Q-FREE PRESENTS

CITY OF SPARKS – VICTORIAN SQUARE PARKING STRUCTURE

LEVEL COUNT OPTION PROPOSAL

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1.0 Why Choose Q-Free?

Q-Free is leading the way with innovative solutions to any parking guidance challenge. Over the last ten years, we have designed and implemented a variety of leading edge solutions to the intelligent parking guidance & monitoring market. Our project team is highly qualified to take on projects such as the one for the City of Sparks. We have worked together on over 350 other global projects and most of our team members have been designing, implementing, and managing projects for over 10 years. In addition, we take enormous pride in the fact that we own the IP to all our products, and that most of our counting products are North American made. We feel confident we can serve the City of Sparks well with our Parking System implementation, as we possess unmatched experience customizing and implementing parking solutions with over 350 parking systems installed worldwide in various industries such as hospitals, convention centers, large employers, shopping centers, casinos, etc.

Among others, our clients include:

2.0 Q-Free Information

2.1.1 Company Overview

Company Name: Q-Free TCS, Inc./Q-Free Parking Solutions
Year Founded: 1999
Parent Company: Q Free ASA
Year Founded: 1984
State of Incorporation: Trondheim Norway
Corporate HQ: Oslo Norway
Center of Competence for Parking: Sudbury, MA (20 miles west of Boston), USA

2.1.2 Company History

Q-Free was founded in 1984 and is headquartered in Trondheim, Norway. The annual turnover is over to $120M. The company is publicly listed on the Oslo Stock Exchange under the ticker QFR. With local offices in more than 20 countries around the world, Q-Free has global reach and local presence with approximately 420 employees representing over 30 nationalities. The map below shows Q-Free's current presence.

Picture 1 Q-Free Worldwide

2010 saw Q-Free move into the US market for tolling applications using video tolling or what we know today as LPR (license plate recognition). Q-Free quickly evolved into a true ITS Company through acquisitions of many market leaders including TCS International of Sudbury MA, a leader in Parking Guidance technology and IP. Acquired 100% in 2012, TCS International, now operating as Q-Free Parking Solutions is a world provider in Parking solutions.

2.1.3 About Q-Free Parking

Founded in 1999, TCS International was first to market in North America with Single Space monitoring and level counting solutions. Evolving from Distributor to Manufacturer in 2004, TCS International went to market with several patents pending designs. End of space single space ultra-sonic sensors eliminating the need for a remote lamp, USDS directional sensors eliminating the need to saw cutting loops into the deck, wireless mesh networks reducing cable and civil work, patented “cluster design” directional sensors eliminating the need of delineation posts are just a few of the reasons Q-Free acquired Q-Free TCS, now Q-Free Parking Solutions, in 2012.

Strong development and financial support has allowed Q-Free to expand and become one of the largest Parking Guidance provides in the world. With installations in 22 countries our base exceeds 350 systems (250 in the North American region). Q-Free Parking headquarters is located 20 miles west of downtown Boston where you will find our development, sales, and manufacturing facilities. All indoor Parking Guidance product is North American made and is assembled and stocked in Sudbury, MA USA.

In 2015, we identified shortcomings with our on-street offering, having been forced to use 3rd party magnetic field sensing products that did not produce the intended accuracy results. We initiated the internal development of a robust, dual technology, in-ground sensor solution harnessing over 30 years of experience in ultra-low power technology as well as 25 years of radar technology experience. The result is the ParQSense Smart Sensor, a robust, sleek, high accuracy sensor with ultra-long range communication. The Q-Free HUB, the cloud based centralized software engine, was custom developed for this application and will enable Q-Free to add a variety of other Q-Free and 3rd party products to the Q-Free offering. In addition, the ParQ Portal, the customer facing user interface and ParQSense API will enable us to take the highly accurate sensor data further.

3.0 Experience and Qualifications

3.1 Project Experience

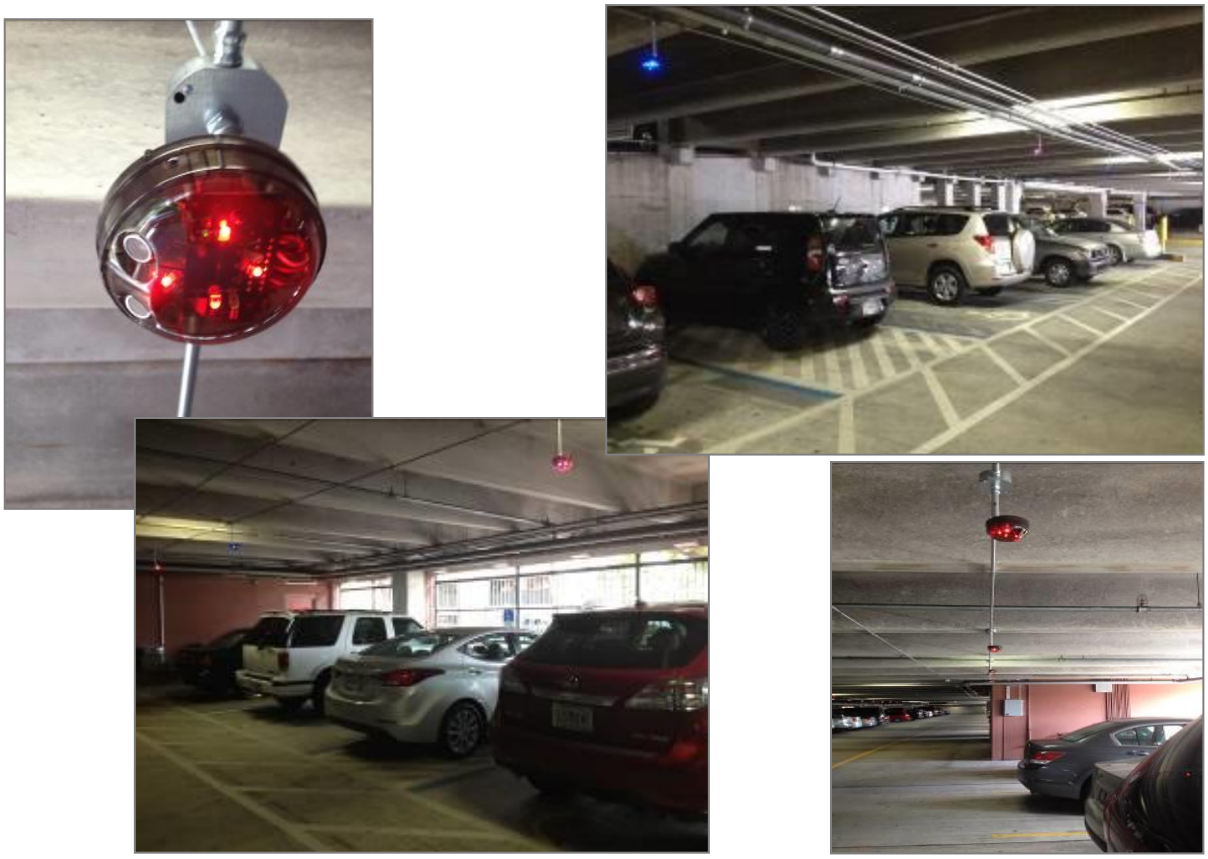
Q-Free has installed parking guidance systems or over 350 projects globally. Some of our most prominent installations include:

1. ADVENTHEALTH - ORLANDO, FL

Q-Free was contracted in 2013 to provide a custom designed single space monitoring system for AdventHealth (formerly Florida Hospital), one of the country's largest not-for-profit health care providers with 22 campuses serving communities throughout Florida. This multi-phase approach project involved the provision of over 2,500 single space sensors, custom design wayfinding and VMS signs for two hospital parking garages. Phase I was completed in the fall of 2014, with the expansion for Phase II (another parking garage with an additional 1,600 single space sensors) completed in 2016. Since then, Q-Free has provided counting systems for two additional garages.

Specifics for this project include:

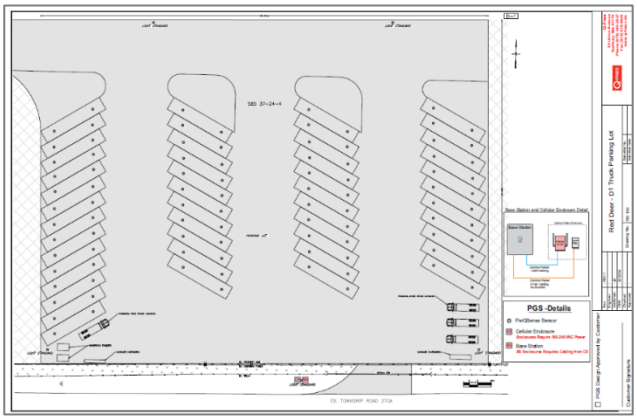
- Over 4,000+ single space sensors in three parking garages
- Level/facility count for two additional garages
- Wireless system communication
- Custom designed wayfinding and VMS signage
- Client/Server central system
- Design and implementation by Q-Free
- Two phase approach to be completed 2018



2. ALBERTA DOT TRUCK STOP, RED DEER, AB

In 2019 Q-Free was approached by a Canadian customer to design and provide a truck parking monitoring system for the Alberta DOT Tuck Stop location in Red Deer, AB. The intention of this project is to provide truck drivers with space availability information before reaching the truck stop. Q- Free was selected as the preferred provider due to our experience providing customized parking solutions, as well as due to the 10+ year lifetime expectancy of the ParQSense sensors and extra-long range base station communication.

Specifics for this project include:



- ParQSense Smart in-ground sensors for truck parking spaces (2 sensors per truck parking space)
- Single base station for truck lot
- Cellular base station communication
- Provision of VMS displays for 3rd party roadway signage
- API for future 3rd party integration
- Design and implementation by Q-Free working with a customer appointed Electrical Contractor
- Implementation process was handled out of the Sudbury office with regular remote project meetings to ensure timelines and customer expectations were met

3. AKSARBEN VILLAGE – OMAHA, NE

Aksarben Village is a mixed-use development in in Omaha, Nebraska. With various research and business offices, restaurants, entertainment venues, shopping, and residential complexes, the owner was looking to improve parking for all different parker types. Q-Free, in an RFP process, was selected to provide a custom designed wayfinding system in 2018. Ultrasonic directional sensors were used at all campus garage entrances/exits to accurately track parking space availability. An interface to 3rd party space availability signage strategically placed around the campus was provided. The project was completed in July 2019, on-budget and on-time.

Specifics for this project include:

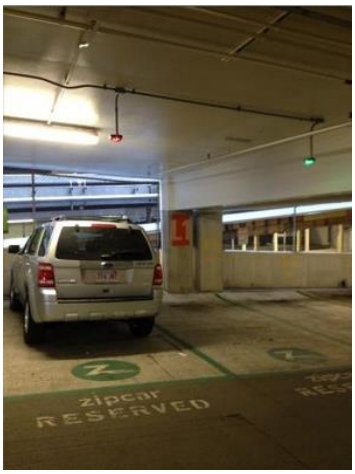
- Custom designed facility count PGS system for 4 campus parking areas
- Interface to 3rd party wayfinding signage
- Wireless system communication
- Ultrasonic directional sensors for facility counts
- Central server networked over the customer network
- Design, implementation, and installation by Q-Free
- System commissioned 2019

4. BOSTON CHILDREN'S HOSPITAL PARKING GARAGE – BOSTON, MA

Boston Children's Hospital, the #1 ranked Children's hospital in the county, looked to Q-Free to provide them with a parking guidance system for one of their highly frequented garages. We were approached in 2012 install a level counting parking guidance system for the 9-level parking garage. In 2013, Q-Free was approached again to expand the system to include single space monitoring for the basement level of the garage.

Specifics for this project include:

- 2 Phase installation with phase I completed in 2012 and phase II completed in 2013
- Mix of level counting & single space monitoring
- Custom parking guidance signs
- Custom designed variable message roadway signs
- Wireless system communication
- Single space sensors for single space monitoring for general, ZIP CAR, and handicapped spaces on the basement level
- Central server networked over the customer network
- Design and implementation by Q-Free

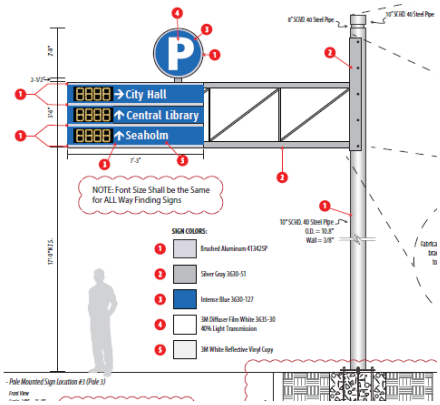


5. CITY OF AUSTIN, TX

In 2016 Q-Free was selected but the City of Austin during a RFP process to provide a customized parking guidance system for three of their downtown garages including custom designed garage and roadways signs around the city intended to guide drivers quickly to available spaces in the city garages. The City's intention was to elevate traffic congestion and reduce cycling and thus gas emissions with this system.

Specifics for this project include:

- Customized PGS systems for (3) City owned garages
- Ultrasonic directional sensors monitoring total garage availability at garage entries and exits
- Wireless system communication
- Internally illuminated custom designed garage signage working with city planners
- (5) Custom designed large pole mounted roadway signs including engineering stamps and drawings including a large extended gantry mounted design
- Central server networked over the customer network
- Design and implementation by Q-Free working with a Q-Free appointed Electrical Contractor
- Implementation process was handled out of the Sudbury office with regular remote project meetings to ensure timelines and customer expectations were met



6. CITY OF BIARRITZ – FRANCE

In 2017, Q-Free was contracted through local French partner INDIGO to install customized Parking Guidance Systems (PGS) for three of their busiest downtown parking garages for the City of Biarritz, an elegant seaside town on southwestern France's Basque coast, which has been a popular resort since European royalty began visiting in the 1800s. It's also a major surfing destination, with long sandy beaches and surf schools. Q-Free provided single-space monitoring which included custom-designed dynamic and static message signs for the Bellevue and Casino parking garages, as well as a custom designed level counting system for the Clémenceau parking garage making parking in this by tourists frequented coastal town a breeze.

Specifics for this project include:

- Single space solution for 500 spaces in (2) highly frequented and visible parking garages (casino & tourist parking)
- Level count solution for multi-level mixed-use garage
- Space availability signage at each garage guiding drivers to available spaces
- Central PGS servers for each garage/operator
- French language software package
- Implementation in conjunction with parking operator
- One of over 45 PGS systems installed in France

7. CROWN CASINO COMPLEX – SOUTHBANK, AUSTRALIA

Q-Free was contacted in 2016 to provide a custom designed level counting system for the Crown Casino complex, one of the largest casino complexes globally. Q-Free was selected as the preferred vendor due to our experience in providing custom designed PGS systems for challenging car parks. This single phase implementation approach managed and supported out of the Q-Free Australia office involved the provision of over level counting directional sensors, custom design wayfinding and VMS signs for this complex parking garage.

Specifics for this project include:

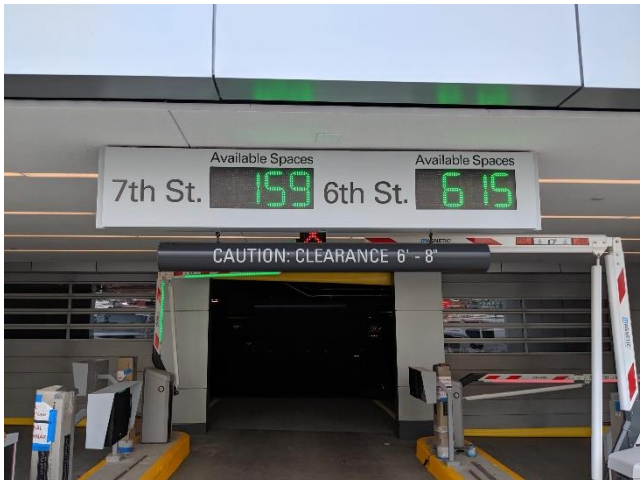
- Monitoring over 2,000 spaces
- Wireless system communication
- Custom designed wayfinding and VMS signage
- Client/Server central system
- Design and implementation by Q-Free managed out of the Q-Free Australia office
- One of (15) PGS systems installed in Australia

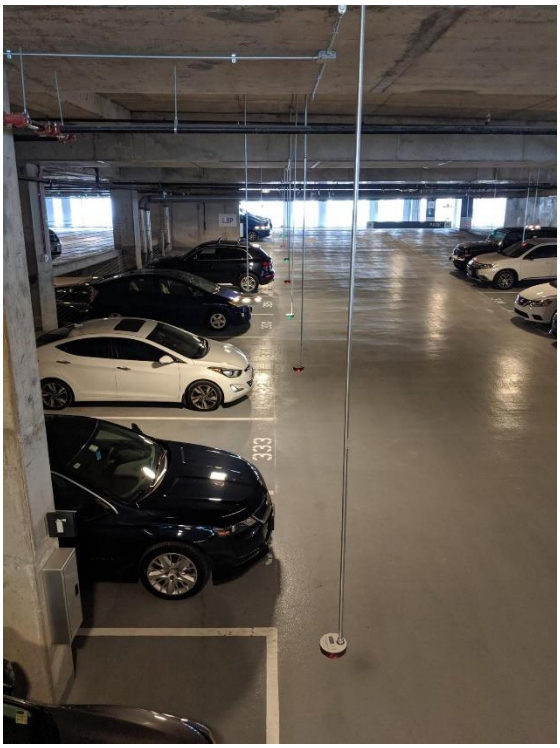
8. DOMINION WORKPLACE – RICHMOND, VA

Dominion Energy has recently completed a new 20-story office tower in downtown Richmond, Virginia. The new tower will be a proud addition to Richmond's skyline, housing retail space and more than 1,000 Dominion Energy employees. To improve parking congestion, the owner issued an RFP for a custom designed PGS and wayfinding system in 2018. Q-Free, along with our local partner, was selected as the PGS provider of choice. Ultrasonic single space sensors were installed at app covered parking spaces of the garage to accurately track parking space availability. Custom designed interior and entry signs quickly and efficiently guide parkers to the first available parking space. The project was completed in July 2019 on budget and on time.

Specifics for this project include:

- Custom designed single space monitoring system PGS system for 1 mixed-use garage
- Almost 1,000 ultrasonic single space sensors
- Custom designed garage entry and interior wayfinding signs
- Wireless system communication
- Central server networked over the customer network
- Design, and implementation by Q-Free
- System commissioned 2019



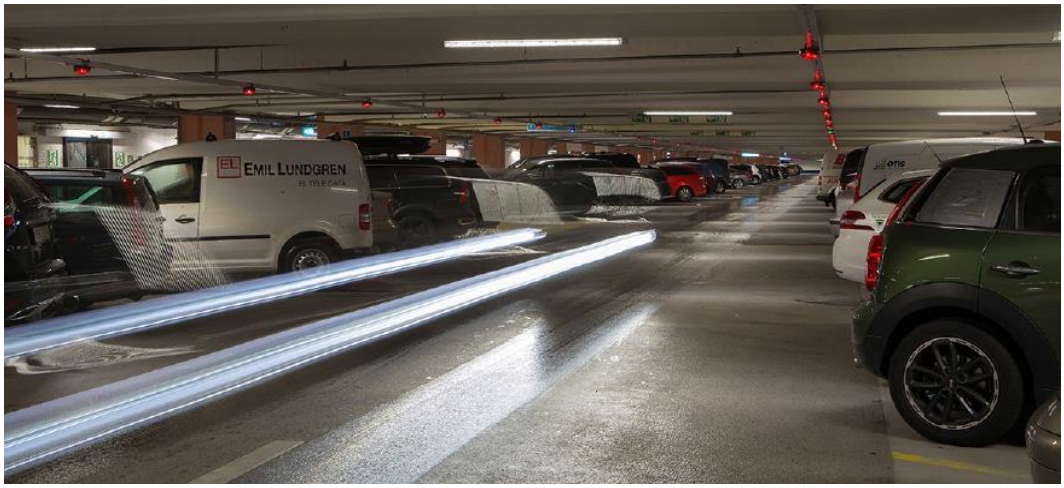


9. ERICCSON GLOBE – STOCKHOLM, SWEDEN

Q-Free was contacted in 2015 to provide a custom designed single space monitoring system for the Ericsson Globe, one of the largest hemispherical buildings in the world and a venue for ice hockey, shows and concerts. This single phase approach managed and supported out of the Q-Free Sweden office involved the provision of over 1,400 single space sensors, custom design wayfinding and VMS signs for this prestigious parking garage.

Specifics for this project include:

- Over 1,400+ single space sensors
- Wireless system communication
- Custom designed wayfinding and VMS signage
- Client/Server central system
- Design and implementation by Q-Free managed out of the Q-Free Sweden office
- One of (50) PGS systems installed in Europe



10. GO TRANSIT METROLINX - GREATER TORTONTO AREA, ON CANADA

GO Transit Metrolinx first approached Q-Free to provide a combination of Single Space Monitoring and Level Counting for the newly erected 5 level parking structure in Oakville, ON. This 1,600-space facility was equipped with a Q-Free designed PGS system in the fall of 2012. In 2013 GO Metrolinx added PGS Systems for the Ajax, Aurora, Erindale and Clarkson GO station garages resulting in Q-Free monitoring over 20,000 parking spaces. Q-Free was contracted again to provide PGS systems for the Hamilton, Burlington, and Bloomington GO sites in 2016, and again in 2018 to provide a system for the GO Cooksville station. All projects were managed and supported out of the Q-Free Toronto office.

Specifics for these projects include:

- Over 20,000 TUS 100 single space sensors offering regular 3-color status lights as well as Handicap or accessible space monitoring.
- Dynamic LED signs in both English and FRENCH displays where required. Master Panel, Roadway and Level count signs
- User friendliness and high levels of accuracy has given Q-Free a total of 9 GO transit garage systems
- Ongoing implementation where garages get added once they become available

- One of over 65 PGS systems installed in Canada

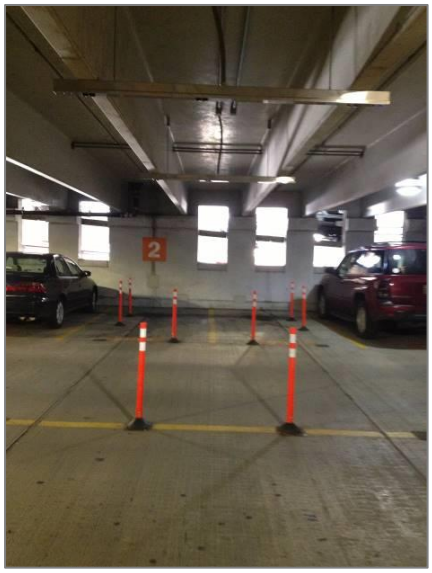
11. JAMES MADISON UNIVERSITY – HARRISONBURG, VA

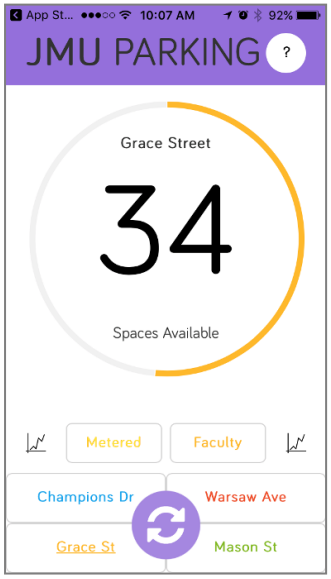
2007, Q-Free was first approached to provide a Parking Guidance System for one of the mixed-use campus garages. The first installation included a level count system for designated parking groups as well as custom designed wayfinding signs, making parking easier for faculty, staff, and visitors. Since then. Q-Free has provided PGS systems for (4) additional garages, in a multi-phase approach. Our open API tool also enabled the launch of a student created mobile app, which connects students, faculty & visitors on-the-go to parking availability information. We are currently under contract to provide an upgrade to the first garage installation.

Specifics for this project include:

- Customized PGS systems for (5) mixed use campus garages
- Ultrasonic directional sensors in total for level counting in addition to single space monitoring for ADA spaces in some of the garages
- Wireless system communication
- Custom designed way finding & space availability signage
- Central server networked over the customer network
- Design and implementation by Q-Free working with a customer appointed Electrical Contractor
- Web interface: https://www.jmu.edu/parking/faculty-staff/space-counts.shtml

- Student developed Parking App on the Apple and Google Platform using Q-Free's provided parking data API: JMU Parking App



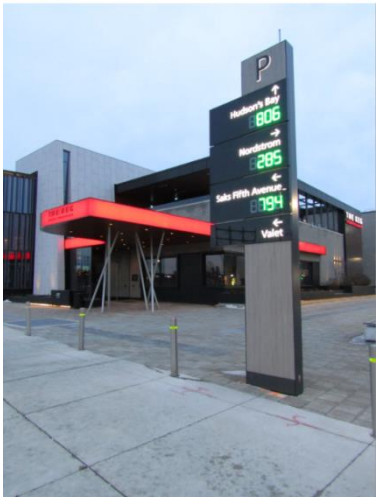


12. SHERWAY GARDENS – TORONTO, CANADA

Sherway Gardens is a large shopping mall located in the greater Toronto area (GTA). The garage has recently under gone renovations, constructing three new parking decks containing a total of 2700 parking spaces. In 2015, Q-Free was contracted to install a Parking Guidance System (PGS) inside the properties North, East, and South parking decks. The PGS is comprised of Single Spaces Sensors (SSS) detecting individual space occupancy for every covered parking space. Ultrasonic Directional Sensors (USDS) located on ramps detect vehicle entries and exits for the uncovered roof levels. LED Displays installed at garage entry points and ramps display individual floor availability. Large LED Master signs are also located along a ring road that spans the entire perimeter of the property. The LED Master signs help to direct traffic to the parkades with the most available spaces. This project was managed and supported out of the Q-Free Toronto office.

Specifics for this project include:

- A mixture of SSS and USDS monitoring availability of covered and uncovered parking spaces
- Large LED Master Signs located across the property directing traffic between parkades
- Centralized PGS server located on the property which provides real time parking counts and customizable reports
- Phased approach completed in 2018

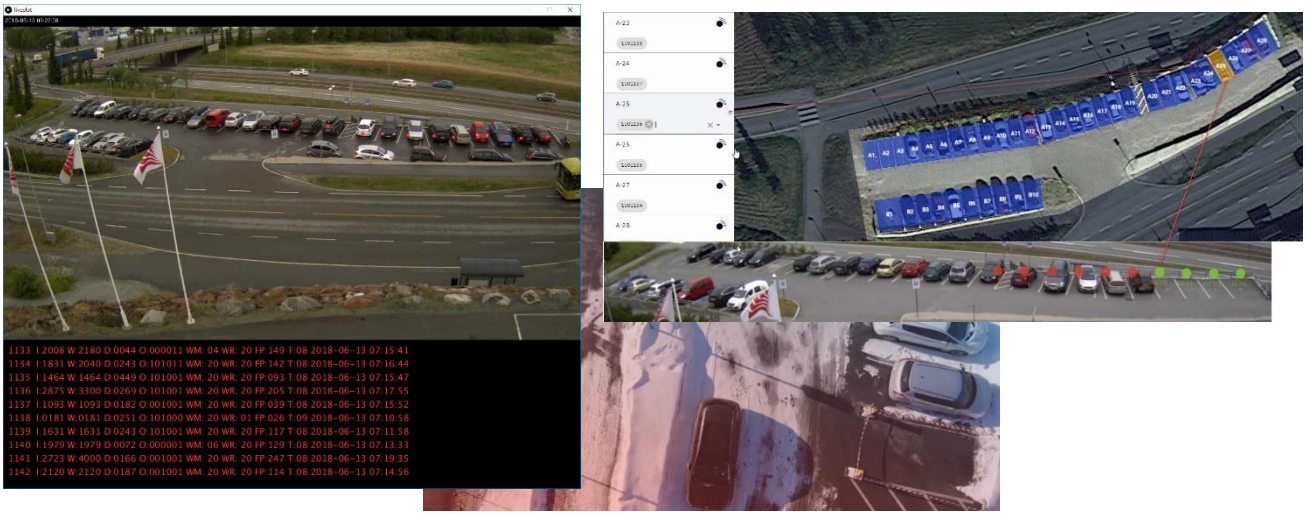


13. RANHEIM PARK 'N RIDE – RANHEIM, NORWAY

The Ranheim Park 'N Ride lot is a highly frequented urban railway transit lot. Q-Free was approached by the customer to provide in-ground sensors for the transit spaces in the parking lot. The main objective of this installation is to monitor parking patterns over a 5-year period to gather statistical data and analytics on driver behavior.

Specifics for this project include:

- ParQSense Smart Outdoor Sensors monitoring lot transit spaces
- Centrally located ParQSense Base Station in considerable distance to parking lot for sensor communication and connection to cloud-based Q-Free HUB software engine
- Reports and statistical data per customer requirements
- Ongoing 5-year research project with ParQSense Smart Sensors, Base Station, and surveillance camera
- Goal of research project is to monitor space usage over time to gain statistical data for analysis and determine parking patterns



14. SHEIK ABDULLA AL SALEM CULTURAL CENTER, UAE

Q-Free was contacted through a local partner to provide a customized parking guidance and wayfinding system for the one of the one of the world's largest cultural complexes, easing parking congestion and providing all visitors to this state-of-the-art with a less stressful parking experience.

Specifics for this project include:

- Single space system for multiple garage monitoring over 5,000 spaces for one of the world's largest cultural complexes
- Exterior and interior garage signage guiding drivers to available spaces
- Central PGS server for all garages
- Implementation with strategic Middle East partner in 2016
- One of 8 PGS systems installed in the Middle East

4.0 Project Approach

4.1 Q-Free Parking Solutions

The Q-Free solution is tried and tested, and combines well-known components with latest technology. This gives customers confidence that they are purchasing a trusted system that is high-performing and future-proof.

The system is developed and refined from our proven design philosophy based on four main value propositions; *accuracy*, *reliability*, *flexibility,* and *low maintenance*. The general aspect of the Q-Free design philosophy value propositions can be summarized as follows:

Accuracy – the system shall be correct and consistent, and provide fair treatment of all liable users.

Reliability – the system shall be dependable for parking system operators as well as users under all varying applicable operating conditions.

Flexibility – the system shall be designed for the present and prepared for the future, with scalability and sustainability over the full life cycle in mind.

Low maintenance – the system shall use high quality components and simple mechanisms that allow for high automation rates with minimal manual intervention and a predictable maintenance schedule.

These value propositions ensure that the system maximizes the overall value for the parking system operator through best performance and lowest possible costs.

4.2 Overview of our Proposed Parking Guidance System Technology

4.2.1 Level Count Sensing Technology

In a Q-Free Level Counting installation, the total facility space availability as well as individual level space availability are monitored by overhead mounted Ultrasonic Directional Sensors (USDS) installed above every garage and level entry and exit. These sensors are suspended from ceilings at the counting points with threaded rod. Using A-B logic the ultrasonic beams are configured to identify the profile of a vehicle only and track the direction of travel (in-bound or out-bound). This calibration allows the system to not be “tricked” by pedestrians, carts, debris bicycles etc. The intelligence of the system allows for the tracking of wrong way traffic, meaning a vehicle entering an exit would be a “wrong way” count and automatically corrected in the software. Mounting these sensors to the ceiling gives Q-Free the advantage over competitive solutions which require saw-cutting loops into the parking deck thus requiring x-raying etc. These sensors can also easily be moved should traffic pattern change. This also provides an advantage over in-ground loops which must be re-cut and x-rayed again.

In the design provided, “cluster” design USDS configurations are proposed. This patented design is used in extra wide (20’+) lanes on entries/bi-directional ramps. A series of 3-USDS sensors are placed across the span to cover all possible transactions. See data sheet in the submission for various scenarios. Utilizing the Q-Free

"cluster" design eliminates the need for lane delineation on the ramps and the additional use of flexible posts, bollards, etc.

Each group of USDS sensors are BUS cabled to a communication enclosure (CP) on the nearby walk or pillar where they receive power and communication. Low voltage 24V power supplies drive the sensors and we have a wireless modem for communication to the server gateway on site. All cabling within the system is low voltage and a 3-pair 18 AWG. Only the CPs and gateways require 120 VAC.

Our industry leading wireless design is KEY, as it eliminates the need for expensive cable and conduit running from each device to a server. This design has been deployed in some of the most highly sensitive government sites, as well as shopping centers, employee facilities, etc. around the world. Our wireless mesh networks guarantee a system uptime of 99.99% as each communication point is a receiver and transmitter at the same time. Each transaction is recorded in Real Time. To enhance the system design, user friendly intelligent signs are placed at key decision points.

4.2.2 Space Availability Signs

ENTRY SIGNS

We propose the following entry sign/s:

- (1) Wall mounted and (1) Blade Projected mounted entry sign indicating space availability for each level of the garage.

Our standard displays in the entry sign have 5" LED character height and can display 4-digits, OPEN and CLSd in single stroke green LEDs and FULL in single stroke red LEDs. We will work with the customer regarding the overall design of the signs including colors, fonts, and/or logos.

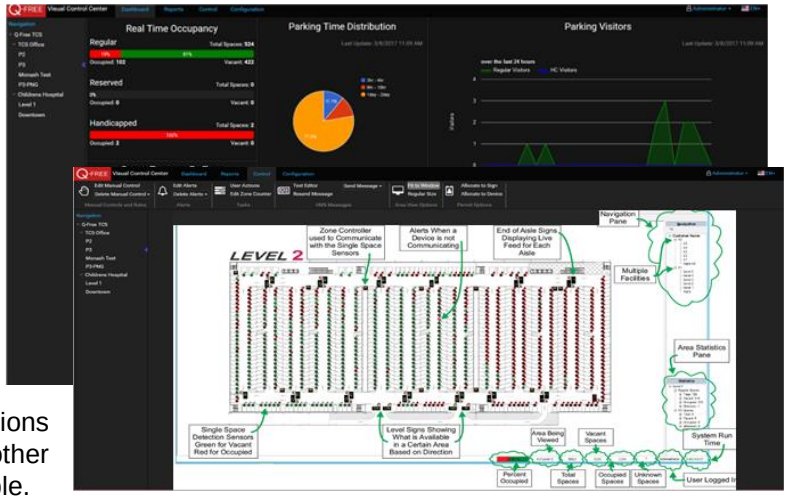
Sample Sign Installations

INTERIOR SIGNS

3-Digit Aisle Displays: For the garage interior, 3-digit aisle type displays, indicating space availability per drive aisle at decision making points, providing optimum way finding for drivers are provided. The displays show up to 3-digits and a universal arrow in single stroke green LEDs, and a red "0" and "X" in single stroke red LEDs.

4.2.3 Central PGS Software

Q-Free will provide a client-based PGS software solution, which allows for multi-user access and dashboard controls through a web-portal. Our PGS software has a customer friendly, windows based, easily maneuverable GUI interface, providing overall status information as well as the ability to generate statistics, and run reports. The dashboard overview provides easy access to the most important system data.



There are no 3rd party software packages in our proposal. All software is owned by Q-Free. Our system has an open API interface to 3rd party applications such as websites, apps, etc. Future expansion to other garages, facilities, roadway sign etc. is readily available.

5.0 PGS Project Approach

Providing services in our competence, we feel we are a highly skilled group with experience in over 350 completed parking projects globally.

For the City of Sparks project, our project approach is as follows:

- The following tasks will be completed during the kick-off meeting/final site meeting:
  - Finalize any open questions or issues not already addressed;
  - Finalization of system design for the parking structure to ensure customer expectations and requirements are met;
  - Investigate current power locations to ensure required enclosures are in optimum locations to be less obtrusive and efficient;
  - Using experience make suggested quantity and location suggestions for intelligent signage. Creating the optimum WAY FINDING and information platform for users.
- In our long experience with PGS systems, sign design confirmation and assembly usually determine the critical path;
- We will submit detailed project submittals within given timelines;
- The owner is required to sign off on the submittals;
- Once approved, all counting equipment will be assembled in its entirety, from our stock inventory at our headquarters in Sudbury, MA;
- The provision of the space availability signage cabinets is contracted to our approved sign cabinet manufacturer using Q-Free manufactured LED displays;
- Assembly of the counting components can be accomplished within 4 weeks after submittal sign off;
- The entry and interior signs can be ready for shipment 8-10 weeks after submittal sign off;
- The installation of the conduit, cabling and PGS equipment will be performed by an Electrical contractor, with Q-Free's remote support;
- Once the installation is completed, Q-Free will commission the site and train owner personnel on the equipment; and
- Any post installation related issues and warranty support will be addressed by Q-Free directly.

5.1 Installation Testing

- **Ultrasonic Directional Sensors (USDS):** Q-Free will test the start-up and connectivity of each USDS and confirm that each sensor is counting correctly and has a strong connection to the communication point.
- **Signs:** Q-Free will test the start-up and connectivity of the signs to the communication point as well as test the LEDs brightness on all signs.
- **Communication Equipment:** Q-Free will test the connectivity throughout the facility to make sure data is successfully being transmitted to and from the Parking Guidance Server. This includes the control and status updates on the Visual Control Center Software.

5.2 Estimated Project Timeline

Starting Point is Receipt of Submittal Approval	
Manufacturing of Counting Equipment	4 weeks
Manufacturing of Entry & Interior Signs	8 - 10 weeks
Standard Shipping	1 week
Installation	6-8 weeks
Commissioning & Training	3 Days

6.0 PGS System Breakdown & Pricing

The proposal is the recommended system design based on limited customer specifications/Q-Free layout drawings Rev 1. The final quote will be provided after full review of all findings. All wiring must be adhered to as indicated in the EC Scope.

6.1 Counting Equipment:

QTY	PART#	DESCRIPTION
13	USDS	**Ultrasonic Directional Sensors:**  • Three (3) unit cluster configuration at wide garage/level entrances/exits and single unit standard configuration at standard width garage/level entrances/exits provided; • Built in central processing unit to control sensor logic; • Built in self-test diagnostics; • Maximum mounting height 8 ft; • Directional counting of vehicles; • Maximum effective speed 12 mph; • 24 VDC low voltage; • Output: plus-minus pulses and/or serial interface via RS-485; • Max. 24'/Delineation required for optimal cluster counting accuracy; • Max. 12'/Delineation required for optimal standard counting accuracy; • Dimensions: 74" L x 2.75" H x 2.5" W; and • Weight: 15.5 lbs. *NOTE:* • *Patent pending;* • *Proximity of vehicles under sensor can skew accuracy;* • *Spacing of sensors depends on garage floor layout and is customized per installation; and* • *Q-Free is not responsible for accurate system counts if proper lane delineation, if required, is not implemented, and maintained by others.*

4	USDS-CP	**Communication Point Enclosures:**
		All components for local network wireless clusters connected to USDS communication points (CP).
		• Ultrasonic directional sensor communication point enclosures provided including:
		  ○ Wireless communication equipment (i.e. modems, power supplies, etc.);
		  ○ Power supplies for USDS and/or signs; and
		  ○ Peripherals, etc.
		• Equipment pre-configured in 14" x 12" x 6" NEMA 4 PVC indoor enclosures.

QTY	PART#	DESCRIPTION
50	**DP**	**Directional Delineation Posts:** • Lane delineation equipment used to ensure proper vehicle counts; • Used to properly channel traffic under count sensor; • 36” standard post; • Includes two (2) reflector stripes; • Adhesive pads provided; • Installation by others; • Max. 24’/Delineation required for optimal cluster counting accuracy; and • Max. 12’/Delineation required for optimal standard counting accuracy. *NOTE:* • *Final quantity of required units is subject to site evaluation due to traffic flow concerns* • *Q-Free does not accept any responsibility for replacement of delineators if damaged or destroyed due to traffic flow. The delineators are placed to ensure proper system performance and are not designed to sustain extensive abuse due to traffic flow or abuse.*
1	**GW**	**Gateway Enclosure:** All components for local network wireless clusters connected to wireless gateway (GW). ○ Wireless gateway enclosure provided including: ▪ Wireless communication equipment (i.e. gateways, power supplies, etc.). ○ Equipment pre-configured in 14” x 12” x 6” NEMA 4 PVC indoor enclosure *NOTE: Wireless gateway (GW) must be physically connected to the existing customer network or directly to the PGS server.*

6.2 Space Availability Signs:

QTY	PART#	DESCRIPTION

1	L4MP	**4-Level Garage Entry Sign (Sample Sign Design):**
		 
		Sample Sign Design
		• 4-Level garage entry sign indicating space availability for each garage level at garage entrance/s;
		• Approximate dimensions: 48” H x 48" W x 6" D;
		• Single sided sign; and
		• Total of (4) space availability displays per sign cabinet:
		  ○ 4-Digit single stroke seven segment display;
		  ○ 5” LED Character height;
		  ○ Number of spaces and OPEN in green; and
		  ○ FULL in red.
		• White reflective vinyl lettering;
		• 24 VDC Low voltage;
		• Super bright wide viewing angle LEDs; and
		• Will match existing single corporate color if required.
		NOTE: Sign price only for quoted sign dimensions, design and mounting. Changes to sign design, dimensions, mounting etc. will require a new quote.

1	PM	**Double Post Mount**
1	L4MP/DS	**4-Level Garage Entry Sign – Double Sided (Sample Sign Design):**  *Sample Sign Design* • Post Mounted • 4-Level garage entry sign indicating space availability for each garage level at garage entrance/s; • Approximate dimensions: 48” H x 48" W x 6" D; • Double sided sign; and

QTY	PART#	DESCRIPTION

		• Total of (4) space availability displays per side per sign cabinet:
		  ○ 4-Digit single stroke seven segment display;
		  ○ 5” LED Character height;
		  ○ Number of spaces and OPEN in green; and
		  ○ FULL in red.
		• White reflective vinyl lettering;
		• 24 VDC Low voltage;
		• Super bright wide viewing angle LEDs; and
		• Will match existing single corporate color if required.
		NOTE: Sign price only for quoted sign dimensions, design and mounting. Changes to sign design, dimensions, mounting etc. will require a new quote.

1	**PM**	**Double Post Mount**

3	**TAS-53DA**	**3-Digit Interior Display – Single Sided:**
		 
		• Single sided interior display indicating space availability for drive aisle/zone
		• Individual dimensions: 7.5” H x 18.625” W x 3” D
		• Character height:
		  ○ 5.0” LED character height
		• Spaces availability display:
		  ○ 3-Digit single stroke seven segment display
		  ○ Number of spaces and universal arrow in green
		  ○ “0” and “X” in red
		  ○ 24 VDC Low voltage
		  ○ Super bright wide viewing angle LEDs
		NOTE: Sign price only for quoted sign dimensions, design and mounting. Changes to sign design, dimensions, mounting etc. will require a new quote.

6.3 Central PGS Server (Hardware & Software):

QTY	PART#	DESCRIPTION
1	**PGS - SERV**	**Central PGS Server Hardware and Software:** Hardware: • Dedicated PGS tower server Dell T-140 or equivalent; • Operating System Windows Server 2016; • CPU: Intel Xeon, 3.0GHz or similar; • Hard Drive: 256GB; • Minimum 8 GB RAM; • 22" Flat screen monitor; and • USB Mouse & keyboard. • Customer supplied UPS backup recommended. Software: • Server based software with web user interface for dashboard controls; • Microsoft™ Windows based; • Operating language English; • Real time graphical analysis for operator control with GUI for parking facility; • Central communications and complete single control and programmability of LED signage and ultrasonic detectors; • Password protected access; • All reprogramming changes are logged; • Complete reporting and statistics for floor counts, occupancy, turnover, alarms, and customizable reports; • Storage and access of historical data; • Alarm monitoring for dynamic signage & counting locations; and • **Remote log in capability required prior to system commissioning & training.** ○ Customer supplied anti-virus software recommended.
1	**API**	**API Tool:** • API tool allowing export of data for upload to client website/mobile app; • Updated counts sent by the PGS system automatically; and • SAMPLE WEBINTERFACE: **https://www.jmu.edu/parking/faculty-staff/space-counts.shtml**

6.4 Installation:

QTY	PART#	DESCRIPTION
1	IN	**Installation:** Inclusions: • Installation of CP enclosures; • Provision of 120 VAC power and conduit per local code to each CP enclosure; • Installation of directional sensors to ceiling with threaded rod and anchors Provision and installation of conduit with 6 conductor of 18 AWG from CP to the first directional sensor of each bus line; • Provision and installation of conduit with 6 conductor of 18 AWG between each directional sensor on the bus line; • Installation of level/entry signs; • Provide and installation of conduit with 4 conductor 18 AWG to level/entry signs from CP points; • Installation of AP gateway enclosure; • Provision and installation of 120 VAC power for gateway AP enclosure; and • Provision and installation of pathway and cabling (Cat5 or better) from gateway to owner's existing network and from computer (location to be determined) to owner's existing network. Exclusions: • Painting & patching and asbestos or lead work; • Forced overtime work due to others; • Any allowances, GC work, demolition work, clean up & rubbish removal; • Required digging, trenching; concrete, asphalt, and protective bollards; • Bonds, insurance, permits, engineering drawings, certifications, foundation design, inspection fees, etc.; • Lost revenue and traffic control. Assumptions: • Install price is for work performed during standard hours; • Large sections of the garage can be blocked off during install; and • Work to be completed on a consecutive work day schedule (Mon.-Fri.). Work to be done on a day to day, week to week schedule.

6.5 Additional Provisions:

QTY	PART#	DESCRIPTION
1	DES	**System Design:** • Standard in-house system design; and • Includes documentation, drawings, and all related design work.
1	PM	**Remote Project Management:** • Perform all off-site coordination and remote project management to supply the PGS system.
1	SC	**System Commissioning & Training:** • Provide on-site technician for final commissioning support; • Perform all testing for PGS system; • Travel related expenses for up to (3) contiguous days during the system commissioning phase of the project included; and • Provide on-site user training on the PGS System as part of the on-site system commissioning efforts, including: ○ System overview; ○ Hardware training; ○ System troubleshooting; and ○ General system maintenance & repair. *Note: All additional services and supporting expenses will be billed per standard rates if delays are caused by customer or a third party.*

Exclusions:

The following is excluded in this proposal:

- Related civil work, including but not limited to:
  - Required digging, trenching, coring, etc.; and
  - Concrete, asphalt, and protective bollards.
- Any type of penetrating survey/initiatives to any structure required to install PGS equipment, signage, conduit, etc.
- SIM Card and/or GPRS data usage charges;
- A/P connection/s to customer network;
- Wireless interference;
- Bonds, insurance, permits, engineering drawings, certifications, foundation design, foundation, delineation, etc.;
- Traffic control; and
- Lost revenue.

NOTE: All additional services and supporting expenses will be billed per standard rates if delays are caused by customer or a third party.

6.6 Price Summary

DESCRIPTION

Price Summary:

PROPOSAL TOTAL (incl. standard freight & handling)	**$119,493.00**

The proposal is the recommended system design based on limited customer specifications/Q-Free layout drawings Rev 1. The final quote will be provided after full review of all findings. All wiring must be adhered to as indicated in the EC Scope.

Terms:

- 30% mobilization with proposal acceptance and/or issuance of PO.
- 60% upon equipment delivery.
- Final invoice (10%) will be issued upon completion of project, and is payable upon receipt.
- This quote is valid for 30 days.
- All prices in US Dollars.
- All orders are binding upon proposal signing and/or PO reception at 100% proposal total.
- Order will be confirmed within one week after receipt of signed proposal and deposit. Please allow 8-10 weeks for delivery from submittal approvals.
- Purchaser is responsible for system maintenance upon project completion.

DISCLAIMER:

- *This document and information is property of Q-Free and is not intended for the use of any but the Business Entity to whom this proposal is addressed.*
- *Warranty is void if watertight connectors are not utilized on all PGS equipment.*
- *Q-Free is not liable for physical or monetary damages associated with onsite services, as well as installation or post installation of purchased equipment and/or system.*
- *This proposal does NOT include a calculation of Sales, User, State, or Provincial Taxes. These taxes are the sole responsibility of the customer.*

All work is guaranteed to be as specified, and will be completed in a professional manner per standard practices. Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays are beyond our control. Owner to carry fire, tornado, and other necessary insurance. Worker's Compensation insurance fully covers our workers.	**Acceptance of Proposal** – The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do work as specified. Date of Acceptance: _____ Authorized Signature_____ Name:_____ PO #: _____

7.0 Warranty

DESCRIPTION

Limited Warranty:

- Q-Free ("Q-FREE") warrants to its direct customer ("Customer") that each Q-FREE product purchased by Customer (each, a "Product") will conform in all material respects to Q-FREE published specifications for such Product for a period of one (1) year from the date of Customer's completion of system commissioning or 14 months from date of Q-Free shipment, whichever incurs the earliest. Spare parts warranty is 90 days from equipment shipment.
- Q-FREE provides warranty services during its normal business hours, and requires LogMeIn access for troubleshooting. If LogMeIn access is not provided, Q-FREE will charge for all phone & site services per Q-FREE' standard rates. Normal business hours are Monday through Friday, 8:00 am to 5:00 pm EST, excluding all US holidays. After hours phone support is available for an additional fee**.**
- Dell international warranty applies to all dell equipment for international sales where applicable.
- Q-FREE' sole obligation under the foregoing warranty shall be to repair or replace, at its option, any Product that fails to comply with the foregoing warranty and is returned to Q-FREE within the warranty period. Customer shall bear all shipping expenses to and from Q-FREE' facility. Labor expenses for diagnostics and/or repairs by Q-FREE will be billed at standard rates.
- This warranty extends only to the Customer, and does not cover Product components that are by nature expendable (i.e. batteries, lamps/bulbs, delineators, etc.) or any on-site labor or material costs associated with removal or replacement of Products or components thereof, nor supporting costs associated and scheduling of police, flagmen, permits, etc.
- In the event Customer purchases from or through Q-FREE materials, equipment or software manufactured by a party other than Q-FREE ("Third Party Products"), this warranty shall not apply to such Third Party Products and in lieu thereof Q-FREE shall use reasonable efforts to pass through to Customer any manufacturer's warranty regarding the Third Party Products.
- This warranty shall not apply if the Customer uses a Product in conjunction with any feature or device not approved in advance and in writing by Q-FREE.
- This warranty shall not apply if watertight connections for conduit, conduit fittings, and connectors are not utilized to protect electronic components.
- This warranty does not cover acts of God (i.e. lightning, earthquakes, flooding, etc.), vandalism, or unintended use or conditions of these products.
- This warranty does not cover any damage caused by the failure to provide a continuously suitable environment including, but not limited to: (i) neglect or misuse, (ii) a failure or sudden surge of electrical power, (iii) direct or indirect water exposure, (iv) improper air conditioning or humidity control, or (v) any other cause other than ordinary use.
- The foregoing warranty is in lieu of all other warranties, express or implied, including without limitation the implied warranties of merchantability, non-infringement, or fitness for a particular purpose, all of which are hereby disclaimed by Q-FREE. The United Nations Convention on Contracts for the International Sale of Goods shall not apply. Q-FREE does not warrant that the operation of any software will be uninterrupted or error free.
- Q-Free does not take any liability for (i) incorrect registration/detection or lack of such; (ii) under-/overcharging users for parking, or (ii) otherwise incorrect enforcement carried out based on output from the Product.
- In no event shall Q-FREE be liable for any loss of profits, loss of income, loss of revenue, or any indirect, special, punitive, or consequential damages arising out of this warranty or otherwise related to any Product
- The liability of Q-FREE for loss or damage arising out of or related to any Product, whether in contract, tort or under any other legal theory, shall in no event exceed 50% of the price paid by the Customer for the Product.

8.0 Customer Agreement Terms and Conditions

Agreement Governs: These terms and conditions (the "Agreement") govern your purchase of the parking guidance equipment including (without limitation) the hardware, software, and any documentation, data, and multimedia content (collectively, the "Equipment") sold to you by Q-Free ("Q-FREE"). This Agreement supersedes all terms and conditions provided by you in any document, including purchase orders accepted by Q-FREE. All other terms and conditions are invalid regardless of when delivered.

Software: With respect to the software that is part of the Equipment, you acknowledge and agree that (a) this Agreement permits you, the original user, to use the software solely in the device or computer it is embedded/installed in by Q-FREE (b) you may not transfer the software to another device, computer or storage media (c) you may not disassemble, reverse engineer, copy, sublicense, or distribute the software except as allowed in this agreement, (d) you may transfer the software to another person only if you deliver the device or computer it is embedded/installed in along with any documentation to that person without retaining any copies and that person complies with the terms of this agreement, (e) Q-FREE retains ownership of the software, and (f) the software contains confidential, propriety information that is a valuable trade secret of Q-FREE and is protected by copyright laws and you will keep such information strictly confidential.

Limited Warranty: The limited warranty applicable to the Equipment is set forth in Q-FREE' standard warranty terms, which accompany this Agreement and are incorporated by reference herein. All other warranties, express or implied, are hereby refused, including without limitation the implied warranties of merchantability, non-infringement, or fitness for a particular purpose.

Governing Law: This Agreement shall be constructed in accordance with the laws of Massachusetts, United States of America without regard to its choice of law provisions. The United Nations Convention on Contracts for the International Sale of Goods shall not apply. Any dispute arising out of or related to this Agreement shall be brought in a court of appropriate subject matter authority located in the Commonwealth of Massachusetts, and you hereby consent to the exclusive authority of such courts.

Limitation of Remedies and Liability: YOUR SOLE AND EXCLUSIVE REMEDIES FOR DEFECTIVE EQUIPMENT SHALL BE AS SET FORTH IN Q-FREE'S STANDARD WARRANTY TERMS REFERENCED ABOVE. IN NO EVENT SHALL Q-FREE BE LIABLE FOR THE COST OF PROCUREMENT OF SUBSTITUTE GOODS, LOSS OF PROFITS, OR FOR ANY OTHER SPECIAL, PUNITIVE, CONSEQUENTIAL, OR INCIDENTIAL DAMAGES, HOWEVER CAUSED, EVEN IF Q-FREE HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, WHETHER SUCH CLAIMS ARE BASED ON CONTRACT, TORT, PRODUCT LIABILITY, OR OTHER THEORIES OF LIABILITY. Q-FREE'S LIABILITY UNDER THIS AGREEMENT FOR LOSS OR DAMAGE SHALL IN NO EVENT EXCEED 50 % THE PRICE PAID FOR THE DEFECTIVE OR OTHERWISE NONCONFORMING EQUIPMENT GIVING RISE TO ANY CLAIM. EXCEPT AS OTHERWISE SET FORTH IN THIS AGREEMENT, Q-FREE MAKES NO REPRESENTATION OR WARRANTIES, EXPRESS OR IMPLIED, CONCERNING THE SERVICES, EQUIPMENT, MATERIALS OR PERFORMANCE.

Assignment: This Agreement shall not be assigned by either party without the written consent of the other party, which shall not be unreasonably withheld or delayed. Notwithstanding the above, Q-FREE may assign this Agreement, without consent, in whole or in part, to (a) any affiliate or subsidiary or (b) a third party in the event of merger, recapitalization, conversion, consolidation, other business combination or sale of all or substantially all the assets of Q-FREE to such third party.

Vendor Product Procurement: Q-FREE will at times change vendors and/or will be unable to procure originally quoted Equipment. In this event, Q-FREE reserves the right without bearing any cost, penalty, or legal exposure of any kind to alter customer approved purchased product and/or components at its own discretion to include but not limited to product availability, and technology changes or enhancements.

Miscellaneous: Any modification or waiver of this Agreement must be in writing and signed by the party against whom enforcement is sought. This Agreement represents the entire and final agreement between you and Q-FREE regarding its subject matter. In the event any suit or action is brought to enforce or interpret any of the terms of this Agreement, the prevailing party shall be entitled to recover from the other party all reasonable attorney fees incurred at trial, on appeal, and on any petition for review, together with such other expenses, costs, and disbursement as may be allowed by law. Please Note:

- *If proper delineation as proposed is not accepted by the customer at system counting points and overall traffic flow concerns, Q-FREE will not be held responsible for overall system counting accuracy. Counting Throughput Accuracy Averages are approximately 95% for USDS counting & loop counting, and 99% for single space monitoring. General count maintenance required with all parking systems.*
- *Sign Prices quoted only for proposed sign design. Any requested changes in sign design will result in sign price to be re-quoted.*
- *All customer logos, brands, trademark names or other trademark symbols can be utilized free of any charge or expense in Q-FREE marketing and/or sales efforts.*
- *Count performance is subject to proper floor condition (i.e. flat/smooth surface).*
- *Structural circumstances might require the use of parking spaces for delineation purposes to ensure proper vehicle counts.*
- *Q-FREE reserves the right without bearing any cost, penalty, or legal exposure of any kind to alter customer approved purchased product and/or components at its own discretion to include but not limited to product availability, and technology changes or enhancements.*
- *Q-Free does not accept any responsibility for replacement of delineators if damaged or destroyed due to traffic flow. The delineators are placed to ensure proper system performance and are not designed to sustain extensive abuse due to traffic flow or abuse.*

Appendix A – Supplemental Documents


PARKING
Real-time parking information to allow drivers and operators obtain parking availability efficiently.
Q
FREE
LEADING THE WAY

PARKING GUIDANCE SYSTEMS

Up to a third of all traffic in urban areas is generated by vehicles looking for somewhere to park. The need to address parking related congestion and pollution has given rise to more sophisticated indoor Parking Guidance Systems (PGS). These systems provide accurate real-time information on the location and availability of parking and can have a very positive effect on congestion, pollution and overall quality of life.

The Parking Guidance Solution, a product of the worldwide development and deployment of ITS in cities, reduces parking space search times by providing information on where space is available. Combining traffic monitoring, communication, processing and information dissemination technologies to give drivers dynamic, real-time information about parking availability within controlled areas, the PGS uses a combination of sensors in and around car parking facilities and information provision systems such as on-street and in-facility displays, the internet and smart device applications.

BENEFITS

A Parking Guidance System optimizes the available parking inventory utilizing all available parking spaces where typically a substantial amount of inventory would go unused due to the inability to be located. Applicable revenues are therefore maximized. Statistical data is tracked and logged, to be used to estimate future trends and provide the best possible parking experience for drivers. Reducing the time spent looking for parking improves the driver experience and ensures that visitors keep coming back. Less time spent looking for parking also provides a significant reduction in emissions, air and noise pollution. A Parking Guidance System is the easiest way for an operator to create a driver friendly experience, increase revenues, and reduce the carbon footprint.

Q-FREE'S TECHNOLOGY

Overhead mounted ultrasonic sensors track vehicles entering or exiting a garage/level or individual parking space. Space availability information is displayed on strategically placed wayfinding signs or other media such as websites or mobile applications, guiding drivers to the nearest available parking space.

The Q-Free wireless system design eliminates the need for expensive cable and conduit running from each device to the central server as typical in other Parking Guidance installations. The wireless mesh network is custom designed for each installation for optimal signal strength penetration guaranteeing a system uptime of 99.99% as each communication point is a receiver and transmitter at the same time. Hardwired applications are also available if required.

Q-Free Parking Guidance systems are flexible to fit any customer requirement. Different technologies and 3rd party products can all be integrated and mixed to provide one of the most flexible Parking Guidance Solutions in the market.

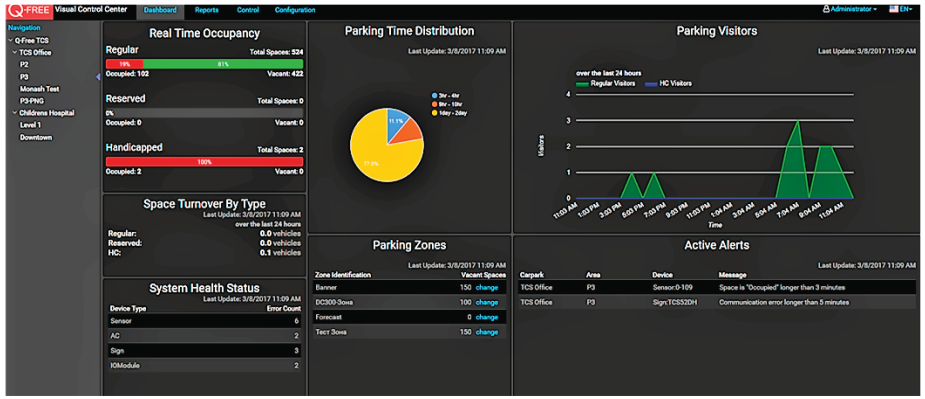
Q-Free Visual Control Center Software

The best sensor technology is nothing without a robust and innovative software engine where the highly accurate sensor data is analyzed, processed and stored. The Q-Free Visual Control Center (VCC) is a client-based PGS software solution, which allows for multi-user access and dashboard controls through a web-portal. Our VCC software has a customer friendly, windows based, easily maneuverable GUI interface, providing overall status information as well as the ability to generate statistics, and run reports. The dashboard overview provides easy access to the most important system data. The Q-Free VCC does not contain any 3rd party software packages; all software is owned and maintained by Q-Free. The open API interface to 3rd party applications provides additional system flexibility.

Parking Guidance Solutions by Q-Free

Over the last 10 years, Q-Free has created one of the most flexible, industry leading Parking guidance solutions on the market.

Engineered and developed exclusively by Q-Free, Q-Free PGS solutions are installed in over 350 locations worldwide. The advantages in wireless system design, sensing accuracy and overall system flexibility, establishes Q-Free as one of the most experienced providers in Parking Guidance market. Q-Free's Parking Guidance Solutions are another great example of how Q-Free is Changing the Movements of Life.



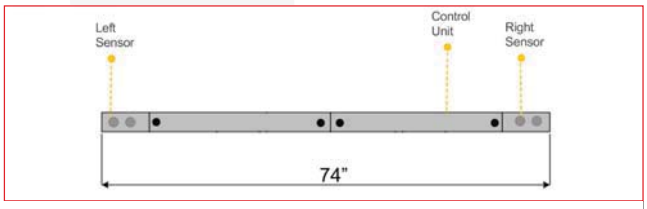
USDS ULTRASONIC DIRECTIONAL SENSOR

- Single unit standard or three-unit cluster design
- Overhead mounting with no need for saw-cutting ground work
- High-accuracy detection, even of wrong-direction events

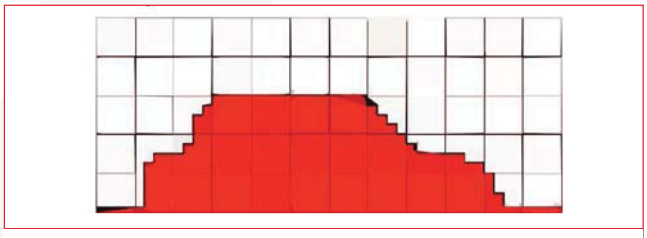
OVERVIEW

The Ultrasonic Directional Sensor is designed to replace inductive loops and provide accurate vehicle counts. USDS sensors are extremely reliable and play an important part in any facility or level-counting parking guidance solution. These ceiling-mounted sensors eliminate the need for saw-cutting groundwork.

Installation is easy, and relocation is possible should traffic patterns change. The three-unit cluster technology reduces the need for delineation to separate entrance and exit lane counts.



Sensor Dimensions



Sensor Directional Analysis

HIGHLIGHTS

- Single unit standard configuration at standard width garage/level entrances/exits (total lane detection of up to 12 feet)
- Three-unit cluster configuration at wide-width garage/level entrances/exits (total lane detection of up to 24 feet)
- One built-in central processing unit to control sensor logic
- Standalone operation with memory back-up offline
- Bi-directional counting of vehicles
- Up to 30km/h (19mph) effective counting speed
- Output: Dry contact and/or serial interface via RS-485
- Power supply voltage: 12–24V DC

FUNCTION

Two groups of ultrasonic sensors on a single USDS sensor continually measure the distance to ground. A passing vehicle produces a typical height profile (see illustration). A vehicle is differentiated from other objects by correlating information using a pattern-recognition process.

TECHNICAL DATA

Type: Ultrasonic distance measurement

Voltage: Low, 24V DC

Data transfer: RS-485 or Plus-Minus relay

Temperature: -4°F to +158°F (-20°C to +70°C)

CONNECTION

18 AWG 4 conductor shielded wire

OPERATIONAL DATA

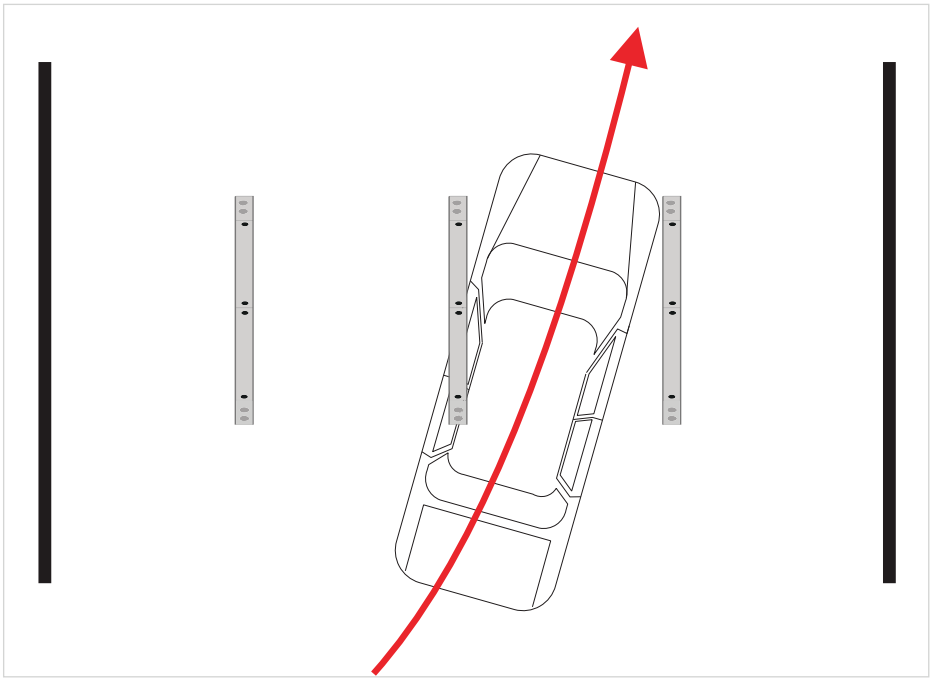
- Detection of vehicles
- Flexible installation options
- Low maintenance

VS.29.03.16

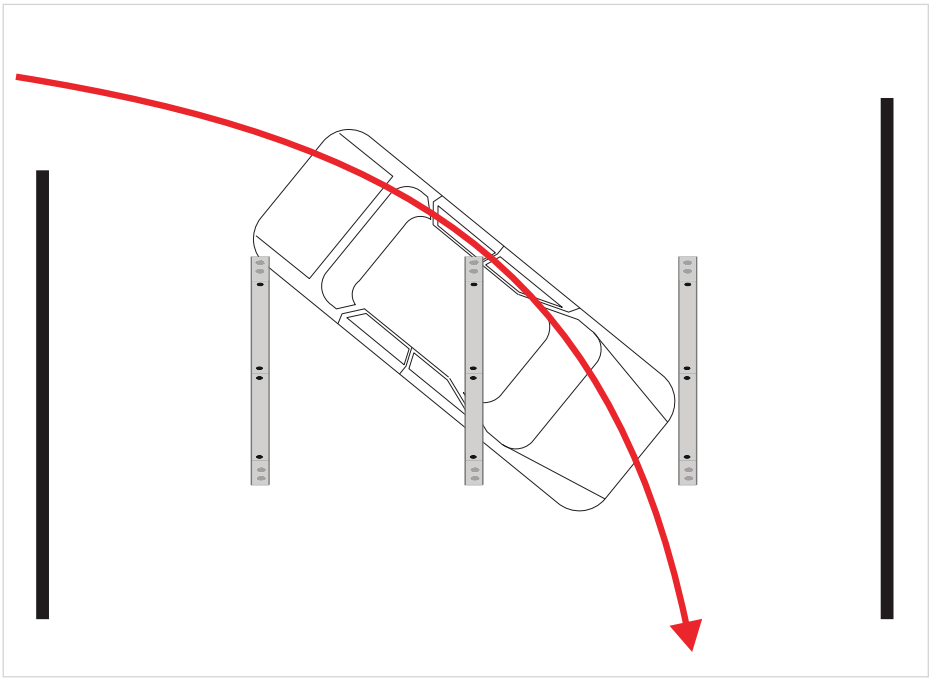
www.q-free.com

For more information contact sales.usa@q-free.com

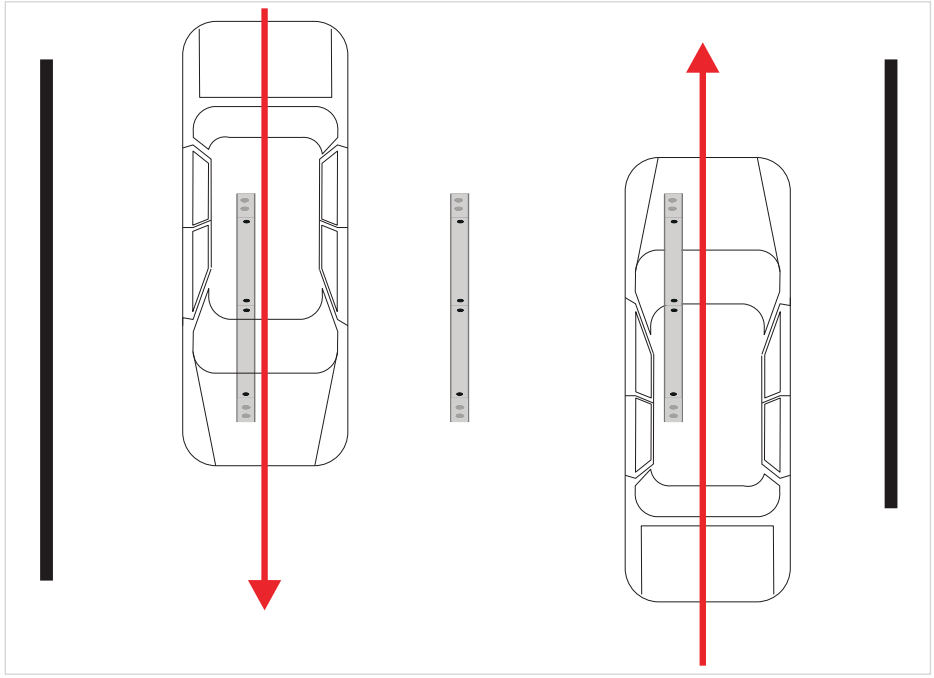
LEADING THE WAY



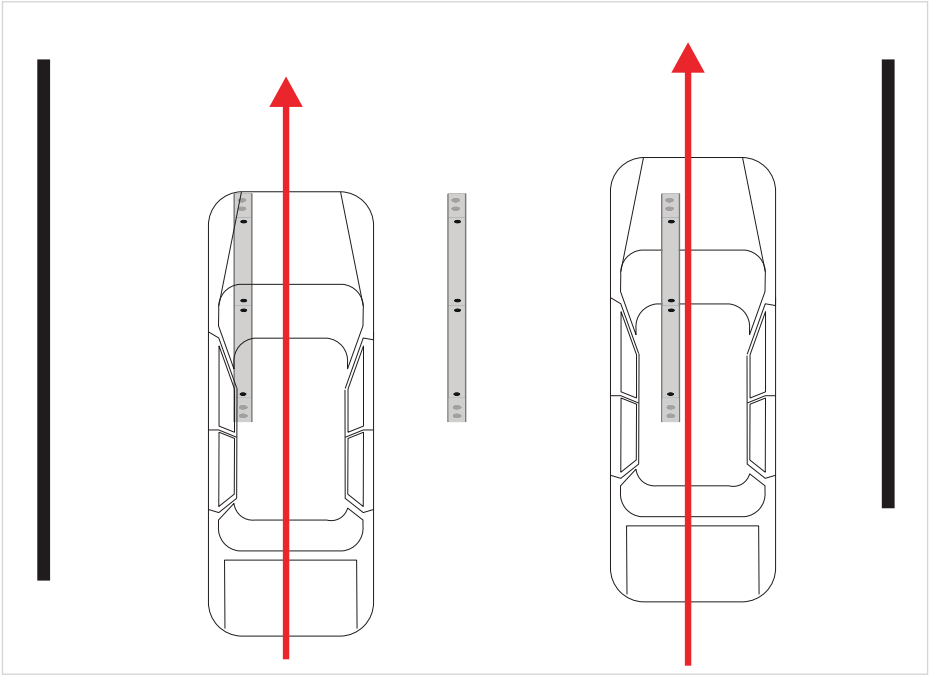
Diagonally across 2 USDS



Diagonally across 3 USDS



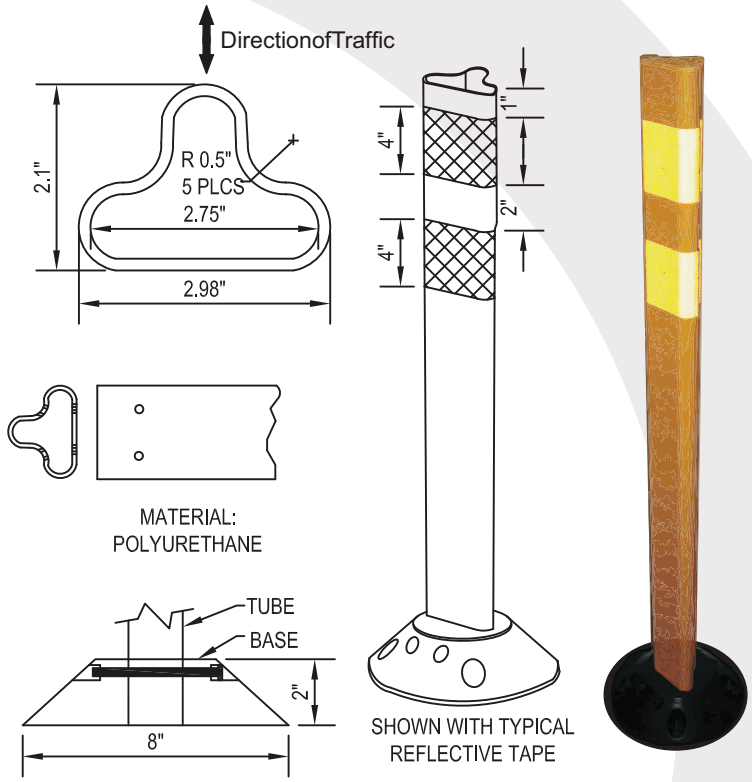
2 Vehicles traveling in opposite directions



2 Vehicles traveling in the same direction

PRODUCT

DP-300-UR DELINEATION POST



DP-300-UR INFORMATION

- Post HeightAvailability
  Standard: 36”
  Optional: 18”, 24”, 28”, or 42”
- Post ColorAvailability
  Standard: yellow
  Optional: white or orange
- Reflective Sheeting ColorAvailability
  Standard: yellow
  Optional: white or blue
- Superior resistance to tearing and puncturing
- Designed for daily traffic abuse

OVERVIEW

The Q-Free TCS Delineation Post (DP-300-UR) comes standard with a butyl pad for adherence to the ground. Delineation posts create a “counting point” for accurate system counts by controlling the traffic speed and proper lane travel throughout the parking facility. The delineation posts are composed of flexible polyurethane plastic which quickly restores back to an upright position after being struck. The polymer maintains its flexibility to -50 F (-45 C) as well as its toughness to fuels, oils, and grease.

Example of Lane Delineation

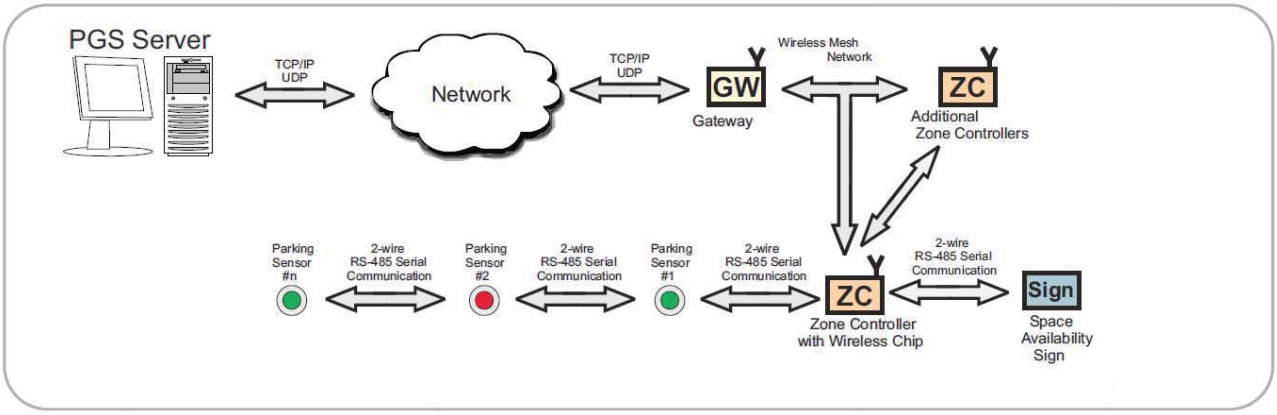
USA 55 Union Ave. | Sudbury, MA 01776 | T +1 978 443 2527 | F +1 978 579 9545
Canada 70 Six Point Rd. Etobicoke, ON M8Z2X2 | T +1 416 259 4862 | F +1 416 252-0285
www.q-free.com | www.tcsintl.com | @QFreeASA
For more information contact sales.usa@q-free.com

Q FREE
TCS

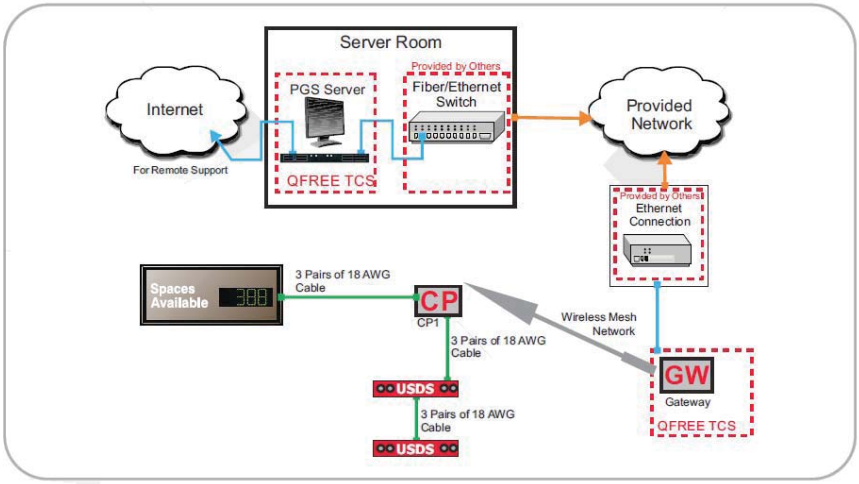
VS.09.07.15

WIRELESS SYSTEM COMMUNICATION

- Based on wireless Mesh technology
- Multiple gateway connection options
- Reduction in cabling and installation costs



Flow diagram of wireless communication single-space sensor system



Flow diagram of wireless communication level/facility counting system

OVERVIEW

The Q-Free wireless communication solution takes advantage of wireless Mesh technology, allowing at-the-edge devices such as sensors and signs to communicate through multiple wireless pathways. It reduces the cost of cabling and installation associated with a traditional hard-wired Parking Guidance System (PGS). Each device or group of devices is wired locally to a modem. This modem wirelessly transfers the device information to the PGS gateway. The gateway is connected through a network to the PGS server where the Q-Free Visual Control Center software manages the whole system and provides a graphical user interface.

HIGHLIGHTS

- Reduction in cabling and installation costs
- Self-healing network
- 100% network uptime
- Deployed in all of Q-Free's PGS installations
- First PGS provider in the world specializing entirely in wireless system communication

VS.25.03.16

www.q-free.com

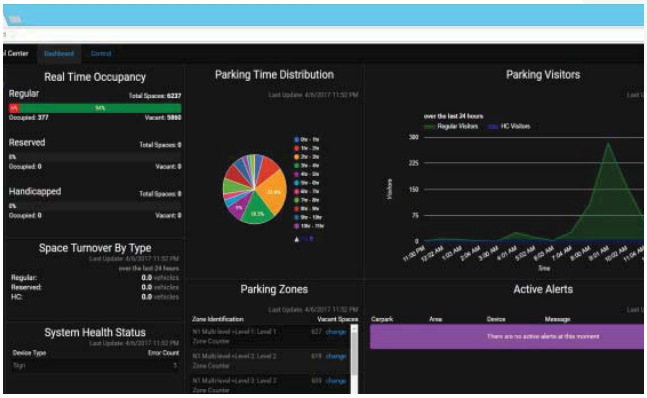
For more information contact marketing@q-free.com

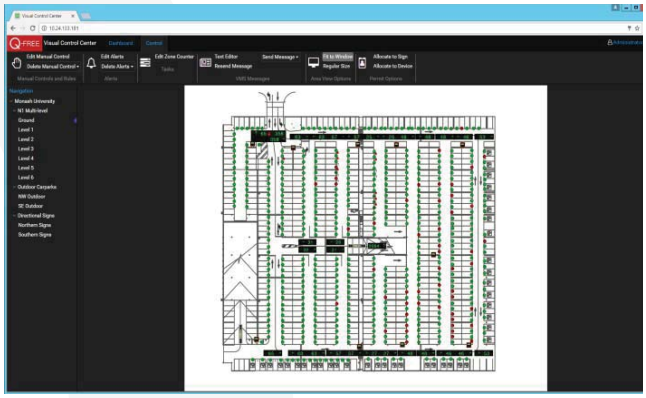
LEADING THE WAY

VISUAL CONTROL CENTER PGS SOFTWARE

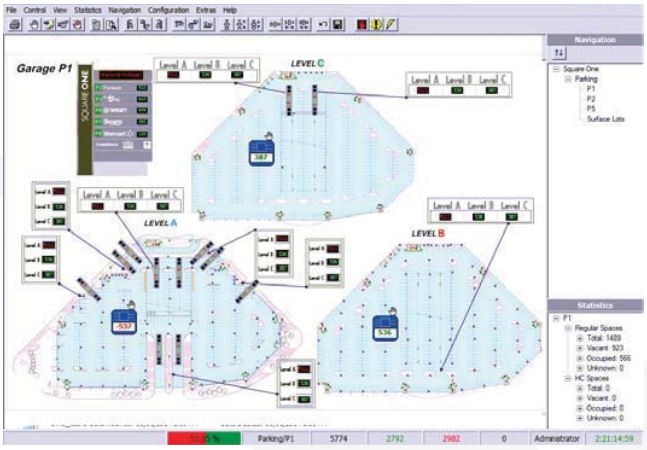
- Proprietary software with in-house development
- Unique optional multi-user platform

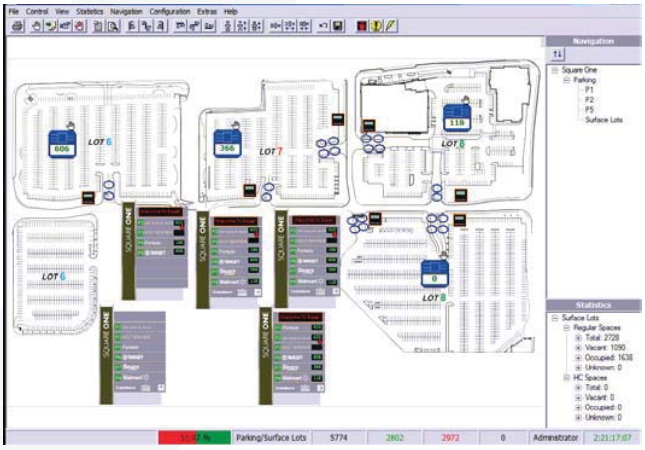
WEB BROWSER ACCESS





CLIENT SOFTWARE ACCESS





OVERVIEW

The Visual Control Center is the graphical user interface and communication service for Q-Free's parking guidance systems. It communicates to all installed devices and displays real-time parking availability, counting device statuses, and sign information. This software enables users to view and export numerical and graphical parking information statistics, providing important occupancy information.

FEATURES

A customized graphical user interface displaying all device statuses and real-time parking availability information. The application can be accessed through the client software on the parking guidance server, or through a web browser. Supported web browsers are Firefox and Google Chrome.

Q FREE

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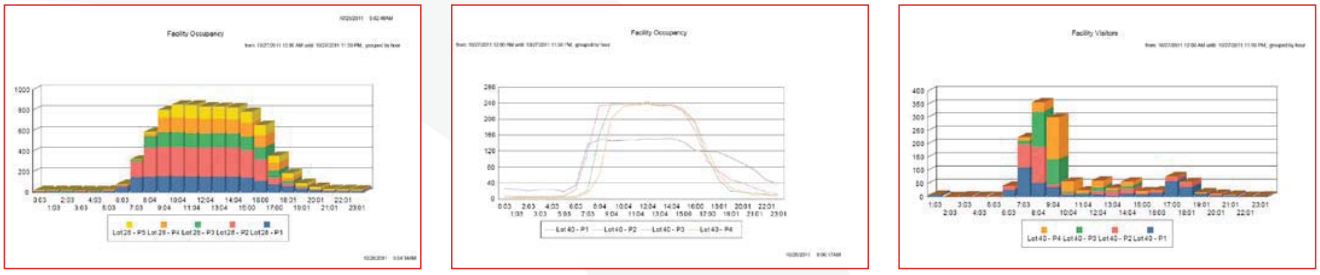


Example of reports available using the Visual Control Center PGS Software

HIGHLIGHTS

- Real-time parking availability
- Easy-to-use graphical user interface
- Device status updates
- Parking information statistics
- Customized on-screen parking guidance layout based on individual facility
- Compatible with all Q-Free parking guidance products
- API tool for exporting parking availability to customer website and/or mobile app
- Optional multi-user platform allowing multiple user access

TYPICAL APPLICATIONS

- Single-space monitoring
- Level counting
- Facility counting
- Surface lot space availability
- Way-finding

STATISTICS AND REPORTS

The Visual Control Center software provides access to a variety of important occupancy status reports:

- Facility occupancy
- Zone or level occupancy
- Facility visitor tracking
- Parking time control
- Parking duration

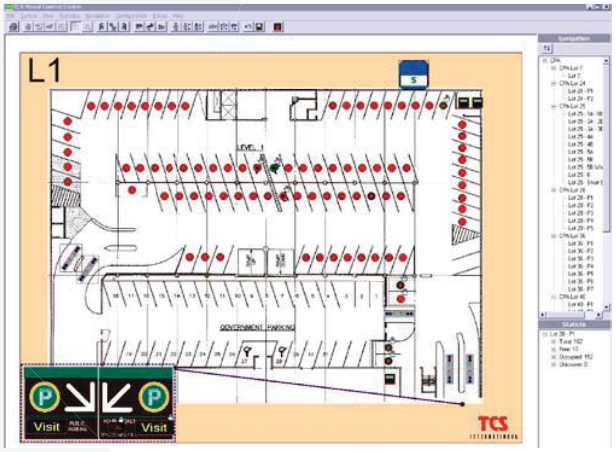
Parking availability statistics provide vital occupancy information and can assist with staffing or marketing plans.

GRAPHICAL USER INTERFACE

The Visual Control Center software is used with all of our parking guidance products:

- Ultrasonic single space sensors
- Ultrasonic directional sensors
- Surface parking space sensors
- In-ground loop technology
- Space availability signs
- Variable message displays
- Wireless Mesh technology

Example of the Visual Control Center graphical user interface displaying a parking level with ultrasonic single-space monitoring technology. The user is able to view real-time parking availability and occupancy on a per-stall basis, as well as parking availability signs.



VS12.03.18

www.q-free.com

For more information contact marketing@q-free.com

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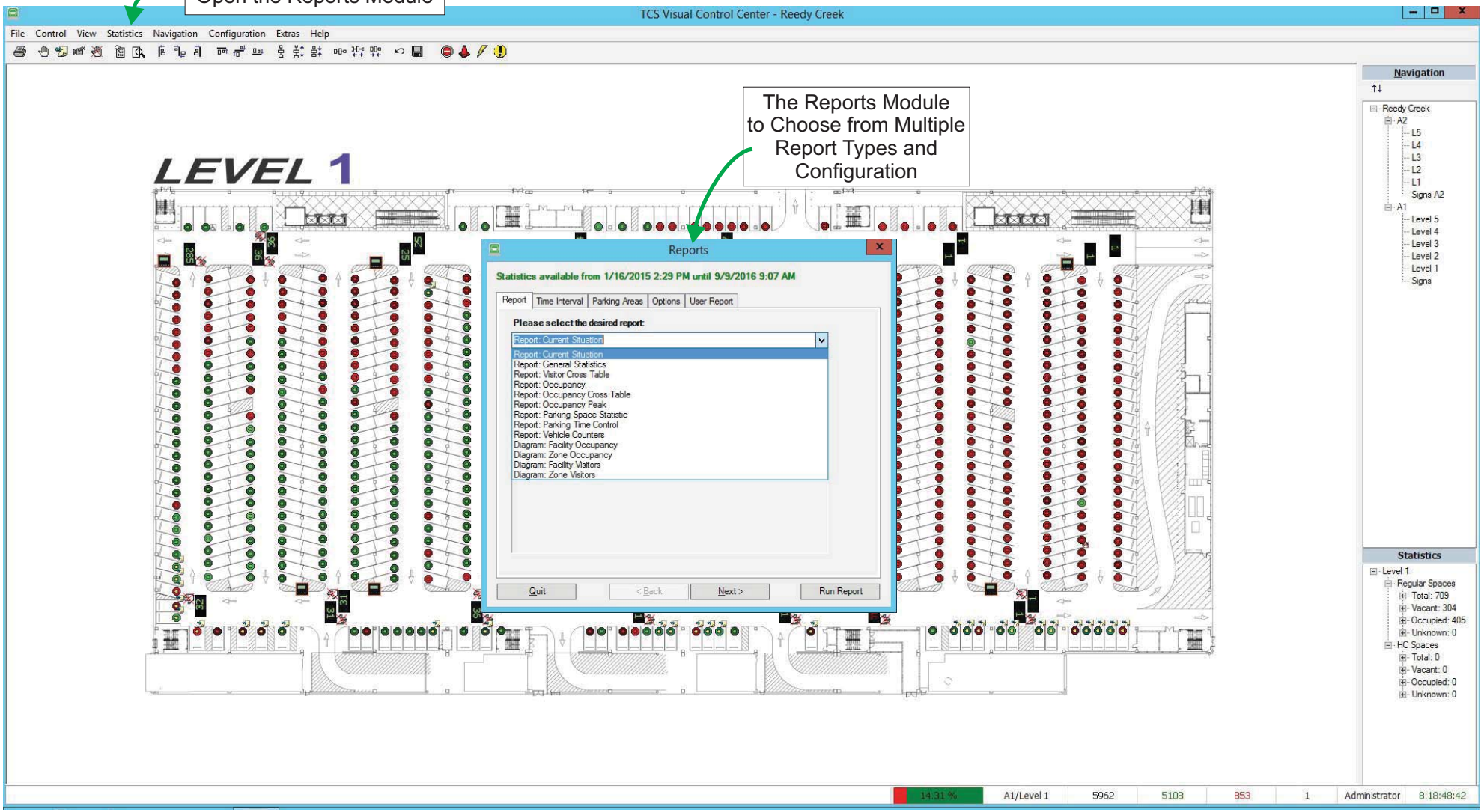
Example Visual Control Center GUI

Q-Free TCS
55 Union Avenue
Sudbury, MA 01776
Phone (978) 443-2527
Fax (978) 579-9545
www.q-free.com
www.tcsintl.com



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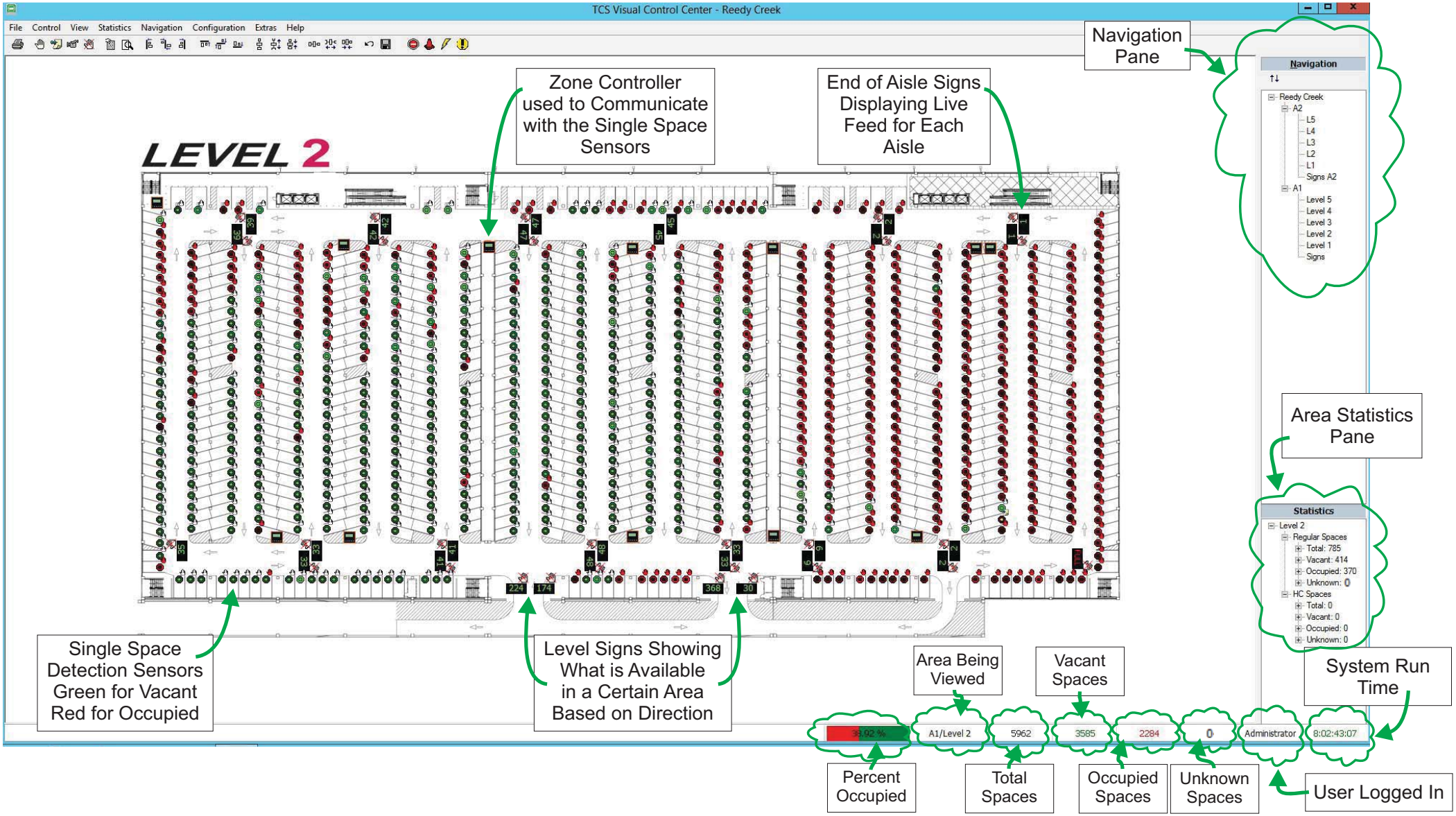

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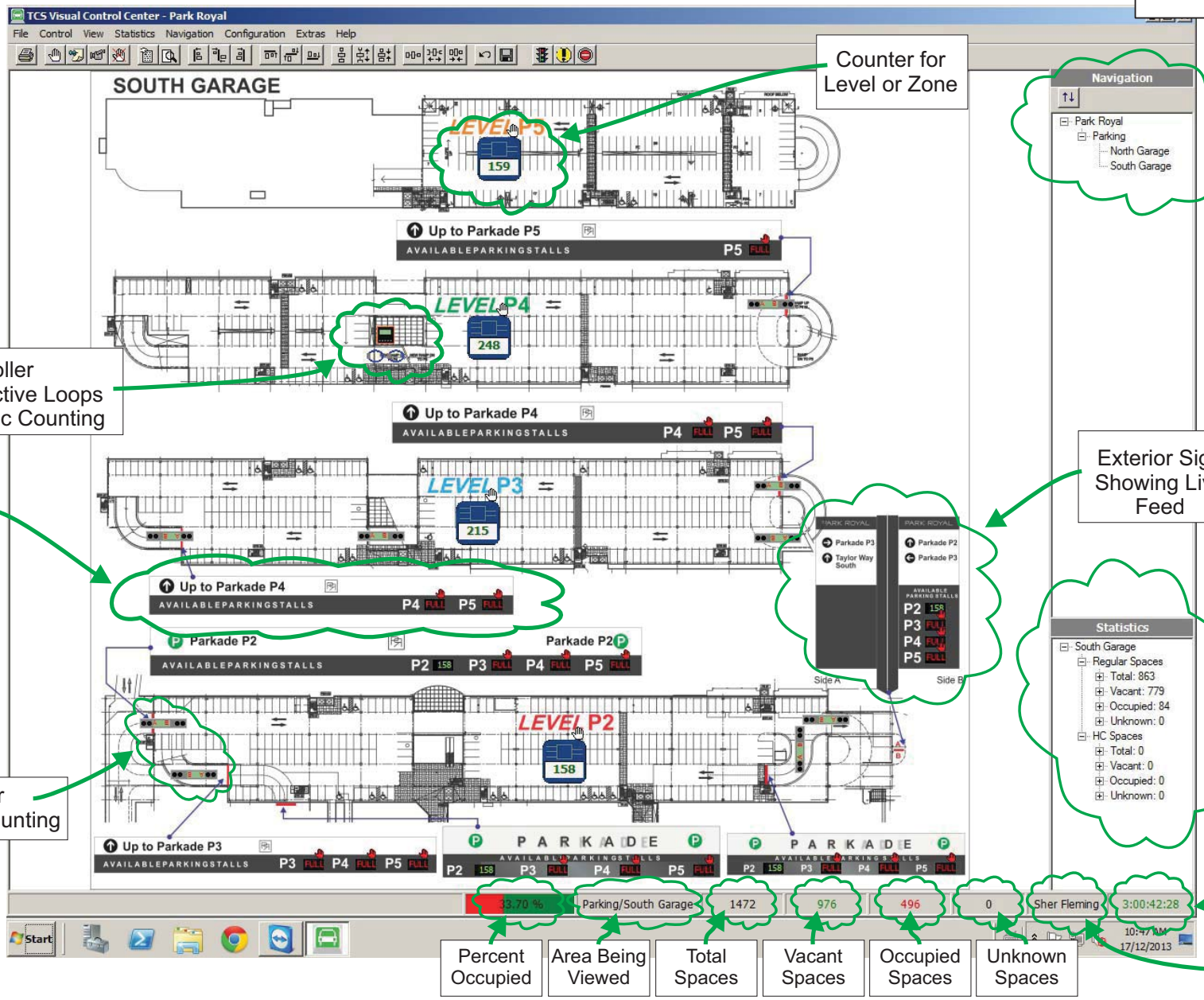

Counter for Level or Zone

Navigation Pane

Zone Controller Connected to Inductive Loops for Directional Traffic Counting

Interior Level Sign Showing Live Feed

Exterior Sign Showing Live Feed

Area Statistics Pane

USDS Used for Directional Traffic Counting

System Run Time

User Logged In

Percent Occupied

Area Being Viewed

Total Spaces

Vacant Spaces

Occupied Spaces

Unknown Spaces

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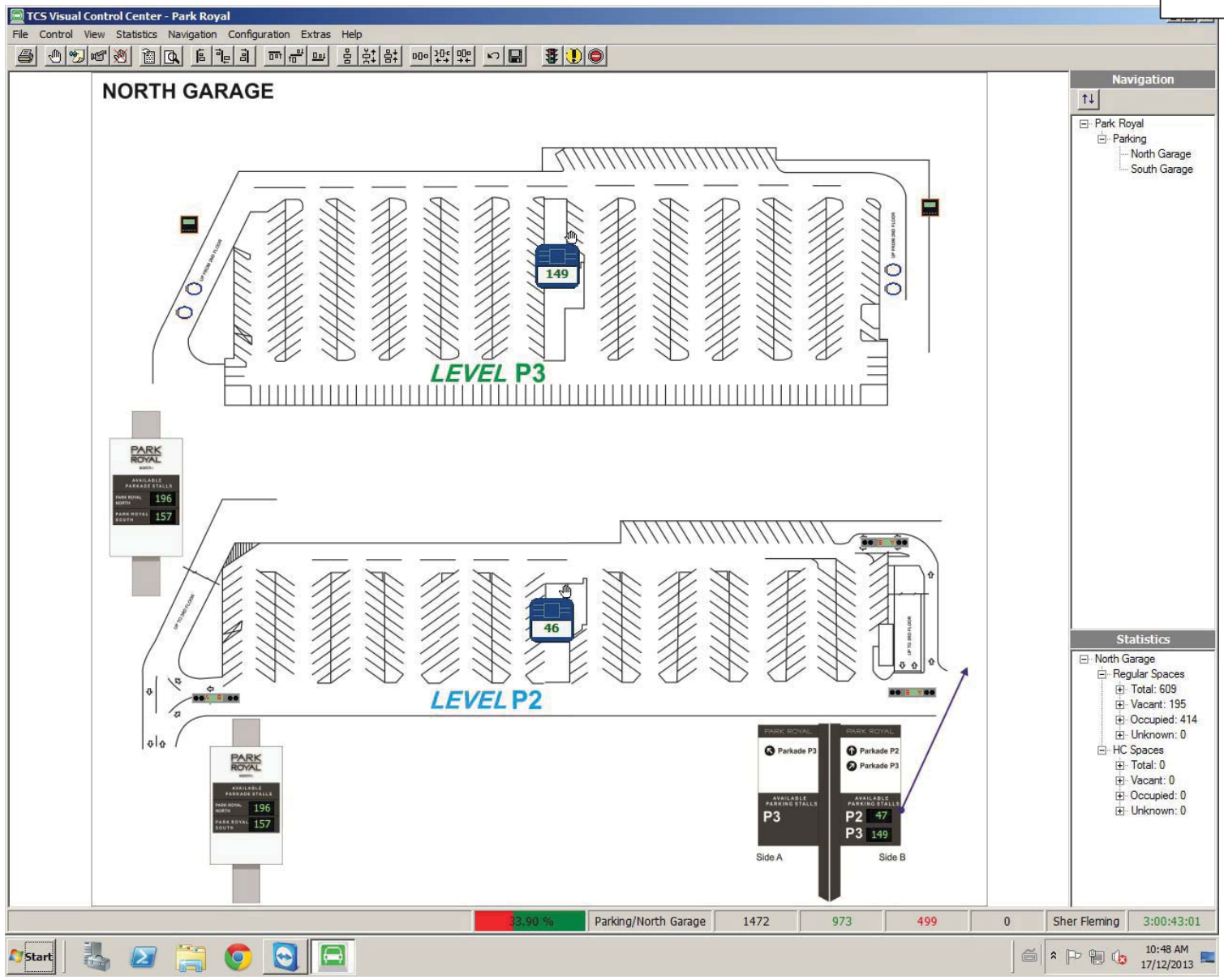

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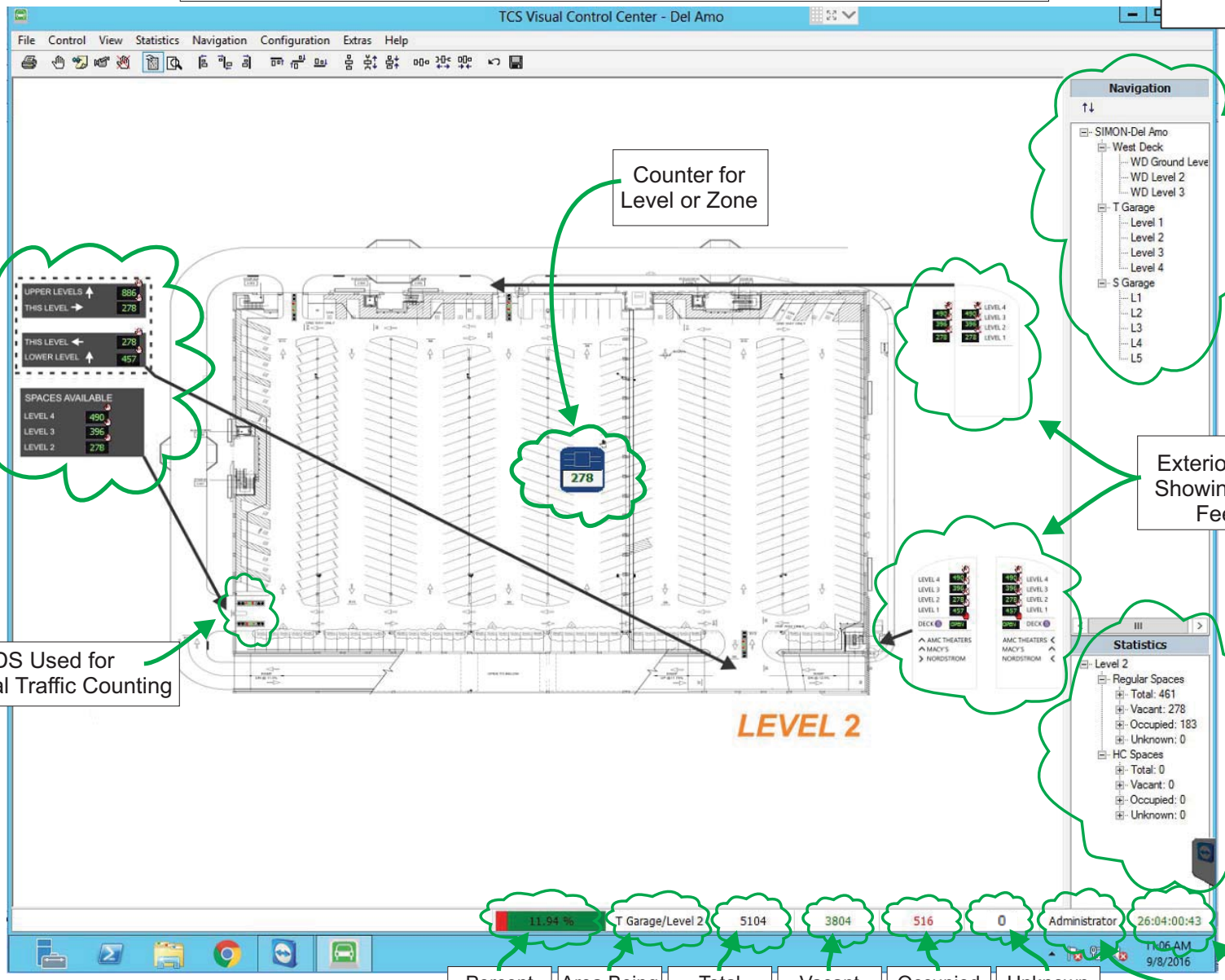

Interior Level Sign Showing Live Feed

Counter for Level or Zone

Navigation Pane

Exterior Sign Showing Live Feed

Area Statistics Pane

USDS Used for Directional Traffic Counting

Percent Occupied

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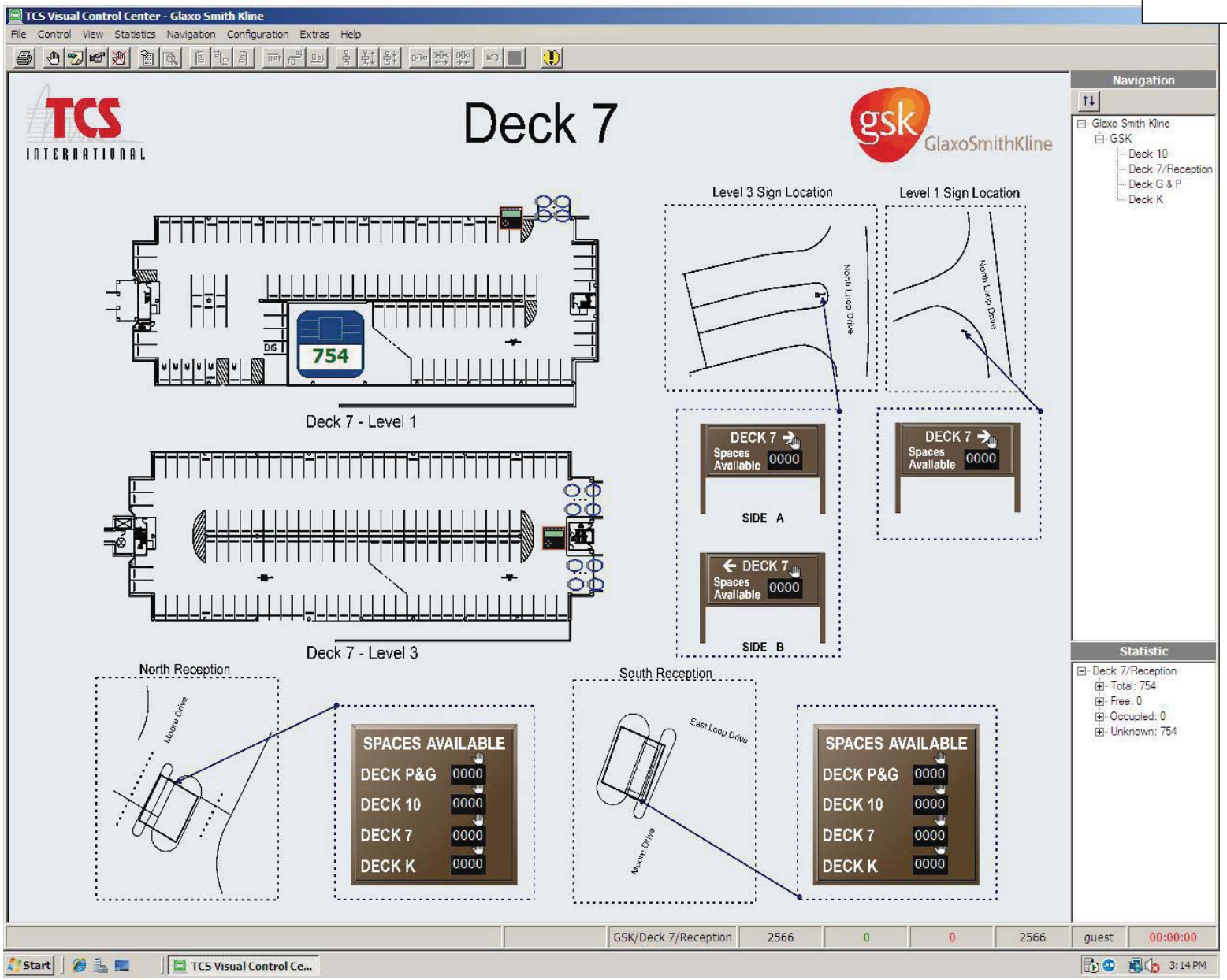

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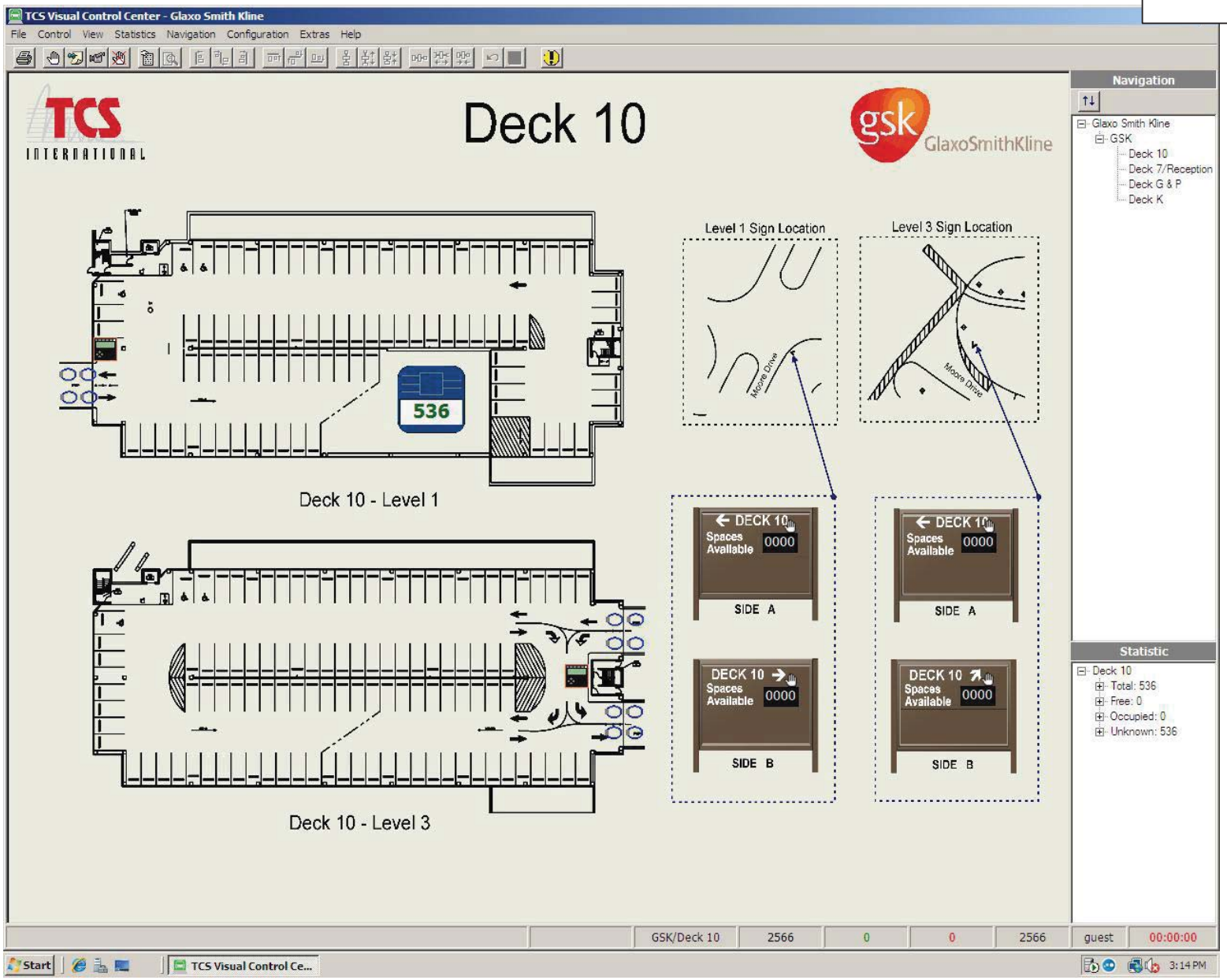

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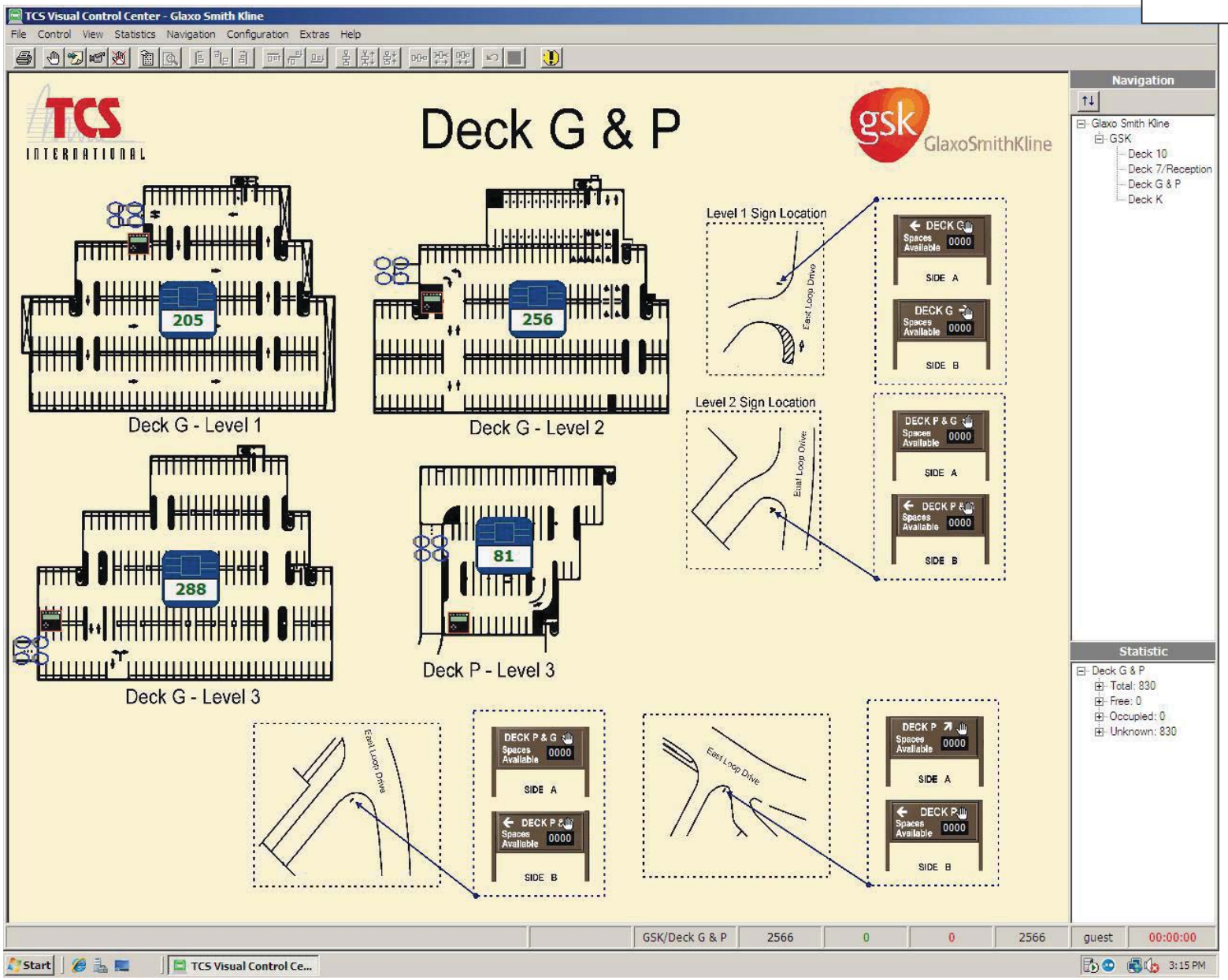

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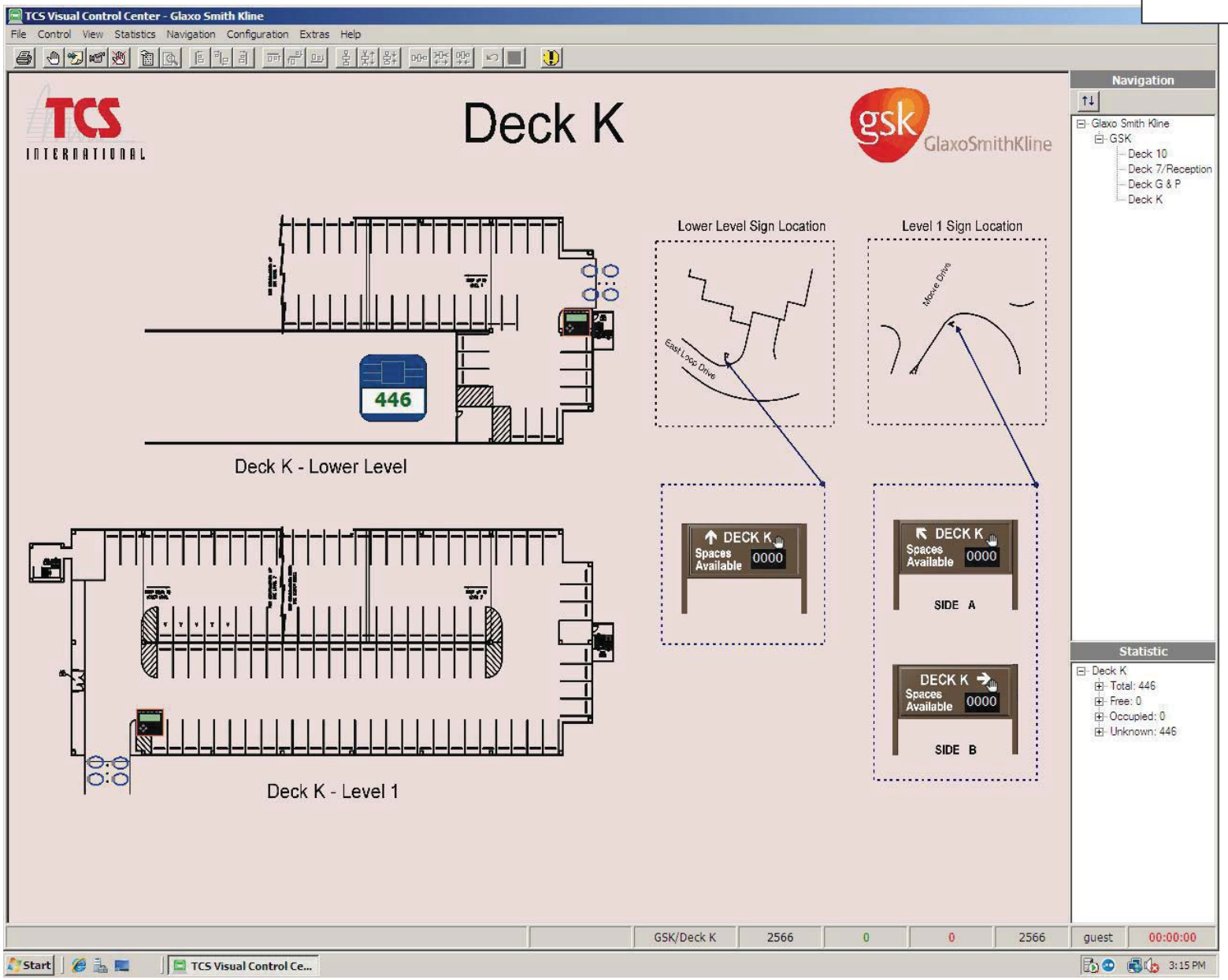

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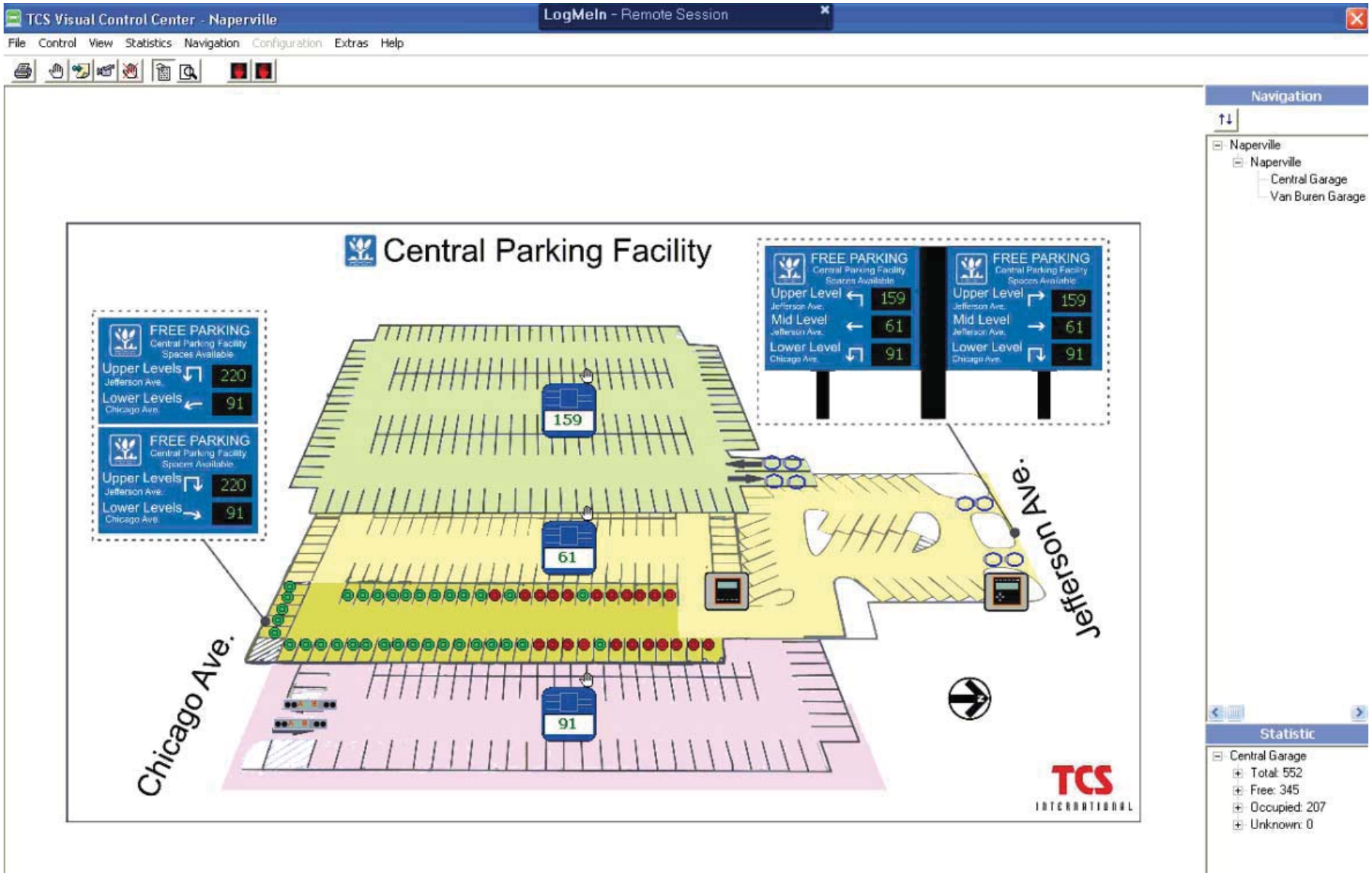

Sample Garage Entry Sign

PRODUCT NUMBER
L4MP

CABINET DIMENSIONS
48" H x 48" W x 6" D

ILLUMINATION SOURCE
Super bright, wide viewing angle LEDs
Available in green & red LEDs
Messages "blank out" when turned off, eliminating confusion
Long life, up to 100,000+ hours

ELECTRICAL
Approximate: 24 +/- VDC

CONSTRUCTION
Faces: Single sided sign
Extrusions (TCL): Corrosion resistant housing with integrated hinged panel

FINISH
Standard Cabinet Color
Custom colors available upon request

MOUNTING
Standward Wall Mount
Optional Double Post Mount
Additional mounting options available for extra charge

MESSAGE	COLOR	HEIGHT	AMPS
4-Digit 7-Segment Board	40° x 100° Green Oval	5.0"	0.35
FULL	40° x 100° Red Oval	5.0"	0.35
Spaces Available	White Reflective Vinyl	4.0"	
Level 1-4	White Reflective Vinyl	4.0"	

Q-Free Boston
55 Union Ave.
Sudbury, MA 01776
P. 978-443-2527

Q-Free Toronto
3445 Lake Shore Blvd W
Etobicoke, ON M8Z 1N2
P. 416-259-4862

Website: www.q-free.com/solution/parking-guidance-systems

Product View

NOTE: Sign image may not exactly represent the finished product. For illustration purposes only.

End of Aisle Sign

PRODUCT NUMBER
TAS-53DA

DIMENSIONS
Cabinet 7.5” H x 18.625” W x 3” D
Viewable window 5.626” H x 16.751” W

ILLUMINATION SOURCE
Super bright, wide viewing angle LEDs
Available in green & red LEDs
Messages “blankout” when turned off, eliminating confusion
Long life, solid state lighting
Automatic brightness adjustment

ELECTRICAL
Integrated solid state power supply
24 VDC Low Voltage
Full brightness is 0.3 Amps max
Conformal coating
QPS Certified

CONSTRUCTION
Single faced sign
Face material is impact resistant poly carbonate
Housing is 3” slim line continuous, corrosion resistant, and aluminum
IP65 Protection class

FINISH
Standard Cabinet Color: RAL 9007 Grey Aluminum

DISCLAIMER
Q-Free will not warrant LED displays used in 3rd party cabinets when failure is due to cabinet integrity, moisture, condensation or leakage determined at Q-Free discretion.

MESSAGE	LED COLOR	HEIGHT	AMPS
1 DIGIT 7 SEGMENT DISPLAY	40°x100° Red Oval	5.0”	0.3
X	40°x100° Red Oval	5.0”	0.3
LEFT ARROW	40°x100° Green Oval	5.0”	0.3
RIGHT ARROW	40°x100° Green Oval	5.0”	0.3
UP ARROW	40°x100° Green Oval	5.0”	0.3
3 DIGIT 7 SEGMENT DISPLAY	40°x100° Green Oval	5.0”	0.3

Q-Free
55 Union Ave.
Sudbury, MA 01776
Website: www.q-free.com

Product View

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