Masabi Hardware - Remote Survey Report
Project Overview

Agency	Duluth	**Author(s):**	Alan Knight
Document Number / Version:	DR2-0007-03		

Date Approved:		**Agency**	
Date Approved:		**Masabi**	

Agency Contact Person(s)

Name		**Email**	
Title		**Phone**	
Responsible for			

Name		**Email**	
Title		**Phone**	
Responsible for			

Masabi Contact Person(s)

Name	Alan Knight	**Email**	alan.knight@masabi.com
Title	Hardware Field Technician		
Responsible for	**Hardware Deployment**		

Name	Ko-Shin Leu	**Email**	koshin@masbi.com
Title			
Responsible for	**Project Management**		

Installation Timeline

	Expected	**Expected**	**Number of**	**Notes (incl. planned vehicles for Pilot)**
Pilot (optional)				

Full Fleet Installation				

Vehicles surveyed from sample groups

Manufacturer	Type	Version	Year of	Number of	Notes (incl. fleet numbers)

Masabi Hardware - Remote Survey Report
Agency's Site Policies and Procedures

Contact Person on Site

Name	Mark Ness, Jim Caywood	**Email**	mness@duluthtransit.com, jcaywood@
Title	Asst Director and Director of Maintenar	**Phone**	218-623-4331, 218-623-4332

Agency's Site Policies

Signing in procedure	Drive into the bus barn, park in lane that we will recommend when the time comes. Report to maintenance Jim Caywood or Mark Ness for staging information.
Signing out procedure	Let Jim Caywood or Mark Ness know you are done also if returning.
Daytime Masabi allowed on site	7-3:30 CST unless organized with Jim Caywood and Mark Ness, can accommodate other hours.
ID required?	No ID is required, we do like it if they are wearing company attire to help recognize staff but not necessary.
General Safety Policies	Masks, safety vests, safety glasses if you require it.
Personal Protective Equipment	Masks, safety vests, safety glasses if you require it.

Installation Times

Earliest start possible	7 AM CST	**Comment**	7-3:30 CST unless organized with Jim Caywood and Mark Ness, can accommodate other hours.
Installation to be finished by	Project timeline is not established yet	**Comment**	
Working hours possible	7-3:30 CST	**Comment**	7-3:30 CST unless organized with Jim Caywood and Mark Ness, can accommodate other hours.
Supported working hours	7-3:30 CST	**Comment**	7-3:30 CST unless organized with Jim Caywood and Mark Ness, can accommodate other hours.

Working on weekends possible?	Yes but will need to verify with Mark Ness or Jim Caywood	**Comment**	7-3:30 CST unless organized with Jim Caywood and Mark Ness, can accommodate other hours.
Breaks / Interruptions		**Comment**	N/A

Installation Locations

Installation location on site	2402 W Michigan St, Duluth MN 55806	**Comment**	
Location description, incl. infrastructure (power, water, WIFI, etc.)	Power, water fountain, facilities, WIFI, indoors	**Comment**	If special requirements please let us know.
Vehicle capacity, i.e. how many vehicles can be installed in simultaneously	2, may be more accomodating during off-peak service	**Comment**	
Interchanging option, i.e. can vehicles be interchanged without moving others	Yes	**Comment**	I am confused at this question This is about how vehicles are parked / staged
Picture of location			

Workshop location for potential drilling etc.	Internal to shop	**Comment**	
Distance to installation location		**Comment**	
Vice available?	Yes	**Comment**	
Picture of workshop		**Comment**	

Location of material storage	Within maintenance area, can be moved by fork lift to accommodate	**Comment**	
Distance to installation location		**Comment**	
Storage security	Staff security	**Comment**	
Material handling equipment availability, i.e. forklift, etc.	7-3.30 CST	**Comment**	

Vehicles Availability

Min number of vehicles available per shift	2	**Comment**	Depends on peak/off-peak time of day
Vehicle availability during shift	2	**Comment**	Depends on peak/off-peak time of day
State requirement of vehicle by the end of shift	Completed	**Comment**	

Masabi Hardware
Site Survey Report

Agency Cable Management Standards

Cable routing requirements	Comment
Use of cable ties	
Cable management layouts in	
Labeling and naming conventions	
Others	
Cable protection requirements	**Comment**
Use of split loom	
Use of armored conduit	
Others	

Agency installation guidelines and policies to be followed by installers
Agency staff will supervise the initial installation of each vehicle type to approve installation process.
No cutting or splicing of the vehicles factory wiring loom is allowed, unless specifically approved by Masabi and the agency.

Masabi Hardware
Remote Survey Report

Person(s) executing the Survey

Name	Alan Knight	**Email**	alan.knight@masabi.com
Title	Hardware Field Technician		

Vehicle surveyed

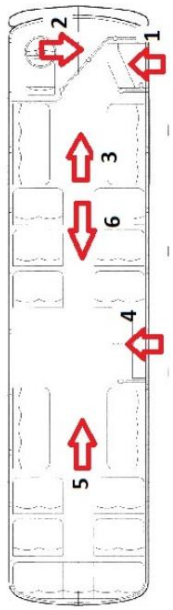
Name / Number	1809	**Model**	LF 40"
Make	Gillig	**Version**	
Total of similar Vehicles	67	**Year**	2018
Name of similar Vehicles			

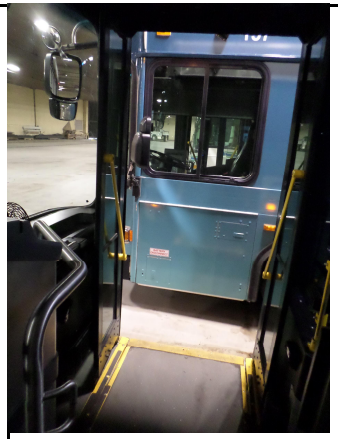
Vehicle Overview

Pictures	
Front Boarding	**Validators to be installed:**

Curbside front entrance **#1**

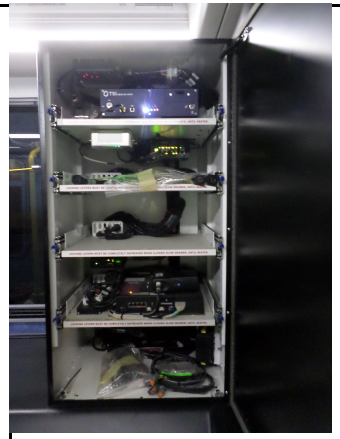
Driverôs seat over to entrance door **#2**





Aisle towards front dash **#3**  	
Middle Boarding (If Applicable)	
Rear Boarding (If Applicable)	
Communication Cabinet	

Example photos



Validator Location Criteria

Validator Location overview			
Location Number	**Location name**	**Additional Stanchion**	**Location selected (if several Validators are installed, select several locations)**
1	Dash Vertical	Yes	
2	Dash Horizontal	Yes	X
3			
4			

Copy this section for additional locations investigated

Validator Location #1 - Dash Vertical	
Location Description	On dash right side mounted vertically

Location Pictures with Space Model

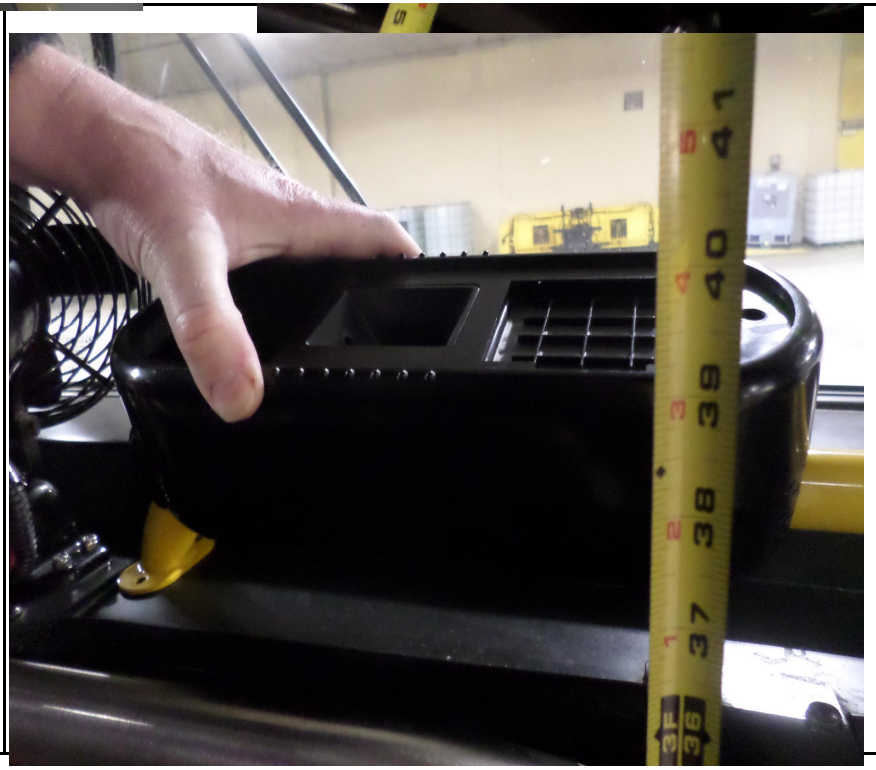
Photos Required

Location Considerations:	
Can the riders operate the validator easily?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Is there a suitable existing stanchion/rail available that can be used to install the validator?	**No**
Potential Issues	
Mitigation Strategies	
Comments	
Will the mounting location still allow the driver to operate the bus safely without impact to sight or controls?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Can the driver observe the validator display and/or hear the audio?	**Yes**

Potential Issues	
Mitigation Strategies	
Comments	
Will the mounting location still allow access to panels, cabinets, and cleaning for maintenance procedures?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Does the validator location conform to Disabled Access policies (e.g ADA Max Height 48") ?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Will the mounting location reduce risk of possible mechanical damage in any way by the riders or operator?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Can riders still access existing safety handrails and storage areas with the mounting location?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Can all the cables routed to the validator be protected and hidden from the riders?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
As everything been considered with the mounting location with no additional concerns?	
Potential Issues	
Mitigation Strategies	
Comments	

Validator Location #2 - Dash Horizontal	
Location Description	On dash right side mounted horizontally

Location Pictures with Space Model



Location Considerations:		
Can the riders operate the validator easily?		**Yes**
Potential Issues		
Mitigation Strategies		
Comments		
Is there a suitable existing stanchion/rail available that can be used to install the validator?		**No**
Potential Issues		
Mitigation Strategies		
Comments	Agency will source stanchion JRV to be installed angled about 45 degrees	
Will the mounting location still allow the driver to operate the bus safely without impact to sight or controls?		**Yes**
Potential Issues		
Mitigation Strategies		
Comments		
Can the driver observe the validator display and/or hear the audio?		**Yes**

Potential Issues	
Mitigation Strategies	
Comments	
Will the mounting location still allow access to panels, cabinets, and cleaning for maintenance procedures?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Does the validator location conform to Disabled Access policies (e.g ADA Max Height 48") ?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	38" mounting height
Will the mounting location reduce risk of possible mechanically damage in anyway by the riders or operator?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Can riders still access existing safety handrails and storage areas with the mounting location ?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Can all the cables routed to the validator be protected and hidden from the riders?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
As everything been considered with the mounting location with no additional concerns?	**Yes**
Potential Issues	Does the front door impede the JRV? Can the JRV be tilted around 45 degrees on the stanchion
Mitigation Strategies	
Comments	Agency said there was no issue with the front door hitting the JRV in this location

Validator Location #3 - Sample name, e.g. on Dashboard, etc.

Validator Location #4 - Sample name, e.g. on Dashboard, etc.

Mounting of the Validator at the selected mounted location #
Stanchion

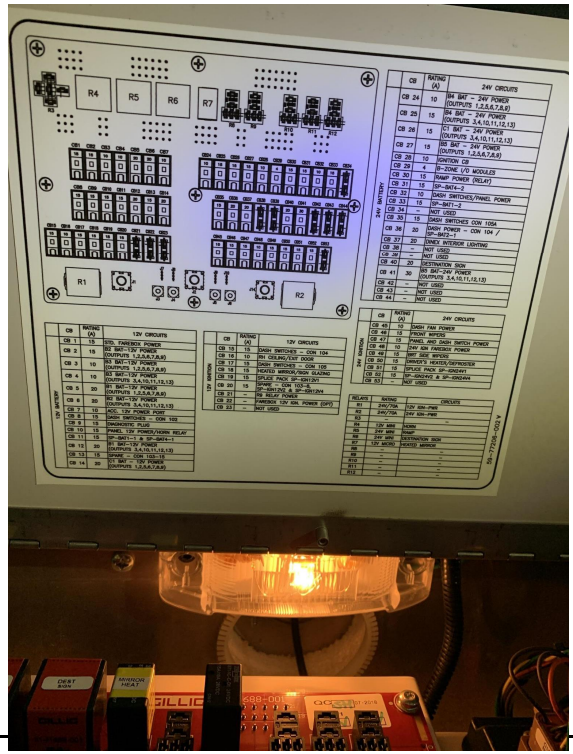
Is there an existing stanchion available?			**No**
Dimensions		**Diameter**	**11/4"**
Color		**Finish**	
Validator mounting angle (e.g 0, 30, 45, 90 degrees)			**45**
There are no additional materials needed, that are not part of a standard install?			**Yes**
Give details if required	**Agency to source stanchion and the required mounting hardware for the mounting of the stanchion to the dash.**		
Non std, mounting details			

Power Source Criteria

Power Source Overview					
Location #	**Location name**	**Voltage 12 or 24V preferred**	**Max. current supply**	**Spare fuse slot available**	**Location selected**
1	Ceiling distribution panel	24v	Supported	No	

Copy this section for additional power locations investigated

Power Supply Location #1 - Sample name, e.g. in communication cabinet power supply rail	
Location description	Ceiling distribution panel

Location pictures	 

Location Considerations	
Will the power cables be protected and hidden from the riders?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Is the power source ignition switched?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
As everything been considered with the power supply location with no other concerns?	**Yes**
Potential Issues	Fused circuit needs to be identified by agency for JRV
Mitigation Strategies	Agency provided electrical panel diagrams have identified circuits to be used
Comments	Additional panel circuit breaker may be required

Power Supply Location #2 - Sample name, e.g. in communication cabinet power supply rail

Power Supply Location #3 - Sample name, e.g. in communication cabinet power supply rail

Connecting validator power cable to the selected power source			
Material needed	**Ring Con. M3 / M5 Other**	**U Con. M3 / M5**	**Other**
Connection description	Ring and Fork connectors required for connection in panel		

Integrated Devices Criteria

Modem/Router/AVL description #1					
Device name, including	Sierra MG90 Router				
What is the device used for?	WIFI internet router				
Device location	Comms Cabinet				
What type of interface is required (e.g Ethernet, RJ232, J1708)	Ethernet				
What I/O interfaces are free and to be used?	RJ45				
What are the cable requirements?	STP Ethernet				
Is DHCP available for network connectivity?					**Yes**
Static IP Configs: IP /Subnet Mask/ Gateway/DNS					

Photo of installed device	Photos Required

Modem/Router/AVL description #2	
Device name, including manufacturer, model, and type	Trapeze Multiple models across the fleet
What is the device used for?	AVL
Device location	Comms Cabinet
What type of interface is required (e.g Ethernet, RJ232, J1708)	Ethernet
What I/O interfaces are free and to be used?	Ethernet
What are the cable requirements?	Ethernet
Is DHCP available for network connectivity?	N/A

Static IP Configs: **IP /Subnet Mask/ Gateway/DNS**					
Photo of installed device	Photos Required				

Modem/Router/AVL description #3

Wiring Criteria

Copy this section if multiple Validators are installed per bus

Wiring validator to communication cabinet (split cable for JRV)		
Is there existing ethernet cables that meet requirements that can be used?		**No**

Description of the chosen wiring route e.g from front step cabinet to under dashboard, through lower drivers side panel, into communication cabinet at head height.	Route the cable through the side panels and dash to stanchion location following factory wiring loom were possible.		
Will 15 or 30 ft of Ethernet cable be sufficient for the installation, if not please enter length.		**Other**	**10ft**
Description of drilling required eg. drill through bulkhead to left of drivers seat to pass cable through.	Only for the cable thru the dash		
Description of possible obstacles.	None reported		

If conduit is required for any part of cable run, please specify location, type, and length.	**Location**	**Type**	**Length ft**
	Protect the length of the cable run.	Split loom	10

Wiring validator (split cable for JRV) to power source		
Is there existing power cables that meet requirements that can be used?		**No**
Description of the chosen wiring route e.g from front step cabinet to under dashboard, through lower drivers side panel, into communication cabinet at head height.	Follow existing factory wiring loom routing to splitter cable from power distribution panel were possible	

Will 15' or 30' of Power cables be sufficient for the installation, if not please enter length.		**Other**	**10ft**
Description of drilling required eg. drill through bulkhead to left of drivers seat to pass ethernet cable through.	None reported		
Description of possible obstacles.	None reported		

required for any part of cable run, please specify location, type, and length.	**Location**	**Type**	**Length ft**
	Agency does not require any split loom for this cable run		0

Wiring validator to AVL			
Is there existing communication cables that meet requirements that can be used?	**Integration via ethernet no additional cabling is required**		**Yes**
What are the specifications of the required cable and termination?			
Description of the chosen wiring route e.g from front step cabinet to under dashboard, through lower drivers side panel, into communication cabinet at head height.			
Will 15' or 30' of cable be sufficient for the installation, if not please enter length.			**Ft**

Description of drilling required eg. drill through bulkhead to left of drivers seat to pass ethernet cable through.			
Description of possible obstacles.			
required for any part of cable run, please specify location, type, and length.	**Location**	**Type**	**Length ft**

Masabi Hardware
Remote Survey Report

Person(s) executing the Survey

Name	Alan Knight	**Email**	alan.knight@masabi.com
Title	Hardware Field Technician		

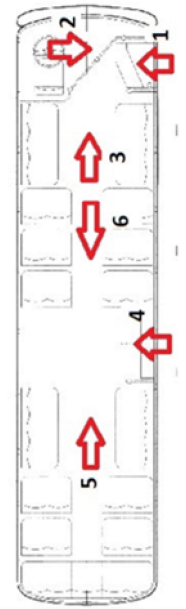
Vehicle surveyed

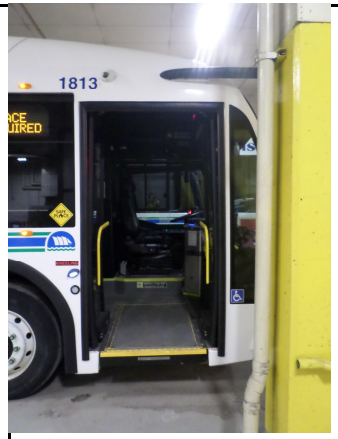
Name / Number	1812	**Model**	Catalyst 2
Make	Proterra	**Version**	Electric
Total of similar Vehicles	7	**Year**	2018
Name of similar Vehicles			

Vehicle Overview

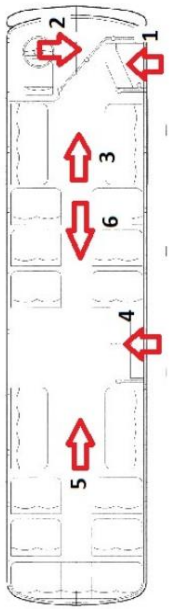
Pictures	
Front Boarding	**Validators to be installed:**

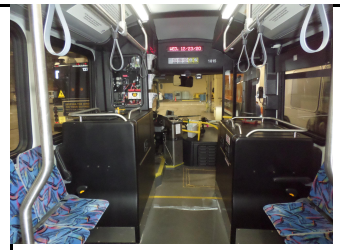
Curbside front entrance **#1**





Driverôs seat over to entrance door **#2**



Aisle towards front dash **#3**  	
Middle Boarding (If Applicable)	
Rear Boarding (If Applicable)	
Communication Cabinet	

Example photos

Validator Location Criteria

Validator Location overview			
Location Number	**Location name**	**Additional Stanchion**	**Location selected (if several Validators are installed, select several locations)**
1	Top rail by farebox	N	
2			
3			
4			

Copy this section for additional locations investigated

Validator Location #1 - Top rail by farebox	
Location Description	On top rail by farebox on rail

Location Pictures with Space Model

Location Considerations:	
Can the riders operate the validator easily?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Is there a suitable existing stanchion/rail available that can be used to install the validator?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Will the mounting location still allow the driver to operate the bus safely without impact to sight or controls?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Can the driver observe the validator's display and/or hear the audio?	**Yes**

Potential Issues	
Mitigation Strategies	
Comments	
Will the mounting location still allow access to panels, cabinets, and cleaning for maintenance procedures?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Does the validator location conform to Disabled Access policies (e.g ADA Max Height 48") ?	
Potential Issues	
Mitigation Strategies	
Comments	37" mounting height
Will the mounting location reduce risk of possible mechanical damage in any way by the riders or operator?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Can riders still access existing safety handrails and storage areas with the mounting location?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	The main part of the rail is still accessible for riders
Can all the cables routed to the validator be protected and hidden from the riders?	**No**
Potential Issues	
Mitigation Strategies	
Comments	Some external cabling required from dash to JRV
As everything been considered with the mounting location with no additional concerns?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	

Validator Location #2 - Sample name, e.g. on Dashboard, etc.

Validator Location #3 - Sample name, e.g. on Dashboard, etc.

Validator Location #4 - Sample name, e.g. on Dashboard, etc.

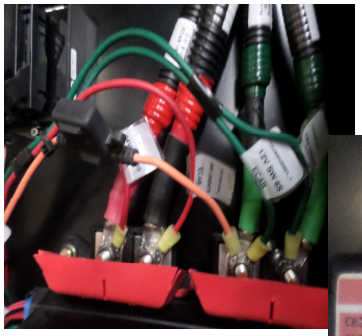
Mounting of the Validator at the selected mounted location #			
Stanchion			
Is there an existing stanchion available?			**Yes**
Dimensions	**11/4**	**Diameter**	
Color		**Finish**	
Validator mounting angle (e.g 0, 30, 45, 90 degrees)		**0**	
There are no additional materials needed, that are not part of a standard install?			**No**
Give details if required	**Unused section of handrail is free to mount the JRV.**		
Non std, mounting details	M6 Rivnuts and screws to mount the JRV to the handrail will be supplied by Masabi.		

Power Source Criteria

Power Source Overview					
Location #	**Location name**	**Voltage 12 or 24V preferred**	**Max. current supply**	**Spare fuse slot available**	**Location selected**
	Distribution panel above Comms	24v		From bus bar	

Copy this section for additional power locations investigated

Power Supply Location #1 - Sample name, e.g. in communication cabinet power supply rail	
Location description	Distribution panel above Comms

Location pictures	  
Will the power cables be protected and hidden from the riders?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Is the power source ignition switched?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
As everything been considered with the power supply location with no other concerns?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	Power is going to be taken from a Switched 24v buss bar and ground will also be taken form this location and a Inline fuse will be required. The actual circuits and termination points will be identifed at the time of the installtion

Power Supply Location #2 - Sample name, e.g. in communication cabinet power supply rail

Power Supply Location #3 - Sample name, e.g. in communication cabinet power supply rail

Connecting validator's power cable to the selected power source			
Material needed	**Ring Con. M3 / M5 Other**	**U Con. M3 / M5**	**Other**
	M5		
Connection description	Buss bar connection, with ring crimp connectors		

Integrated Devices Criteria

Modem/Router/AVL description #1					
Device name, including	Sierra MG90 Router				
What is the device used for?	WIFI internet router				
Device location	Comms Cabinet				
What type of interface is	Ethernet				
What I/O interfaces are free and	RJ45				
What are the cable	STP Ethernet				
Is DHCP available for network connectivity?					**Yes**
Static IP Configs: IP /Subnet Mask/ Gateway/DNS					

Photo of installed device	Photos Required

Modem/Router/AVL description #2	
Device name, including manufacturer, model, and type	Trapeze Multiple models across the fleet
What is the device used for?	AVL
Device location	Comms Cabinet
What type of interface is required (e.g Ethernet, RJ232, J1708)	Ethernet
What I/O interfaces are free and to be used?	Ethernet
What are the cable requirements?	Ethernet
Is DHCP available for network connectivity?	N/A

Static IP Configs: **IP /Subnet Mask/ Gateway/DNS**					
Photo of installed device	Photos Required				

Modem/Router/AVL description #3

Wiring Criteria

Copy this section if multiple Validators are installed per bus

Wiring validator to communication cabinet (split cable for JRV)		
Is there existing ethernet cables that meet requirements that can be used?		**No**

Description of the chosen wiring route e.g from front step cabinet to under dashboard, through lower drivers side panel, into communication cabinet at head height.	Route the cable through the side panels and dash following the factory loom to stanchion mounting and then through dash and externally to JRV mounting. For the cable to enter the JRV it will need to be routed through the mounting rail which will require drilling. ***There is no external option to run the cable into the JRV.***		
Will 15 or 30ft of Ethernet cable be sufficient for the installation, if not please enter length.			**20Ft**
Description of drilling required			
Description of possible obstacles.			

If conduit is	**Location**	**Type**	**Length ft**
	External cable going to JRV on Stanchion	Split loom	4

Wiring validator (split cable for JRV) to power source

Is there existing power cables that meet requirements that can be used?			**No**
Description of the chosen wiring route e.g from front step cabinet to under dashboard, through lower drivers side panel, into communication cabinet at head height.	Follow existing factory wire loom routing to splitter cable from power distribution panel		
Will 15' or 30' of Power cables be sufficient for the installation, if not please enter length.	No additional cable required to be added splitter cable	**Other**	**0ft**
Description of drilling required eg. drill through bulkhead to left of drivers seat to pass ethernet cable through.	Only for the cable thru the dash		
Description of possible obstacles.	None reported		

If conduit is required for any part of cable run, please specify location, type, and length.	**Location**	**Type**	**Length ft**
	Agency does not require any split loom for this cable run		0

Wiring validator to AVL			
Is there existing communication cables that meet requirements that can be used?	**Integration via ethernet no additional cabling is required**		**Yes**
What are the specifications of the required cable and termination?			
Description of the chosen wiring route e.g from front step cabinet to under dashboard, through lower drivers side panel, into communication cabinet at head height.			
Will 15' or 30' of cable be sufficient for the installation, if not please enter length.			**Ft**
Description of drilling required			
Description of possible			

If conduit is required for any part of cable run, please specify location, type, and length.	**Location**	**Type**	**Length ft**

Masabi Hardware
Remote Survey Report

Person(s) executing the Survey

Name	Alan Knight	**Email**	alan.knight@masabi.com
Title	Hardware Field Technician		

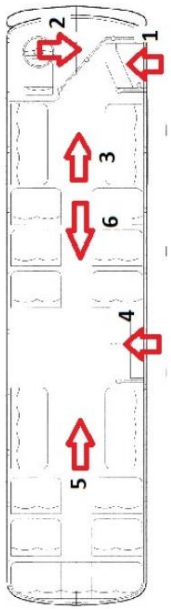
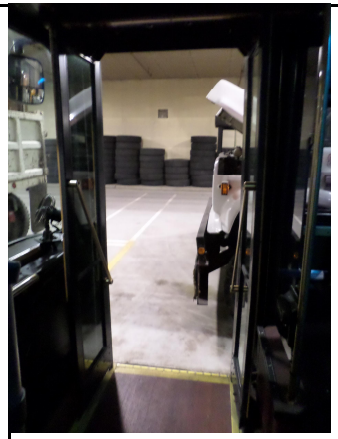
Vehicle surveyed

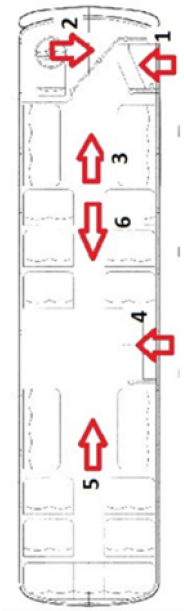
Name / Number	1501	**Model**	Trolly
Make	Gillig	**Version**	
Total of similar Vehicles	1	**Year**	2015
Name of similar Vehicles			

Vehicle Overview

Pictures	
Front Boarding	**Validators to be installed:**

Curbside front entrance **#1**

Driverôs seat over to entrance door **#2**  		

Aisle towards front dash **#3**  	
Middle Boarding (If Applicable)	
Rear Boarding (If Applicable)	
Communication Cabinet	

Example photos

Validator Location Criteria

Validator Location overview			
Location Number	**Location name**	**Additional Stanchion**	**Location selected (if several Validators are installed, select several locations)**
1	On Dash	Y	X
2			
3			
4			

Copy this section for additional locations investigated

Validator Location #1 - On Dash	
Location Description	On right side of dash

Location Pictures with Space Model

Location Considerations:	
Can the riders operate the validator easily?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Is there a suitable existing stanchion/rail available that can be used to install the validator?	**No**
Potential Issues	
Mitigation Strategies	
Comments	
Will the mounting location still allow the driver to operate the bus safely without impact to sight or controls?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Can the driver observe the validator's display and/or hear the audio?	**Yes**

Potential Issues	
Mitigation Strategies	
Comments	
Will the mounting location still allow access to panels, cabinets, and cleaning for maintenance procedures?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Does the validator location conform to Disabled Access policies (e.g ADA Max Height 48") ?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	43" mounting height
Will the mounting location reduce risk of possible mechanical damage in any way by the riders or operator?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Can riders still access existing safety handrails and storage areas with the mounting location?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Can all the cables routed to the validator be protected and hidden from the riders?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
As everything been considered with the mounting location with no additional concerns?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	

Validator Location #2 - Sample name, e.g. on Dashboard, etc.

Validator Location #3 - Sample name, e.g. on Dashboard, etc.

Validator Location #4 - Sample name, e.g. on Dashboard, etc.

Mounting of the Validator at the selected mounted location #				
Stanchion				
Is there an existing stanchion available?				**No**
Dimensions		**Diameter**	**11/4"**	
Color		**Finish**		
Validator mounting angle (e.g 0, 30, 45, 90 degrees)			**45**	
There are no additional materials needed, that are not part of a standard install?				**Yes**
Give details if required	**Agency to source stanchion andn the required mounting hardware for the mounting of the stanchion to the dash.**			
Non std, mounting details				

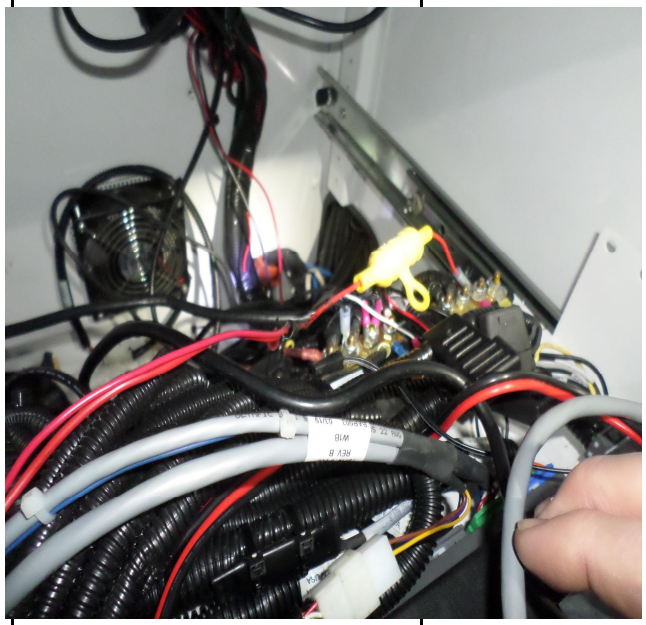
Power Source Criteria

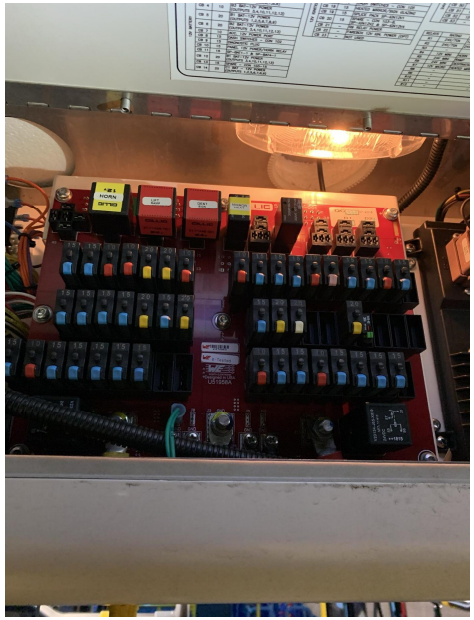
Power Source Overview					
Location #	**Location name**	**Voltage 12 or 24V preferred**	**Max. current supply**	**Spare fuse slot available**	**Location selected**
	Ceiling distribution panel	24		No	

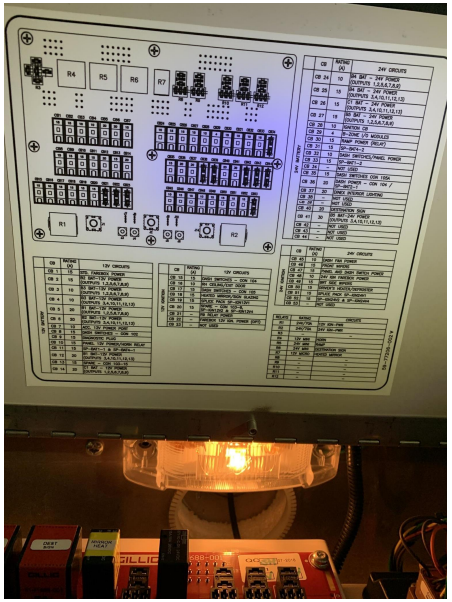
Copy this section for additional power locations investigated

Power Supply Location #1 - Sample name, e.g. in communication cabinet power supply rail	
Location description	Ceiling distribution panel

Location pictures	







Location Considerations:		
Will the power cables be protected and hidden from the riders?		**Yes**
Potential Issues		
Mitigation Strategies		
Comments		
Is the power source ignition switched?		**Yes**
Potential Issues		
Mitigation Strategies		
Comments		
As everything been considered with the power supply location with no other concerns?		**Yes**
Potential Issues	Fused circuit needs to be identified by agency for JRV	
Mitigation Strategies	Agency provided electrical panel diagrams have identified circuits to be used	
Comments	Panel is the same as the 40" LF Gillig Additional panel circuit breaker will be required	

Power Supply Location #2 - Sample name, e.g. in communication cabinet power supply rail

Power Supply Location #3 - Sample name, e.g. in communication cabinet power supply rail

Connecting validator's power cable to the selected power source			
Material needed	**Ring Con. M3 / M5 Other**	**U Con. M3 / M5**	**Other**
Connection description	Ring and Fork connectors required for connection in panel		

Integrated Devices Criteria

Modem/Router/AVL description #1					
Device name, including	Sierra MG90 Router				
What is the device used for?	WIFI internet router				
Device location	Comms Cabinet				
What type of interface is required (e.g Ethernet, RJ232, J1708)	Ethernet				
What I/O interfaces are free and to be used?	RJ45				
What are the cable requirements?	STP Ethernet				
Is DHCP available for network connectivity?					**Yes**
Static IP Configs: **IP /Subnet Mask/ Gateway/DNS**					

Photo of installed device	Photos Required

Modem/Router/AVL description #2	
Device name, including manufacturer, model, and type	Trapeze Multiple models across the fleet
What is the device used for?	AVL
Device location	Comm Cabinet
What type of interface is required (e.g Ethernet, RJ232, J1708)	Ethernet
What I/O interfaces are free and	Ethernet
What are the cable requirements?	Ethernet
Is DHCP available for network connectivity?	N/A

Static IP Configs: **IP /Subnet Mask/ Gateway/DNS**					
Photo of installed device	Photos Required				

Modem/Router/AVL description #3

Wiring Criteria

Copy this section if multiple Validators are installed per bus

Wiring validator to communication cabinet (split cable for JRV)		
Is there existing ethernet cables that meet requirements that can be used?		**No**

Description of the chosen wiring route e.g from front step cabinet to under dashboard, through lower drivers side panel, into communication cabinet at head height.	Route the cable through the side panels and dash to stanchion location following the factory wiring loom		
Will 15 or 30ft of Ethernet cable be sufficient for the installation, if not please enter length.		**Other**	**10ft**
Description of drilling required eg. drill through bulkhead to left of drivers seat to pass cable through.	Only for the cable thru the dash		
Description of possible obstacles.	None reported		

required for any part of cable run, please specify location, type, and length.	**Location**	**Type**	**Length Ft**
	Protect the length of the cable run.	Split loom	10

Wiring validator (split cable for JRV) to power source		
Is there existing power cables that meet requirements that can be used?		**No**
Description of the chosen wiring route e.g from front step cabinet to under dashboard, through lower drivers side panel, into communication cabinet at head height.	Follow existing factory wire loom routing to splitter cable from power distribution panel	

Will 15' or 30' of Power cables be sufficient for the installation, if not please enter length.		**Other**	**10ft**
Description of drilling required eg. drill through bulkhead to left of drivers seat to pass ethernet cable through.	None reported		
Description of possible obstacles.	None reported		

required for any part of cable run, please specify location, type, and length.	**Location**	**Type**	**Length ft**
	Agency does not require any split loom for this cable run		0

Wiring validator to AVL			
Is there existing communication cables that meet requirements that can be used?	**Integration via ethernet no additional cabling is required**		**Yes**
What are the specifications of the required cable and termination?			
Description of the chosen wiring route e.g from front step cabinet to under dashboard, through lower drivers side panel, into communication cabinet at head height.			
Will 15' or 30' of cable be sufficient for the installation, if not please enter length.			**Ft**

Description of drilling required eg. drill through bulkhead to left of drivers seat to pass ethernet cable through.			
Description of possible obstacles.			
required for any part of cable run, please specify location, type, and length.	**Location**	**Type**	**Length ft**

Masabi Hardware
Remote Survey Report

Person(s) executing the Survey

Name	Alan Knight	**Email**	alan.knight@masabi.com
Title	Hardware Field Technician		

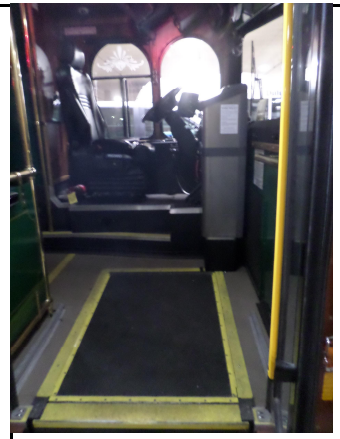
Vehicle surveyed

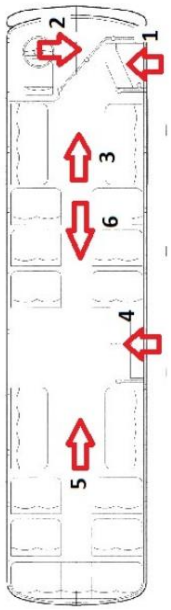
Name / Number	1901	**Model**	Trolly
Make	Hometown	**Version**	
Total of similar Vehicles	1 +1	**Year**	2019
Name of similar Vehicles			

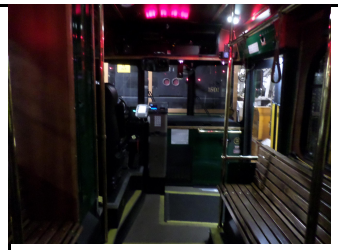
Vehicle Overview

Pictures	
Front Boarding	**Validators to be installed:**

Curbside front entrance **#1**



Driverôs seat over to entrance door **#2**  	

Aisle towards front dash **#3** 	
Middle Boarding (If Applicable)	
Rear Boarding (If Applicable)	
Communication Cabinet	

Example photos

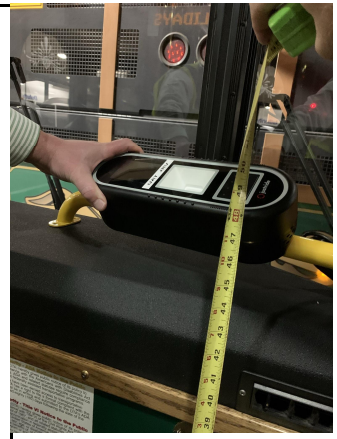
Validator Location Criteria

Validator Location overview			
Location Number	**Location name**	**Additional Stanchion**	**Location selected (if several Validators are installed, select several locations)**
1	On Dash	Y	
2			
3			
4			

Copy this section for additional locations investigated

Validator Location #1 - On Dash	
Location Description	On right side of dash

Location Pictures with Space Model



Location Considerations:	
Can the riders operate the validator easily?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Is there a suitable existing stanchion/rail available that can be used to install the validator?	**No**
Potential Issues	
Mitigation Strategies	
Comments	
Will the mounting location still allow the driver to operate the bus safely without impact to sight or controls?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Can the driver observe the validator's display and/or hear the audio?	**Yes**

Potential Issues	
Mitigation Strategies	
Comments	
Will the mounting location still allow access to panels, cabinets, and cleaning for maintenance procedures?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Does the validator location conform to Disabled Access policies (e.g ADA Max Height 48") ?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	48" mounting height
Will the mounting location reduce risk of possible mechanical damage in any way by the riders or operator?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Can riders still access existing safety handrails and storage areas with the mounting location?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
Can all the cables routed to the validator be protected and hidden from the riders?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	
As everything been considered with the mounting location with no additional concerns?	**Yes**
Potential Issues	
Mitigation Strategies	
Comments	

Validator Location #2 - Sample name, e.g. on Dashboard, etc.

Validator Location #3 - Sample name, e.g. on Dashboard, etc.

Validator Location #4 - Sample name, e.g. on Dashboard, etc.

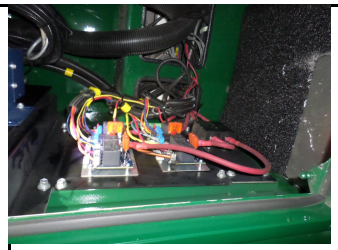
Mounting of the Validator at the selected mounted location #				
Stanchion				
Is there an existing stanchion available?				**No**
Dimensions		**Diameter**	**11/4"**	
Color		**Finish**		
Validator mounting angle (e.g 0, 30, 45, 90 degrees)			**45**	
There are no additional materials needed, that are not part of a standard install?				**No**
Give details if required	**Agency to source stanchion and the required mounting hardware for the mounting of the stanchion to the dash.**			
Non std, mounting details				

Power Source Criteria

Power Source Overview					
Location #	**Location name**	**Voltage 12 or 24V preferred**	**Max. current supply**	**Spare fuse slot available**	**Location selected**
	Driver Side outer distribution panel	24		No	

Copy this section for additional power locations investigated

Power Supply Location #1 - Driver Side outer distribution panel	
Location description	Driver Side outer distribution panel

Location pictures	

Location Considerations:		
Will the power cables be protected and hidden from the riders?		**Yes**
Potential Issues		
Mitigation Strategies		
Comments		
Is the power source ignition switched?		
Potential Issues		
Mitigation Strategies		
Comments	TBD	
As everything been considered with the power supply location with no other concerns?		**Yes**
Potential Issues	Fused circuit needs to be identified by agency for JRV	
Mitigation Strategies		
Comments		

Power Supply Location #2 - Sample name, e.g. in communication cabinet power supply rail

Power Supply Location #3 - Sample name, e.g. in communication cabinet power supply rail

Connecting validator's power cable to the selected power source			
Material needed	**Ring Con. M3 / M5 Other**	**U Con. M3 / M5**	**Other**
Connection description	TBD		

Integrated Devices Criteria

Modem/Router/AVL description #1					
Device name, including	Sierra MG90 Router				
What is the device used for?	WIFI internet router				
Device location	Comms Cabinet				
What type of interface is required (e.g Ethernet, RJ232, J1708)	Ethernet				
What I/O interfaces are free and to be used?	RJ45				
What are the cable requirements?	STP Ethernet				
Is DHCP available for network connectivity?					**Yes**
Static IP Configs: **IP /Subnet Mask/ Gateway/DNS**					

Photo of installed device	Photos Required

Modem/Router/AVL description #2		
Device name, including manufacturer, model, and type	Trapeze Multiple models across the fleet	
What is the device used for?	AVL	
Device location	Comms Cabinet	
What type of interface is required (e.g Ethernet, RJ232, J1708)	Ethernet	
What I/O interfaces are free and to be used?	Ethernet	
What are the cable requirements?	Ethernet	
Is DHCP available for network connectivity?	N/a	**Yes**

Static IP Configs: **IP /Subnet Mask/ Gateway/DNS**					
Photo of installed device	Photos Required				

Modem/Router/AVL description #3

Wiring Criteria

Copy this section if multiple Validators are installed per bus

Wiring validator to communication cabinet (split cable for JRV)		
Is there existing ethernet cables that meet requirements that can be used?		**No**

Description of the chosen wiring route e.g from front step cabinet to under dashboard, through lower drivers side panel, into communication cabinet at head height.	Route the cable through the side panels and dash to stanchion location following factory wiring loom		
Will 15 of 30ft of Ethernet cable be sufficient for the installation, if not please enter length.		**Other**	**15ft**
Description of drilling required eg. drill through bulkhead to left of drivers seat to pass cable through.	Only for the cable thru the dash		
Description of possible obstacles.	None reported		

required for any part of cable run, please specify location, type, and length.	**Location**	**Type**	**Length ft**
	Agency does not require any split loom for this cable run		0

Wiring validator (split cable for JRV) to power source		
Is there existing power cables that meet requirements that can be used?		**No**
Description of the chosen wiring route e.g from front step cabinet to under dashboard, through lower drivers side panel, into communication cabinet at head height.	**Route cable through panels**	

Will 15' or 30' of Power cables be sufficient for the installation, if not please enter length.	**Splitter cable will reach external distribution panel**		**0Ft**
Description of drilling required eg. drill through bulkhead to left of drivers seat to pass ethernet cable through.	None reported		
Description of possible obstacles.	None reported		

If conduit is required for any part of cable run, please specify location, type, and length.	**Location**	**Type**	**Length ft**
	Agency does not require any split loom for this cable run		0

Wiring validator to AVL

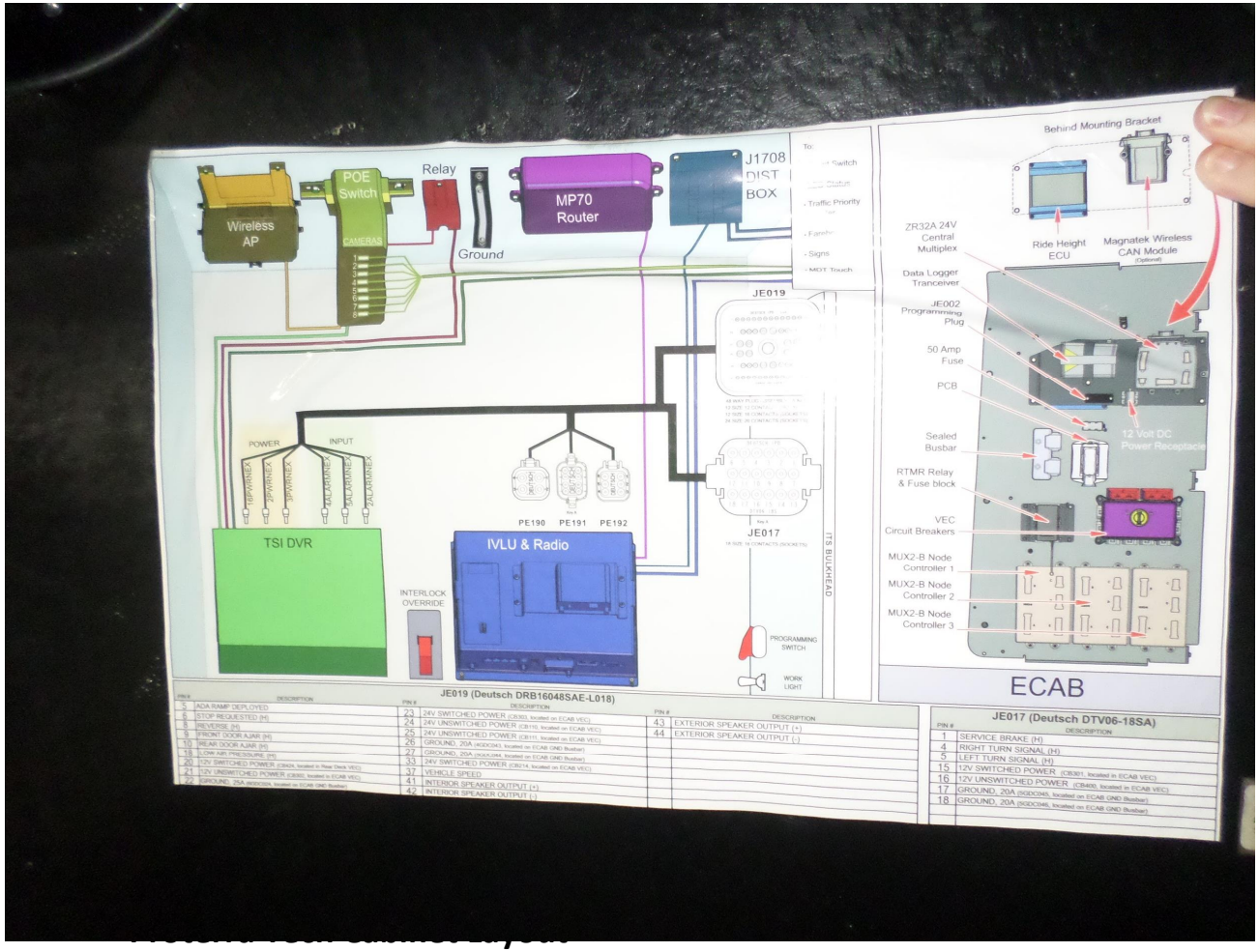
Is there existing communication cables that meet requirements that can be used?	**Integration via ethernet no additional cabling is required**		**Yes**
What are the specifications of the required cable and termination?			
Description of the chosen wiring route e.g from front step cabinet to under dashboard, through lower drivers side panel, into communication cabinet at head height.			
Will 15' or 30' of cable be sufficient for the installation, if not please enter length.			**Ft**

Description of drilling required eg. drill through bulkhead to left of drivers seat to pass ethernet cable through.	
Description of possible obstacles.	

If conduit is required for any part of cable run, please specify location, type, and length.	**Location**	**Type**	**Length ft**

Masabi Hardware
Remote Survey Report

Copy any additional photos to this Sheet as required



Proterra Breaker Layout