

# State of Georgia 2016 Mass Transit Solicitation

99999-SPD-SPD0000138

## APTA Form CER 10: Vehicle Technical Information

**NOTE:** This is a sample form. The Agency should customize it to comply with its proposed requirements.

This form must be completed and included in the Technical Proposal.

### GENERAL COACH DATA SHEET

[insert bus type]

<b>Bus manufacturer:</b>	ARBOC Specialty Vehicles, LLC
Bus model:	Spirit of Liberty
<b>Understructure manufacturer:</b>	Freightliner Custom Chassis
Model number:	XBA

### Basic Body Construction

Type:	Body on chassis
<b>Tubing or frame member thickness and dimensions</b>	
Overstructure	1.5"x1.5" 16ga Steel Tube
Understructure	2"x2"x0.25" Steel Tube
<b>Skin thickness and material</b>	
Roof	.1875" with substrate
Sidewall	.1875" with substrate
Skirt panel	.1875" with substrate
Front end	.125" Fiberglass
Rear end	.120" TPO

### Dimensions

<b>Overall length</b>	Over bumpers	36	ft	3	in.
	Over body	35	ft	0	in.
<b>Overall width</b>	Over body excluding mirrors	8	ft	4	in.
	Over body including mirrors—driving position	10	ft	5	in.
	Over tires front axles	7	ft	10	in.
	Over tires center axle		ft		in.
	Over tires rear axles	7	ft	9	in.

Overall height (maximum)

10	ft	9	in.
10	ft	0	in.

Overall height (main roof line)

Angle of approach

9	deg
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Breakover angle

12	deg
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Breakover angle (rear)

	deg
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Angle of departure

8.7	deg
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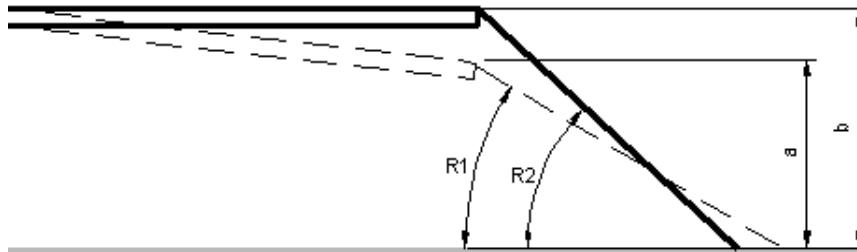
### Doorway Dimensions

#### Front

#### Rear

Width between door posts	42	in.		in.
Door width between panels	39	in.		in.
Clear door width (with Entry Assist)	35	in.		in.
Doorway height	80	in.		in.
Knuckle clearance	1.5	in.		in.

Step height from ground measured at center of doorway



#### Front doorway, empty

#### Ramp angle

#### Rear Doorway, empty

Kneeled	a.	10	in.	R1	9	deg	a.		in.
Unkneeled	b.	13	in.	R2	13	deg	b.		in.

### Interior head room (center of aisle)

Front axle location

85	in.
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Center axle location

	in.
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Rear axle location

79	in.
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Aisle width between transverse seats

38	in.
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### Floor height above ground (centerline of bus)

At front door

10	in.
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At front axle

19.5	in.
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At drive axle

30	in.
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At rear door  in.

**Minimum ground clearance (between bus and ground, with bus unkneeled)**

Excluding axles  in.

Including axles  in.

**Horizontal turning envelope** (see diagram below)

Outside body turning radius, TR0 (including bumper)

33 ft  0 in.

Front inner corner radius, TR1

13 ft  0 in.

Front wheel inner turning radius, TR2

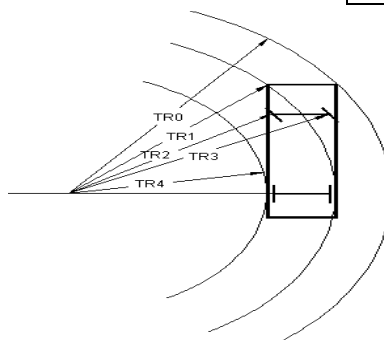
ft  in.

Front wheel outer turning radius, TR3

ft  in.

Inside Body Turning Radius innermost point, TR4 (including bumper)

ft  in.



**Wheel base**

Front  150 in.

Rear  in.

**Overhang, centerline of axle over bumper**

Front  95.25 in.

Rear  128.75 in.

**Floor**

Interior length

21 ft  8 in.

Interior width (excluding coving)

8 ft  0 in.

Total standee area (approximately)

24 ft<sup>2</sup>

Minimum distance between wheelhouses:

Front  36 in.

Rear  28 in.

Center  in.

Maximum interior floor slope (from horizontal)

2.5 deg

**Passenger capacity provided**

Total maximum seating	29	
Standee capacity	10	
Minimum hip to knee room	28	in.
Minimum foot room	9	in.

**Weight**

	No. of people	Front axle			Center axle			Rear axle			Total bus
		Left	Right	Total	Left	Right	Total	Left	Right	Total	
Empty bus, full fuel and farebox	0	3107	2657	5764				6355	5860	12215	17979
Fully seated, full fuel and farebox	29	3770	3244	7014				8323	7825	16148	23165
Fully loaded standee and fully seated, full fuel and farebox	39	4322	3491	7813				8521	8328	16849	24662
Crush load (1.5x fully loaded)											
GVWR				25990							
GAWR				10000						17500	

**Engine, main**

Manufacturer	Cummins				
Type and weight rating	Diesel				
Model number	ISB 6.7				
Bore	4.21	in.			
Stroke	4.88	in.			
Displacement	408	in. <sup>3</sup>			
Compression ratio	17.3:1				
Injector type and size	Direct Injection				
Net SAE horsepower	240	hp	at	2300	RPM
Net SAE torque	560	lb/ft	at	1600	RPM
Crankcase oil capacity					
New engine, dry		gal			
New engine, wet	3	gal			
Turbocharger make and model	Holset, VGT				
Maximum speed, no load		RPM			
Maximum speed, full load		RPM			
Speed at idle		RPM			
Speed at fast idle		RPM			

**Engine information/graphs to be attached with this form:**

Engine speed vs. road speed

Torque vs. engine speed

Horsepower vs. engine speed

Fuel consumption vs. engine speed

Vehicle speed vs. time (both loaded and unloaded)

Vehicle speed vs. grade (both loaded and unloaded)

Acceleration vs. time

Change of acceleration vs. time

### Hybrid drive or transmission

Manufacturer	Allison			
Type	Automatic B220			
Speeds	6			
Gear ratios	Forward:	3.10-1, 1.81-1, 1.41-1, 1.00-1, 0.71-1, 0.61-1	Reverse:	4.49-1

Shift speeds

1st–2nd	10.7	mph
2nd–3rd	22.7	mph
3rd–4th	29.2	mph
4th–5th (if applicable)	41.1	mph
5th–6th (if applicable)	57.2	mph

Fuel capacity (including heat exchanger and filters)	70 gal
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### Voltage regulator

Manufacturer	Leece-Neville
Model	Integrated

### Voltage equalizer

Manufacturer	
Model	

### Alternator

Manufacturer	Leece-Neville		
Type	Air Cooled		
Model	A0014944PA		
Output at idle	270	amps	
Output at maximum speed		amps	
Maximum warranted speed		rpm	
Speed at idle (approximately)		rpm	
Drive type	Engine Belt		

### Starter motor

Manufacturer	Delco 29MT
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Type	Gear Reduction
Model	82200571

### Air compressor

Manufacturer	Cummins		
Type	Single Piston		
Rated capacity	18.7	CFM	
Capacity at idle (approximately)		CFMs	
Capacity at maximum speed (engine)		CFM	
Maximum warranted speed		rpm	
Speed idle		rpm	
Drive type	Engine Belt		
Governor:			
Cut-in pressure		psi	
Cut-out pressure		psi	

### Axles

#### First

Manufacturer	Meritor		
Type	Drop Axle		
Model number	MFS 10		
Gross axle weight rating	100 00	lbs	
Axle load		lbs	

#### Second

Manufacturer	Detroit		
Type	Drive Axle		
Model number	19K 2N		
Gross axle weight rating	175 00	lbs	
Axle load		lbs	

#### Third

Manufacturer			
Type			
Model number			
Gross axle weight rating		lbs	
Axle load		lbs	
Axle ratio			

### Suspension system

Manufacturer	Reyco Granning		
Type:	First:	Solid Beam	

Springs:	Second:	Trailing Arm
	Third:	
	First:	Firestone
	Second:	Firestone
	Third:	

### Joint

Manufacturer	Dana Spicer
Type	SPL100
Model number	

### Wheels and tires

#### Wheels

Make	Accuride
Size	19.5"
Capacity	5,000 per wheel
Material	Steel

#### Tires

Manufacturer	Michelin
Type	XZE
Size	245/70R19.5
Load range/air pressure	H/120 psi

### Steering, power

#### Pump

Manufacturer and model number	TRW
Type	Internal
Relief pressure	2865 psi

#### Booster/gear box

Manufacturer and model number	TRW
Type	TA565
Ratio	

Power steering fluid capacity	2 gal
Maximum effort at steering wheel	lbs (unloaded stationary coach on dry asphalt pavement)
Steering wheel diameter	18 in.

### Brakes

Make of fundamental brake system	Hydraulic Disc
Brake chambers vendor size and part number:	First: Bosch 66mm Caliper
	Second: Bosch 66mm Caliper
	Third:

Brake operation effort

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**Slack adjuster's vendor's type and part numbers**

First:	Right:	
	Left:	
Second:	Right:	
	Left:	
Third:	Right:	
	Left:	
Length:	First take-up:	
	Second take-up:	
	Third take-up:	

**Brake drums/discs**

First:	Manufacturer		
	Part number		
	Diameter		in.
Second:	Manufacturer		
	Part number		
	Diameter		in.
Third:	Manufacturer		
	Part number		
	Diameter		in.

Brake lining manufacturer

Type


**Brake lining identification**

First:	Forward	
	Reverse	
Second:	Forward	
	Reverse	
Third:	Forward	
	Reverse	

**Brake linings per shoe**

First	
Second	
Third	

**Brake lining widths**

First 



 in.



Second  in.  
Third  in.

#### Brake lining lengths

First  in.  
Second  in.  
Third  in.

Brake lining thickness  in.

#### Brake lining per axle

First  sq. in.  
Second  sq. in.  
Third  sq. in.

#### Cooling system

##### Radiator/charge air cooler

Manufacturer   
Type   
Model number   
Number of tubes   
Tubes outer diameter  in./  in.  
Fins per inch  fins  
Fin thickness  in.  
Total cooling and heating system capacity  gal  
Radiator fan speed control   
Surge tank capacity  quarts  
Engine thermostat temperature setting: Initial opening (fully closed)  °F  
Fully open  °F  
Overheat alarm temperature sending unit setting  °F  
Shutdown temperature setting  °F

#### Air reservoir capacity

Supply reservoir  in.<sup>3</sup>  
Primary reservoir  in.<sup>3</sup>  
Secondary reservoir  in.<sup>3</sup>  
Packing reservoir  in.<sup>3</sup>  
Accessory reservoir  in.<sup>3</sup>  
Other reservoir type  in.<sup>3</sup>

#### Heating, ventilation and air conditioning equipment

Heating system capacity  BTU/hr  
Air conditioning capacity  BTU

Ventilating capacity  CFM

### Compressor

Manufacturer	<input type="text" value="Valeo"/>		
Model	<input type="text" value="TM43"/>		
Number of cylinders	<input type="text"/>		
Drive ratio	<input type="text"/>		
Maximum warranted speed	<input type="text"/>	rpm	
Operating speed	<input type="text"/>	rpm (recommended)	
Weight	<input type="text"/>	lbs	
Oil capacity	Dry	<input type="text"/>	gal
	Wet	<input type="text"/>	gal
Refrigerant:	Type	<input type="text"/>	<input type="text"/> lbs

### Condenser

Manufacturer	<input type="text" value="Valeo"/>		
Model	<input type="text" value="11122735AD"/>		
Number of fins/in.	<input type="text" value="24"/>		
Outer diameter of tube	<input type="text"/>	in.	
Fin thickness	<input type="text" value=".01"/>	in.	

### Condenser fan

Manufacturer	<input type="text" value="Valeo"/>		
Model	<input type="text"/>		
Fan diameter	<input type="text" value="11"/>	in.	
Speed maximum	<input type="text" value="n/a"/>	rpm	
Flow rate (maximum)	<input type="text" value="n/a"/>	CFM	

### Receiver

Manufacturer	<input type="text" value="Valeo"/>		
Model	<input type="text"/>		
Capacity	<input type="text" value="15grams"/>	lbs	

### Condenser fan drive motors

Manufacturer	<input type="text" value="Valeo"/>		
Model	<input type="text"/>		
Type	<input type="text" value="PM"/>		
Horsepower	<input type="text"/>	hp	
Operating speed	<input type="text"/>	rpm	

### Evaporator fan drive motors

Manufacturer	<input type="text" value="Valeo"/>		
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Model		
Type	Dual squirrel Cage	
Horsepower	n/a	hp
Operating speed	n/a	rpm

#### Evaporator(s)

Manufacturer	Valeo	
Model	Mini Sphere	
Number of rows	24	
Number of fins/in.	12	
Outer diameter of tube	.25	in.
Fin thickness	.01	in.
Number of evaporators	1	

#### Expansion valve

Manufacturer	Valeo
Model	n/a

#### Filter-drier

Manufacturer	Valeo
Model	Mini Sphere

#### Heater cores

Manufacturer	Valeo	
Model	Mini Sphere HT	
Capacity	70000	Btu/hr
Number of rows	2	
Number of fins/in.	12	
Outer diameter of tube	.25	in.
Fin thickness	.01	in.
Number of heater cores	1	

#### Floor heater blowers

Front	In Rooftop unit
Rear	

#### Controls

Manufacturer	Valeo
Model	

#### Driver's heater

Manufacturer	ACC Climate Control
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Model	PN: 24042A0000B	
Capacity	50000	Btu/hr

### Ventilation system

Type	Freeblow
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### Coolant heater

Make	Espar	
Model	05 001 282	
Capacity	15000	Btu

### Interior lighting

Manufacturer	TecNiq	
Type	LED	
Number of fixtures	8	
Size of fixtures	4" round	
Power pack	12 volt	

### Doors

#### Front

Manufacturer of operating equipment	A&M Systems
Type of door	Double out
Type of operating equipment	Electric

#### Rear

Manufacturer of operating equipment	
Type of door	
Type of operating equipment	

### Passenger windows

#### Front

Manufacturer	Cleer Vision		
Model	CT Series		
Type	Clamp Ring		
Number:	Side	13	
	Rear		
Sizes:	36x36	19x36	
Glazing:	Type	Tempered	
	Thickness	.125"	
	Color of tint	Black	
	Light transmission	24%	

**Mirrors**

	Size	Type	Manufacturer	Part no.	Model no.
Right side exterior	9x13	Heated/remote	Safe Fleet		
Left side exterior	9x13	Heated/remote	Safe Fleet		
Center rearview	6x16	flat			
Front entrance area					
Upper-right corner					
Rear exit area					

**Seats****Passenger**

Manufacturer	Freedman
Model	GO-ES
Type	Mid-Hi 3pt

**Operator**

Manufacturer	USSC
Model and part number	G2 Series
Type	Air Suspension

**Paint**

Manufacturer	
Type	

**Wheelchair ramp equipment**

Manufacturer	Braun Mobility		
Model number	RA300		
Capacity	1000	lbs	
Width of platform	34	in.	
Length of platform	62	in.	
System fluid capacity		quarts	
Type of fluid used	Exxon Univis HVI		
Operating hydraulic pressure		psi	
Hydraulic cylinders:	Size		
	Number		

**Wheelchair securement equipment**

Manufacturer	Q'Straint
Model number	Q8100-A-SC3 (Deluxe Slide-N-Click)

**Destination signs**

Manufacturer	Twin Vision
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Type

Mobilite LED

### Character length

Front destination	42.13	in.
Front route		in.
Curbside destination	27.96	in.
Rear route		in.

### Character height

Front destination	4.1	in.
Front route		in.
Curbside destination	4.1	in.
Rear route		in.

### Number of characters

Front destination	13
Front route	
Curbside destination	7
Rear route	

### Message width

Front destination	42.13	in.
Front route		in.
Curbside destination	27.96	in.
Rear route		in.

### Electrical

#### Multiplex system

Manufacturer	I/O Controls
Model number	CV-BCM-ARBOC-02

#### Batteries

Manufacturer	Alliance Batteries
Model number	Group 31
Type	1520 CCA (2 Batteries)

### Communication system

#### GPS

Manufacturer	TDB
Model number	

**PA system**

	Manufacturer	Model number	Number
Amplifier	REI	700890	1
Microphone	REI	480015	1
Internal speakers	Mito Corporation	17-4006NU4	4
External speaker	River Park	MA3013LG	1

**Energy storage (hybrid drive)**

Type	N/A	
Number of cells		V
Battery pack voltage		V
Weight		lbs

**Security camera system**

Manufacturer	REI	
Model number		
Number of cameras	3	
Storage capacity	320gb	

**Bike racks**

Manufacturer	Sportworks
Model number	DL2

**Fire detection system**

Manufacturer	Fogmaker	
Model number		
Fire detectors		
Type (thermal or optical)	Thermal	
Number of detectors	3	

**Automatic voice annunciator system**

Manufacturer	TBD
Model and part number	

**Annunciator LED sign**

Number of signs	
Housing dimensions	
Character length	in.
Character height	in.
Character width	in.

**GPS antenna**

Manufacturer	TBD
Model and part number	

**Automatic passenger counter**

Manufacturer	TBD
Model and part number	a.
	b.
	c.
Sensor type	

**Real-time bus arrival prediction system**

	Manufacturer	Model number
Router		
Cellular modem		
Charge protection		

**Electronic tire pressure monitoring system**

Manufacturer	
Model number	

**Electronic brake stroke/wear indicator system**

Manufacturer	N/A
Model number	

**NOTE:** All information above is accurate to the timeframe upon submission. The Agency reserves the right to update above data if changes occur, upon consultation with the customer.