



AGENCY ON BAY MANAGEMENT

4000 Gateway Centre Boulevard #100 · Pinellas Park, FL 33782

727.570.5151 Ext. 40

<http://www.tbrpc.org/abm>

MEETING AGENDA

September 11, 2014

9:00 AM

FULL AGENCY

Mayor Bob Minning, Chair

1. CALL TO ORDER / WELCOME
2. PUBLIC COMMENT/ ANNOUNCEMENTS
3. APPROVAL OF JULY 10, 2014 MEETING SUMMARY
4. FLORIDA WATER AND LAND CONSERVATION AMENDMENT

A representative from [Florida's Water and Land Legacy](#) will provide an overview of Amendment I, the Florida Water and Land Conservation Amendment, and explain how the proposed amendment may benefit the protection and management of Tampa Bay.

Action: Consider endorsing the Florida Water and Land Conservation Amendment

5. SWUCA RECOVERY STRATEGY: POTENTIAL ROLE OF RECHARGE AND ASR IN THE MIA

Don Ellison, SWFWMD, will discuss strategies for addressing salt water intrusion in the [Most Impacted Area](#) of the Floridan aquifer in light of recent recharge studies and an evolving regulatory framework governing aquifer storage and recovery. The SWFWMD is seeking partners, water sources and project options to help meet the minimum aquifer level in this area of the Tampa Bay region.

Action: None. Information only.

6. TAMPA BAY CRUISE TERMINAL PRE-FEASIBILITY STUDIES

TBRPC staff will summarize studies released earlier this year by the [US ACOE](#) (February) and [FDOT](#) (June) that contemplate the possibility of constructing a cruise terminal west of the Sunshine Skyway and facilitate a discussion regarding the involvement of the Agency on Bay Management if or when future decisions about this issue are being made.

Action: None. Information only.

7. OTHER ITEMS
8. ADJOURN

If you are a person with a disability who needs any accommodation in order to participate in this meeting, you are entitled, at no cost to you, to the provision of certain assistance. Please contact the Tampa Bay Regional Planning Council at (727) 570-5151 Ext. 17 within three working days of the meeting.



MEETING SUMMARY

AGENCY ON BAY MANAGEMENT

JULY 10, 2014

The full Agency met on July 10, 2014 in the Council conference room located at 4000 Gateway Centre Boulevard, Pinellas Park, FL. Mayor Bob Minning chaired the meeting.

Members/alternates present included the following:

Bob Minning, ABM Chair, Treasure Island/TBRPC
Lizanne Garcia, SWFWMD
Sarah Josuns, City of Clearwater
Stanley Kroh, TECO
Robin DiSabatino, Manatee County
Serra Herndon, Tampa Bay Watch
Al Higginbotham, Hillsborough County
Kevin Shelton, AMEC
George Isiminger, Port Manatee

George Henderson, Pinellas Citizen
Woody Brown, City of Largo/TBRPC
Angeleah Kinsler, TBRPC
Lindsay Cross, Tampa Bay Estuary Program
Jan Platt, Recreational Fishing Interests
Rob Brown, Manatee County
Sally Thompson, Hillsborough Citizen
Cathy Quindiagan TBEP CAC
Jim Iglar, Florida Aquarium

Other individuals present:

Barry Lenz, HDR
Bart Weiss, Hillsborough County
Julie Christian, FWC/FWRI
Judy Ashton, FDEP
Cameron Jaggard, Pew Charitable Trusts

Kyle Rodriguez, UF
Shelby Butts, Birkitt Environmental Services
Mary James, The Ash Group
Bill Fehring
Penny Hall, FWRI
Maya Burke, TBRPC/ABM Staff

Agenda Item 1 · Call to Order/Welcome

Chair Minning called the meeting to order at 9:03 a.m.

Agenda Item 2 · Public Comment

No public comments were made.

Agenda Item 3 · Approval of the March 13, 2014 Full Agency Meeting Minutes

Upon a motion by Mr. Shelton and a second by Mr. Higginbotham, the meeting summary was approved unanimously.

Agenda Item 4 · Florida Conservation and Technology Center

Mr. Kroh shared a progress report on the construction to date of the future Conservation and Technology Center located near the existing Manatee Viewing Center. Mr. Isiminger asked about when the fish hatchery was anticipated to come online and Mr. Kroh responded that it would be one of the last pieces to be completed, probably in five years. Ms. Thompson wondered about whether or not solar trash cans would be used on site. Mr. Weiss asked about the use of reclaimed water at the Center. Mr. Henderson was curious if the project would increase public access year-round and at what cost, if any. Ms. Platt sought assurance that manatees would not be adversely affected by the project and, specifically, the private boat ramp. She also commended TECO for their voluntary effort to improve and share this piece of Tampa Bay.

Agenda Item 5 · Little Fish, Big Role

Mr. Jaggard summarized the Pew Charitable Trusts efforts to raise awareness about the importance of forage fish and the environmental and economic imperatives for their protection. Ms. Platt noted the anecdotal abundance

of forage fish in Tampa Bay and shared the ABM's role in banning shrimping in Tampa Bay. She was interested if any local research on the topic exists. Mr. Henderson inquired about the Pew Charitable Trusts position on the Spawning Potential Ratio (SPR) of 35% for mullet.

Agenda Item 6 · Potential Habitat Restoration Project

Mr. Weiss sought feedback on a very conceptual project in Hillsborough County to beneficially use reclaimed water to rehydrate portions of the Kracker Avenue ELAPP property. Ms. Cross asked about the existing habitats on the property. Ms. Platt strongly urged Mr. Weiss to find out the original acquisition purpose of the Kracker Avenue property and report back to the Agency when more information is available. Ms. Thompson suggested a timeline of the Tampa Bay Estuarine Ecosystem project might be informative. Ms. Cross suggested that Mr. Weiss contact Tom Ries about his experience and restoration designs at the Lost River Preserve. Mr. Shelton asked about the quantities expected to be diverted away from direct surface water discharges and whether or not those quantities would be guaranteed year-round to these types of projects.

Agenda Item 9 · Other Items

Chair Minning noted that a copy of the FDOT Tampa Bay Cruise Study had been shared with members for their information.

Agenda Item 10 · Adjourn

Chair Minning adjourned the meeting at 10:37 a.m.

Recording Secretary

Mayor Bob Minning, Chair

Water and Land Conservation - Dedicates funds to acquire and restore Florida conservation and recreation lands

Ballot summary

Funds the Land Acquisition Trust Fund to acquire, restore, improve, and manage conservation lands including wetlands and forests; fish and wildlife habitat; lands protecting water resources and drinking water sources, including the Everglades, and the water quality of rivers, lakes, and streams; beaches and shores; outdoor recreational lands; working farms and ranches; and historic or geologic sites, by dedicating 33 percent of net revenues from the existing excise tax on documents for 20 years.

Constitutional changes

Amendment 1 would add a Section 28 to Article X of the Florida Constitution:

SECTION 28. Land Acquisition Trust Fund. --

a) Effective on July 1 of the year following passage of this amendment by the voters, and for a period of 20 years after that effective date, the Land Acquisition Trust Fund shall receive no less than 33 percent of net revenues derived from the existing excise tax on documents, as defined in the statutes in effect on January 1, 2012, as amended from time to time, or any successor or replacement tax, after the Department of Revenue first deducts a service charge to pay the costs of the collection and enforcement of the excise tax on documents.

b) Funds in the Land Acquisition Trust Fund shall be expended only for the following purposes:

1) As provided by law, to finance or refinance: the acquisition and improvement of land, water areas, and related property interests, including conservation easements, and resources for conservation lands including wetlands, forests, and fish and wildlife habitat; wildlife management areas; lands that protect water resources and drinking water sources, including lands protecting the water quality and quantity of rivers, lakes, streams, springsheds, and lands providing recharge for groundwater and aquifer systems; lands in the Everglades Agricultural Area and the Everglades Protection Area, as defined in Article II, Section 7(b); beaches and shores; outdoor recreation lands, including recreational trails, parks, and urban open space; rural landscapes; working farms and ranches; historic or geologic sites; together with management, restoration of natural systems, and the enhancement of public access or recreational enjoyment of conservation lands.

2) To pay the debt service on bonds issued pursuant to Article VII, Section 11(e).

c) The moneys deposited into the Land Acquisition Trust Fund, as defined by the statutes in effect on January 1, 2012, shall not be or become commingled with the General Revenue Fund of the state.

Fiscal note

WATER AND LAND CONSERVATION – DEDICATES FUNDS TO ACQUIRE AND RESTORE FLORIDA CONSERVATION AND RECREATION LANDS, #12-04

This amendment does not increase or decrease state revenues. The state revenue restricted to the purposes specified in the amendment is estimated to be \$648 million in Fiscal Year 2015-16 and grows to \$1.268 billion by the twentieth year. Whether this results in any additional state expenditures depends upon future legislative actions and cannot be determined. Similarly, the impact on local government revenues, if any, cannot be determined. No additional local government costs are expected.

TAMPA HARBOR FEDERAL NAVIGATION PROJECT, HILLSBOROUGH COUNTY, FL

INITIAL APPRAISAL REPORT FOR NEW CRUISE CHANNEL AND BERTH

February 2014



**US Army Corps
of Engineers** ®
Jacksonville District

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Tampa Harbor Federal Navigation Project, Initial Appraisal Report

1 STUDY AUTHORITY

The authority for the completion of this initial appraisal report is the House of Representatives Congressional Resolution 2533, 105th Congress (1997):

“Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, That the Secretary of the Army review the report of the Chief of Engineers on the Tampa Harbor, Florida, published as House Document 491, 91st Congress, Second Session and other pertinent reports, with a view of determining if the authorized project should be modified in any way at this time, with particular reference to a deep draft anchorage.”

This authority was also used to complete a general reevaluation report on Tampa Harbor Federal navigation project, to be submitted for approval in 2014. The general reevaluation report addressed general congestion concerns in the main stem channel and did not address the concerns noted in this initial appraisal.

2 STUDY PURPOSE

The purpose of this initial appraisal report is to determine whether there is Federal interest and benefits to the nation from improvements to the Tampa cruise terminals, facilities, or access channels. If Federal interest exists, this report will be used to support a Fiscal Year (FY) 2016 funding request for feasibility study funds. The initial appraisal report will be incorporated into the overall reconnaissance phase upon receipt of study funds, including Project Management Plan (PMP) development, and drafting of a Feasibility Cost Sharing Agreement (FCSA).

3 STUDY BACKGROUND

Cruise operations are an important part of the port operations at Tampa Harbor. However, the cruise terminals are located near the northern end of the 70 mile long Federal navigation channel, necessitating a long transit through channels currently operating under restrictions and avoiding air draft restrictions. Improving the cruise vessel accessibility would allow Tampa Port Authority to shorten the transit time, increasing efficiency and potentially accommodate larger vessels.

3.1 EXISTING PROJECT

The Tampa Harbor Federal navigation project has one main stem channel, roughly 42 miles long (out of the 70 miles of channel in the Federal project) with a 500- foot width and 43-foot depth, leading in and out of the Tampa Bay port system. This single stem channel must be transited not only by vessels going to and from Port Tampa Bay, but also vessels going to and from Port Manatee, St. Petersburg Harbor, and Weedon

Tampa Harbor Federal Navigation Project, Initial Appraisal Report

Island, as shown in Figure 1. The single stem is comprised of nine cuts. Cuts Egmont Key 1&2, Mullet Key, and A to F of the main stem channel are 42 miles long.

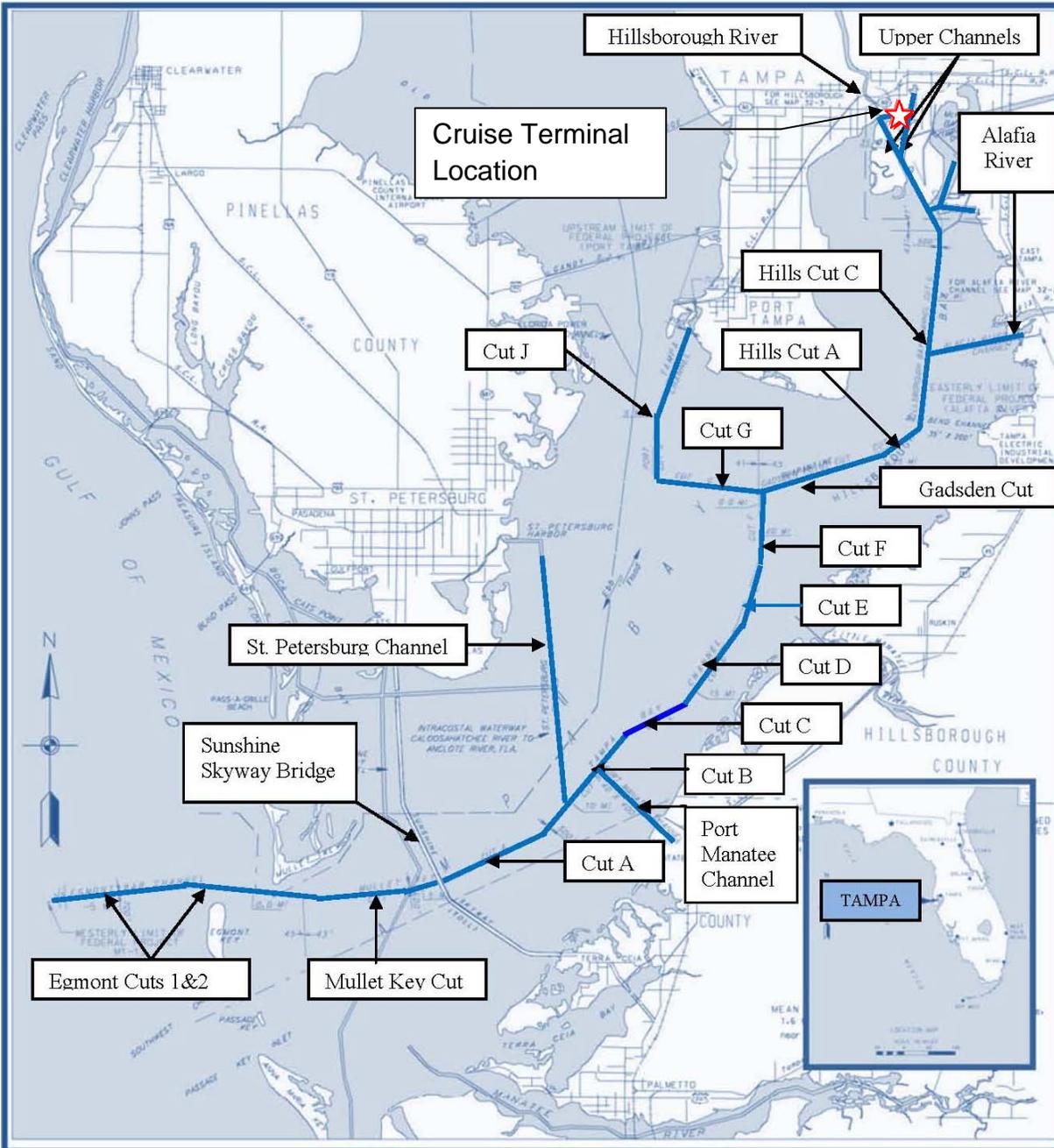


Figure 1: Tampa Harbor Federal Navigation Channels

Tampa Harbor Federal Navigation Project, Initial Appraisal Report

Tampa Harbor Federal navigation project was first authorized in 1899 and has been modified many times. Project authorizations are summarized in Table 1.

Table 1: Tampa Harbor Project Authorizations		
ACTS	WORK AUTHORIZED	DOCUMENTS
TAMPA BAY		
3 Mar 1899	Channel 27 feet deep by 300-500 feet wide from Gulf of Mexico to Port Tampa.	Specified in Act & H. Doc. 52/55/3
3 Mar 1905	Channel depth of 26 feet with sufficient width.	Specified in Act.
TAMPA AND HILLSBOROUGH BAYS		
25 Jun 1910	Depth of 24 feet in Hillsborough Bays	H. Doc. 634/61/2
8 Aug 1917	Channels 27 feet deep by 200-500 feet wide from Gulf of Mexico to and in Hillsborough Bay, and basins at mouth of Hillsborough River and Ybor Estuary.	H. Doc. 1345/64/1
HILLSBOROUGH RIVER		
3 Mar 1899	Channel 12 feet deep by 200 feet wide to within 100 feet of Lafayette St. Bridge (maintenance only).	H. Doc. 545/55/2 & A.R. for 1898 p. 1357
TAMPA HARBOR		
22 Sep 1922	Consolidation of above projects.	Specified in Act.
3 Jul 1930	Egmont Channel 29 feet deep and Sparkman Channel 300 feet wide.	H. Doc. 100/70/1
30 Aug 1935	Egmont Bar Channel 32 feet deep by 600 feet wide; Mullet Key Cut 30 feet deep by 400 feet deep; other project channels in Tampa Harbor, except in Hillsborough River, 30 feet deep by 300 feet wide and basin at Port Tampa 550 feet by 2,000 feet.	S. Doc. 22/72/1
20 Jun 1938	Widen bend between Sparkman Channel and Cut D, Hillsborough Bay Channel by 250 feet; Ybor Channel 400 feet wide; and extend Hillsborough River basin easterly 300 feet.	S. Doc. 164/75/3
20 Jun 1938	Breakwater at Peter O. Knight Field.	S. Comm. Print 76/1
2 Mar 1945	Sparkman and Ybor Channels 400 and 500 feet wide;	S. Doc.

Tampa Harbor Federal Navigation Project, Initial Appraisal Report

Table 1: Tampa Harbor Project Authorizations		
	extend Ybor basin westerly 250 feet, and Hillsborough River basin easterly 150 feet in lieu of 300 feet.	183/78/2
2 Mar 1945	Channel 9 feet deep by 100 feet wide in Hillsborough River and removal of obstructions to Florida Ave. Bridge.	H. Doc. 119/77/1
2 Mar 1945	Channel 25 feet deep by 150 feet wide and basin in Alafia River	S. Doc. 16/77/1
17 May 1950	Egmont Channel 36 feet deep; Mullet Key Cut 34 feet deep by 500 feet wide; Tampa Bay, Hillsborough Bay, Port Tampa Channels 34 feet deep by 400 feet wide; Port Tampa turning basin 34 feet deep by 750 feet by 2,000 feet wide; Sparkman Channel and Ybor turning basin 34 feet deep; and channel 30 feet deep by 200 feet wide to and including turning basin 700 feet by 1,200 feet in Alafia River.	H. Doc. 258/81/1
3 Sep 1954	Removal of obstructions in Hillsborough River from Florida Ave. Bridge to City Water Works Dam (maintenance to be assumed by local interests).	H. Doc. 567/81/2
23 Oct 1962	Channel and turning basin at Port Sutton 30 feet deep; Ybor Channel 34 feet deep and 400 feet wide.	H. Doc. 529/87/2
31 Dec 1970	Egmont Bar Channel 46 feet deep by 700 feet wide; Mullet Key Cut Channel 44 feet deep by 600 feet wide; Tampa Bay Main Channel 44 feet deep by 500 feet wide to junction of Hillsborough Bay and Port Tampa Channels; Hillsborough Bay Channel 44 feet deep by 500 feet wide to junction with Port Sutton entrance channel, thence 42 feet deep by 400 feet wide; Ybor Channel 40 feet deep by 300 feet wide; Port Tampa Channel 42 feet deep by 400 feet wide from junction with Hillsborough and Tampa Bay Channels to Port Tampa turning basin; Port Tampa turning basin 42 feet deep, 2,000 feet long and 900 feet wide; Port Sutton entrance channel 44 feet deep by 400 feet wide; Port Sutton 44 feet deep with turning diameter of 1,200 feet; enlargement of Ybor turning basin and deepening to 42 feet; East Bay entrance channel 44 feet deep by 400 feet and 500 feet wide about 2,000 feet north from Port Sutton turning basin; East Bay turning basin 44 feet deep with 1,200 feet turning diameter; East Bay approach channel 44 feet deep by 300 feet about 2,500 feet north	H. Doc. 91-401/91/2

Tampa Harbor Federal Navigation Project, Initial Appraisal Report

Table 1: Tampa Harbor Project Authorizations		
	from the East Bay turning basin; and maintenance of Port Sutton terminal channel 44 feet deep by 200 feet wide for a distance of 4,000 feet. Project is authorized for initiation and partial accomplishment not to exceed \$40,000,000.	
17 Nov 1986	Maintenance of local channel and turning basin to a depth of 34 feet in Tampa East Bay.	Public Law 99-662
17 Nov 1986	Widening of Port Sutton Turning Basin an additional 105 feet to the fender line along Pendola Point.	Public Law 99-662
17 Nov 1986	De-authorization of the bottom one foot of the main ship channel (see above) from 44 feet to 43 feet and of the turning basin at the junction of Garrison Channel, Seddon Channel, and Hillsborough River.	Public Law 99-662
17 Nov 1988	Port Sutton Channel deepening to 43 feet over length of 3,700 feet.	Public Law 100-676
28 Nov 1990	Maintenance of the Alafia Channel at a depth of 34 feet if the non-Federal sponsor dredges the channel to such depth, except that the non-Federal sponsor shall reimburse the United States for the incremental costs incurred by the Secretary in maintaining the channel at a depth greater than 30 feet.	Public Law 101-640
1997	“Review the report of the Chief of Engineers on the Tampa Harbor, Florida, published as House Document 491, 91 st Congress, Second Session and other pertinent reports, with a view of determining if the authorized project should be modified in any way at this time, with particular reference to a deep draft anchorage.”	H.R. Congressional Resolution 2533, 105 th Congress
17 Aug 1999	The project for navigation, Tampa Harbor-Big Bend Channel, Florida consisting of an entrance channel extending east from the main ship channel, a turning basin, an east channel, and an inner channel at a depth of 41 feet. The authorization includes raising the dikes on placement area 3D in order to accommodate the construction material and an additional dike raising to accommodate maintenance material.	Public Law 106-53
11 Dec 2000	Port Sutton, Florida - a channel extending east from Port Sutton Turning Basin over a length of 3,700 feet with a width of 290 feet and a depth of 42 feet.	Public Law 106-541

21 Dec 2000	Alafia River, Florida - Widening the channel by 50 feet to the south (total width of 250 feet) and deepening the channel to a project depth of 42 feet MLLW. Enlarging the turning basin to provide a 1,200-foot diameter area at the channel depth of 42 feet MLLW. Placement within the designated ODMDS site, with some material going into beneficial use areas including expansion of Bird Island, creation of tidal wetland habitat adjacent to Disposal Area 2D, and shore protection along the northern bank of Bird Island.	Public Law 106-554
7 Nov 2003	"That the Secretary of the Army, acting through the Chief of Engineers, is directed to use funds appropriated for the navigation project, Tampa Harbor, Florida, to carry out, as part of the project, construction of passing lanes in an area approximately 3.5 miles long, centered on Tampa Bay Cut B, if the Secretary determines that such construction is technically sound, environmentally acceptable, and cost effective."	Energy and Water Act 2003, 108 th Congress, Report 108-357
8 Nov 2007	Tampa Harbor Cut B, FL – "In general, modifies the authorized project and authorizes the Secretary to construct passing lanes in an area approximately 3.5 miles long and centered on Tampa Harbor Cut B if found to be necessary for vessel safety."	Public Law 110-114, H.R. 1495

3.2 STUDY AREA

Tampa Port Authority has expressed concern over the safe and efficient transit of cruise vessels through the harbor and the desire to consider alternate locations for cruise berthing. This initial appraisal report focuses on existing and potential locations of cruise vessels; however, additional areas within the Federal Navigation project may warrant study to identify opportunities for improving the safety and efficiency of the port should a feasibility study received funding.

3.3 PROJECT SPONSOR

The non-Federal sponsor for the Tampa Harbor Federal navigation project is the Tampa Port Authority (TPA). TPA has expressed interest in participating as the cost sharing partner for a feasibility study.

3.4 CONGRESSIONAL DISTRICT

The study area lies within the jurisdiction of Florida Congressional District 14, currently held by Representative Kathy Castor (D). The study area is also adjacent to District 13, currently vacant, and to District 16, Representative Vern Buchanan (R). The study area is also served by Senators Marco Rubio (R) and Bill Nelson (D).

3.5 OTHER PROJECTS IN STUDY AREA

Several other Federal water resource projects exist in the area associated with Tampa Harbor. Other navigation projects include the Intracoastal Waterway (Caloosahatchee River to Anclote River, Florida), Long Boat Pass, St. Petersburg Harbor, and Manatee Harbor. Other Federal projects within the study area that fall under other USACE missions include the Cedar Hammock Flood Control Project, as well as the authorized Pinellas County, Manatee County, and Sarasota County hurricane and storm damage reduction projects.

Widening of Cut B of Tampa Harbor Federal navigation project was authorized by WRDA 2007. A general reevaluation report was drafted and is currently under review for approval. Once approved by the Assistant Secretary of the Army (Civil Works), further authorization is not required and USACE may seek funding for construction of the project. The report recommends the widening of a portion of Cut A and all of Cut B from the existing width of 500 feet to 600 feet. No deepening is recommended. The benefits of the widening result from transportation cost savings due to eliminating the restriction of large vessel meeting and passing in Cut B.

4 EXISTING AND FUTURE WITHOUT PROJECT CONDITIONS

4.1 ENVIRONMENTAL CONSIDERATIONS

Tampa Bay is Florida's largest open-water estuary at approximately 400 square miles. Tampa Bay includes a mosaic of habitats, including seagrasses, mangroves, salt marshes, mud flats, oyster bars, hard bottom, freshwater wetlands, and salterns. The watershed supports a rich and diverse assemblage of plants and animals, along with a rapidly growing human population that has made the region the second largest metropolitan area in the state. The population in Tampa Bay's 2,600 square mile watershed is approximately 2.5 million, and much of the shoreline is heavily developed. Navigation dredging, disposal of dredged material, stormwater runoff, increasing recreational boat usage, industrial activity, and wastewater effluents have caused environmental degradation in the Bay; however, water quality has improved dramatically in the past ten years.

4.2 NAVIGATION CONSIDERATIONS

Tampa Harbor is a large, natural Y-shaped indentation of the Gulf of Mexico midway up the west coast of peninsular Florida. The Tampa Harbor Federal navigation project consists of approximately 70 miles of Federal channels dredged from 43 to 45 feet to provide access for deep draft vessel traffic using terminal facilities located in Port Tampa Bay, Port Manatee, St. Petersburg Harbor, and Weedon Island, including several electrical power stations, and extensive docking facilities.

Cruise vessels are an important part of the overall operations of Tampa Harbor. Cruise ships currently transit over 400 times per year, but the number of transits is expected to increase in the coming years. Operational protocols limit vessel movement when cruise ships are in port or transiting to provide safe operations for passengers and to accommodate the cruise ship schedules. While cruise vessels are transiting, no meeting, passing, or overtaking is permitted. Vessels must wait at sea or berth to avoid the cruise vessels. All active cruise terminals (2, 3, and 6) are located at the most northern part of Tampa Harbor at Ybor Channels. Allowing cruise vessels to berth closer to the entrance channel at a more southern point could potentially lift current restrictions and reduce delays for all other vessels within the harbor. Due to the configuration of the channels and berthing areas, some vessels at berth must wait for other vessels to vacate before they can depart. This is true in the area of berths 267 and 269. Cruise vessels are limited to a maximum length of 965 feet because of Sparkman channel and turning basin dimensions in the current berthing location. The cruise terminal is at the upper limit of cruise ship capacity due to channel geometry, air draft restrictions from two bridges, and number of berths. Tampa Port Authority has expressed the desire to accommodate more and larger cruise vessels to reflect current and future changes in the vessel fleet.

Additional concerns were identified in the channel transit of the cruise vessels. Storms are sometimes an issue due to the length of time the cruise vessels must transit the long Tampa Harbor Federal channels (typically 3-4 hours). Cruise vessels in particular are vulnerable to wind velocities and direction, causing difficulties in steerage and potential safety hazards.

4.3 ECONOMIC CONSIDERATIONS

The focus of this initial appraisal is to determine whether further study of alternatives that alleviate channel and terminal constraints to cruise shipping at Port Tampa Bay is warranted. Further study is reasonable only if any proposed navigable waterway improvements are likely to result in a positive change in national economic development. The purpose of this section of the initial appraisal is to determine whether navigable waterway improvements that reduce constraints to cruise shipping at Tampa

Harbor will cause national economic development benefits. In addition, any complicating factors to be addressed in future economic analyses are identified.



Figure 2: Existing Cruise Terminal

Potential for National Economic Development Benefits

The constraining factors on cruise shipping are inadequate cruise terminal capacity, insufficient widths at the Sparkman Channel and turning basins to accommodate future cruise shipping and air draft constraints at the Sunshine Skyway Bridge. The most efficient way to alleviate these constraints is to move the cruise terminal to the Gulf side of the Sunshine Skyway Bridge. Doing so will result in the following:

- Transit time from the sea buoy to the cruise terminals would be reduced.
- Cut B would no longer be restricted to one way traffic during fantasy class cruise ship transits.
- The size constraints on cruise vessels would be eliminated at Tampa Harbor.

Benefits from Reducing Cruise Vessel Transit Times

The limited scope of this analysis precludes any in depth analysis of all the factors that would be accounted for to determine the cost of cruise shipping with and without a project. However, using available data, it is possible to estimate the benefits that could accrue by reducing the distance between the sea buoy and the cruise terminal. Relocating the cruise facilities to the west of the Sunshine Skyway Bridge reduces the cruise ship transit time from four hours to just under one hour. Figure 3 illustrates the process used to estimate the potential for national economic benefit (NED) benefits. Table 2 provides greater detail on the distribution of passenger traffic, transit costs and transit cost savings. Moving the cruise ship berthing to Mullet Key, west of the Sunshine Skyway Bridge, has the potential of producing benefits of approximately \$10 million per year in cruise vessel transit cost savings.

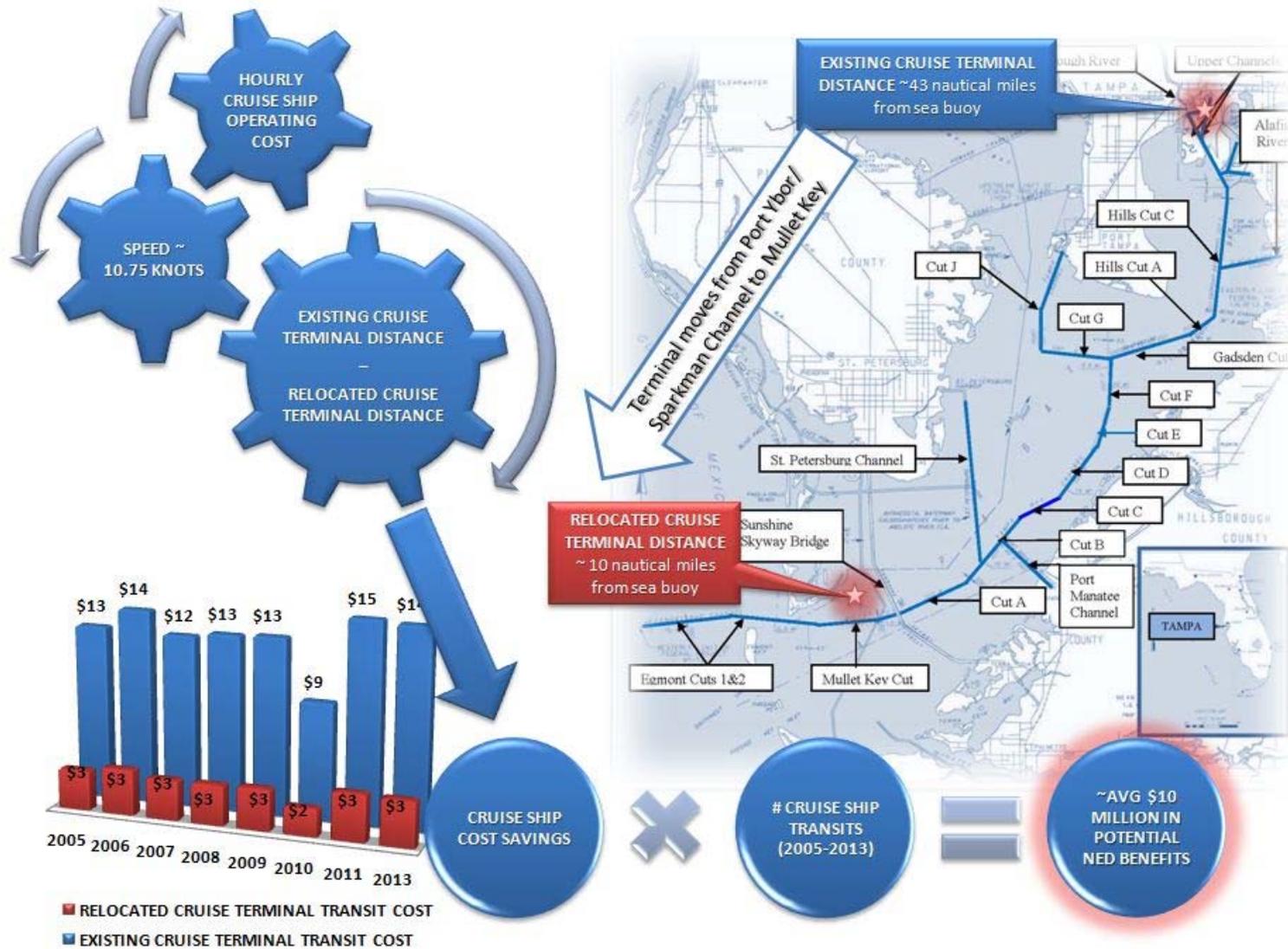


Figure 3: Conceptual Model of National Economic Benefit (NED) Benefit Estimation

Table 2: Cruise Traffic, Transit Cost, & Benefit Potential¹

YEAR	NUMBER OF PASSENGERS	NUMBER OF TRANSITS	EXISTING CRUISE TERMINAL TRANSIT COST	RELOCATED CRUISE TERMINAL TRANSIT COST	POTENTIAL FOR NED BENEFITS
2006	710,000	373	\$12,600,000	\$2,900,000	\$9,700,000
2007	870,000	439	\$14,000,000	\$3,300,000	\$10,700,000
2008	680,000	359	\$12,400,000	\$2,900,000	\$9,500,000
2009	730,000	363	\$12,700,000	\$2,900,000	\$9,800,000
2009	750,000	367	\$12,800,000	\$3,000,000	\$9,800,000
2010	520,000	244	\$8,500,000	\$2,000,000	\$6,500,000
2011	900,000	423	\$14,500,000	\$3,400,000	\$11,100,000
2012	970,000	471	\$16,300,000	\$3,800,000	\$12,500,000
2013	830,000	422	\$14,300,000	\$3,300,000	\$11,000,000
TOTAL	6,960,000	3,461	\$118,100,000	\$27,500,000	\$90,600,000
AVERAGE	770,000	385	\$13,100,000	\$3,100,000	\$10,100,000

Removing the Main Channel One-Way Traffic Restriction during Cruise Vessel Transits

At the time of this writing, Cut B of the main channel is restricted to one way traffic during fantasy class cruise vessel transits. Moving the cruise vessel berths would remove this restriction and would generate benefits for other vessel classes and types.

Eliminating Cruise Vessel Size Constraints

Eliminating restrictions on cruise ship size at Tampa Harbor is another source of NED benefits. Vessels are constrained to an air draft of 176 feet due to the Sunshine Skyway Bridge (180 foot air draft). Due to inadequate terminal capacity, the Port Tampa Bay can only accommodate vessels with capacities of 3,000 passengers or less.

Relocating the cruise terminals to the west of the Sunshine Skyway Bridge would allow the fleet of cruise vessels to transition to larger ship sizes. These vessels can service more passengers per vessel call, resulting in transportation cost savings.

Table 3 provides details on vessel characteristics of the world cruise ship fleet and the size limitations at Tampa Harbor.

¹ Cruise traffic data from Tampa Port Authority. Cruise vessel transit costs estimated using IWR vessel operating cost.



Figure 4: Cruise Vessels and the Sunshine Skyway Bridge

Table 3: Average Cruise Vessel Characteristics

VESSEL CLASSES	LENGTH OVERALL (LOA)	BEAM (Feet)	DRAUGHT (Feet)	GROSS REGISTER TONNES (GRT)	PASSENGER CAPACITY
1K PASSENGER SHIP	334	51	16	8,785	328
2K PASSENGER SHIP	792	97	26	64,062	1,995
3K PASSENGER SHIP	938	110	27	91,939	2,873
4K PASSENGER SHIP	1,022	122	28	129,128	3,872
5K PASSENGER SHIP	1,035	124	27	137,481	4,937
6K PASSENGER SHIP	1,091	133	29	167,053	6,256
7K PASSENGER SHIP	1,184	217	31	225,282	6,731

Other Considerations

Conversations with port officials indicate that 10-15 years into the future without project condition, most of the world cruise fleet will not be able to enter Tampa Bay. As a result, cruise traffic is anticipated to plummet. Alternative futures with changes to the cruise berthing facilities could increase the future cruise traffic. See Figure 5 for detail on future cruise traffic.

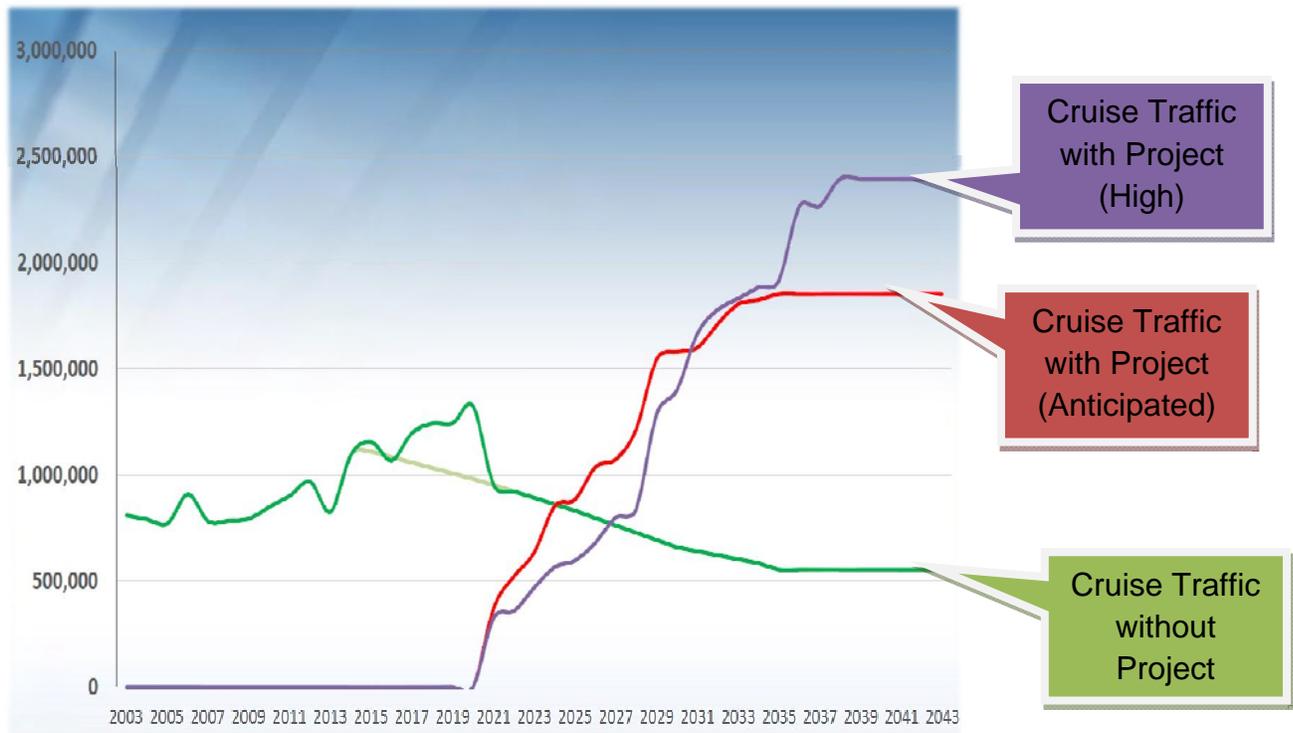


Figure 5: Cruise Traffic Projections (Source: Florida Department of Transportation, FDOT)

The future growth in cruise vessel traffic introduces additional complexity into the economic modeling effort because the future with and future without project conditions would be different. Presumably the demand for cruises that could no longer be satisfied at Port Tampa Bay would move to other U.S. seaports that can accommodate larger cruise vessels. These are regional transfers of economic activity for which there is no Federal interest in preventing unless doing so would yield a transportation cost savings (i.e. the demand can be serviced at a lower cost at the subject port).

The future without project condition would need to describe the following:

- The U.S. seaports representing the next best alternative for the traffic that can no longer be facilitated at the Port Tampa Bay to ship size constraints.
- The portion of cruise demand anticipated to transfer to alternate seaports that could be serviced in Port Tampa Bay for a lower cost in the event of a project.
- The cost of satisfying this demand at the alternate port.

Following receipt of funding to start a feasibility study, the Jacksonville District will collaborate with the Deep Draft Navigation Center of Expertise (DDN-PCX), the Institute for Water Resources (IWR), and HQUSACE to ensure that all methods and assumptions are technically adequate and policy compliant.

Conclusion

Based on the information presented, the aforementioned navigable waterway improvements are likely to result in NED benefits. Since this implies the possibility of a Federal interest, further study is warranted from an economic perspective.

5 PLAN FORMULATION

5.1 FEDERAL OBJECTIVES

The “Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies” (The Principles and Guidelines, or P&G) are the principle guidelines for planning by Federal agencies involved in water resource development. The Federal objective as stated in P&G is to contribute to national economic development (NED) consistent with protecting the Nation’s environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements. In other words, economic benefits to the Nation must exceed project costs. Federal planning concerns other than economic include environmental protection and enhancement, human safety, social well-being, and cultural and historic resources.

5.2 PROBLEMS

- Safety protocols for cruise ships mandate no meeting, passing, or overtaking of cruise vessels in the main channel. These restrictions create delays for all other vessels of 1-12 hours, and congestion in the harbor when there is a cruise vessel in transit.
- Safety protocol for wind for vessels transiting in or out of Sparkman channel causes delays.

- Frequent, unpredictable storms cause transportation delays and navigation safety incidents. Once the cruise vessel starts transiting the channel, there is nowhere to stop.
- Turning basin size is limiting size of cruise vessels.
- Existing cruise terminals are at capacity and limit the passenger capacity to 3000 people.
- Newer larger cruise vessels are not able to call at Tampa Harbor.

5.3 OPPORTUNITIES

- Reduce transit times for cruise vessels.
- Lift certain restrictions, reduce delays, reduce navigation safety concerns, and reduce congestion for other vessels.
- Provide for larger and newer cruise facilities.
- Provide ability to use larger cruise vessels.

5.4 CONSTRAINTS

- Avoid and minimize impacts to environmental resources, threatened and endangered species, and essential fish habitat, and provide mitigation for unavoidable impacts.
- Air draft of Sunshine Skyway Bridge limited to 180 feet. This constrains the size of vessels able to transit under the bridge.
- Avoid inducing traffic restrictions or unreasonable congestion on area roadways to access cruise terminals.

5.5 PLANNING OBJECTIVES

Planning objectives were developed during the preparation of this initial appraisal report. Further development is expected upon receipt of study funds and the commencement of reconnaissance and feasibility phases. The objectives of the study are to:

- Investigate and analyze existing and future vessel size and movement information, especially cruise vessels.
- Reduce transportation costs of future vessels transiting the harbor.
- Improve efficiency and safety of future vessels transiting the harbor.
- Provide opportunities for future growth in cruise vessels, including size of vessels and number of vessels calling.
- Identify on a preliminary basis the environmental and cultural resource impacts and concerns associated with channel and berthing configurations.

5.6 PLANNING CRITERIA

Other criteria used in the planning process include the completeness, effectiveness, efficiency, and acceptability of the alternatives considered. The alternatives will be evaluated using the four accounts of national economic development, regional economic development, environmental quality, and other social effects. Local and state concerns will also be considered, including implementability, costs, and agency concerns.

5.7 POTENTIAL ALTERNATIVES

Alternatives to improve the cruise vessel transit were considered in a preliminary discussion and will be further evaluated during the feasibility phase of study. Channel and berthing modifications focus on moving the cruise facilities towards the entrance of the harbor to shorten the transit time, eliminate congestion, and remove the constraint of the Sunshine Skyway Bridge. Several locations and configurations of new cruise terminals are possible. Other alternatives are possible to change the bridge to improve safety and remove the air draft constraint. Additional alternatives will be evaluated in the course of the feasibility study. The preliminary alternatives are presented in Table 4.

Table 4: Preliminary Alternatives

Management Measures	Must Combine With Other Measures?	Initial Screening
Cruise Terminal south of Skyway with bridge	N	Environmental Issues
Cruise Terminal south of Skyway with ferry	N	Environmental Issues
Use Egmont Key as Cruise Terminal	N	Environmental Issues
Ferry people to offshore Cruise Terminal	N	Environmental Issues
Raise Sunshine Skyway	Y	Does not solve Problem
Build tunnel to replace Sunshine Skyway	Y	Does not solve Problem
Make Sunshine Skyway a drawbridge	Y	Does not solve Problem

5.8 PRELIMINARY ANALYSIS OF ALTERNATIVE PLANS

A new cruise terminal island built south of the Sunshine Skyway Bridge would eliminate the air draft restriction, storm safety restrictions, and transportation delays north of the Sunshine Skyway Bridge. A bridge to the island terminal could be built from either side: Pinellas County or Manatee County. The dredging would be balanced with the amount of fill needed to create the island, so that no disposal area or outside material is needed. The terminal would be closer to land on the Pinellas side of the main navigation channel, with cheaper main road connection and cheaper utility connection. The

strongest winds at the mouth of Tampa Harbor have a northerly component, so a terminal on the Pinellas side is subject to shorter wind fetch and is better sheltered.

Another option would be to ferry passengers to the terminal, either departing from Pinellas County or Manatee County. An offshore terminal would avoid congestion within the Tampa Harbor channels. A ferry would be more costly than building a bridge, and subject to inclement weather delays.

5.9 ENVIRONMENTAL CONCERNS

The Jacksonville District is aware of several environmental concerns/issues associated with this project. These known concerns and any others raised by stakeholders will be fully evaluated and documented in the NEPA document that will be prepared to support the feasibility study.

- Potential impacts to seagrass, mangrove wetlands, or salt marsh depending on the alternative chosen. Building new upland areas will require the destruction of aquatic habitats, which will require extensive coordination with local interests and resource agencies. Any new channels that are necessary for accessing the site will also require extensive coordination. Resources located in the project area will need to be surveyed, and mitigation will be required for any impacts.
- Potential effects on threatened and endangered species from the creation of the cruise terminal and any associated dredging. Depending on the scale of the project and its location, this could be a significant issue and will require potentially extensive consultations with USFWS and NMFS.
- Potential impacts at the Tampa Harbor Ocean Dredged Material Disposal Site (ODMDS) if the site is required for disposal of material during dredging operations, and the need for additional testing/monitoring at the ODMDS. This will require coordination with EPA and FDEP, and may require a detailed monitoring program to ensure sensitive resources in the area of the ODMDS are not impacted. If all dredged materials are beneficially used in the construction of the island, this would be unnecessary.
- Potential impacts at the confined upland disposal sites if the sites are required for disposal of material. This will require coordination with the resource agencies and the issuance of a water quality certification by FDEP; however, this is not expected to be a significant issue. If all dredged materials are beneficially used in the construction of the island, this would be unnecessary.
- Cultural resource surveys of the project area would be required to ensure there are no impacts.

The Jacksonville District will coordinate with the Florida Department of Environmental Protection (FDEP), the Florida Fish and Wildlife Conservation Commission (FFWCC),

the Florida State Historic Preservation Office (SHPO), the U.S. Fish and Wildlife Service (USFWS), the U.S. Environmental Protection Agency (USEPA), and the National Marine Fisheries Service (NMFS). A scoping meeting will be held at the beginning of the feasibility phase to investigate potential concerns regarding the proposed project. All input received from the state and Federal resource agencies during the coordination will be discussed at this meeting.

6 FEDERAL INTEREST

6.1 FEDERAL INTEREST

Federal interest in navigation of Tampa Harbor started as early as 1899. Interest in improving Tampa Harbor for deep draft commercial shipping has continued since that time. Based on the number of cruise vessels calling at Tampa Harbor, and potential reductions in transit times with alternate cruise berthing locations, significant transportation cost savings could be realized. Moving the cruise vessel berths to avoid Cut B of the main channel restrictions to one way traffic would generate benefits for other vessel classes and types. Eliminating restrictions on cruise ship size due to air draft and terminal capacity would allow the fleet of cruise vessels to transition to larger ship sizes. These vessels can service more passengers per vessel call, resulting in transportation cost savings. Based on the economics information available, navigation improvements are likely to result in NED benefits and are in the Federal interest.

6.2 VIEWS OF FEDERAL, STATE AND ENVIRONMENTAL RESOURCE AGENCIES

As of the date of this initial appraisal report, no resource agencies have submitted comments on the proposed study to examine the cruise terminals.

7 PRELIMINARY FINANCIAL ANALYSIS

Based on discussion with the Tampa Port Authority (non-federal sponsor) in late 2013, the sponsor is ready, willing, and able to execute the FCSA and provide its share of the funding to support the cost-shared feasibility phase. The cost of the feasibility phase will be developed as part of the PMP upon receipt of study funds, and will be cost-shared 50% Federal and 50% non-federal.

8 SUMMARY OF FEASIBILITY STUDY ASSUMPTIONS

The following assumptions will provide the initial basis for feasibility studies. These assumptions will be added to/revised as needed during future iterations of the planning steps.

- The economics analysis would need to account for the likelihood of construction of the widening of Cut B authorized by WRDA 2007.

Construction has not been approved or funded at this time.

- Full analysis of reasonable alternatives will be performed, including the no action alternative, structural and non-structural measures, to optimize potential feasible alternatives to improve cruise accessibility while minimizing environmental effects.
- The feasibility study would likely require a multiport analysis to show that moving the cruise terminal is an NED benefit, and not just a Tampa Area regional benefit. This would include the capacity of other ports to support growth in the cruise industry.
- The economics model will need to demonstrate that there is a transportation cost savings for cruise vessels leaving from Tampa, as opposed to other Gulf of Mexico ports.
- Modeling studies conducted during the feasibility phase will include hydrodynamic, economics, sedimentation, and ship simulation models.
- Public involvement will be achieved through public meetings and/or workshops and interagency work group meetings.
- A National Environmental Policy Act (NEPA) analysis will be prepared to document the decision-making process and to analyze the project's effect on human health and the environment.
- Consideration of alternatives will be fully coordinated with the USFWS, NMFS, and other appropriate agencies pursuant to environmental statutes.
- The consideration of alternatives in the study will fully comply with the requirements of the Clean Water Act, as amended and the National Environmental Policy Act.
- Appropriate cultural resources investigations will be conducted within the study area to ensure historic areas are not adversely affected by proposed project plans.

9 POTENTIAL ISSUES AFFECTING INITIATION OF FEASIBILITY PHASE

Continuation of this study into the cost-shared feasibility phase is contingent upon an executed FCSA, and the receipt of both Federal funding and non-Federal funding.

10 CONCLUSIONS

This initial appraisal report determines there is Federal interest in further investigation of navigation improvements to the Tampa Harbor Federal navigation project. Preliminary data based on vessel calls, types of cruise vessels, and projections of the world fleet suggests that there are additional National Economic Development (NED) benefits associated with harbor modifications, especially related to the cruise vessels, which would add benefit to the national economy. A feasibility study is the intended report to evaluate Federal interest over a period of evaluation of fifty years. This report will be

Tampa Harbor Federal Navigation Project, Initial Appraisal Report

used to support a Fiscal Year 2016 budget request for a General Investigations (GI) funded feasibility study to be cost shared with the local sponsor, Tampa Port Authority.

TAMPA BAY CRUISE STUDY PRE-FEASIBILITY



Final Report
July 8, 2014

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I EXECUTIVE SUMMARY

The cruise line industry provides extensive economic impacts to the residents and business community throughout the State of Florida. According to Cruise Lines International Association (CLIA) more than USD\$7-Billion was spent in Florida in 2012 by cruise line passengers and crew. The cruise line industry also provides thousands of jobs throughout the State of Florida from its corporate offices (the top 3 cruise lines worldwide are headquartered in South Florida – Carnival Corporation, Royal Caribbean Cruises, Ltd. and Norwegian Cruise Line) as well as jobs in ground transportation, tourism, logistics, food and beverage, etc.

As the birthplace of the modern cruise industry, Florida has long held the distinction of being the number one U.S. cruise state in terms of passenger sailings and economic impacts. In fiscal year 2012, more than 12.5 million cruise passengers sailed from the key Florida homeports of Jacksonville, Tampa, Port Canaveral, Port Miami, Palm Beach, and Port Everglades, while an additional 832,000 port-of-call passengers visited Key West.

To solidify its growth in the global tourism market the cruise line industry is continuing to develop new cruise line vessels to be deployed not just to Florida, but to worldwide ports as well. New cruise vessels capable of carrying more than 5,000 passengers, over 1,200-feet in length, air drafts of more than 180-feet and tonnages exceeding 125,000 have already been deployed into the worldwide market. These larger vessels will most likely become the deployment norm for the North American cruise industry moving forward. Thus, it is essential to understand the current conditions of the cruise infrastructure supporting the industry and those impediments if Florida ports want to maintain its cruise dominance while it competes on a worldwide basis for cruise vessel deployment. In addition to supporting infrastructure, other considerations are taken into account by cruise line decision makers when positioning vessels, as noted in an earlier Florida Department of Transportation (FDOT) study.¹

FDOT commissioned this study to address a key infrastructure issue that will impact cruise line deployment to the Tampa Bay and Florida's west coast region over the mid- to long-term (10 – 25 years). Low bridge clearance as a result of the air-draft height limitation of the Sunshine Skyway Bridge at a maximum of 180-feet does not allow for the larger cruise vessels to utilize the cruise

terminals and support infrastructure developed within Tampa Bay. While this is not unique to Tampa Bay, i.e., Jacksonville has similar issues, this report focuses on Tampa Bay.

As cruise ships have grown in passenger capacity, the air draft of most new ships is now exceeding the height limit of the Sunshine Skyway Bridge at 180-feet. Today, Tampa Bay is a thriving homeport option to several of the major cruise lines. However, as more of the larger air draft ships are built and deployed into the cruise market and the older vessels are withdrawn or redeployed out of the major markets, these vessels will not be able to call on Tampa Bay. The available options are outlined below:

- Do nothing and only receive vessels that fit into the present air draft envelope;
- Build a new port seaward of the bridge; or,
- Replace the Sunshine Skyway Bridge.

For this study, the State of Florida has chosen to develop a work plan to allow for a methodical decision-making process. The Plan can be executed in phases beginning with this Pre-Feasibility Study serving to establish the future cruise traffic for the region taking into consideration the air draft issue and then examining the options available for the Tampa Bay region.

It is important to note that FDOT is not recommending one option over another. Rather this Pre-Feasibility Study attempts to bring the best data together on the current and future projections of the cruise industry impacts on the Tampa Bay region so that the Tampa Bay community can decide which course of action they may wish to pursue. Each of the three alternatives need to be further explored to weigh the feasibility of each. With the exception of the Do Nothing alternative, the environmental community and public will require strong justifications to balance the environmental impact and mitigation with the economic impacts to the Tampa Bay region.

Each of the available options presented has a cost component. The implementation of new facilities will require the implementation of creative modes of moving people and baggage to and from the airport, major highway systems and Tampa's downtown core. Assessing whether or not there are additional uses or combinations of uses for a new development seaward of the bridge will need to be evaluated as part of the overall process. Replacing the existing bridge presents potential issues related to costs, community impacts for a lengthy road closure period and others.

¹ Florida Department of Transportation, Florida's Cruise Industry: A Statewide Perspective, November 2013,

2 WORLDWIDE CRUISE INDUSTRY

Global overview

The cruise industry is a significant contributor to the world's economies with over \$100 billion in economic impact including \$33 billion in global wages. In 2013, an estimated 21.3 million passengers embarked one of over 400 cruise ships and 21.7 million passengers are forecasted for 2014. The cruise industry has consistently grown since 1980 by 7.2% per annum.

The underlying successes of the cruise industry as a whole are detailed below:

- The industry is constrained by ships (supply), not passengers (demand). The delivery of new large capacity vessels with an extended life cycle provides for a compelling growth strategy;
- There is a high level of repeat clientele demand due to satisfaction and the demand for new and different passenger experiences;
- The industry is rapidly expanding in several cruise regions worldwide due to passenger demand and the quest for increased revenue opportunities and lower costs;
- Major deployment factors include:
 - Passenger demand – cruise lines use survey tools, travel agent and passenger feedback as key indicators for future deployment; and,
 - Yields – lines place vessels into itinerary patterns with high demand and lower operating costs to maximize passenger spending per day.
- There are opportunities for ports worldwide to become part of the cruise business. However, there is a cost in the development of infrastructure and support tourism businesses that must be addressed. Return on investment parameters and the ability of ports and cities to provide platforms for a variety of social and economic impacts to the community must be addressed as part of any development opportunity;
- Some cruise brands and consumers see a saturation of traditional ports and regions, which allows for new port opportunities on a worldwide basis. This is further exacerbated by the implementation of costly regulatory and operational costs in some regions;

- The industry is controlled by a handful of US based profitable cruise operators with key players in Europe and Asia;
- Currency exchange rates play a major role in shipbuilding and deployment patterns that define the timing and deployment patterns of cruise brands;
- Weather patterns, consumer demand and cruise line operations have influenced deployments in many regions extending or moving seasonality into non-traditional time slots. This includes new cruise sailings that now include Christmas and holiday sailings in traditionally summer cruise regions, such as the Baltic, as well as year round cruises from New York that depart in the winter for the Bahamas and Caribbean; and,
- The industry has shown itself to be generally recession resistant by controlling and reducing costs, shifting capacity between longer and shorter cruises, developing vessels with more outside cabins, on-board amenities, re-fitting vessels for all year-round cruising in specific regions and allowing for discounting on cabin fares to pick up the potential for on-board revenue spending in order to stay profitable.

Cruise line business model

The industry is supply-led and has formulated a business model to take advantage of its mobility and size. The fundamentals of the cruise industry business model are outlined below:

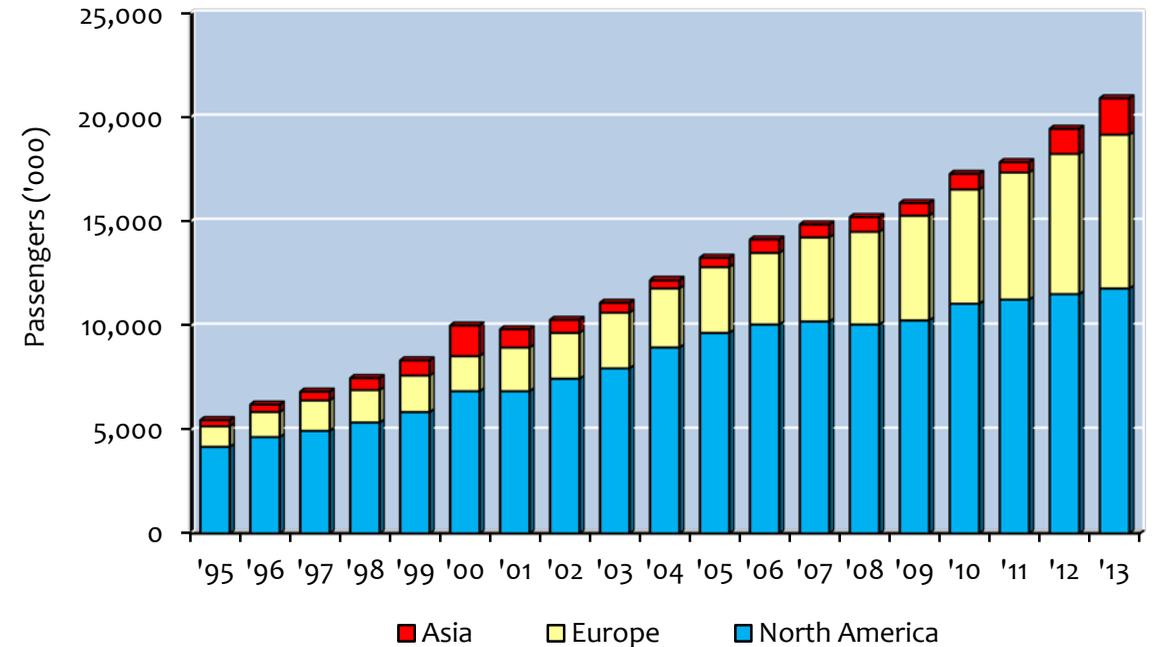
- Control supply and demand through new-builds and vessel deployments;
- Develop cruise itineraries that are easy to sell to cruise consumers (marquee destination with demand), profitable (per diem vs. cost of operations), and Upsell to cruise consumers (provide for strong shore side revenue opportunities). This is accomplished through:
 - Using cruise vessels with a broad appeal to targeted consumer demographic and financial threshold;
 - The appeal of cruise line brands and in many cases individual vessels in a fleet;
 - Creation of cruise itineraries that fit within consumer vacation patterns of 4-day, 5-day, and 7-day patterns;
 - Deployment of cruise vessels close to base cruise consumer groups; and
 - Mix of European and North American and other consumer groups to fill capacity.

- Cabin ticket price is only a portion of the overall revenue possibilities. The lines have also been able to create revenue opportunities on-board and shore-side by developing the following:
 - Varieties of shore excursions catering to many demographics;
 - Destination-oriented deployments;
 - On-board retail options;
 - Unique bar and casino revenue options; and,
 - On-board services such as spa, classes and lecture series, and unusual experiences.
- Control the expense side through balancing the cost of a deployment or destination against the value it produces.

Global Cruise Passenger Growth

Through the use of the above business model, the cruise industry has grown every year. **Figure 1** illustrates the growth of the cruise line industry from 1995 through 2012. As shown, the North American region continues to be the main consumer generating market. However, there has been significant growth in the European market over the past ten years. Asia has maintained a relatively flat growth over the period, but has an unexhausted growth potential due the large population base with fast-growing income streams and the desire to travel abroad and within the vast Asian region. The market share breakdown for 2013 include: the Caribbean region (34.4%) including the Bahamas was the number one cruise destination by way of passenger bed-days (*a formula based upon lower cabin berths x cruise length x sailings*) with the Mediterranean (21.7%) ranking second and Northern Europe (11.1%) third overall. The Australia/New Zealand (5.0%) and Alaska (4.8%) regions round out the top 5 destinations with Asia (3.4%) and South America (3.9%) continuing to grow overall capacity.

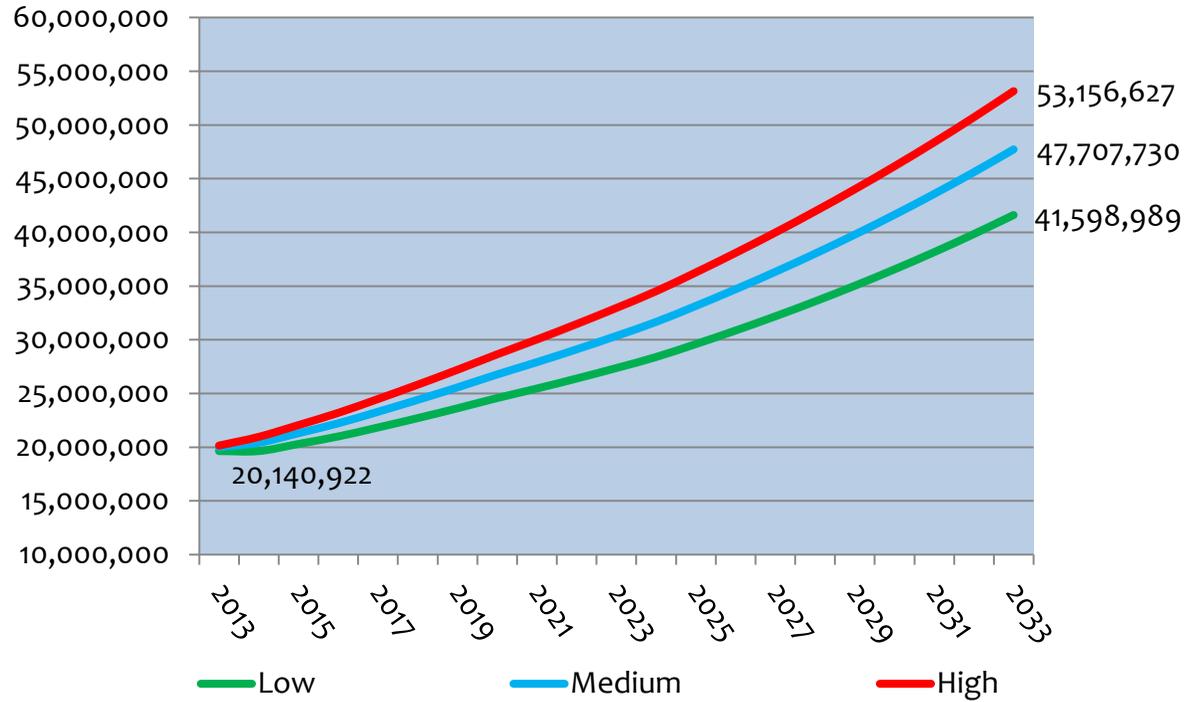
Figure 1: Conventional cruise worldwide and regional expansion, 1995 – 2013



Source: Cruise Industry News Annual

Based upon the additional market supply and factoring a minimal withdrawal factor of 5% to 10%, **Figure 2** shows the potential worldwide passenger growth through 2033 estimated to be between 41 and 53-million passengers. This is a growth factor of approximately 5.6% to 8.2% per annum (consistent with the past growth factor experienced since 1980).

Figure 2: Conventional cruise worldwide growth projections, 2013 – 2033

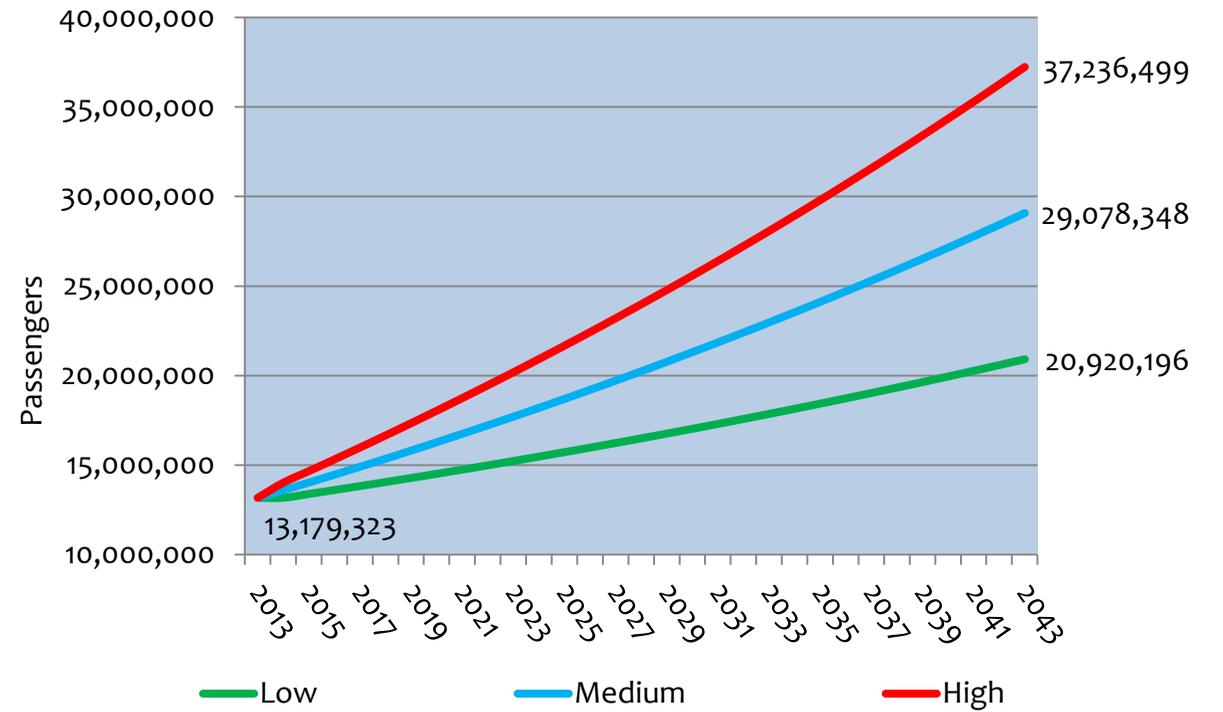


Source: Bermello Ajamil and Partners, Inc.

North American Growth

Based upon the new build delivery orders and those that are destined primarily for the North American market **Figure 3** provides a 30-year growth projection. As shown, growth ranges from 2.0% to 5.9% per annum with a final range of between 20.9 and 37.2-million passengers in 2043.

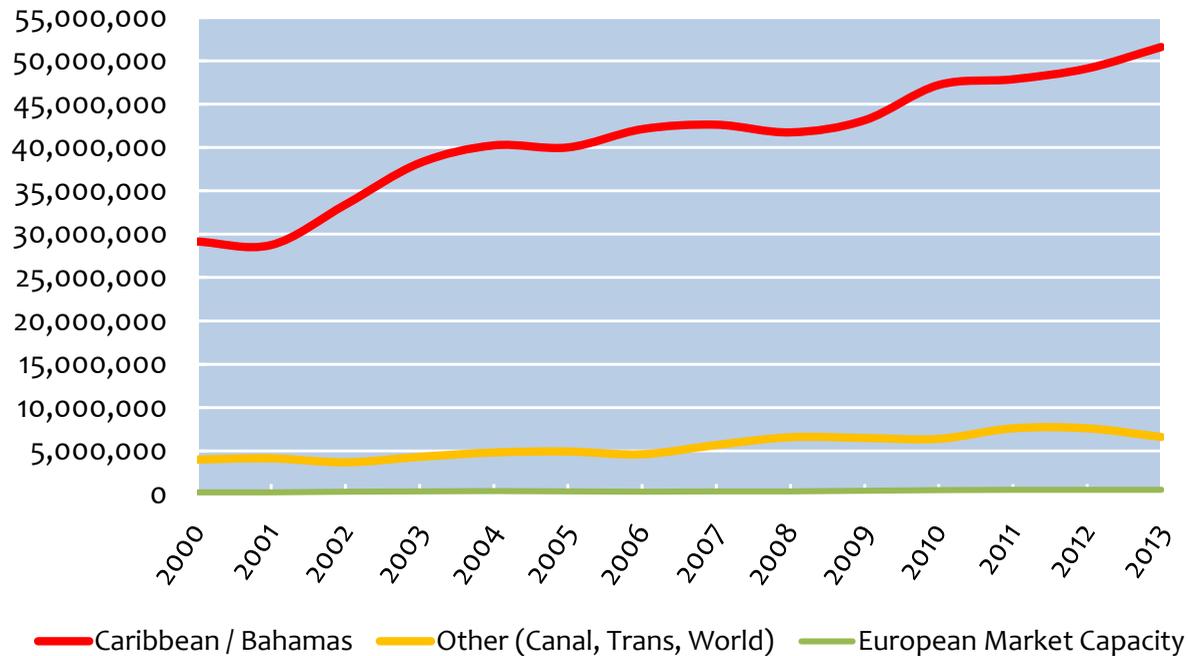
Figure 3: North American Cruise Market Growth Projection, 2013 – 2043



Source: Bermello Ajamil and Partners, Inc.

Figure 4 outlines the key North American Market Capacity Placement. As shown the Caribbean/Bahamas region provides the greatest impact to the marketplace with smaller contributions from Panama Canal, Trans-Atlantic and world sailings. Additionally, these markets are also fed by the European consumer market as it grows and begins to spread further out as their consumer demands additional itinerary options outside of the current arena.

Figure 4: North American Cruise Key Capacity Placement, 2001 – 2012



Source: Cruise Industry News Annual

The success of the Caribbean/Bahamas region is based on a series of factors including growth opportunities and constraints and traffic influences. Growth factors include the following:

- Operators are continuing trends toward US and key Caribbean homeports:
 - To reach drive consumer markets (limited market supply); and,
 - To reach lower Caribbean / Central America cruise region (via deployment).
- Carnival controls majority of all beds in the region (60%):
 - Norwegian Cruise Line is focusing on the US market - expanding their presence and Caribbean foothold focus; and,
 - RCI is moving small ships out of the region in favor of larger ships with international leanings (50%).
- Consumer demand - value for money;
- The world economy is growing shorter cruises;
 - Boosting short haul Bahamas / Caribbean / Private Island combinations.

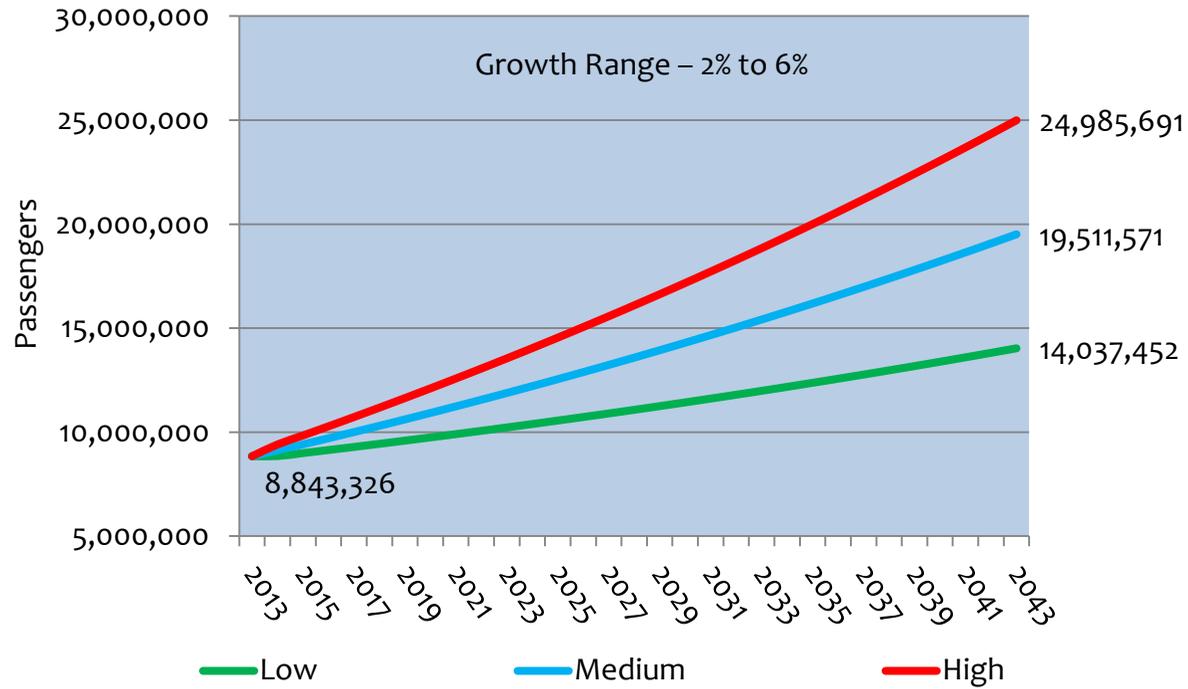
- Poor Bahamas infrastructure and services are impacting passengers / line deployment.

The factors influencing the regional traffic are:

- **Homeland Market:** Homeports along the Atlantic and Gulf Coasts have opened key drive markets for cruise lines:
 - Feedback indicates these are limited in scope (primarily due to the balance of per diem vs. operational costs).
- **Demographic Target Markets:** Northeast and Southeast regions provide an overall disproportionate volume of cruisers overall to the region;
- **4- to 7-day Cruise Product:** The ability of ships to reach lower Caribbean and Bahamas has changed deployments and enhanced the opportunities for new homeports outside of the primary South Florida region that once served the Caribbean and Bahamas market;
- **Seasonality of US East Coast Region:** US Northeast coast ports are used for year-round cruising. They can also then reach out to a broader consumer market that does not need to rely on airlift;
- **Airlift:** Essentially taken out of the mix with deployment offerings that are close to home. Cruisers are willing to drive from 4 to 6 hours and in many cases we are seeing overnight travel to cruise ports;
- **Vessel Size/Capacity:** Infrastructure and ability to service large cruise vessels are a critical factor for long-term success for any homeport and port of call in the region (downstream ports have product issues that must be solved into the mid-term to allow for continued growth).

Based upon the past success and potential growth opportunities for the Caribbean/Bahamas region **Figure 5** outlines the projections through 2043. As shown, growth is anticipated between 2.0% and 6.0% per annum over the period. This includes the addition of European and Asian consumers.

Figure 5: Caribbean and Bahamas Growth Projections, 2013 – 2043



Source: Bermello Ajamil and Partners, Inc.

Cruise Line Deployment Drivers

Table 1 outlines a number of cruise line drivers that in many cases become challenges for destinations on a regional or port basis. These are separated into four distinct areas. Each is important, but it is necessary to address each of these key components in order to meet the needs and expectations of the cruise industry over the long-term from a deployment and infrastructure perspective. Marketing and Sales is the key deployment driver. Deployment is based upon consumer awareness and demand. Marine operations also play a key role in ensuring the itinerary pattern routing and ports provide a safe and secure environment for the cruise vessel asset.

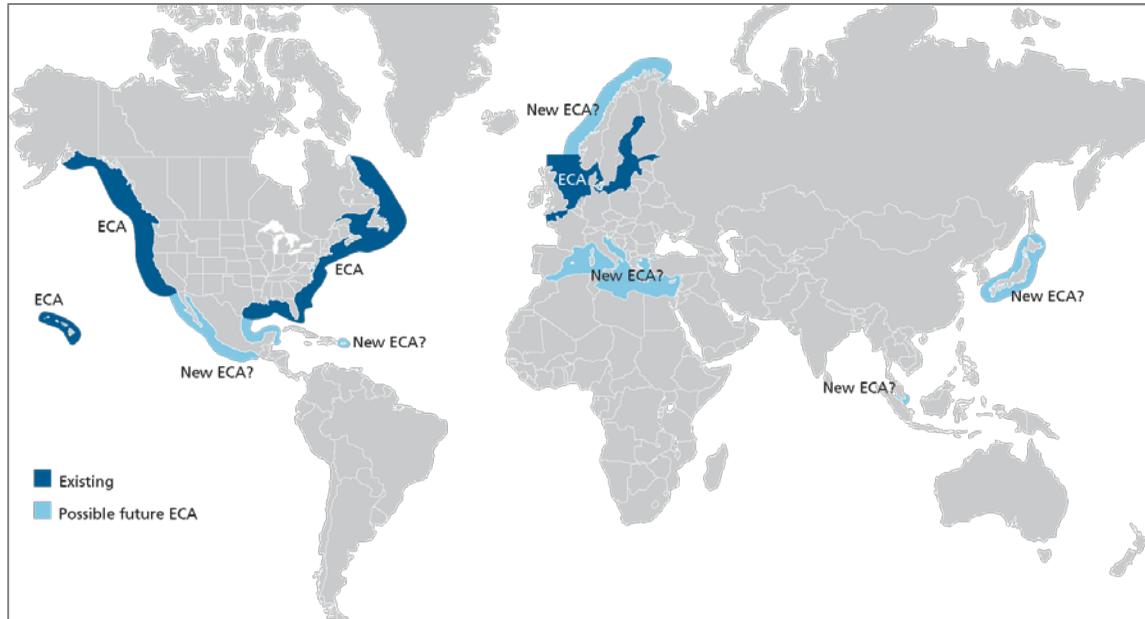
Table 1: Destination challenges: Cruise line needs

• Marketing and Sales	• Marine Operations
<ul style="list-style-type: none"> • Consumer awareness and education • Access to consumers – sales chains • Marketability for the consumer • Fit with cruise brand philosophies • Fit with consumer holiday patterns 	<ul style="list-style-type: none"> • Marine navigation and access • Security • Berth, apron and terminal features • Ground transportation areas • Provisioning
<ul style="list-style-type: none"> • Landside – coach and guide needs • Airlift – capacity and cost • Lodging – capacity and cost • Consumer product satisfaction • Destination venue capacities 	<ul style="list-style-type: none"> • Port charges • Labor, fuel and other operating costs • Regulatory and environmental issues • Maritime law • ECA and European Union Environ. laws
• Logistics, Air and Shore Excursions	• Finance and Legal

Source: Bermello Ajamil and Partners, Inc.

Other key issues that have and will continue to affect the cruise industry over the mid-term will be the full implementation of Emission Control Areas (ECAs) throughout the Baltic, Northern Europe, and the perimeter of North America with possible extension in the future to other regions such as the Mediterranean, as shown in Figure 6. The costs to the industry in terms of fuel, monitoring and on-board emission systems are still being contemplated.

Figure 6: Current and Potential Emission Control Areas (ECAs) Worldwide



Source: DNV-GL as sourced by International Maritime Association

Cruise vessel trends and new-build program

Cruise operators have been highly successful in introducing new vessel inventory and developing on-board products that generate sustained interest in cruising. Cruise brands continually work to improve the quality and quantity of on-board experiences with more diverse food and beverage venues, entertainment and deck activities, meeting and conference facilities and recreation areas.

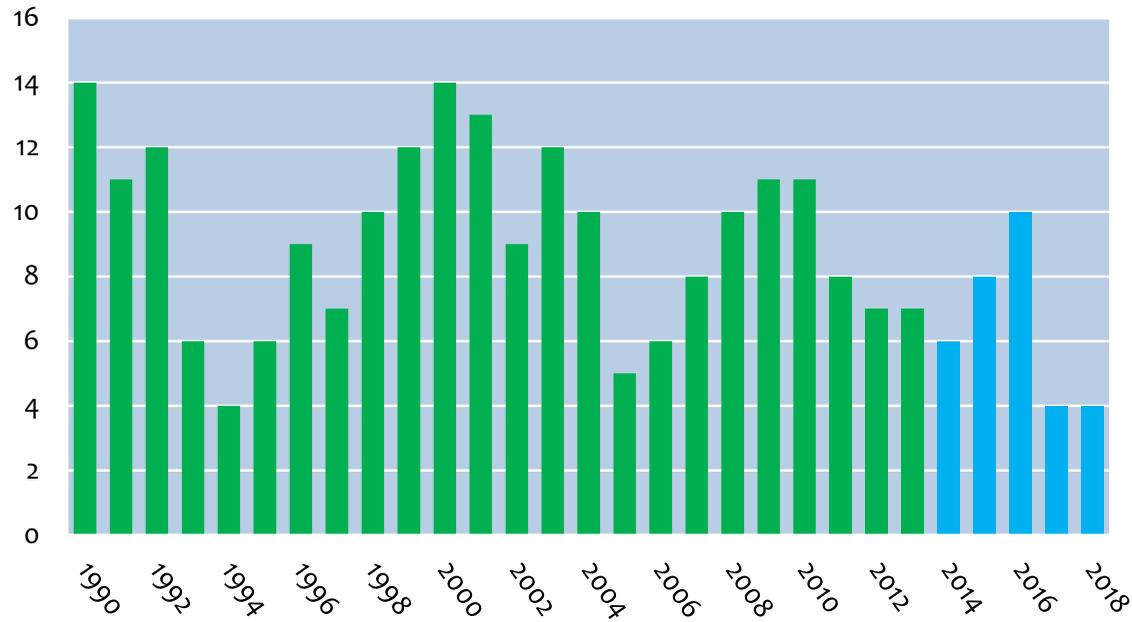
Responding to cruise passenger demand, cruise operators continue to order new vessels, although at a more restrained pace than observed at the peak of vessel orders in the late 1990s through the mid-2000s. Amongst their primary efforts is the creation of larger and more lavish vessels furnished with veranda-style outside cabins, grand central atriums, health spas and other amenities found in the best land-based resorts. This trend became the norm in the mid-1990s and has continued as cruise brands introduce innovative products and services on the newest vessels to further differentiate themselves from the competition and generate renewed public interest in cruising. Consumers generally meet each new vessel launch with enthusiasm, and ultimately, increased passenger bookings.

For each of the homeports to remain competitive in the cruise marketplace into the future and be able to fully accommodate the future generation of cruise vessels, current and future berth, terminal facilities and upland support areas and impediments such as channels, bridges and power lines will need to accommodate these larger cruise vessels. To forecast these future facility requirements and passenger throughput, it is important to take into account the trends in ship construction and deployment.

- More than 70% of the vessels delivered or on order since 2009 exceed the 120,000-GT mark, with this number increasing annually. The length overall (LOA), breadth, and air drafts of the new build vessels are increasing. In the Appendix of the study (Cruise Design Vessel Outlook) there is an extensive review and assessment of the growth of the modern cruise vessel with specific analysis related to the air draft of the newer ships.
- As of December 2013, there were 26 new cruise vessels on order and scheduled for delivery over the next five years (2014 through 2018). **Figure 7** below shows the cruise vessel new build deliveries from 1990 through 2018.

This supply propels the industry forward. There are established trends within the delivery pattern that coincide with the industry utilizing deliveries as a tool to control demand and pricing. Cruise line vessel orders are also affected by exchange rates and shipyard dry-dock / wet-dock slot availability in the limited number of yards that build these high quality vessels.

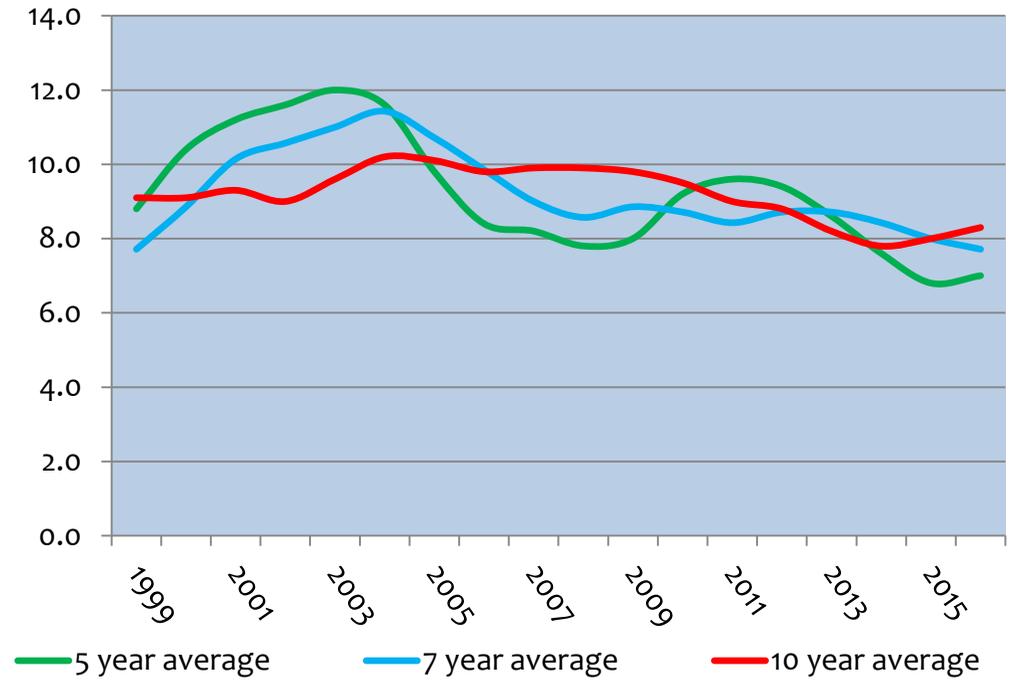
Figure 7: Conventional cruise vessel deliveries and on order, 1990 – 2018



Source: Bermello Ajamil and Partners, Inc.

Figure 8 shows the average per year ship deliveries on a 5, 7 and 10 year averages. It is clear that over a ten-year average ships are delivered at a pace between 8 to 10 ships per year.

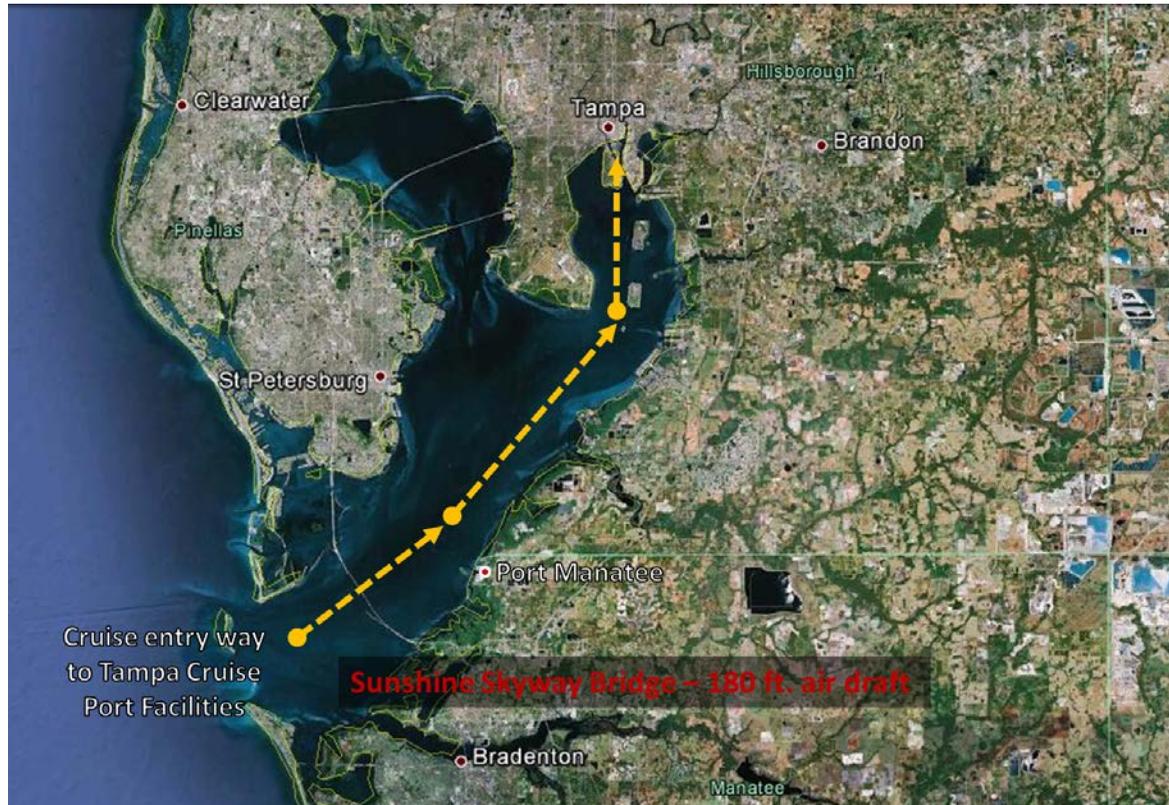
Figure 8: Average ship deliveries, 1999 – 2016



Source: Bermello Ajamil and Partners, Inc.

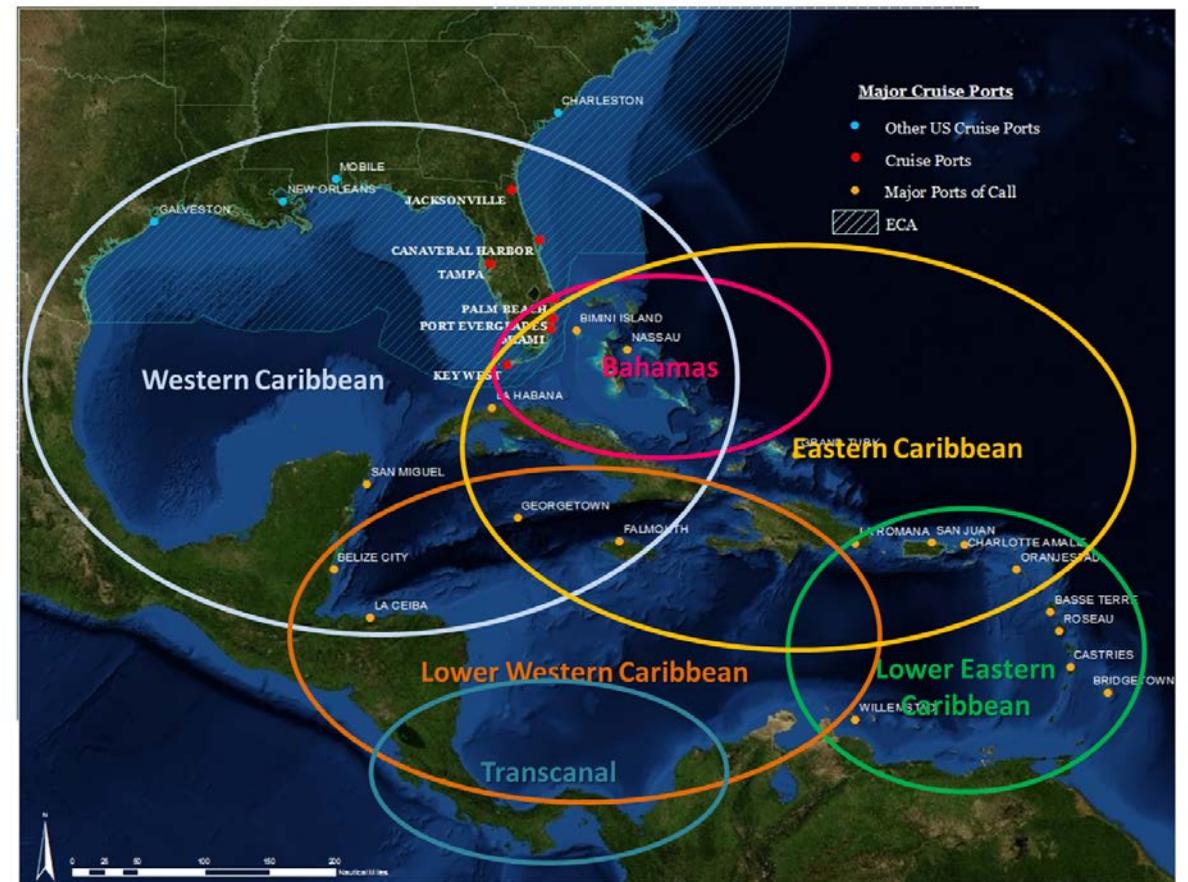
The cyclical nature of shipbuilding is driven by economics, shipyard competition, cost of capital, availability of government support or subsidies and consumer demand. Most of these factors are external to passenger issues.

3 TAMPA BAY CRUISE BUSINESS AND OUTLOOK



Today, Tampa Bay hosts several of the major cruise lines for homeport operations in the downtown core of Tampa at three state-of-the-industry and full-service terminals. To transit into Tampa Bay the vessels must pass under the Sunshine Skyway Bridge which has an air draft restriction of 180 feet. The terminals are accessed once in the Bay via the Sparkman Channel which also restricts the ships' length overall (LOA) to 965 feet.

In Fiscal Year 2013, Tampa hosted some 826,000 cruise passengers on 179 cruise calls. It is anticipated that in 2014 almost 1.1-million cruise passengers will sail from Tampa Bay on 239 cruises. The primary cruise region for service is the Caribbean, particularly the Western Caribbean for Tampa Bay, due to speed and distance from its geographic location. However as noted above, Tampa Bay can also serve as a homeport on sailings for other Lower Caribbean, Transcanal, Trans-Atlantic, and repositioning cruises. Cruises from Tampa range from 4-, 5- and 7-days plus, primarily sailing to Western Caribbean destinations. The North American consumer is the primary passenger. The map below provides the historical reference for the primary North American cruise market growth that has propelled the industry forward to date and is the primary Tampa Bay market base.



Below are some of the typical itinerary patterns that sail from the Tampa Bay region.



From Tampa Bay the primary port offerings are found in the Western Caribbean with the marquee ports of Cozumel, Grand Cayman and Key West; private destinations of Mahogany Bay and Costa Maya; and, the newer port options in the region of Belize, Guatemala and Roatan (where Mahogany Bay is the private Carnival Corporation port).

Tampa Bay's Fit in the Cruise Regional Market

Tampa Bay's strength in terms of strategic fit is to serve as a Caribbean homeport for regional cruise deployments. These are primarily Western Caribbean sailings due to speed and distance issues. Longer sailings of 7-days or longer can reach lower into the Caribbean region. However, cruise lines would then

typically deploy to an alternative Florida or other homeport to serve this market deployment. **Table 2** provides an overview of the fit.

Table 2: Tampa Bay cruise fit

Target Cruise Sectors	Homeport
Western Caribbean	↑
Eastern Caribbean	■
Southern Caribbean	■ / ↑
Canal & Repositioning	■ / ↑
Bahamas	↓

Key: Strong (↑), Fair (■), Weak (↓)

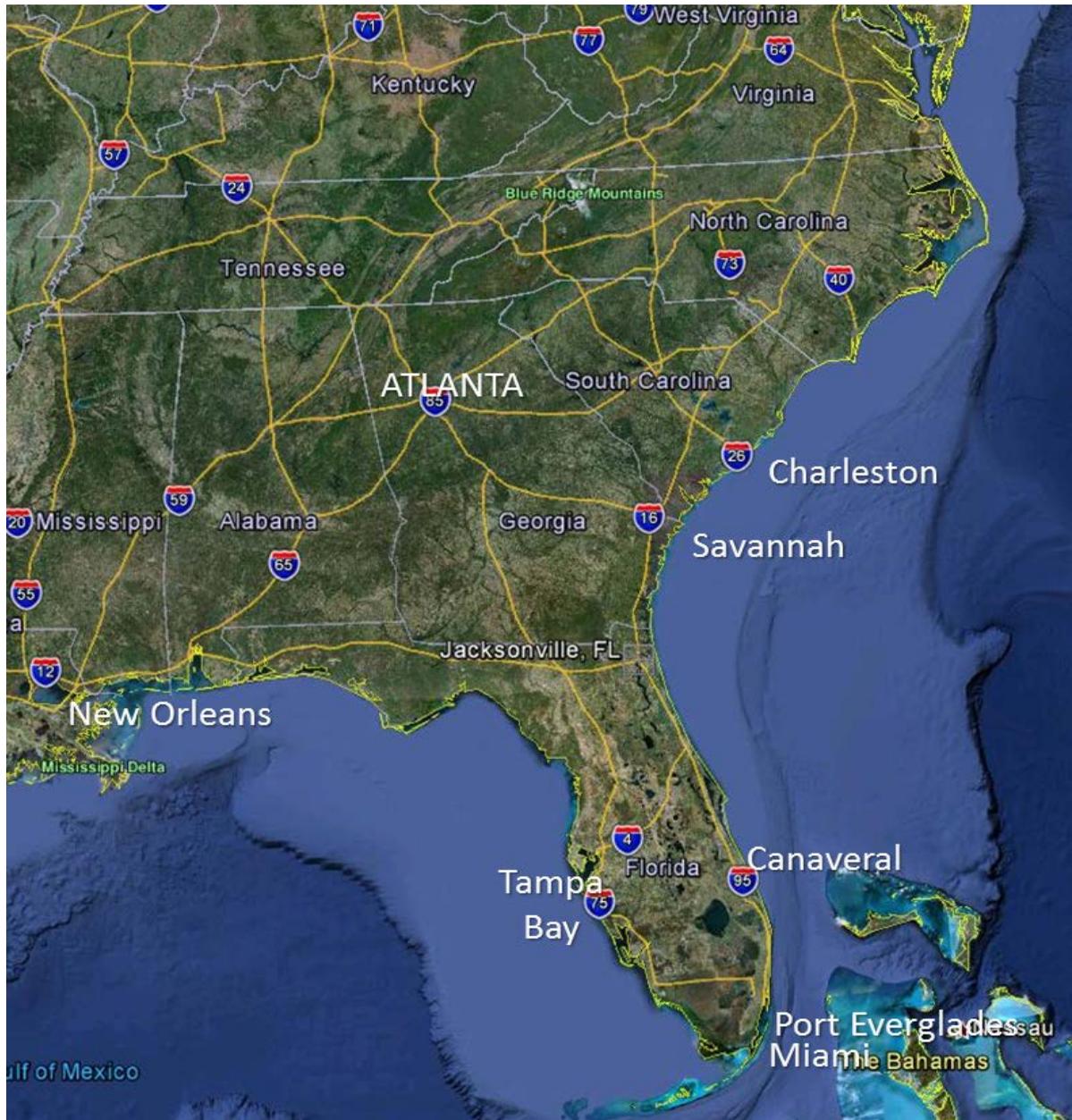
Source: Bermello Ajamil and Partners, Inc.

Regional Competitor Ports

For Tampa Bay the primary competitor for cruise passenger traffic is New Orleans with secondary competitors in the Gulf region being Mobile, Houston and Galveston. This is mainly due to the similar itinerary patterns offered from these ports to the western Caribbean and Mexican ports of call. Jacksonville is also a secondary competitor for cruise traffic, but this is due to the similar cruise consumer catchment area of the greater southeast US region including Georgia, Alabama and the Carolinas. However, Jacksonville cannot offer itineraries to the western Caribbean due to its geographic location. Jacksonville's main itinerary offerings include the Bahamas and eastern Caribbean.

Due to its geographic location, consumer draw and bridge impediments, Tampa Bay homeport options are viewed as a secondary deployment market for the cruise line industry in Florida. Port Canaveral, Port Miami and Port Everglades are the primary homeports providing drive-in and fly-in options for cruise consumers and itinerary patterns throughout the Bahamas, Caribbean, and other destinations.

There are limited port-of-call opportunities due to Tampa Bay's geographic location. Each of the Florida homeports taps into the primary core southeast target consumer market to varying degrees. The southeast drive market is very active in Florida and provides the primary traffic for Tampa Bay cruise tourism.

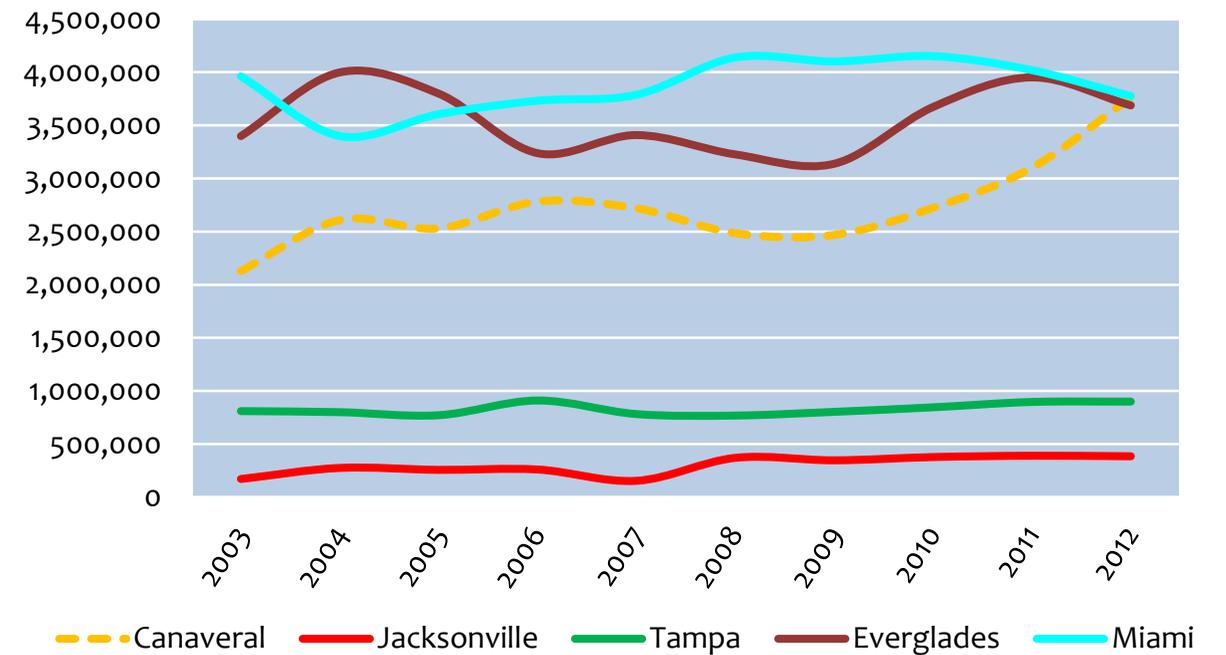


This consumer catchment is also shared with New Orleans, Mobile, Jacksonville and Charleston. However, as illustrated above, these ports provide homeport options that do vary from Tampa Bay in terms of itinerary patterns.

At present neither Tampa Bay nor Jacksonville has the ability to homeport the large cruise vessels in the world cruise fleet due to air draft issues at each port (bridge(s) and power lines).

Figure 9 shows that Port Canaveral, Port Miami and Port Everglades provide for the majority of the traffic from Florida ports within the competitive sphere of Tampa Bay. Tampa and Jacksonville are more regional in nature and cater to a smaller cruise consumer market overall.

Figure 9: Competitive Port Passenger Throughput, 2003 – 2012, not including day sailings



Source: Ports listed and Bermello Ajamil and Partners, Inc.

Cruise Line Decision-Maker Feedback

As part of the study process cruise line decision makers were asked to provide feedback on the Tampa Bay issues. All of the major North American Cruise operators provided input via interview or e-mail questionnaire. The feedback is found below:

- Tampa is a big city and airport with some appeal;
 - Canaveral is closer to Orlando and has a larger airport – coupled with the investments made it makes for a better (deployment) choice;
- Tampa Bay marine transit is more difficult (in comparison to competing regional ports);
 - 4 hours, one way traffic and 340-meter channel;
- Downstream ports of Belize and Roatan are not big enough to start a new market;
- Tampa Bay is restricted by a lack of itinerary options;
- In 10-years the fleet will start exceeding air draft restrictions (for Tampa Bay);
- Over the next few years there will be no smaller ships left;
- There is a strong market potential to grow (Tampa Bay);
 - Replacing vessels with larger ships (is the mechanism); and,
 - Drive market focused – Tampa Bay is isolated with a small percentage fly market;
- Prefer Tampa Bay over New Orleans;
 - Stronger geographic positions (5 hours shorter with lower fuel percent cost); and,
 - Galveston would cannibalize region with deployments;
- Likely (traffic) has peaked in Tampa;
 - Limiting own growth keeps demand up;
 - Strong drive market; and,
 - Do not see huge future demand for deployments to Tampa Bay;
- Tampa Bay's issue is where to take the ship;
 - Needs creative itineraries;
- If they build for larger ships they will get the business;
 - We would likely guarantee vessels to port for expansion;
- Continuation of 1 vessel in Tampa into the next 3 years;
 - Sooner or later vessel(s) will need to be replaced as they are closing in on the end of life for ship at 25 years; and,
 - Vessel air draft similar to today long-term (pinnacle class);
- Tampa Bay may be the lowest yielding market in Florida;
- Tampa Bay is doing well as compared to Canaveral;
 - Better passenger spend;
- Line is destination focused, thus concentrating on the lower Caribbean deployments;
 - May look for new homeport if there is congestion; and,
 - Have not studied Tampa's source market;
- There is a familiarity and comfort with FLL (Port Everglades);
 - Easy access for selected itinerary types; and,
 - Disadvantage is that they are always the same;
- Large ships are the future;
 - Small ships will soon be the Grand class.

Cruise Line Homeport Logistics

If a new homeport were to be built seaward of the Sunshine Skyway Bridge, there would be significant cost savings for cruise lines based upon their feedback. A cruise facility on the seaward side of the bridge would reduce sailing time by approximately 4 hours, thus saving fuel. Cruise vessels must sail down the channel from the bridge to and from Channelside in downtown Tampa where the primary cruise terminals are currently located. Providing an option that would not require vessels to transit the channel would also be safer for all ships in that it would remove one-way traffic from the ship channel.

A seaward cruise facility option would also improve the speed and distance ratio (lower fuel consumption) for vessels sailing on itinerary patterns from Tampa Bay. This additional time on an

itinerary pattern (4 hours saved by not having to transit the channel) would not necessarily provide for new ports from Tampa Bay. However, this time could reduce speeds to downstream ports of call or could be used to provide additional time in these ports that could then be used create additional revenue opportunities such as more shore excursion options; more shore excursion departures; or, more time in port to shop at retail stores promoted by the cruise lines.

A cruise facility created on the seaward side of the bridge (outside of downtown Tampa) would also create a number of issues for cruise line logistics. There is a longer distance for supply trucks and service vehicles to travel from the current highway corridors; longer commutes for facility staff, stevedores and Customs and Border Protection (CBP) personnel; and, it is a longer distance from the airport, downtown core, major hotels, etc. Based on cruise line feedback these challenges would not provide unique or costly challenges to the cruise lines that are deployed to Tampa Bay. Thus, it would not be a negative determining factor as to cruise line deployments to Tampa.

Projections

The projections shown herein are used as the baseline to determine Tampa Bay’s future cruise demand. The cruise projections assess the current industry trends impacting future cruise passenger and vessel throughput over a 30-year planning period (FY2013 – FY2043). This assessment of one of the primary revenue drivers identifies global and regional market trends that impact potential levels of traffic.

As it relates to cruise traffic, the projections are based upon an examination of Tampa Bay’s existing position in world and regional cruise deployments, levels and types of cruise operations, and overall traffic patterns based on the most probable range of passenger (first) and vessel (second) throughput. The assessment includes the growth analysis of the regional future trends for the Caribbean and Bahamas regions and other deployments that may impact Tampa Bay.

It is difficult to project the cruise lines’ growth for a region or Port over the mid-term (3 to 5 years) as for the most part lines themselves rarely know their deployment outside of this time period due to outside forces and market trends. To project out over a 30-year period is especially difficult and filled with numerous assumptions. However, this exercise does provide a perspective of the potential market over the period should all of the fundamentals be maintained in the industry and region.

Projections anticipate that the cruise industry will continue to follow fundamental positive trends. The methods and various assumptions incorporate the best interpretation of demand and supply conditions

in the marketplace. Projections are un-constrained in nature and do not take into account the potential berth capacity, utilization or other limiting factors of Tampa Bay or downstream ports. There are several factors that have been considered in contemplating the projections shown. The projection models used include:

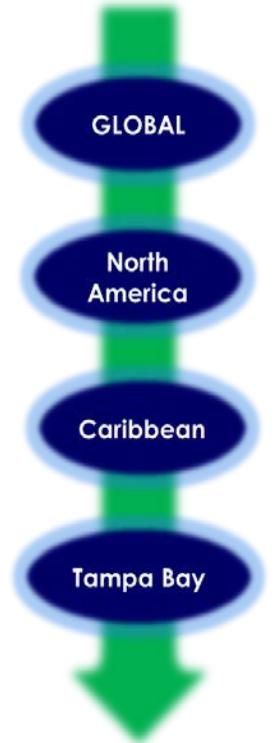
- Trend regression that is a basic test and is based upon past success;
- Market capture based upon past achievements in gaining market share in the primary markets (Caribbean) that impacts Tampa Bay. This is a direct competitive look at the market; and,
- Scenarios based on cruise line trends and opportunities. These are the key for Tampa Bay in assembling scenarios that are actionable due to the opportunities associated with additional traffic growth. They include two constrained and one unconstrained approach.

The methodology, shown in the adjacent figure, is as follows:

- Understanding of Global forecasts;
- Market capture of North America (primarily for Tampa Bay);
- Market share of key market deployments; and,
 - Caribbean, etc.;
- Market share to Tampa Bay;
 - Homeport options; and,
 - Expansion or contraction due to the Sunshine Skyway Bridge impact, ECAs and global position.

Key projection factors for Tampa Bay include the following elements:

- Impact of the Sunshine Skyway Bridge height limitations or non-constrained picture;
- Caribbean market growth – where is it long-term?;
- Opportunities to expand air traffic access to Tampa Bay region and rely less on the drive-to market for cruise growth;
- Competition and deployment splits;
- North American (SE) and future European and Asian consumer desire;
- Cruise duration (shorter or longer sailings into the long-term?); and,



- Cruise season extension for Tampa Bay beyond the peak seasonality.

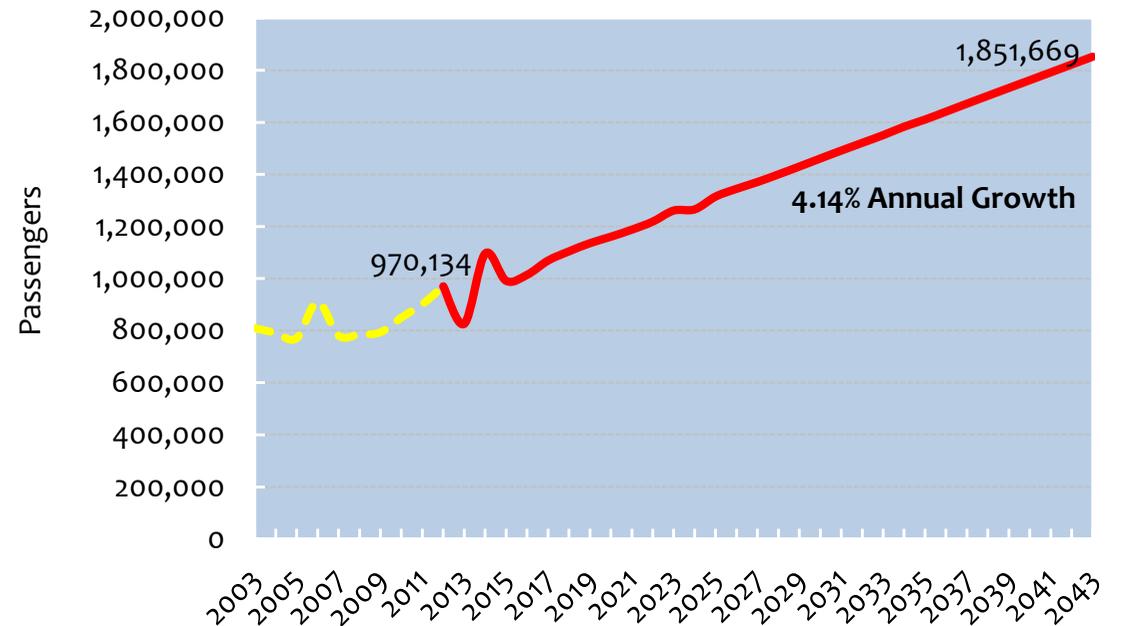
Past trends of the region were used to estimate future capture levels based on cruise offerings as seen in **Figure 5** on page 6 in the previous section, which make up the identified key patterns feeding cruise passengers to the region and potentially to Tampa Bay into the future. An estimated capture rate was developed for the overall North American cruise passenger projections based upon a historical analysis and future assumptions for growth including worldwide growth projections, impact of ECAs and other competitive factors.

It is assumed that the region will maintain a stable base for cruise operations with fluctuations due to the implementation of policies related to ECAs. These projections were developed irrespective of facility use. Projections were done for a 30-year baseline term.

Projection approach 1 – Natural Growth (Trend Regression)

Figure 10 is a trend progression model based on historical events to project future throughput. This model is basic and used as a guideline. The annual growth is 4.14% with approximately 1.8 million passengers in FY2043 on 287 cruise calls. The average annual growth rate from 2003 – 2013 was .19%. There is a substantial cruise passenger increase in FY2014 that pushes capacity past the 1-million mark. However, the 4.14% growth rate is unlikely over the long-term with the current constraints.

Figure 10: Tampa Bay natural growth passenger projection, 2003 – 2043



Source: Bermello Ajamil and Partners, Inc.

Projection approach 2 – Market Capture

The market capture approach is based upon Tampa Bay’s past track record for capturing a percentage of all passengers in the region. An assumption is then made as to the future ability to capture a percentage of the overall market over the 30-year projection period. Tampa’s historical cruise passenger capture rate from 2003 to 2012 is 11.26% of the overall market. Growth has remained relatively flat over the period with increases over the past two years and then a slight drop to less than 10% for 2013. Tampa is expected to capture over 12% in FY2014.

It is envisioned for the Caribbean to continue its growth rate. Thus, capture ranges into the future for Tampa may be from 10.59% to 11.26%. See **Figure 11**.

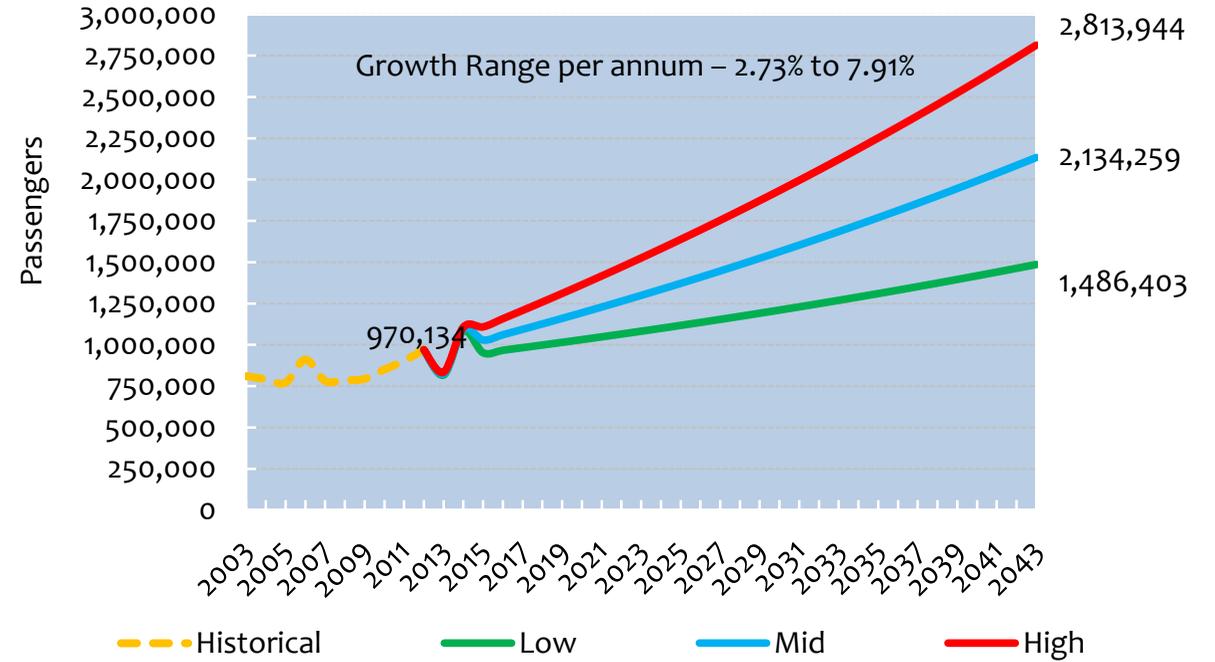
Figure 11: Tampa Bay market capture rates, 2003 – 2013



Source: Bermello Ajamil and Partners, Inc.

Based upon the market capture model **Figure 12** shows the growth in FY2043 to be from 1.4 million to 2.8 million cruise passengers on 231 to 437 cruise calls. This model is unconstrained and would likely require additional cruise facilities over the long-term and the ability to bring larger vessels into Tampa Bay that presently exceed the air draft limits of the Sunshine Skyway Bridge.

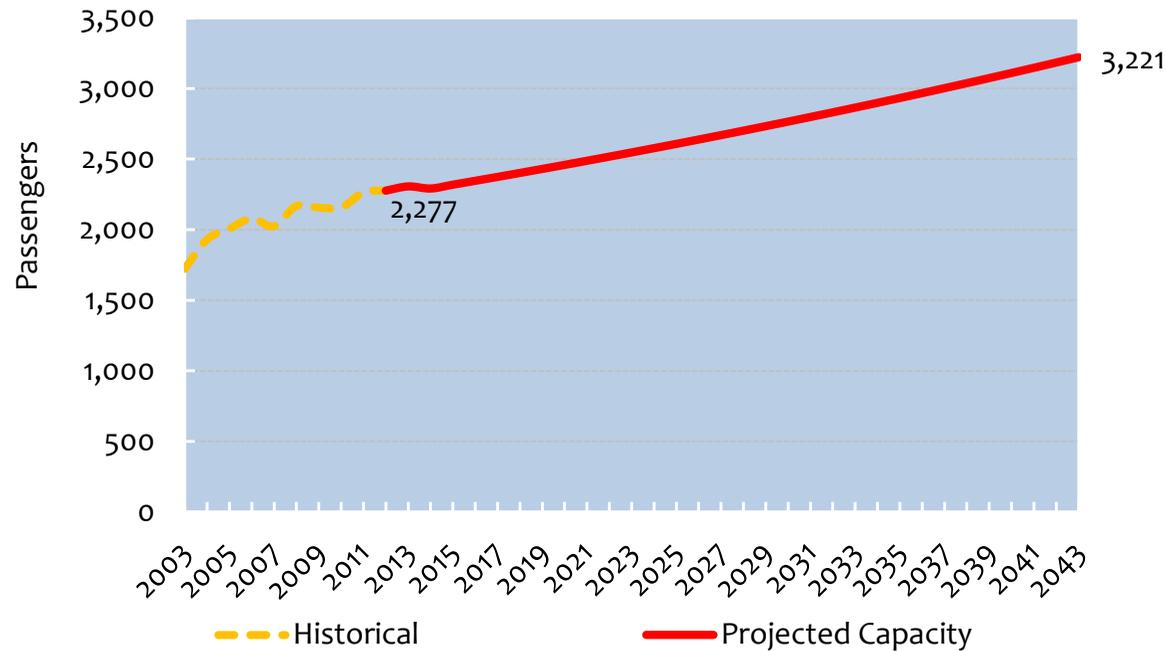
Figure 12: Tampa Bay market capture passenger projection, 2003 – 2043



Source: Bermello Ajamil and Partners, Inc.

Under the standard models outlined the passenger capacity per sailing increases due to the larger size ships. Thus, as shown in **Figure 13** the passenger capacity per call moves from 2,277 to 3,221 passengers per cruise call in FY2043. This is a growth rate of 1.32% per annum.

Figure 13: Tampa Bay passenger capacity per vessel call projection, 2003 – 2043



Source: Bermello Ajamil and Partners, Inc.

Projection approach 3 – Vessel deployment scenarios

Under this approach, based upon past trends of the cruise industry, marketplace assumptions have been made as to the deployment of cruise vessels to and from Tampa Bay as a secondary homeport into the mid-term and a more significant homeport into the long-term. This approach requires additional work on the part of Tampa Bay and regional partners to entice cruise deployments and provide the platform necessary for the lines to be successful such as infrastructure, cost and operational stability, tourism attraction growth, removal of impediments (air draft and channel traffic issues).

In this industry, success breeds success. Thus, as one cruise line brand is successful with a cruise product in the region another will then look to also come into the marketplace and set up its product for their target consumer market. Three scenarios were assembled illustrating levels of deployment to Tampa

Bay based upon current and projected contractual levels, the development of new markets, North American and European deployment trends, ECAs impacts, and the draw of new markets, such as Asia, for large cruise vessels into the long-term.

We have established the ship size and range of vessel calls for each scenario based upon our interpretation of the potential growth of the region, seasonality, type of vessels that will likely be deployed to the region and Tampa Bay; and, historical context as it relates to the types of itineraries in the region based upon speed and distance issues.

Scenario targets include primarily North American and European brands. Mid- to long-term forecasts are based upon success and continued positive trends inclusive of per diem and revenue generation.

In addition, the scenarios are based upon factors including interviews with cruise lines, constrained and unconstrained (based upon air draft considerations) and sailing types. For each scenario, lower berth capacity was used. Dependent upon the brand an additional 10% to 20% sailing capacity was also factored into the sailing figures. These are based upon past statistical assessments of cruise lines in the market. By example, Carnival typically sails at 120% capacity, while Holland America Line is closer to 90% to 110% based upon market segment and sailing type. An assumption that it would take a minimum of 10 years for the development of berths that do not limit air draft was used (scenario 3).

Scenario #1 –Carnival / RCI Growth Dominant

- Carnival Fantasy 90-98 (2,040 cap.) 554 yr. round
- Carnival Spirit 01-04 (2,470 cap.) 7 yr. round
- Carnival Spirit 01-04 (2,470 cap.) 554 yr. round
- Carnival Spirit 01-04 (2,470 cap.) 554 yr. round
- HAL R Class 97-00 (1,432 cap.) 7 seasonal
- HAL Signature Class 08-10 (2,104 cap.) 7 seasonal
- HAL S Class 93-96 (1,266 cap.) 7 seasonal
- RCI Vision Class 95-98 (2,200 cap.) 554 yr. round
- RCI Radiance Class 01-04 (2,112 cap.) 7 yr. round
- Norwegian Jewel Class 05-07 (2,466 cap.) 7 seasonal
- Princess Sun Class 95-98 (1,950 cap.) 10/11 seasonal

Scenario #2 – Add Norwegian / European lines (additional opportunities)

- Norwegian Jewel Class 05-07 (2,466 cap.) 7 seasonal
- MSC Musica Class 06-10 (3,013 cap.) 7 short seasonal

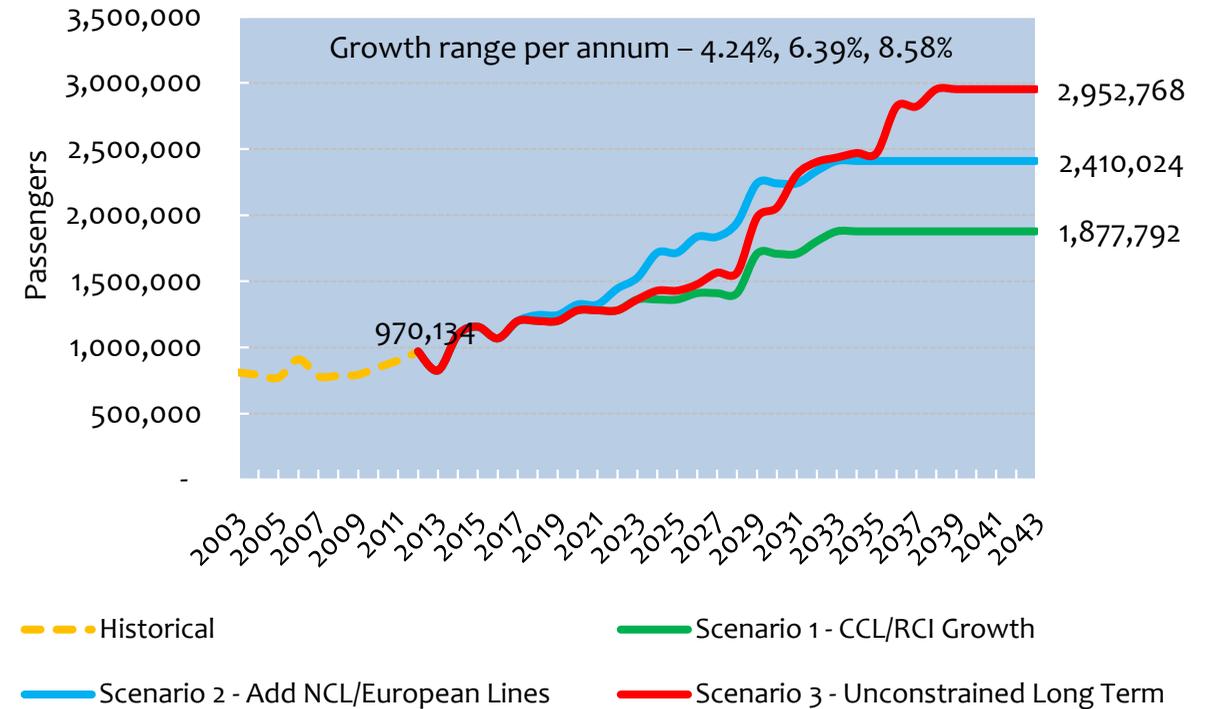
- MSC Lirica Class 03-05 (2,099 cap.) 7 seasonal
- AIDA Vita Class 02-03 (1,266 cap.) 10/11 seasonal
- AIDA Diva Class 07-13 (2,050 cap.) 10/11 seasonal

Scenario #3 – Unconstrained large ship deployment

- Carnival Fantasy 90-98 (2,040 cap.) 554 yr. round
- Carnival Spirit 01-04 (2,470 cap.) 7 yr. round
- Carnival Spirit 01-04 (2,470 cap.) 554 yr. round
- Carnival Spirit 01-04 (2,470 cap.) 554 seasonal
- Carnival Conquest Class (3,006 cap.) 7 yr. round
- Carnival Dream Class (4,000 cap.) 7 yr. round
- HAL S Class 93-96 (1,266 cap.) 7 seasonal
- HAL R Class 97-00 (1,432 cap.) 7 seasonal
- HAL Signature Class 08-10 (2,104 cap.) 7 seasonal
- RCI Vision Class 95-98 (2,200 cap.) 554 seasonal
- RCI Radiance Class 01-04 (2,112 cap.) 7 yr. round
- RCI Voyager Class (3,114 cap.) 554 seasonal
- RCI Freedom Class (3,634 cap.) 7 seasonal
- RCI Quantum Class (4,180 cap.) 7 seasonal
- Norwegian Jewel Class 05-07 (2,466 cap.) 7 seasonal
- Norwegian Epic / Breakaway Class (4,000 cap.) 554 seasonal
- Princess Sun Class 95-98 (1,950 cap.) 10/11 seasonal
- Princess Grand Class (3,600 cap.) 7 seasonal

Under these scenarios the projection model for cruise passenger throughput rises to between 1.8 and 2.9 million passengers by FY2043. It would be anticipated that vessel size would continue to increase into the long-term, particularly under scenario 3 as it is unconstrained. Thus, in FY2043 vessel capacity is expected to range from 2,739 to 3,402 passengers per call. See **Figure 14** for the overall passenger growth based upon the above scenarios. Growth per annum ranges from 4.24% to 8.58% under these scenarios.

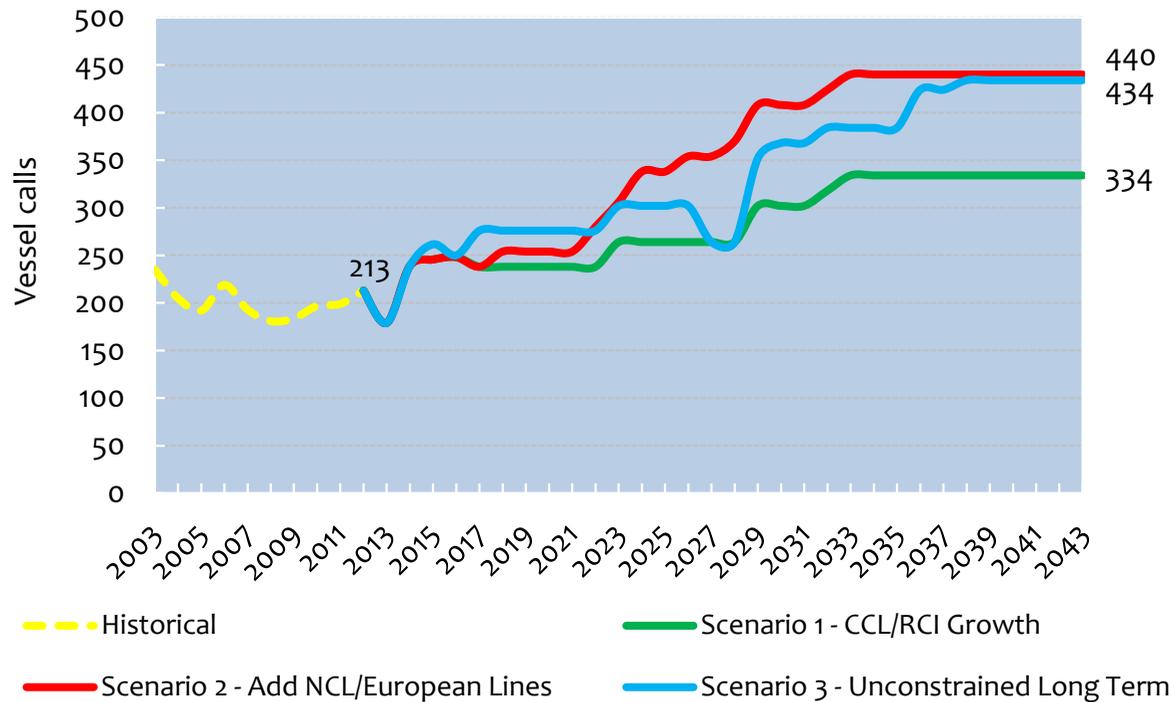
Figure 14: Tampa Bay deployment scenarios passenger projection, 2003 – 2043



Source: Bermello Ajamil and Partners, Inc.

Figure 15 illustrates the number of calls ranging from 334 to 440 revenue based cruise calls (double count for homeporting) based upon the scenarios presented. The total number of calls is based upon the passenger projection divided by the projected number of passengers per vessel. Under these projections the total number of passengers is estimated first, followed by the vessel capacity for the port. That then drives the total number of cruise calls.

Figure 15: Tampa Bay scenario cruise calls projection range, 2003 – 2043



Source: Bermello Ajamil and Partners, Inc.

Projection Conclusions

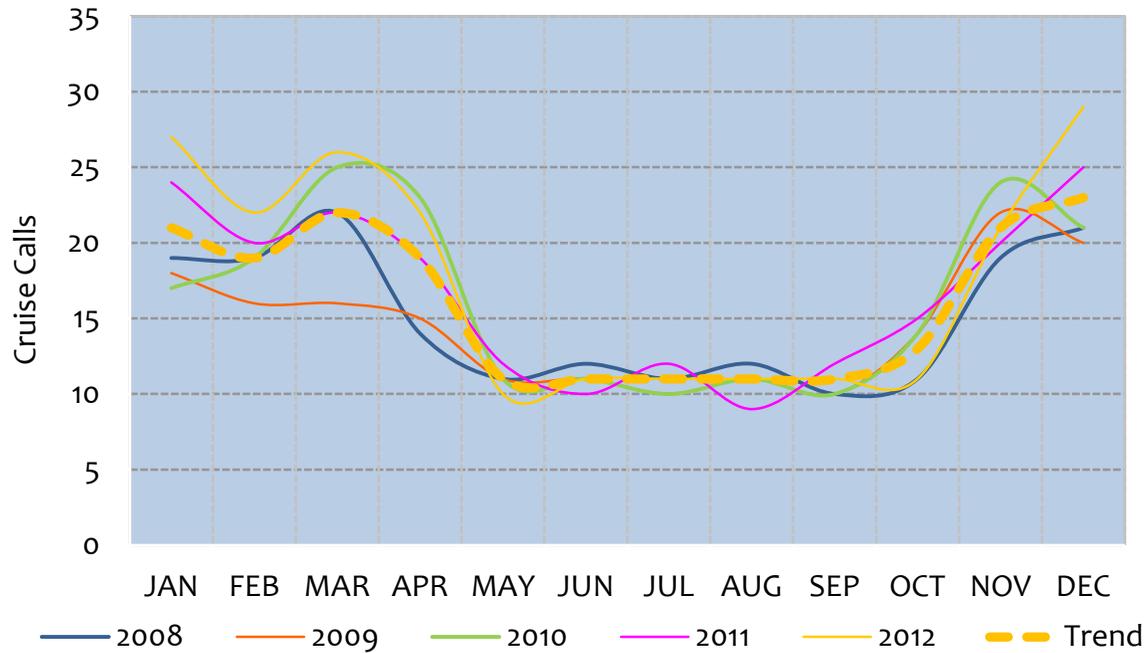
- All of the major cruise brands indicated that there is a willingness to deploy larger vessels into the Tampa Bay market if facilities are available;
- If facilities are not available in Tampa in the long-term to accommodate larger ships, this does not mean vessels will necessarily go to another Florida port. It is likely that a percentage of vessels would be lost to another regional deployment competitor;
- Cruise brands would guarantee vessels for the ability to berth larger ships in Tampa Bay. However, it must be recognized that Tampa Bay is likely a 2nd tier port in Florida based upon cruise feedback. This would limit overall deployment numbers into the long-term. This is primarily due to airlift value and a limited drive market; and,
- Tampa Bay does not lose all traffic in the long-term if the air draft issue is not resolved, but over time there are much more limited deployment options to Tampa Bay. Thus, Tampa Bay will slowly become a secondary vessel market with small ships (mid- to long-term).

Berth Demand

Based upon the projections featured earlier starting on page 13, berth demand scenarios were established for Tampa Bay. These take into consideration the number of passengers per vessel, seasonality, daily distribution and the overall numbers of cruise line customers. Demand is very specific for each port.

As shown in **Figure 16**, peaking for Tampa Bay occurs primarily in the months of November through April which coincides with the high Caribbean cruising period, which is likely the long-term deployment trend for the region and Tampa Bay. New traffic may be generated in the summer months or some peak traffic moved to accommodate new tourism products in the long-term.

Figure 16: Tampa Bay monthly peaking patterns of passenger traffic

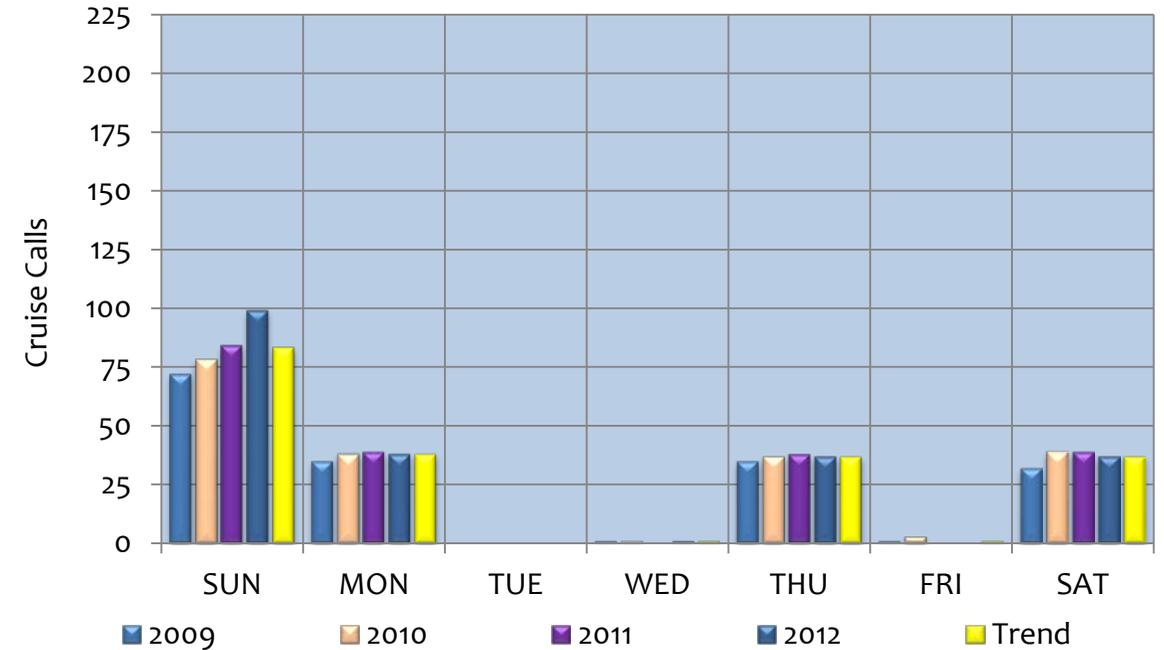


Source: Bermello Ajamil and Partners, Inc.

Tampa Bay’s traffic is a combination of 7-Day and 5, 5, 4-Day cruise itinerary products that provide for higher berth use on Saturday and Sunday and Monday and Thursday. There is a relatively open berth on Friday for vessel deployment. As suggested it is likely that similar historic daily distribution patterns over time will be continued. It must be noted that the number of cruise passengers per day also increases over time. This increase impacts infrastructure such as Ground transportation areas (GTA), parking, curb side areas and terminal operations.

Figure 17 shows the daily passenger peaking for the past 4 years and the average for the weekdays.

Figure 17: Tampa Bay daily peaking patterns of passenger traffic

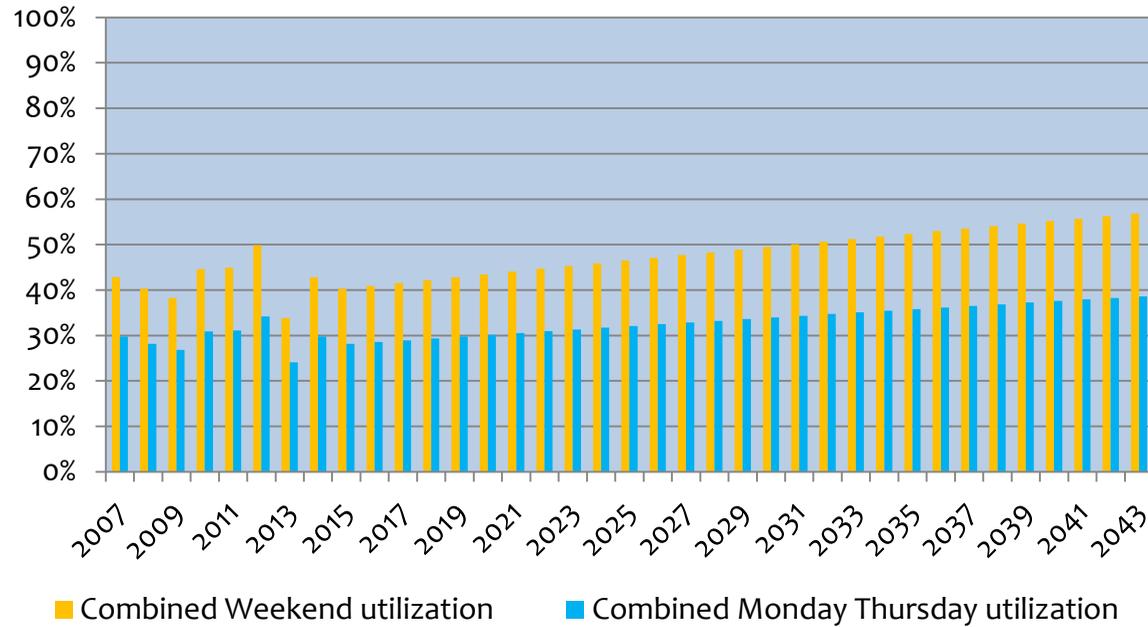


Source: Bermello Ajamil and Partners, Inc.

As shown, weekend days (including Friday, Saturday, Sunday and Monday) and the typical 5, 5, 4-day homeport sailing day of Thursday are the peak cruise homeport traffic days for Tampa. Weekend days (Saturday and Sunday) are the preferred homeport 7-day cruise pattern option due to the consumer demographic vacation patterns. Additionally, the itinerary patterns drive the days as well. This trend for Tampa will likely continue into the future. If more vessels are deployed to Tampa then this would affect the need for additional berth and terminal infrastructure.

Based upon the future deployment trends for Tampa Bay under projection scenario two – mid-range, Figure 18 illustrates that beyond into the long-term there is likely not a new demand for additional berth requirements based upon the current constraints of Tampa Bay. Cruise traffic would stay at manageable levels and the current 3 cruise berth / terminal options would be sufficient to meet the future requirements. However, should these be managed on a per brand basis and contracted accordingly then this formula may change and require additional infrastructure.

Figure 18: Tampa Bay Scenario 2 mid-range berth demand

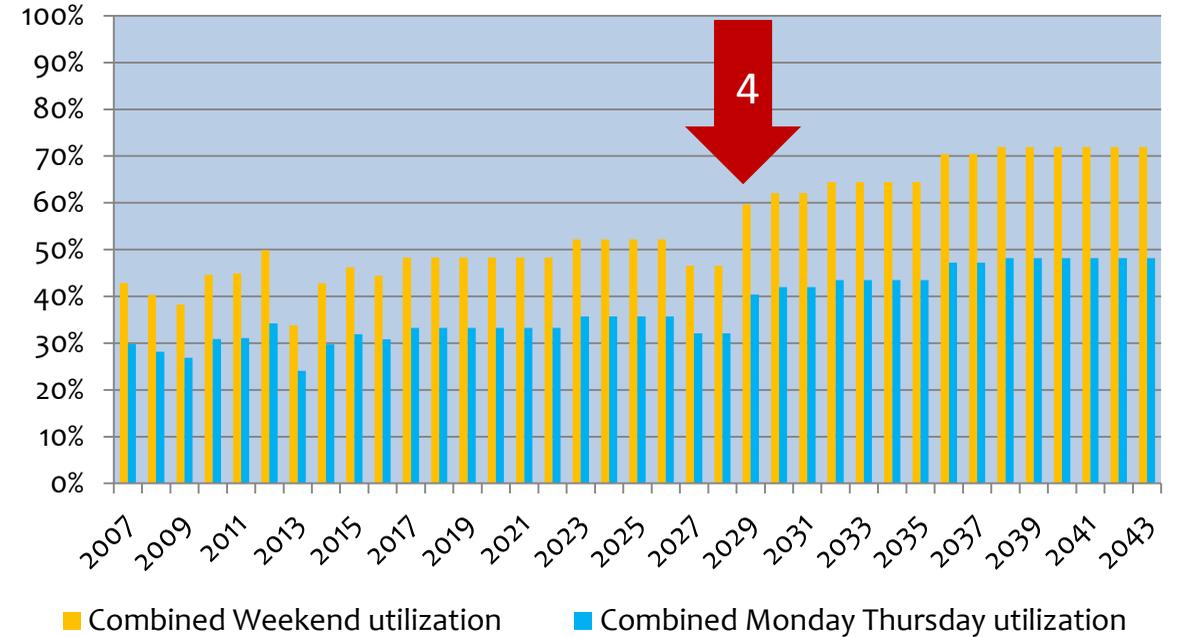


Source: Bermello Ajamil and Partners, Inc.

As shown above, weekend utilization does not reach above 60% over the projection period. Based upon past assessment experience new berth needs are required when demand reaches approximately 75% to 80% utilization.

Figure 19 shows that under the high projection scenario 3 that there is likely a need for a 4th berth in Tampa to support weekend homeport operations. This would be required in approximately 2028 to 2032. Under the high scenario with the current deployment trends the Sunday homeport slots are saturated at some 75% to 80% by 2030.

Figure 19: Tampa Bay Scenario 3 unconstrained berth demand

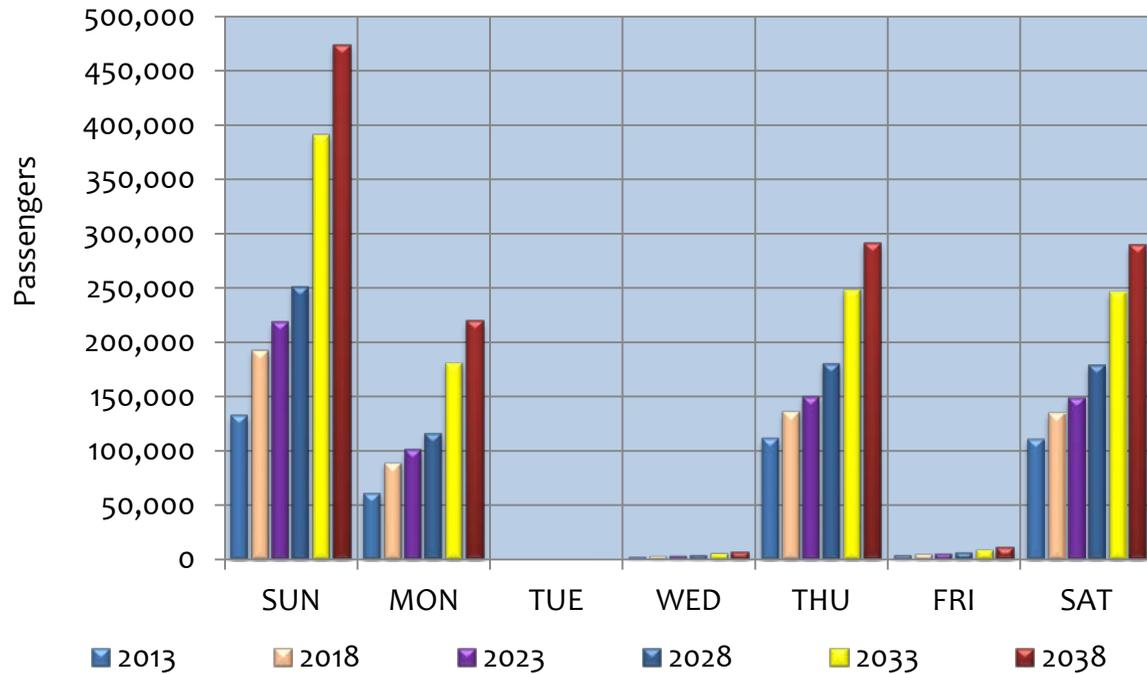


Source: Bermello Ajamil and Partners, Inc.

As illustrated above the increase in daily passenger traffic over the projection period poses a significant impact to the upland support infrastructure.

Figure 20 shows the daily passenger counts over the long-term based upon the high passenger throughput scenario in the projection model. This drives curb side (taxi and coach), parking and other landside and air requirements. By 2038 the Tampa Bay region could anticipate 3 to 5 times the number of passengers on a given weekend homeport day under this scenario.

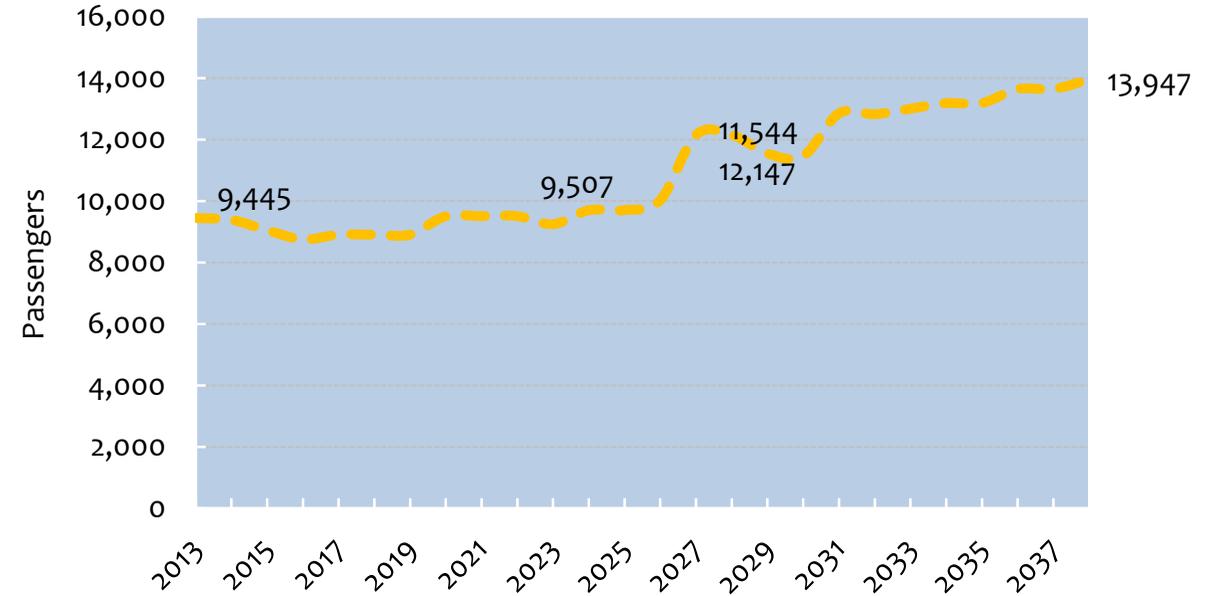
Figure 20: Tampa Bay Scenario 3 unconstrained daily passenger counts, 2013 – 2038



Source: Bermello Ajamil and Partners, Inc.

Figure 21 presents a scenario for parking demand using the high projection model. As shown this is based upon the likelihood that 75% of the cruise traffic to Tampa would be the southeast drive consumer market. To determine the total number of cars the standard 2.2 persons per vehicle was used. This does not consider cruise day overlaps. Parking demand climbs to almost 14,000 spaces by 2038 under scenario 3.

Figure 21: Tampa Bay Scenario 3 unconstrained parking demand, 2013 – 2038



Based upon 75% drive market in peak 6 month season; 2.2 pax per car; Does not consider cruise day overlap

Source: Bermello Ajamil and Partners, Inc.

Demand Conclusions

- There is a new berth required into the long-term with 4 total berths (add one in 2028/29) – primarily due to Sundays 80% capacity or the combined weekend utilization rate based upon the high projection scenario. This requirement could come earlier based upon contractual issues and the cruise brands desire for peak weekend deployment day use.
- Due to the intensive consumer drive market the parking areas would also be highly impacted.

Economic Impacts

To determine long-term economic impacts the Tampa Bay impact model was used based on the 2012 study completed for the Port of Tampa by Martin Associates. The ratios used within the tables are based upon a per passenger basis for each of the categories presented. In addition, a 3% per annum cost of living increase was factored into all dollar figures.

As shown in the graphics presented in this section the highest impacts occur in the long-term based upon an unconstrained deployment scenario, which provides for more and larger vessels with higher passenger capacities over the projection period.

Table 3 shows the 2012 total economic impact for the Port of Tampa including cruise operations. As shown, almost 2,000 jobs were created due to the cruise industry in the Tampa Bay region and USD\$90-million in personal income. Table 4 is specific to cruise, and compares the airport impacts.

Table 3: Port of Tampa total economic impact, 2012

CATEGORY	CARGO	CRUISE	SHIPYARD	REAL ESTATE	TOTAL
JOBS					
DIRECT	11,573	874	1,374	970	14,791
INDUCED	12,695	528	730	444	14,397
INDIRECT	8,754	580	1,015	224	10,573
RELATED USER JOBS	40,455	NA	NA	NA	40,455
TOTAL JOBS	73,478	1,981	3,119	1,637	80,216
PERSONAL INCOME (1,000)					
DIRECT	\$566,481	\$24,510	\$59,893	\$34,161	\$685,044
INDUCED	\$1,272,429	\$46,535	\$56,473	\$28,979	\$1,404,416
INDIRECT	\$415,785	\$19,843	\$35,529	\$10,032	\$481,189
RELATED USER INCOME	\$1,622,094	NA	NA	NA	\$1,622,094
TOTAL PERSONAL INCOME	\$3,876,790	\$90,888	\$151,894	\$73,172	\$4,192,744
VALUE OF ECONOMIC ACTIVITY (1,000)					
BUSINESS SERVICES REVENUE	\$1,258,574	\$379,776	\$174,693	\$86,647	\$1,899,690
RELATED USER OUTPUT	\$13,184,087	NA	NA	NA	\$13,184,087
TOTAL VALUE OF ECONOMIC ACTIVITY	\$14,442,661	\$379,776	\$174,693	\$86,647	\$15,083,777
LOCAL PURCHASES (1,000)	\$778,744	\$32,028	\$91,205	\$31,151	\$933,127
STATE & LOCAL TAXES (1,000)					
DIRECT, INDUCED AND INDIRECT	\$209,687	\$8,444	\$14,126	\$6,805	\$239,062
RELATED USER TAXES	\$150,855	NA	NA	NA	\$150,855
TOTAL STATE AND LOCAL TAXES	\$360,541	\$8,444	\$14,126	\$6,805	\$389,916

Source: Martin Associates 2012

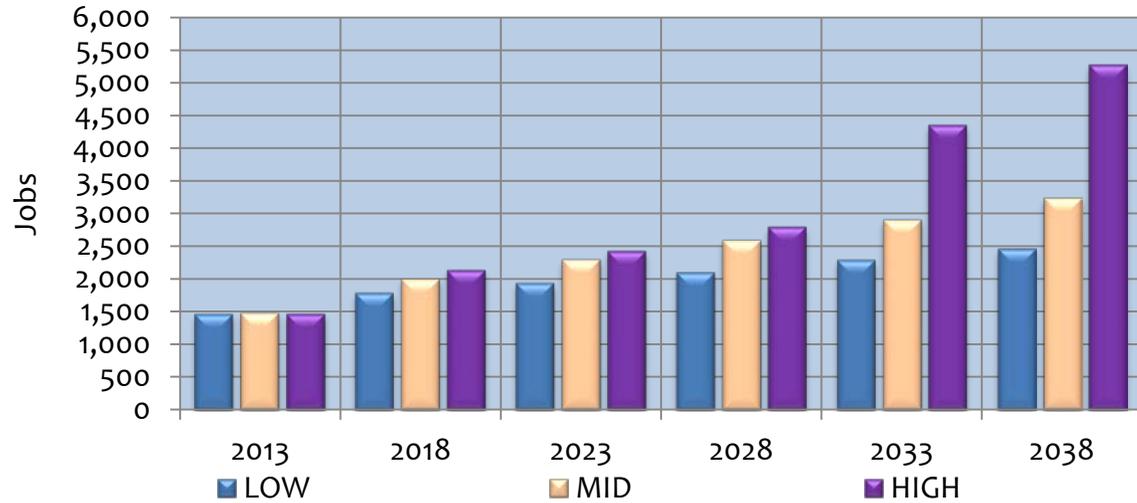
Table 4: Port of Tampa cruise economic impact, 2012

CATEGORY	CRUISE	AIRPORT	TOTAL
JOBS			
DIRECT	797	77	874
INDUCED	498	30	528
INDIRECT	447	133	580
TOTAL	1,741	240	1,981
PERSONAL INCOME (1,000)			
DIRECT	\$22,612	\$1,898	\$24,510
RE-SPENDING/LOCAL CONSUMPTION	\$44,753	\$1,782	\$46,535
INDIRECT	\$14,741	\$5,102	\$19,843
TOTAL	\$82,107	\$8,781	\$90,888
BUSINESS REVENUE (1,000)	\$269,591	\$110,185	\$379,776
LOCAL PURCHASES (1,000)	\$18,177	\$13,850	\$32,028
STATE/LOCAL TAXES (1,000)	\$7,636	\$808	\$8,444

Source: Martin Associates 2012

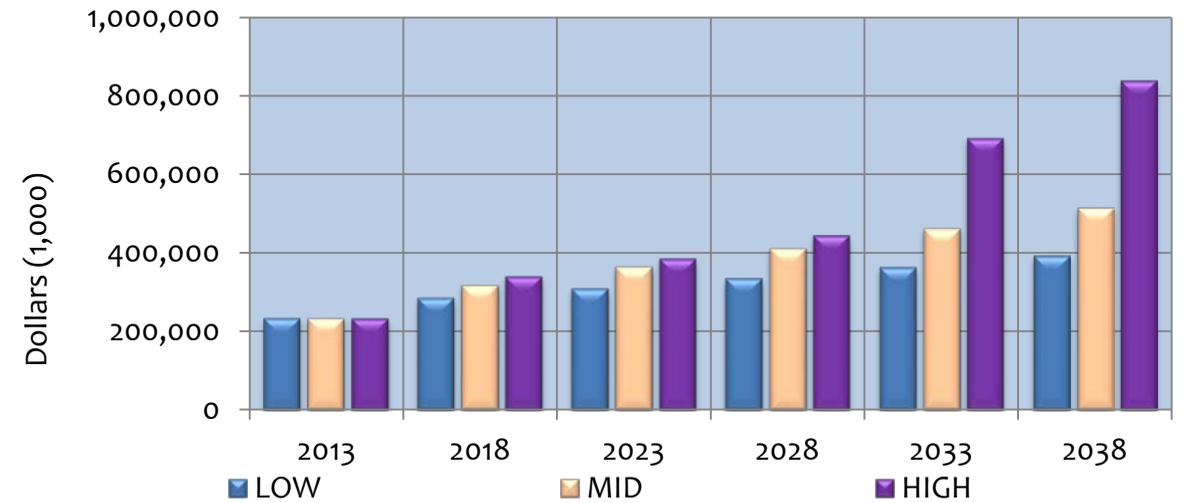
Figures 22 through 26 below express the economic impacts to the Tampa Bay region from 2013 to 2038 based upon the unconstrained high scenario 3. As shown, once the air draft impediment is no longer an issue there is significant positive impacts to the surrounding area economy. In 2038 the number of jobs generated by the cruise industry will be approximately 5,250; up from some 1,500 today. During the same period, business income, purchases and tax income to the local and state also see substantial gains due to the increased presence of the cruise industry.

Figure 22: Tampa Bay Cruise Job Impact, 2013 – 2038



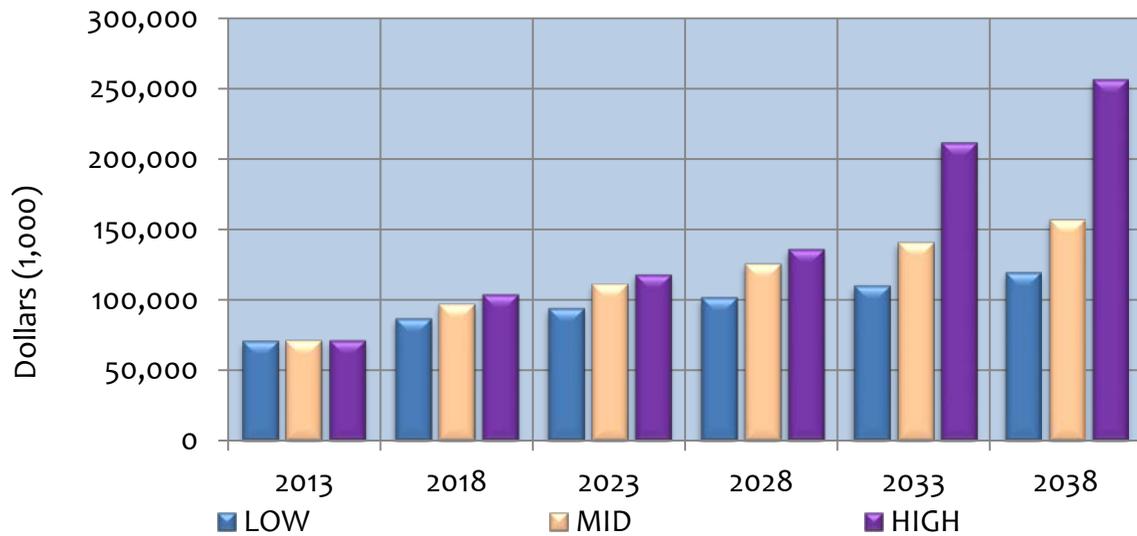
Source: Bermello Ajamil and Partners, Inc.

Figure 24: Tampa Bay Cruise Business Revenue Impact, 2013 – 2038



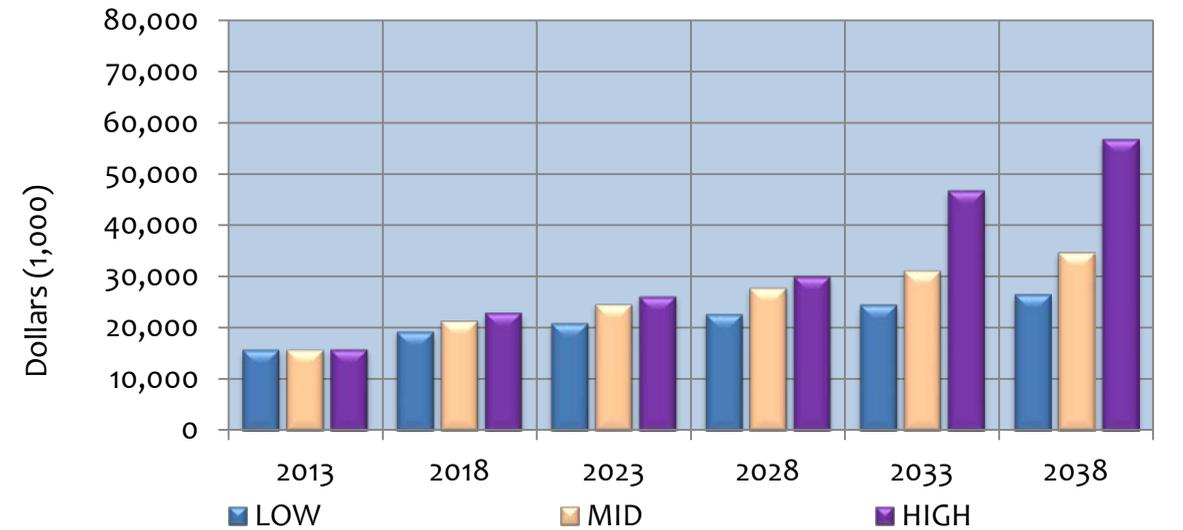
Source: Bermello Ajamil and Partners, Inc.

Figure 23: Tampa Bay Cruise Personal Income Impact, 2013 – 2038



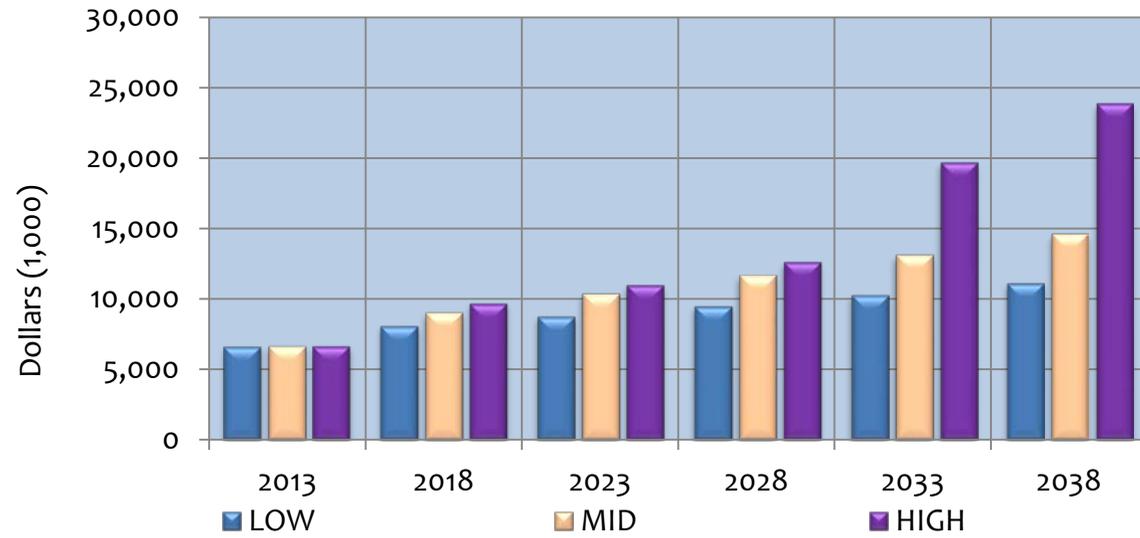
Source: Bermello Ajamil and Partners, Inc.

Figure 25: Tampa Bay Cruise Local Purchases Impact, 2013 – 2038



Source: Bermello Ajamil and Partners, Inc.

Figure 26: Tampa Bay Cruise State and Local Tax Impact, 2013 – 2038



Source: Bermello Ajamil and Partners, Inc.

4 CRUISE OPTIONS AND FACILITY PROGRAM ASSESSMENT

As part of the study process the following available options outlined below were examined for validity in this initial pre-feasibility phase:

- Do nothing and only receive vessels that fit into the present air draft envelope;
- Build a new port seaward of the bridge; or,
- Replace the Sunshine Skyway Bridge.

In order to make a decision, the ramifications and feasibility of each option must be understood. If development of a new seaward port or bridge replacement takes place this would represent one of the most potentially significant projects in Tampa Bay and in Florida. There are several issues and challenges associated with the project including the potential loss of cruise market share and economic impacts to the Tampa Bay region and to Florida; impacts on users and neighbors; and, environmental and political implications.

1. Do Nothing Option

A choice could be made to do nothing and receive only those vessels that fit into the bridge's air draft envelope into the future. As outlined in Sections 3 and 5 there is a significant loss of economic impact and jobs to the region over the long-term should this be the choice. Not doing anything that will allow larger vessels to use the Tampa Bay regional market for homeport and port of call activities into the future will likely mean that the Tampa Bay region will miss out on between 33- to 35-million cruise passengers through 2043.

Additionally, these cruise passengers will likely not be absorbed by other Florida ports, based on information from cruise lines. Most of this business, therefore, would be lost to other Gulf Ports (not Florida) in the region. This is primarily due to the western Caribbean itinerary offerings from Tampa and the consumer market catchment area (drive market) where a majority of the passengers come from to cruise from Tampa. The other Florida ports do not necessarily provide for the same offerings, as Mobile or New Orleans.

Conclusions

- There would be a significant loss of cruise traffic in the long-term with some 33- to 35-million passengers lost.
- The loss of this significant cruise traffic would have negative economic and job impacts on the Tampa Bay Region. Further analysis would be required and warranted to understand the full magnitude of these potential impacts.
- The majority of cruise passenger traffic lost in Tampa Bay would not be absorbed by other Florida ports, but instead likely be absorbed at ports such as Mobile and New Orleans.

It is noted, however, that the drive market for Tampa should be further explored. Even though considered "limited" by cruise lines, the air draft restriction that is currently associated with Tampa warrants further investigation in strategic planning options.

2. Build a New Port Seaward of the Bridge

As part of the scope for the Pre-Feasibility Study the potential development options for a cruise facility seaward of the Sunshine Skyway Bridge were developed and assessed in order to provide a vision outlook for the required capacity of these types of cruise facility(s), including the cost, timeline for development, and potential alternative uses.

Additionally, impacts to the environment and other lines of business in the Tampa Bay region were also examined.

Based upon the projections, berth demand and design vessel template the following platform was established:

- 4 berth homeport facility;
- Each terminal needs to be a nominal 100,000 square feet to accommodate all of the required aspects of a homeport terminal facility inclusive of lobby, security, waiting/check-in areas, baggage laydown, Customs and Border Protection and other ancillary options. It is contemplated that each terminal would provide for simultaneous embarkation / debarkation;

- Parking facilities with 9,000 spaces and space for future expansion is required; and,
- Ground Transportation Areas (GTA) to accommodate the requirements for coach, taxi, shuttle, private vehicles, etc. for embarkation and debarkation is needed.

A general cruise facility concept capable of accommodating 4 cruise vessels berths that respond to the predicted market demand into the long-term for future cruise operations to the Tampa Bay region and allow for an unconstrained cruise condition were developed. In general the concepts developed to evaluate order-of-magnitude costs and the associated return on investment provided for the following elements:

- Sites - 44 acres (1,915,823 sf) to 58 acres (2,520,752 sf);
- Cruise Terminal footprint - 100,000 square feet (T); and,
- Parking garage is 6 levels with 1500 spaces per parking garage to accommodate 9,000 spaces in total (P).

In assessing the potential layout options the following elements are observed:

- All layouts consume about the same area +/- 50 acres;
- Plan selection can be done simultaneously with navigation, hydrodynamic and environmental considerations; and,
- Siting is critical based upon environmental and community impacts.

Preliminary Cost Estimates

Preliminary cost analyses for cruise facility plan options range from \$632-million to \$647-million without inflation, depending on the potential location of the facility. The costs include a 20% allowance of hard cost for mitigation, 15% for soft costs and contingency set at 20% of hard costs plus mitigation and soft costs. Several potential theoretical layouts were used to calculate the costs. The different layout options that were used to calculate costs are approximately 50 acres in land and berth area. More detailed costs can only be determined once a siting study is completed and an actual project budget is calculated.

Alternative Uses

With the development of a new seaward cruise facility there may be opportunities for alternative uses and shared options as part of the development that may provide positive impacts to the environment and surrounding communities, while providing for additional lines of business for the Tampa Bay region.

A specific market assessment to determine these uses was not part of the Pre-Feasibility Study.

Alternative and complementary uses may include the following:

- Marina;
 - Mega-yachts (including service and repair facility);
- Hotel;
 - Boutique hotel;
 - Provide for yachts, plus retail, restaurant;
- Ferry facility;
 - Regional and international to service Mexico, etc.;
- Marine, environmental, military, weather facility; and,
 - Bay location provides access to a variety of sites, data points;
- Cargo.
 - Container port for large deep draft vessels; and,
 - Specialty cargo.

Facility Impact Observations

The Army Corps of Engineers is currently studying the Tampa Bay channels to determine the long-term impacts on maritime traffic. Thus, besides the Sunshine Skyway Bridge air draft limitation two of the major channel issues facing Tampa Bay are the following:

- Channels are too narrow for safe two-way cruise traffic (beam and LOA are the main factors); and,
- There is a 965-foot limitation on cruise vessel length due to the Sparkman channel and turning basin.

There are also other related issues in channels closer to the Tampa downtown core, as well as potential capacity restrictions at the existing cruise terminal facilities which could impact the ability of the Tampa Bay region to accommodate larger 3,000-passenger plus vessels in these facilities. There is currently a Channelside Study underway sponsored by Port Tampa Bay to determine current and future capacity requirements of the existing facilities.

Conclusions

- Environmental issues will need to be considered in further study of these alternatives.
- All alternatives need to be further researched.

3. Replace the Sunshine Skyway Bridge



Another alternative which would allow large cruise vessels (more than 180-foot air draft) to transit into Tampa Bay is to replace the bridge to a vertical clearance of 240-feet in order to accommodate this cruise vessel traffic.

FDOT conducted a brief study of three Sunshine Skyway Bridge alternatives:

- **Build a new bridge and demolish the existing bridge:** This option would not require the closing of the existing bridge, thus maintaining traffic flow during the entire construction period. Therefore, there would be no toll revenue loss. The total cost of construction and demolition would be approximately \$2.0-billion. The construction period for a new bridge would be 4 years. The demolition of the existing bridge would take 2-years.
- **Raising the deck vertical profile (lifting the impacted bridge section to 240-feet):** Under this option the existing bridge would need to be closed for approximately 1.5 to 2-years during the lifting operation. Total construction time would be 3-years. The cost would be approximately \$1.5-billion. This option has a very high risk of instability during the cutting and lifting phase of the operation. Adding new piles may also induce the unexpected settlement of the existing pile structures.
- **Raising the deck vertical profile to 240-feet (demolishing and replacing the impacted bridge section):** This option would provide lesser risk, but has a longer closing time for construction of approximately 3-years. The cost would be approximately \$1.5-billion. This option may cause problems for maintenance and future bridge replacement due to the combination of new structure and existing structure that would be 30- to 40-years old by the time this would be completed.

Conclusions

- Overall costs associated with this alternative are high.
- Environmental issues will need to be considered in further study of this alternative due to the extensive bridge work.
- Traffic impacts during construction of a bridge system will be extensive as part of these alternatives for an extended period of time.
- Existing cruise facilities would continue to be viable in the downtown Tampa core, although they would require upgrades to support larger cruise vessels, namely, LOA and maximum beam of existing cruise berths. For example, the longest cruise ship that can dock at Port Tampa Bay is 965 feet. This restriction, along with the maximum beam,

needs to be factored into planning and design of any prospective renovations to the Sunshine Skyway Bridge.

- It must be determined what impacts the bridge work and closing will have to marine traffic transiting in and out of Tampa Bay during this period.

5 PRE-FEASIBILITY STUDY CONCLUSIONS

This Pre-Feasibility Study, undertaken by FDOT, is the first phase in finding a solution to the low clearance of the Sunshine Skyway Bridge and providing insight into how to sustain and grow the cruise business in the Tampa Bay area. This phase of the study served to establish the future cruise traffic for the region taking into consideration the air draft issue and then examined the options available for the Tampa Bay region. Three options were explored to handle the larger ships that will be entering the market over the next 20 years, including do nothing, to build a new port seaward of the Sunshine Skyway Bridge, and to replace the Sunshine Skyway Bridge. This report has emphasized the fact that over next 10 to 15 years the Sunshine Skyway Bridge will impede growth to the Tampa Bay region due to the air draft limitations for cruise vessels entering the Bay. This is a limiting factor today and will be a further limiting factor for cruise vessel deployment to the Tampa Bay area into the future. Cruise lines will respond, and have done so already, by placing smaller older ships into the regional market. The air draft impediment has already cost the region cruise vessel deployments as they are not able to accommodate larger cruise vessels with air drafts of more than 180 feet.

Either of the build options explored could be pursued, with future analysis done into the feasibility of each. It is important to establish the clear value of the investment, for whichever option is chosen. Subsequent feasibility of alternatives will require Internal Rate of Return (IRR) and Return on Investment (ROI) evaluations. In addition, refined cost estimates, funding plans, and potential funding sources will need to be identified. Identifying the necessary strategies for maintaining and increasing the market share of the Caribbean cruise region is also recommended in order for the state of Florida to sustain its position in the global cruise industry.² Additional feasibility analyses will need to be initiated by local partner agencies and the Tampa Bay community with FDOT providing appropriate assistance as may be requested.

² A recent study, Florida's Cruise Industry; A Statewide Perspective, completed by FDOT in November 2013 lists future opportunities and strategies related to the Caribbean region that can be used as the basis for further analysis.

TERMINOLOGY

Several definitions, cruise industry terms and acronyms may not be familiar to the reader. We define several of these terms in the following section.³

- 1) **Adequacy.** Sufficient to satisfy a requirement or meet a need. Barely satisfactory or sufficient.⁴
- 2) **Air Draft.** The maximum height of a vessel above the waterline.
- 3) **Apron.** Area immediately adjacent to the vessel berth where vessels' lines, provisioning, gangway and other operations occur.
- 4) **APCD (Available Passenger Cruise Days).** This is the formula cruise lines typically utilize to assess and compare cruise itineraries from a financial perspective.
- 5) **Anchorage.** Location where a vessel may anchor. In destinations where docks are not present to accommodate vessel operations, anchorages are used and passengers are shuttled to/from the cruise vessel to a landside location using a small boat (tender). Anchorages are generally only used in ports-of-call.
- 6) **Beam.** The width of the cruise vessel at its widest part. *Panamax Vessels* refer to vessels with beams that can transit the Panama Canal (beam is equal to 36m or less). *Post-Panamax Vessels* and *Super-post Panamax* have beams that exceed the width of the Panama Canal, or greater than 36m.
- 7) **Bed (berth)-nights.** A typical cruise industry form of capacity measurement representing the number of lower berths (a bed on a cruise vessel, with the aggregate total generally determining the vessel's normal passenger capacity) times nights of operation in a region.
- 8) **Berth.** (1) A bed, generally attached to the deck and/or bulkhead onboard a vessel. (2) An anchorage or dock space for a vessel in port.
- 9) **Bunkers.** Marine fuel used for propulsion.
- 10) **Cabotage Laws** (also referred to as *coastwise cruise vessel laws*). Relates to the ability of foreign-flagged vessels to transport goods and passengers between domestic ports. Cabotage Laws are often put into place to protect domestic cruise vessel industries.
- 11) **Conventional cruises (homeport cruises with destination and port-of-call cruises).** Leisure oriented voyages on deep-water, ocean-going cruise vessels of two-or-more nights often to a variety of destinations. Conventional cruises are offered either by regional or international operators marketing to a variety of consumer sectors and nationalities.
- 12) **Cruises-to-Nowhere (homeport cruises without destination).** Generally geared toward a local consumer market (within a one-hour drive) with the mainstay of the cruise experience is focused around on-board gaming, food and entertainment.
- 13) **Deadweight Tonnage.** Refers to the actual weight of cargo, fuel and stores required to bring the vessel down to her load-line marks.
- 14) **Displacement Tonnage.** The amount of water displaced by the vessel or the actual weight of the vessel. (This measure is not often used to describe cruise vessels, but it is meaningful in describing military vessels and the structural capacity of port and terminal facilities. It is typically applied to a vessel in normal operating state i.e. with fuel and stores on board).
- 15) **Dockage.** Fees levied by a port or destination for the right to dock a vessel.
- 16) **Draft.** The depth of water required by a vessel to float; the measurement in meters of the extent to which the vessel projects below the surface of the water.
- 17) **ECAs.** Emission Control Areas established through treaties provides for a decreased NoX and SoX emissions in select zones such as the Baltic, Europe and North America.
- 18) **Ferry.** Term usually applied to a vessel transporting passengers and vehicles from point to point. The key difference between these operations and conventional cruises is that ferry

³ Bermello, Ajamil and Partners, Inc. 2013, and Israel, Giora and Laurence Miller, *Dictionary of the Cruise Industry*, Seatrade Cruise Academy, 1999.

⁴ *The American Heritage Dictionary of the English Language*, Fourth Edition by Houghton Mifflin Company, 2000.

operations have as their primary business focus offering transportation services, not a travel and leisure experience.

- 19) **Gross Tonnage (GT).** A measure of a vessel's enclosed volume. This term has emerged as the standard measure of communicating a vessel's size. A *Mega-vessel* generally refers to a vessel of 70,000 GT or larger.
- 20) **Ground Transportation Area (GTA).** Zone in which vehicles, including buses, taxis and private cars are organized and accessed as part of cruise terminal/destination embarkation and disembarkation activities.
- 21) **Homeport** (also referred to as *baseport*, *port of embarkation*, *turnaround port*). A marine facility and destination city that serves as the base of operations from which the cruise begins and/or terminates.
- 22) **Itinerary.** Ports visited on a given cruise. Two itinerary types are generally observed. *Open-jaw (OJ) itineraries* refer to those deployments where the cruise begins at one homeport and end at another. *Round Trip* or *Closed-jaw itineraries*—the more common type observed—begins and end from the same homeport.
- 23) **Length Overall (LOA).** Total length of a cruise vessel, including any incidental structure that may extend this dimension.
- 24) **Lower Berth Capacity.** The number of beds of standard height on a cruise vessel. The number of lower berths determines the vessel's normal passenger capacity. *Maximum Passenger Capacity* refers to the total number of passengers that can be accommodated on the cruise vessel in lower berths and other flexible berths (also referred to as *upper berths*).
- 25) **Met ocean.** A contraction of the words 'meteorology' and 'oceanology' referring to the waves, winds and currents conditions that affect offshore operations.
- 26) **Mixed-Use Facility.** Refers to facility or complex with more than one type of real estate or operational use. Mixed-use facilities are generally: (1) Contiguous in nature; (2) Developed within a broader master plan constructed at one time or in phases; and, (3) Provide for a symbiotic vessel to occur among all uses such that the sum of the mixed-use facility from a

real estate or operational perspective is greater than its parts. Mixed-use maritime facilities often include cruise, ferry, marina, commercial, residential, recreational and other upland transportation facilities.

- 27) **Need.** A condition or situation in which something is required or wanted. Necessity; obligation. To be necessary.⁵
- 28) **Panamax vessel.** Size standard that equals the largest vessel dimension capable of transiting the Panama Canal. Generally based on the beam of the vessel. Vessels classified as Panamax are of the maximum dimensions that will fit through the locks of the Panama Canal, each of which is 304-m long by 33.5-m wide and 25.9-m deep. Thus a Panamax vessel will usually have dimension of close to 965 ft. long (294m), 106 ft. wide (32.3m) and a draft of not more than 39.5 ft. (12.04m). See Beam.
- 29) **Passenger Services Act (PSA).** Under the Passenger Vessel Services Act of 1886 (46 USC §289), foreign-flagged vessels cannot transport passengers directly between U.S. ports.
- 30) **Passenger Tax** (also referred to as a *head tax*). Port charge assessed against each passenger aboard the vessel. Generally the principal income stream to ports and destinations for accommodating cruise activities.
- 31) **Port-of-call** (also referred to as a *way-port*). One of several destinations visited as part of the cruise itinerary. The focus of the port-of-call is on tourism activities adjacent to the cruise arrival area and the transportation of passengers to regional points of interest.
- 32) **Post-Panamax vessel.** Size standard that exceeds the largest vessel dimension capable of transiting the Panama Canal. Generally based on the beam and length of the vessel. These vessels have dimensions that are wider than longer than Panama Canal locks – such as a beam of 36-m. and length of 311-metres. See Beam.
- 33) **Revenue Passenger.** This generally refers to a homeport passenger or in some very limited cases port-of-call passengers (Vancouver where all passengers are charged for on/off the vessel), whereby passenger counts reflects the Port's passenger wharfage or Tariff rate charging policy. For homeport calls the actual number of passengers is doubled to show

⁵ The American Heritage Dictionary of the English Language, Fourth Edition by Houghton Mifflin Company, 2000.

that the cruise operator is charged by the port for the passenger boarding and disembarking the vessel at a set fee.

- 34) **Super-Post Panamax vessel.** Generally refers to the largest cruise vessels in existence today. This is also a general term for the largest cargo vessels in existence today. These vessels are defined not only by their dimensions, but also their carrying capacity of more than 3,000 + passengers and GT approaching and exceeding 150,000.
- 35) **Terminal.** Building where cruise passengers embark and/or disembark in a homeport destination.
- 36) **Throughput Passenger** (also referred to as a *revenue passenger*). Total number of passengers arriving and/or processed at a cruise homeport and port-of-call.
- 37) **Transit Passengers.** By literal definition, the status of cruise passengers at a port-of-call.

APPENDIX

CRUISE DESIGN VESSEL OUTLOOK

Understanding the potential future cruise design vessels that will call at the Florida ports is an important aspect when contemplating cruise infrastructure requirements for the long-term (25-years). In addition, the design vessel(s) for each of the Florida ports may be different based upon deployment characteristics of the cruise lines calling at the port.

The design vessel establishes requirements for navigation, berths, apron, fenders and mooring structures, gangways (quantity and capacity), terminal / reception space allocation, ground transportation area (coach, taxi, private vehicle and mini-bus quantities) and parking spaces, etc.

See **Figure A-28** for data on the continued growth of the passenger capacity per vessel. New build vessels are increasing in size and the trend is continuing.⁶

Figure A-27: Average passengers per ship by year of construction, 1999 – 2016



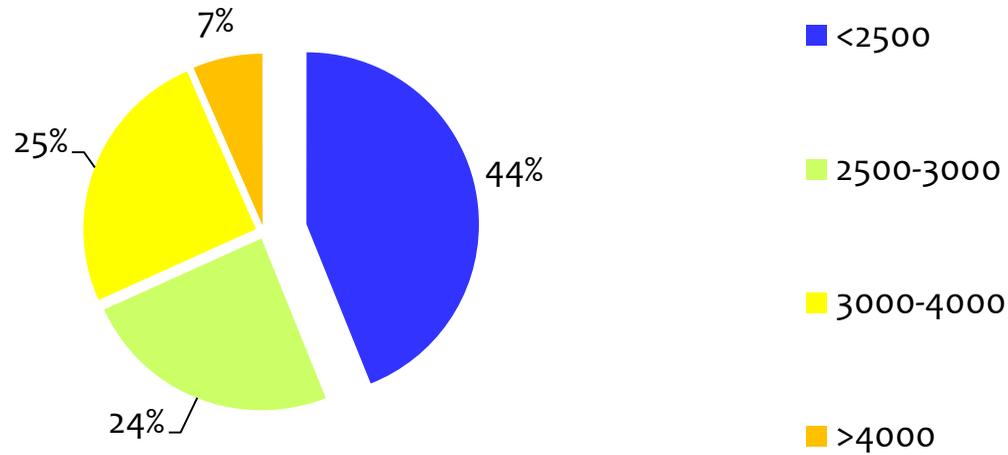
Source: Bermello Ajamil and Partners, Inc.

Based on cruise line interviews and an understanding of the cruise line market, the next generation of cruise vessels will initially be deployed to the primary cruise regions of the Caribbean and Mediterranean regions. However, it is likely that these vessels will also be deployed to new destinations worldwide over time.

Figures A-29 through A-31 illustrate the trend of the worldwide fleet passenger capacity expanding. Currently 44% of the fleet has less than 2,500-passengers.

⁶ For the years 2013 through 2016 Figure A1 averages do not include 8 total small ship vessels ranging from 200 to 928 passengers per ship.

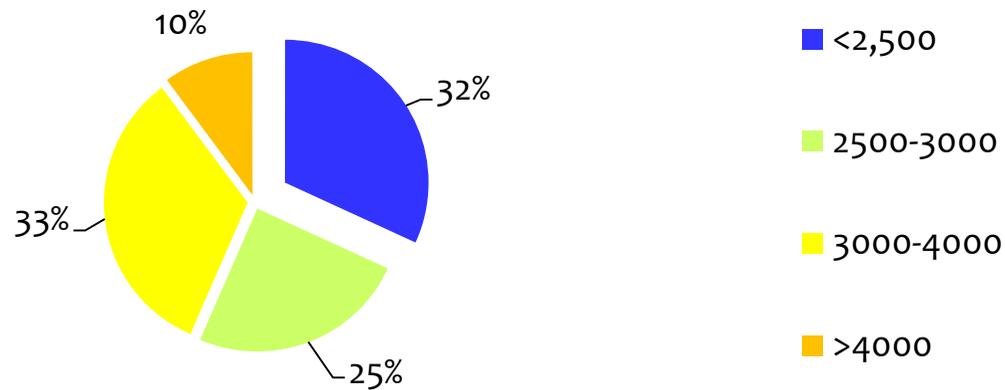
Figure A-28: Current world cruise fleet size distribution



Source: Bermello Ajamil and Partners, Inc.

Of the ships built in the last 10 years 33% have passenger capacities from 2,500 – 3,000. See **Figure A-30**.

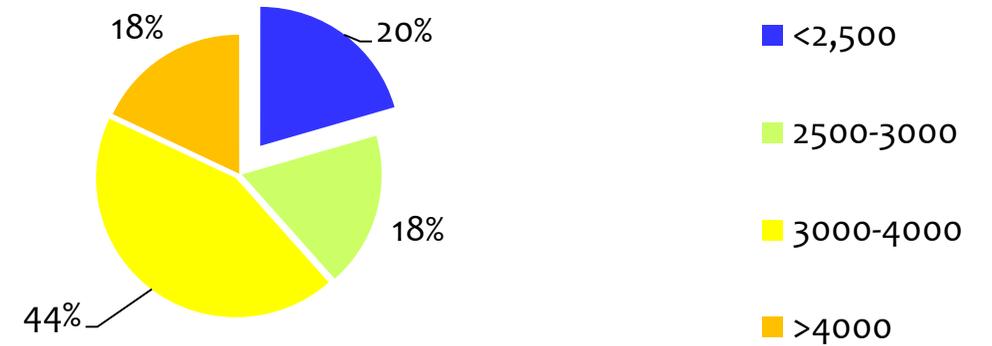
Figure A-29: Ships built in the last 10 years



Source: Bermello Ajamil and Partners, Inc.

Over the past five years, 44% of the vessels built have passenger capacities from 3,000 – 4,000 and 18% have more than 4,000-passengers. See **Figure A-31**.

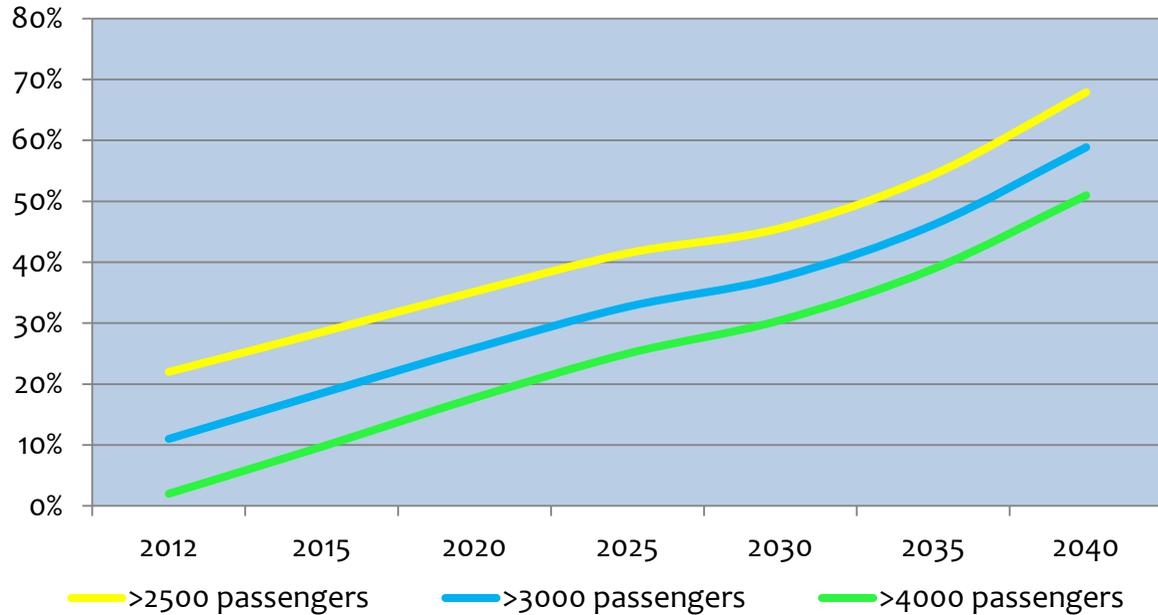
Figure A-30: Ships built in the last 5 years



Source: Bermello Ajamil and Partners, Inc.

Figure A-32 shows the projected number of passengers per ship in the worldwide fleet through 2040. This is based upon the current new build passenger capacity trend and the continued withdrawal of cruise vessels from the fleet as they reach an average age of approximately 25 years.

Figure A-31: Projected percentage of passengers per ship, 2012 – 2040



Source: Bermello Ajamil and Partners, Inc.

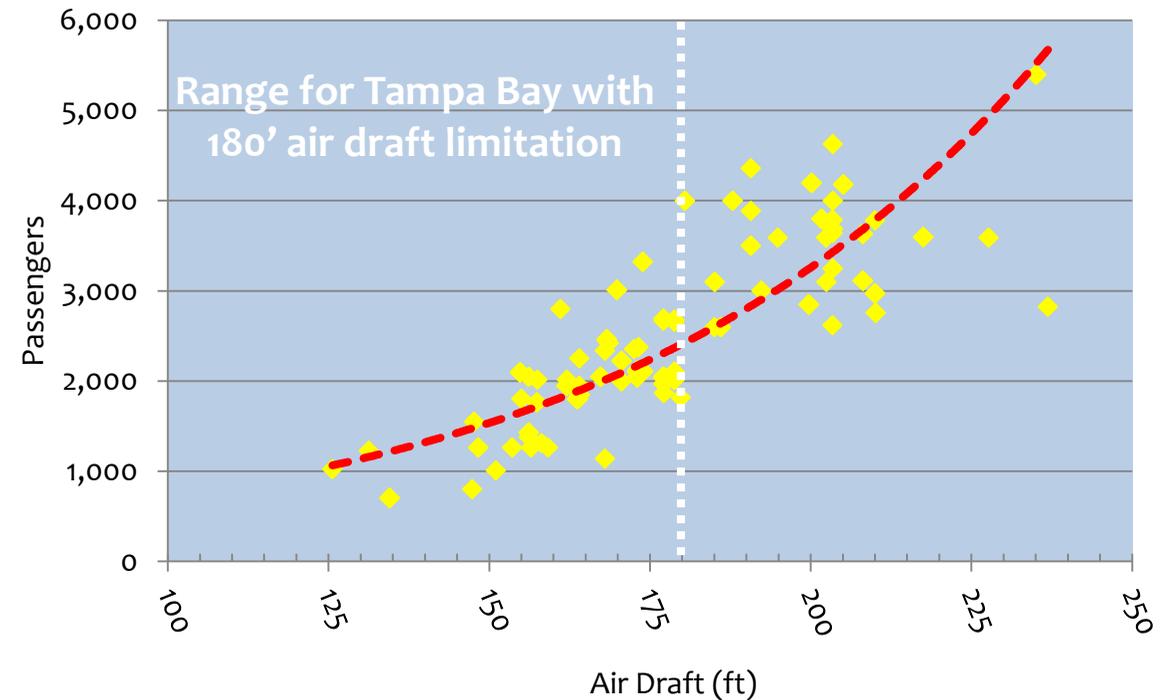
Future vessel sizes are driven by the need to optimize capacity providing for more space to increase revenue options and spread the cost over a greater area in terms of passenger loads. Thus, this larger vessel format provides for more passenger amenities and better sales yields through the use of outside cabins on the larger perimeter hulls with more balconies. There are also grander atriums for improved space allocation allowing for better flow and logistics related to the distribution of passenger boarding and disembarking. The economics of the vessels are also better in terms of crew-to-passenger ratios and power-to-fuel consumption allowing for greater fuel conservancy on a per passenger basis. With the continued rise of fuel costs due to the Emission Control Area (ECAs) rules and other worldwide regulations this is an important element in reducing the operational costs of each cruise vessel sailing.

Air Draft Assessment

Figure A-33 below illustrates the link between passenger capacity and air draft. This is a critical element in the new build trend to bolster the economies of scale of the new cruise vessels by providing space for

additional cabins, particularly outside / balconies that drive a higher ticket price. The other factors in this formula are the length overall and breadth of the cruise vessel. As shown, the new build cruise vessels with higher air drafts also accommodate more passengers. These are the primary vessels that have been deployed to the major homeports throughout Florida and worldwide. The range shown from 1,000 to 3,200-passengers per vessel is the primary fleet for Tampa Bay to date that can fit within the air draft limitation. However, several vessels from 3,000 to 3,200 do not fit into this profile.

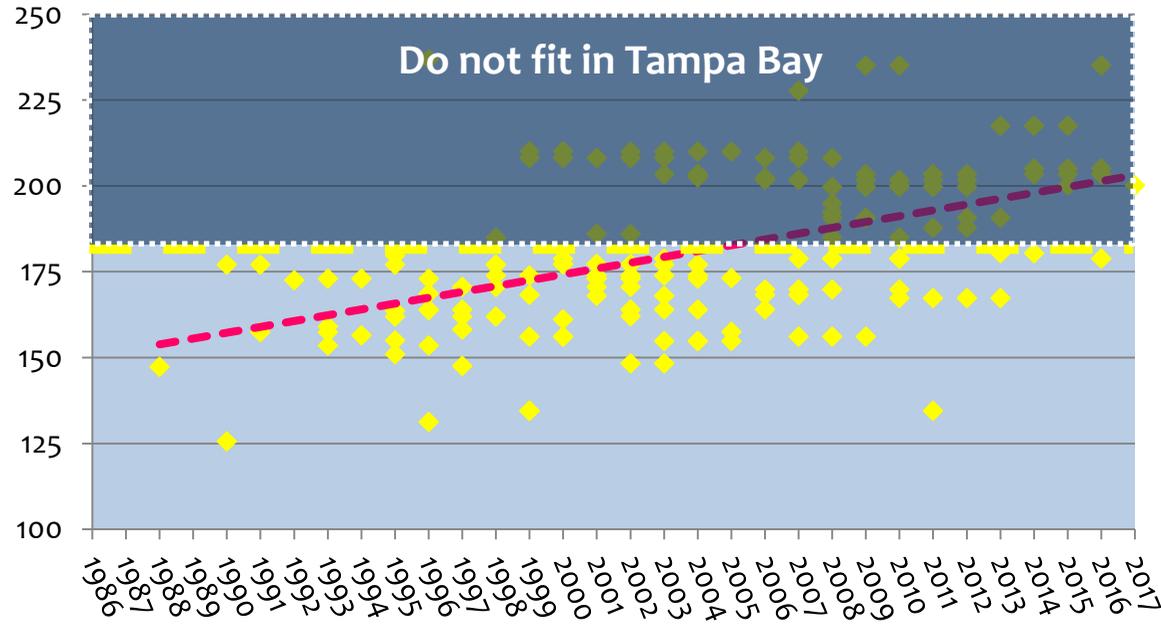
Figure A-32: Ship capacity vs. air draft



Source: Bermello Ajamil and Partners, Inc.

Figure A-34 provides the air draft of cruise vessels over a period from 1986 through 2017 for those ships built and delivered to date, as well as those currently on the order book for the primary North American fleet. As shown, beginning in the mid-1990s the air drafts of cruise vessels began to move over the 180-foot mark. Today, there are many cruise vessels being built with air drafts of more than 200 feet plus.

Figure A-33: Cruise ship air draft (ft.) by year of construction, North American fleet 1986 – 2017est.



Source: Bermello Ajamil and Partners, Inc.

In assessing the 166 vessels in the large vessel world fleet (> 700 passengers) as of December 2013 including the major North American brands, and European brands such as MSC, AIDA, PandO, Costa, etc. built from 1990 – 2017 (2014 – 2017 on order) the following particulars have been defined:

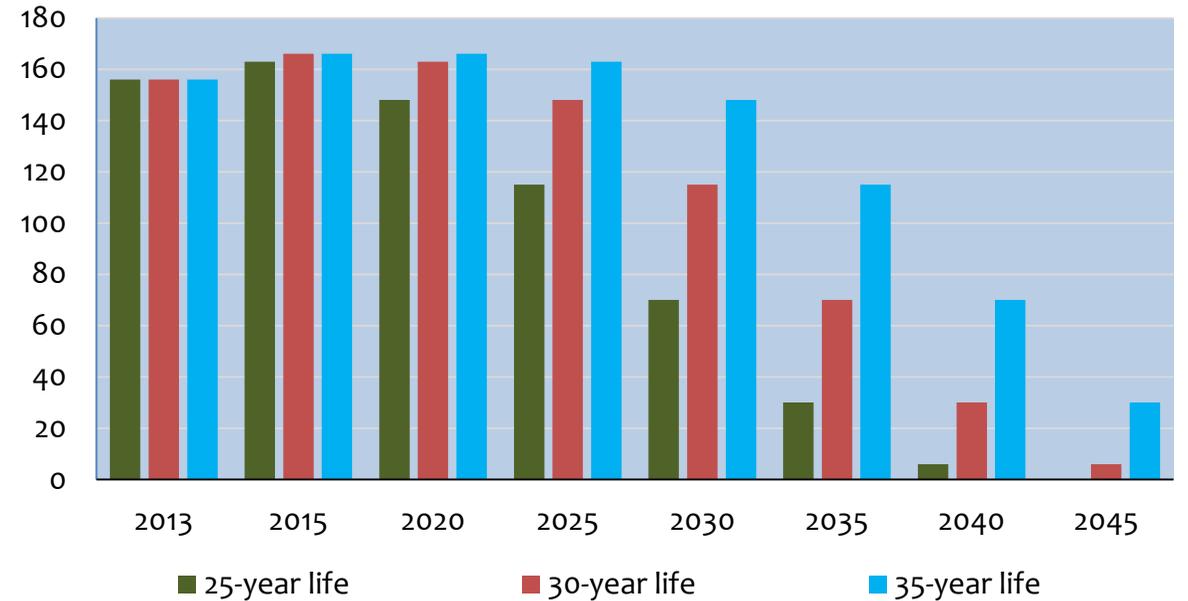
- 98 vessels are less than 180-foot air draft:
 - 39 were built prior to 2000 (40%) are more than 13 years old;
 - 46 were built from 2000 - 2007 (47%);
 - 13 were built after 2008 (13%), and are Less than 5 years old; and,
 - The average age of these vessels is 12 years, 74,002 GT, 1,991 lower berth capacity.

- 68 vessels are more than 180 ft. air draft:
 - 4 were built prior to 2000 (6%) and are more than 13 years old;
 - 22 were built from 2000 – 2007 (32%);
 - 42 were built after 2008 (62%), and are less than 5 years old; and,

- The average age is 5 years, 132,167 GT, 3,558 lower berth capacity.

Figure A-35 illustrates the projected longevity of the existing cruise fleet based upon the life cycle of a cruise vessel ranging from 25 to 35 years. This is the basis through which the estimates for the withdrawal of the smaller older vessels in the fleet for the newer larger ships are extracted. Based upon the new build dates of the fleet it is then estimated that approximately 100 of the fleet today will be gone by 2030 with a 25-year life span, and the same number in 2040 based upon a 35-year span.

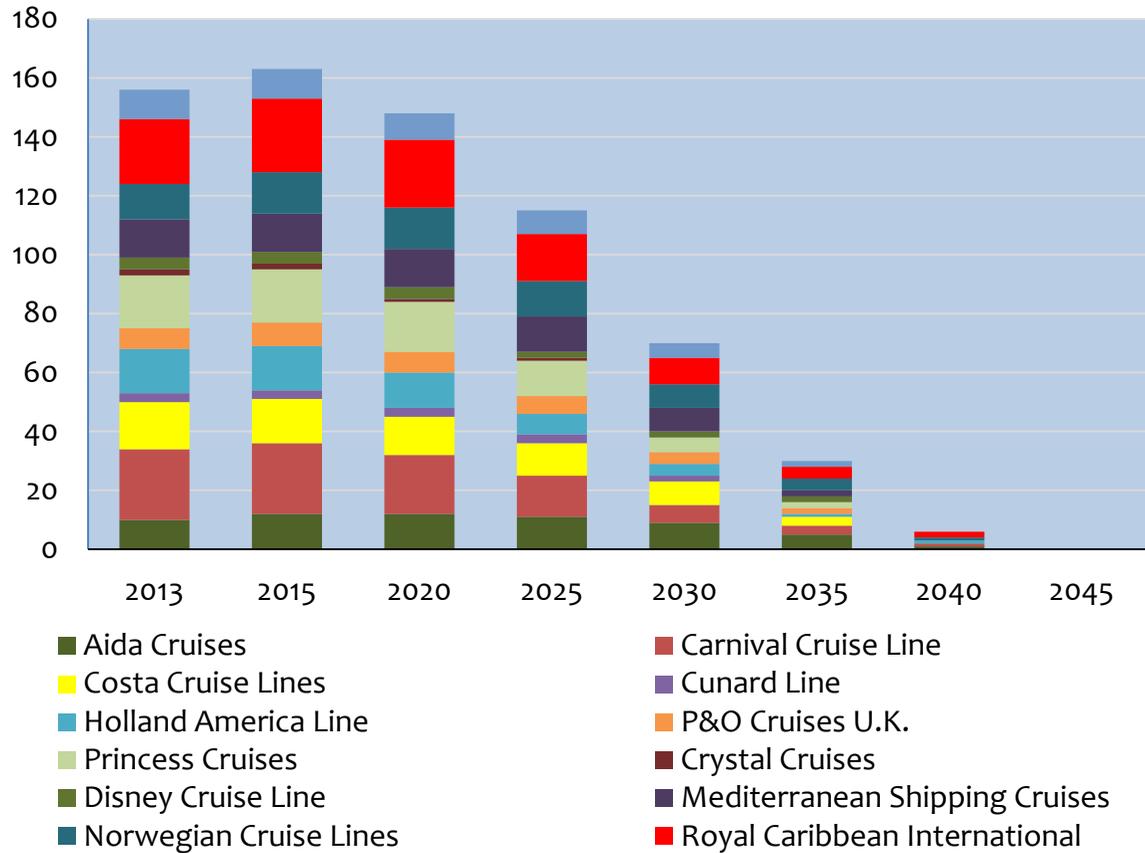
Figure A-34: Estimated longevity of the current cruise fleet



Source: Bermello Ajamil and Partners, Inc.

Figure A-36 provides a view of the existing major fleet’s longevity by cruise brand.

Figure A-35: Estimated longevity of the current cruise fleet by cruise brand



Source: Bermello Ajamil and Partners, Inc.

Cruise line feedback on air drafts varied based upon the brand and their deployment and operating characteristics. Critical feedback from the major cruise brands includes the following:

- New-build characteristics are determined by economies of scale and the cruise brands target market;

- Long-term it is likely that the vessel capacity of the ships will be more challenging for homeports and destinations than air draft limitations;
 - There are a few air draft limitation exceptions worldwide including Tampa Bay (bridge), Jacksonville (bridge and power lines), Baltimore (bridge), St. Lawrence River (bridge), Alaska Inside Passage (power lines and Seymour Narrows), Vancouver, CA (Lion's Gate Bridge); Baltic entrance via Copenhagen (bridge); and,
 - Other examples of bridge heights over the 180-ft. mark include the New York – Verrazano Narrows (219-ft.); San Francisco – Golden Gate Bridge (225-ft.); Suez Canal – Peace Bridge (230-ft.); Panama Canal – Americas Bridge (201-ft.).

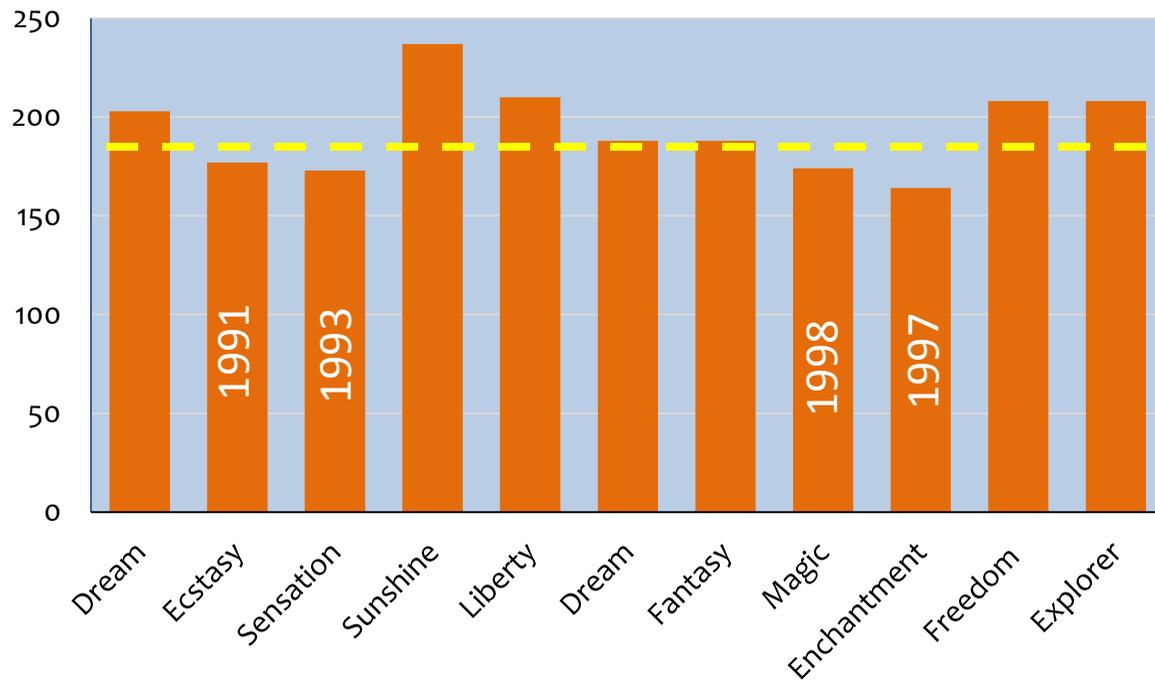


- A cruise vessel life expectancy in the major fleets is approximately 25 years, then they typically move to secondary market in Asia or the Greek Isles; and,
 - These secondary markets wanting tonnage are minimal at present and likely will not see increasing demand into the mid-term;
- It is unlikely that there will be a reverse trend of larger air draft vessels.
 - Vessels gain more floors for outside and balcony cabins that have higher ticket price points;
 - Passenger capacity and on-board revenue areas are expanded and provide for more opportunities;
 - It is less costly per passenger for cruise operational expenses; and,

- Some vessels may continue to be limited in areas due to harbor entryways, e.g., channel width and turning areas (length overall and breadth), maneuvering, berth lengths and upland terminal support areas.

Figure A-37 shows examples of the vessels deployed closest to the Tampa Bay region illustrating the number of vessels that fit into the 180-foot air draft parameter and those that do not presently. It is significant to note the age of the vessels deployed that do fit into the Tampa Bay air draft envelope range from 16 to 23 years old.

Figure A-36: Air drafts of vessels at the closest ports to Tampa Bay

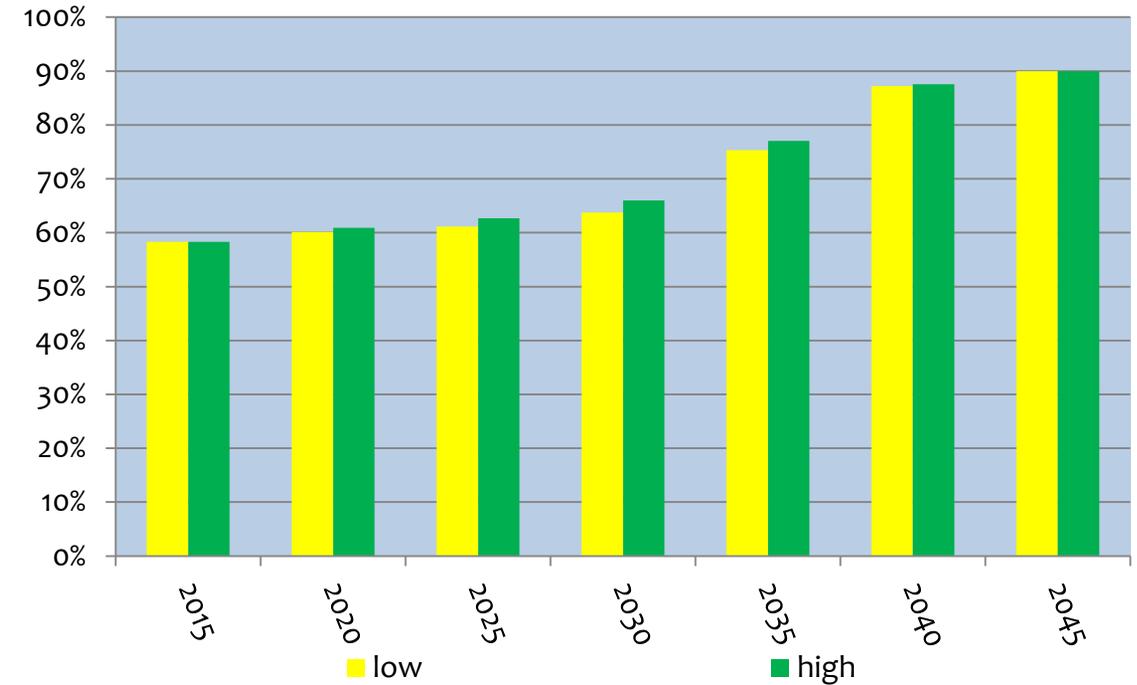


Source: Bermello Ajamil and Partners, Inc.

As shown in Figure A-38, an estimate of the primary North American cruise fleet that deploys to the Florida ports, inclusive of Tampa Bay, shows that in 2015 almost 60 percent of the vessels will be more than 180 feet in air draft. This will continue to increase over time as older vessels depart the fleet and

are replaced by new builds. Thus, by 2045 it is estimated that some 90% of the major North American cruise ships will be over 180 feet in air draft.

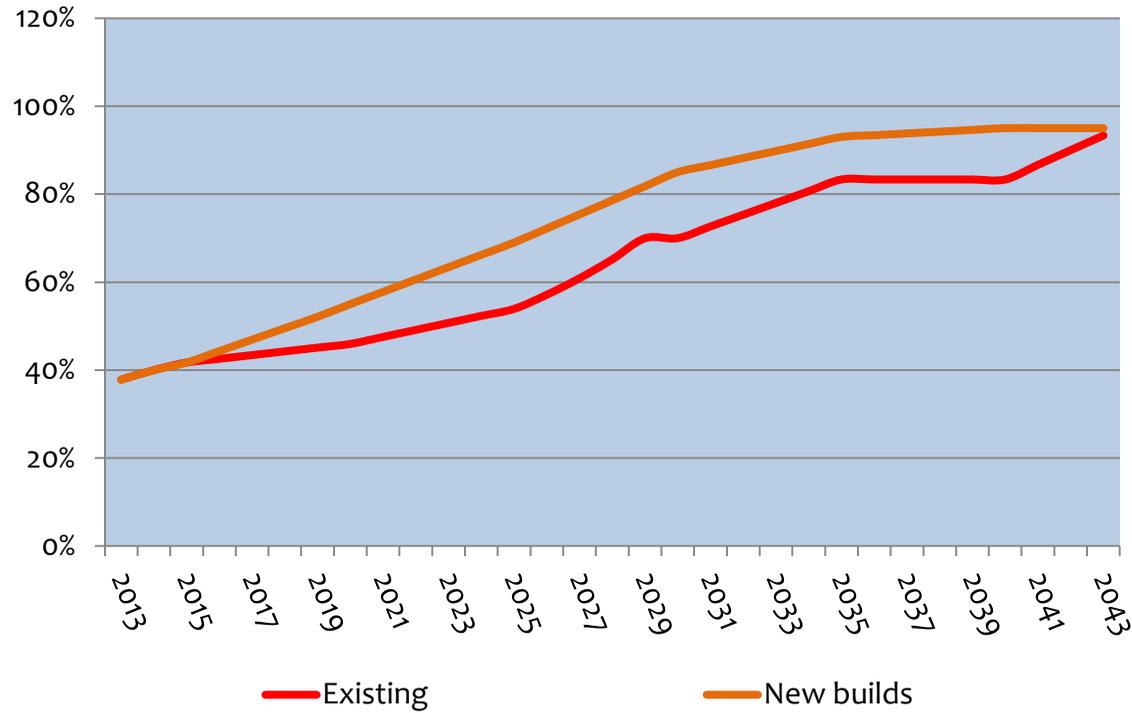
Figure A-37: Percent of North American cruise fleet above 180-feet, 2015 – 2045 estimates



Source: Bermello Ajamil and Partners, Inc.

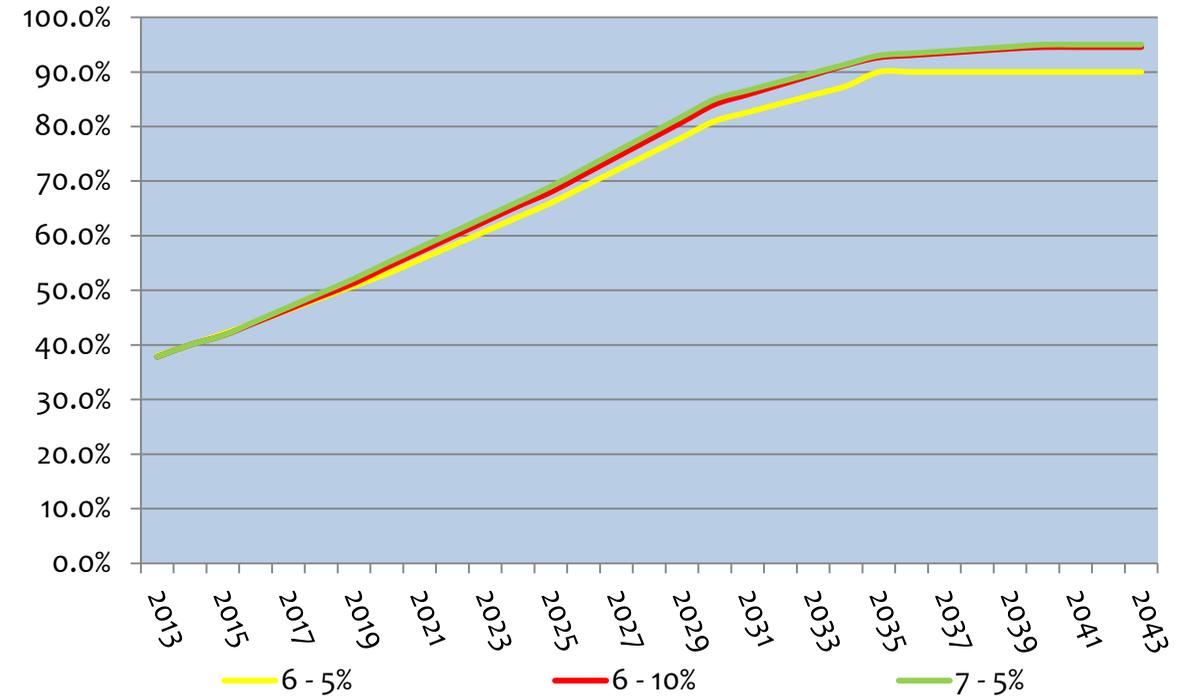
Figures A-39 and A-40 provide two ways to visualize the cruise fleet into the long-term in terms of air draft. These graphs show the overall composition in terms of the existing fleet minus the withdrawal of older vessels as they reach their life expectancy. Then, new ships that are currently in the marketplace (built within the past five years) with higher air drafts and the cruise vessels on order (likely trending into the future) continue to build a larger fleet of cruise ships with more overall tonnage, higher passenger volumes, lengths and increased air drafts.

Figure A-38: Forecast of North American cruise fleet above 180 feet in air draft



Source: Bermello Ajamil and Partners, Inc.

Figure A-39: Forecast of North American cruise fleet above 180 feet in air draft



Source: Bermello Ajamil and Partners, Inc.

In **Figure A-40** the expressions illustrate the following:

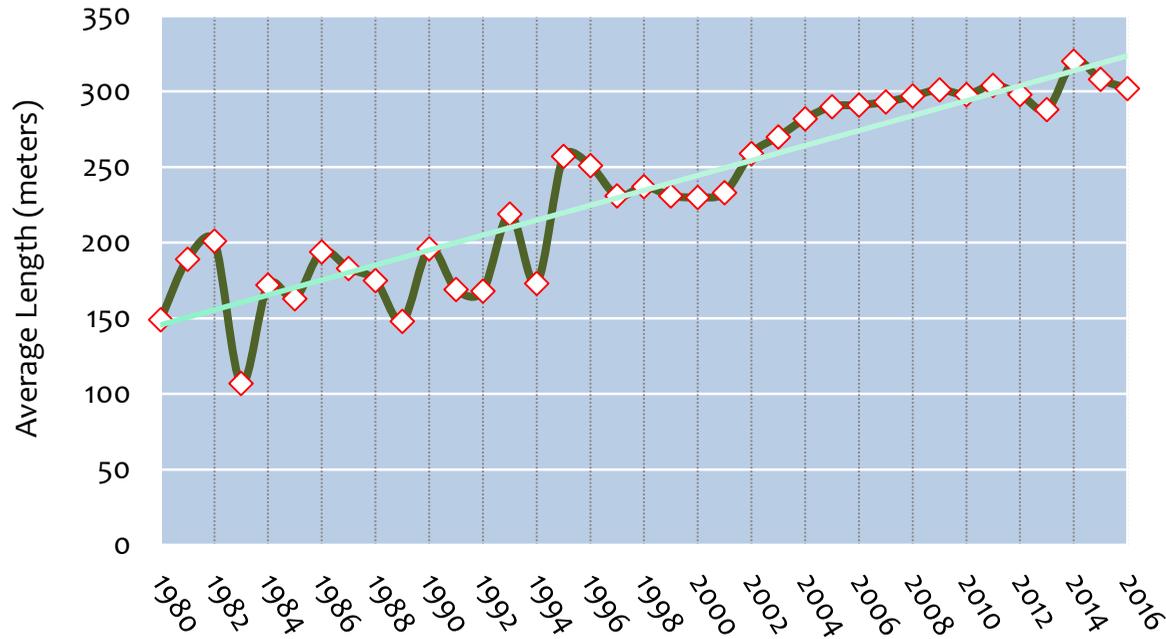
- The first number, i.e. the 6, or 7, are the estimated number of new ships delivered from here on out through the projection period on an annual basis; and,
- The second number (%) is out of those new ships the percentage that will be less than 180 feet in air draft.

Length Overall

As illustrated, the lengths and beams of cruise vessels are also increasing over time to accommodate the increased passenger capacity, cabin configuration and on-board revenue source accommodations.⁷

Figure A-41 shows the length of vessels in meters by year of construction hovering at more than 300 meters.

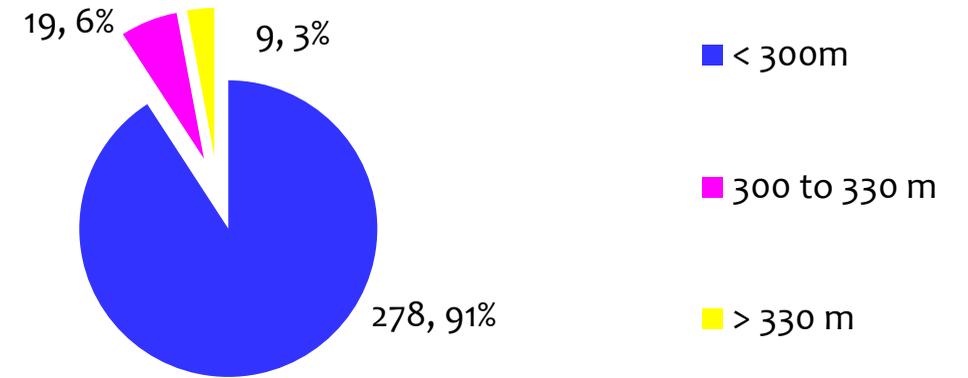
Figure A-40: Average LOA of ships by year of construction, 1980 – 2016



Source: Bermello Ajamil and Partners, Inc.

Figures A-42 through A-44 illustrate the trend of the worldwide fleet size expanding. The current fleet has 9% of the fleet at more than 300 meters. See **Figure A-42**.

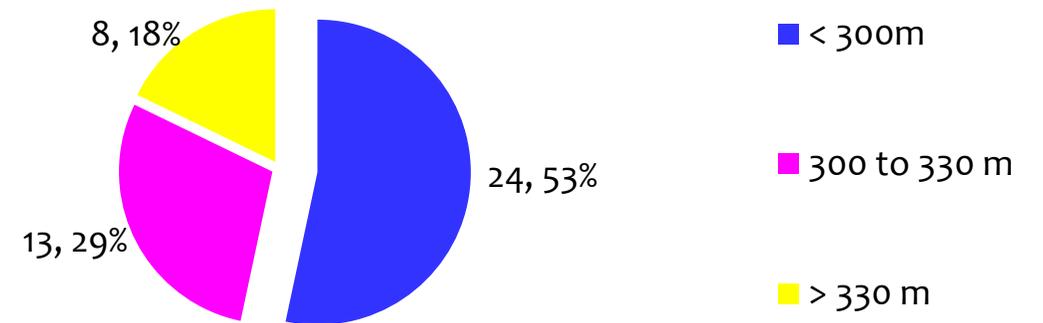
Figure A-41: Current world cruise fleet size distribution, 2013



Source: Bermello Ajamil and Partners, Inc.

Of the ships built in the last 5 years 47% are more than 300 meters in length. See **Figure A-43**.

Figure A-42: Ships built in the last 5 years, 2013

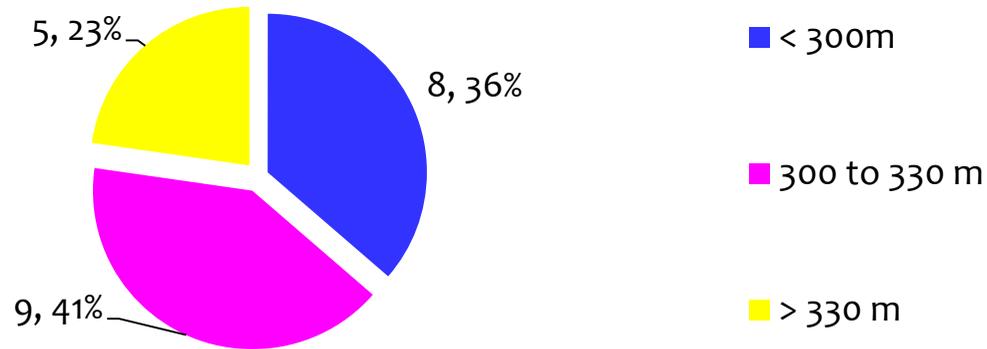


Source: Bermello Ajamil and Partners, Inc.

⁷ On-board Revenue Source Accommodations are spaces built into the vessels whereby revenues can be generated inclusive of bars, casino, retail outlets, spa facilities, specialty restaurants, etc. Larger vessels have more spaces for these types of revenue producing amenities.

Moving forward from 2013, 78% of the vessels on order are more than 300 meters long. See **Figure A-44**.

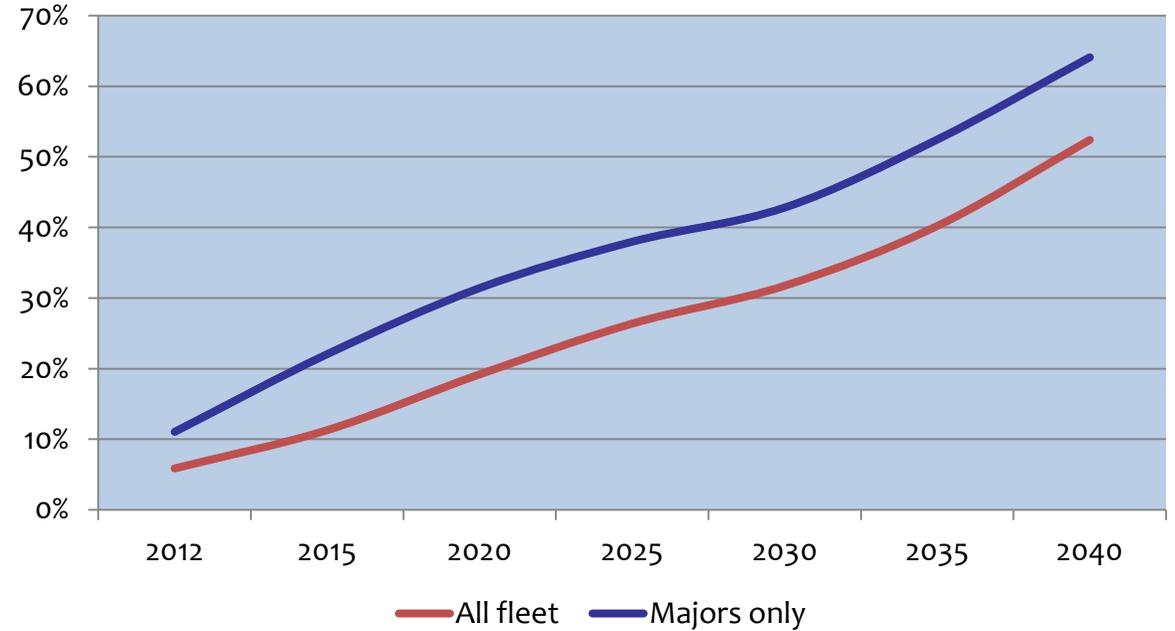
Figure A-43: Ships currently under construction, 2013



Source: Bermello Ajamil and Partners, Inc.

Thus, looking over the long-term in **Figure A-45** it is assumed that of the total worldwide fleet more than 50% of all cruise vessels will be greater than 300 meters in length in 2040.

Figure A-44: Projected percentage of ships over 300 meters (1,000-foot plus), 2012 – 2040



Source: Bermello Ajamil and Partners, Inc.

Observations based upon the air draft vessel analysis

Over the next 10 to 15 years the Sunshine Skyway Bridge will impede growth to the Tampa Bay region due to the air draft limitations for cruise vessels entering the Bay. This is a limiting factor today and will be a further limiting factor for cruise vessel deployment to the Tampa Bay area into the future. Cruise lines will respond, and have done so already, by placing smaller older ships into the regional market. The air draft impediment has already cost the region cruise vessel deployments as they are not able to accommodate larger cruise vessels with air drafts of more than 180-feet.

It is estimated that in 15 years cruise traffic to the Tampa Bay region will fall significantly as 90% of the world cruise fleet will not be able to enter Tampa Bay due to the height restriction of the Sunshine Skyway Bridge (180 feet). This would then reduce the importance of the Tampa Bay as a cruise homeport. Only smaller older vessels in the fleet would be deployed to Tampa Bay into the long-term.

This would cause a substantial negative economic impact to the community over the period as the numbers of cruise ship calls and passengers decline.

Current Tampa Bay Cruise Activity

Cruise vessels using the Tampa Bay cruise facilities in 2013 included the following:

- Carnival Cruise Line:
 - *Carnival Paradise* – 2,040 lower berths, 177.1-ft. air draft on 5, 5, 4-day sailings with 76 calls (built 1998); and,
 - *Carnival Legend* – 2,100 lower berths, 173.0-ft. air draft on 7-day sailings with 25 calls (built 2002).



- Holland America Line:
 - *Ryndam* – 1,266 lower berths, 156.5-ft. air draft on 7-day sailings with 15 calls (built 1994).
- Royal Caribbean International:
 - *Jewel of the Seas* - 2,110 lower berths, 173.9-ft. air draft on 5, 5, 4-day sailings with 28 calls (built 2004); and,
 - *Brilliance of the Seas* – 2,112 lower berths, 173.9-ft. air draft on 5, 5, 4-day sailings with 11 calls (built 2002).

- Norwegian Cruise Line:
 - *Norwegian Dawn* – 2,224 lower berths, 170.6-ft. air draft on 7-day sailings with 24 calls (built 2002).

In Fiscal Year 2013, Tampa hosted some 826,000 cruise passengers on 179 cruise calls. It is anticipated that in 2014 almost 1.1-million cruise passengers will sail from Tampa Bay on 239 cruises to the Caribbean, Bahamas, Panama Canal and other destinations throughout the region and hemisphere.

Tampa Bay Design Vessels

Multiple brands and vessel types servicing several different itineraries are within Tampa Bay’s potential market sphere. They include the North American market, which typically offers newer larger vessels, greater passenger capacity, higher air drafts, LOAs and beam. These have typically been the newer vessels in the worldwide fleet. Mid-size and small vessels are also a potential opportunity based upon the geographic position of Tampa Bay in relation to the Western Caribbean and the Panama Canal.

See the **Table A5** design vessel template for Tampa Bay.

Table A-5: Design vessel template

Type	Design Vessel 1 (Panamax)	Design Vessel 2 (post-Panamax)	Design Vessel 3 (super post-Panamax)
Passengers	2,000 to 2,600	2,600 to 4,000	4,000 to 5,400 +
Crew	850	1,200	+1,200
GRT / Displacement Tons	Up to 100,000 / + 50,000	+ 100,000 / + 50,000	+ 150,000 / + 70,000
LOA (ft)	900 - 985	985 - 1,100	1,100 +
Beam (ft)	118	Over 118 (gen.130 - 165)	150 +
Draft (ft)	28 - 36	28 - 36	28 - 36
Air Draft (ft)	Less than 178	178 to 208 +	208 +

Source: Bermello Ajamil and Partners, Inc.