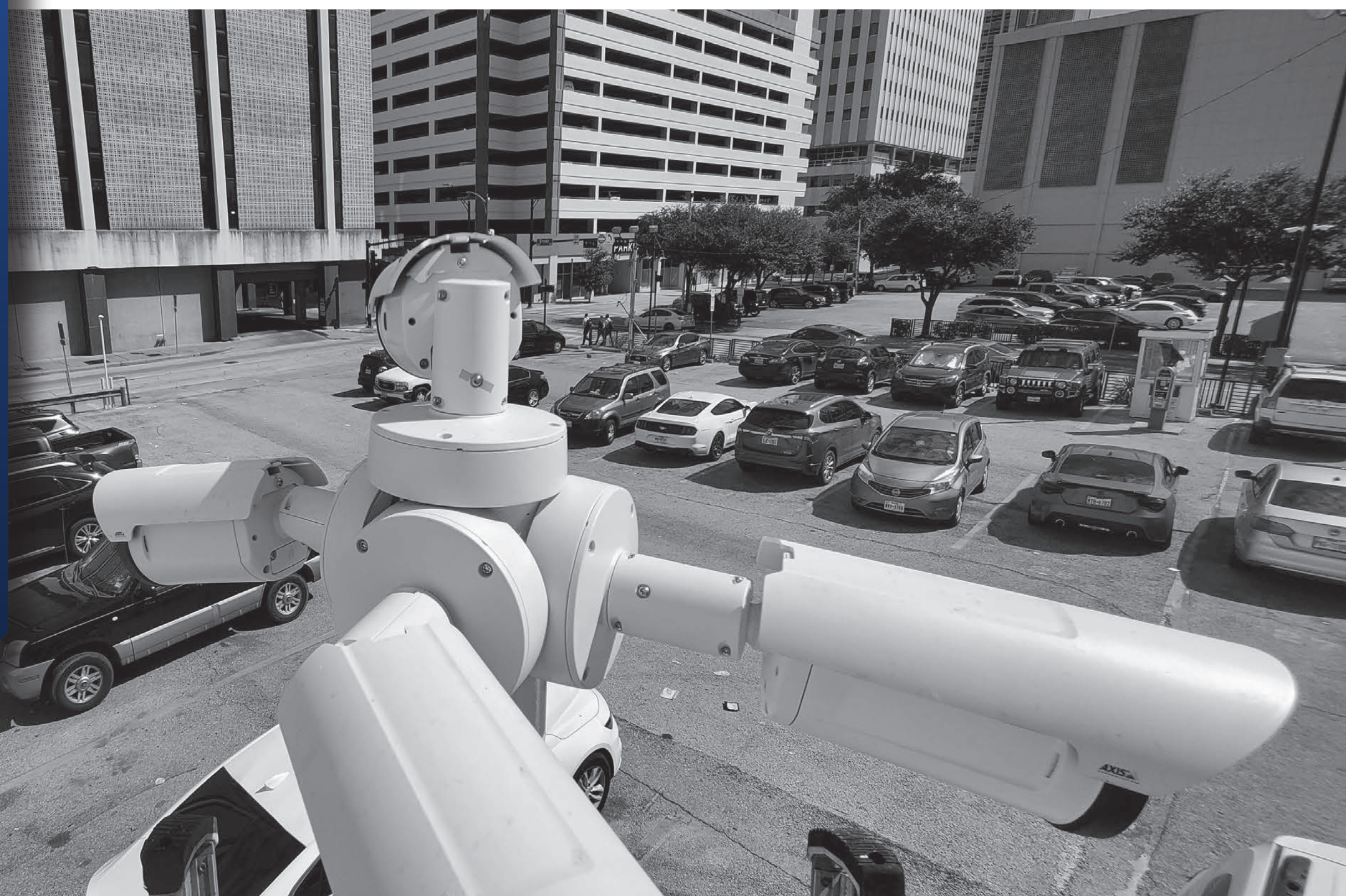
WE RECOGNIZE THE FUTURE



ASURA

TECHNOLOGIES

AI / ML APPLICATIONS,
PARKING, TOLLING



INTRODUCTION

ASURA TECHNOLOGIES IS A PROPRIETARY SOFTWARE DEVELOPER,
CREATING STATE OF THE ART NEURAL NETWORK-BASED ENGINES WITH
PROTECTED IP RIGHTS



AUTOMATIC VEHICLE DATA COLLECTION USING ALPR AND VIDEO ANALYTICS

PARKING COMPLIANCE MANAGEMENT AND TRAFFIC
SURVEILLANCE SOLUTIONS

COMMERCIALIZATION OF SOLUTIONS
TO MODERNIZE KEY SEGMENTS OF
THE VALUE CHAIN

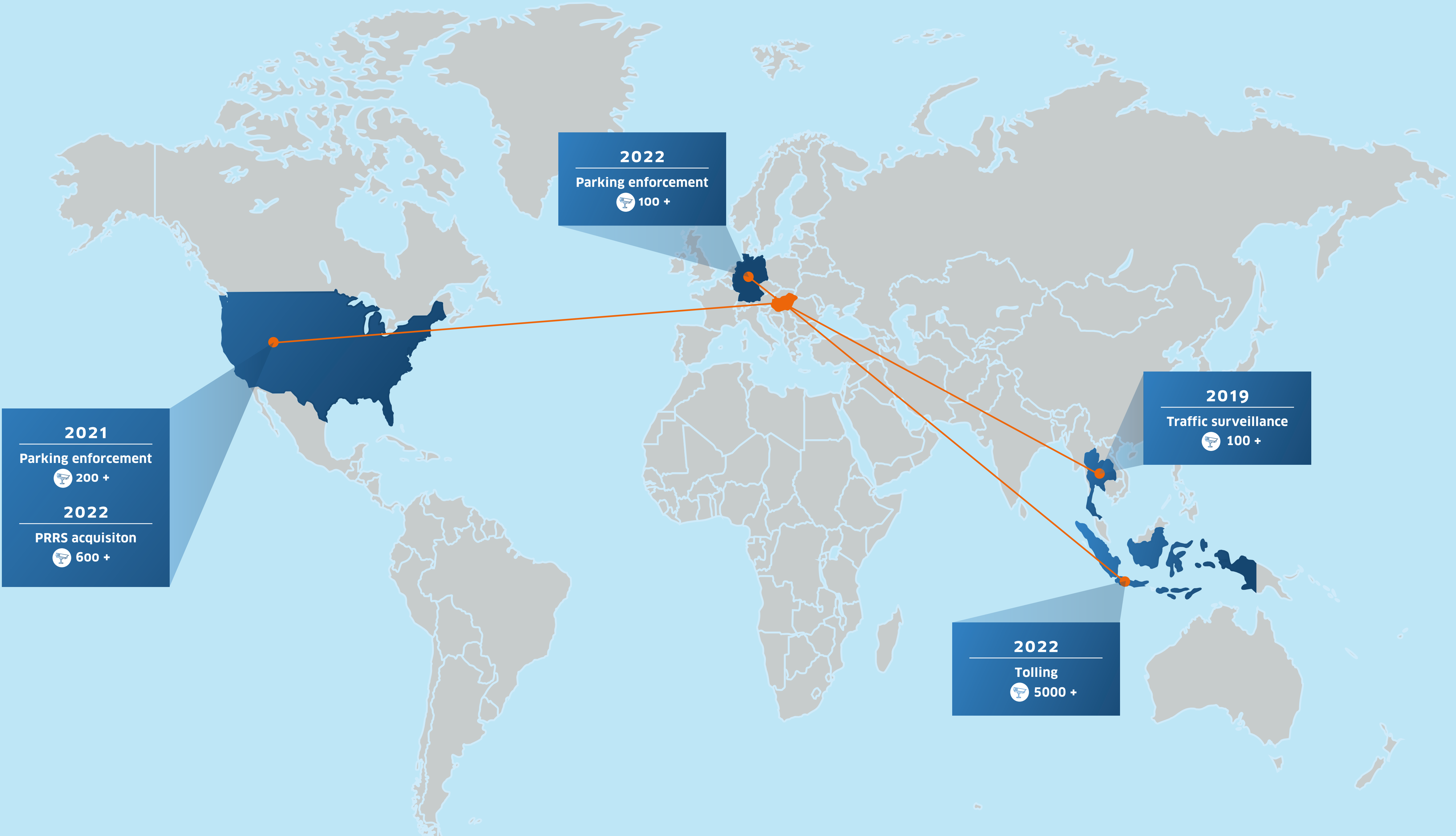


BOXED PRODUCTS

SAAS MODEL

REVENUE SHARING

HUNGARIAN CORE WITH GLOBAL REACH



COMPANY GROUP STRUCTURE



ASURA
TECHNOLOGIES
HUNGARY
• HQ, R&D



ASURA
TECHNOLOGIES
NEW CO
• new market entry



ASURA
TECHNOLOGIES
INDONESIA
• MLFF project coordination



ASURA
TECHNOLOGIES
USA
• Parking Enforcement
Technology provider

+



PRRS
PARKING
COMPLIANCE **AI**
www.parkingai.com

**PARKING
COMPLIANCE
SERVICE CO**
• Service company,
enforcement and collections

MANAGEMENT, COMPANY GROUP COORDINATION
• 6 FTE

DEVELOPERS
• 29 FTE

**PROJECT
MANAGEMENT**
• 7 FTE

**FINANCE
/ ACCOUNTING**
• 2 FTE

**SALES
/ MARKETING**
• 3 FTE

**SYS
ADMIN**
• 2 FTE

PRRS
• 60 FTE

TOTAL
• 109 FTE

CONFIDENTIAL!
Penetrating new markets

SENIOR MANAGEMENT



MÁTÉ KISS-GY.

CEO, CO-FOUNDER

Máté is a natural born entrepreneur, started his web design agency at 16, since then, for the past 20 years, he has been continuously building businesses with a strong tech focus, Asura Technologies being the latest in the line. Máté has an extensive international professional network in the global mobility industry and local political and business decision makers. He is a dynamic leader with a strategic vision, his challenging the status quo still remains to be the catalyst of company growth.



LÁSZLÓ LEGINUSZ

CTO, CO-FOUNDER

László started out as a full-stack developer, later went on to learn extensively about video analytics and machine learning. Has over 15+ years of developer and 10+ years of developer team management experience. László has been involved in the development of multiple medical- and business information systems before founding Asura Technologies and joining as its CTO. He currently manages a diverse team of 25 developers, overseeing R&D projects and managing day-to-day IT operations.



PÉTER MÁNDI

CMO, CO-FOUNDER

Péter has 19+ years of marketing and communication experience. Starting his marketing career at multinational FMCG companies like Nestlé, Mars and Wyeth, he was responsible for the management of international brands on local and regional (CEE) basis. After a number of successful product launches in the region, he later worked as business development and marketing consultant for Hungary-based tech companies before founding Asura Technologies.



GÁBOR BÜRCHNER

BOARD MEMBER, STRATEGY ADVISOR

Gabor holds more than two decades of international corporate finance / M&A and investment management experience. Spent 15 years in leading positions at CACIB, of which 10 years as a Managing Director at the EMEA investment banking division of the bank's Paris HQ. He has successfully closed numerous large-scale international M&A deals, IPOs and led strategic advisory assignments in various countries across the EMEA region.



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TECHNOLOGIES

OUR SOLUTIONS

CORE TECHNOLOGY: ASURA RECOGNITION UNIT (ARU)

ARU: common framework for video analytics
and ALPR software

FEATURES:

- Easy integration via API
- Quick setup and calibration via its graphical interface.

ADVANTAGES:

- Quick and easy camera connection setup
- Built-in event database with several filters and search function
- Data export options include Excel, .csv and real-time upload through TCP
- Multiple video analytics tools in the same framework

ARU OPERATIONAL PROCESS



SERVICES OPERATING IN THE ARU FRAMEWORK

- AUTOMATIC LICENSE PLATE RECOGNITION
- VEHICLE MAKE AND MODEL RECOGNITION
- VEHICLE CATEGORIZATION
- AUTOMATIC ACCESS CONTROL
- PARKING PLACE OCCUPANCY MONITORING

ARU MAIN APPLICATION AREAS

1. FRICTIONLESS PARKING
2. TOLLING OPERATIONS

ALPR FEATURES

- Reads license plate numbers in 150+ countries, generally delivering 98% + recognition rate, improving over time
- Uses AI-based vehicle detection as trigger
- Processes mobile and fixed camera footage as well
- Mobile ALPR adds GPS location to events if such data is available from an external source
- Can be connected to any IP camera
- Multi lane reading up to 3 lanes with one camera
- The engines use machine learning to improve performance over time.

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MMR AND VEHICLE CATEGORIZATION

Our solutions use neural networks to obtain information on vehicles in free flow traffic. The vehicle make and model recognition (MMR) software identifies vehicle brand (e.g.: Saab) and type (e.g.: 900), while the vehicle categorization software recognizes the vehicle category (e.g.: passenger car, bus, truck with trailer) according to the partner's pre-defined rule-set.

The screenshot shows the 'ARU MANAGER' interface with a 'Live view' section. It features two camera feeds of a car in a lane. Below the feeds, there are three data panels: LPR (License Plate Recognition), MMR (Make and Model Recognition), and Traffic data collection. A 'BACK' button and an 'Event log' link are also visible.

LPR	
License Plate	RBA-588
Registration number:	RBA588
Country:	Hungary
State/Province:	-
Character size:	25px
Vehicle list(s):	-
Confidence:	94%

MMR	
Make:	Mercedes-Benz
Model:	V 250
Color:	black

Traffic	
Traffic data collection	
Direction:	Approaching
Violation:	No

The screenshot shows the 'ARU MANAGER' interface in 'RUNNING' status. It displays a grid of four vehicle detection events. Each event includes a camera feed, a license plate, a date, and a time. The events are categorized as 'front_exit', 'KFF401', and 'Szemelygep es kisteher exit'.

Event	Date	Time
front_exit	2021.11.25	11:22:51
KFF401	2021.11.25	11:22:52
Szemelygep es kisteher exit	2021.11.25	11:22:51

OTHER AI-BASED SOLUTIONS PROVIDED BY ASURA

FACIAL RECOGNITION SOFTWARE:

detection of human faces in real-time on a camera or other digital image and matching them with faces already taught to the system.

MASK DETECTION SOFTWARE:

detection of masks on a human face regardless of mask patterns. Operates even in crowded environments.

USE CASE:

HOME QUARANTINE SYSTEM

Mobile application helping home quarantined people to verify staying at quarantine location without police checks. Uses face recognition to verify user and GPS location check to verify location.

100.000+

USERS

1.000.000+

SUCCESSFUL REMOTE CHECK-INS

URBAN TRAFFIC SURVEILLANCE

ASURA TECHNOLOGIES USES MULTIPLE VIDEO ANALYTICS TOOLS TO PROCESS VIDEO FOOTAGE OF CAMERAS INSTALLED THROUGHOUT THE CITY TO COLLECT URBAN TRAFFIC DATA:

TRAFFIC COUNTING

- License plate number, Location, Vehicle make and model, Vehicle category

VEHICLE CATEGORY MONITORING

- Flag banned vehicles based on category

TRAFFIC MONITORING FOR WANTED VEHICLES

- Connect to enforcement agency databased with API to fetch wanted vehicle lists and flag matches

CONGESTION CHARGING

- The tolling data collection system is ideal for data collection for congestion charging due to low costs and high reliability

BICYCLE COUNTING

AI-POWERED VIDEO ANALYTICS

ENSURES DATA COLLECTION OF THE HIGHEST PRECISION.

BICYCLE COUNTING

- Indication of direction
- Distinguishes between cyclists, pedestrians and other potential bicycle road users

POTENTIAL USE CASES

- Preparation for decision making on bicycle road infrastructure developments
- Data input for predictive traffic light control

BICYCLE COUNTING PERFORMANCE RATIO

MANUAL
COUNTING

100%

AI-POWERED
VIDEO
ANALYTICS



100%

CURRENT BICYCLE
COUNTING
EQUIPMENT

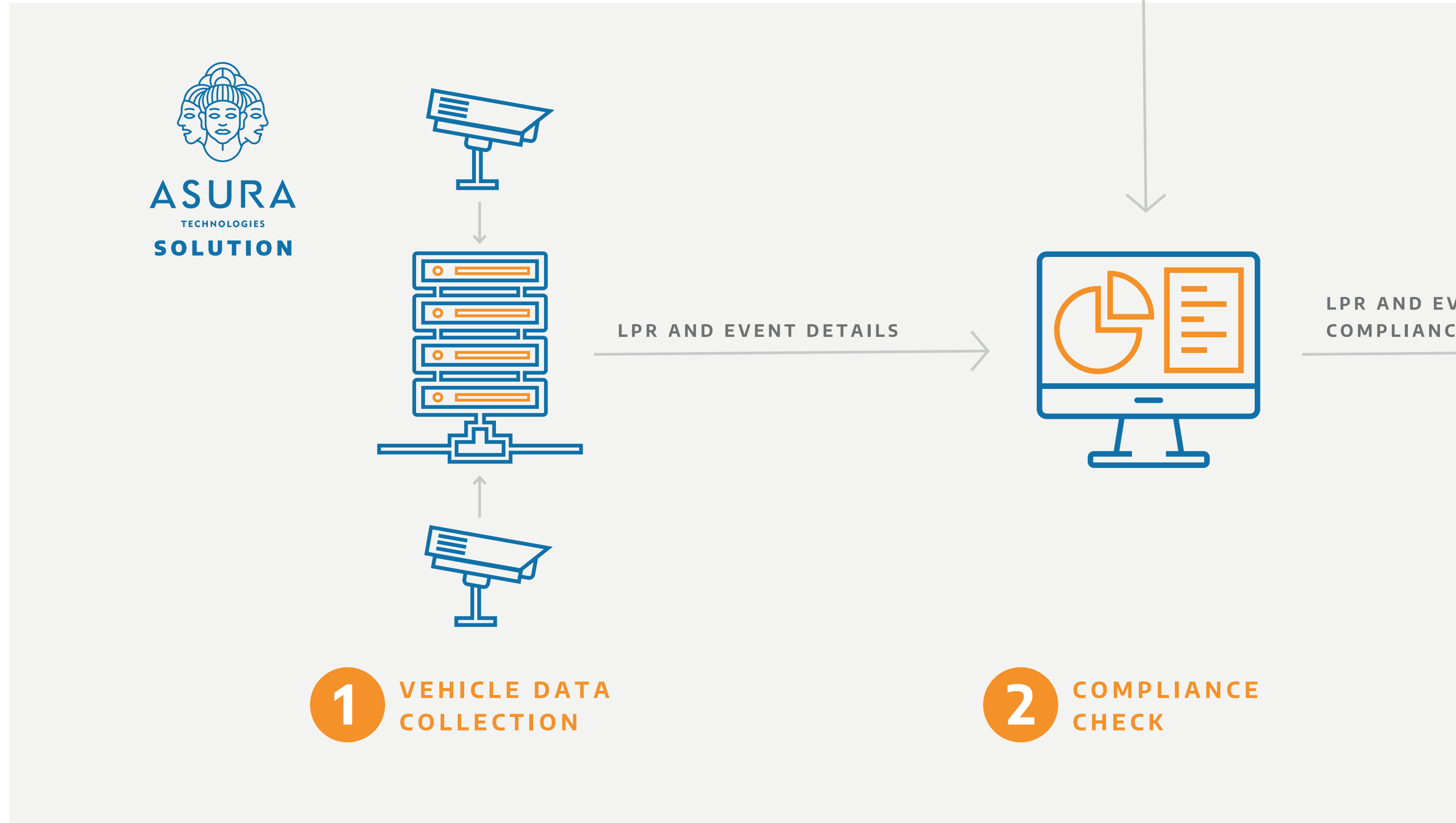
75%



TYPICAL USE CASE OF ASURA SYSTEMS

3RD PARTY PAYMENT SOLUTIONS

ASURA SOLUTIONS INCLUDED AS VITAL COMPONENT OF PAID MOBILITY SERVICES



1 VEHICLE DATA COLLECTION

2 COMPLIANCE CHECK

3 BI SYSTEM / DATA WAREHOUSE

1. FRICTIONLESS PARKING ENFORCEMENT

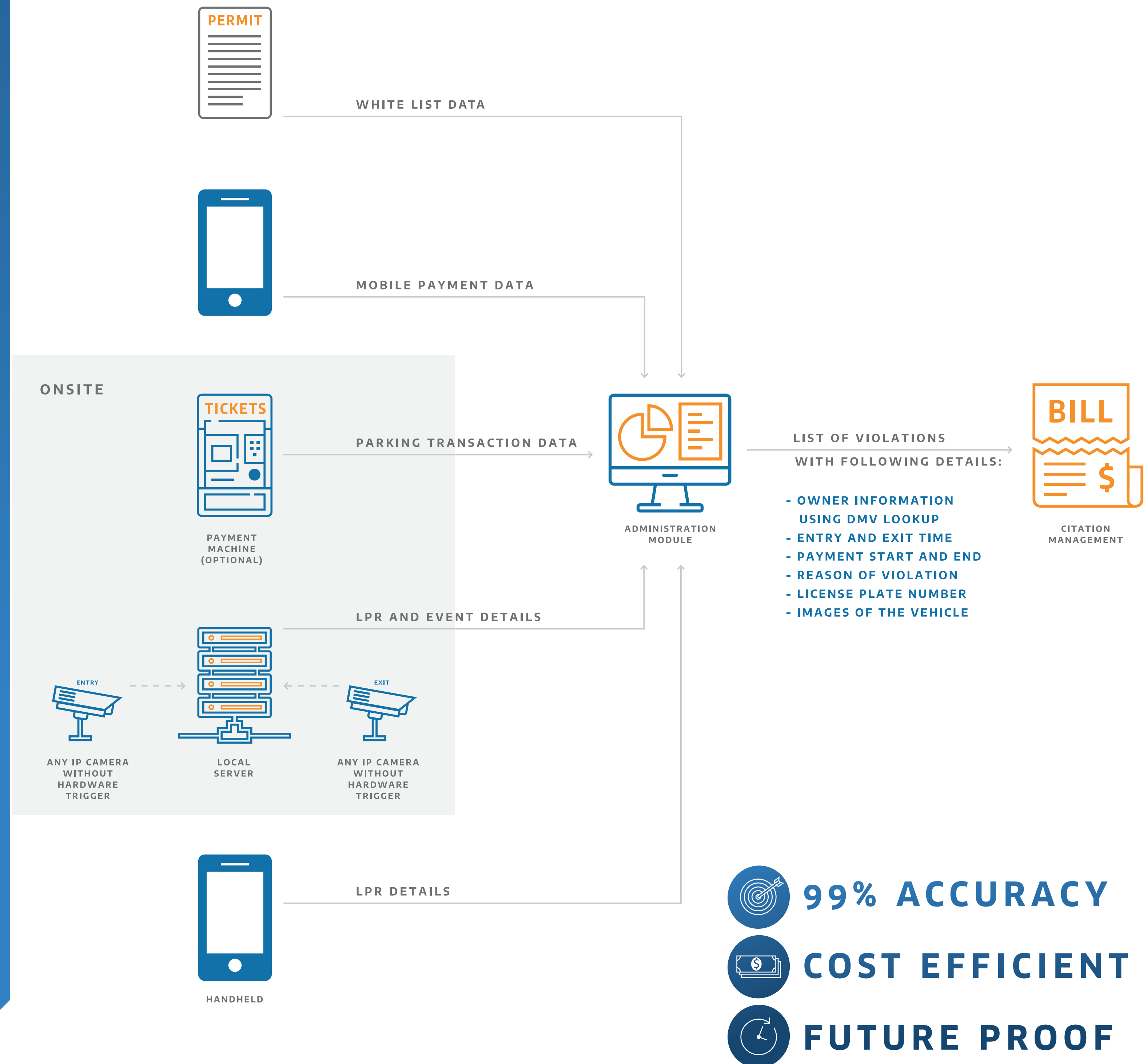
(USA PARKING COMPLIANCE MONITORING)

WHAT IS FRICTIONLESS PARKING ENFORCEMENT?

Asura Technologies and its subsidiary, Parking Revenue Recovery Services (PRRS) provide a free flow solution to maximize parking revenues by automation of enforcement efforts with an asset-light software-based solution on parking premises nationwide. ARC System, developed by Asura is the technological piece responsible for parking lot monitoring, while PRRS provides the citation management and collection services.

ADVANTAGES

- ALPR for vehicle registration and payment checks upon leaving
- Free flow: no gates or barriers
- 24 / 7 operation
- Automatic notice generation: DMV -> Citation letter



- 99% ACCURACY**
- COST EFFICIENT**
- FUTURE PROOF**

FICTIONLESS PARKING ENFORCEMENT (ARC SYSTEM) IN THE US:

100+

SITES
MONITORED

500+

CAMERAS
OPERATED

35.000+

PARKING
NOTICES / MONTH

300% <

AVG. INCREASE
IN PARKING
REVENUE

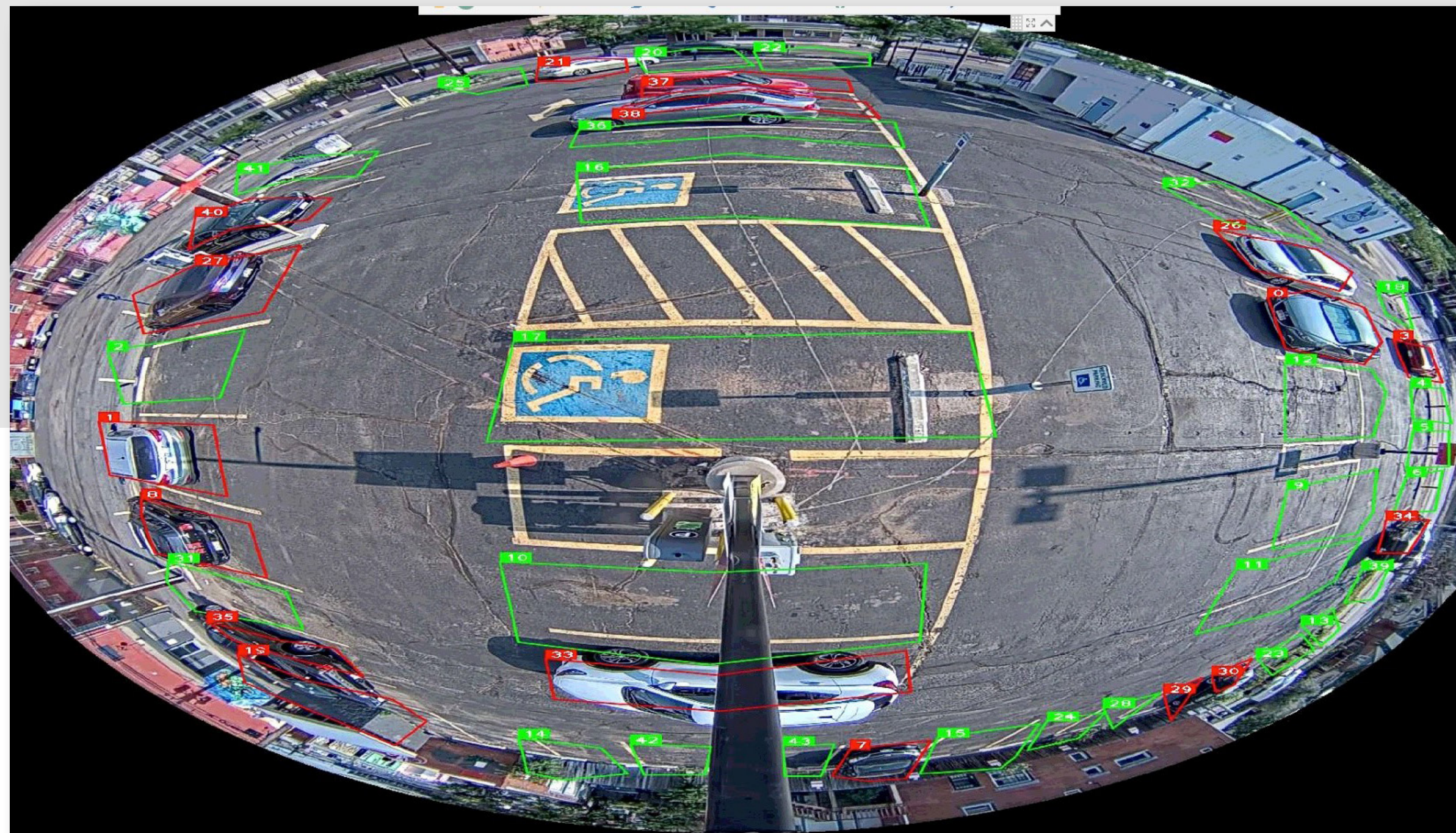
FRICITIONLESS PARKING-ADD-ONS AND DEV PIPELINE

ADD-ONS:

- Handheld enforcement tool
- Validation tool for permit holders

IN DEVELOPMENT:

- Complete real time lot monitoring:
parking space occupancy monitoring + ALPR



13:03 000 Merged Lot EXIT SITE

1. Add Notice

Plate Number* LIP722

VIN Vehicle identification numbe

Country* Please select a country! ▾


State Please select a state! ▾


Make* Make...

Color* Please select a color! ▾

Type* Please select a type! ▾

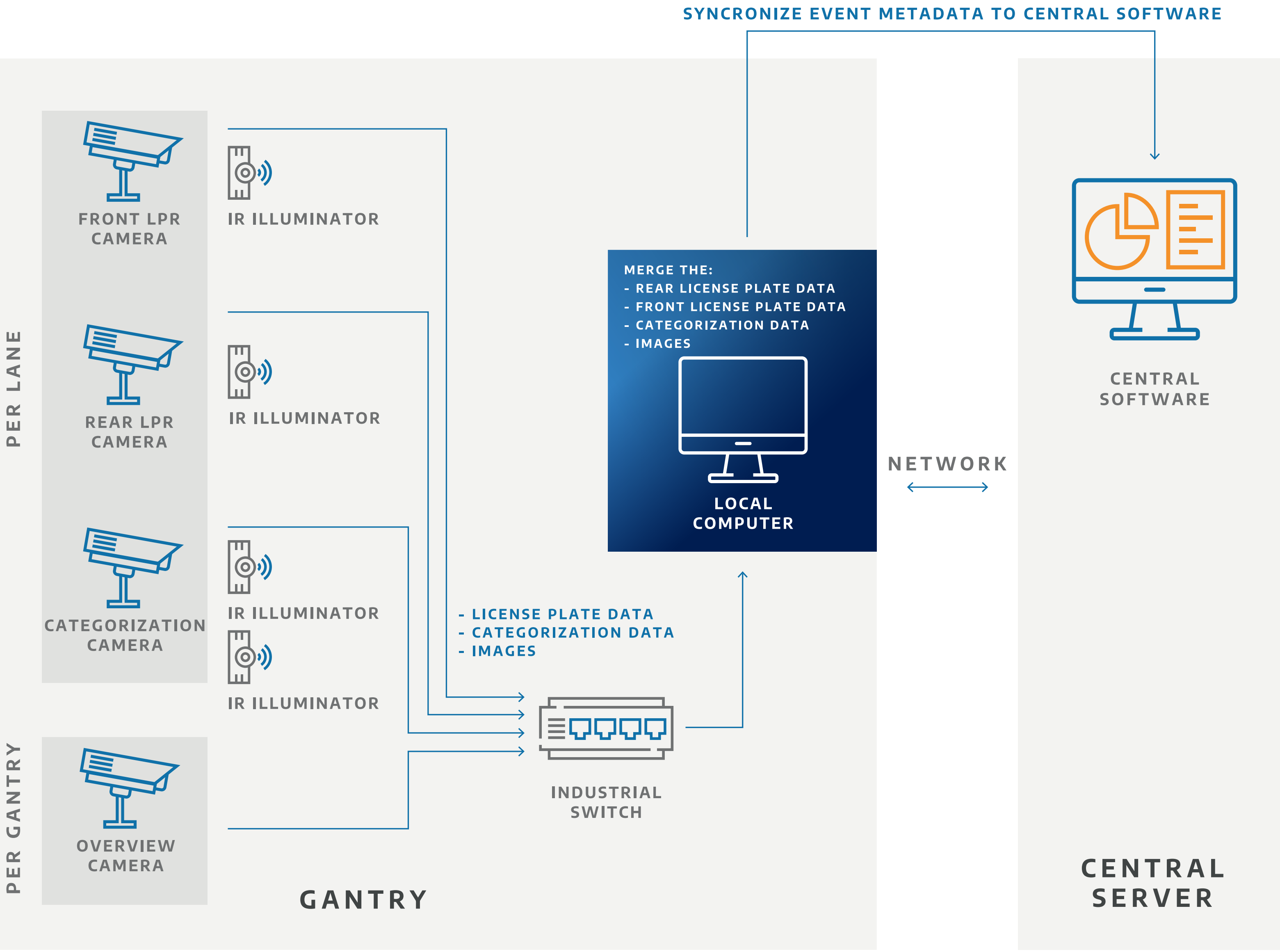
Violation type* Please select a violation type

Images* 



2. MULTI LANE FREE FLOW SYSTEM

DATA COLLECTION MODULE FOR INDONESIAN MLFF SYSTEM



INDONESIAN MLFF PROJECT

Asura in concession with other technology providers won a tender to modernize over 1700 km-s of the Indonesian highway system. Asura designed and delivers the data collection piece of the operation. The Indonesian highway network is planned to be extended to 6000 km-s in the upcoming years.

- POTENTIAL INVOLVEMENT IN 6000 KM HIGHWAY DEVELOPMENT
- FREE FLOW SOLUTION
- MARKET TESTED SOFTWARE ENGINES

DATA COLLECTION PHASE	APPLIED TECHNOLOGY
Vehicle detection / Triggering	Proprietary video analytics: AI-based object detection
Vehicle identification	ALPR
Vehicle categorization	Proprietary video analytics: AI-based vehicle categorization

DATA COLLECTION SYSTEM SETUP - SOFTWARE



AI-based object detection in ARU (proprietary video analytics software)

Proprietary ALPR engine. Employs a neural network to improve reading rate over time.

Proprietary Vehicle Categorization engine and axle counting. Employs a neural network to improve performance over time.

All of Asura Technologies Ltd.'s software implemented in the project are proprietary, developed by the company. Asura Technologies does not employ free- or open-source 3rd party software for its solutions.



DATA COLLECTION SYSTEM SUMMARY

ADVANTAGES:

CAMERA ONLY SETUP:

- Economic system implementation and maintenance.
- Hardware triggers (radars) are eliminated, the system uses AI-based object detection for triggering instead of a timer-based approach (leading to better detection rate)
- Good performance even in scenarios problematic for LiDAR implementing systems (traffic jams/vehicles switching lanes).

CATEGORIZATION is performed using video image, works in normal conditions and in traffic jams as well, the system does axle counting as well.

NEURAL NETWORK IMPLEMENTATION ensures performance improvement over time for LP reading rate and categorization

WHO WE WORK WITH



ACHIEVEMENTS





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THANK YOU FOR YOUR ATTENTION!

WWW.ASURATECHNOLOGIES.COM