

**CITY MANAGER’S OFFICE  
MEMORANDUM**



**TO:** Bob Vitas, City Manager  
**FROM:** Norman Whitaker, Transit Director  
**SUBJECT:** Bus Fleet Replacement FY 2013-2014

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**Purpose of the Report**

The Key West City Commissioners have tasked Key West Transit (KWT) staff to research the following before purchasing New Bus Fleet:

- “Green” Fleet for sustainability goals
- Smaller buses for downtown routes

**Approach and Methodology**

Transit staff held discussions to set up a Five (5) Year *Tentative Plan*. They are as follows:

- 100% of all new bus purchases will exceed our Climate Action Plan
- 25% of new bus fleet will be Hybrid Clean Diesel Electric
- New buses will be appropriately sized for our city streets
- New bus purchase shall maintain or increase levels of ridership
- New bus purchase shall maintain or increase levels of service

Fiscal Year & Amount	Number & Type of Buses – Gillig BRT Low Floor
FY 2014 (\$1,225,600 w/ additional funds pending)	Three (3) Clean Diesel & one (1) Hybrid Diesel Electric
FY 2015 (\$1,570,400)	Three (3) Clean Diesel
FY 2016 (\$742,400)	One (1) Hybrid Diesel Electric
FY 2017 (\$739,200)	One (1) Hybrid Diesel Electric
FY 2018 (\$813,600)	One (1) Hybrid Diesel Electric

Note: Depending on available yearly funding and the dependability of the Hybrid Diesel Electric buses, bus purchases may be subject to change.



## **City of Key West Transportation Coordination Team**

### ***Approval of 25% Hybrid Bus Purchase***

**Authors:** Alison Higgins, Sustainability Coordinator

**Reviewers:** City's Transportation Coordination Team: Donny Barrios, Doug Bradshaw, Don Craig, Rod Delostrinos, Peter Horton, Greg Veliz, Marilyn Wilbarger, John Wilkins, Norman Whitaker, Jim Young, David Fernandez

#### **Executive Summary**

The recommendation in this memo was vetted by the City's internal Transportation Coordination Team (named above), whose mission is to proactively and efficiently coordinate transportation related plans, projects, policies and funding in order to reduce congestion in our roadways, improve safety and quality of life for our residents and tourists, reduce greenhouse gas emissions, save taxpayer money, and ensure smarter use of our right of ways.

In light of the City's growing green initiatives and resolution to reduce greenhouse gasses (ghg) by 15% by 2015, the City Commission requested that staff green both the City's own fleet and the community's transportation footprint.

For Fiscal Year 2013-2014, Staff reviewed many manufacturers and options and pursuant to the City of Key West Ordinance, Section 2-844, brand name specifications, recommends the purchase of three (3) 30' Gillig Clean Diesel Low Floor BRT buses and one (1) 30' Gillig Hybrid Low Floor BRT bus from the LYNX Contract No. 14-C09.

The Team agreed on this 25% hybrid arrangement for a number of reasons. Of greatest concern was increasing the reliability of the fleet by adding as many new busses as the budget would allow. A hybrid only purchase would almost halve the number of reliable buses the City would be able to put on the road, jeopardizing service and therefore ridership.

Because of great strides in government mandated diesel efficiency, the Team was impressed with the fuel efficiency of the non-hybrid "Clean Diesel" busses, which have a 75% reduction on emissions in comparison to the busses they are replacing. When combined with the biodiesel blends the City is already using and intends to increase next fiscal year, the bus fleet is expected to hit its' 15% ghg reduction goal.

Lastly, the Team feels that the commitment to a 25% hybrid balance on this and all future bus fleet purchases is the most fiscally responsible approach to going green for the fleet, due to the steady improvement of hybrid technology over time.

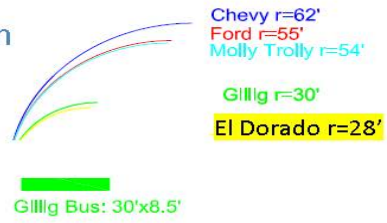
# Bus Comparison Table

Bus Model	Climate Goals	Turning Radius	Useful Life	Body Type	Stowage Space	Capacity		ADA	
						Seating	Standing	Easy Boarding	Seats Displaced
Gillig Hybrid Clean Diesel, 30ft. 	✓	30'	12 year/ 500,000	Stainless steel	✓	32	15	✓	4
Gillig BRT Low Floor, 30ft. 	✓	30'	12 year/ 500,000	Stainless steel	✓	32	15	✓	4
El Dorado Hybrid  Electric	✓	30'	12 year/ 500,000	Carbon Steel	✓	32	15	✓	4
El Dorado BRT  Low Floor, 30ft	✓	30'	12 year/ 500,000	Carbon Steel	✓	32	15	✓	4
Molly Trolley 	N/A	50' – 60'	3 year/ 36,000	Aluminum	N/A	30	0	Optional	4
Cutaway 	✓	50' – 60'	7 year/ 200,000	Chevy Express	N/A	23	0	Optional	8

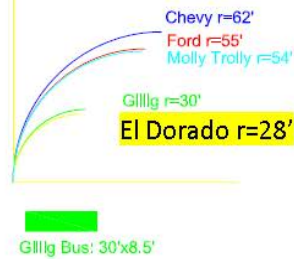
# Turning Radius



Bus Turning Radii overlaid at the intersection of Simonton and South Street



Bus Turning Radii overlaid at the intersection of Eaton and Whitehead Streets





Stowage area for suitcases, groceries, pet carriers, etc.



Aisle area - 30' Bus vs. Cutaways





Full Bus Photos presented are peak times

12/3/13 Bus 807  
6:04 PM  
(Blue Route at White & Truman)

8/29/13 Bus 804  
12:06 PM  
(Orange Route at Fogarty & 4th)



12/8/13 Bus 809  
11:34 AM  
(Green Route at Senior Center)

12/8/13 Bus 807  
4:36 PM  
(Blue Route at Key Plaza Shopping Center)

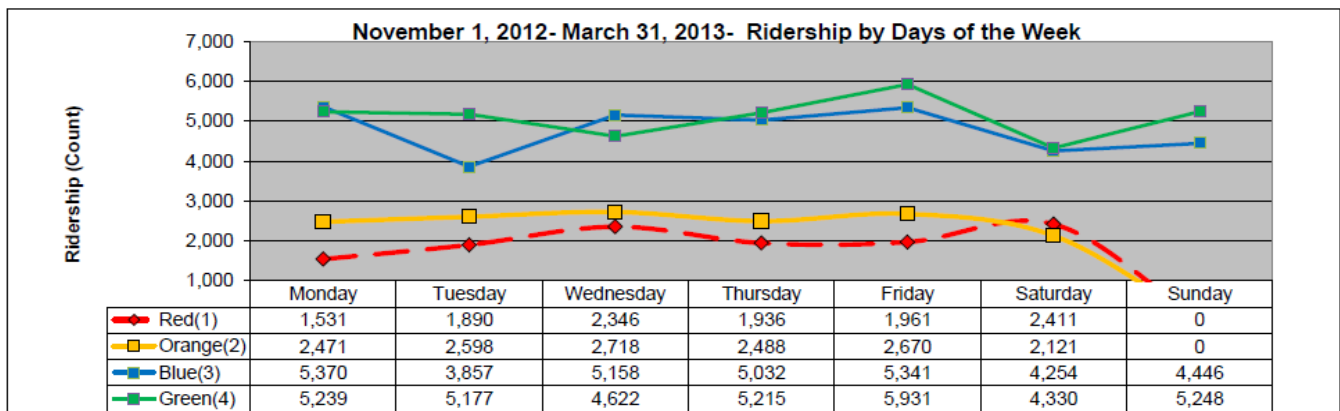


## Automatic Passenger Count (APC) Ridership Report – Peak (November 1, 2012 to March 31, 2013)

Ridership Report - CITY

**November 1, 2012 - March 31, 2013  
Peak**

	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday	
	Total	Average Per Day	Total	Average Per Day	Total	Average Per Day	Total	Average Per Day	Total	Average Per Day	Total	Average Per Day	Total	Average Per Day
Red(1)	1,531	72.9	1,890	99.5	2,346	111.7	1,936	92.1	1,961	89.1	2,411	109.6	0	0.0
Orange(2)	2,471	117.6	2,598	136.7	2,718	129.4	2,488	118.4	2,670	121.4	2,121	96.4	0	0.0
Blue(3)	5,370	255.7	3,857	203.0	5,158	245.6	5,032	239.6	5,341	242.8	4,254	193.4	4,446	202.1
Green(4)	5,239	249.4	5,177	272.4	4,622	220	5,215	248.3	5,931	269.6	4,330	196.8	5,248	238.5

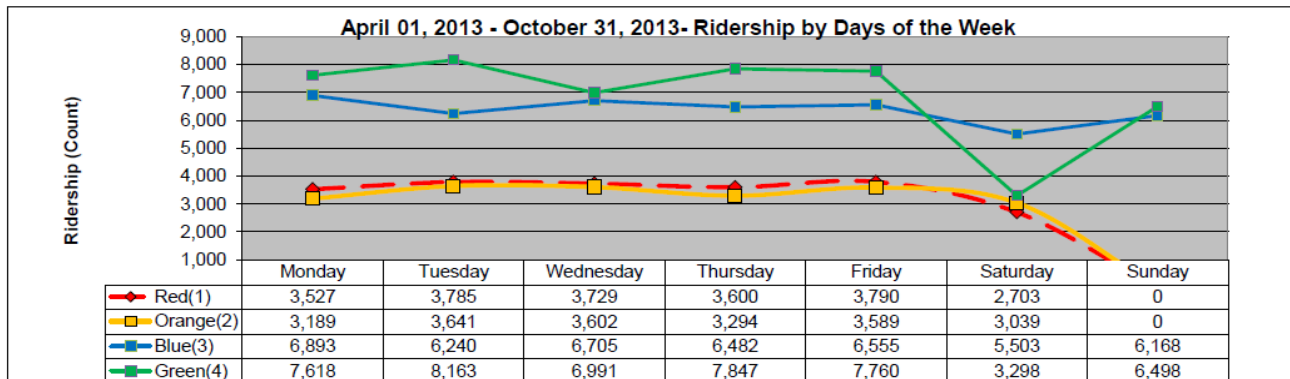


## Automatic Passenger Count (APC) Ridership Report – Non Peak (April 1, 2013 to October 31, 2013)

Ridership Report - CITY

**April 01, 2013 - October 31, 2013  
Non-Peak**

	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday	
	Total	Average Per Day	Total	Average Per Day	Total	Average Per Day	Total	Average Per Day	Total	Average Per Day	Total	Average Per Day	Total	Average Per Day
Red(1)	3,527	121.6	3,785	122.0	3,729	120.2	3,600	120.0	3,790	126.3	2,703	90.1	0	0.0
Orange(2)	3,189	109.9	3,641	117.5	3,602	116.2	3,294	109.8	3,589	119.6	3,039	101.3	0	0.0
Blue(3)	6,893	222.4	6,240	201.3	6,705	216.3	6,482	209.1	6,555	211.5	5,503	177.5	6,168	199.0
Green(4)	7,618	245.7	8,163	263.3	6,991	225.5	7,847	253.1	7,760	250.3	3,298	106.4	6,498	209.6



Key West Transit with the assistance from Florida Department of Transportation (FDOT) was successful in allocating funds for Bus Fleet Replacement in the Five (5) Year Transportation Plan - FY2014 to FY2018. The funding is as follows:

Fiscal Years:	Amount:	(Pending) Additional Funding:
FY 2014	\$1,225,600 / \$2,072,532	<ul style="list-style-type: none"> <li>• \$412,398 (Additional funding)</li> <li>• \$434,534 (reallocated from transit facility to bus fleet)</li> </ul>
FY 2015	\$1,225,600 (City – 2001 Fleet) \$344,800 (City / LKS – 2003 Fleet)	\$0 (Please note that FDOT is aware that KWT is in need of additional funding)
FY2016	\$742,400 (City / LKS 2003 Fleet)	\$0 KWT will request for additional funding if needed and if funding is available.
FY 2017	\$739,200 (City / LKS 2003 Fleet)	\$0 KWT will request for additional funding if needed and if funding is available.
FY 2018	\$813,600 (City / LKS – 2003 Fleet)	\$0 KWT will request for additional funding if needed and if funding is available.

LYNX, Central Florida Regional Transportation Authority had published a Request for Proposal (RFP) - Purchase of Heavy Duty Transit Coaches. After the RFP process, Gillig was awarded the contract. Key West Transit was included in the RFP, therefore, gives us permission to purchase off of Contract No. 14-C09. The contract is attached for your review.

Purchasing the 30' Gillig Low Floor BRT buses is urgently needed given the following reasons and research:

- Reduce the cost of maintenance and inventory
- Able to continue providing an efficient public transit system
- New warranted vehicles with minimal initial support costs
- Twelve (12) Year Life Cycle / 500,000 miles
- Construction of the bus has stainless steel chassis for strength and corrosion resistance
- Patented aluminum body for weight reduction
- Turning Radius 30' and Approach / Departure Angle – 9 degrees
- Seating max - 32 passengers, but can transport up to 47 passengers, reducing traffic by up to 24 vehicles
- According to a study conducted by the Northeast Advanced Vehicle Coalition (NAVC), nitrogen oxides (NOx) emissions for diesel hybrids were 30 to 40 percent lower than a conventional diesel vehicle.
- 75% reduction on emissions compared to a conventional diesel bus



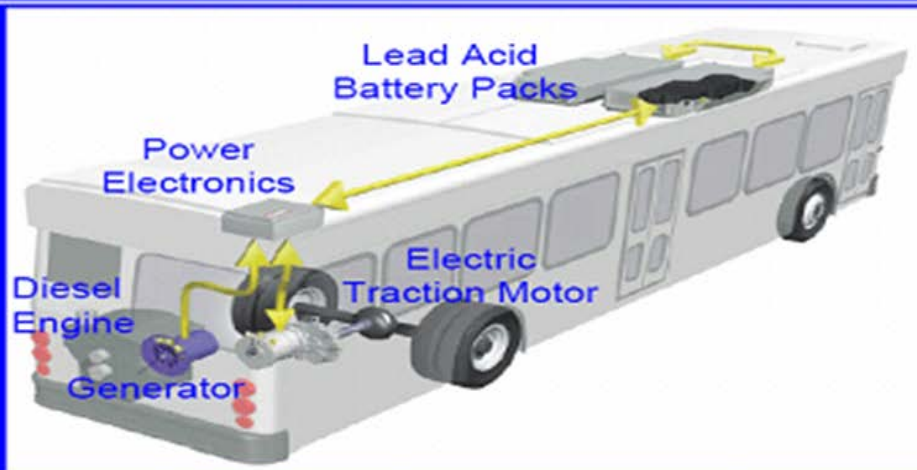
Gillig Low Floor BRT



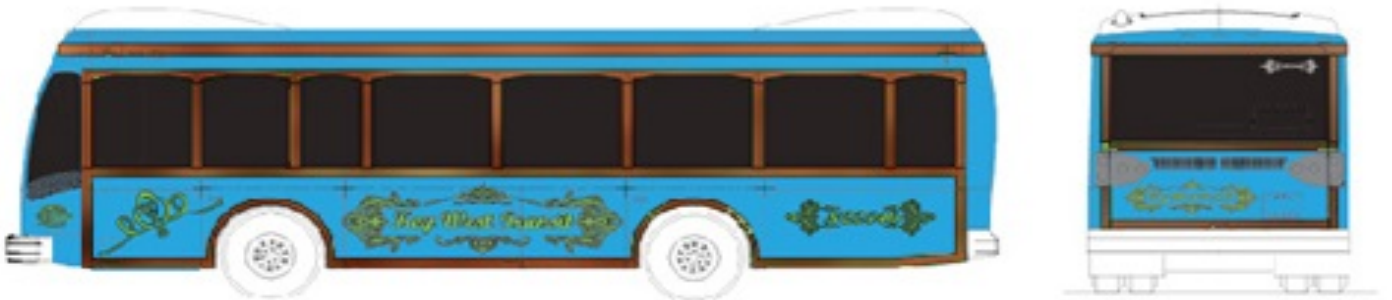
Gillig Hybrid Electric Clean Diesel (Low Sulfur) Bus



## BAE Hybrid System



**Bus Wrap Options:**



In the Gillig cost proposal, the basic paint color selections are part of the base price.

Please note, these tentative bus wraps for your review, are not included in the cost proposal from Gillig. The bus wrap cost is estimated at \$6,000 per bus and will require going out for bid.



**Staff researched other options and they are as follows:**

- El Dorado E-Z Rider II BRT Low Floor Clean Diesel and Hybrid Clean Diesel Electric
- Molly Trolley
- Cutaway Buses

**El Dorado E-Z Rider II BRT Low Floor Bus**



The El Dorado E-Z Rider has some of the same similarities as the Gillig Buses have – operational wise. The only differences are:

- Brand Name
- Body style
- Carbon steel vs stainless steel (Gillig)
- \$324,328 (El Dorado) & \$421,650 (Gillig)

**El Dorado Hybrid Electric**





Molly Trolley







Key Wet Transit does not recommend the use of Molly Trolleys for the following reasons:

- Unable to use for the Lower Keys Shuttle route
- No standing and stowage room
- Not able to lower / kneel the bus
- Rear lift which would require the driver to exit out of his seat to operate.
- Warranty too short – 3 years / 36,000 miles
- Base price cost depending on the options - \$135,000 to \$150,000

On 2/10/2014 the Key West, Fl. Transportation Director Norman Whitaker contacted

Jamie Bradish  
Molly Corporation  
60 Willie Hill Road  
P.O Box 1799  
Wells, ME 04090  
Tel. (207) 646-5908  
Fax. (207) 646-6497  
[jbradish@mollytrolley.com](mailto:jbradish@mollytrolley.com)

to obtain information relating to the curb to curb turning radius of a Molly Trolley.

Jamie Bradish, indicated that the Molly Corporation builds on a variety of Ford and Freightliner chassis. Mr. Brandish also indicated they could correct fit for application.

Depending on engine location, chassis, and wheelbase the turning radius can range up to 54 feet.

On 2/11/2014, the Key West , Fl. Transportation Director Norman Whitaker spoke by telephone to

Joe Moyer  
Historic Tours of America®  
201 Front Street  
Key West, Florida 33040  
Phone (305) 296-3609

to obtain information relating to the curb to curb turning radius of a Molly Trolley.

Joe Moyer provided the following informaiton and gave permission to include it in the documents being used as a bus purchase back-up:

Joe Moyer indicated that he assisted with the design and building of twenty five (25) trolleys used by Historic Tours in Key West, Florida. Joe Moyer stated Molly Trolleys are used as well. Joe Moyer also stated that depending on the engine location, chassis, and wheelbase length, the curb to curb turning radius could range from twenty four (24) to fifty four (54) feet.

When the Transportation Director Norman Whitaker spoke to Joe Moyer about the use of trolleys on actual fixed transit routes, Joe Moyer agreed that trolleys are mainly used for tourism, beach, and downtown open air shuttle type service routes, and would not be the best vehicle to use in transit due to weaker air conditioners and because the chassis were always being changed.



# 2013

## F53 Super Duty Motorhome Chassis

### Technical Specifications cont'd

#### Cooling Systems

##### COOLING SYSTEM SPECIFICATIONS

Engine	Cooling	Trans. Usage	Radiator				Rows of Tubes	Fins Per Inch	Cooling System Capacity (qts. (liters))	Fan Specifications			
			Frontal Area (sq. in.)	Height	Width	Thick.				In-Tank Trans Cooler	Type	No. of Blades	Blade Dia. (in.)
6.8L (415) 3V SEFI V10	Standard	All	857	28.4	30.19	1.42	1	17.8	27.5 (26)	Standard	Plastic	8	20.0

##### AUXILIARY AUTOMATIC TRANSMISSION OIL COOLER APPLICATIONS

Engine	Transmission	Cooler — No. of Plates
6.8L (415) 3V SEFI V10	5-speed Automatic Overdrive	33

#### Fuel System

##### FUEL SYSTEM DATA

Electronic Fuel Injection	Sequential Multiport Fuel Injection
Fuel Pump	Single Electric-in-tank High Pressure
Fuel Filter	In-tank Large Capacity (One)
Air Cleaner	Dry Element, Replaceable

#### Steering

##### STEERING SPECIFICATIONS

Wheelbase (in.)	Power Steering <sup>(1)</sup>		Turning Diameter (ft.)	
	Gear Ratio		Curb-to-Curb	
		16,000–22,000-lb. GVWR w/19.5" wheels	22,000-lb. GVWR w/22.5" wheels	24,000–26,000-lb. GVWR w/22.5" wheels
158.0	18.4:1	45.4	—	—
178.0	18.4:1	49.7	—	—
190.0	18.4:1	52.2	—	—
208.0	18.4:1	56.1	63.7	—
228.0	18.4:1	60.3	68.6	60.6
242.0	18.4:1	63.3	72.0	66.8
252.0	18.4:1	—	—	69.5

(1) Power steering fluid cooler is standard.

#### Suspensions

##### FRAME SPECIFICATIONS

Wheelbase (in.)	No. of Crossmembers	Maximum Side Rail Section (Height x Width x Thickness) (in.) <sup>(1)</sup>	Section Modulus (cu. in.)	16K–22K Yield Strength (psi)	24K–26K Yield Strength (psi)
158.0	7	9.16 x 3.00 x .025	9.46	36,000	—
178.0	7	9.16 x 3.00 x .025	9.46	36,000	—
190.0	7	9.16 x 3.00 x .025	9.46	36,000	—
208.0	8	9.16 x 3.00 x .025	9.46	36,000	—
228.0	9	9.16 x 3.00 x .025	9.46	36,000	50,000
242.0	9	9.16 x 3.00 x .025	9.46	36,000	50,000
252.0	9	9.16 x 3.00 x .025	9.46	—	50,000

(1) Measured to inside of metal.

##### SHOCK ABSORBER SPECIFICATIONS

Type	Usage	Front			Rear		
		No. Used	Piston Dia. (in.)	Type	No. Used	Piston Dia. (in.)	Type
Bilstein	Std.	2	1.63	Gas-pressurized	2	1.63	Gas-pressurized

Cutaway Buses (Paratransit vehicles)



Base price: \$90,000 to \$100,000  
For Hybrid option: additional \$60,000





Key West Transit does not recommend the use of Cutaways buses on the fixed route services. The Cutaways are used more for Para-transit services (door to door), Hotel Shuttle services, Vehicle Rental Pick-up / Drop-off service, and the cutaways can also be rented for personal use such as special events for weddings, birthdays, prom, etc.

Life cycle is seven (7) years / 200,000 miles. Seating capacity for a 30-ft cutaway is twenty-three (23); this includes the driver and the 2 wheelchair passengers.

The cutaway buses are not low floor – meaning that the driver cannot lower / kneel the cutaway bus for the passengers and the cutaway is equipped with a lift instead of a ramp.

The differences with the wheelchair lift and wheelchair ramp are as follows:

- The driver will have to park the cutaway bus, get out of his seat, go to the back to drop the lift, secure the wheelchair passenger on the lift, raise the lift, secure the wheelchair passenger in the wheelchair seating area, secure and lock the lift, get back into the cutaway, make sure everyone is seated and then he will proceed to continue on his route. If this was a “ramp”, the driver releases the ramp, the wheelchair passenger will roll themselves onto the ramp and into the bus, and the driver will then lift up the seats to secure the wheelchair passenger, and then proceed on route.
- Once the wheelchair passenger reaches their destination, the driver will have to repeat the above steps for the lift compared to the driver having to unsecure the wheelchair passenger and releasing the ramp for the wheelchair passenger to exit the bus.



Transit bus with wheelchair passengers



Cutaway bus with wheelchair passengers



The Director of Key West Transportation Department, Norman Whitaker had a phone conversation with Ms. Anna Haskins, the Special Needs Coordinator for Monroe County and had asked if she could provide information relating to the larger cutaways in Key West. Below is the response received from Ms. Haskins.

City of Key West Mail - RE: Buses - Revision



Carolyn Haia <chaia@keywestcity.com>

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**RE: Buses - Revision**

1 message

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**Haskins-Anna** <Haskins-Anna@monroecounty-fl.gov>  
To: Norman Whitaker <nwhitaker@keywestcity.com>  
Cc: "chaia@keywestcity.com" <chaia@keywestcity.com>

Fri, Jan 17, 2014 at 8:46 AM

Monroe County Transit (Transportation) acquired a vehicle several years back which was larger in size than what we normally order. (I have referenced the vehicle in the second paragraph) We did this so that we could accommodate more clients. In the process, we found that this bus was unmanageable on the smaller City of Key West Streets. Our Key West drivers stated that it was difficult to maneuver and because we are a door to door service, many of our clients had to wait for a different bus which could make it down their small streets and lanes. Given our recent history with this type of bus we made the decision to move it up to our Upper Keys area where most of the driving is on the main roads. I am unable to speak of the actual turning radius but this was apparently part of the problem. The drivers that operated this bus in the Key West area complained that it was difficult to maneuver citing the turning radius as well as other factors as their concern. In recent purchases, we considered these reasons as factors in going with the much smaller more easily maneuvered vehicles.

Our Vehicle that I speak of is a 2007 GM/GLAVAL TITAN 25' CAW It has a W/C LIFT holds up to 16 amb – if only ambulatory - or up to 6 wheelchairs if all spaces are utilized leaving room for only 2 ambulatory. The current (Upper Keys) driver states that to him this bus is great with turning in the areas that he has to operate. In fact, he would prefer to drive this bus over the smaller cutaways as it has a better turning radius than the much older vehicles in their area. He did cite that the bus is larger(in footprint) and is set up higher than the other buses. He sees this as a bit of a disadvantage in the Keys.

It would seem that our smaller buses would not fit your purposes and the amount of people which you handle. However this slightly larger cutaway has a footprint which may not suit your needs either and the maneuverability(or lack thereof) on the small Key West Streets would be a challenge. I am not sure that this helped. I wanted to give you all of the information available to me so I asked the actual drivers and received mixed responses. If you have any questions or concerns regarding this information, please, do not hesitate to contact me.

Anna Marie Haskins

Special Needs Coordinator

Monroe County BOCC

Transportation

1100 Simonton St, Rm 1-198

Key West, Fl 33040

305-292-4591