Ferry Transit Disabled Access: New York – New Jersey Harbor Private Ferries A Case Study

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Abstract

Passenger ferries in the New York - New Jersey Harbor have proliferated in recent years and now carry almost 67,000 passengers each day, with over 50 vessels serving 39 routes. With 1.6 million disabled individuals in New York City alone, accessibility is a key concern. The US Access Board, a Federal agency tasked with developing accessibility standards, is in the process of developing accessibility standards for passenger vessels. A milestone in this process was reached with the publication in December 2000 of recommended vessel accessibility guidelines by the Board's Passenger Vessel Access Advisory Board (PVAAC), an assembly of representatives from the disabled community and the passenger vessel industry. This paper applies the PVAAC recommendations to the smallest vessel of the New York - New Jersey Harbor private transit ferry fleet, providing insights on the design challenges of small passenger vessel accessibility. The paper is intended to heighten the awareness of such design challenges among the disabled, vessel operators, and marine designers, and to provoke innovative solutions.

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INTRODUCTION

The New York - New Jersey Harbor private ferry fleet provides mass transit service to approximately 67,000 riders daily. This paper addresses that fleet's accessibility, noting significant challenges and accomplishments.

There are over 4,000 passenger vessels in the United States, serving over 200 million passengers per year. Federal guidelines are now being developed to improve the accessibility of passenger vessels. The Americans with Disabilities Act (ADA) is a comprehensive civil rights law that prohibits discrimination on the basis of disability and requires, among other things, that newly constructed and altered State and local government buildings and facilities, places of public accommodation, and commercial facilities be readily accessible to and usable by individuals with disabilities.

BACKGROUND

The New York - New Jersey Harbor private ferry fleet is a remarkable example of private enterprise cooperation with public agencies to provide mass transit, long considered a public responsibility. The New York - New Jersey Harbor's Staten Island Ferry public service, operated by the City of New York between two of its boroughs as a free service, carries 65,000 daily riders. Over ten years ago, a former trucking company owner and visionary, Arthur Imperatore, Sr., began commuter ferry service across the Hudson River between New Jersey and Manhattan. Today, his New York Waterway ferry service carries over 90% of the approximately 67,000 daily riders of private ferries. New York Waterway earns \$6 million in profits on revenues of \$73 million annually. Fares for the New York Waterway ferry currently range from \$3 to \$15. The entire private fleet consists of over 50 vessels, serving 39 routes and 26 terminals, none of which compete directly with the Staten Island Ferry. (See Figure 1).

Ferry service in the New York - New Jersey Harbor consists primarily of short hauls, unlike typical commuter ferry routes in Seattle, San Francisco, and Boston of 10 miles or more. Eighty seven percent of the New York - New Jersey Harbor private ferry routes are 4 miles or less. See Figure 2. This is significant because the shorter ferry routes tend to be served by smaller vessels. Size matters very much when it comes to accessibility of passenger vessels. As vessel size decreases, it is increasingly difficult to achieve accessibility. Where accessibility is achieved, it is done so with a higher percentage of passenger space real estate than for larger vessels. The private commuter ferries range in passenger capacity from 74 to 400, and range in length from 16.2 m (53 ft) to 39.9 m (131 ft). (See Figures 3 - 5). By contrast, the Staten Island Ferry operates two 6,000-passenger vessels, 94.5 m (310 ft) long.

The Architectural and Transportation Barriers Compliance Board (US Access Board, www.access-board.gov/) is an independent Federal agency concerned with accessibility for people with disabilities. The Board is responsible for developing and maintaining accessibility requirements for transit vehicles. In 1998, the Board created the Passenger Vessel Access

Advisory Committee (PVAAC), which included owners and operators of various passenger vessels, designers of passenger vessels, organizations representing individuals with disabilities, and others. PVAAC used the report (ADAAG-R, http://www.access-board.gov/ada-aba/commrept) of the Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG) Review Advisory Committee as a baseline for writing its own recommendations for passenger vessel accessibility. ADAAG serves as the basis of standards issued by the departments of Justice (DOJ) and Transportation (DOT) to enforce the law.

The PVAAC report (www.access-board.gov/pvaac/commrept/index), issued in December 2000, is being used by the US Access Board to develop the proposed rules for passenger vessel access which will supplement the Board's ADA Accessibility Guidelines for Transportation Vehicles.

The Passenger Vessel Accessibility Guidelines (PVAG) are intended to cover primarily larger passenger vessels, i.e., those classified by the US Coast Guard as Subchapter H and K (see 46 CFR 70 - 80 and 114 - 122). The Guidelines also apply to vessels subject to subchapters C or T (see 46 CFR 24 - 28 and 175 - 185) which are typically smaller vessels. Subchapter T vessels have a gross tonnage (volumetric units of 100 cubic feet) of under 100 tons, carry no more than 150 passengers, and have accommodations for not more than 49 overnight passengers. If a vessel measures less than 100 gross tons but carries more than 150 passengers (or has accommodations for not more than 49 overnight passengers), it then loses its "T-Boat" designation and becomes a Subchapter K vessel. If its tonnage is greater than 100, it then becomes a Subchapter H vessel. Approximately one-half of the New York - New Jersey Harbor private ferry fleet is made up of "T-boats", while the balance of the fleet consists of "K-boats".

Passenger vessels have been covered by the ADA since its inception in the early 1990's. Without specific guidelines addressing passenger vessels, designers and operators have had to consider the general nondiscrimination principles of the ADA. Additionally, the Department of Justice's (DOJ) Technical Assistance Manual includes guidance where ADAAG has no standards for a particular type of facility. The DOJ manual provides that "[i]n such cases, the ADAAG standard should be applied to the extent possible. Where appropriate technical standards exist, they should be applied. If there are no applicable scoping requirements (i.e., how many features must be accessible), then a reasonable number, but at least one, must be accessible."

The Board's proposed guidelines will not require that all existing passenger vessels be brought up to a level of access that would comply with the proposed (or final) guidelines. All existing facilities have had an ongoing obligation to achieve program accessibility (if covered by Title II - state and local government services, such as the City of New York's Staten Island Ferry service) or to remove architectural barriers if it is readily achievable to do so (if covered by Title III - places of public accommodation and commercial facilities, such as the New York - New Jersey Harbor private ferry fleet). However, these guidelines are intended to address new construction and alterations only.

The next step will be for the Board to publish the guidelines in final form. For further information from the US Access Board, please contact: Paul N. Beatty, Office of Technical and Information Services, Architectural and Transportation Barriers Compliance Board, 1331 F Street, NW., Suite 1000, Washington, DC 20004-1111. Telephone number (202) 272-0012 (Voice); (202) 272-0082 (TTY). Electronic mail address: beatty@access-board.gov.

CASE STUDY

This paper critiques the smallest vessel of the New York - New Jersey Harbor private transit ferry fleet for disability access. The vessel is a 74 passenger, 16.2 m (53 ft) high-speed catamaran ferry (Figure 5). She is a Subchapter T vessel (under 100 gross tons and carrying not more than 150 passengers), built in 2002.

This paper applies the PVAAC criteria for new construction, not for alterations, and for Subchapter H and K vessels to the subject vessel, which is regulated under Subchapter T, and identifies a sampling of discrepancies found. Although the PVAAC addresses Subchapter C and T vessels, it establishes a length on deck threshold of 19.8 m (65 ft) to apply its criteria. The subject vessel has a length on deck of 16.1 m (53 ft). Even though it would thus be exempt from the PVAAC criteria as currently presented, this vessel is remarkably accessible for its size. If such a small vessel can achieve this level of accessibility, there are important lessons to be learned which can be applied broadly to vessels of similar and greater size.

Citations from the PVAAC December 2000 Report are italicized in text boxes, with the numbering referring to the Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities Review Advisory Committee Report (ADAAG-R).

Onboard Accessible Routes

The vessel has two passenger decks (Main and Upper). The Main Deck has an area of 97.6 m^2 (1007 ft²). The vessel is boarded on the Main Deck, over the bow, through the port and/or starboard door(s). The passenger salon is fitted with aircraft type seating with wide aisles, port and starboard (Figure 6). There is a snack bar at the aft end of the cabin, and a rear door out to the Main Deck aft, where there is a unisex toilet room, and a stairway up to the Upper Deck (Figure 7). The Upper Deck has bench seating in the weather (Figure 8).

206.2.3 Multi-Level Passenger Vessels. At least one accessible route shall connect each level required to be accessible, including mezzanines, onboard multi-deck passenger vessels.

EXCEPTION 1. An accessible route is not required to levels located above or below the accessible level in passenger vessels that are less than three decks or that have less than 3,000 square feet (280 m^2) per deck.

EXCEPTION 2. An accessible route is not required between decks on a high-speed ferry with only two passenger decks where all types of passenger facilities are available on the accessible deck.

EXCEPTION 3. An accessible route is not required to a deck which is less than 300 (28 m^2) square feet in size.

It might be argued that the open air seating and expanded view from the Upper Deck constitutes a "passenger facility" not available on the Main Deck, even though the Main Deck salon is fitted with large picture windows. In this case, even if the open air seating and/or viewing area were deemed to constitute a "passenger facility", the vessel would qualify under Exception 1 on the basis that her individual deck space is less than 280 m² (3,000 ft²), and vertical access (by elevator or lift) to the Upper Deck would not be required.

It should be noted that in the case of this and many small vessels, the installation of an elevator would not be feasible. The primary obstacle would be the vessel stability, since the

vertical center of gravity of the elevator, its housing, and machinery would likely be above the overall vessel center of gravity. Other considerations include the added electrical loads, added propulsion requirements for greater weight, space and arrangement considerations, vessel draft, trim and heel, and cost of installation and maintenance. As the vessel size is increased, the impact of an elevator is decreased. Larger "K" vessels and "H" vessels would not be expected to have an elevator become a "show stopper" on the basis of stability alone. Smaller "K" vessels, however, such as the high-speed passenger catamarans serving the New York - New Jersey Harbor, would likely be seriously impacted by the addition of an elevator, both from the added weight that would degrade speed as well as the stability considerations.

206.5.1 Accessible Entry and Departure Points. Each accessible entry and departure point shall have at least one accessible door or doorway. 404.2.3 Clear Width. Doorways shall have a clear opening of 32 inches (815 mm) minimum. Clear openings of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees. Openings more than 24 inches (610 mm) in depth shall provide a clear opening of 36 inches (915 mm) minimum.

The vessel has two identical weathertight loading doors forward (Figure 9), and an aft door of the same dimensions. The clear opening of the doorway is 876 mm (34-1/2 in), exceeding the 815 mm (32 in) criteria.

404.4 Doors with Coamings. Doors such as weathertight and watertight doors, that have coamings which exceed ½ inch (13 mm) in height shall comply with 404.2 (manual accessible doors) or 404.3 (automatic and power assisted accessible doors) unless modified by 404.4, and shall comply with the applicable sections of 405 (ramps), unless modified by 404.4.

Note: Coaming Definition. The vertical plating bounding a hatch or located at the base of a door for the purpose of stiffening the edges of the opening and resisting entry of water. Coamings may be required by U.S. Coast Guard regulations or provided as part of good design practice.

404.2.5 Thresholds. Thresholds, if provided at doorways, shall be 1/2 inch (13 mm) maximum in height. Raised thresholds and changes in level at doorways shall comply with 302 and 303.

405.2 Slope. Ramp runs shall have a running slope not steeper than:

a. 1:4 if the rise is 3 inches (75 mm) maximum;

b. 1:6 if the rise is 6 inches (150 mm) maximum;

c. 1:8 if the rise is 9 inches (230 mm) maximum; or

d. 1:12 if the rise is greater than 9 inches (230 mm).

The cabin doors are fitted with 76 mm (3 in) coamings in accordance with USCG regulations. The inside deck has a change in level of 19 mm (3/4 in), due to the construction of the door frame, exceeding the 13 mm (1/2 in) criteria. The doorframe is flush with the exterior deck, thanks to fixed ramping (Figure 10). The ramp has a slope of only 1:24, one-sixth of the maximum permitted for the 75 mm (3 in) coaming.

Access barriers presented by coamings on vessels are common. Keeping the sea out of the vessel will always be a primary consideration. Use of ramping, either fixed plates or decking

compound, combined with the use of low profile doorframes, should provide a workable solution to this problem.

On / Off Accessible Route

For the subject vessel, passengers are boarded over the bow on the Main Deck forward.

1004.1 General. A transfer span will typically bridge from the side of the vessel to a landing on essentially the same level. The purpose of the transfer span is to accommodate the motion differences between the vessel and the float or dock.

1004.2 Slope. The slope of the transfer span shall not exceed 1:20 at a static condition. 1005.1 General. Gangways which are part of an accessible means of embarking/ disembarking a vessel shall comply with this section. Gangways shall be permitted to

assembarking a vessel shall comply with this section. Gangways shall be permitted to have transition plates complying with 1006 at the top and bottom.

1005.2 Slope. The slope of a gangway provided at a pier shall comply with 1005.2.1 and the slope of a gangway carried on a vessel shall comply with 1005.2.2.

1005.2.1 Pier Provided Gangway - Slope. (See advisory comment in appendix to this chapter.)

Note: Slope measured when vessel is in a static condition at a particular water level. 1005.5 Clear Width. The clear width between handrails shall be 36 inches (915 mm) minimum.

EXCEPTION: Where the main deck area of the vessel is less than 3,000 square feet (280 m^2), a gangway shall be permitted to have a clear width of 32 inches (815 mm) minimum. 1005.6 Horizontal Gap. The horizontal gap between the transition plate and the ramp, or the deck edge and the ramp shall be no greater than 3 inches (75 mm).

At this particular loading facility, the gangway slope is extreme, 2-1/8 in/ft (slope = 1:5.6). The PVAAC did not specify a fixed maximum slope for gangways due to extremes of tide and pier configurations. However, the gangway shown (Figure 11) is fixed at both ends to a floating pier; its slope does not vary with the tide. As such, there is a presumption that the slope should not exceed 1:12.

The gangway has a clear width of 902 mm (35-1/2 in), exceeding the 815 mm (32 in) criteria specified for a vessel of this size.

The base of the gangway has a vertical step of 64 mm (2-1/2 in), clearly exceeding the 13 mm (1/2 in) criteria for change in level. A hinged flat plate at the base would be effective here.

This vessel loads passengers at seven different terminals around the city, none of which is owned by the ferry operator. There are at least 26 such terminals served by the New York - New Jersey Harbor private ferry fleet, 14 of which are in New Jersey. Some of the terminals are cityowned, some are state-owned (or owned by a bi-state authority), and some are privately owned. The point is, in most cases, the ferry operator has little control over the loading configuration or the equipment provided. The problem is compounded by the wide variety of vessels, with different freeboards (height of the loading deck above the water), trims, bow shapes, and vessel size.

With the exception of the long haul commuter vessels that serve the Jersey shore and the Statue of Liberty vessels of the Circle Line fleet, almost all of the New York - New Jersey Harbor private ferry fleet loads over the bow. Nominal tides for this region are about 1.2 m (4

ft). Most of the terminals are served by floating piers (Figure 12). One notable exception is shown in Figure 13, where portable steps are used to compensate for tidal range. The New York - New Jersey Harbor is known for strong currents. The boat traffic in and around the terminals produces vessel motions that make loading difficult. The relatively small vessels, when compared to the bulk of the floating piers, add to the relative motion problem at the vessel/pier interface. Figures 14 and 15 show views of gangways that are better configured for their intended service.

The standard procedure for most of the ferry operators is to maneuver up to the pier, nudging the bow up to the pier fender at idle speed. Ahead throttle is then increased dramatically to hold the vessel in place while passengers are disembarked and re-embarked. In many cases, the relative motion of the vessel and the pier is significant, with vertical displacements of 100 mm (4 in) or more not uncommon during the loading process. While many of the piers have gangways/transition plates that make up this difference, many do not. At a minimum, a transition plate should be specified to provide safe passage over the vessel/pier interface.

Efforts are underway to investigate the use of locking bars to hold the vessel to the pier during loading operations. Although the impetus for this study is to reduce the vessels' fuel consumption and engine emissions during loading operations, such devices, if proved feasible, could enhance the safety and accessibility of the loading operation.

Egress

The primary means of escape from the subject vessel is via the weathertight doors at both ends of the Main Deck. The relatively low freeboard allows direct transfer from the deck to primary lifesaving gear.

Vessel Type - Subchapter T (46CFR177.500) Total MOE (Means of Escape) - 2 At least one MOE must be: 1. independent of watertight doors (117.500(a)). MOE can be: 1. normal exits (177.500(c)); 2. emergency exits; 3. passageways/ corridors; 4. stairways; 5. ladders; 6. deck scuttles; 7. windows. MOE cannot be: 1. elevators.

The vessel complies with PVAAC egress criteria.

Toilets

The vessel has a unisex toilet room located on the Main Deck aft.

213.1 Where toilet facilities are provided, they shall comply with 213. Where toilet facilities are provided on an inaccessible level, toilet facilities shall also be provided on an accessible level.

ADAAG-R 703.2.7 Mounting Location. Where a sign containing tactile characters is provided at a door, the sign shall be located alongside the door at the latch side.

The sign for the toilet room is mounted on the door, not alongside it. (See Figure 16).

604.8.1.1 Size. Wheelchair accessible compartments shall be 60 inches (1525 mm) wide minimum measured perpendicular to the side wall, and 56 inches (1420 mm) deep minimum for wall hung water closets and 59 inches (1500 mm) deep minimum for deck mounted water closets measured perpendicular to the rear wall.

The toilet room measures 1842 mm (72-1/2 in) wide by 1511 mm (59-1/2 in) deep, exceeding the PVAAC size criteria.

404.2.3 Clear Width. Doorways shall have a clear opening of 32 inches (815 mm) minimum.

Clear width of the toilet room door is 864 mm (34 in), exceeding the PVAAC criteria.

404.2.5 Thresholds. Thresholds, if provided at doorways, shall be 1/2 inch (13 mm) maximum in height.

The doorway has no threshold, ideal for wheelchair access, and exceeding PVAAC criteria. (See Figure 17).

Table 404.2.4.1 Maneuvering Clearances at Manual Swinging Doors.				
TYPE OF USE		MINIMUM MANEUVERING CLEARANCE ¹		
Approach	Door Side	Perpendicular to	Parallel to Doorway ²	
Direction		Doorway	(beyond latch side unless noted)	
From front	Pull	60 inches (1525 mm)	18 inches (455 mm), 24 inches	
-			(610 mm) preferred	
From front	Push	48 inches (1220 mm)	0 inches $(0 \text{ mm})^3$	
Notes:				
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1. Maneuvering clearance shall include the full width of the doorway.

2. Doors to hospital patient sleeping rooms are exempt from the clearance beyond the latch side of the door provided the door is 44 inches (1120 mm) wide minimum.

3. Add 12 inches (305 mm) if closer and latch are provided.

Maneuvering clearance for opening the door from the outside is 1143 mm (45 in), less than the PVAAC criteria of 1525 mm (60 in) for this application. For opening from the inside (See Figure 18), the subject vessel door has only a 51 mm (2 in) offset from the side bulkhead. PVAAC criteria call for a 305 mm (12 in) offset of the door.

404.2.7 Door Hardware. Handles, pulls, latches, locks, and other operable parts on accessible doors shall comply with 309.4. Such hardware shall be 30 inches (760 mm) minimum and 44 inches (1120 mm) maximum above the finished deck surface.

The dogs (latching devices) on the weathertight cabin doors and on the exterior toilet room door do not comply with these criteria. It is clear that they are intended to be crew operated only. (See Figures 16 & 18).

603.3 Mirrors. Mirrors shall be mounted with the bottom edge of the reflecting surface 40 inches (1015 mm) maximum above the finish deck surface.

The bottom edge of the mirror is located 1245 mm (49 in) above the deck, exceeding the allowable height per PVAAC criteria. (See Figure 19).

604.2 Location. The water closet shall be located with a wall or partition to the rear and to one side. The centerline of the water closet shall be 16 inches (405 mm) minimum to 18 inches (455 mm) maximum from the side wall or partition. 604.4 Height. The height of water closets shall be 17 inches (430 mm) minimum to 19 inches (485 mm) maximum measured to the top of the toilet seat. Seats shall not be sprung to return to a lifted position.

The toilet, shown in Figure 19, is located 455 mm (18 in) off the bulkhead, complying with PVAAC criteria. The toilet height is also compliant at 430 mm (17 in).

604.5 Grab Bars. Grab bars shall be provided on the rear wall and on the side wall closest to the water closet.

604.5.1 Side Wall. Side wall grab bars shall be 42 inches (1065 mm) long minimum, located 12 inches (305 mm) maximum from the rear wall and extending 54 inches (1370 mm) minimum from the rear wall.

604.5.2 Rear Wall. The rear wall grab bar shall be 24 inches (610 mm) long minimum, centered on the water closet. Where space permits, the bar shall be 36 inches (915 mm) long minimum with the additional length provided on the transfer side of the water closet.

There is no grab bar fitted at the rear bulkhead as called for by PVAAC criteria. The side wall grab bar is compliant at 876 mm (34.5 in) above the deck and compliant in length as well.

604.7 Dispensers. Toilet paper dispensers shall comply with 309.4 and shall be 7 inches (180 mm) minimum and 9 inches (230 mm) maximum in front of the water closet. The outlet of the dispenser shall be 15 inches (380 mm) minimum and 48 inches (1220 mm) maximum above the finished deck surface. There shall be a clearance of 1-1/2 inches (38 mm) minimum below and 12 inches (305 mm) minimum above the grab bar. Dispensers shall not be of a type that control delivery or that do not allow continuous paper flow. ADAAG-R 308.2 Forward Reach. 308.2.1 Unobstructed. Where a clear floor or ground space allows only a forward approach to an object and is unobstructed, the high forward reach shall be 48 inches (1220 mm) maximum and the low forward reach shall be 15 inches (380 mm) minimum above the floor or ground.

The toilet paper dispenser is mounted 1092 mm (43 in) above the deck, with a clearance of 197 mm (7-3/4 in) between the paper outlet and the grab bar, vs. the PVAAC criteria of 305 mm (12 in). There is room to mount the dispenser below the grab bar.

The soap dispenser is located 1118 mm (44 in) above the deck and the paper towel dispenser is 1219 mm (48 in) above the deck, complying with the PVAAC criteria.

606.3 Height. Lavatories and sinks shall be mounted with the front of the higher of the rim or counter surface 34 inches (865 mm) maximum above the finish deck surface. 606.4 Faucets. Faucets shall comply with 309. Hand-operated, self-closing faucets shall remain open for at least 10 seconds.

606.6 Exposed Pipes and Surfaces. Water supply and drain pipes under lavatories and sinks shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under lavatories and sinks.

The lavatory (shown in Figure 19) has a rim located 864 mm (34 in) above the deck, and has the proper faucets, complying with PVAAC criteria. However, its drain and hot water supply pipes are not insulated or otherwise configured to protect against contact, as called for by PVAAC.

For any passenger ferry, deck space = earning capacity (seating area). Despite the discrepancies noted above for the case study vessel's toilet room, for a vessel of this size to dedicate this much of her Main Deck to this function is a testament to her designer and owner in furthering accessibility. Even more revealing is the fact that this vessel, dubbed a "water taxi", is a short haul vessel. Her longest route involves no more than a 15-minute ride. She cruises at 25 knots. A taxi ride across Manhattan streets could easily take 45 minutes, yet none of them are fitted with toilets. A number of the other commuter ferries do not even have toilets, due to the short crossings.

Drinking Fountain

The vessel has no drinking fountains.

Lodging

Lodging is not applicable to this vessel, which has no overnight passenger accommodations.

Vehicle Parking

The subject vessel is passenger only, and does not carry vehicles.

Building Blocks

The vessel has a snack bar at the aft end of the passenger salon.

ADAAG-R 904.4 Point of Sales and Service Counters. Point of sales and service counters required to be accessible shall have a portion of the counter 36 inches (915 mm) minimum in length and 36 inches (915 mm) maximum in height above the finished floor or ground.

The snack bar counter is 1245 mm (49 in) above the deck, without a lower portion as called for by PVAAC.

Employee Areas

Employee work areas are for the most part located on an accessible route.

Subchapters C & T Vessels

Almost all of these vessels, including the subject of this case study, are smaller than Subchapter H and K vessels, but they constitute a much larger population of vessels, including the majority of day fishing boats, dinner cruise boats, whale watching and other sightseeing boats, and passenger ferries. If accessibility is difficult to achieve in larger vessels, it is even more so with smaller craft. Similarly, the impacts on vessel design and construction are much more pronounced for small craft. The PVAAC Report addresses small craft to some extent, and establishes a threshold based partially on vessel length, and on other parameters, to provide accessibility for many of the Subchapters C & T vessels. For small sailing vessels, the length on deck threshold was set at 24.4 m (80 ft). For small power vessels, the length on deck threshold was set at 19.8 m (65 ft). These vessels provide extensive opportunities for research and development of innovative solutions to passenger accessibility.

Wheelchair Spaces

The subject vessel is certified to carry 74 passengers. There are 53 fixed seats and one wheelchair securing space (See Figure 20) on the Main Deck in the passenger salon, as well as ten 2-person bench seats on the Upper Deck.

S1.2 Clear Deck Spaces - Required Number. Clear deck spaces, each 30 inches (760 mm) minimum by 48 inches (1220 mm) minimum, shall be provided in accordance with Table S1.2 and shall be dispersed among vessel program areas.

Table S1.2 Clear Deck Spaces

Passenger capacity of vessel	Minimum Number of Wheelchair Spaces
50 or less	2
51 to 100	4
101 to 149	6

Applying the above criteria to the subject vessel, four such wheelchair spaces would be required.

CONCLUSION

The marine environment can be harsh on the able bodied, and even more so on the disabled. Since the passage of the Americans with Disabilities Act of 1990, there has been slow progress in making marine vessels accessible. While much of the lack of progress can be attributed to cost considerations, there remain many accessibility barriers attributable to vessel and passenger safety. The US Access Board has been steadfast in its efforts to develop effective and efficient accessibility guidelines for passenger vessels, working actively with the design community, vessel operators, and the disabled. In the meantime, a number of progressive vessel operators have forged ahead to lead in breaking down barriers to accessibility. The subject case study vessel exemplifies that leadership, and provides valuable lessons learned for the design community to build on and expand the population of accessible passenger vessels.

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Figure 4 High-speed catamaran ferry, 150 passenger, 23.9 m (78.5 ft) long, Subchapter T





Figure 6 Main Deck passenger salon, looking aft



Figure 7 Stairway to Upper Deck

Figure 8 Upper Deck seating





Figure 9 Cabin door, Main Deck forward, starboard side



Figure 10 Main Deck ramping to door coaming



Figure 11 Gangway, bow loading, North Cove, World Financial Center





Figure 13 Fixed pier loading, Liberty Harbor, Jersey City



Figure 14 Floating pier gangway, World Financial Center



Figure 15 Gangway, bow loading, Pier 11, Wall Street



Figure 16 Unisex Toilet Room door



Figure 17 Toilet Room door threshold

Figure 18 Toilet Room door, inside



Figure 19 Toilet Room interior





Figure 20 Deck sockets for wheelchair restraints