INTELLIGENT TRANSPORTATION AND EQUIPMENT

Voice, Vision, AI, IoT – System Solutions

Arcturus
We are Edge.
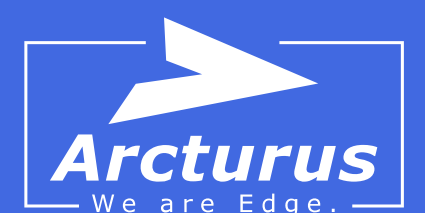
OVERVIEW

Arcturus has been developing edge and embedded systems for over 20 years and during this time has amassed a broad portfolio of hardware, software, tools and expertise. System solutions provide access our core skills and capabilities to accelerate your product development.

Engagements are individually structured and tailored to the needs of each project with dedicated engineering resources that work directly with you to identify requirements, execute on project deliverables and ensure a smooth process from development to deployment. Projects typically consist of a mix of hardware, software, services and support, with simple engagement packages to help get development moving quickly.
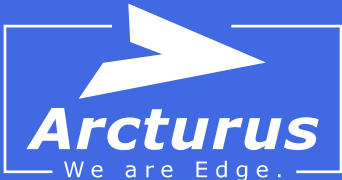
KEY TECHNOLOGIES

Arcturus is focused on five areas of excellence; real-time systems, security, connectivity, communications and machine learning. We offer three product lines that encompass these areas:
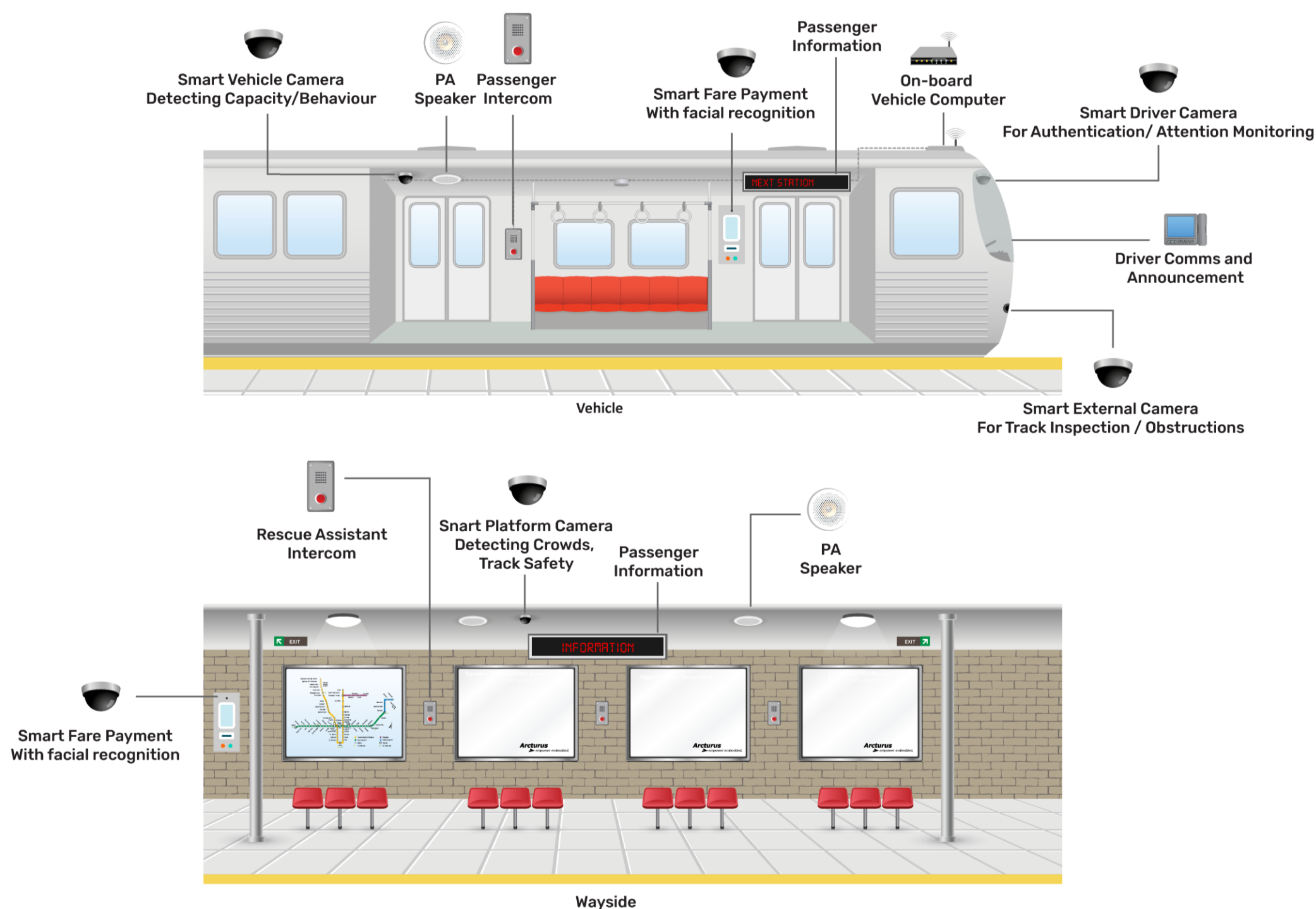
- SIPxtream™ - Hardened Voice and Video Communications

- Mbarx™ - Secure IoT Endpoints, Tools and Gateways

- Brinq™ - Edge AI and Vision Analytics

Each product line offers enablement solutions, turn-key applications and specialized hardware. Our system solutions program allows us to work directly with you to combine access to products and customize solutions to address your specific application needs.

APPLICATIONS

- ✔ Passenger information systems
- ✔ Vehicle operator authentication
- ✔ Driver awareness monitoring
- ✔ Vehicle computers and recorders
- ✔ Wayside, passenger and driver comms
- ✔ LMR/DMR and (RoIP) backhaul
- ✔ Wi-Fi radio systems, beltpacks
- ✔ Safety systems for yards and tracks
- ✔ Vision-based road surface or track inspection
- ✔ In vehicle safety / security and behaviour detection
- ✔ Capacity and people counting
- ✔ Fare evasion monitoring
- ✔ Vehicle of interest spotting
- ✔ Heavy equipment safety
- ✔ Equipment situational awareness

Smart Vehicle Camera
Detecting Capacity/Behaviour

PA Speaker

Passenger Intercom

Smart Fare Payment
With facial recognition

Passenger Information

On-board Vehicle Computer

Smart Driver Camera
For Authentication/ Attention Monitoring

Driver Comms and Announcement

Vehicle

Smart External Camera
For Track Inspection / Obstructions

Rescue Assistant Intercom

Snart Platform Camera
Detecting Crowds, Track Safety

Passenger Information

PA Speaker

Smart Fare Payment
With facial recognition

Wayside

INTELLIGENT TRANSPORTATION

Arcturus transportation system solutions target passenger information, safety, and operator communication in vehicles, stations, wayside systems, central control and airports. They are designed to meet or exceed NEMA recommendations for audio intelligibility along with central management tools, self-test functions and integration with other systems or equipment.

System Integration by Mbarx

Central to any connected product is the need to manage it, update it and gain insights into its performance. Mbarx Secure IoT provides a secure end-to-end solution for management, telemetry and OTA firmware updates. In addition, Mbarx offers tools and reference implementations for installers or IT personnel to help them easily visualize their systems, connect, control, update and manage.

Tools and endpoints work together with Mbarx Site Controller gateways to form an ecosystem of connectivity, making it possible to manage endpoints at remote sites anywhere, anytime, even if they are located securely behind firewalls.

The Operations Controller gateway stack supports real-time Operation Technology (OT) workflow. It bridges the gap between automation and human control by providing a real-time, back-end telemetry interface into endpoints and supervising their workflow. Front-end presentation using web services allows for event monitoring, control and interaction with endpoints, including event notifications via SMS, VoIP or push. This makes Operation Controllers ideal for environments where users need to act and respond to events generated by devices, sensors, or actions – such as vehicle alarms access or passenger assistance requests.

Tools, gateways and endpoints operate independent of cloud connectivity to ensure security and privacy by using an end-to-end trust chain architecture. Tools can be OEM branded as part of a system solution engagement, providing a unified experience for you customer.

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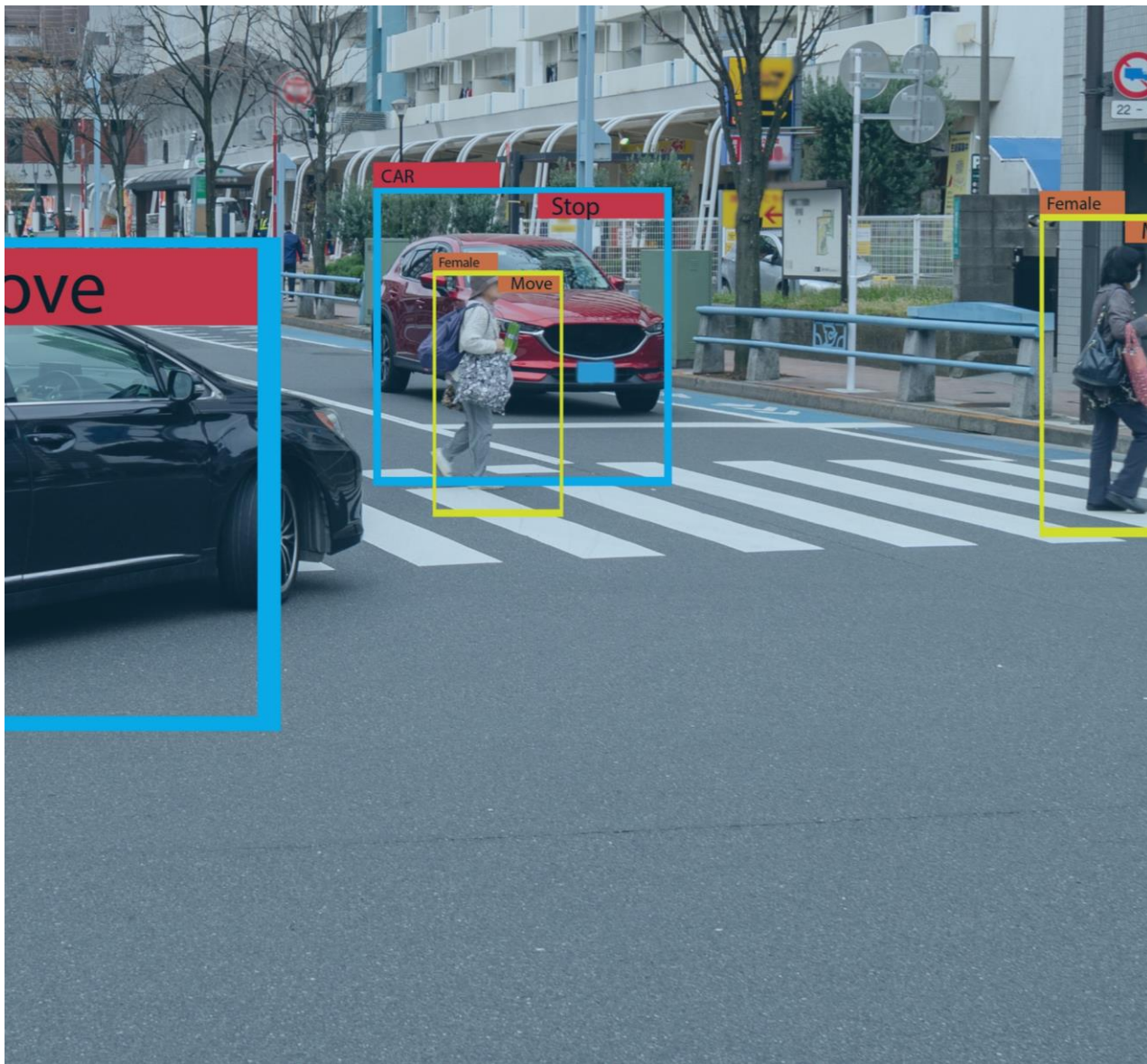
Edge AI, Vision and ML by Brinq

Brinq Edge AI and Vision Analytics for Intelligent Transportation systems enables intelligence at the edge by providing real-time insights on people, vehicles and objects. It is suitable for in-vehicle, wayside or station applications including:

- Authentication using facial recognition
- Intrusion, boundary crossing, zone and proximity monitoring
- Occupancy detection
- Package analytics
- Tracking and reidentification
- Clothing type/colour characterization
- Physical distancing / proximity
- Action recognition
- Behaviour detection
- Emotion detection
- Vehicle make / model characterization
- License plate recognition

Arcturus has 2D, 3D and depth sense vision, ML, and data science experts in-house that develop custom analytics, datasets, train and optimize models or develop specialized use cases.

Communications by SIPxtream

SIPxtream delivers a range of voice and video services for applications that demand mission critical communications. SIPxtream can support

RTOS/MCUs in a low as 20KBytes of SRAM or scale to sophisticated multichannel, multi-mode secure voice and video systems using Linux. Central to SIPxtream are:

- High quality voice communications
- Intercom, PA and specialized PTT or handset modes
- Camera integration
- Multimode video (streaming or webservice)
- VoIP and PA, unicast and multicast voice / video transmission
- Recorded announcements for notification
- Intelligibility enhancements and advanced audio algorithms
- Resilience, redundancy, failover, degraded operating modes
- Self-test functions and quality analytics
- Secure and encrypted communications

We have experts in house capable of adapting signalling, implementing codecs, interop testing and supporting specialized requirements.

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Communications and Passenger Information

Voice and data services provide the intelligence and access needed to operate smartly. Arcturus communication solutions are designed to meet or exceed NEMA and NFPA audio intelligibility recommendations for voice communications with options for camera, video or surveillance analytics. Arcturus provides expertise in developing specialized communications devices that meet stringent EN50155 requirements for rolling stock while being flexible enough to offer various mounting and system integration options.

Fleet Telemetry

Understanding how your fleet is performing is key to efficient operations. On-board computers need to meet complex vehicle integration requirements while providing data, voice and video services for core communications and telemetry. Arcturus platforms offer a scalable range of ruggedized compute options with the latest serial, CAN, USB integration and connectivity.

Value for Stakeholders

Cross-domain solutions return value for stakeholders by using data to power intelligence. Fleet vehicles provide mobile analysis platforms to gain insights on road surface or track obstructions while maintaining an ever-vigilant watch for license plates of interest. Specialized detection solutions can reduce fair evasion, improve safety / security for passengers, monitor drivers and enhance operations.

Heavy Equipment

Whether it's equipment for the rental market or deep mining, safety is paramount. Heavy equipment needs to ensure operator compliance with safety procedure and detect dangerous situations before they become an incident. Arcturus vision and edge AI solutions detect operator attentiveness, monitor for personal protective equipment and provide proximity notification for other vehicles, people or objects. This provides the situational awareness operators and owners need to improve safety and limit risk.

ARCTURUS HARDWARE

Whether you want to design your own chip-down solution or leverage our boards and modules to accelerate time-to-market, Arcturus offers hardware, design services and support to help. We have hundreds of thousands of devices in service and we leverage this expertise to help you.

- Quality - Field failure rates as low as 0.1% / 10,000 units
- Longevity - Product life-cycles in excess of 20+ years
- Time-to-Market - Boards and modules ready to integrate
- Reduced Risk - Hardware and software expertise, support
- Lower Cost of Ownership - Software ready for deployment, reduces development cost

Arcturus Networks Inc.

📍 701 Evans Ave. – Suite 300
Toronto, ON
M9C 1A3
CANADA

📞 Toll Free North America: 1.866.733.8647
Tel: +1 416.621.0125

🌐 https://ArcturusNetworks.com

✉️ arcsales@arcturusnetworks.com

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