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# Expression of interest

## Contact details

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| Country | TURKEY |
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## Short description of the organisation

ISSD provides solutions for Intelligent Transportation Systems (ITS) such as active traffic management, dynamic junction management, and automated number plate recognition. Our systems are working effectively at more than 750 junctions in Turkey and 11 countries.

## Specific skills related to the project

We are looking for a project consortium that is interested in the call for " “HORIZON-CL5-2024-D6-01-06: Optimising Multimodal Network and Traffic Management, Harnessing Data from Infrastructures, Mobility of Passengers And Freight Transport", with which we can cooperate on the following topics.

ISSD is a R&D company that delivers Intelligent Transportation Systems (ITS). ISSD has specialties in several fields such as dynamic junction management systems and overall city junctions orchestration, sensor-based traffic analysis systems, enforcement systems and automatic incident detection systems. ISSD products target sustainability related issues and public safety for better urban ecosystems.

***City Traffic Network Monitor and Sensor Fusion***

ISSD has successfully developed algorithms that process data incoming from Bluetooth sensors and collect Floating Car Data (FCD). These algorithms are capable of processing incoming data both offline and in real-time by utilizing cloud computing.The developed algorithms are utilized to calculate speed profiles,analyze traffic occupancy and congestion, detect incidents and anomalies and distill the normal behavior of the areas that the systems supervise.
Furthermore, these algorithms can utilize distributed processing tools for whole city-based real-time analysis and can utilize data collected from Bluetooth sensors to extract Origin-Destination (OD) matrices and determine travel time between two consecutive sensors, in real-time. Data from the analyzed traffic systems are visualized and displayed on the web interface to aid with the decision-making process.

***Traffic Scene Analysis***

Using its experience and capabilities in the field of traffic engineering, ISSD has been able to design, develop and optimize robust deep learning models. ISSD has also been capable of producing efficient, realtime algorithms that rely on machine learning for tracking, counting, license plate recognition, incident detection and object detection using both edge and center processing and utilizing CPUs, GPUs, VPUs, and NPUs in their operation.

These algorithms help creating image-based traffic monitoring and enforcement, incident detection, traffic data collection and adaptive junction management systems that can work throughout different

weather, lighting, and indoor/outdoor conditions. Today those systems collect and process data from more than 200.000 cameras to ensure a safer and smoother traffic, worldwide.

***Sensor Development and Integration***

ISSD has been able to develop a multitude of traffic sensors that are capable of operation in outdoor and indoor environments. These sensors provide a wide range of data regarding traffic flow. The provided data can help contribute to traffic management and anomaly detection significantly as the deployment of such sensors across an area can significantly increase both the accuracy of detection and the reliability and efficiency of the decision-making algorithms and the traffic management systems.

This is done in parallel to the storage of historical data for later forecasting and redundancy analysis. The developed sensors are also integrable with any traffic management system in use, to be utilized as additional data resources.

***System Architect and Applier***
ISSD has the sufficient knowledge and experience to define required traffic needs and determine the required architecture and subsequently design and then develop and integrate the systems accordingly and manage the life cycles of the multitude of intelligent transportation systems it offers.

***Central Management and Control Software***
ISSD has designed and developed the central software that is needed for traffic control of city-wide traffic network. The designed software has all the features and functionalities needed to manage a city sized traffic network.

This is coupled with the ability to manage results coming from different algorithms and display them in a comprehensible visual manner through its web-based interface, providing valuable information to the user and reducing the service, maintenance, and labor costs.

***Traffic Consultancy Services***
Intersection, Corridor and Signal Design
Geometric design of signalized and roundabout junctions, merging locations and corridors, signal duration optimization, signal coordination and signal design works are done through internationally accepted geometric road standards (Highway Capacity Manual 2010 HCM).

Traffic Simulation
PTV Group softwares are mainly used for testing traffic engineering studies. It is possible to evaluate the benefits of a project via before-after studies in a simulation environment.

Traffic Impact Analysis
The purpose of Traffic Impact Studies is to evaluate the impact of a planned project on traffic production and attraction ability.

Traffic Safety Projects
Road safety studies have attracted great attention in recent years. The studies focus on detection of accident hotspots, analysis of traffic accident statistics and planning of policies to minimize accident risk at such locations. These studies are supported by internationally accepted resources such as Highway Safety Manual, 2010 HSM.

Parking Studies
Parking design projects, traffic simulation for parking areas, mitigation scenarios.

Public Transportation Studies
Analysis of public transport smart card data to plan and optimize public transport lines.

Micro-mobility and Accessibility Analysis
Beyond vehicular traffic, we provide solutions for pedestrian, bicycle and scooter users such as; campus accessibility analysis, bike lane design, ITS for micro-mobility users etc.

Trainings with Certification
Three of the limited number of PTV Group Certified Trainers in the world are working in ISSD. More than 15 trainings about traffic engineering, traffic simulations and macro modeling are given during the 1 year period.

## Proposed activities for the project

ISSD has been building a deep and comprehensive expertise on the following areas since 2009:

- Image processing
- Embedded system design
- Prototype production, testing and implementation
- Real-time applications
- Field implementation of a prototype
- System architecture design
- System integration
- Traffic engineering
- Data analytics
- Software development
- Hardware development

ISSD can contribute to the R&D projects within the fields of expertise. Not limited to the following ones:

- Traffic scene analysis
- Testing the prototype in the simulation environment and in the field
- Analysis of various types of traffic data
- Real-time field installation of the developed prototype
- Integrating different components of the proposed system
- Literture review, benchmarking and research for smart transportation studies
- Communication with the existing equipment in the field
- Software developlenst such as interfaces, mobile apps etc.

## References

| Project acronym / starting date | Main objectives | Main Activities | Role in the project |
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| CHAOS<br>01.08.2009 | Smart Junction Management System | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Coordinator |

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| M-CHAOS<br>01.08.2010 | Intelligent Traffic System Management, Single Intersection Intersectionof Multiple Concurrent Passing the Board | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Coordinator |
| K-CHAOS<br>01.02.2012 | Design and Development of Intelligent Control System Contributions | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Coordinator |
| ASUDE<br>01.04.2013 | Communicate with each other and the Integrated Home Systems Intelligent Driver Assistance Systems | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Coordinator |
| FCD-R<br>01.07.2015 | Development of a Real-Time Corridor Traffic Management System Using Floating Car Data. | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Coordinator |
| BLUE-F<br>01.04.2017 | Development of Real-Time Analysis System Based on Bluetooth and Floating Car Data for Journey Demand Forecast | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Coordinator |
| IMGE-SC<br>01.10.2014 | Development of Image Processing Capable Integrated Intelligent Traffic Cameras | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Coordinator |
| KİTS<br>01.08.2016 | Developing and Designing Red Light Violation Detection and Radar Based Instant Speed Violation Detection Systems | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Coordinator |

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| TYM<br>01.10.2014 | The Traffic Management Center Design and Traffic Management Center Software Development | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Coordinator |
| TTO-M<br>01.01.2018 | Decision Support System Design and Development for Public Transport Operations and Planning | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Coordinator |
| DAR ALAN<br>01.08.2019 | Development of Dynamic Junction Control Systems Using Fisheye Camera and Floating Car Data for Small-sized Junctions | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Coordinator |
| VAKA<br>01.07.2018 | Development of a Decision Support System for Case Management and Impact Assessment Based on Image Processing and Floating Car Data (FCD) | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Coordinator |
| SPECTO<br>01.11. 2019 | Smart-Tunnel Standard Application Experiment Contract and Specific Application Experiment Contract | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Coordinator |
| USF<br>15.09.2020 | F4Fp–SME- Urban Scale FCD | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Coordinator |
| HG-KKC<br>01.01.2021 | Development Of Integrated Traffic Exciting Management Unit With Vehicle Sensors | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Partner |

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| CONSCAN<br>01.01.2021 | Development Of An Ai-Based Autonomous Container Identification System Using Depth And Imaging Sensors | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Coordinator |
| C-ITS<br>01.01.2021 | Detection Of Anomalies Through The Dome Camera Using Computer Vision And Transferring Detection Data To In-Vehicle Built-In Units | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Coordinator |
| SAYEM-SC<br>01.04.2021 | Smart City Faz-2 | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Partner |
| MOBİLE-EDS<br>01.09.2022 | Autonomous Mobile On-Vehicle Parking And Safety Lane Violation Detection System | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Coordinator |
| B-Stress<br>01.08.2022 | Development Of Geographical Data-Based Mobile Application For Safe And Comfortable Travel Of Micromobility Users And Pedestrians | We developed the software and hardware of the project with our R&D team and sold it as a product. | Project Coordinator |