

WMATA FQ18152 Amendment 07 - Appendix E - Requirements Compliance Matrix
Replaces Amendment 06 Appendix D - Requirements Compliance Matrix

	Requirements	Key Design Features	Comment	Compliance
				Yes/No
Faregates				
Access Control	Provide barrier for controlled egress and ingress	Provide retractable or paddle (swing) type barriers		
		Be able to withstand impact up to 300 lbs.		
		Complete open and close cycle within 700 ms		
		Limit gap between barriers < 2 inches		
		Process at least 35 passengers per minute		
		Open instantly with initiation of emergency alarm or faregate array command		
		Restrict entry upon command		
		Open automatically for loss of power, emergency alarm activation, and detection of a power fault.		
		Provide components which meet 40K cycles Mean Time Between Failures (MTBF)		
		ADA compliant		
	Support configurable bi-directional ingress/egress configuration	All faregate aisles should be configurable to change the entry and exit designation from local and central faregate management applications		
		All faregate aisles should be configurable to support bi-directional entry and exit		
Retract automatically when barrier encounters an obstruction	Faregates should recognize when the barriers range of motion has been obstructed and immediately retract to prevent injury or damage			
Provide continuous operation in 'network down' conditions	Full function when faregates communication to the central system is off line			
Fare Evasion Mitigation	Limit customer throughput to one customer per transaction	Sensor capability to distinguish when more than one customer attempts to clear the barrier without a second payment transaction and initiate audible and visual alarms		
	Provide system alarms	Initiate an alarm when customer attempts to travel through the barrier behind another customer without paying fare		
		Initiate an audible and visual alarm when barrier is obstructed		
	Distinguish support animals and other customer packages from incidents of fare evasion	Provide sensing capability distinguish single customers with packages or service animals from fare evasion incidents		
Provide WMATA access to control settings and adjustments on gate operation	Ability to loosen or tighten constraints on what constitutes fare evasion on a gate by gate level. (speaks to the operation of sensors and barrier control)			
	Process fare transactions in accordance with WMATA's fare rules	Interface with WMATA's fare payment application Nextfare 5		
	Process WMATA list service transactions (web sales, benefits, refunds, etc..)	Store up to 2 Million entries for each list service items (hot lists, refund transactions, web sales transactions, Smart Benefit transactions, good list).		
		Recognize WMATA valid WMATA fare media and fare products		
		Recognize approved WMATA non-SmarTrip fare media		

	Requirements	Key Design Features	Comment	Compliance
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Fare Payment (Faregate transaction processing)	Process and store fare transactions when communication to central system is offline	Recognize expired or other invalid fare products		
		Initiate read/write communication for fare transaction processing		
		Full system (reader and gate) will complete fare transaction within 300ms		
		Recognize fare media that correspond to stored autoloading transactions, write the transaction to the fare media, and store and upload transaction data.		
		Interface with customer display to support customer messaging for account balances, list service transaction confirmation, stored fare products; and event messages		
	Identify invalid fare transactions and initiate corresponding alarms and error messages	Identify invalid fare media		
		Identify fare media that is not configured for entry or exit and initiate alarm and error message		
		Identify instances where fare media with unlimited fare products have already been presented and prohibit additional fare transactions so that customers are not charged twice for the same trip and so that customers do not use unlimited use fare media for more than one trip at a time.		
	Distinguish fare payment types	Distinguish concession fare media, valid fare products and single trip fare payments		
	Interface with faregate barrier controller, alarms, and display applications	Interface with fare barrier controls to support transaction messages and alarms to customers		
Trigger alarms for fare evasion events such as "hot list media", fraudulent fare media, and low balance				
Trigger faregates indicators for up to 3 different fare types				
Fare table Interface	Provide a method of distributing fare tables gate/reader subsystem:	Must be able to report immediate on fare table version active at each gate/reader subsystem.		
		Fare tables shall be distributed to the gate system in customizable groups.		
		The method of communication between the central fare tables function and the faregate/reader subsystem shall be Ethernet.		
	Control faregate service designation and directional configuration management	Accept faregates service and configuration controls from the faregate central system, local devices, and mobile devices		
	Control faregate alarms	Faregate alarms should be adjustable so that alarms can be deactivated by authorized user from the Station Manger Terminal or Central System, but the error events that trigger the alarms are captured.		
	Support command priority control management	Configured with an hierarchal command structure so that maintenance applications depending upon user.		

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Faregate Management	Interface with WMATA emergency alarm system	Interface with WMATA emergency alarm system to automatically open faregate when station emergency alarm is activated. WMATA's emergency alarm system sends signal (3 to 30 volts, ac or dc) to indicate an emergency condition.		
		Faregate connectivity to the emergency alarm system shall have a configurable delay that can be adjust for 0 to 45 seconds to allow the alarm to be deactivated from the Station Terminal in the event there is a false alarm		
		Provide an "emergency button" that automatically opens all station faregates when compressed		
	Provide status messaging to support system monitoring applications	Faregate status and directional configuration status shall be uploaded to the fare central system and station terminals to support status monitoring applications		
	Maintain records of all gate/reader interface activity	Maintain user log records, and report on all gate/reader interface activity		
		Maintain user log records, and report on all gate/reader state changes		
Customer Interface	Provide customer display capable of displaying multiple data items	Provide adjustable backlighting to adjust to varying light conditions.		
		Support self adjusting back lighting that automatically adjust to lighting conditions.		
		Display available balance, valid fare media, and other transaction events		
		Display list service transactions including Smart Benefits transfers, refunds, and web sales transactions.		
	Provide illuminated messages	Illuminated messaging to support directional configuration or service status		
	Provide emergency lighting	Illuminated directional indicators to locate faregates in an emergency		
	Provide fixed instructional messages	Signage for fare payment targets including braille		
		Instructional messages for wheelchair accessibility or fare payment		
	Provide audible messaging	Provide configurable audible message to indicate successful transaction		
		Provide configurable audible alarms to indicate payment failure or fare evasion event		
Maintenance	Provide maintenance user authentication at device	Provide service display and keypad to authenticate maintenance users		
	Support local and central diagnostic applications	Provide tools and diagnostic functionality to identify malfunctioning components or applications		
		Support local and remote diagnostic applications		
	Supply push button control inside the faregate to control barriers for testing purposes	Barrier cycles used for testing shall not impact payment transaction counts		

	Requirements	Key Design Features	Comment	Compliance
				Yes/No
	Modular design	Faregate components shall be modular and easily accessed and replaced by maintenance personnel		
	Maintain maintenance records of maintenance logs and diagnostic results	Store maintenance log data and upload data to central system Store maintenance diagnostic test results and upload data to central system.		
Data Management	Provide secure local data storage	Store up to 2 million for each type of list service transactions		
		Encrypt transaction data so that no data stored on faregate array so that faregates are not part of the PCI envelope of certifying devices.		
		Store at least 30 days of faregate transaction, event, and log data locally		
	Automatically upload data to the faregate central system	Upload audit register and event data to the faregate central system when communication is available		
		Automatically upload stored transaction and even data when communications is restored to the central systems.		
Support the secure manual transfer of stored data to authorized device	Allow for the secure manual transfer of faregate data to an authorized device			
Security	Provide faregate cabinet locks , keys, and user authentication gateways	Provide faregate cabinet locks		
		Password protected access control for maintenance applications		
		Payment target protections that protect unit from accessing security keys.		
	Provide alarms for unauthorized access	Initiate event when faregate cabinet is opened and there is no corresponding maintenance log-in		
Initiate alarm if faregate cabinet is opened for an extended period of time				
Communication	Provide independent local connectivity to Station Terminal Device and WMATA emergency alarm system	Supply local communication to Station Terminal Device that is independent of WMATA Metro Net WAN		
		Provide independent local connectivity to emergency button inside the kiosk to open faregates in an emergency.		
	Provide secure connectivity via WMATA Metro NET WAN to the current fare payment central system	Implement system addressing over WMATA MetroNet to provide secure communication between faregates and WMATA's fare payment central system to exchange fare schedules, list service transactions, hotlists, fare transaction data and all other data exchanges that impact faregate operation and fare payment transactions.		
		Provide secure authentication of devices for communication interfaces between faregates and fare payment central system.		
	Provide secure connectivity via WMATA Metro NET WAN to the faregate central system	Implement system addressing over WMATA MetroNet to provide secure communication between faregates and WMATA's faregate central system to exchange faregate transaction, log, and event data and all other data exchanges needed to support faregate operation and monitoring.		
		Provide secure authentication of devices for communication interfaces between faregates and faregate central system.		

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Power	Interface with WMATA's power infrastructure	Utilize a 120 volt 20 amp circuit for primary power		
		Utilize 120 volt 15 amp circuit to power emergency lighting		
		Utilize a twist lock receptacle for both main power and emergency power		
	Include a ground fault interrupt safety device	Provide a ground fault interrupt safety device on main and emergency gate power.		
	Automatically open barriers if power to faregate is lost	In the event that the faregate power is lost the faregates barriers shall automatically open and faregate emergency lighting shall be activated.		
Finishing	Durable rust resistant stainless steel finish	Be resistant to damage from common scratches and force impacts		
		Stainless Steel Grade 316L or better		
		Provide accent color scheme that incorporates WMATA brown color scheme and faregate footprint		
		Provide stainless steel No 4 brushed finish		
Environmental	Operate within range of weather conditions	Operate in temperatures from 0 to 122 degrees F and in predicable weather conditions including rain, snow, sleet, high humidity, and high winds		
	Reduce dust intake	Filter dust particles		
		Operate reliably with air borne dust particles up to 180 micrograms per cubic cm		
	Withstand vibrations	Withstand vibrations of slow and fast moving freight trains		
Withstand shock	Internal components shall withstand the impact of shock caused from vibrations or other external impacts			
	Title VI Compliance	Customer messaging for symbols and text must conform to Title VI guidelines including comprehension for customers with limited English proficiency and other disabilities		
	NFPA 130 Compliance	Meet NFPA requirements for height, width, and egress		
	ISO 14443 A and B Compliance	Meet ISO 14443 A and B communication and security protocols		
	ADA Compliance	Meet all ADA design requirements and be certified as ADA compliant		
		Include ADA enhancement for two additional payment targets on the ADA faregate cabinet.		
All other applicable local, state and federal standards	Devices and installation of devices must conform with all applicable standards as listed in the RFP including NEC and UL requirements			
Software /Firmware	Provide software and firmware that is free of defect and that is maintainable and/or upgradable over the live of the device.	Utilize an operating system that is maintainable and upgradable through the life of the equipment		
		Maintain version numbering and control for all system software and firmware		
		Accept software and firmware updates that are pushed down from faregate central system and current system central system depending upon the application that is being updated.		

Station Terminal Devices

	Requirements	Key Design Features	Comment	Compliance
				Yes/No
Faregate Management	Provide faregate barrier control and configuration management	Provide faregate controls to place faregates in or out of revenue service		
		Provide controls to manage faregate entry/exit configuration settings		
		Provide controls to open and close faregates by aisles, array, station mezzanine and multiple selectable station mezzanines		
		Provide controls to restrict entry by aisles, array, station mezzanine and multiple selectable station mezzanines		
	Provide emergency alarm system time delay override	Support a configurable delay of 0 to 45 second to override station emergency alarm system		
	Support faregate display background lighting adjustments	Provide controls to adjust brightness of the customer display background lighting.		
	Control audible alarm on/off commands	Provide selectable options to turn on and off faregate audible alarms and adjust alarm volume		
Control faregate concession fare light applications	Provide selectable options to turn on and off faregate concession fare light indicators			
Faregate Monitoring	Provide dashboard display of faregate configuration and operational status	Provide dashboard display faregate configurations and revenue service status		
		Provide dashboard display of active faregate alarms		
		Provide dashboard display of faregate aisle entry and exit transactions by user log-in and/or date		
Security	Provide Secure User authentication	Support log-remote log-in from faregate central system		
		Upload log records to faregate central system		
		Interface with WMATA central directory to maintain current list of authorized users		
		Provide lock out and password reset functionality		
Communication	Provide independent local connectivity to faregates for emergency controls	Supply local communication to faregate cabinets and to Station emergency system to support emergency faregate controls		
	Provide connectivity to Platform Validators (PVs) to be able to read fare media	Provide local connectivity to PVs to read patrons fare media		
	Provide secure connectivity via WMATA Metro NET WAN to the faregate central system	Implement system addressing over WMATA MetroNet to support secure communication to the fare central system		
Software /Firmware	Provide software and firmware that is free of defect and that is maintainable and/or upgradable over the live of the device.	Utilize and operating system that is maintainable and upgradable through the life of the equipment		
		Maintain version numbering and control for all system software and firmware		
		Accept software and firmware updates from faregate central system and current system central system		
Station Manager Portable Devices				
	Provide faregate barrier control and configuration management	Provide faregate controls to place faregates in or out of revenue service		
		Provide controls to manage faregate entry/exit configuration settings		

	Requirements	Key Design Features	Comment	Compliance
				Yes/No
Faregate Management	Provide faregate barrier control and configuration management	Provide controls to open and close faregates by aisles, array, station mezzanine and multiple selectable station mezzanines		
		Provide controls to restrict entry by aisles, array, station mezzanine and multiple selectable station mezzanines		
	Support faregate display background lighting adjustments	Provide controls to adjust brightness of the customer display background lighting.		
	Control audible alarm on/off commands	Provide selectable options to turn on and off faregate audible alarms and adjust alarm volume		
	Control faregate concession fare light applications	Provide selectable options to turn on and off faregate concession fare light indicators		
Security	Provide secure user authentication	Support log-remote log-in from faregate central system		
		Upload log records to faregate central system		
		Provide lock out and password reset functionality		
Communication	Provide secure connectivity via WMATA Metro NET Wi-Fi to the faregate central system	Implement system addressing over WMATA MetroNet to support secure communication to the faregate central system to communicate with faregate systems and support software downloads.		
		Provide secure authentication of devices for communication interfaces between portable devices and faregate central system.		
Physical Characteristics	Portable	Devices should be small, light weight and contained within casing that allows the device to be easily carried		
	Durable	Devices should be contained with protective casing that protects the device damage from predictable minor events such falling to the ground or knocking against a hard surface		
	Provide fare media reader	Device should either contain card reader or have associated peripheral device		
Software /Firmware	Provide software and firmware that is free of defect and that is maintainable and/or upgradable over the live of the device.	Utilize and operating system that is maintainable and upgradable through the life of the equipment		
		Maintain version numbering and control for all system software and firmware		
		Accept software and firmware updates from faregate central system		
Faregate Central System				
Faregate Management	Provide configurable application to select faregate management control	Support station selection for faregate monitoring or control		
		Allow for configuration management by configurable faregate groups including by station, mezzanine, array, or selectable station groups.		
	Support remote Station Terminal log-in	Support Station Terminal log-in override to allow authorized users to log into Station Terminal Devices remotely		
		Provide faregate controls to place faregates in or out of revenue service		
		Provide controls to manage faregate entry/exit configuration settings		

	Requirements	Key Design Features	Comment	Compliance
				Yes/No
Faregate Management	Support all Station Terminal faregate control commands	Provide controls to open and close faregates by aisles, array and station mezzanine		
		Provide controls to adjust brightness of the customer display background lighting.		
		Provide selectable options to turn on and off faregate audible alarms and adjust alarm volume		
		Provide selectable options to turn on and off faregate concession fare light indicators		
		Provide for the creation of groups of faregates. These groups may be used to send commands to multiple gates.		
Faregate Monitoring	Provide selectable web based dashboard screens that display faregate status, events and transactions	Provide dashboard configuration selections that allow user to monitor system dashboards, mezzanine dashboards, or mezzanine groups.		
		Display dashboard of faregate operational and entry/exit configuration status system wide or by select mezzanines or mezzanine groups		
		Display dashboard of faregate entry/exit transaction counts		
Reporting	Provide configurable system performance daily reports	Provide Station Terminal log reports that are configurable by mezzanine, employee ID, date, and time		
		Provide Portable log reports that are configurable by mezzanine, employee ID, date, and time		
		Provide Faregate transaction summary reports that are configurable by mezzanine, employee ID, date, and time		
		Provide Faregate event summary reports that are configurable by mezzanine, alarm event ID, date, and time		
Remote faregate diagnostics	Provide remote activation and reporting for faregate diagnostic applications	Provide for remote system log-in and activation of faregate diagnostic applications to allow authorized central system users to identify faregate failures or performance issues and prepare appropriate corrective action.		
		Support remote system resets that allow authorized users to power down or reset faregate modules.		
Security	Support user authentication through WMATA central directory	Provide user authentication that is supported by badge and password presentation		
		Interface with WMATA central directory to maintain current list of authorized users		
		Support configurable settings to grant access controls for different user classes.		
		Support log-remote log-in from faregate central system		
		Upload log records to faregate central system		
		Provide lock out and password reset functionality		
Data Management	Provide secure data storage	Have capacity to store at least 10 years of system data and reports		
		Archive data nightly, monthly and annually		
	Automatically upload data from faregates, station terminals and portable devices	Upload data from faregates, station terminals and portable devices		

	Requirements	Key Design Features	Comment	Compliance
				Yes/No
		Automatically upload stored data after a loss of communication		
Communication	Provide secure connectivity via WMATA Metro NET WAN to faregates devices	Provide device authentication for communication with fare system devices including faregates, station terminals, and portable devices		
	Provide secure web based access via WMATA Intranet for system monitoring applications	Support web based system monitoring applications so that faregate dashboard reports are accessible by authorized users via WMATA's Intranet.		
Software /Firmware	Provide software and firmware that is free of defect and that is maintainable and/or upgradable over the live of the device.	Utilize and operating system that is maintainable and upgradable through the life of the equipment		
		Maintain version numbering and control for all system software and firmware		
	Provide software distribution and fallback control	Push down software and firmware updates to faregates, Station Terminals, and Portable Devices		
		Maintain success/fail records for software changes to all devices.		