Port of New Bedford
Quantification of Base Seafood Cargo

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EXECUTIVE SUMMARY

The purpose of this task is to derive an estimate of the cargo that could migrate from overland routes to a Port of New Bedford American Marine Highway (AMH) service using the seafood as the base cargos with the potential of expanding to other commodities. NAPI has used a diffusion of innovation statistical model to estimate the potential cargo for an existing AMH system from its onset to the following two years. NAPI's analysis has resulted in an estimate of cargo that theoretically could migrate from the road to an in place AMH service. Based on NAPI's analysis, the Seafood Industry is found capable of providing a significant base cargo for justifying the establishment of a Port of New Bedford AMH Service.

In addition to NAPI's previous Task 1 Letter [1](October 29, 2009) and Task 2 Report[2] (December 16, 2009), essential background documents used for Task 3A included: (1) the "New Bedford Harbor Study"[3] by HR&A Advisors, Inc., May 1, 2009 , a mostly qualitative but comprehensive analysis of growth potential for existing and potential Port Industries, and (2) the report by Reeve & Associates titled "Analysis of the Potential Market for Short Sea Shipping Services over the Ports of Fall River and New Bedford[4]. March 29, 2006", presents shipping cost-differential information for cargo between the Port of New Bedford and Florida ports, as well as the New York Harbor ports. Additionally, we conducted preliminary discussions with seafood processors, reviewed NOAA's Seafood Landings data for Port of New Bedford and received seafood cost data from the Port of New Bedford Harbor Development Commission (HDC).

The Reeve & Associates Report has shown that cost differentials between AMH and the Trucking mode are favorable to the AMH. Indeed, on a New Bedford to Jacksonville or to Bayonne leg, AMH shipping costs are lower by 17% to 31% and by 27% to 31%, respectively, depending on whether or not Harbor Maintenance Taxes are applied. In NAPI's approach, comparative cost advantages are considered as implicitly underlying the model, but cost differentials are too small to be determinants of market capture. Market capture is further influenced by other factors of psychological nature, such as the perceived "risks of the shift to the AMH" or the "extent of behavioral changes required. These factors are amenable to statistical approaches used in marketing research.

[1] North American Port Infrastructure LLC, Task 1 – Prepare Baseline Market and Financial Data Letter, October 24, 2009.
[2] North American Port Infrastructure/GeoInsight Inc, Assessment of Commercial Interests for American Marine Highways in New Bedford, December 16, 2009.
[3] HR&A Advisors, Inc., New Bedford Harbor Study, May 1, 2009.
[4] Reeve & Associates, Analysis of the Potential Market for Short Sea Shipping Services over the Port Ports of Fall River and New Bedford, March 29, 2006.

Traditional factors such as the service's perceived advantage or benefit, the immediacy of benefits and price differentials are also implicitly present. These are taken to be perceived positively by all stakeholders, as established by earlier interviews

The model was run in three AMH service configurations (Port of New Bedford to Port of Jacksonville, Florida with a stop at Bayonne, New Jersey, Port of New Bedford to Bayonne, New Jersey only, Port of New Bedford to Port of Jacksonville, Florida only), for the service's Year 1 (by Quarter) and for the Service's Years 1 to 4 (by 6-months periods). The calculations yield a tabulation showing the Seafood Market share and resulting cargo estimated to migrate from the trucking mode to an AMH service in Port of New Bedford, in each configuration.

For ease of reading and interpretation, with the report the tabulation is broken down into six Tables, i.e.:

- AMH Configuration 1: Port of New Bedford to Port of Jacksonville with a stop in Bayonne (Table #2 for Year 1, then Table #3, for the period from Year 1 to Year 4);
- AMH Configuration 2: Port of New Bedford to Port of Jacksonville only (Table#4 for Y1, then Table #5, for Y1` to Y4)
- AMH Configuration 3: Port of New Bedford to Bayonne only (Table #6 for Y1, then Table #7, for Y1 to Y4)

Each Table is followed by short comments, focusing on the progression of market capture from period to period and from a service configuration to the next one.

The rationale and the assumptions underlying the model and its resulting Tables are explained in Section 2 to 4, and should be kept in mind while examining the figures in the Tables.

Freight market shares captured by the AMH are converted to discrete number of barges of 140 truck capacity. Some of the barges are "Less than Completely Loaded" designated by the acronym LCL, by analogy with the "Less than Container Load" or with the "Less than (railway) Car Load" terms used for quantities of material from different shippers, or for delivery to different destinations, which might be carried in a single railway car for efficiency.

The following Table ES 1 presents a Consolidated Summary for the three AMH services modeled. This Table is illustrative of the results found in the Report, where discussion and interpretation of the individual services along with the assumptions underlying the model are presented.

Table ES1: Consolidate Summary – Port of New Bedford AMH Seafood Cargo Capture (Years 1 to 3): Bayonne, New Jersey and Port of Jacksonville, Florida Services

Service	Combined Bayonne, NJ and Jacksonville, FL			Bayonne, NJ only			Jacksonville, FL only		
Year End	1	2	3	1	2	3	1	2	3
Market Share Capture									
Incremental Capture M$	22.04	82.52	52.15	14.33	53.64	33.9	7.71	28.88	18.25
Cumulative Capture M$	31.95	163.65	302.5	20.77	106.37	196.63	11.18	57.28	105.88
Cumulative Tonnage Captured	21298	109100	201667	13843	70915	131083	7454	38185	70583
Cumulative TEU/Trucks on AMH	1775	9092	16806	1154	5910	10924	621	3182	5882
Number of Barges	13	65	120	9	43	78	5	23	42

Our Report concludes that the establishment of an AMH Service based on shipment migrations from the Seafood Industry is justified under certain conditions. In the first two AMH configurations, and not in the third one, the Seafood Industry is found capable of providing a base justifying the establishment of an AMH Service. The freight volumes involved are just sufficient to start up such a service, but they evolve to become viable and self sustaining. The way the details of such a service will be worked out (frequencies, port rotations, number of ports called, procedures to manage seasonal demand, vigilance at signs of saturation, etc.) are of the essence to its success.

An important fact to consider is the likelihood that, once the AMH is established and primed, other commodities will enter the AMH system, so that the outlook may be more favorable than discussed. However, such a development would accelerate the appearance of signs of strain in the system, and would put pressure for the Port to commit sooner to further capital expenditures and investments.

Our analysis could be refined if less rudimentary data can be collected. Yet, refining the analysis is not likely to change the general nature of the conclusions.

The present refinement level of our analysis only establishes the existence of a base and gives it shape, structure, and magnitude. Further refinements would be necessary, if it is envisaged to undertake the economic and financial feasibility of the AMH venture, which both rely on a more detailed market assessment and demanding standards.

Critical Steps Forward to Realize Potential AMH Development:

The following outlines the activities that must be undertaken for the HDC to be able to engage carriers/shippers/operators with a business oriented plan for implementation of a Port of New Bedford AMH service and realizing the cargo volumes predicted in this report.

1. Quantification of base cargos other than seafood cargo. Project base cargo volumes and supporting market data to be incorporated with the previous market work completed for base seafood cargo. Focus efforts on expanding the understanding of base cargos other than seafood cargo.

2. Estimate of capital expenditure for Carrier/Terminal Operator for the development of an AMH service consolidated with the Port of New Bedford capital expenditures NAPI summarized in our previous Task 2. The Port capital expenditures could possibly be offset by a MARAD "Short Sea Transportation Grant" under H.R. 2647, Section 3512.

3. Financial Model preparation based on the estimated capital expenditures (Step 1), operating costs, expected AMH annual cargo revenues (for the seafood industry as provided in the New Bedford Harbor Study and other commodities with emphasis on the Cape Wind Energy Port traffic and other ocean carrier service developments), and financial costs (in various assumptions including a grant from MARAD for a "Short Sea Transportation Grant" under H.R. 2647, Section 3512) resulting in a cash flow analysis and rate of return (ROR) spreadsheet.

4. Obtain a letter of interest from a financial institution – the cash flow analysis and rate of return (ROR) spreadsheet (Step 2) will provide the basis for discussions with specialists within lending institutions and equity capital firms.

5. Use the letter of interest and the cash flow analysis and ROR to negotiate an AMH partnership between a Carrier/Terminal Operator and Port of New Bedford.

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SECTION 1: PURPOSE AND SCOPE: MAKING NEW BEDFORD A SHORT SEA SHIPPING HUB

The present report builds upon and supplements NAPI's Task 1 and Task 2 Reports, and must be read concomitantly with the detailed and substantive information included in these two Reports.

In accordance with our (March 31, 2010 and July 20, 2010) proposals, the purpose of this Subtask (3B.1) is to estimate the base cargo volume possibly available for the America's Marine Highway (AMH) from New Bedford seafood cargos, which would serve as the basis for future discussions with commercial shippers and terminal operators, and to tabulate estimated potential cargo volumes for AMH activities in Port of New Bedford.

SECTION 2: APPROACH AND METHODOLOGY

2.1 Documents used

In addition to NAPI's previous Task 1 Letter (October 29, 2009) and Task 2 Report (December 16, 2009), essential background documents used for Task 3A included: (1) the "New Bedford Harbor Study" by HR&A Advisors, Inc., May 1, 2009 , a mostly qualitative but comprehensive analysis of growth potential for existing and potential Port Industries, and (2) the report by Reeve & Associates titled "Analysis of the Potential Market for Short Sea Shipping Services over the Ports of Fall River and New Bedford. March 29, 2006", presents shipping cost-differential information for cargo between the Port of New Bedford and Florida Ports, as well as New York/New Jersey Ports. Additional qualitative but potentially quantifiable information was obtained by exploring online, both websites managed by stakeholders, and relevant news/business profiling websites.

2.2 Rationale

Each of the above mentioned Reports includes transcripts of a relatively small number of interviews with shippers, carriers and other stakeholders. Although informative, the interview approach was not found to be conclusive, nor conducive to inferences about modal shift intentions, let alone commitments.

Furthermore, allocating future shipments on the basis of classical modal spilt models was not found applicable to the problem at hand, because these models solely rely on cost differentials between two transport modes, generally familiar to most operators, through their prior experience with those modes.

Other approaches undertake averaging and rating stakeholders along several criteria weighed according to their relative importance as measured by the analysts' opinions. Such methods (akin to the Delphi technique) yield opaque formulas, and produce projections sometimes merely mirroring the analyst's personal ideas and fail to convince investors of the forecasts validity.

In the past, the above methods achieved limited in predicting market shares captured by technologically innovative transportation solutions. Indeed, if, in a long-term equilibrium perspective, a modal split formula reflecting cost differentials, can predict the traffic diverted from a rural road to a divided highway, methods such as the above mentioned, were always powerless at predicting the early market potential of genuine technological innovations, such as containerization, RoRo, airborne containers, double-stack trains, neo-bulk shipping, electric cars, etc., success, failure, market size, percentage market shares.

The AMH concept must be considered as a technological innovation in its own right. The diffusion of the AMH in the transportation system will take place like all kinds of innovations, as

successive groups of shippers adopt the new technology until the AMH market share eventually reaches a steady state level. Shipper's willingness and ability to adopt the AMH depends on their awareness, interest, evaluation, trial, and adoption.

In our New Bedford model, shippers are grouped into different tiers which define the timing of their entry at the lowest modal share shift level (rate of acceptance). We assume that once they enter at this lowest level the rate at which they shift increasing percentages of their shipments to the AMH (rate of market capture) will be the same, and follows an S shaped curve, also known as a logistic curve.

The information gathered in earlier interviews with stakeholders indicates that the rate of diffusion of the AMH mode is influenced by:

1. The service's perceived advantage or benefit.
2. Riskiness of the shift to the AMH.
3. Ease of the AMH use - complexity of the service.
4. Immediacy of benefits.
5. Observability.
6. Trialability (entry at the lowest modal share shift level).
7. Price differential between the AMH and the mode in use.
8. Extent of behavioral changes required.
9. Required investments and Return on investments

In our model, we assume that most of these AMH features are positively perceived. The users are not yet decided to commit to use the AMH, because it is not concretely available to be observed and to be tried.

A precise description of the Baseline startup physical facilities and service is therefore provided as follows, to this effect, and it stresses the system's ease of use, namely:

At the outset, the baseline service is assumed to be provided every other week, on articulated barges carrying 140 trailers, pushed from behind by a tug boat, serving a Florida Port (for example Jacksonville or Port Canaveral), with a stop in Bayonne, NJ, and departing from the State Pier. This is the configuration we are using to derive the AMH base market in the present task. As traffic builds up over time, this configuration will evolve in line with the conclusions of the model's development in complexity within the next tasks.

In the New Bedford model used for this current Task, we focus on one group of customers at a time, and we assume that the observability of this group will serve for marketing to the next group. We also emphasize triability, in the sense that shifting shipments to the AMH mode is progressive, with an entry at the lowest modal share shift level. The issues of immediacy of benefits and of price differentials between the AMH and the truck hauling mode now in use have already been covered in the "Reeve" Report, whose results are well publicized for the origin-destination couples of interest here, i.e. New Bedford and both Florida and New Jersey ports.

Three points are left out from Baseline to be handled statistically, i.e. point 2, (riskiness of the shift to the AMH), point 8 (extent of behavioral changes required) and point 9 (the required investments and the return on these investments). Statistical market share capture models are perfectly adapted to deal with points 2 and 8.

The issue of investments is a separate one, and has two prongs.

First, New Bedford Port capital expenditures, which were described and quantified in NAPI's Task 2 Report, and summarized here. Capital expenditure costs for terminal improvement and expansion: $ 7.5 Million (RO/RO berth improvements and apron and yard improvements for cargo operation including crane equipment and including $0.5 Million for berth area dredging to –30 MLW (envisaged AMH operations have to co-exist with the ongoing and future ferry service). Detailed consideration of the rate of return on these investments is scheduled within the next tasks.

Second, the investment issue is of concern to the freight and port services sector, which encompasses several industries, including carriers, ports, terminal operators, and third-party logistics (3PL) providers, such as freight forwarders and consolidators. Non-asset-based 3PLs do not own the vehicles or equipment used in providing their services. These firms are the majority of 3PLs. Their cooperation is practically assured, and they do not have significant investments to engage. They contract with trucking companies, other carriers, and distribution centers for whatever they need to fulfill their services. This provides them more flexibility than the asset-based firms and they are able to offer expedited and customizable supply chain solutions. Asset-based 3PLs own their own trucks and distribution centers. They are more suitable for large corporations requiring long-term contracts and value-added international transportation management services. Asset-based 3PLs and the large shippers who use them, will incur costs if they shift to the AMH, and will paradoxically be slower to enter the system.

This feature is captured within our model, at the time of grouping shipper companies into tiers, by including in the set of indicators used, an indicator reflecting the complexity (heaviness) or simplicity (lightness) of the way they turn to outsourcing services not core to their line of business. This indicator is partly subjective, and measured by visiting online websites profiling these companies.

The bottom line is that if, by dealing with the only two influential factors left, i.e. point 2, (risk the shift to the AMH), and point 8 (extent of behavioral changes required), our model shows that the Port of New Bedford can be successful at building upon visionaries and pragmatists, and can create a bandwagon effect (also known as a cascade effect) in which the momentum builds and the AMH mode becomes a de facto standard mode along with the other modes.

SECTION 3: PORT OF NEW BEDFORD'S BASELINE AMH DEFINITION

As mentioned, it is critical to publicize the complete image of the baseline startup service components and features. They have to be clear and simple as discussed above. There can be no base market without the description of the baseline service and its definition in terms of the service's performance on the 9 influential factors discussed above.

As a fundamental premise of our methodology, our model assumes that this requirement is fulfilled along the following overview and definitions.

2.1 The AMH concept

Under the short sea shipping concept produce, seafood, timber and other domestic goods is transported along the East Coast by boat instead of truck, reducing traffic along the Interstate 95 corridor.

Ships move up and down the Atlantic coast, carrying goods between New York and New Jersey, Florida (Jacksonville or Port Canaveral) and Massachusetts. Trucks meet the vessels in port, load the goods and deliver them to short-haul destinations. In New Bedford, various companies would be participating in the loading and unloading of vessels, storing goods in cold storage warehouses prior to shipping, with trucks to deliver goods from New Bedford to short-haul destinations around New England. Domestic short sea shipping services are assumed to be exempt from the harbor maintenance tax. It is further assumed that the industry will rely on U.S.-built articulated barges, pushed from behind by a tug boat.

In the interviews, individual shippers and carriers have displayed a range of views –some common, some specific to each of them. For example, a common view is that sending the commodities to New York by vessel rather than truck would be too costly and time consuming, as it seems to be too short of a haul, while short sea shipping seems to be more cost-effective for longer hauls, such as from New England to Virginia and Florida.

In contrast with the baseline, the target is for New Bedford to be sending and receiving goods to and from a Florida port two years from now, on articulated tug barges of no more than 400 feet in length carrying 140 trailers with a start-up frequency of two to four short sea shipping barges per month, evolving later to one to two per week.

2.2 Implementation of the Concept

New Bedford's current cargo facilities in terms of berth and yard capacity need to be improved to effectively support the above described short-sea service. State Pier can handle the AMH

shipping traffic with some structural improvements. In this configuration, there would be no need to change the Route 6 bridge.

The State Pier is the Port's most immediate opportunity for AMH operations. State Pier includes the New Bedford State Pier and its warehouse/open storage operations and the New Bedford Ferry terminal. Additionally, the South Terminal to the south may present the Port with opportunities for mid- to long term expansion.

For the New Bedford State Pier and the New Bedford Ferry Terminal, the HDC has completed planning and engineering studies, proposing several redevelopment projects that would improve the terminal through rehabilitation of the berths and yard area to handle the AMH operations. These improvements address lay-down areas and berth strength for heavy lifts. These activities will co-exist with the ongoing and future ferry service. Additionally, the HDC has proposed a series of transportation improvements to the State Pier, such as providing an extension of rail onto the site. To allow for the loading and offloading of vessels at State Pier, there are several considerations under study, including strengthening of the berth apron for the use of mobile cranes and potential improvements to accommodate Ro/Ro ramps.

State Pier description / 8 Acres /Annual throughput 16,000 to 36,000 TEU/year (depending on operating efficiencies/10 to 14 tons per TEU (Container loads are much lighter for conventional freight (mainly retail) than for commodities, the shipping industry prefers using larger containers, i.e. 40 footers, as they offer more volume for the same handling cost. If shipping commodities loads are 26 to 28 tons for a 20 footer and 30 tons for a 40 footer).

SECTION 4: THE NEW BEDFORD MODEL

4.1 The four Tiers in the New Bedford Seafood Industry

In the interviews, individual shippers and carriers have displayed a range of views –some common, some specific to each of them. For example, they would not express the chances that they would use the AMH, or assess the potential of success of such a service. Other views included doubts about a steady buildup of AMH cargo volumes. As mentioned above, another common view is that sending the commodities to New York by vessel rather than truck would be too costly and time consuming, while short sea shipping seems to be more cost-effective for longer hauls, such as from New England to Virginia and Florida.

The important fact we focus on in the model elaborated here, is that, notwithstanding the diversity of individual views, the set of stakeholders forms a "statistical population" whose overall behavior is predictable by means of well established statistical market segmentation methods.

While it is not feasible to sort out and aggregate single views, it is easier and more accurate to tackle the problem statistically, rather than individually. Therefore, the first thing that we did was to group the shippers into homogenous Tiers, which are amenable to which statistical results can be applied.

The grouping of shippers into five Tiers, was based on dynamic indicators found in earlier reports and from online information, e.g. productivity, size, whether the company has branches or is a single location, whether the existing logistic network appears complex (difficult to modify) or simple (light), whether the company emphasizes its concern for environmental sustainability (as an indicator of community activity), etc., and deemed to be correlated with the above mentioned 9 factors found in earlier reports to influence the rate of diffusion of the AMH mode.

Along with most analysts, we labeled these groups of adopters of the new AMH technological innovation as visionaries (Tier 1), trendsetters (Tier 2), pragmatists (Tier 3), followers (Tier 4) and hangers-on (Tier 5). For different innovations, a shipper might be a trendsetter of refrigeration innovations, but a laggard of logistic innovations. As explained below in more detail, within each of these Tiers, and at successive periods, the AMH will capture from shippers usual mode, a percentages of their shipments, increasing over time, and derived from standard deviations from the mean of the normal bell shaped curve.

4.1.1 Tiers composition

These categories can be further described as follows, although the model does not make use of these descriptors:

- Visionaries - more prosperous, more venturesome and more risk-oriented.
- Trendsetters – young, popular, more educated, tend to be community leaders.
- Pragmatists – deliberate, more conservative but open to new ideas, active in community.
- Followers - skeptical, traditional, less educated, fairly conservative and less socially active.
- Hangers-on – fear of debt, very conservative, know all the right lingo, neighbours and friends are main info sources, but just seldom actually do anything.

The distribution of the Tiers was compiled as shown the following Table, from information found in the "New Bedford Harbor Study", by H&RA Advisors, Inc, dated May 01, 2009. The sales data appearing in the Table are somewhat optimistic, but their orders of magnitude are sufficiently accurate for the purpose of this task. Indeed the model presented here will need to be refined as better data becomes available, and research is pursued.

Table 1: Tiers Composition

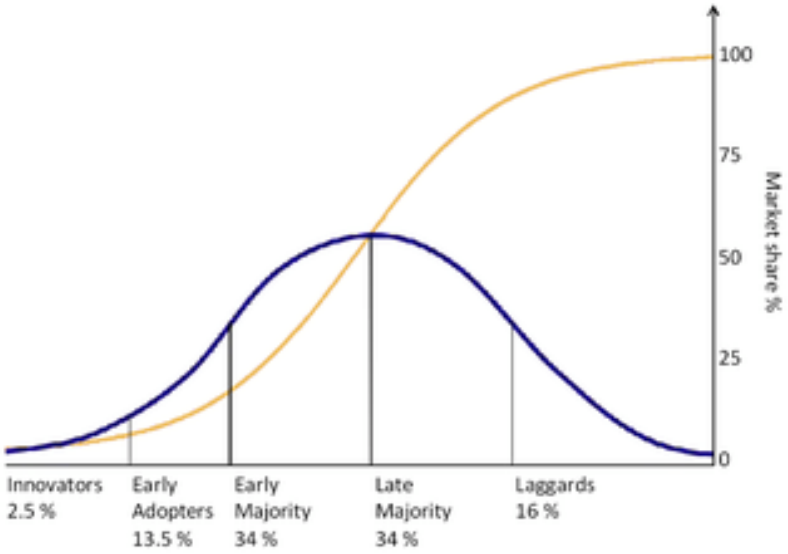
		Number in Group	Percentage (numbers)	Sales MM$	Percentage Sales
Tier 1	Visionaries	10	17.54%	9.6	3.04%
Tier 2	Trendsetters	11	19.30%	23.7	7.50%
Tier 3	Pragmatists	10	17.54%	52.5	16.61%
Tier 4	Followers	12	21.05%	145.3	45.97%
Tier 5	Hangers-on	14	24.56%	85	26.89%
	Total	57	100.00%	316.1	100.00%

4.1.2 Market share capture

More specifically, with respect to the five Tiers, e.g. the visionaries (Tier 1), trendsetters (Tier 2), pragmatists (Tier 3), followers (Tier 4) and hangers-on (Tier 5), our model specifies that within each Tiers, shipper will statistically allocate to the AMH, over time, increasing percentages of their shipments, derived from standard deviations from the mean of the normal bell shaped curve, whose cumulative distribution is the "logistic distribution", characterized by the "s-curve" shown below. In other words, within each Tier (even within the "visionaries" Tier,

for example), the shippers are diversified, and include companies which, from the point of view of releasing their shipments to the AMH, over time, after their entry, will behave as innovators, early adopters, early majority, and laggars. The percentages of their shipments captured by the AMH are statistically derived from this curve.

Figure 1: Logistic Curve



The logistic distribution and the S-shaped pattern that results from it have been extensively used in many different areas the most important of which include the diffusion of new-product sales, and the diffusion and substitution of primary energy sources.

4.1.3 Entry points in time

In order to observe the sequential entry of the Tiers in the AMH system, and start accounting for the incremental capture of their shipments, we have divided the timeline into several entry points in time. The first four entry points were the four quarters following the AMH inauguration. This choice was made by feedback consideration of the service frequency. The next entry points are separated by a six months period.

We define the rate of adoption of an entrant company, as the transfer rate of this company's shipments from truck hauling to the Port of New Bedford AMH.

4.2 First Tier entry and incremental market share transfers

For the first tier, we calculate an incremental percentage of volumes shifting to the AMH, over time – slow at the start (2.5% of the sales at entry), more rapid as modal shifting increases,

evolving to 13.5%, then 34%, etc. At some later point, after several Tiers have entered the system, these increments will be leveling off, if the service shows signs of stress or saturation.

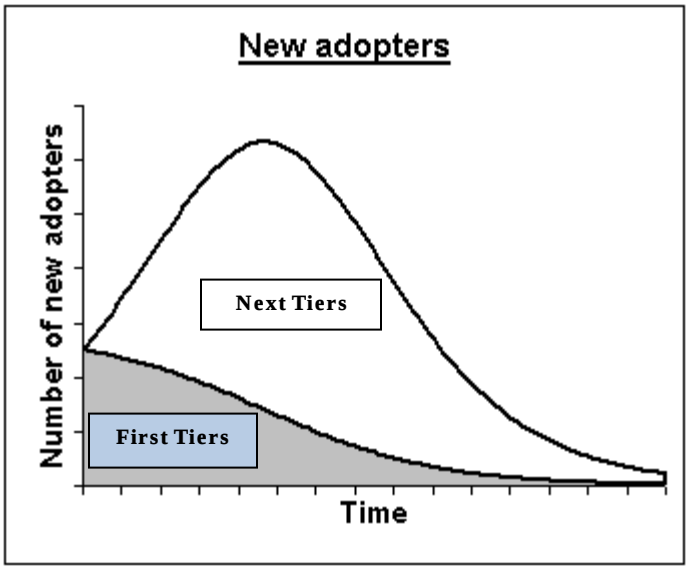
At that point in time, the AMH will have to mitigate saturation by introducing a new event, such as an extension of the service or the building of additional terminal space.

4.3 Successive Tier entries and market share capture.

The successive Tiers enter the system as they observe the results achieved by the other Tiers, and their after-entry behaviour is assumed to be the same, i.e. they follow a process of progressively entrusting to the AMH larger shipment proportions, over time.

The process can be visually described by the following graph:

Figure 4: New Adopters and Saturation



New adopters generate additional tiers, which enter the sysyem, and behave, over time, in the same wat as the fish tiers. At a point in time, when saturation appears, the Port's AMH will have to mitigate saturation stress by introducing a new event, such as an extension of the service or the building of additional terminal space.

Our calculations show that saturation of the State Pier in unlikely to occur with traffic migrating from the Seafood sector alone. However, if other commodities and sectors, decide to join the AMH, Saturation is will very likely to occur and will have to be studied in a separate task.

SECTION 5: MARKET SHARE CAPTURE BY AN AMH SERVING BOTH A NEW JERSEY PORT AND A FLORIDA PORT

We start by considering the viability of an AMH Service between Port of New Bedford and Florida, with a stop in New Jersey.

The Table shows that, for the first year we explicitly have 4 quarterly periods (Q1, Q2, Q3, and Q4= Year 1), which include 4 entry points, located at the end of every quarter (Tier 1 enters during Q1, Q2 Tier 2 enters, Q3 Tier 3 enters, Q4=Y1 Tier 4 enters)

We first calculate, in terms of fish shipments $ values, the Market Shares incrementally captured by the AMH during every time period,

Next, we cumulate these successive increments, and we convert these values in Metric tons using an average of $1,500 per ton.

These tonnages are then converted in TEU containers, using the average of 12Metric Ton per container

Finally, we calculate the number of 140 TEU barges required to move these Containers to either New Jersey or Florida

5.1 First Year (New Jersey and Florida Service)

The first year results are found in the following Table:

Table 2: Freight market share captured by Port of New Bedford AMH (First Year): New Jersey and Florida service

Time period	Q1	Q2	Q3	Q4=EndY1
(Year 1)				
M$ Market Share Capture				
Incremental Capture(M$)	0.24	1.89	7.78	22.04
Cumulative Capture(M$)	0.24	2.13	9.9	31.95
Cumulative Tonnage Captured	160	1419	6603	21298
Cumulative TEU/Trailers on AMH	13	118	550	1775
Number of Barges	1	1	4	13

Table 2 shows that the build up is indeed very slow, but takes place. During the first two quarters there is freight for less than a barge capacity, although freight almost reaches a barge capacity at the end of the first quarter.

At the end of the third quarter, the service can fill just about 4 barges (560 slots). If the service is scheduled to include a barge every other week, i/e. if it is a two barges per month service, it requires up to 6 barges per quarter. Table 2 shows that such a service can be viable at the end of the first year.

5.2 Subsequent years (New Jersey and Florida Service)

Subsequent years results are found in the following Table:

Table 3: Freight market share captured by New Bedford AMH (Years 2 to 4): New Jersey and Florida Service

Time period	Q4=EndY1	MidYear 2	EndYear 2	MidYear 3	EndYear 3	MidYear 4	EndYear 4
(Years 2 to 4)							
M$ Market Share Capture							
Incremental Capture(M$)	22.04	49.18	82.52	86.7	52.15	13.6	0
Cumulative Capture (M$)	31.95	81.13	163.65	250.35	302.5	316.1	316.1
Cumulative Tonnage Captured	21298	54087	109100	166901	201667	210733	210733
Cumulative TEU/Trucks on AMH	1775	4507	9092	13908	16806	17561	17561
Number of Barges	13	32	65	99	120	125	125

A two-barge per month service (every other week), adds up to 6 barges per quarter, and to 24 barges per year. It appears from Table 3 to be attainable after 1.5 year.

A four-barge per month service (weekly), adds up to 24 barges per 6-month period, or to 48 barges per year. It appears from Table 3 to be attainable after 2 years.

A two barges per week service adds up to 48 barges per 6-months period, or to 96 barges per year. It appears to be feasible from Table 3 from the middle of the third year.

If the State Pier capacity is 16,000 TEU's per year, it will be reached by the end of the third year, and possibly before, depending on the seasonality of the demand for barge transport. AMH incremental market shares will be leveling off, as the service will show signs of stress or saturation. At this time, the Port's AMH will have to mitigate saturation stress by introducing a new event, such as an extension of the service or the building of additional terminal space

SECTION 6: MARKET SHARE CAPTURE BY AN AMH SERVING ONLY A NEW JERSEY PORT (BAYONNE)

Our review of the various analyses of the Potential Market for AMH services over the Ports of Fall River and New Bedford led us to adopt a reasonable estimate of the sales spilt between the Jacksonville or other, Florida destination (35%) and the Bayonne, New Jersey destination (65%). Consequently the model was run once more for the New Bedford-Bayonne service, to yield the following conclusions.

6.1 First Year (Bayonne only Service)

The first year results are found in the following Table:

Table 4: Freight market share captured by Port of New Bedford AMH (First Year): Bayonne only Service

M$ Market Share Capture:	Q1	Q2	Q3	Q4=EndY1
(Year 1)				
Incremental Capture M$	0.156	1.23	5.05	14.33
Cumulative Capture M$	0.156	1.38	6.44	20.77
Cumulative Tonnage Captured	104	922	4292	13843
Cumulative TEU/Trucks on AMH	9	77	358	1154
Number of Barges	1	1	3	9

Table 4 shows that the build up is slower than in the previous case. During the first two quarters there is freight for less than a barge capacity, and freight slightly exceeds two barges capacity at the end of the third quarter.

At the end of the third quarter, the service cannot fill 4 barges (560 slots). If the service is scheduled to include a barge every other week, i/e. if it is a two barges per month service, it requires up to 6 barges per quarter. Table 3 shows that such a service can be viable at the end of the first year, as well as the previous example.

6.2 Subsequent years (Bayonne only Service)

Subsequent years results are found in the following Table:

Table 5: Freight market share captured by Port of New Bedford AMH (Years 2 to 4): Bayonne only Service

Market Share capture (Years 1 to 4)	Q4=EndY1	MidYear 2	EndYear 2	MidYear 3	EndYear 3	MidYear 4	EndYear 4
Incremental CaptureM$	14.33	31.97	53.64	56.36	33.9	8.84	0
Cumulative Capture M$	20.77	52.74	106.37	162.73	196.63	205.47	205.47
Cumulative Tonnage Captured	13843	35157	70915	108486	131083	136977	136977
Cumulative TEU/Trucks on AMH	1154	2930	5910	9040	10924	11415	11415
Number of Barges	9	20	43	65	78	82	82

A two-barge per month service (every other week), requires up to 6 barges per quarter, and to 24 barges per year. It appears from Table 5 to be attainable at the end of the second year.

A four-barge per month service (weekly), requires up to 24 barges per 6-month period, or to 48 barges per year. It appears from Table 5 to be attainable by the middle of the third year.

A two barges per week service requires up to 48 barges per 6-months period, or to 96 barges per year. From Table 5, it does not appear to be feasible at the end of the fourth year.

If the State Pier capacity is 16,000 TEU's per year, it will not be reached by the end of the fourth year. Till then, the service will not show signs of stress, strain nor saturation, and the Port's AMH will not have introduce new events, such as an extension of the service or the building of additional terminal space

SECTION 7: MARKET SHARE CAPTURE BY AN AMH SERVING ONLY A FLORIDA PORT (PORT OF JACKSONVILLE)

7.1 First Year (Port of Jacksonville only Service)

The first year results are found in the following Table:

Table 6: Freight market share captured by Port New Bedford AMH (First Year): Port of Jacksonville only Service

Market share capture (Year 1)	Q1	Q2	Q3	Q4=EndY1
Incremental Capture M$	0.084	0.66	2.72	7.71
Cumulative Capture M$	0.084	0.74	3.47	11.18
Cumulative Tonnage Captured	56	497	2311	7454
Cumulative TEU/Trucks on AMH	5	41	193	621
Number of Barges	1	1	2	5

Table 6 shows that the build up is indeed very slow. During the first two quarters there is freight for less than a barge capacity, and freight almost reaches almost two barges capacity at the end of the third quarter.

At the end of the fourth quarter, the service can fill just a little more than 4 barges (560 slots). If the service is scheduled to include a barge every other week, i/e. if it is a two barges per month service, it requires up to 6 barges per quarter. Table 6 shows that such a service cannot yet be viable at the end of the first year.

7.2 Subsequent years (Port of Jacksonville only Service)

Subsequent years results are found in the following Table:

Table 7: Freight market share captured by Port of New Bedford AMH (Years 2 to 4): Port of Jacksonville only Service

Market Share Capture (Years 1 to 4)	Q4=EndY1	MidYear 2	EndYear 2	MidYear 3	EndYear 3	MidYear 4	EndYear 4
Incremental Capture M$	7.71	17.21	28.88	30.35	18.25	4.76	0
Cumulative Capture M$	11.18	28.4	57.28	87.62	105.88	110.64	110.64
Cumulative Tonnage Captured	7454	18931	38185	58415	70583	73757	73757
Cumulative TEU/Trucks on AMH	621	1578	3182	4868	5882	6146	6146
Number of Barges	5	13	23	35	42	50	50

A two-barge per month service (every other week), requires up to 6 barges per quarter, and to 24 barges per year. It appears from Table 7 to be almost attainable at the end of the second year.

A four-barge per month service (weekly), requires up to 24 barges per 6-month period, or to 48 barges per year. It appears from Table 7 to be attainable by the middle of the fourth year.

A two barges per week service requires up to 48 barges per 6-months period, or to 96 barges per year. From Table 7, it does not appear to be feasible at the end of the fourth year.

If the State Pier capacity is 16,000 TEU's per year, it will not be reached by the end of the fourth year. Till then, the service will not show signs of stress, strain nor saturation, and the Port's AMH will not have introduce new events, such as an extension of the service or the building of additional terminal space

SECTION 8: CONCLUSIONS

The above analysis relies only on the Seafood Industry shipments in order to justify the establishment of a Port of New Bedford AMH service. Although, in the first two above configurations, this industry is found capable to provide a minimal base to this effect, it is clear that the freight volumes involved are barely sufficient to start up such a service. The way the details of such a service are worked out (frequencies, port rotations, number of ports called, procedures to manage seasonal demand, vigilance at signs of saturation, etc.) are essential to its success.

The important fact however that is it would be reasonable to expect that once the Port of New Bedford AMH service is established and primed, other commodities would enter the fray, so that the outlook may be more favorable than discussed. Such a development would be double edged insofar that it may accelerate the appearance of signs of strain in the system, and would put pressure for the Port to commit to further capital expenditures and investments.

The analysis could be refined if less rudimentary data can be collected. Yet, it does not seem that this additional effort would change the general nature of the conclusions. However such an effort would be necessary in order to complete the market assessment and bring it up to the demanding standards of the economic and financial feasibility of the venture, beyond the present level of the analysis which only establishes the existence of a base and gives it shape, structure, and magnitude level.

<u>Critical Steps Forward to Realize Potential AMH Service Development:</u>

The following outlines the activities that must be undertaken for the HDC to be able to engage carriers/shippers/operators with a business oriented plan for implementation of a Port of New Bedford AMH service and realizing the cargo volumes predicted in this report.

1. Quantification of base cargos other than seafood cargo. Project base cargo volumes and supporting market data to be incorporated with the previous market work completed for base seafood cargo. Focus efforts on expanding the understanding of base cargos other than seafood cargo.

2. Estimate of capital expenditure for Carrier/Terminal Operator for the development of an AMH service consolidated with the Port of New Bedford capital expenditures NAPI summarized in our previous Task 2. The Port capital expenditures could possibly be offset by a MARAD “Short Sea Transportation Grant” under H.R. 2647, Section 3512.

3. Financial Model preparation based on the estimated capital expenditures (Step 1), operating costs, expected AMH annual cargo revenues (for the seafood industry as provided in the New Bedford Harbor Study and other commodities with emphasis on the Cape Wind Energy Port traffic and other ocean service developments), and financial costs (in various assumptions including a grant from MARAD for a "Short Sea Transportation Grant" under H.R. 2647, Section 3512) resulting in a cash flow analysis and rate of return (ROR) spreadsheet.

4. Obtain a letter of interest from a financial institution – the cash flow analysis and rate of return (ROR) spreadsheet (Step 2) will provide the basis for discussions with specialists within lending institutions and equity capital firms.

5. Use the letter of interest and the cash flow analysis and ROR to negotiate an AMH partnership between a Carrier/Terminal Operator and Port of New Bedford.

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