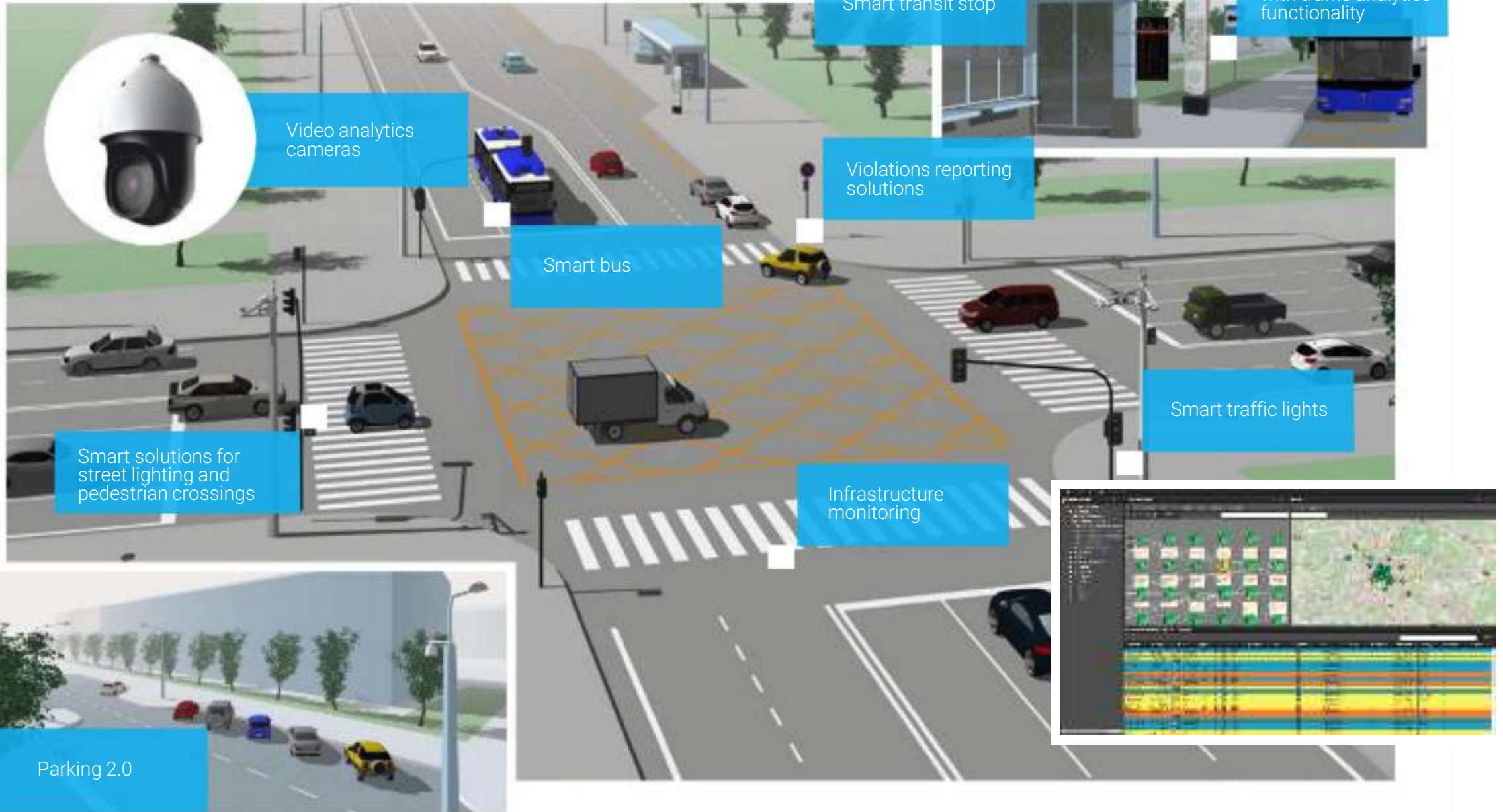




DIGITAL
City Lab

SMART CITY SOLUTIONS

Smart City elements



Smart parking

- **Urban Parking 2.0**

Multifunctional IT system for parking space management

- **SOVA. Smart cameras**

24/7 online parking space monitoring

- **Sesam. Smart parking access barriers**

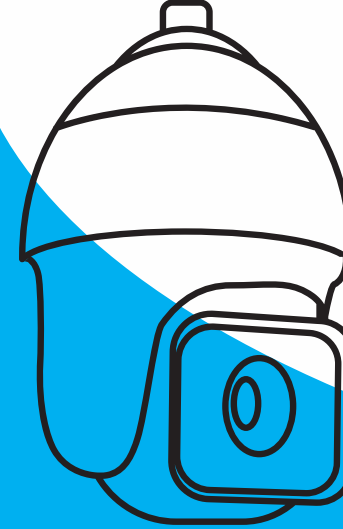
Smart system for controlling parking entry/exit

- **Digital parking lots**

Dynamic digital parking map compatible with all navigation systems (driverless cars, Amazon, Google, etc).

- **Urban Parking**

Federal mobile application for parking: search and pay for parking



CAN SCAN AND READ LICENSE PLATES, AND REMEMBER CAR PROFILE, IF LICENSE PLATE IS NOT DETECTED.



CAMERAS DETECT AND CLASSIFY PARKING AND STOPPING VIOLATIONS.

SMART CAMERAS

"SMART PARKING" IS AN EFFICIENT SYSTEM FOR MANAGING URBAN PARKING USING IT SOLUTIONS



Informing drivers

Mobile app, website, info boards, signs, contact centers, communications



Integrated monitoring

Smart cameras, mobile detection units, mobile patrols



Processing violations

Ensures integration and data sharing with the external systems of related agencies and the automatic processing of fines



Parking fee processing

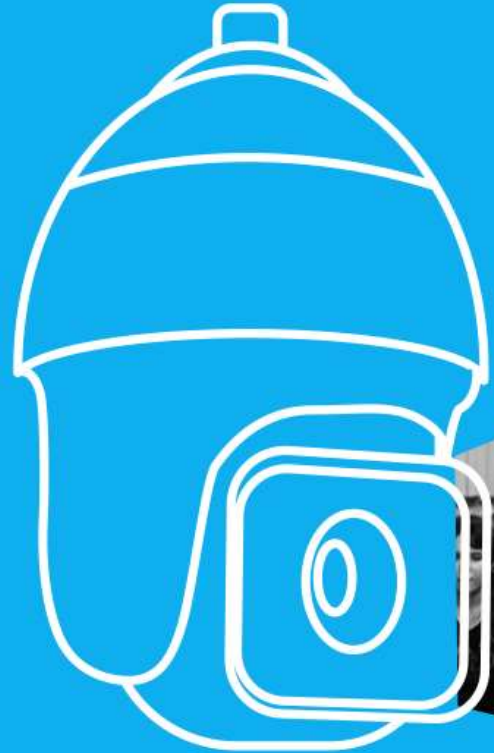
Parking meters, mobile app, online bank, SMS, database of benefit holders, payment verification



Enhanced analytics

Data analysis: traffic load, payments, violations, forecasts to increase project efficiency

Smart parking



SOVA software suite offers a broad range of solutions for detecting parking and stopping rule violations, as well as forwarding this information to related agencies

SOVA
Automated
Violation
Detection
Complex

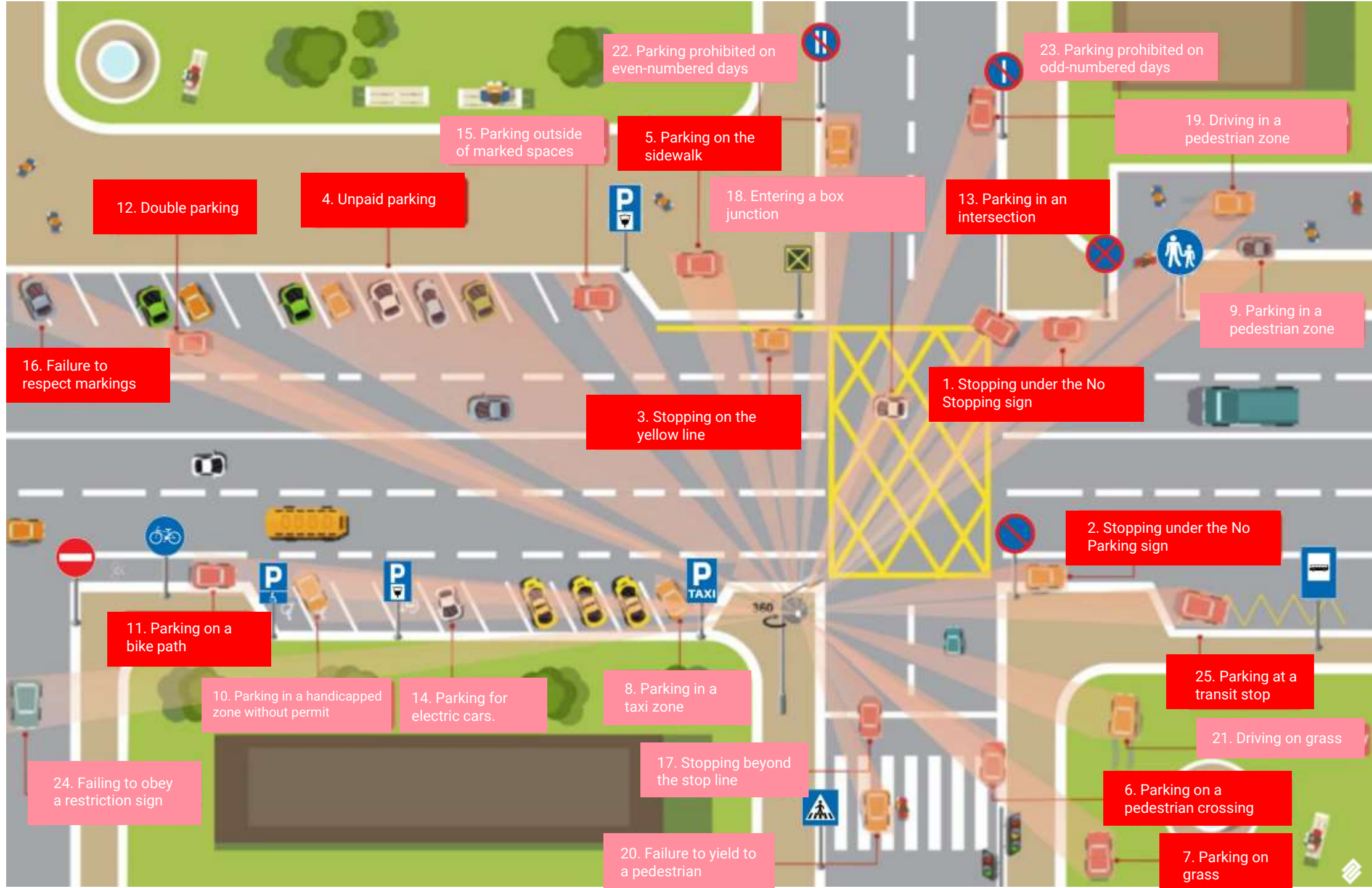


VIOLATION 1



SOVA SOFTWARE SUITE

THE SYSTEM IS DESIGNED TO DETECT 25 TYPES OF VIOLATIONS



The system is designed to detect 25 types of violations



VIOLATION TYPES

- | | | |
|--|--|--|
| 1. Stopping under the No Stopping sign | 10. Parking in a handicapped zone without permit | 19. Driving in a pedestrian zone |
| 2. Stopping under the No Parking sign | 11. Parking on a bike path | 20. Failure to yield to a pedestrian |
| 3. Stopping on the yellow line | 12. Double parking | 21. Driving on grass |
| 4. Unpaid parking | 13. Parking in an intersection | 22. Parking prohibited on even-numbered days |
| 5. Parking on the sidewalk | 14. Parking for electric cars. | 23. Parking prohibited on odd-numbered days |
| 6. Parking on a pedestrian crossing | 15. Parking outside of marked spaces | 24. Failing to obey a restriction sign |
| 7. Parking on grass | 16. Failure to respect markings | 25. Parking at a transit stop |
| 8. Parking in a taxi zone | 17. Stopping beyond the stop line | |
| 9. Parking in a pedestrian zone | 18. Entering a box junction | |



MONITORING METERED PARKING ZONE

Smart parking

URBAN ASSISTANT SERVICE

Automated solution for reporting parking payment violations using a smartphone

Automatically checks whether parking has been paid, offering option to either confirm payment or report violation after waiting 15 minutes.

Reporting other traffic-related violations

Uses mobile devices to identify and report violations related to traffic and street management, such as stopped or parked vehicles on or within five meters of a pedestrian crossing.

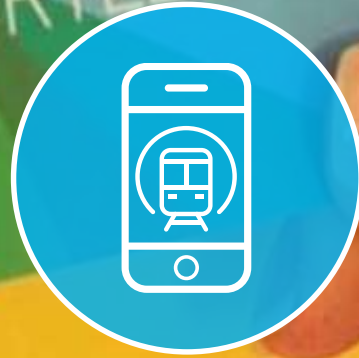
Automated solution for reporting stopping violations

Uses mobile devices to identify and report violations, automatically scans license plates, location as well as date and time of violation.



Easy Pass

single urban transport system



Ticketing solutions

1

Easy Pass includes the metro, surface transit and commuter rail.

2

Covers the city's entire public transit system.

3

New payment, validation and access control technology, including contactless passes.

4

A single transit app, and support for other media and applications.

5

Differentiated zone pricing option.

PAYMENT SERVICES

SINGLE E-PASS ON A SMARTPHONE



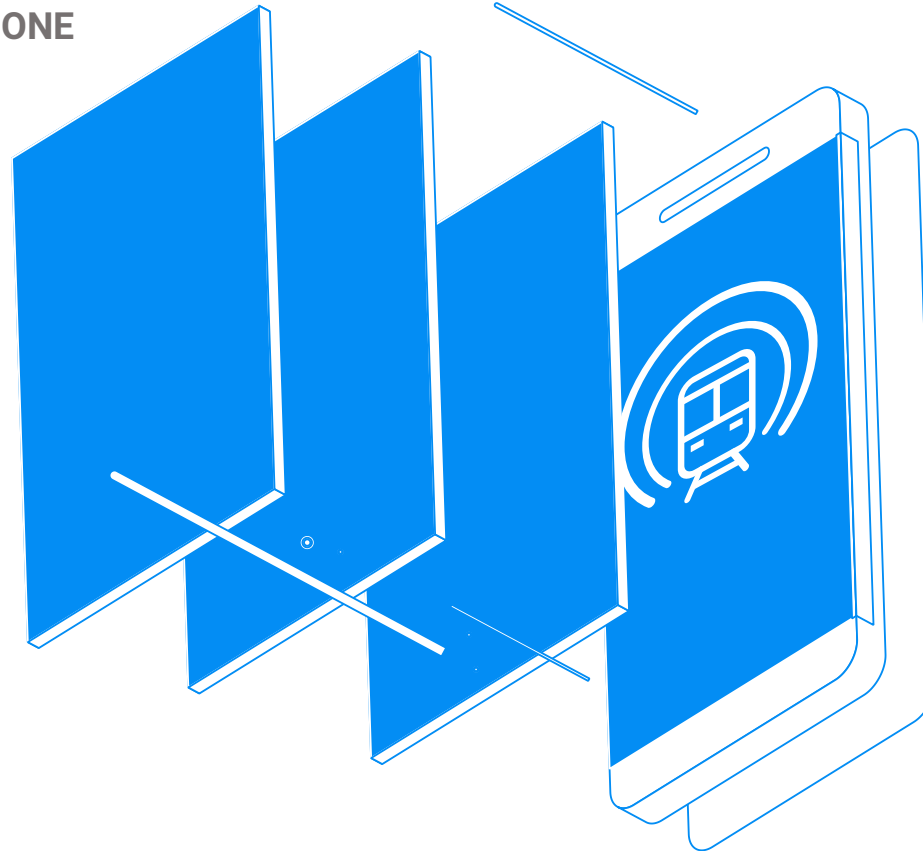
Barrier gates

- access at barrier gates
- locates point of exit
- offline operation

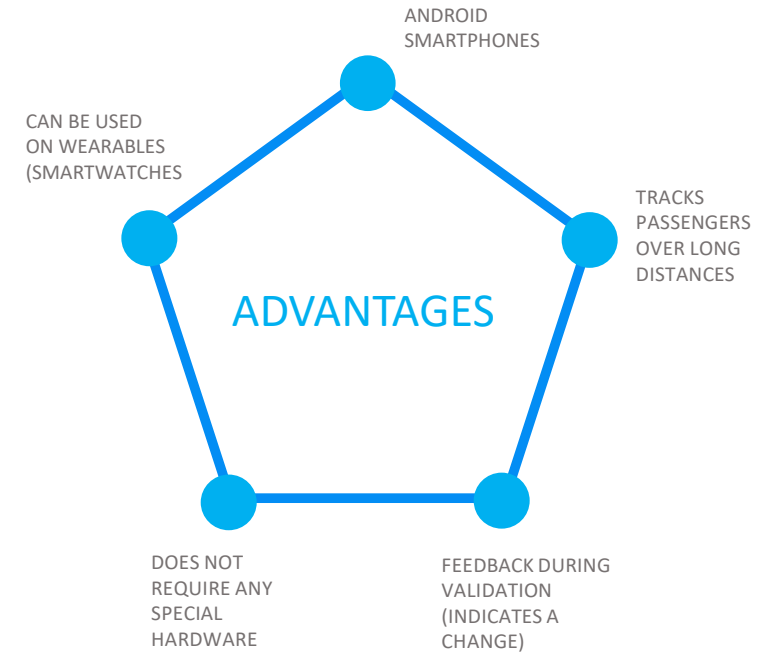


No barrier gates

- contactless payment
- automatic check-in
- automated checks
- tracks a transit route



BLUETOOTH



+ A TRANSIT PASS THAT IS FULLY DIGITAL AND DOES NOT REQUIRE PHYSICAL MEDIA (CARD)

+ OPERATIONAL OFFLINE – THE HOST DEVICE DOES NOT HAVE TO BE ONLINE WHEN VALIDATING THE PASS

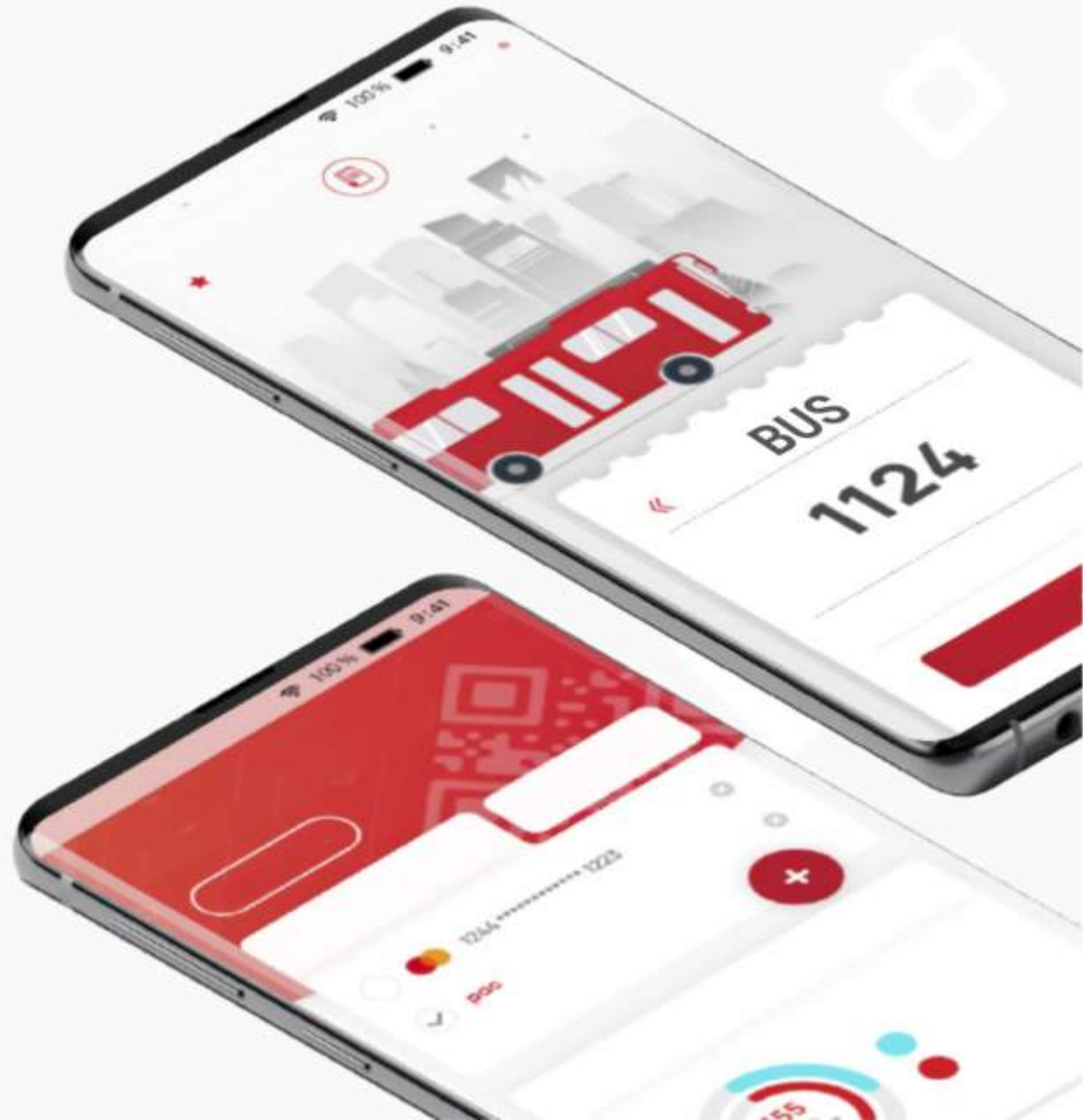
+ FLEXIBLE PRICING AND RATES, FROM VARIABLE PRICING TO INDIVIDUAL OFFERS

+ COMPLETE AND TRANSPARENT HISTORY OF USER ACTIONS AND TRANSACTIONS

+ BUY TICKETS ON THE GO USING AN ADDED CARD OR APPLE PAY/GOOGLE PAY

PAYMENT SERVICES

Service for paying
transit fares using
a QR-code



DIGITAL PROFILING

CAR SHARING

VELOBIKE

METRO WIFI

WIFI ON SURFACE TRANSIT, IN RESTAURANTS
AND SHOPPING MALLS

INFORMATION STANDS, SMART CCTV,
TRANSIT HUBS

SOCIAL MEDIA

SPECIALIZED SURVEILLANCE



BIG DATA

BASED ON TENS
OF MILLIONS OF DAILY
TRANSACTIONS

SENSORS

CAMERAS

POLICE

FARES

INTELLIGENT TANSPORTATION

SYSTEM

TAXI

PUBLIC TRANSIT

ALL THESE DIVERSE SMART CITY SOLUTIONS GIVE RISE TO A NEW CLASS OF APPLICATIONS.
IT STARTS WITH THE ACCUMULATION AND ANALYSES OF A MAJOR DATASET.
THIS IS HOW NEW PREDICATIVE SERVICES ARE CREATED.

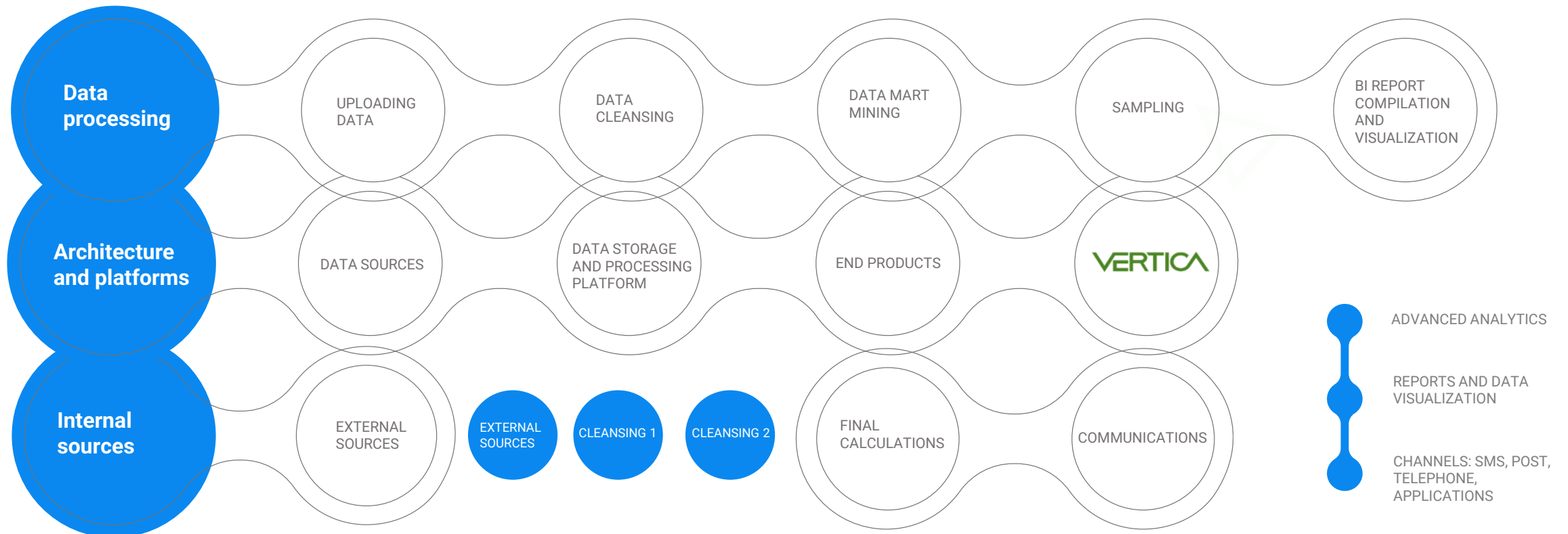
URBAN INNOVATION ANALYTICS CENTER

KEY FEATURES

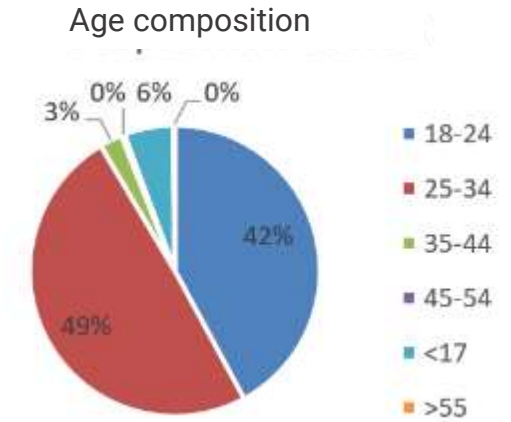
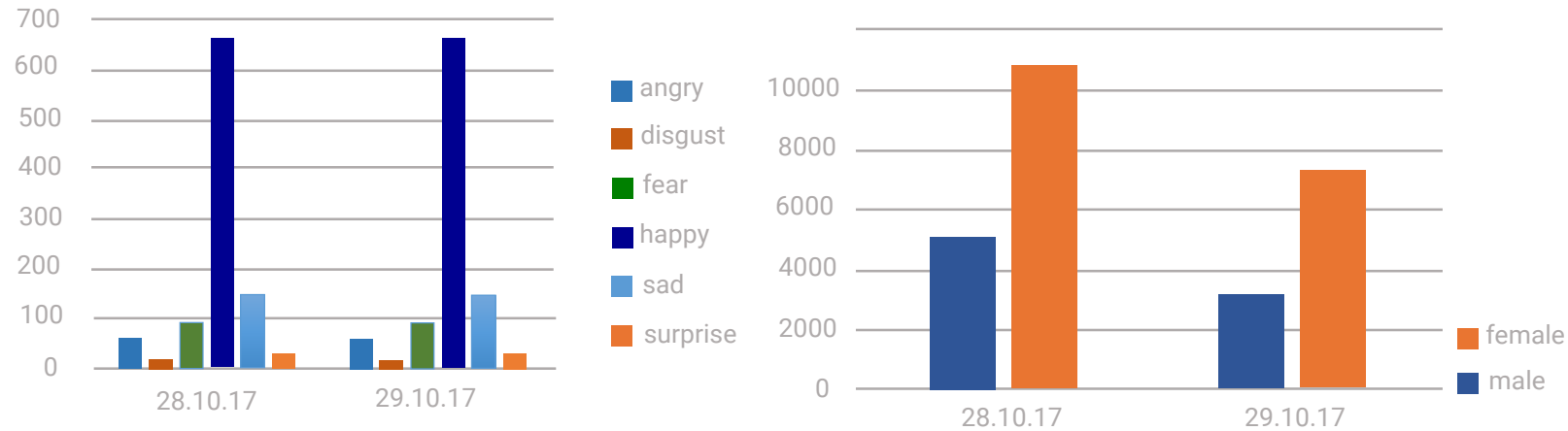
- Dozens of data sources
- Big data processing
- Analytics team

TASKS

- transportation profiling
- circulation matrix, event visitor profile
- individual notifications



MODULE MONITORING OF PEDESTRIAN TRAFFIC USING STANDS AND PUBLIC TRANSIT STOPS



- Evaluates pedestrian traffic in a specific direction
- Saves a one-of-a-kind database of faces seen during the day and forwards this data to the face recognition system
- Sniffer for obtaining mac-addresses for WiFi and Bluetooth
- Ability to detect strong sounds (car accident, hitting a stand, a shot, an explosion) and launch a prearranged response (record video, call for emergency response, forward information to the central office)



STATPAD

PEDESTRIAN TRAFFIC ANALYSIS SOLUTION

CASE

FOOT TRAFFIC ANALYTICS FOR
RETAIL STORES WITH
ACCURACY

97%



Gender



Customer
traffic
direction



Age



Number of
people
passing and
entering a
store



Distinctive
features



Number of
purchases

Alternative scenarios for using **STATPAD**:

- Automated traffic assessment using street cameras
- Data separation for training neural networks
- Face database

INTELLIGENT TRANSPORTATION SYSTEM

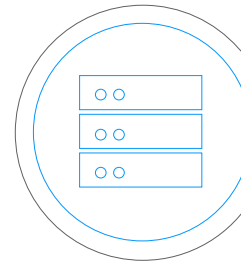
Designed to aggregate, convert and structure data from various sources, including internal and external systems

COLLECTION SUBSYSTEM



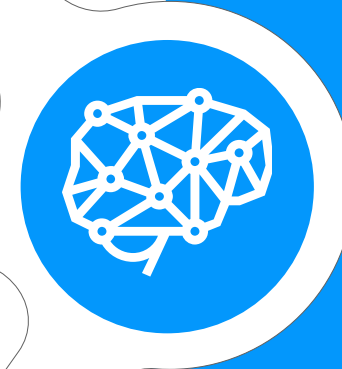
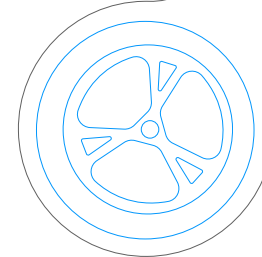
STORAGE SUBSYSTEM

Centralized and uninterrupted storage, role based access control and data processing



MANAGEMENT SUBSYSTEM

Monitors key indicators and manages state of external systems, analyzes big data and it forecasts



ITS

THE INTELLIGENT TRANSPORTATION SYSTEM (ITS) IS A CONCEPT THAT INTEGRATES THE LATEST INFORMATION AND COMMUNICATION TECHNOLOGY AND AUTOMATION SOLUTIONS INTO THE TRANSPORTATION INFRASTRUCTURE, VEHICLES AND USERS. IT IS DESIGNED TO IMPROVE TRANSPORT SECURITY AND EFFICIENCY, AND PRODUCE A POSITIVE ECONOMIC EFFECT ON THE REGION OF USE.

Smart bus

INTEGRATING VIDEO ANALYTICS INTO ONBOARD SYSTEMS



- PASSENGER TRAFFIC METER
- LTE/WI-FI ROUTER
- DRIVING QUALITY CONTROL SENSOR
- VIDEO CAMERA

- counting people entering and leaving the bus to control passenger load
- identifying fare dodgers
- automatic face detection and comparison with reference images
- Wi-Fi for passengers



- Driving quality analysis
- Telemetry analysis
- Passenger traffic statistics per route or vehicle
- Identifying routes with the most fare dodgers
- Data feed on available seating to mobile apps

RIVER BOAT TRAFFIC ANALYSIS SYSTEM

LOCATION OF VESSEL IS INDICATED ON AN INTERACTIVE MAP.

CCTV FOOTAGE AVAILABLE IN REAL TIME



- Identifies vessel type (motor ship, yacht, etc.)
- Identifies vessels
- Determines the speed
- Records vessel movements in both directions, counts the number of vessels

- Detects ship traffic congestion
- Searches for saved content and displays it
- Notification of docking and speed violations.

URBAN TRANSPORT INFRASTRUCTURE MONITORING AND CONTROL



TECHNOLOGY SYSTEMS FOR TRANSIT HUBS:

- Access control and management systems
- Alarm systems
- Fire alarm systems
- Video servers and CCTV cameras
- Guaranteed energy supply systems

IT INFRASTRUCTURE:

- Servers at transit hubs
- Agency-side servers
- Data storage systems
- Air conditioning for server rooms
- Telecommunications equipment
- Automatic telephone stations, and telephony hardware and software

INFORMATION SECURITY FOR URBAN INFRASTRUCTURE



A- SIEM

- 1 Collects data from any sources
- 2 Data analysis
- 3 Information from network devices, data protection tools and information systems
- 4 Applications for access and identification control
- 5 Tools for managing vulnerabilities

