Economic Feasibility of the Alaska-Canada Rail Link : An International Focus

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Introduction

The Alaska Canada Rail Link (ACRL) is the railroad link from Alaska to the rest of the North American rail system (from Alaska to Canada and down to lower 48 states) and has been under consideration since the Alaska Railroad was started in 1914.

There have been many attempts to determine where the real value is in the rail link, and there have been equally as many plans to support each theory. The vast majority of these studies tend to focus on regional prospects and direct benefits to relatively small groups of people. Single states in the U.S., groups of people in Canada, people in the mining industry, benefactors of the proposed natural gas pipeline, and so many others have lobbied and reported on every facet of the individual benefits of the rail link. Suffice it to say that many individuals would benefit and profit from the existence of the link, however, developing a complex global view that details the benefits a huge portion of the international market could share and the millions of people who are directly or indirectly tied to it will, most likely, provide a significantly more feasible plan.

This report will focus on international trade patterns between the U.S., Asia, and Canada in tandem with the overarching economic, efficiency, environmental, and cost elements associated with the ACRL's construction. The report will reconstruct and elaborate upon in-depth information acquired from local Alaskan studies, Canadian studies, and others from around the world to form the "best possible case" for the links creation.

Taking on containership traffic from Asia is the crux of the ACRL Project if it is to come to fruition. This inherently requires elements of international cooperation with, and political affirmation of the project, which will only come if all regions and entities can find value. Value for this project has often been solely measured in monetary amounts when there are many other factors that need equal consideration such as; security enhancements, speed & availability development, local/international job creation numbers, transportation infrastructure improvements, environmental/sociological impacts, capacity increases, intermodal transport improvement, and the ACRL's position in future projects.

- The proposed ACRL would create over **1,045,000 working years of labor**.
- The proposed ACRL would create an estimated **150,000 new high paying jobs**, typically earnings around $50,000 – $75,000 a year.

- The proposed ACRL would create **$5,000,000,000 in new wages.**
- The proposed ACRL would make Alaska an international hub for the exchange of goods and could (based on acquiring 10% of west coast port traffic) save Asian shippers approximately:
    - **USD $759,110,400 in annual savings** from shipping to LA/LB or;
    - **USD $332,110,800 in annual savings** from shipping to Prince Rupert or;
    - **USD $1,636,831,800 in annual savings** from shipping to New York
- The proposed ACRL would allow Alaska and Canada to ship out an estimated **$170 billion in domestic products**.
- The proposed ACRL would save Alaska **$41 billion in transportation cost cuts** for mineral resource production.
- The proposed ACRL would create new entrepreneurship opportunities (in both rural and urban Alaska) otherwise unavailable without direct transport of goods to international markets.

In order to fully understand the viability of the ACRL we have to understand how rail functions in North America and the impacts associated with the combination of railways and ocean ports. Railways throughout North America are essential to the transport of goods from the international community and have significantly enhanced local economies by providing direct and indirect employment, better transportation infrastructures, and strategic global positioning. Over the past one hundred years there have been an increasing number of projects undertaken to connect these railways in order to increase the availability of goods and lower the cost involved in the transportation of goods. The infrastructure in place to acquire most of the goods from the international community is an intermodal structure that, depending on the proximity of rail to the shipper, can be very expensive and time consuming. Intermodal shipping means that goods are transported between at least two different kinds of transport such as railways, trucks, container ships, and planes. Different transportation methods have different costs and time elements associated, generally calculated in the cost-per-ton of goods to ship and the speed at which the goods can be delivered. A proper balance of these elements is crucial for efficient and cost effective national and international distribution of goods. Although planes and boats are primary methods of transport from international locations, once they arrive at airports or ports they must offload their goods, leaving trains and trucks to complete the transport of the international goods.

It is this intermodal transaction point that is most important to the success of the proposed ACRL because sea ports handle the majority of all goods coming to North America, which are then handled by rail and truck.

However, rail, as apposed to truck, provides some unique characteristics that make it especially advantageous for the transportation of goods:

Reliability/Safety - Comparing rail traffic with other traffic modes, rail traffic is undoubtedly the most reliable traffic mode. Making use of rail traffic in North America prevents dozens of casualties, hundreds of injuries, and tens of millions of dollars in losses each year. Accident rates for rail traffic participants are almost zero, which is not true for automobile or air transport. Road transportation of goods carries along with it a direct danger for participants' safety in every accident. In regards to rail, the most serious accidents are most often caused by motor vehicles drivers at railway crossings. High levels of safety and reliability make rail transportation one of the most favorable traffic modes. At the same time, rail traffic relieves the pressure on overburdened networks of highways and primary roads, which contributes to a smooth and safe road transport that then ensures better prevention from damages and losses on transported goods.

Responsibility to Humans and Environment - Human activities and international business is continuously observing a growth in production as well as consumption. The growth accompanies the shipping of goods on each step, including

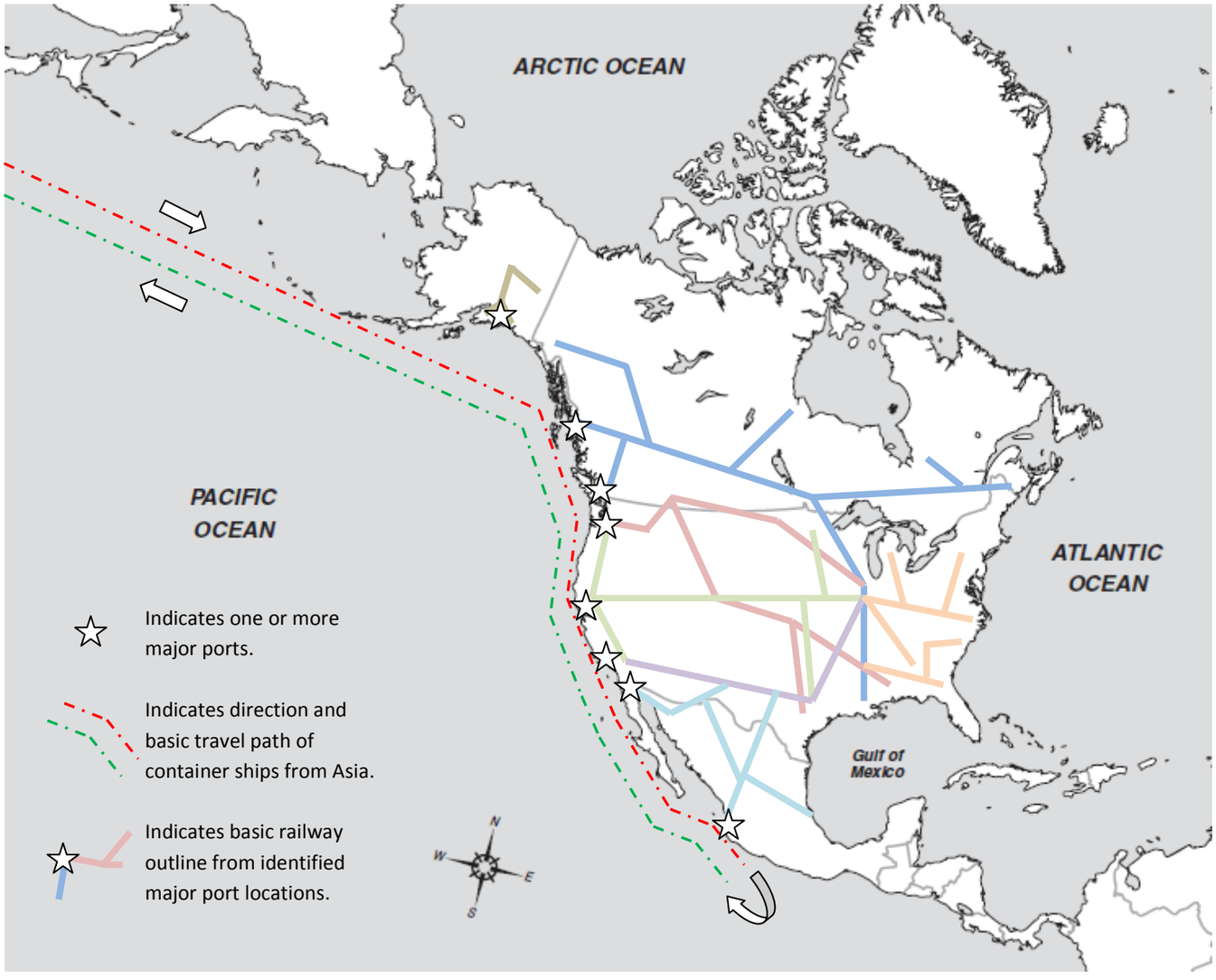
the expansion of transportation infrastructures. The number and volume of transportation modes is growing and requirements on speed, punctuality, reliability, and flexibility of transportation modes is increasing day by day. Millions of tons of goods transported each day by various traffic modes have an impact on the condition of the environment. Responsibility for the continued protection of the environment is a duty of all men and organizations; this responsibility is often shirked by catering to the noticeable appeal of environmental protection through elaborate and misleading marketing campaigns. The ability to meet a customer's requirements in an environment-friendly manner has become one of the basic criteria for the transportation of goods; this of course also comes with a significant competitive advantage with other transportation modes. Railway traffic is an efficient and environment-friendly transport system in many cases, whereas large volumes of goods can be transported on long distances quickly and with a minor impact on the environment. Compared with automobile or air transport, railway transport produces the lowest amount of emissions and requires much lower costs on regeneration of damaged environment. When the negative impacts on the environment caused by the transportation industry were researched, only 8% came from railway transport, while up to 90% came from road transport, and road transport performance is 50% lower than the traffic performance of railway transport. Another important argument placing railway transport above road transport is that there is a lower occupation on agricultural land. While road transport occupies almost 74% of such land, railway transport occupies only 27%.

Transportation Capacity and Cost – Rail transportation capacity and price conditions the world over has giving rail a specific and irreplaceable position. It enables and facilitates the transportations of goods, transportation of which by a different traffic mode would be too expensive and therefore inefficient. It enables the transportation of bigger quantities of goods over long and medium distances at relatively low costs. Rail has lower transport restrictions In comparison with road carriers and can, regardless of weather, consistently provide the timely delivery of goods. The road carriers must respect several regulations, such as limitations in utilizing highways and primary roads, limitations in traffic peaks, or obligations to keep safety breaks.

Place in Intermodal Transportation – Planes and container ships bring all international goods to the United States but are very expensive to operate and must offload goods as soon as possible with the least amount of traffic so as to minimize operational costs. This means that having rail available near major ports closest to international shippers is critical. Once goods reach a port rail systems need to transport goods to the farthest possible point before utilizing truck delivery to ensure cost effectiveness, timeliness, and quality of delivered goods. Rail combines flexibility and fast transposition of goods with a low consumption of energy and positive ecological impacts. An unquestionable advantage to the intermodal structure is that combined transport with rail to an integrated network of pre-existing high efficiency railways and "door-to-door" delivery of goods by trucks will render lower shipping costs, faster delivery of goods, lower negative impacts to the environment, and increased benefits to the United States Economy.

The question then becomes, "If rail is so efficient and cost effective how can rail transportation be improved without major comprehensive infrastructure redesign?" The key is increasing availability to rail for targeted shippers and lowering costs incurred from other forms of intermodal transportation such as container ships, planes, and etc. In order to reduce these other intermodal costs and lower the amount of time it takes to get products to market an in-depth assessment of potential shippers and United States port locations must be taken into account. The following is a list of current strategic ports along the west coast with a graphic that outlines the locations of the ports, the container ship routes from Asia, and railways used to ship freight throughout North America.

Basic Railway Distribution Model with Container Ship Travel Outline



Los Angeles/ Long Beach	LA/LB: >11M TEUs in 2004; expected to grow by 1.5M TEUs in 2005 Portside capacity exists in berths and quay cranes; operation density increasing (~4800 TEU/gross acre/year) Roads, rail, labor and trucking all constrained
Mexico	Ensenada: small maritime capacity with poor road connections Manzanillo and Lazaro Cardenas: small with limited labor pool and poor inland connections Punta Colonet: development is many years off and will be high cost
Other Southern California	San Diego: residents oppose container trade Hueneme: focused on refrigerated trade, and has inferior inland connections
Northern California	San Francisco: poor inland logistics and negative attitude toward commercial freight Oakland (1.5-2M TEUs): current capacity can be expanded by additional 1M TEUs; ultimately plans to allow up to 6M TEUs after significantly increasing road and rail infrastructure and remodeling terminals
Pacific Northwest	Seattle (1.5-2M TEUs): no expansion room; current focus is on densification and increased utilization Tacoma (1.5-2M TEUs): could accommodate a second terminal but face challenges from First Nations Portland and Vancouver USA: situated on the Columbia and are more expensive for shippers
British Columbia	Port of Prince Rupert (.5 TEUs): building another Deltaport pod over the next several years; longer term rail service issues Fraser Surrey Docks: some new capacity coming on stream, but limited
Alaska	Port of Anchorage: The Port of Anchorage

is currently the busiest port in Alaska, handling up to 640,000 TEU's annually from international containerships.

Port of Seward: The port of Seward has facilitated the largest commercial cruise ships in the United States and has constant port traffic year round. Seward is currently only handling a fraction of the traffic that it is capable of managing.

Whittier: Whittier is also currently serving large cruise ships and is a fully functional port capable of handling deep-water container ships.

Port MacKenzie: Port MacKenzie is the only south-central port site not constrained by urbanization. The 14 square miles of uplands are dedicated solely for commercial/industrial development with the intention of creating a port to handle containership traffic.

North America's ports on the west coast combined with the importance of the railways connected to them will be thoroughly analyzed for past, present, and future viability as effective nodes for intermodal transportation of goods from Asia. However, before that can be done a full understanding of rail in North America and past efforts to enhance rail transportation of goods must be analyzed. This document will discuss the breadth of railway and intermodal transportation of goods, the depth of knowledge for the continued enhancement of intermodal transportation in North America, and finally will discuss the proposed application of this acquired data as it relates to the proposed ACRL.

Breadth

1. Rail transport and markets:

From the beginning of industrialized society, transportation of goods has been a problem with many different solutions. The solution of freight-rail systems was a triumph of 19th century America; it freed business and industry from the need to locate near sea, river, and canal ports. It opened up domestic east–west trade corridors and underpinned the development of the United States as an industrial power. But the freight-rail system was eclipsed in the 20th century by trucking and highways, which freed business and industry again, this time from the need to locate near rail lines and terminals. Long-haul trucking, which provided reliable, door-to-door service, captured a large share of east–west freight traffic from the railroads and much of the north–south freight traffic from coastal steamers and river barges.

Whilst railways were still in their infant stages the only viable method of transportation from busy sea ports was transport by truck. Railways have since grown as have complex highway systems allowing for more rapid distribution of goods to more places. However, the highway system is increasingly congested, and the social, economic, and environmental costs of adding new highway capacity are prohibitively high in most areas. State departments of transportation are increasingly asking if expanding the capacity of the freight-rail system in some cases might be a more cost-effective way of increasing the capacity of the total transportation system.

When asking to see if rail is a cost effective solution, it is important to understand the current challenges that the rail industry faces. The railroad industry had many of its problems begin when they slid into bankruptcy in the mid-1900s. The government deregulated the railroad industry in 1980 and the mergers and reorganization that followed restructured the industry. System mileage was cut in half, from 380,000 miles of track at its peak in 1920 to 172,000 miles today. Ownership was consolidated into seven “Class I” railroads that today originate 84 percent of the traffic and generate 91 percent of railroad revenue, and 551 regional and short-line railroads that operate 30,000 miles of track, originate 16 percent of traffic, and generate nine percent of railroad revenue. Freight-rail productivity was increased and ton-miles handled per railroad employee has nearly quadrupled since 1980. Rates were dropped, service was improved, and market share was stabilized at 28 percent of total domestic ton-miles and about 40 percent of intercity ton-miles. However, the productivity gains and competitive rates have not been sufficient to rebuild market share and increase revenue. Railroad revenues have continued to drop. The industry’s return on investment has improved from about four percent in 1980 to about eight percent in 2000; however, it is still below the cost of capital at 10 percent. Most of the benefits of railroad reorganization and productivity improvements have accrued to shippers and the economy in the form of rate cuts, rather than to the railroads and their investors.

This is a major problem for the railroad industry because it is extraordinarily capital-intensive. Railroads spend about five times more to maintain rail lines and equipment than the average U.S. manufacturing industry spends on plant and equipment. Wary of the gap between the railroads’ capital needs and their income, investors have backed away from railroad stocks. This has reduced the amount of money available to railroads to invest in the freight-rail system, forcing the railroads either to borrow money to maintain and expand infrastructure or defer maintenance and improvements.

In order to have rail as an increasingly advantageous solution to goods distribution, investments must made; and for investments to be made, there must be clear and concise data to prove rails importance. As outlined by the American Association of State Highway and Transportation Officials (AASHTO), “The rail industry today is stable, productive, and competitive, with enough business and profit to operate but not to replenish its infrastructure quickly or grow rapidly. Market forces will continue to pressure the rail industry to streamline and downsize, to maximize revenues, and to minimize capital costs.” Knowing the perils that the current rail industry faces AASHTO see’s that the freight-rail system’s possible futures are as follows:

- **No Growth**
  With minimal Class I investments accomplished by the railroads from revenue alone and from investments in short-line improvements and safety enhancements, the freight-rail system could carry the same volume of freight in 2020 as it carries today, but little more. Freight that could not be handled by the railroads, much of it heavy commodities, would move to trucks and the highway system. This would shift almost 900 million tons of freight and 31 billion truck VMT to the highways, costing shippers $326 billion, costing highway users $492 billion (in travel time, operating, and accident costs), and adding $21 billion to highway costs over the 20-year period. This $21 billion is a conservative figure that does not include the costs of improvements to bridges, interchanges, local roads, new roads, or system enhancements. If these were included, the estimate could double. This scenario illustrates how insufficient investment in our nation's freight-rail system could negatively impact highways and the overall transportation system.

- **Constrained Investment**
  With additional investment — approximately what the Class I railroads can afford today from their revenue plus borrowing — the freight-rail system could handle additional traffic, but could not keep pace with growing demands for freight movement. It could handle around half of its "fair share" of forecast growth in freight-rail tonnage. The balance would likely shift to trucks and the highway system. This would transfer almost 450 million tons of freight and 15 billion truck VMT to the highways, costing shippers $162 billion, costing highway users $238 billion (in travel time, operating, and accident costs), and adding $10 billion to highway costs over the 20-year period. Inclusion of costs for bridges, interchanges, etc., could double this estimate.

- **Base Case**
  With a higher level of investment, the freight rail system could maintain its current share of commodity-lane traffic, and accommodate its "fair share" of forecast growth in freight-rail tonnage. Funding would come from a combination of railroad investments (above and beyond what currently can be funded from revenues and borrowing) and public-sector participation. In this scenario, the highway system would still shoulder the full forecast growth in truck-freight tonnage and truck VMT.

- **Aggressive Investment**
  With a still-higher level of investment, the freight rail system could increase its share of freight traffic, capturing more than its base case share of forecast growth, and relieving some of the anticipated truck and congestion pressure on the nation's highway system. Funding needs would be met by greater railroad investments and increased public-sector participation. This would allow freight rail to carry a larger percentage of freight tonnage in 2020 than it carries today (17 percent in 2020 compared to 16 percent today). It would shift 600 million tons of freight and 25 billion truck VMT off the highway system, save shippers $239 billion, save highway users $397 billion, and reduce highway costs by $17 billion. Inclusion of costs for bridges, interchanges, etc., could double this estimate. To simply keep up with freight rail's share of the forecast demand — the base case scenario — the freight-rail system needs substantial capital investment. The precise amount has not been determined, but can be generally estimated from a variety of sources.

- **Rail Safety Needs — $13.8 billion**
  The Institute for Transportation Research and Education at North Carolina State University surveyed state rail-safety needs, focusing on highway-rail at-grade crossings. This estimate includes costs for additional warning systems, grade separations, grade-crossing eliminations, and track relocations for both freight and passenger systems. These needs have usually been addressed by a combination of private and public investment.

- **Short-Line Improvements — $11.8 billion**

The tracks and bridges of much of the nation's short-line system are inadequate to handle the newer 286,000-pound and 315,000-pound railcars coming into service. A study commissioned by the American Short-Line Rail Road Association estimated the cost of upgrading the nation's short-line system to handle 286,000-pound railcars at $6.9 billion. This estimate is consistent with the findings of the Railroad Shipper Transportation Advisory Council (White Paper III, April 2000), which was based on a 1999 survey by AASHTO. The council found a total capital need of $11.8 billion, of which $9.5 billion was unfunded. The council's estimate included deferred maintenance, safety and speed improvements, and weight improvements. In recent years, these needs have been largely addressed by public investment.

- **Class I Infrastructure Repair and Maintenance** — $4 to $5 billion annually, or $80 to $100 billion over 20 years

- **Class I Infrastructure Improvements, above and beyond Repair and** Maintenance — $3.5 billion annually, or $70 billion over 20 years

The Class I railroads currently are investing around $2 billion annually for improvements above and beyond repair and maintenance. This is not sufficient to meet the needs of the base case scenario, and is more consistent with the constrained investment scenario. Should this continue, it means that freight rail will lose market share, thereby increasing transportation and highway system costs over the next 20 years. Higher levels of investment will be needed to achieve either the base case scenario or aggressive investment scenario. The total cost to achieve the base case scenario is estimated at $175 to $195 billion over 20 years. Railroads should be able to provide the majority of the funding needed (up to $142 billion dollars) from revenue and borrowing, but the remainder (up to $53 billion, or $2.65 billion annually) would have to come from other sources — including but not limited to loans, tax credits, sale of assets, and other forms of public-sector participation. Compared to the constrained investment scenario, the base case scenario removes 450 million tons of freight and 15 billion truck VMT from the highways, saves shippers $162 billion, saves highway users $238 billion, and saves $10 billion in highway costs over the 20-year period. Inclusion of costs for bridges, interchanges, etc., could double this estimate. The total cost to achieve the aggressive investment scenario is estimated at $205 to $225 billion over 20 years. Up to $83 billion, or $4.15 billion annually, would have to come from sources other than railroad revenue and borrowing. Compared to the constrained investment scenario, the aggressive investment scenario removes 1,035 million tons of freight and 40 billion truck VMT from the highways, saves shippers $401 billion, saves highway users $635 billion, and saves $27 billion in highway costs over the 20-year period. Inclusion of costs for bridges, interchanges, etc., could double this estimate.

While these are preliminary estimates that should be confirmed by detailed benefit/cost studies, the conclusion is that relatively small additional investments in the nation's freight rail system can be leveraged to provide relatively large public benefits. These investments must be made at the network level. Public participation in rail system investments has historically addressed the bottom of the system: grade crossings, branch lines, and commuter rail services. The present need is to treat the key elements at the top of the system: nationally significant corridor choke points, intermodal terminals and connectors, and urban rail interchanges. Investments at this level hold the most promise of attracting and retaining freight-rail traffic through improvements in service performance.

It becomes clear that the fate of rail lies in the choice for the nation's freight-rail system to be either "market-driven evolution" of the freight-rail system or "public-policy-driven expansion" of the system. The market-driven evolution will accommodate some of the forecasted freight growth, but relieve little of the forecast congestion on the highway system. A public-policy-driven expansion could produce a rail industry that provides the cost-effective transport needed to serve national and global markets, relieve pressure on overburdened highways, and support local social, economic, and environmental goals.

Many states have already taken steps consistent with a public policy-driven approach, by investing directly in their rail systems, and by forming public–private partnerships to implement specific projects. But making increased levels of investment and realizing the public benefits of a strong freight-rail system at a national level will require a new partnership among the railroads, the states, and the federal government. This partnership must enunciate a clear national policy of improving freight system productivity; expanding state eligibility and flexibility to invest where freight-rail improvements have significant highway and public benefits; increasing loan and credit enhancement programs; and initiating innovative tax-expenditure financing programs, including accelerated depreciation, tax-exempt bond financing, and tax-credit bond financing. The partnership must extend beyond state boundaries to match the scale of the policy and investment decisions to the scale of today's freight-rail system.

The problems of the freight transportation sector, especially the challenges facing the freight-rail industry, and the consequences of not addressing them are clearer today than they ever where in the past, and they will sharpen in the coming years. The public sector and the private freight transportation community must advance public policy options that improve the capacity, productivity, and security of the freight-rail system as an integral part of the national freight transportation system.

With the proper support from public and private entities, intermodal or intermodal scenarios where rail is an integral part of an over all global network of goods distribution will be the key to opening new market opportunities. The company Industrial Synthesis provides us with further insight into the role of freight shipment by rail and the challenges and opportunities associated with it.

> "Rail transport in the US can be subdivided into passenger-rail and freight shipment segments. At present, the majority of rail transport in the United States is based in freight train shipments. Freight railroads are crucial to the nation's economy – they move 40 percent of manufactured goods and raw supplies."

Challenges and Opportunities for Freight Rail

Recently, some key changes have occurred within the supply chain segments that have impacted the rail road industry, resulting in corporate changes to their service offerings.

First, the rail road industry is keeping pace with the strong demand for international intermodal traffic. However, the anticipated growth in volumes of imports suggest that there will be continuing pressure placed on current rail assets, requiring more efficient processing centers in the near future.

Second, in the past, ocean carriers have offered door-to-door service for international intermodal containers providing importers with a service called Inland Port Intact (IPI rates). This means that the container moves from the foreign port to the US port, to rail and to an inland destination from the inland intermodal rail terminal to the importers distribution center, all on the same Bill of Lading/Pricing process. However, the carriers have recently indicated a lack of will to support destinations inland beyond large distribution hubs, or beyond cities where they have significant volumes and can control empty container flow. This trend is essentially reducing the number of inland ports or gateways where service will be provided by the carrier. This shift reduces the number of destinations for the rail provider, increases the volume of destination-centric volume, and improves reverse logistics volumes from key gateways.

Third, the rail operators are no longer willing to support the traditional "rail-served" buildings that stand alone or are concentrated in specific areas of a community or city.

Lastly, the increased volume of imported vehicles will require that the rail carriers reengineer their approach to vehicle management and related assets. The US is preparing for an onslaught of vehicles from Chinese producers, with some entering the US by way of vehicles assembled in Mexico—thus providing access to that market in parallel.

With the growing focus on intermodal traffic, where goods are being shipped by air, by sea, by land, and many variations within each system of shipping; creative ideas have come forth to better connect the worlds global markets. The concept is that if, at all times, shippers are able to move goods quickly, even if it is at slightly higher costs, then they will be able to produce more goods to sell faster. The global market is consistently and increasingly demanding that instantaneous changes be made available to facilitate growing customer base desires.

The value that ports create for local economies is important to take into account when considering the true impact of global shipping practices. California's ports serve as a major economic engine for their state and the nation as a whole. In 2008, port facilities processed an estimated $500 billion of goods. More than 40 percent of containerized imports enter the country through California ports, and nearly 30 percent of the country's exports depart through them. Further north in Washington we can see that Puget Sound's ports provide the most direct shipping link between major markets in Asia and the heavily populated East Coast. Foreign exports directly and indirectly account for 25 percent of Washington's economic output. With Washington serving as a transshipment center, the ports of Seattle and Tacoma are a major distribution hub for the many companies that maintain warehouses nearby. The ports of Seattle and Tacoma each handle approximately two million containers a year. The transport of goods traveling via rail or truck to retail locations throughout the region—or to warehouses before being shipped overseas—create jobs, business income and tax revenue for the state.

- The ports of Los Angeles and Long Beach generate more than $10 billion in state and local tax revenues a year.
- Businesses that receive imports or ship exports through the Port of Los Angeles generate about $12.1 billion and stimulate an additional $5.5 billion in local industry indirect sales.
- Employees for businesses that receive imports or ship exports through the Port of Los Angeles spend about $4.1 billion in the region.
- With more than $100 billion of cargo moving through the Port of Long Beach every year, foreign and domestic shippers and steamship companies spend more than $5 billion in the region.
- More than $10 billion a year is spent on wholesale distribution services for goods imported through the Port of Long Beach.

California ports also have a significant nationwide impact:

- More than three million jobs across the country are linked to California's public ports.
- The Port of Los Angeles generates $21.5 billion in federal tax revenue.
- More than $32 billion a year is spent nationwide on wholesale distribution services for goods that come through the Port of Long Beach.

- The ports of Seattle and Tacoma's seaport activities generate several hundred million dollars in state and local revenues.
- Cargo operations at the Port of Seattle create more than $3 billion in business revenue. Firms that provide services at the port's marine facilities spend $660.6 million in local purchases.
- Businesses that provide maritime services to the Port of Tacoma's marine terminals receive about $1.7 billion of revenue.

Washington ports also have a significant nationwide impact:

- Port of Tacoma activities produce $205 million in federal tax revenues.

- Two mainline railroads—the Burlington Northern/Santa Fe and the Union Pacific/Southern Pacific—are integral in the movement of grain from Midwestern states to the Port of Seattle seaport for export.

Even further north on the west coast, in Canada, port shipping activities generate $10.5 billion in Gross Domestic Product (GDP), $22 billion in economic output and $6.1 billion in wages.

Port Metro Vancouver released a study in November 2008 prepared by InterVistas Consulting Inc. that confirms that the port activities generate 132,700 jobs and $10.5 billion in GDP. The amalgamated Port Metro Vancouver jurisdiction borders on 16 municipalities and covers 600 km of shoreline extending from Point Roberts at the Canada/U.S. border through Burrard Inlet to Port Moody and Indian Arm, and from the mouth of the Fraser River, eastward to the Fraser Valley, north along the Pitt River to Pitt Lake, and includes the north and middle arms of the Fraser River. The Port hosts the operation of 28 major marine terminals and several domestic intermodal terminals.

The port's main sectors of direct employment include maritime cargo and the cruise industry. Across Canada, the maritime cargo sector generates $2.2 billion in wages, while the cruise industry accounts for 5,700 direct jobs with a payroll of $200 million. Overall, the value of cargo shipped through the port annually is $75 billion.

Port Metro Vancouver is Canada's largest and North America's most diversified port, trading $75 billion in goods with more than 130 trading economies annually.

It is clear that having a port is an essential boost to a regions economy and has the ability to employ thousands of people. As highways become more congested and costs of operating sea freighters and other ocean going cargo vessels increases, all signs point to providing saving costs by offering a shorter route and expedient offloading time. Canada's port in Prince Rupert is a unique port because it has excellent positioning in regards to Asian and Russian markets. It is not only very close to these ports but is able to handle a good deal of shipping containers each year providing jobs and huge economic enhancements to the local and national economy.

Prince Rupert, B.C.; January 21, 2009 - Led by a surge in container traffic through the Fairview Terminal, the Port of Prince Rupert handled 10,596,863 tonnes in 2008, a moderate increase over 2007, despite a global economic downturn that has resulted in declining traffic through most other North American West Coast ports.

Fairview Terminal handled 181,890 TEUs (20-foot equivalent units) from 78 vessels in its first full year of operations, following the facility's opening in late October, 2007. The terminal's throughput for the first six months was 42,555 TEUs, before jumping more than 300 per cent in the second half of 2008 with 139,335 TEUs as a result of the addition of the second COSCO/CKYH Alliance service in July. In the fourth quarter, the terminal operated at greater than 60 per cent of its 500,000 TEU capacity with a throughput of 79,106 TEUs.

"The opening of the Fairview Container Terminal in 2007 was an important step toward connecting the Canadian economy to the developing economies of Asia and solidifying Canada's position as a leader in international trade in the Asia Pacific Region," says PRPA Board of Directors Chair **Dale MacLean**. "The new express gateway is providing shippers with unparalleled speed and reliability, a competitive advantage in their supply chain management, while the Fairview Terminal has created a solid foundation for economic activity in Western Canada and a stimulus for new investment across the region."

Prince Rupert Port Authority (PRPA) President & CEO **Don Krusel** says the second half surge in traffic reflects the growing confidence of shippers in the competitive advantages of moving their cargo through the new Asia-North America express gateway corridor anchored by the Prince Rupert container terminal.

"The PRPA, in conjunction with our CN, Maher Terminals and the COSCO-CKYH Alliance partners, are delivering on our commitment to providing our shipping customers with unparalleled reliability, speed and cost effectiveness," notes Mr. Krusel. "This is more crucial now than ever before because the global economic turmoil is drastically effecting their businesses. The competitive advantages of shipping through Prince Rupert are delivering value to their bottom lines."

Mr. Krusel points out that the record-breaking 1.8 million tonnes of container cargo which moved through Fairview Terminal during 2008 is demonstrated proof of the success and value of the government and private-sector investment in the container terminal.

"Fairview Terminal never achieved more than one million tonnes of cargo in any given year during its first 30 years of operation as a bulk/breakbulk facility. Now, after only 14 months of operation, and with considerably more capacity for growth, the terminal is moving 80% more cargo through a brand new trade corridor into North America."

Ridley Terminals Inc. (RTI) handled 4,847,031 tonnes in 2008, down slightly from 5,085,771 tonnes in 2007. RTI experienced an increase in coking coal, petroleum coke and wood pellets, but a decrease of nearly 300,000 tonnes of coal as a result of production cutbacks by its coal producing customers.

Throughput at Prince Rupert Grain (PRG) decreased 26.3 per cent in the calendar year to 3,759,517 tonnes from 5,098,402 tonnes as a result of a 33.6 per cent drop in wheat traffic. However, PRG, which handles about 30% of grains moving through Canadian west coast ports, saw an increase in barley, canola and grain screenings in 2008.

The Port of Prince Rupert's cruise business experienced its best cruise season in its five years of operations, welcoming 63 ships and a record 103,635 passengers compared to 99,135 in 2007, and a 21% increase in passengers participating in shore excursion tours, from 25,621 in 2007 to 30,962 in 2008. The continuous improvements in the shore excursion program resonated with more passengers, who spent nearly $2.4 million in the city on tours and excursions in 2008, up 32.4% from 2007 and 267% in 2006. In addition, the total economic impact of the cruise industry in Prince Rupert is estimated to have exceeded $10 million in 2008.

The PRPA also made significant progress on the Fairview Terminal Phase 2 expansion and Canpotex potash terminal projects. The planning component for Phase 2, a 1.5 million TEU facility, is 95% complete, including all field and marine work in preparation for construction. The PRPA is anticipating Phase 2 construction to begin in late 2010, dependent upon the concluding of the environmental assessment currently under review by federal regulatory agencies. Meanwhile, Canpotex is well into the feasibility study for its planned new potash handling terminal on Ridley Island. The facility is one of two west-coast terminal projects that will add approximately 11 million tonnes of annual potash shipping capacity to its current 12 million tonnes by the end of 2012.

In addition to the cost saving and value added to local and nation economies, the shorter trip from Asian markets to the west coasts of North America are more environmentally friendly.. A new study commissioned for the Port of Seattle suggests the carbon footprint on north Asian shipments to the Midwest is much lower if they unload along the West Coast. The shorter ocean journey more than makes up for the longer rail ride, at least in terms of carbon emissions, says the study by the Alameda-based Herbert Engineering Corp.

For deliveries north of Memphis, the ports of Seattle and nearby Tacoma had the lowest greenhouse gas toll: a 24% savings in emissions on shipments from Shanghai to Chicago via Seattle, vs. New York -- even more for bigger ships. From Memphis south, it's more environmentally friendly to ship to Los Angeles, Long Beach or Oakland.

In the current economic climate, shippers are looking primarily at cost. But as fuel costs rise, Northwest ports expect to look more and more attractive. Grabbing a niche as the "green gateway" can only help, Charles Sheldon, the Seattle seaport's managing director, told reporters. "I've been meeting with major shipping lines in the last couple years where they've asked the question, 'What are you doing to reduce the carbon footprint of your supply chain?'"

The importance of Intermodal transport of goods to North Americas west coast ports from Asia is an economic and environmental decision for the international community. Support has oscillated in regards to rail transport of goods in years past whilst the international community has disgusted ways to relive road traffic, help the environment, reduce costs, enhance local economies profitability, increase jobs and expedite trade. The resounding voice in North America has been to say that investing in rail is an, “all-in wager on the economic future of the United States…" as stated by Warren Buffet.

> More than 4,000 miles of train tracks stretch through California, winding up the blustery Cajon Pass and snaking through the desert surrounding Barstow. Those tracks could be seeing a lot more traffic in the next few years as trains loaded with Chinese-made toys, electronics and clothing roll eastward, connecting West Coast ports with cities across the United States.
>
> Warren Buffett is a believer. In November, the world's second-richest man paid $34 billion for railroad giant Burlington Northern Santa Fe Corp., despite a deep downturn in the railroad industry.
>
> Buffett characterized his investment as an "all-in wager on the economic future of the United States." But it's also a bet on globalization and the renewed importance of rail in the nation's transportation network.
>
> Southern California is a key hub in his new empire. About 40 percent of all goods that the U.S. receives in containers from overseas enter the country through the seaports of Los Angeles and Long Beach. That freight must then move overland to retailers across the country.
>
> Fort Worth-based BNSF has invested hundreds of millions of dollars in recent years to beef up its Southern California operations to grab a bigger share of that business.
>
> "Within our 28-state network, California is incredibly important to us," said Matthew K. Rose, chief executive. "A lot of trade comes through there, a lot gets consumed in California, and a lot gets handled and repackaged there."
>
> China's rise has given a new push to U.S. railroads, which have chugged their way back into the nation's transportation future after losing ground for decades to the trucking industry.
>
> The sheer volume of inbound cargo from Asia to North America - more than 40 million container loads last year - has made it cost-prohibitive to haul all those goods over congested U.S. highways.
>
> Rail companies have strengthened their networks and upgraded their equipment to handle the ubiquitous metal shipping containers to provide a nearly seamless transition from cargo ship to freight train to truck or any combination in between.
>
> This so-called intermodal traffic has been the fastest-growing segment of the industry for about a decade.

> In 2008, international and domestic intermodal cargo accounted for nearly a third of the railroad's revenue, a figure that's expected to grow when the U.S. economy gets back on track.
>
> Although factory jobs have been lost to Asia, international trade is now a pillar of the Southern California economy, accounting for more than 300,000 jobs.
>
> Chains such as Wal-Mart Stores Inc. and Costco Wholesale Corp. depend on the nation's trains running on time.
>
> "There wouldn't be big-box retail and globalization if you had to truck in all those containers - it wouldn't be worth the cost," said Anthony Hatch, a rail consultant in New York.
>
> Over the last 20 years, ton-miles of freight hauled by the biggest railroads doubled, from 876,984 ton-miles in 1985 to 1.77 million in 2007, according to government figures.
>
> Paul Bingham, managing director of world trade and transportation markets at research firm IHS Global Insight Inc., projects that number will grow 14 percent within a decade.
>
> Environmental concerns are also helping to fuel rail's comeback. Railroads can move a ton of freight an average of 457 miles on a gallon of fuel, according to the Association of American Railroads.

There have been many ideas in which to better connect the lucrative Asian and American markets; one such idea to increase America's responsiveness in the global market is to directly connect the two largest economies on earth with a tunnel. The bridge or tunnel would provide a connection linking Asia, Africa and Europe with North America and South America. The Bering Strait would be spanned comprised of three tunnels connected via the Diomede Islands for a total distance of about 64 miles. The three long tunnels would each be slightly longer in length than the Hangzhou Bay Bridge, currently the longest sea-crossing bridge in the world. The construction of such a tunnel would face unprecedented engineering, political, and financial challenges.

The project, which Russia will be coordinating with the U.S. and Canada, would take 10 to 15 years to complete, Viktor Razbegin, deputy head of industrial research at the Russian Economy Ministry, told reporters in Moscow. State organizations and private companies in partnership would build and control the route, known as TKM-World Link, he said.

A transport corridor from Siberia into the U.S. will feed into the tunnel, which at 64 miles will be more than twice as long as the underwater section of the Channel Tunnel between the U.K. and France, according to the plan. ``This will be a business project, not a political one,'' Maxim Bystrov, deputy head of Russia's agency for special economic zones, said at the media briefing. Russian officials have presented the plan to the U.S. and Canadian governments and the project is consistently being re-evaluated to ascertain its viability.

The Times reported this story about the tunnel when it was initially conceived:

> Russia has unveiled an ambitious plan to build the world's longest tunnel under the Bering Strait as part of a transport corridor linking Europe and America via Siberia and Alaska.

The 64-mile (103km) tunnel would connect the far east of Russia with Alaska, opening up the prospect of the ultimate rail trip across three quarters of the globe from London to New York. The link would be twice as long as the Channel Tunnel connecting Britain and France.

The $65 billion (£33 billion) mega-project aims to transform trade links between Russia and its former Cold War enemies across some of the world's most desolate terrain. It would create a high-speed railway line, energy links and a fibreoptic cable network.

Proposals for a tunnel under the Bering Strait were first advanced a century ago under Tsar Nicholas II but foundered with the outbreak of the First World War and the Russian Revolution. The idea was revived after the collapse of the Soviet Union but was shelved once again in Russia's financial meltdown of 1998.

Russian officials insist that the tunnel is an economic idea whose time has now come and that it could be ready within ten years. They argue that it would repay construction costs by stimulating up to 100 million tons of freight traffic each year, as well as supplying oil, gas and electricity from Siberia to the US and Canada.

Maxim Bystrov, deputy head of Russia's agency for special economic zones, said: "This will be a business project, not a political one." The tunnel across the international date-line would be built in three sections through two islands in the Bering Strait and would link 6,000km (3,728 miles) of new railway lines. The tunnel alone would cost an estimated $10-12 billion to construct.

The scheme is being championed by Viktor Razbegin, deputy head of industrial research at Russia's Economic and Trade Development Ministry. He has long advocated a tunnel under the Bering Strait to provide a land route between Russia and the US, and published a feasibility study in the 1990s.

He told journalists that state and commercial companies would form a public-private partnership to fund and run the project. A conference in Moscow next week will propose an inter-governmental agreement with the US to underwrite construction of the transport link in return for a stake in the business.

Russian Railways is said to be examining the construction of a 3,500km route from Pravaya Lena, south of Yakutsk, to Uelen on the Bering Strait. The tunnel would connect this to a 2,000km line from Cape Prince of Wales, in West Alaska, to Fort Nelson, in Canada.

The project could save Siberia and the US $20 billion a year in electricity costs, according to Vasily Zubakin, deputy chief executive of Hydro, a subsidiary of Russia's main electricity producer, Unified Energy Systems. The company plans to build two giant tidal plants in the Far East to supply tengiga-watts of electricity by 2020.

However, some of those said to be involved in the project appeared sceptical. Sergei Grigoryev, vice-president of the state oil pipeline monopoly Transneft, said: "I've never heard of this plan. We need to first develop fields in East Siberia."

Others also questioned whether it made economic sense, pointing out that Alaska has large oil reserves of its own and that China's huge market was closer and more lucrative.

Although there has been much debate since the idea has had real attention as a viable project, only recently has there been any further progress. In his Dec. 20 interview to the London *Daily Express*, Russian Railways President Vladimir Yakunin emphasized that it would actually be feasible within a decade, to link the world together by a Bering Strait tunnel between Russia and America. A review of late-2009 government documents and regional press from Russia's Far East regions demonstrations that officials there are indeed planning for this to happen.

Magadan Region, famous for its gold mines and brutal prison camps in the mid-20th century, is situated on Russia's Pacific Coast — north of Khabarovsk Territory and south of Chukotka, the province which borders on the Bering Strait. The Territorial Planning Scheme for Magadan Region, publicized Sept. 9 by the Advis.ru agency, includes the Bering Strait project as follows: "The Magadan Region Territorial Planning Scheme takes into account the strategy for the development of both the Far East and Russia [as a whole]. It includes, for example, such a 'megaproject' as the Transcontinental Railway BAM - Yakutsk - Uelen [where BAM stands for Baikal-Amur Mainline], with a line through Magadan Region and a tunnel across the Bering Strait to Alaska — a project which has been included in the Russian Federation Transport Strategy for the Period to 2030, and which is viewed by the Russian and U.S. Governments as the greatest infrastructure project of the 21st century. In the long term, completion of this Transcontinental Railway to Alaska will make it possible to diversify the raw-materials orientation of the Magadan Region's economy, with the creation in the city of Magadan of a new, intermodal transportation node, through which freight flows connecting Canada and the USA with the Pacific nations will pass. This means the railway, first and foremost, but also a role for Magadan Region in a Transarctic Air Corridor, connecting America, Southeast Asia and Australia by the shortest routes; and it means the development and rebirth of the importance of the Port of Magadan on the Sea of Okhotsk."

Even in the area of recreational adventure trips and among car enthusiasts, the reality of the Bering Strait rail line is catching on. The Russian auto site Kolesa.ru carries a press release announcing a new type of snow tire: "The Cordiant Polar 2 has been chosen by the organizers of the Polar Ring expedition for use on the fourth leg of the expedition, which will take place between the end of 2009 and 2011. The route of this leg of the polar expedition traces that of the future major railway line from the banks of the Lena River to the Chukotka village of Uelen on the coast of the Bering Strait: Yakutsk - Pravaya Lena - Zyryanka - Uelen, and then will cross the Bering Strait, pass along the coastline of the Alaska and Canada archipelago and end at the Canadian village of Resolute Bay."

The project is not only feasible, it is imperative to facilitate world wide economic growth and efficiency. New Kerala (a world news leader) points out the necessity of this rail corridor to take place:

> **Bering Strait Imperative**
>
> The intensity of use of this railroad corridor, and its effect on overall economic productivity of North American and Eurasian nations, changes entirely when it crosses the Bering Strait—as is now definitely technologically feasible by tunnel using the two islands, (Little Diomede and Big Diomede) which lie along the Strait crossing in order to break up its total length. The long-awaited Alaska-Canada railroad corridor then becomes an extension of the northern Eurasian Land-Bridge—involving the Trans-Siberian and Baikal-Amur lines, and the Chinese northern rail line construction extending to them—and part of the "world land-bridge."
>
> For example, whereas American consultant Cooper in Juneau estimated that a railroad corridor between Alaska and Canada would reach 70 million tons of freight per year, he reported that the Siberian State Transport University has done extensive study of traffic over a Bering land-bridge. The freight traffic on the same corridor, if so extended, would then more than quadruple, to as much as 300 million tons per year among the nations of North America, Russia, China, Korea, Japan, and Europe.
>
> This would be propelled by the savings of time in moving most kinds of freight. Take a 40-foot standard freight container being shipped from Shanghai to New York City. Entirely by sea—the cheapest means—it takes 30-35 days (by air, the cost per pound is nearly 20 times higher). By sea across the Pacific and then rail across America, takes 20-22 days; ship and truck, 20-25 days. But entirely by rail on the "world land-bridge," the container would arrive in only 10-12 days, and cost just 3-5% more than all-sea shipping.
>
> Moreover, in this context of world infrastructure building and connection, the transport corridor from Alaska down the West Coast of North America is then not enough. An additional corridor from Alaska becomes

necessary and, in fact, more important: This corridor, as consultant Cooper has drawn it, will come southeast across Western Canada to cross into North and South Dakota, and continue as the Central North American Land-Bridge Corridor. This section of it is the long-"missing" major north-south rail corridor down the center of the United States—following the route of U.S. Highway 83—to Texas, and into Mexico.

This combination of two new rail and *development corridors*, both flowing across the Bering Strait to join the Eurasian Land-Bridge, connect North America to the "world land-bridge."

They also make clear the complete coherence between the Eurasian Land-Bridge idea—for which Presidential candidate Lyndon LaRouche is known internationally, and which is being carried out in projects by China and other countries—and his "Super-TVA" policy for the United States' recovery from economic depression.

The North American side of this railroad corridor construction would involve tens of thousands of new productive jobs directly, and many tens of thousands more resulting from that economic activity. If double-tracked, the Alaska-to-West Coast and Midwest corridor routes would cost $7-10 billion in construction; the much greater Bering Strait-crossing land-bridge corridor construction, by several nations, $70-100 billion.

Collaboration is an obvious issue when the problem of intermodal or direct transportation of goods is considered. There are many countries, states, public entities, and private entities involved that all must work together to produce a successful network of transport. In many parts of the world, railways have been intrinsically linked with economic development and political control. And it is here that we find the greatest reluctance to release them fully into the private sector. The European compromise of private or state-owned operators competing on state-funded infrastructure seems to be a step forward, but some commentators suggest that vertical separation is only a half-way house, and this model may not prove sustainable in the longer term. So in order to provide for the best possible circumstance for international collaboration any new rail infrastructure changes must focus on the international long term.

When looking into the long term, plans should be made that looks forward over 30 years and address many complex issues not just immediate economic elements. This is essential because trains and railways created now will still be in service in 30 years' time, and other assets will last even longer. But it is also challenging because it is impossible to forecast accurately demand that far into the future. Some cities and regions will grow faster than others. People and firms are likely to respond to the challenge of global climate change by changing travel patterns and ways of working. The pace of technological change is unpredictable. Forecasts have been wrong before, and any strategy that tried to build a rigid investment program based on fixed long-term forecasts would inevitably be wrong again.

So in addition to long term planning the absolute requirement of profitability must be addressed. Railroads account for more than 41 percent of freight ton-miles, more than any other mode of transportation on earth. The rail ton-mile share has been trending upward over the past 15 years, after remaining flat or falling for decades. In part due to their superior cost effectiveness, railroads generate less than 10 percent of intercity freight revenues. Railroads revenue share has been falling for decades, a reflection of the intensity of the competition they face and of the large rate reductions railroads have passed through to their customers over the years.

Conversely, in 2006, America's railroads moved more freight than ever before. Although rail traffic was down slightly in 2007 (due to problems in the housing and auto sectors), but the long-term trend is clearly upward. The U.S. Department of Transportation recently forecasted that freight railroad demand would increase to 88 percent by 2035 from 2002 levels. Other forecasters predict substantial rail traffic growth as well; this information points to an urgent need for adequate rail capacity in the years ahead in order to meet that growth.

Long term, collaborative, and profit generating geared planning is essential to rails success. This growing ideal can only be achieved through sustainability of growth in the railway market. Perhaps the first step in identifying what will make rail sustainable is to look at the management and the value they provide. The following article outlines this need for management assessment in relation to profitability for long term success:

> There are many privately-owned railways around the world, ranging from the huge Class I freight operators in North America to dedicated heavy-haul mining railways. The majority of them are freight operators, although the three biggest JR companies run profitable passenger businesses
>
> We have commented before that one of the sticking points seems to be a reluctance amongst politicians to accept commercial reality — that a private-sector railway needs to earn profits to fund reinvestment and generate shareholder value, or it risks going out of business. A key factor behind the renationalization in New Zealand is the perception that the private owners failed to invest in renewal of infrastructure or rolling stock, running down the value of the assets.
>
> The importance of shareholder value is also highlighted by the ongoing dispute at CSX. The best way to make money is to identify market opportunities and exploit them — which may lie behind recent calls for reregulation from shippers in the USA reluctant to face the prospect of rising tariffs. But profitability is essential if a railway operator is to ensure access to capital for investment, and freight rates should be naturally constrained by competition if the market is working properly.
>
> Last year's study by the Association of American Railroads into future growth trends suggested that $135bn would have to be invested in capacity expansion on the US trunk network over the next 30 years. AAR estimates that the private railroads can raise $70bn of this through revenue growth and find another $26bn from productivity savings. But that still leaves a shortfall of $39bn to be addressed, and in this bastion of free market policy there is growing talk of seeking public money to reflect rail's wider societal advantages.
>
> To some extent, this change of attitude may reflect the growing awareness of environmental sustainability, with the perceived benefits of a modal shift from road to rail further complicating the balance between public and private control. Such societal benefits need to be properly valued, in order to avoid the risk referred to by CER Chairman Aad Veenman that mobility is seen as a 'public good' and under-valued. In a market economy, everything has a price. And if the public and politicians want their railways to provide services which are not commercially justified, they must be willing to meet the costs — whether the operator is publicly or privately owned.

There is without a doubt a place for both public and private operators, and neither should be seen as intrinsically better than the other. But it is vital to recognize that no railway, whatever its ownership, can deliver unless the underlying political and commercial framework within which it must operate is right for its market. Getting this right will be the biggest challenge for the railway industry in the years ahead.

Rail has always been a public-private undertaking, from the time the federal government awarded land to build the nation's first passenger train lines more than a century ago to the formation of Amtrak in 1970. With the government deeply subsidizing other forms of transportation, it would be difficult for rail to compete without such an assist. Highways are subsidized by the collection of gas taxes at the pumps. Airports are built and expanded with taxpayer dollars. That rail could go it alone seems doubtful.

Robert Puentes, a senior fellow at the Brookings Institution's Metropolitan Policy Program in Washington, said the nation's financial crisis has upturned traditional ways of doing business, creating an opportunity for creative financial

endeavors, such as leveraging private money to support innovation. DesertXpress initially prized its status as the nation's only privately-proposed passenger rail line. "We think that's unique feature," president Tom Stone said recently.

But the company has also increasingly suggested it would be interested in low-cost government loans available for rail development, given the stingy credit market. An existing government loan program offers 100 percent financing for up to 35 years to develop rail lines. Winston has seen this private-public financing model before, and his analysis is not kind. "These private concerns have an interest in these projects. Then they get into it and they say they need funding from the government. Then the whole thing falls apart."

So with an understanding that neither public nor private ownership is flawless, it is also understood that their contributions are both necessary. Competitiveness, innovation, and marketing are aspects that both styles of ownership must consider in regards to sustainability. Priorities required for sustainable, profitable, and cooperative rail are compounding now; it is the specifics that will determine overall success. Reporter Chris Jackson explains some of these specifics to help clarify the elements needed to steer the future of rail in a lucrative direction:

Three priorities on the path to a sustainable railway

Environmental considerations are assuming an increasing importance in shaping global transport policies. Such is the potential impact that delegates to the UIC Highspeed 2008 congress in Amsterdam agreed by a substantial margin that environmental concerns and global warming were the biggest single issue to emerge in the rail sector over the past three years.

There are many unanswered questions about the science of climate change, but there is a growing concern about the use of fossil fuels, which account for 80% of global energy production, and pressure to develop alternative sources of renewable energy. Figures suggest that the transport sector now accounts for 30% of total energy use.

Earlier this year the European Environment Agency published *Climate for a Transport Change*, looking at the impact of transport across 32 countries. The report warns that 'greenhouse gas emissions in the transport sector continue to increase steadily', with rising demand for freight and passenger movement outweighing any gains from improved energy efficiency and the introduction of non-fossil fuels.

EEA believes that measures to reduce the environmental impact of transport 'must go beyond the sector itself' to address wider economic issues, although 'the transport sector must raise its game'. Rail is seen as more sustainable than other modes, but whilst both freight and passenger traffic are rising in absolute terms, the report finds that rail's market share is continuing to fall. And UIC's Senior Adviser, Environment & Energy, Raimondo Orsini warned in Amsterdam that 'in some areas public perception is very different from the real data'.

I believe that there are three main ways in which the rail industry needs to address environmental issues – competitiveness, innovation and campaigning.

There is certainly much that can be done right now to encourage greater use of rail. As we have remarked before, if high speed trains are to compete effectively against air there is an urgent need to improve the customer interfaces, particularly in terms of information and ticketing. To compete with the flexibility of the private car, rail operators must offer fast, reliable and cost-effective transport, plus better integration with other modes to provide convenient door-to-door service. Freight shippers also demand reliability, quality of service and competitive rates, although recent surveys suggest that when it comes to modal choice environmental

issues are still some way down their list of priorities.

As Eurostar CEO Richard Brown told us earlier this year, the operator's *Tread Lightly* campaign not only includes a pledge of carbon-neutral operation, but addresses other aspects such greater use of recyclable materials, rainwater harvesting, and cutting paper consumption by 25%. Barely six months after the campaign was launched, a survey found Eurostar was perceived as one of the top 20 environmentally-aware companies in the world.

Research is needed into emissions, energy and noise, as well as operational innovations such as freight telematics. Prof Roger Kemp addressed the energy questions in the January issue of Railway Gazette International, and recent concerns over rising prices and food shortages seem to confirm his warning that biofuel production may not be as 'green' as its proponents believe.

Noting that some governments are imposing environmental obligations or increased taxes on the rail sector, but perversely not on its less-sustainable competitors, UNIFE Chairman André Navarri pointed out in Amsterdam that 'the EU needs a legal framework where rail is not penalised in taxes and aviation gets away scot-free'.

The European rail industry continues to campaign for a level playing field, driven in part by a remit for the European Commission to bring forward proposals by June for revisions to the Eurovignette Directive on road tolls for heavy lorries. Suggesting that the EU needed a policy that would 'achieve emissions reduction without damaging the economy', which implied 'a modal shift to rail', UNIFE Director General Michael Clausecker insists that 'as an industry we do not believe in dirigiste measures'. Nevertheless, he is concerned that the proposals envisage a marginal rather than full-cost approach to meeting the external costs that road users impose on society.

With the external costs of European transport as a whole put at around 7% of GDP, it is clearly important to address policy imbalances and campaign for fairer treatment. However, there is inevitably a risk that the rail sector will be seen as lobbying for its own interests, unless it is seen to be making efforts to put its own house in order.

There is still much to do, but if the industry can get it right, as Navarri told congress delegates in Amsterdam, 'we are only at the beginning of a railway renaissance throughout the world.'

The worsening congestion on our roads in tandem with the positive cost benefits that rail brings, are currently, not enough. The environmental factors that all forms of transportation must adhere to are only becoming more stringent and rail has the most environmentally sound infrastructure of all modes of goods transport. The consequences of relentlessly increasing road and air traffic have adverse effects on human health and both the local and global environment. Although railways still have environmental impacts they are considerably less than both road and air travel. A substantial shift of passengers and freight from road and air to rail would benefit everyone through reduced congestion and less damage to the environment.

Steep fuel costs and stringent emissions regulations are pushing the railroad industry to build cleaner and more-efficient locomotives. Just like automobile companies, train manufacturers are integrating microprocessor and auxiliary battery technologies into powerful engines. The technological innovations are adding to the railroad's heritage as one of the most energy-efficient transportation modes, industry officials contend. While the United States has not ratified Kyoto, the nation's seven major freight railroads — which carry 90 percent of domestic rail freight — have agreed to curb their greenhouse gas emissions through a U.S. Environmental Protection Agency partnership. Through the non-binding agreement, the railroads aim to collectively cut up to 66 metric tons of carbon dioxide and 200,000 tons of nitrogen oxides emissions per year by 2012.

The environmental impacts of freight shipping modes extend far beyond the typical “ecosystem damaging effects” that dominates common thought. Instead the global environmental stage now must consider safety, health, energy, and even space impacts from huge cities to protected forests. Although the major focus in this document has pertained to rail freight transport, for the advantages of rail to be fully utilized passenger travel benefits must also be included (especially when environmental benefits are involved).The Friends of the Earth Foundation in the UK has studied and produced an analysis of the environmentally benefits of rail; this brief analysis provides a substantial boost to rails position as the most viable option for environmentally friendly rail transport and makes its position in intermodal transport that much more essential:

Climate change - Personal Travel
All motorized transport produces Carbon Dioxide (CO2) one of the so called “greenhouse gases” that contribute to climate change. Trains are an energy-efficient carrier of people and goods and hence produce relatively less CO2 emissions per passenger than other modes. Travelling by rail reduces your contribution to climate change. Emissions of CO2 per passenger/Km are, on average, approximately half that of travel by car.

Climate change - Freight Transport
The majority of our freight in the UK travels by road. Switching some of this to rail would result in a dramatic reduction in CO2 emissions. Carrying freight by rail results in an 80% cut in CO2 emissions per Kilogram carried compared to road haulage.

Public Health
Up to 24,000 vulnerable people are estimated to die prematurely each year because of poor air-quality and transport is a major contributor to this problem through engine exhaust emissions. Although rail carries 7% of U.K traffic it emits only 0.2% of Carbon Monoxide, 2% of Nitrous Oxide, 1% of Volatile Organic Compounds and 2.5% of Sulphur Dioxide emissions. Electric trains are also pollution free at point of use, and do not contribute to localized air quality problems in urban centers. Electricity can also be generated by emission free renewable energy sources such as wind and solar.

Saving Energy
Rail is a relatively energy efficient transport mode. Rail transport uses far less energy per passenger kilometer than road. A rail passenger travelling by high speed train, even at 200Km/hr, typically uses only 0.8 - 1.0 MJ of energy compared to 1.4 - 2.8MJ for a car driver/passenger. In 1999 UK road transport consumed 80 times as much energy as rail, while the distance travelled by road passengers and freight was only 15 times as much.

Noise
Road noise effects the quality of life of many people in the UK, as a result, 32 million residents are exposed to greater than 55dB, the comparative figure for rail being only 1 million. In its 1980 recommendations The World Health Organization stated, “a level of less than 35dB is recommended to preserve the restorative process of sleep”. The cost of noise damage from road traffic in the UK is 25 times that of rail.

Safety
Despite recent accidents rail is still a far safer mode of transport than road: you are 9 times more likely to be killed travelling by private car and 2.5 times more likely by air.

Less Lorries
Lorries are a major source of noise, vibration and harmful particulates in the form of black smoke emissions, one freight train can carry 1000 tons of freight replacing 50 lorry movements.

Environmental Cost
It has long been recognized that road users do not pay the true financial cost of the environmental damage that they cause. A recent consultants report calculated that the costs of environmental damage, accidents and congestion per passenger kilometer travelled are 3-10 times higher for road than for rail.

Space Saving
Britain is a crowded island with the 3rd highest population density in the EU14. Rail makes more efficient use of space: a double track railway can carry up to 10 times the number of people per hour than a 2-lane road.

Visual Intrusion
Despite recent improvements in the landscaping of new roads, railways are far less visually intrusive. Much of the rail network, constructed in the 19th century has had time to blend in to the landscape and in many cases arguably, actually enhances it.

The future of rail is now at a turning point where we must look 30 years ahead and make decisions soon to enhance the global goods transportation infrastructure. Maintaining that advantage in the face of an expected doubling in demand for freight transportation in the year 2020 will require significant investment in transportation capacity. We must determine which future transportation infrastructure investments will generate the greatest economic and public benefits, and then make those investments. The alternative is declining economic productivity and a cap on growth of our economy.

This paper has covered many essential elements for rail to succeed, and we know that a productively growing economy requires an efficient logistics system based on sufficient transportation infrastructure to meet growing demand. However, our nation's privately owned and financed freight railroads cannot generate on their own all capital required to take full advantage of intermodal's potential; nor should they be expected to, given that so many of the benefits of expanded intermodal use would flow to the general public rather than directly to the railroads themselves. Therefore, a dramatic expansion of rail intermodal, and the enormous public benefits it would provide, can occur only through the use of innovative public/private partnerships that should become as integral part of national transport policy. If we fail to make this choice, we will face a crisis of mobility and reduced economic growth in the years to come. Emily T. Simon reports some of the continued specific benefits of rail transport that make it such an attractive investment opportunity in the nation:

> The golden age of the railroad ended in the mid-20th century, when Americans switched from Pullman cars to Chevys and eventually 747 jetliners. Yet, to John R. Stilgoe, Robert and Lois Orchard Professor in the Faculty of Arts and Sciences and Harvard Graduate School of Design, trains are anything but passé. Based on analyses of real estate investment patterns along railroad corridors, Stilgoe predicts that trains will once again play a key role in shaping American life.
>
> "Train travel will supplant highway and air travel in the next few decades," Stilgoe says. "Furthermore, electric railroads will increasingly be used to distribute freight items — such as coal and grain — as well as mail and express packages." He explores this scenario in a recently published book, "Train Time: Railroads and the Imminent Reshaping of the United States Landscape" (University of Virginia Press, 2007).
>
> Stilgoe cites investment and real estate activity as the best indicators of the impending railroad renaissance. He notes that in April 2007, for example, investor Warren Buffett purchased 39 million shares of Burlington Northern Santa Fe, which operates railroad services in the Midwestern and western United States.

“It’s very clear what is happening,” Stilgoe says. “The share price of railroad stocks is going up and up. One would never imagine that railroads could be good investment … but then why is Warren Buffett so interested?”

Stilgoe also says that real estate transfers in Midwestern towns that lie along old rail routes have been more frequent, with most properties significantly increasing in value.

“There is a lot of money moving this way,” he says, “because these satellite towns will be worth a great deal when the trains come back. Investors are purchasing everything from derelict buildings to gravel plots, which can be easily transformed into parking lots when the time is right.”

Stilgoe adds that politicians are increasingly interested in exploring railroad development. In “auto-centric” cities like St. Louis and Atlanta, he says, politicians are initiating feasibility studies to determine how an increased railroad presence would enhance commercial activity.

“Rail-equipment manufacturers are already soliciting orders,” says Stilgoe. “This is well under way.”

According to Stilgoe, the three prime factors driving railroad development are population growth, rising gas prices, and advanced technology.

“Experts anticipate that there will be 150 million more Americans by 2050,” says Stilgoe. “Anyone who drives knows that the highways are already jammed and can hardly accommodate additional traffic.” Stilgoe argues that extension of high-speed rail service would alleviate crowded urban highways by enabling commuters to live farther from the city center.

“If more passenger trains were permitted to go 90 miles per hour — which they are capable of doing — that would dramatically impact the shape of urban and exurban settlement,” he says.

Development in Albuquerque, N.M., provides a compelling example of Stilgoe’s theory. In 2004, city officials ordered 10 new bi-level commuter railroad cars, at a price of $2.2 million each. The cars serve a newly expanded network that connects small communities throughout greater Albuquerque.

“Wealthy people can live north or south of the city, come in to do their work, and leave again,” says Stilgoe.

In addition to population growth, Stilgoe argues that increasing gas prices will lead more passengers to the railroad.

“As gasoline rises it becomes cheaper to travel by train,” Stilgoe says. “Railroads are part of a sustainable future.”

Fuel efficiency will not only alter passenger travel, says Stilgoe, it will also impact the distribution of freight. Electrified railways will provide a convenient and low-cost method of delivering goods and packages throughout the country.

“In the 1930s it was possible to order a fridge in the morning and have it delivered by train later the same day,” says Stilgoe. “Americans forgot about this, but we’re starting to put it back together.”

Finally, Stilgoe suggests that advanced technology will play a key role in encouraging railroad development.

"This is a high-tech industry," he says. "We have the technology to revitalize outdated tracks, to turn them into electrified rails that can support high-speed, on-time trains." Eco-friendly locomotives have already been developed, as well as onboard computer systems designed to calculate the most fuel-efficient speeds.

"Few people have taken notice of the developments in the railroad industry," Stilgoe says. "But they should — because it is going to have an undeniable impact on the future of our nation."

Breadth Conclusion:

The problems that our economy will face in the future, absent accelerated development of the rail intermodal alternative, are substantial and will increase dramatically if we do not define a new public policy to encourage increased reliance on rail intermodal infrastructures. Intermodal can, and should, grow much more rapidly. We simply cannot build enough additional highway capacity to accommodate the forecasted growth in freight demand; nor should we want to, given that augmenting railroad intermodal capacity and capabilities is a more efficient and effective alternative.

Nor can we afford to do nothing and continue, by default, along our current path. Our economy relies on productivity increases to grow. Productivity gains will become much more difficult to achieve if transportation and logistics costs escalate rather than continue to decline. The inefficiency tax on our economy of a deteriorating transportation network will be enormous.

Unfortunately, the privately owned railroads cannot solve this problem alone. The reality is that government has played, and will continue to play, a decisive role in shaping the nature and use of investment in transportation infrastructure. The private capital to invest at the levels required to drive dramatic intermodal growth and to relieve our dependence on tucks and highways cannot be generated by the freight railroads because of the numerous structural and regulatory issues that benefit tucks over intermodal and limit railroads' ability to invest enough to fully reap the huge public benefits of rail intermodal structure to our nation.

Today, we have the most efficient logistics system in the world. Logistics costs are highly sensitive to transportation costs; consider the impact on our economy — and on the ability to compete in a global marketplace — if our logistics costs, driven by steadily rising transportation costs in the future, became higher than those of the developed nations with which we compete.

The question of whether or not rail will again be a lucrative, efficient and preferred mode for the transport of goods is an international question, not just a question for America. International trade is the most powerful economic force on the planet and the trade between Asia and America is the center of it all. Expedient shipping of goods from Asia to America and vise versa is increasingly becoming more congested at containership ports and air transport of goods is incredibly expensive and limited in capacity. Efforts have been made to construct new ports closer to Asian markets in North America and ports as far north as Prince Rupert in Canada have been very successful, but very small. Congestion in California's ports leaves shipping containers waiting in line for many days at a time after an already lengthy, and expensive, journey. The smaller ports are generally unable to facilitate larger ships and they would be unable to manage increased containership traffic.

These ports create jobs, bolster economies, and raise overall standards of living in surrounding communities. They are however, running out of space with no ability to expand in nearly all cases. There are basically 3 tracks of rail that connect the west coast of North America to the east coast; one in Canada and two in California. Building ports outside of these areas means no connection to rail, which means no connection to America's marketplaces, which means no new ports are feasible to be created outside of these three places.

International trade must find a new champion, one which can take advantage of untapped resources without inciting incredible costs. North America must look at its current railways and ports to better utilize current rail/port infrastructure and improve upon what makes financial sense.

We are at a critical moment in the development of North America's freight transportation infrastructure and in the formulation of public policy. The combination of long term planning, both public and private investments, environmentally consciousness policies and practices, strategic intermodal positioning, and a sustainable methodologies will give rail and, in turn, our national economy, its best possible position in the global market. We must realize that the past is a poor author to the future and that the price of choosing not to facilitate and invest in a rail intermodal alternative will be an enormous tax on the economy and a potential cap on GDP growth. Alternatively, a national transport infrastructure reformulated to stimulate investment in the most efficient and appropriate use of each mode would have significant economic, social, and environmental benefits.

Depth

International trade between Asia and North America's west coast ports, takes place predominately through the ports of Los Angeles, San Diego California, Ensenada Mexico, the San Pedro Bay ports in Southern California and the ports in Vancouver Canada (such as the Port of Prince Rupert). All of these ports forecast to more than double their containership traffic volume in the next fifteen years. These greater volumes of commercial traffic are adding to congestion and environmental pressures on landside transportation systems, particularly those associated with the major urban cluster regions on the west coast; the incredibly overwhelmed containership ports in the greater Los Angeles metropolitan area serving as a case in point.

As our world shifts into a greener and more economically efficient marketplace existing business infrastructures must be modified if not replaced entirely. In the case of goods distribution specifically, there are 4 main issues to tackle;

- The Issue of Efficiency
- The Issue of Cost
- The Issue of Local/International Economic Impacts
- The Issue of Environmental Impacts

These key points have been discussed by many entities with many different conclusions but each entity shares similar needs that this section of the paper will elaborate upon.

For the United States, the choice for the nation's freight-rail system is between "market-driven evolution" of the freight-rail system and "public-policy-driven expansion" of the system. Market driven evolution will accommodate some of the forecasted freight growth, but it will relieve little of the forecasted congestion on the nations highway system. A public-policy-driven expansion could produce a rail industry that provides the cost-effective transport needed to serve national and global markets, relieve pressure on overburdened highways, and support local social, economic, and environmental goals. As rail is almost completely owned and operated by private entities in the U.S. it is clear by rails current slow growth that a combination of public and private is needed.

Many states have already taken steps consistent with a public policy-driven approach, by investing directly in their rail systems, and by forming public–private partnerships to implement specific projects. But making increased levels of investment and realizing the public benefits of a strong freight-rail system at a national level will require new partnerships among the railroads, the states, and the federal government.

These partnerships must enunciate a clear national policy for improving freight system productivity; expanding state eligibility and flexibility to invest where freight-rail improvements have significant highway and public benefits; increasing loan and credit enhancement programs; and initiating innovative tax-expenditure financing programs, including accelerated depreciation, tax-exempt bond financing, and tax-credit bond financing. The partnerships must extend beyond state boundaries to match the scale of the policy and investment decisions to the scale of today's freight-rail system.

Strategic rail expansion in combination with shorter sea shipping is being considered as a possible solution for alleviating landside congestion stemming from commercial traffic in urban corridors, and this section of AMEP's study evaluates the potential of leveraging short sea shipping routes in the context of North America's west coast. Focusing on specific commodity and market segments, a number of shipments could be shifted to short sea shipping movements.

Consideration was given to which type of maritime and port operation might be best suited for international and local market segments.

Efficiency

When efficiency of rail freight is considered there are two main considerations, one is to consider how easily freight trains gain access to goods and the second is how quickly they can ship these goods.

Access to Goods

Freight trains move 40% of all goods in America and most all of these goods are brought here by containerships from Asia. Although port traffic has been increasing over the last 20 years, where the traffic is being spread has changed only recently. The entire west coast has recently been experiencing a downturn in port traffic as a result of the poor economy, and although ports are still overwhelmed, only North America's northern most port has managed to see any growth over this last year. It is easily predictable that containership traffic in North America's ports will recover over the coming years, but this temporary downturn presents a window of opportunity to reflect on the past and make changes for the future.

Because there are only 3 major veins of rail that connect the west coast to the rest of North America's markets, ports will only become more trafficked even though they are currently at or over capacity. There is no more room for growth in California's major port areas because there are no more rail connections outside of the existing 2 port areas. This leaves North America with increasingly overburdened, slow, and costly ports as the only means to handle increasing containership traffic; this is not only inefficient for all the parties involved, but it is also a huge expense that shippers and buyers alike will not be able to bear for much longer.

Shorter sea shipping ideals point towards moving ports to locations closer to Asia's markets and ensuring that they can grow and handle future containership traffic to become an advantageous shipping location, as well as reduce traffic in traditional port locations. The only question with this is, where do you put a new shipping location if there is no rail connections further north than Prince Rupert? Before that answer can be ascertained we must observe the current trends in the containership traffic market on the west coast.

This is the data in regards to the west coast and charts over 99% of total U.S. and Canada West Coast container port traffic as sited by Seaports Consultants Canada Inc., measurements are based on TEU's (Twenty-foot Equivalent Unit - a measurement of cargo based on a standard ocean shipment container, which is 20 feet in length.):

Overall West Coast trends:

- Cumulative third quarter 2009 traffic is off from about 17 million TEU in 2008 to about 14 million TEU
- The overall traffic decline was about 17.5%
- port traffic fell by about 11%

Of the U.S. ports:

- Cumulative third quarter 2009 traffic is off from about 15 million TEU in 2008 to about 13 million TEU
- The overall traffic decline was about 18.3%
- Declines by port range between 12% and 30%

Again, only the Port of Prince Rupert experienced growth:

- Its cumulative third quarter 2009 traffic is up significantly over the same period of 2008 because of the addition of a second shipping service in mid 2008; 181,000 TEU in 2009 from 100,000 TEU in 2008
- Volumes in the third quarter of 2009 are above those of the first and second quarters of 2009 and the fourth quarter of 2008
- It still handles about 1% of the total West Coast volume

1% may seem like a very small portion of the containership traffic that the west coast handles, but its growth even during hard economic times is a testament to the benefits of its strategic location. Unlike other ports the Port of Prince Rupert handles almost exclusively international goods, this is no accident. In Canada, the Port of Prince Rupert offers a geographic location that reduces sailing time from Asia, plus high productivity and no U.S. Harbor Maintenance Tax. However, the port also faces the disadvantages of having a lower frequency of service and the potential for double inspection of U.S. bound cargo (by Canadian Customs at the port, and then by U.S. customs when it crosses the border).

Even with the problems that the port experiences there is still no stopping its growth and prominence in west coast shipping environment. Prince Rupert is strategically located but its small size prohibits it from truly alleviating the stress on southern ports. It is clear that for any port to be efficient they need to not only be strategically located but they must also have the capacity to handle large numbers of container ships.

The U.S. having major ports that cannot be utilized at maximum efficiency because of congestion means that Asian shippers are starting to look else ware as pointed out by Amy Hsuan of The Oregonian in Nov. 2009:

> And while the recession has equally hurt eastern ports, the improvements have meant that shippers no longer rely solely on the West Coast to get their goods inland. In addition, congestion over the years at the Los Angeles and Long Beach ports has meant that shippers were already looking for alternative routes.
>
> Over the past decade, West Coast ports have lost about 1 percent of traffic each year to ports elsewhere, including in Canada and Mexico.
>
> "Over the last couple of years, you already saw a lot of shift of volume because of the compelling economics," Kemmsies said. "As the infrastructure in the country improves, you have to expect the routes to change a bit."
>
> But the global recession has only elevated the anxiety of West Coast ports over the loss of business. Some industry insiders say the economic lull will stretch on for years, which means competition among ports will remain cut-throat.
>
> "There won't be an uptick until 2011," said Barry Horowitz, a consultant for the Port of Portland. "It's painful, but 2010 will not be a hugely busy year for the shipping and port business."
>
> In recent months, the six major West Coast ports and two railroads have met twice to find a way to work together.

It is clear that change is not only needed for rails continued improvement, but change must be taken in order for rail to even exist. Overburdened ports have dissuaded shippers and forced them to pursue other ports, this has also severely damaged local economies relying on port traffic as a way of life. “The past is a poor author of the future,” and we must change how rail and ports can work together to be more efficient, providing the lowest possible costs with the highest possible benefits.

Efficiency is paramount and international trade utilizing ports and rail systems is essential for global economic progression, yet with high levels of congestion and shippers backing out of North America's southern west coast ports, how does North America better facilitate trade? On top of already visible declining port efficiency, there stands the problem that there is only limited comprehensive information available on the efficiency of ports, and much less evidence of the effect of port efficiency on trade. This is why a model must be created to paint a better picture of the issue, and to do so information from the past must be compiled in the most logical fashion possible.

Logic points to three major considerations when it comes to freight rails access to goods at North America's ports. The first being what kind of costs and methodologies are involved with Asian shippers at their ports before any goods are shipped to North America. The Second involves the actual cost and time of moving these goods to their port destination, as we have begun to discuss. Finally the costs, methodologies and time associated with unloading goods at North American ports must be accessed. These elements, although very simplistic, are without a doubt the best possible way to determine how to alleviate North America's problem with ports, and vicariously, the problems with North America's freight rail system.

The U.S. Army Corps of Engineers released a document in 2006 that detailed the necessity for understanding these different elements for the first time. The report, "Port Efficiency and Trade Flows," amasses pre existing knowledge on port efficiency, which was few and far between, but has been, to date, the most comprehensive document on this subject. One of the major focuses of the document was to clearly explain why the three previously mentioned elements of efficiency are so important, as can be seen below.

> Our conceptual starting point for estimating port efficiencies is the information contained in the measure of "import charges" incurred by the goods in transit, as reported in the U.S. Census data. More specifically, the U.S. Census defines import charges as:
>
> > "…the aggregate cost of all freight, insurance, and other charges (excluding U.S. import duties) incurred in bringing the merchandise from alongside the carrier at the port of exportation – in the country of exportation – and placing it alongside the carrier at the first port of entry in the United States."
>
> These import charges consist of three primary components: 1) costs associated with loading the freight and disembarking from the foreign port, 2) costs connected with transportation between ports, and 3) costs associated with U.S. port arrival and unloading of the freight. Component 1 is directly related to the foreign port's efficiency, at least for the portion of the port services connected with loading freight and efficient disembarking of ships. There are undoubtedly other foreign port services and attributes that are not included in this import charges measure.
>
> However, to the extent that the efficiency of these non-included services is strongly correlated with the efficiency of the included services, component 1 of import charges should be a good measure of overall foreign port efficiency. In analogous fashion, U.S. port efficiencies are directly connected to component 3 of import charges. Component 2 costs, connected with transportation between ports, are identified with a few observable factors. Namely, ocean freight costs have been found to be highly correlated with distance, while insurance costs correlate with value per weight of the product (e.g., see Clark et al. (2004), pp. 8-9). Given this breakdown of components comprising import charges, a regression of import charges on distance measures, weight and value of the product, and other observables described in the next section, remove component 2 effects. This leaves components 1 and 3 in the error term along with assumed random white noise.
>
> Identifying components 1 and 3 can be accomplished through the introduction of "fixed effects" for the U.S. and foreign ports. In particular, there are repeated shipments to many U.S. ports in a given year for a given product

originating from the same foreign port, we can include a dummy variable (fixed effect) for each foreign port and uncover its underlying contribution to import charges. Likewise, with multiple observations for each U.S. port for a given year and a given product, a dummy variable (fixed effect) uncovers each U.S. port's underlying contribution to import charges. These port fixed effects provide measures of port efficiencies. That is, as a port's contribution to import charges (i.e., the costs of getting the products to the docks and unloaded) increases, costs increase, and, thus, will be inversely related to the port's efficiency.

Now, with a better established background for what effects port efficiency, a "best possible" scenario begins to unfold. It is understood that a North American port will most likely be more successful, efficient, and improve over access to goods if it:

- Is located geographically closer to the shipper's ports, reducing the overall expenses involved with the transport of goods.
- Can handle both large and small containerships.
- Can handle large numbers of containerships without having port congestion leading to long waiting periods to offload goods.
- Is connected to a major rail corridor that is capable of delivering goods from North America's west coast to its east coast and as many places in-between.

Speed of Shipping

The speed of rail, truck, containership, and airplane transport of goods is essential to bolster the understanding of intermodal transportation and which modes of transportation are best suited for different situations in North America. Each freight mode offers certain advantages and disadvantages in terms of cost, speed, reliability, visibility, and security, with shippers buying freight services that best fit their specific shipping needs.

The speed of shipping is an issue with many complex facets, however, in the past data tended to boil down all issues into 4 basic categories; the first was concerning a shippers need to conduct very fast shipping, which was vastly more expensive than other forms of shipping but was generally more reliable as it was transported by airplane and truck; the second concerned a shippers need to ship quickly and disperse goods over a small area, again this was usually accomplished by utilizing trucks, however, these trucks tended to acquire their goods directly from ports as apposed to acquiring goods from planes; the third concerned a shippers need to ship goods quickly over a very wide area, this required both truck and rail to transport goods acquired from ports; and the forth concerned a shippers need to ship goods constantly but with a non-specific time frame, this was generally accomplished by rail alone because the cost per ton unit was significantly less that any other form of transport.

For example, package and express shippers favored air and truck because these modes offer the fastest and most reliable door-to-door service for lightweight shipments. The cost is high, but customers were willing to pay for the high quality of service. In contrast, shippers of bulk commodities like coal, grain, and petroleum prefered to use water and rail. These modes offered less speed and reliability than air, but provided transportation at a far lower unit cost, which made these commodities affordable across the nation.

In the intermodal network rail occupied a place between and overlapping water transport and trucking. It competed with water transport for heavier, lower-value, less time-sensitive commodities. It also competed with trucking for higher-value, often containerized, shipments moving over longer distances; and it was the preferred mode for a number of economically important, but heavy and bulky commodity groups, such as coal, farm products, and minerals.

10 years ago statistical information was compiled to better show how different modes of transportation moved goods across the United States. The data established that:

> There are several sources and types of freight data available to assess the performance of the goods movement system and its component modes. In this report, we have relied on the TRANSEARCH year 2000 database. The TRANSEARCH database includes all domestic moves by truck, air, rail, and water, and is linked to a set of commodity-specific future forecasts. According to
>
> TRANSEARCH:
>
> > The nation's freight system moved 14 billion tons of domestic freight valued at $11 trillion over 4.5 trillion ton-miles in 2000. Figure 5 shows the share of tons, ton-miles, and revenue dollars for each mode.
> >
> > - Trucks moved 78 percent of the nation's domestic freight tonnage, generated 60 percent of its ton-mileage, and accounted for 88 percent of its dollar value, the highest percentage in each category. Trucks moved 11 billion tons valued at $9.5 trillion over 2.6 trillion ton miles in 2000.
> >
> > - Rail moved 16 percent of total domestic freight tonnage, second to truck. Rail moves tended to be longer in distance than truck moves and therefore accounted for a proportionately higher share (28 percent) of ton-miles. Rail moves also tended to involve lower-value commodities than truck, so rail represented a proportionately lower share (6 percent) of total domestic freight value. Rail moved two billion tons valued at $600 billion over 1.2 trillion ton-miles in 2000.
> >
> > - Water (e.g., river barges, and coastal and lake steamers) moved six percent of tonnage, 15 percent of ton-miles, and one percent of value. These figures cover only domestic waterborne tonnage. Like rail, water moves tended to be longer in distance and lower in value than truck moves. Domestic shipping moved one billion tons valued at $138 billion over 540 billion ton-miles in 1998. Figure 8 shows the density (in tons) of inland and coastal water freight on the major water routes.
> >
> > - Air represented a negligible share of tonnage and ton-miles, but a disproportionately high share of value, 5 percent. Air freight tends to be very light and valuable.
>
> Another widely used set of freight statistics is published annually by the Eno Foundation in its "Transportation in America" series. The Eno data includes more modes — it covers pipelines, in addition to air, rail, water, and truck — but it reports only "intercity" tonnage (tonnage moving from one local area or commercial zone to another). By excluding tonnage that is not intercity in nature — which is predominantly handled by truck — the Eno data reports a lower share of tonnage, ton-mileage and value for trucking than the TRANSEARCH data. The Eno data is useful in comparing the performance of freight modes in terms of longer-distance services. Eno data suggests that, for intercity freight in the year 2000, rail was responsible for 41 percent of intercity ton-mileage, compared to 29 percent for trucks, 17 percent for pipelines, 13 percent for water, and less than one percent for air. This clearly highlights the critical role that rail plays in moving large quantities of freight over long distances.

The importance of rail and the speed in which goods are distributed has changed significantly since the year 2000, and so has the kinds of goods that rail ships. It is important to understand where rail has been, as was stated above, but rail has made many leaps and bounds to become a more prominent mode for the transport of goods. Intermodal rail traffic has skyrocketed, rising from 3 million trailers and containers in 1980 to more than 12 million in 2007. Rail now transports a huge variety of goods everything from greeting cards and clothing to furniture and computers, as apposed

to the predominantly low-value goods being shipped 10 years ago. Rail still continues to ship ever increasing amounts of industrial and agricultural products like grain but is now faster and more reliable than it has been in the recent past. Rail freight traffic is now involved in around 60 percent of all intermodal traffic exports and import activities in the United States alone.

Trucks are, and will continue to be, critical to freight transportation and to North America's economy. However, railroads are now more cost effective, more fuel efficient, and more environmentally desirable than an over-reliance on highways for freight transport. A single freight train can now do the work of 280 or more trucks, that's equivalent to making room on our highways for more than 1,100 cars. As congestion rises on our roadways, rail, on most all medium to long distribution routes, has actually become a much faster mode for the transportation of goods compared to trucks.

As rail freight travel continues to greatly reduce the number of cars on North America's highways, shippers will continue to find perhaps rails largest increasing benefit, less time for products to get to market. Even in the U.S. itself highway congestion costs $87 billion just in wasted travel time (4.2 billion hours, or nearly a full week for every traveler) and wasted fuel (2.8 billion gallons, or three weeks' worth of gas for every traveler) per year. Lost productivity, cargo delays, and other costs add tens of billions of dollars to this tab. Shifting freight from trucks to rail reduces the pressure to build costly new roads and helps cut the cost of maintaining the roads America already has.

Rail is now faster and more efficient than trucks, cheaper and more efficient than planes, and is increasingly able to handle the responsibilities of all modes of goods transportation. Improvements and efficiencies will continue to be applied to rail to create faster and more reliable transport, whilst truck traffic can only become more and more restrictive. Investing in North America's rail infrastructure is a modal shift that must take place in order to prepare for the future of goods transportation, there will only be more global trade in the years to come and rail is perhaps the only economically viable solution to manage this impending burden.

Cost

The Costs associated will freight rail include the installation/operating costs, costs to shippers to send goods and costs associated with the maintenance of rail.

Installation and Operating Costs

Roads that handle all car and truck traffic are incredibly expensive and time consuming to build. It can easily cost $15 million (and often much more) and well over a decade just to add a lane to a mile of highway; this compared to the $.7-$8 million and relatively little time for a typical mile of rail line to be laid. The costs of installing freight rail is quite inexpensive in comparison with the costs of building roads, and the maintenance of freight rail tracks is equally cost efficient.

In addition to the cost effective nature of rail installation, it is most often the case that rail is more expedient to lay and therefore more cost effective with time elements. Per mile costs for rail greatly vary depending on the terrain that track must be laid, for instance it can cost up to 400% more to lay track over river/mountainous areas versus flat grass lands. However, even when rail is installed in the most harsh of conditions it is still cheaper than installing roadways in any condition. The following table is a break down of the basic cost matrix (cost per-mile) used to determine rail installation costs created by Cambridge Systematics:

Table 7.2 Average Unit Costs

Construction Cost (per mile)

1 N/S-TWC 1 CTC-TCS $700,000
2 NS-TWC 2 CTC-TCS $700,000
1 ABS 1 CTC-TCS $500,000
2 ABS 2 CTC-TCS $600,000
1 CTC-TCS 2 CTC-TCS $3,800,000
2 CTC-TCS 3 CTC-TCS $4,400,000
3 CTC-TCS 4 CTC-TCS $4,400,000
4 CTC-TCS 5 CTC-TCS $4,400,000
5 CTC-TCS 6 CTC-TCS $4,400,000
Key: N/S-TWC – No Signal/Track Warrant Control.

ABS – Automatic Block Signaling.

CTC-TCS – Centralized Traffic Control/Traffic Control System.

Note: The table presents average costs for typical rail freight corridors. The actual costs of the corridors were estimated using railroad-specific capacity tables. Per mile construction costs for Eastern rail corridors were higher than the averages presented in the table because of the number of urbanized areas, hilly terrain, and numerous river crossings. Conversely, per mile construction costs for Western rail corridors in non-urban areas were lower than the averages presented in the table because of the prevalence of flatter, non-urbanized areas along some Western railroad primary corridors. At the request of the railroads, the railroad-specific cost tables were not included in this report to protect confidential railroad business information.

Source: Cambridge Systematics based on Association of American Railroads and Class I railroads' data.

Expansion costs for major bridges and tunnels were estimated separately for each facility based on the cost of recent and comparable projects. Expansion costs for facilities such as intermodal yards, carload terminals, fueling stations, and maintenance facilities were estimated using the anticipated number of intermodal units, cars, and trains operating in the corridor.

The estimates do not include all line expansion costs on short line and regional railroads, nor the cost of expanding tunnels, bridges, and service facilities on the short lines and regionals. Neither the Class I nor the short line and regional railroad estimates include the cost of additional real estate, the cost to maintain or replace existing rail lines and facilities, or the cost to acquire additional locomotives and railcars.

The recommended improvements and the cost estimates assume that the future demand for rail freight transportation will be met by using current technology and existing rail corridors. The analysis also assumes that there will be no shift in freight traffic among modes (i.e., rail, truck, water), and no significant changes in regulation or other factors that could change the demand for or supply of rail freight services.

Rail is relatively inexpensive, however, there are numerous alternative futures that the rail industry could take, and freight rail is already exercising its power to be more cost effective. Freight rail has begun to make significant technological changes by making major shifts in market/trade patterns and new innovations in freight rail operations. "Our country's recession didn't stop our investment in America or our rail system. We are five time more capital-intensive than other industries, and last year, we spent near-record levels to maintain and modernize the nation's

freight rail network. Since 1980, we have invested more than $460 billion in infrastructure improvements and maintenance—that's 40¢ out of every revenue dollar."

The U.S. Department of Transportation forecasts that freight railroad demand will rise 88% by 2035 from 2002 levels. Investing in freight rail keeps America moving forward. Based on U.S. Department of Commerce data, every dollar spent to expand our network – investing in tracks, equipment, locomotives and bridges – returns $3 for the American economy. That's a 200% return on investment. Making every dollar work harder is more important than ever and Investing in freight rail and its huge cost savings does just that.

Huge cost savings can be acquired by increasing the number of trains, hauling more cars per train, and loading railcars more efficiently to make better use of the 286,000-pound capacity of current freight cars. These improvements would allow the railroads to carry the same amount of rail freight in 2035, but carry it with fewer trains.

> "A 0.5 percent productivity improvement would reduce the number of trains to about 87 percent of the initial 2035 forecast number of trains."

Although innovation will alleviate the cost of rail implementation and operation it is important to understand that the average U.S. freight rail rates (based on revenue per ton-mile) have already fallen 49 percent from 1981 to 2008. Rail rates dropped across geographical regions and for almost every commodity. The extreme cost savings shippers' access through the low price (per-ton) of rail in combination with constant technological improvements is making freight rail return as an economic super tool capable of delivering goods with higher speed, lower cost and improved efficiency over other modes of transport.

One of the most important questions to consider when observing the operation of freight is,"what is the overall fuel consumption of freight trains?" this is important to consider because fuel is a constant cost and efficiency issue during freight rail operation. In regards to fuel efficiency there have been claims that rail cars have the ability to travel 436 miles to one gallon of diesel fuel. If this claim is true and the national average for diesel fuel is currently $3, then it could be said that shipping by rail costs about .0068 cents per mile, as apposed to truck, which at an average of 15mpg costs 5 dollars per mile; if it is true that rail can travel 436 miles to the gallon of diesel fuel then rail is effectively **735%** more cost efficient than transport by truck.

To discover whether or not this claim is true, especially for freight trains, the following research will look at where the numbers have come from, how they will change in the future, and how do trucks stand out from rail transport in the cost of shipping environment.

The first question is, where are the numbers generated to back up the claim of rails intensely superior gas mileage? The answer comes from the fact that each year railroads in the U.S. are required to submit reports to the federal Surface Transportation Board, the regulatory body that took over some of the functions of the old Interstate Commerce Commission. The annual reports compiled by each railroad are considered to be public information (available on the STB Web site). The STB also posts facts about the number of railroad ties replaced, cubic yards of ballast placed and the cost of new locomotives (which will be covered in the maintenance portion of this section), the railroads also report totals for the number of gallons of diesel fuel consumed and tons of freight moved. The government doesn't tally up those figures anymore, but fortunately, the Association of American Railroads does. When rail expert and analyst, Brooks Jackson, compiled data in regards to AAR's findings, the following information was revealed:

> According to our calculations, which match the AAR's tally exactly, the nation's seven major railroad companies reported the following for 2007:

- Moving 1,770,545,245,000 ton-miles of freight
- Consuming 4,062,025,082 gallons of diesel fuel (including freight trains and trains in switching yards, but excluding passenger trains)

The average works out to be 435.88 ton-miles per gallon of fuel.

Some rail lines do better. The Soo Line, which is the U.S. branch of the Canadian Pacific, operating in the upper Midwest, reported moving each ton of freight 517.8 miles per gallon of diesel fuel, on average. Lines operated by the Grand Trunk Corp. reported 510.5 ton-miles per gallon.

The national average figure of 436 miles is the highest on record, according to AAR, and a 3.1 percent increase from the 423-mile figure reached in 2006.

The rail industry says its fuel efficiency has increased by 85 percent since 1980. It attributes that to factors that include using new and more efficient locomotives, training engineers to conserve fuel, using computers to assemble trains more efficiently in the yard and to plan trips more efficiently to avoid congestion, and reducing the amount of time engines are idling.

This information from STB and AAR backs up the claim clearly and with very little room for interpretation, but what about trucks? It would be unfair to ignore the cost advantages of truck transport and its place in the world of shipping goods. For instance, trucks offer unparalleled flexibility and maneuverability in localized areas, so although rail may be more cost efficient, rail is incapable of physically traveling in-between all of the many different locations in localized markets. Trucks and rail both have important places in the international intermodal shipping arena, but when one mode attempts to fulfill the work of the other, it leads to unnecessary financial waste. Trucks are poor vessels for medium to long distance transport of goods, just as trains are poor vessels for short range multi-node distribution of goods. As far as cost is concerned, even with higher operating costs, trucks are a currently irreplaceable method for short range distribution of goods.

On addition to this, even as the 436 mile per gallon figure is accurate, its meaning is also open to interpretation, especially by the U.S. trucking industry. Although this is not yet the Environmental portion of this document it is important to consider what this amazing fuel cost efficiency means for North America as Brooks Jackson again points out:

We contacted Clayton W. Boyce, vice president of Public Affairs and Press Secretary of the American Trucking Association. "While railroads almost certainly have a fuel efficiency advantage over trucks, their claims that they are thus also more environmentally benign are suspect at best, as are statements that enough freight will shift from truck to rail to even make a difference," Boyce said.

For one thing, freight often has to travel farther by rail than it would by truck, because "railroads go to very few communities," Boyce said. He also notes that heavy-duty trucks have been required to burn ultra-low-sulphur diesel fuel (15 parts per million) since 2006 and says trains can legally continue burning higher-sulphur diesel (500 parts per million) for another four years.

Indeed, for all their fuel efficiency, locomotives are still a major source of pollution. The U.S. Environmental Protection Agency says:

EPA: Locomotive engines are significant contributors to air pollution in many of our nation's cities and ports. Although locomotive engines being produced today must meet relatively modest emission requirements set in 1997, they continue to emit large amounts of nitrogen oxides and particulate matter (PM), both of which contribute to serious public health problems.

In March of this year, the EPA issued more strict regulations for new and remanufactured diesel locomotives that it said will reduce locomotives' soot by 90 percent and emissions of nitrogen oxide by 80 percent. The EPA predicted it would be sometime after the year 2030 before the new, low-polluting engines replace all those now in use, however.

So it is established, rail is monumentally more cost efficient that trucks, but at the cost of being somewhat less environmentally efficient. This potentially un-environmentally friendly relationship is however, not as it may seem; freight rail's main use in North America is for the medium to long distance transport of goods, meaning that trains have very minimal contact with community areas, so although they produce pollutants, they do so mainly away from our communities and their over all infrastructure has very little impact on the environment, as opposed to truck transport and infrastructure which predominantly operates all day in heavily populated community locations (more information about the complex environmental nature of rail will be covered later in the document).

Cost to Shippers

Rail is an important player in intermodal shipping and is by far the most cost effective mode for shipping massive quantities of goods, but this paper will briefly analyze the pro's and cons of other forms of shipping goods as they relate to the overall international intermodal infrastructure.

Shipping by Sea

Shipping by sea is conducted by containerships in one of the following categories:

- **Panamax** - A Panamax ship is 294 meters long, at the maximum size able to transit the Panama Canal.
- **Post-Panamax** - A post-Panamax is too big for the Canal, but able to transit Suez.
- **Capesize** - A Capesize is too long, deep, or wide for either of the Canals, and therefore circle around the Cape of Good Hope and Cape Horn. Some bulk carriers and supertankers fall into this class.
- **Malaccamax** - Malaccamax ships are mostly still in the planning stage. These ships would handle 20,000 containers and up. Their draft would be so deep that they might scrape the bottom of the Malacca Strait. (Separates Sumatra and the Malay peninsula; carries most European-Asian trade in consumer goods, and also most of the Middle-East Asian petroleum shipping.) Therefore they would be blue-water only. One such ship exists, a tanker named Tateyama built in 2002.

These mammoth ships serve as the facilitators for most of the bulk international trade in the global economic community. Although they themselves do not ship goods across countries, to markets, or to door steps they connect countries by spanning oceans and carrying unmatched quantities of goods to ports all around the world. To cross the oceans requires, understandably, high operating costs, so port location and ease of access is paramount.

The fuel that containerships burn on their way across the ocean is important to consider, especially for the subject of cost. The fuel that they utilize is not high quality marine diesel, it is what is referred to as "bunker fuel". Bunker fuel or furnace fuel oil (FFO) has a very high viscosity and requires heating, usually by a recirculated low pressure steam system, before the oil can be pumped from a bunker tank because It is so thick, it must be heated to extreme temperatures just to get it to flow into the engines. Although Bunker Fuel at one point in time was very inexpensive (pennies per gallon) as

of October 23, 2009 bunker fuel (380 Centistoke) is about $1.66 per gallon. A 7000 TEU container ship will burn about 217 tons/day; this is about $99,000 per day in fuel costs, making all containership travel come with a huge price tag.

Fuel costs often represent as much as 50-60% of total ship operating costs, depending on the type of ship and service. Ocean carriers are required to recover these costs to maintain levels of service, meaning the price of shipping goods will continue to face upward pressures. An illustration of the cost impacts with containership travel follows:

> To illustrate the effect of the rising fuel costs, consider the following example of a large modern container vessel used in the Trans-Pacific trade with an actual, maximum container capacity of 7,750 TEUs (twenty foot equivalents) or 3,875 FEUs (forty foot equivalents). With the cost of bunker fuel at $552 per ton, with fuel consumption at 217 tons per day, a single 28-day round trip voyage for this one vessel would produce a fuel bill of $3,353,952. This number could be greater for a number of reasons, such as if the voyage were more than 14 days, or if the vessel were smaller and less fuel efficient per container, or if schedule delays required the vessel to speed up to stay on schedule.
>
> Recovery of fuel cost from cargo customers is a challenge when one considers that vessel capacity utilization is not 100%, that trades are not evenly balanced (e.g., U.S. Trans-Pacific exports may utilize only half of a vessel's capacity), that different trades and commodities can handle different levels of rates, and that fuel prices continue to rise. If a cargo shipper pays less than its share of the fuel cost, it can only mean that other shippers must pay more, and/or the carrier fails to recover its operating cost, which is not a sustainable business scenario.

Approximately 1,500 ocean-going liner vessels, mostly containerships, make more than 26,000 U.S. port calls each year, providing American importers and exporters with efficient transportation services to and from roughly 175 countries. Today, U.S. commerce is served by more than 125 weekly container services. The annual fuel cost for the services is tens of billions of dollars and continues to rise substantially. Shipping by sea is currently a necessity in the international intermodal shipping environment, it is costly, but for the number of goods it can ship for the price (.8 cents per ton-mile) How carriers seek to obtain recovery of these rapidly rising fuel costs in the current market is a matter for commercial negotiations, we must make ships more efficient eventually, but for now we must find ways to significantly shorten containership travel time.

Shipping by Land

Rail

Today, U.S. and North American freight railroads are the most affordable in the world. According to World Bank data, average U.S. freight rail rates are half those in China and Japan, and 50 to 75 percent below those in major European countries. Freight railroads are critical to the economic health and global competitiveness of the United States. In terms of ton-miles, railroads annually move more than 25% of the United States' freight and connect businesses with each other across the country and with markets overseas. They also directly contribute tens of billions of dollars each year to the economy through wages, purchases, retirement benefits, and taxes.

There are four different types of freight railroads: Class I, regional, local line haul, and switching & terminal. Class I railroads are defined as those with revenue of at least $346.8 million in 2006. They comprise just one percent of freight railroads, but account for 67 percent of the industry's mileage, 90 percent of its employees, and 93 percent of its freight revenue.

A regional railroad is a line haul railroad with at least 350 miles and/or revenue between $40 million and the Class I threshold. There were 33 regional railroads in 2006. Most have between 75 and 500 employees.

Local line haul railroads operate less than 350 miles and earn less than $40 million per year (most earn less than $5 million per year). In 2006, there were 323 local line haul railroads. They generally perform point-to-point service over short distances.

Switching and terminal (S&T) carriers are railroads that primarily provide switching and/or terminal services, regardless of revenue. They perform pick up and delivery services within a certain area.

The price per ton mile for freight to be shipped by all these forms of rail is cheaper than any other on land; because of significant fuel, capacity and speed advantages rail can afford to ship goods for around 3 cents per ton-mile. Freight customers, in the absence of rail, would most likely transport their goods by truck for at least a portion of the distance. Truck transportation is considerably more expensive than rail transportation; estimated cost per ton-mile for truck transportation ranges from 26 to 32 cents, depending on whether the trip is short-haul or long-haul, and whether it is an entire truckload or less than a truckload. For this study, we assumed it is long-haul and a truckload, and a typical estimation of price for a truck to transport goods over the long haul would cost 26 cents per ton-mile, more than eight and a half times the cost of rail's most expensive option for transportation. Thus, for each ton-mile of freight shipped over freight rail systems, the customer saves between 23 and 29 cents for every ton-mile of goods shipped, which translates to 9-11% of the cost of shipping by truck.

Truck

In order to better understand the cost of shipping involved with trucks it is also important to understand that truck shipping has a unique niche that rail cannot fill, no matter how efficient or cost effective. Trucks in the U.S. have restructured the way goods can be moved by allowing markets to move away from ports and railways. Currently roads cover more ground than any other for of ground transportation allowing trucks to exercise incredible flexibility. While rail and water continue to serve the U.S.'s many market hubs, trucks are often the only way to serve the new suburban and ex-urban markets, and it is because of these realities that trucking has become the dominant mode of freight transportation on land.

However trucks position is changing as highway congestion increases exponentially, its operating costs increase dramatically, and its harm to the environment becomes more and more apparent. The cost per ton-mile for a truck to ship goods (around 30 cents per ton-mile) is one that is quite closely tied to two separate factors; one being the cost of diesel fuel and the other being highway congestion and the time it takes for truck to ship goods.

Unlike trains, trucks are not fuel efficient vehicles, and because of this a great deal of their shipping costs stems from their inefficient use of diesel. The cost of diesel is getting more expensive and previously 2008 the cost of diesel reached an all time high of $4 dollars a gallon, this threatened the entire freight truck industry with collapse. Fortunately fuel cost has since declined to a national average of around $3 a gallon, though even these prices are enough to significantly constrain the industry and force shippers to consider other cheaper options. Additionally it is important to note that costs of diesel are again rising, non-fuel efficient vehicles such as trucks will be forced to eventually create super fuel efficient engines or face certain collapse. The following article from 2008 is a good reminder of what the trucking industry will eventually face with its current costly reliance on diesel.

> The cost of diesel gasoline in the US soared to historic highs over the past several weeks, threatening independent truck drivers with financial ruin and forcing a sharp hike in transportation costs, which reverberates throughout the economy.
>
> According to the most recent reports, the national average cost of diesel—used mainly in trucks, farm equipment, and other machinery—is now a record $4 a gallon. Last year, the average price was only $2.75 a gallon.

The cost of gasoline, used in most automobiles in the US, has also risen substantially and now averages $3.28 a gallon. With the spring and summer seasons coming, a period when fuel prices generally rise, some analysts predict that gasoline prices will go up to $3.50 or $4 a gallon by the July 4 holiday period.

The entire transportation industry relies on diesel fuel, including trains and cargo ships, but the impact on trucking is particularly severe. The economic slowdown has already led to a decline in freight shipments and a glut of available trucks, which has driven rates paid to independent drivers below the cutthroat levels of 2002. At the same time, the ripple effect of high fuel prices on manufacturing, production, and consumption is booting inflationary pressures everywhere.

Diesel fuel currently accounts for nearly 28 percent of the total fuel used in the US and nearly 63 percent of fuel used in Europe. As oil companies closed refineries to boost profits in the past period, reduced refinery capacity has been unable to keep up with demand. In the short term, diesel prices have risen with the rise in the price of oil, driven in large part by a flood of investors into the commodity markets.

The dramatic diesel price increases threaten to ruin many independent truck drivers, including the author of this article, who is also an independent owner/operator. During the past six years, I have seen my monthly fuel price average jump from a base of $1.37 a gallon in 2002 to the present $4 a gallon—that is, nearly 300 percent.

The rapid rise in fuel prices means that independent truck owner-operators, or those who run a small fleet of trucks, are being driven to bankruptcy. Fuel surcharges, which are added on to freight rates, are not always guaranteed and never keep up with these rapidly rising costs. The only recourse for many is to shut down their trucks or fall further behind their other fixed costs.

A flat tire in the course of one week can mean the difference between a profit and a loss.

In real terms, at least 50 percent of truck-generated income is going right back into the fuel tanks. Factor in maintenance, and that bill can approach 75 percent. Thousands of operators have been forced to look for shortcuts, put off critical maintenance procedures, or park their rigs altogether because they cannot earn a living.

There has been a sharp increase in truck repossession as well. Repossessor Nassau Management reported a 110 percent increase in 2007 over 2006. In an indication that truckers are parking their rigs rather than being on the road and out of reach, repossession companies are finding it easier to repossess driver's trucks. "It used to take weeks, now it takes days or hours," stated Edward Castagna, president of Nassau Management.

Rumors are already spreading of a nationwide truck strike, as thousands of drivers have been forced into bankruptcy or had their trucks repossessed.

Between 1974 and 1983, when oil prices quadrupled during the oil embargo, there were at least three major national trucking strikes in the US. The largest and most violent was in 1979, lasting for over two weeks. The Carter administration responded to the oil crisis by deregulating the oil industry. Carter also pushed for the mandatory fuel surcharge legislation that exists to this day.

At that time, it was estimated that 20 percent of the nation's 500,000 truckers were independents. Today, approximately 9 percent of 3.4 million truckers are independents according to the US Labor Department. Deregulation has resulted in depressed freight rates and a bonanza for large trucking companies that now dominate the industry. The largest companies pay for fuel in bulk, and purchase thousands of tractors at a time. They can weather a fuel crisis by raising transportation rates when forced to.

> In contrast, many independents drivers are dependent on freight brokers. These are middlemen who match a driver with a shipper one load at a time, and take a sizeable cut for themselves. Landstar System, one of the largest freight brokers in the country, brokered loads totaling $881.57 million in 2007, more than double the revenue four years earlier.
>
> A recent article in the Associated Press noted, “Truckers complain that the brokerage system is unregulated and lacks transparency: They know what they’re getting paid, but they don’t know what the shippers are paying the brokers.” For example, the AP wrote, “A load traveling 800 miles that cost a shipper nearly $3,000 to send may pay the trucker $1,000, out of which the trucker would pay all expenses including fuel and insurance.”
>
> In the same article, a driver was reported to have seen his take home pay drop from $50,000 a year to $11,000 in 2007. The reason: his fuel costs skyrocketed. During the previous eight months he spent $64,000 on fuel.
>
> Recent oil and gas price increases have been driven primarily by speculation and the fall of the US dollar. Crude oil futures are now well above $100 a barrel, once considered an extremely unlikely circumstance.
>
> Many analysts have attributed the rising oil prices to the weakness of the dollar, as international investors are buying oil shares to hedge against dollar depreciation. Interest rate cuts by the Federal Reserve have further weakened the dollar and helped fuel the rise in the cost of oil.

Fuel dependence is dangerous because of the rising costs, but there is still a place for trucks in an international intermodal environment. For trucks to be effective In the future, highway congestion and how trucks are best suited to provide their crucial services must be analyzed.

Trucks will always be a necessity in intermodal shipping infrastructures due to their ability to distribute goods with high levels of flexibility, but the distance they move needs to be considered. Trucks are most effective in areas where massive quantities of goods are amassed and need multiple location delivery within a relatively small or medium sized area. The problem with road congestion originates from massive quantities of goods being moved as a whole on highways over very long distances, medium distances, and short distances instead of solely where they are most effective. Because truck traffic moves the majority of freight in the U.S. and truck traffic attempts to bare the burden of all goods shipping, their own efficiency and cost effectiveness is greatly reduced do to congestion.

Rail is the most cost effective and efficient way to ship massive quantities of goods on land with the added benefit of being able to greatly reduce truck traffic without hurting the truck industry. As trucks are most efficient at moving goods over small or medium areas (where their flexibility can be fully utilized) it makes since to relieve pressure from highways by shifting the massive number of goods shipped by trucks to rail. Trucks should continue to ship huge amounts of goods all over North America by strategically targeting markets where their flexible infrastructure is needed, but they could actually be more efficient if rail handled a majority of all goods over long distances as it would significantly reduce highway traffic.

The current state of highway congestion effects the U.S. in many ways as the following article explains.

> Congestion effects economic productivity in several ways. American businesses require more operators and equipment to deliver goods when shipping takes longer, more inventory when deliveries are unreliable, and more distribution centers to reach markets quickly when traffic is slow. Likewise, both businesses and households are effected by sluggish traffic on the ground and in the air, reducing the number of workers and job sites within easy reach of any location. The growth in freight is a major contributor to congestion in urban areas

and on intercity routes, and congestion effects the timeliness and reliability of freight transportation. Long-distance freight movements are often a significant contributor to local congestion, and local congestion typically impedes freight to the detriment of local and distant economic activity.

Growing freight demand increases recurring congestion at freight bottlenecks, places where freight and passenger service conflict with one another, and where there is not enough room for local pickup and delivery. Congested freight hubs include international gateways such as ports, airports, and border crossings, and major domestic terminals and transfer points such as Chicago's rail yards. Bottlenecks between freight hubs are caused by converging traffic at highway intersections and railroad junctions, steep grades on highways and rail lines, lane reductions on highways and single-track portions of railroads, and locks and constrained channels on waterways. A preliminary study for the Federal Highway Administration (FHWA) identified intersections in large cities, where both personal vehicles and trucks clog the road, as the largest highway freight bottlenecks (USDOT FHWA 2005a).

As passenger cars and trucks compete for space on the highway system, commuter trains and freight trains compete for space on the railroad network in metropolitan areas. The growth in rail freight is occurring at the same time rising fuel prices and environmental concerns are encouraging greater use of transit.

Congestion also is caused by restrictions on freight movement, such as the lack of space for trucks in dense urban areas and limited delivery and pick-up times at ports, terminals, and shipper loading docks. One estimate of urban congestion attributes 947,000 hours of vehicle delay to delivery trucks parked at curbside in dense urban areas where office buildings and stores lack off-street loading facilities (ORNL 2004). Limitations on delivery times place significant demands on highway rest areas when large numbers of trucks park outside major metropolitan areas each night waiting for their destination to open and accept their shipments (USDOT FHWA 2002).

Bottlenecks cause recurring, predictable congestion in selected locations while the temporary loss of capacity, or nonrecurring congestion, is widespread and less predictable. Sources of nonrecurring delay include incidents, weather, work zones, and other disruptions. These nonrecurring, often-unpredictable, sources of highway delay have been estimated to exceed delay from recurring congestion (ORNL 2004). Weather, maintenance activities, and incidents have similar effects on aviation, railroads, pipelines, and waterways. Aviation is regularly disrupted by local weather delays, and inland waterways are closed by regional flooding and droughts.

Additionally, freight congestion is caused by other factors that are considered either recurring if they are systemic problems or non-recurring if they represent an isolated event. Recurring and non-recurring sources of freight congestion include equipment shortages, short-term labor disruptions, and long-term shortages in key occupations such as truck drivers, inefficient operating practices at terminals and border crossings, and traffic backups at toll booths. Technology is reducing some of these sources, such as through electronic toll collection.

Currently truck traffic is very costly to shippers compared to rail, and although it has its place in an international intermodal infrastructure, it is on the path to becoming increasingly more costly and inefficient.

Shipping by Air

The cost of shipping by air is by far the most expensive of all solutions, at the least 85 cent per ton-mile. Air transport like trucking has an integral role in international intermodal transport of goods because of its ability to move goods very quickly and reliably. Air transport is, however, incapable of transporting massive quantities of goods at a low cost. Though air transport is unparalleled in speed it is simply unable to provide the shipping quantities produced by sea, the shipping flexibility and maneuverability of trucking, or the shipping efficiency and cost of rail. Air transport can provide

very low numbers of goods quickly, safely, and reliably and that is why it is essential for low volume expedient delivery of goods.

Shipping Cost Conclusion

A complex network of sea, rail, truck, and air transportation with a particular focus on efficient intermodal transport of goods will create the best possible scenario for future shipping costs. In order to accomplish this freight rail must be utilized strategically to offset the economic waste from other forms of shipping. Shifting most of North America's long haul freight to trains will save billions of dollars in fuel and operational costs and alleviate stress on roadways, thereby allowing truck and other forms of transportation to move more efficiently and cost effectively.

Shipping by sea, although the preferred method for international shipping, becomes increasingly more expensive the farther ships must travel and the length of time they must spend in ports. As most containerships that North America receives are loaded with goods from Asia it is important to understand oceanic shipping routes (covered in section ?????? of this paper) and the costs associated with every mile of travel. Shipping by air is an important element in international shipping for its expedience and reliability, but is extremely cost inefficient.

It becomes clear that solutions need to arise to handle new containership traffic and better utilize railways, without costing North America or the U.S. more than is feasible. From a shipping cost stand point it is understood that:

1. Containerships need to find ways of greatly shortening travel routes.
2. Highway congestion and growing fuel costs can be alleviated by moving more freight from trucks to trains.
3. Air transport of massive quantities of goods is cost inefficient for international shipping.
4. Overall, rail is the most cost advantageous option for land shipping infrastructure improvement and growth.
5. Overall, containership ports are the most cost advantageous option for international shipping infrastructure improvement and growth.

Cost of Maintenance

In this section the basic costs associated with maintaining railway systems will be briefly assessed.

There are many factors that contribute to the cost of rail maintenance including usage, types of trains utilizing the rail, the environment around the rail, parts replacement, and many other unpredictable factors such as earthquake damage and etcetera. United States Class I railways maintain their infrastructure through a mix of ordinary maintenance and periodic renewal of infrastructure components. Different railways use different proportions of ordinary maintenance and periodic renewal with little consensus as to the best combination. There have been many attempts to scientifically and mathematically calculate the exact figures for railway maintenance (**Reference Illinois paper**) but in general there are 4 main costs; rail and turnout replacement costs, tie replacement costs, ballast replacement costs, and miscellaneous renewal costs such as bridge repair costs or disaster recovery funds. An Iowa DOT rail system planning document attempted to break their "cost per mile" of rail maintenance into these categories to better assess what costs would be.

> All branchlines in Iowa were evaluated to estimate the cost of upgrading to handle heavier rail cars. Even though Union Pacific plans to upgrade 500 miles of its branchlines by 2012, these lines were included in this evaluation. UP has already upgraded the Mason City line through Lake Mills to handle 286,000-pound loadings. There are approximately 2,130 miles of branchlines in Iowa that carry less than five million gross tons annually. For

purposes of this assessment, Level 3 lines carry 1.0 to 5.0 million gross ton-miles annually, Level 4 lines carry 0.5 to 1.0 million annually, and Level 5 lines carry less than 0.5 million annually. Most of these lines have been upgraded in the past to handle cars with a weight limit of 263,000 pounds, generally with 90-pound rail. One major expense to upgrade these lines to carry the heavier loads is heavier rail. There are 290 miles that have less than 90-pound rail and another 960 miles that have less than 112-pound rail. Another critical need on these branchlines is the bridges that may require upgrading or possible replacement. The assumptions used to determine the cost of upgrading are as follows. This information was reviewed with the Iowa railroads and deemed reasonable.

All turnouts would be replaced with a number 10, 115-pound turnout. Up to 1,000 cross ties per mile would be replaced to achieve a non-defective tie percentage of 75 percent after rehabilitation. 1,000 cubic yards per mile necessary for six inches of clean ballast under the ties would be added to provide good drainage and stability for the welded rail.

Item	Cost per Mile
Rail and Turnout Replacement	$170,000
Tie Replacement	$ 60,000
Ballast Replacement	$ 25,000
Miscellaneous Renewal	$ 10,000
Total	$265,000

Generally speaking freight rail is much more cost efficient to maintain than North America's roadways. It requires less materials, construction equipment, time, and money to construct one mile of rail in comparison with roadways. Though the cost varies for every mile of freight rail it is extremely cost efficient, yearly costs, from 2005 were around 4-5 billion dollars for rail whilst the Federal Highway Administration estimated it needed $375 billion to fund repair and improvement projects for U.S. roadways.

Local and International Economic Impacts of U.S. Freight Rail

Local Economic Impacts

Many states in the U.S. understand that having freight rail service is vital to their local economies and have created many opportunities for rail to thrive and grow because rail is such a significant part of their economic development and transportation programs. A quote from the Idaho Department of Commerce, " Idaho's economy, particularly in rural areas, relies heavily upon the freight-rail system to facilitate movement of the state's natural resources and manufactured products to local, national, and international markets. Most Idaho companies surveyed that ship by rail state that they could not exist without access to railroads." reflects the importance of rail to many state departments of economic development, commerce, and agriculture.

Rail can also be an important player in local economies by enhancing other businesses efficiency through services such as shipping goods from local industries in warehousing, distribution, and manufacturing. Rail provides opportunities to open new enterprises where, because of the lack of efficient transportation system, there could not have been an economically viable business. America's freight railroads employ nearly 190,000 well-paid, highly technical workers. The overwhelming majority of today's railroad employees are American union workers whose jobs cannot be off-shored.

Railroad employees are also among the best-paid workers in American industry. Each year, U.S. freight railroads pay some $18 billion in wages and benefits to their employees.

In addition to the current workforce, freight rail supports more than 1.2 million people directly associated with the industry, such as manufacturers and supplier partners. Freight rail is so economically important to local economies that for every one freight rail employee there are 4.5 other jobs created and supported. Rail supports jobs in construction, manufacturing, agricultural, retail, food service, health care, the arts and entertainment industries.

Freight rail expansion also supports job growth by allowing for hundreds of thousands of person-years worth of labor. Based on Department of Commerce data, every $1 billion invested in freight rail expansion creates 20,000 jobs. Investing in rail creates jobs for local communities, boosts local economies, and provides an efficient shipping infrastructure for the future.

Job Growth – The Effects of Public and Private Investment

Rails potential to create jobs is advocated by states all over this nation attempting to keep their local communities economically viable. New rail extensions, even small ones, can employ hundreds of people and provide hundreds of thousands of person-years of labor. Rail operations and maintenance provides steady well paying jobs, in fact the average railroad employee made around $98,500 a year. As the economy rebounds and demand to move more goods by rail increases, railroads will provide a significant portion of the funding needed to accommodate growth and expansion. However, there will remain a funding gap that can be addressed through policies such as investment tax incentives and increased use of public-private partnerships.

In order to maintain job growth in local communities and enhance the viability of rail for the future a modal shift must take place, private and public sector cooperation with rail. “Partnerships offer a mutually-beneficial way for railroads and governments to solve critical transportation problems. If more freight were moved by rail, the public would benefit tremendously through lower shipping costs, reduced highway gridlock, lower fuel consumption, lower greenhouse gas emissions, and improved safety. Partnerships allow governments to greatly expand the use of rail while paying only for the public benefits. Railroads would pay for the benefits they receive. It’s a win-win-win for everyone involved.” Combining the technical and human resources of private rail owners with the vast program incentives that can be offered through only public entities makes for an extremely stable freight rail infrastructure. “In many cases, these partnerships only involve the public contributing a portion of the initial investment required to make a project feasible, with the railroad responsible for funding all future maintenance to keep the project productive and in good repair. Since railroads pay for the benefits they receive, public-private partnerships are not “subsidies” to railroads. Some transportation problems can’t be solved if each party acts alone. The answer is cooperation. Many potential rail projects would provide a combination of public benefits (such as decreasing highway congestion by taking trucks off highways) and benefits for freight railroads (such as enabling faster, more reliable train operations).” However, this synergistic relationship between public-private entities most benefits local economies with the creation and retention of jobs. With the added benefit of infrastructure improvement that this relationship provides it means that not only are jobs created now, but future jobs are continually assured through freight rail incentive programs provided by states.

An example of just how many states are currently pushing for freight rail can be seen in the following article:

CONNECTICUT

Under Connecticut law, a passenger or freight railroad operating in the state may qualify for an exemption from the gross earnings taxes it owes to Connecticut in exchange for undertaking projects to preserve or improve its facilities (CGS § 13b-226 et seq.) By November 1 annually, railroads seeking the tax exemption must submit to

the transportation commissioner a list of the preservation and improvement projects they intend to undertake to qualify for the exemption. The commissioner must review the proposed projects, make any modifications to them he deems necessary, and issue a final list of tax exemption projects by December 31.

When establishing the tax exemption projects for a railroad, the commissioner must consider the:

1. existing and prospective financial ability of the railroad to comply with the projects;

2. tax exemption projects, if any, established for the railroad by any other state;

3. plans, if any, recommended for the railroad by any committee or other group of public officers here or in any other state; and

4. reports and recommendations, if any, proposed by the United States, any state, or any agency or commission relating to the railroad.

Tax exemption projects must include one or more of the following:

1. railroad track or facility improvement projects in Connecticut involving maintenance , rehabilitation, or construction of tracks, bridges, stations, or platforms or acquisition or rehabilitation of equipment used exclusively in Connecticut;

2. light density freight line preservation in Connecticut, where the revenue and variable cost of such lines create the potential for abandonment; or

3. intercity rail passenger service expansion in Connecticut.

The transportation commissioner must make periodic inspections to determine the degree of compliance with respect to the tax exemption projects and must report annually by October 1 to the governor and the legislative transportation and finance, revenue and bonding committees.

Each year, by March 1, the commissioner must certify to the governor the railroads that are in compliance with the program and eligible to receive the tax exemption. The commissioner must also submit a report on that date to the governor and the chairs of the Transportation Committee and the Finance, Revenue and Bonding Committee that describes the effect of the tax exemption provided during the preceding calendar year, the projects undertaken, and the degree of compliance by the participating railroads. He must also include (1) a summary of the financial condition of the participating railroads, (2) a list of all railroads not granted a tax exemption and the reasons for this, and (3) any recommended changes to the law.

PROGRAMS IN OTHER STATES

Wisconsin

There are two programs in Wisconsin. One is the Freight Railroad Preservation Program and the other is the Freight Rail Infrastructure Improvement Program (Wis. Stats. , Sec. 85. 08).

The Freight Railroad Preservation Program provides state grants for up to 80% of the cost to (1) purchase abandoned rail lines in an effort to continue freight service or preserve the opportunity for future rail service and (2) rehabilitate facilities, such as tracks or bridges, on publicly-owned rail lines. Eligible recipients can be a

county, municipality, transit commission, railroad, or a current or potential user of rail freight service. For the current budget period (FY 2007-2009), a total of $ 22 million in bonding has been authorized by the legislature for use in this grant program. Since the program's beginning, more than $ 92 million in grants has been made.

The Freight Railroad Infrastructure Improvement Program was added in 1992. The loan program allows the state to encourage a broader range of improvements to the rail system, in particular those on privately owned lines. It also provides funding for other rail related projects such as loading facilities. Loans can cover up to the entire cots of projects that:

1. connect an industry to the national railroad system;

2. make improvements to enhance transportation efficiency, safety, and intermodal freight movement;

3. accomplish line rehabilitation; and

4. develop the economy.

To be eligible for a loan, a project must confer a public benefit and enhance economic development in the state. Program guidelines set parameters for doing a cost-benefit analysis for determining public benefit and for prioritizing projects for funding.

Loans are funded from repayment of prior loans. Over $ 79 million in loans have been made through this program since it began in 1992.

Michigan

Michigan has two programs—the Michigan Rail Loan Assistance Program and the Freight Preservation and Economic Development Program. The Rail Loan Assistance Program involves no-interest loans for periods of up to 10 years. Loans may be made to railroads, local governments, economic development corporations, and current or potential users of freight railroad services. Loans are limited to a maximum of $ 1 million per project and per applicant. The loan recipient must provide a funding match of at least 10% of eligible project costs and this must be used before the state funds may be drawn upon. The rail loan fund operates as a revolving fund so that future loans are dependent on repayments.

Projects for receipt of rail assistance loans are evaluated for relative merit in conjunction with overall program goals. This process looks at a project's public benefits to safety and the economy. Typical factors that are considered are jobs created or retained, improved rail service to industrial and agricultural rail customers, elimination of grade crossings, and reductions in highway congestion. The Michigan Department of Transportation estimates that approximately $ 3. 3 million is available in the current year under this program.

The Freight Preservation and Economic Development program provides either low-interest loans or grants. They can go to transportation companies, private companies or local governments. The loans or grants can cover up to 50% of the rail freight portion of a project when the rail improvement facilitates economic development.

Washington Rail Bank

The Washington Rail Bank was created by the legislature in 2007 to promote economic development through advancing rail freight activities. The program seeks to fund smaller capital rail projects that help improve freight movement. Railroads, port districts, rail districts, private companies, and local governments are eligible to apply

for funds, which take the form of interest-free loans. A total of $ 2. 5 million has been authorized for the rail bank in the current biennium.

A recipient can receive up to $ 250,000 for rail capital projects that must be matched by at least 20% of funds from other sources. Typical projects can include:

1. development of strategic multimodal consolidation centers;

2. purchase of rolling stock;

3. improvements or additions to terminals, yards, roadway buildings, fuel stations, railroad wharves, or docks;

4. communication operating system improvements or additions;

5. siding track, railroad grading, or tunnel bore improvements or modifications;

6. bridges, trestles, culverts, or other elevated or submerged structures.

Mississippi Local Government Revolving Loan Program

Mississippi law authorizes the Mississippi Development Authority to make low interest loans to counties or municipalities for the purpose of implementing freight rail service projects. These can involve the acquisition, construction, installation, operation, modification, or rehabilitation of any freight rail facilities. Loans can be made for up to a 15-year period at an interest rate that is one percent less than the Federal Reserve discount rate. Federal funds must be used to pay a minimum of five percent of the cost of each approved project. The development authority determines the maximum amount of any award. The law caps the maximum aggregate amount available to all counties at $ 8 million.

Illinois

The Illinois Rail Freight Program provides assistance to communities, railroads, and shippers to preserve and improve rail freight service. The program was established in 1983. The program's primary purpose is to serve as a link between interested parties and to channel government funds to projects that achieve statewide economic development. It consists primarily of low-interest loans to finance rail improvements, but in some instances grants are provided. The program focuses on projects with the greatest potential for improving access to markets and maintaining transportation cost savings, and where state participation will leverage private investments to solve rail service problems. Projects are evaluated through a cost-benefit analysis. State funding for the program comes from general fund appropriations and through loan repayments.

Maine Industrial Rail Access Program

The purpose of the Maine Industrial Rail Access Program is to (1) stimulate economic and employment growth through generating new or expanded rail service, (2) preserve essential rail service where it is economically viable, (3) enhance intermodal transportation, and (4) preserve rail corridors for future transportation use. Private railroad companies, municipalities, counties, non-profit organizations, and private enterprises wanting to avail themselves of rail freight transportation are eligible to apply. Eligible projects fall into four categories—rehabilitation, new siding improvements, right-of-way acquisition, and intermodal facility construction. The program provides financial assistance for up to 50% of project costs.

The project evaluation process rates potential project recipients in these 10 categories: (1) job retention or creation, (2) new investment, (3) intermodal efficiencies, (4) size of private cost share, (5) anticipated decrease in air emissions, (6) anticipated decrease in highway maintenance costs, (7) anticipated decrease in highway congestion, (8) transportation and logistics cost savings, (9) improvements in rail service, and (10) benefit-cost ratio.

Annual funding levels are determined based on amounts specified in the publicly-approved general obligation bond act, which currently is about $ 1 million.

New Jersey

New Jersey provides funding for capital improvements that result in the continuation of economically viable rail freight services through its Rail Freight Assistance Program. Projects must show a positive cons-benefit-cost ratio taking into consideration factors like job creation and increased railroad revenue. Project sponsors are required to continue freight service on the improved area for at least five years after completion of the project. Projects can be for acquisition of rail lines or property, rehabilitation assistance, or facility construction. However, state financial assistance cannot be used to subsidize operating costs.

Projects funded through this program are included as part of the state's annual State Rail Plan. Grants for rehabilitation or construction projects are for 90% of costs with the remaining 10% matched from the railroad or other project sponsor. However, for state-owned lines, up to 100% of the rehabilitation costs can be covered.

Since 1994, more than $ 65 million has been provided for rail projects through the State Rail Plan. In 2008, the plan contains 17 new projects totaling more than $ 23. 6 million.

Pennsylvania

The Pennsylvania Rail Freight Assistance program seeks to provide financial assistance for rail freight infrastructure improvement to (1) preserve essential rail freight service where economically feasible and (2) preserve or stimulate economic development through generation of new or expanded rail freight service. Funding is allocated from the state general fund. Matching grants can be made to railroad companies, transportation organizations, municipalities, municipal authorities, and users of rail freight infrastructure.

The maximum state funding for any project is $ 700,000 or no more than 70% of actual project cost, whichever is less. Projects can be for maintenance, construction, or a combination of both. However, funds cannot be used for acquiring land, land rights, buildings, or building materials to construct new buildings. The program is funded at approximately $ 8. 5 million annually.

In addition to the rail freight assistance program, Pennsylvania provided another $ 20 million in 2007 for seven railroads and five businesses in its capital bonding program. Several of the grants provide local businesses with connections to rail lines. Others are for infrastructure rehabilitation.

Another program in Pennsylvania is its Infrastructure Bank, which was established in 1998. Loans are made at one-half the prime lending rate for a period of up to 10 years. Infrastructure Bank loans are currently being made at a 3% interest rate. Eligible borrowers can be municipalities, counties, transportation authorities, economic development agencies, non-profit organizations, and private corporations. All types of transportation infrastructure projects compete for these loans, not just rail.

Minnesota Rail Service Improvement Program

The Minnesota Rail Service Improvement Program draws its funding from both state general fund appropriations and general obligation bonding. It has five program components. The Rail Line Rehabilitation Program provides low- or no-interest loans to railroads to rehabilitate and preserve rail lines. When it completes the rehabilitation project, the railroad repays the state on a negotiated per-car basis or at a predetermined fixed rate. Loans are for up to 70% of project costs.

Other program components include:

1. the Rail Purchase Assistance Program, which helps regional rail authorities purchase rail lines if a financial analysis shows it can operate profitably, purchase and rehabilitation costs will not exceed benefits, and the authority can operate the line capably or can contract with a capable operator;

2. Rail User and Rail Carrier Loan guarantee Program, which helps shippers and carriers to obtain loans for rail rehabilitation and capital improvements by guaranteeing up to 90% of the loan;

3. Capital Improvement Loans, which lend rail users up to $ 200,000 or 100% of costs, whichever is less, to improve rail facilities, track connections, or loading, unloading, or transfer facilities; and

4. Rail Bank Program, which is used to acquire and preserve rail lines for future state, public, and commercial transportation needs.

The capital improvement loan portion of the program is used on a regular basis. The other program areas are used on an as-needed basis.

Ohio Rail Development Commission

The Ohio Rail Development Commission was established in 1994 as a component of the Ohio Department of Transportation. Its purpose is to provide assistance to companies for new rail and rail-related infrastructure with the goal of promoting retention and development of Ohio companies through the use of effective rail transportation. Companies who are considering adding rail to existing operations are also eligible for assistance. The commission works with the Ohio Department of Development and other public and private development related organizations to provide assistance to these companies.

Grant funding is generally limited to projects where significant job creation or retention (25 or more jobs) is involved. Grantees must commit to job creation or retention numbers and rail usage. Loan financing is available to qualified applicants even if jobs are not being created or retained. The standard loan package is a five year loan at an interest rate equal to two-thirds of the prime rate.

Virginia

Virginia created a Rail Enhancement Fund in 2005. The fund provides a dedicated revenue stream for passenger and rail freight improvements at a level of $ 23 million annually. Use of the funds requires a minimum matching contribution of at least 30%, which must come from non-state sources such as railroads, local governments, or regional authorities. Projects are selected by the Commonwealth Transportation Board based upon the recommendations of the Rail Advisory Board. Funding can be used for creating additional track and capacity, track and infrastructure improvements, and improved intermodal facilities, and passenger rail initiatives.

Besides this fund, Virginia also has a Rail Industrial Access Program which it began in 1987. This program provides funds for new or improved access to a business for freight delivery. Businesses that want to participate

must complete an application that is reviewed by the Economic Development Group of Virginia. The program provides for financial assistance to localities, businesses, or industries seeking to provide freight rail service between the actual site of an existing or proposed commercial facility and a rail carrier's tracks. The first $ 100,000 grant to any one project requires no match from the business. Any additional funding above that level requires a one-to-one match. The program typically receives funding of $ 1 million to $ 3 million annually. Unused funds do not carry over, but are used for highway industrial access projects instead.

Virginia's third program is its Rail Preservation Grant Program. This provides grants or loans for the purpose of preserving short line railroad operations in the state. Funds can be provided to local governments, authorities, agencies, transportation commissions, or non-public sector entities on a 70% state and 30% local matching basis. Funding to large railroads may be in loan form. However, funds cannot be used for general railroad operating expenses. Funding to short line railroads can be either loans or grants to purchase or refinance operating railway properties.

This list of states trying to enhance, build, or repair rail infrastructure continue to grow throughout the United States and North America; states and countries around the world are driven to promote the creation and utilization of freight rail because it creates jobs, boosts local economies, and fills an important place in the intermodal transportation of goods. Projects all around the U.S. have the potential to or have provided jobs for thousands of people, a few examples are as follows:

Minnesota - Chicago Hub Network has potential to create 1,570 new jobs
Alaska – Alaska Canada Rail Link has potential to create 31,500 new jobs
Mississippi – Mississippi River Corridor Project has potential to create 1,500 new jobs
Florida – Sunrail Project has potential to create 11,523 new jobs
Pennsylvania – Freight Rail Reinvestment Project has potential to create 1,290 new jobs
Virginia – Proposed Virginia High Speed Rail has potential to create 185,500 new jobs

This list of potential projects is increasing every year as the importance of freight rail becomes more apparent and the potential for creating jobs cannot be ignored.

The Local Economic Benefit of Rail and Sea Port Synergy

Local economies benefit from freight rail's ability to create jobs, improve transportation infrastructures, and provide the shipping for valuable goods in massive quantities. Rail must acquire these massive goods from somewhere and more often than not that somewhere is local sea ports. The ports receive goods from international locations on various sizes of containerships. There are many economic benefits of creating, operating and maintaining these ports for local communities and, like rail, they create many jobs and provide huge economic opportunities; but without a direct rail connection to transport goods medium or long distances, ports cannot be prosperous.

This is why synergy between ports and rail is important; rail is currently the only efficient solution to tackle the transport of the massive number of goods that containerships bring. Overseas trade, especially between Asia and America, is by far the biggest economic driver for ports in the U.S. and with the mammoth cost of shipping goods from point A to point B America needs to take a look at making its ports more efficient. "The tremendous growth in overseas trade volumes moving through our ports in the past decade has been a huge boon to the American economy," said Kurt Nagle, president and chief executive officer for the American Association of Port Authorities. "The jobs these imports and exports create are spread throughout the country, not just in port cities, making them a vital part of our nation's economic fabric."

In 2007 a comprehensive report was released that detailed the economic impact of ports in the U.S.; the results of that report are as follows:

> Last year, United States deep-draft seaports and seaport-related businesses generated approximately 8.4 million American jobs and added nearly $2 trillion to the economy, according to a just-completed study by a Lancaster, Pa.-based business consulting service that specializes in port-sector economic impact studies.
>
> Based upon 2006 U.S. port cargo statistics and thousands of recent port-sector interviews, Martin Associates late this month completed an in-depth study into the economic impacts of coastal and Great Lakes ports, examining aspects ranging from jobs and wages to business and tax revenues. Of the 8,397,301 Americans working for ports and port-related industries in 2006, nearly 7 million were employed by firms involved in handling imports and exports, such as retailers, wholesalers, manufacturers, distributors and logistics companies.
>
> "The tremendous growth in overseas trade volumes moving through our ports in the past decade has been a huge boon to the American economy," said Kurt Nagle, president and chief executive officer for the American Association of Port Authorities. "The jobs these imports and exports create are spread throughout the country, not just in port cities, making them a vital part of our nation's economic fabric."
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> In addition to citing employment numbers, Martin Associates' new study also shows that businesses providing goods and services to U.S. seaports directly and indirectly paid $314.5 billion in total wages and salaries. Of this total, $207.4 billion came directly from businesses involved in handling international waterborne commerce. Moreover, the 2006 report shows that port-sector businesses generated a high rate of economic output, with business revenues and the value of the goods and services they provided totaled $1,976.4 billion, or nearly $2 trillion.
>
> In addition, port-sector businesses paid more than $102 billion in federal, state and local taxes in 2006.
>
> "Compared to the last study we developed in 2000 (based upon 1999 data), these figures indicate a significant increase in the financial benefits that the port industry provides the American economy," said Dr. John C. Martin, president of Martin Associates, "This new report shows that port-related activities are contributing to the economy in record numbers."
>
> With a doctorate in economics from George Washington University and having performed more than 300 individual economic impact analyses and port strategic and master plans for ports throughout the country in his 30 years in business, Dr. Martin is widely regarded as a leader in port market and economic studies.
>
> Looking specifically at employment in the nation's seaports, the study shows that 507,448 Americans held jobs such as terminal operators, longshoremen, freight forwarders, steamship agents, ship pilots, tug and towboat operators, chandlers, warehousemen, as well as jobs in the dredging, marine construction, ship repair, trucking and railroad industries. These direct port-sector jobs supported another 630,913 induced jobs due to purchases of food, housing, transportation, apparel, medical and entertainment services.
>
> Also included as induced jobs were those with local, state and federal agencies providing support functions such as education and municipal services. The port-sector firms providing direct services to the cargo and vessel activity at the nation's seaports made $26.3 billion in purchases to support their direct activity, supporting another 306,289 indirect jobs. These include, for example: jobs with suppliers of parts and equipment; firms providing maintenance and repair services to the businesses dependent on port operations; utilities providing services to marine terminals; and office supply firms.

"One thing that isn't obvious in the new report is that port-sector jobs tend to pay above-average wages, which is important to ensuring America remain a strong economic force in the global community," said Dr. Martin. In his 2006 report, Dr. Martin found that the number of direct, induced and indirect jobs from business activities at our nation's ports stood at 1,444,650, and the earnings and consumption dollars from those jobs came to $107.1 billion. Overall, he said port-sector workers today earn, on average, about $50,000 a year, which is $13,000 more per year than the National Average Wage Index, as computed by the Social Security Administration.

The study was developed using individual economic impact models that Martin Associates has developed for the majority of the nation's seaports. These models are based on interviews with more than 10,000 port tenants, maritime service providers, trucking firms, railroads, terminal operators, towing companies, pilot associations and other port-related entities. The models were updated using 2006 import and export data provided by the U.S. Maritime Administration (MARAD), as well as port-specific data for domestic cargo shipments handled at the ports but not included in the international cargo data provided by MARAD.

8.4 million jobs is a huge, and without rail to efficiently transport a vast majority of those goods the number of jobs would be much less. Ports are however, as a whole very congested and rail nor truck cannot assuage this congestion fast enough. Rail and truck freight carriers struggle to pull as many goods as they can from ports in order to deliver them as fast as possible; this traffic is harmful to ports as shippers begin to look for other less congested port solutions. In response to this congestion ports on the west coast of North America have slowing been creeping further north to facilitate quicker access to Asian markets, in addition to taking the traffic from Asian shippers.

Although there has been a move to locate ports further north and closer to Asian markets, there is also the issue of having access to rail, without it is not feasible to develop a port infrastructure. Again the synergy between ports and rail is called forth; without freight rail a port will fail, and if freight rail did not have a connection to any ports it would fail in kind. For this reason it becomes very complicated issue, do you create a port anyway and form a whole new rail system to support it; do you extend rail to the future site of a port and rely on public-private sector investors to invest in port development?

The Port of Prince Rupert's (the west coast's northern most port) solution was to build and continuously expand their port, but it was easily connected to the near by Vancouver rail system. Los Angeles and San Francisco expanded in much the same way until their ports could not expand any further and are now congested with no room to grow. In addition to there being few remaining places connected or rear rail, there are also very few places that have the natural deep water areas in which it is feasibly to establish new ports

- The Western United States has only 4 major ports with natural deepwater harbors and the necessary intermodal infrastructure, rail and interstate highways: Seattle to the extreme north, San Francisco to the middle, and Los Angeles and San Diego serving the south.
- All of these ports serve the lucrative and growing shipping business from China, Japan, Korea and other countries of the Asian rim.
- The two southernmost major US ports of Los Angeles (San Pedro) and San Diego have already reached, or will soon reach, the limits of their capacities and there is no room for expansion.
- This has caused the Mexican government to look seriously into building a major sea port to take advantage of Asia trade. But such a sea port cannot be just anywhere on the west coast --- it must be far enough north that it also provides efficient access to the wealthy US market.
- There are no railroads or major highways or other significant infrastructure in Baja California which would facilitate such a port being built there.
- The intermodal traffic and border security in California is already overloaded, and there is no room to expand.

Knowing that sea ports and freight rail systems generate tremendous local economic benefits and yet not having any foreseeable solution is the topic of some debate all over the U.S., Mexico and Canada.

Freight Rails Overall Economic Impact for Local Economies

Freight rail brings with it direct employment, indirect employment, local economic stimulation, new opportunities for entrepreneurs, competitive global positioning and raises the standard of living for entire communities. Freight rail needs access to sea ports to distribute goods and if both ports and rail work together in a local area their total economic impact is much stronger than it would be with rail alone.

Rail provides and supports millions of well paying jobs every year with the potential to create millions more as public and private entities strive to grow the advantageous freight rail system. However the question still remains, “Where and how do you strategically establish or enhance freight rail and sea port infrastructure to best benefit local economies and the international economic communities?”

International Economic Impacts

According to a recent report entitled "Transportation - Invest in America: Freight - Rail Bottom Line Report", prepared by the Association of State Highway and Transportation Officials (AASHTO) freight rail effects the international economy and its shippers because:

- 40% of intercity freight ton-miles are handled by rail.

- Rail freight moves over 600 miles on an average trip, while the average truck trip is about 245 miles.
- 92 billion truck-vehicle miles of travel would be added to the nation's highway system without our rail freight system.
- This additional truck traffic would cost federal, state and local transportation agencies an additional $64 billion over the next 20 years.
- If all rail freight were shifted to trucks, it would cost shippers an additional $69 billion per year - or $1.4 trillion over the next 20 years.
- Rail freight provides shippers with cost-effective transportation, especially for heavy and bulky commodities.
- Rail is also a preferred mode for hazardous materials shipments because of its positive safety record.
- Rail freight can be a critical factor in retaining and attracting manufacturing industries (and jobs) that are central and regional economies.
- Rail freight carries 16% percent of the nations' cross-border trade.
- Intermodal freight-rail service is critical to the global competitiveness of U.S. industries.
- Rail freight is fuel-efficient and generates less air pollution per ton-mile than trucking.
- Rail freight is vital to military mobilization and provides critically needed transportation system redundancy in national (and state) emergencies.
- The rail industry today is stable, productive and competitive, with enough revenue and profit to operate, but not enough to replenish its infrastructure quickly or grow rapidly.

Beyond the clear and diverse economic benefits that rail provides to international shippers with its many efficiencies, it is important to understand that freight rail still needs improvement. Improvements will come from public-private investment and intensive programs along with the strategic creation, extension, and repair of United State’s freight rail systems. Rail freight shipping is not now and will never be a solely one economy endeavor, successful future rail projects need to account for local economies, national economies, and the global implications of all new rail projects. Bolstering local economies in the U.S. with freight rail systems does no mean that it must directly provide economic benefits to

China, however, extending rail in a community means increasing international market reach, which helps local economies and the international originators to cost effectively provide their goods to new markets; or vise versa where a new rail extension my provide new manufactures, miners, or retailers a new way to ship products not just within their local community but to international locations as well, this again helps both local and international economies.

Environmental Impacts

This research paper has covered the importance of shortening containership travel from economic and efficiency standpoints, yet there is an even more important reason, the environment. When speaking about the environmental impacts of a particular form of transportation it is important to consider issues such as the effects on humans, animals, plants, geological formations, oceans, rivers, lakes, air, and the future of ecosystems as a whole. Containerships are a very serious contributor to pollution, in fact they are quite possibly the largest contributor of pollutants on planet Earth. They continuously, 24 hours a day for 280 days a year pumps such massive amounts of toxic particulate into the air that tens of thousands of people die as a direct result. The cost of the transportation of goods is often measured in fuel spent per ton-mile or the speed at which a ton of goods can be shipped, but the cost of containership travel every year can be measured in human lives. The following article is one of many that details the horrific cost of containership traffic:

> Britain and other European governments have been accused of underestimating the health risks from shipping pollution following research which shows that one giant container ship can emit almost the same amount of cancer and asthma-causing chemicals as 50m cars.
>
> Confidential data from maritime industry insiders based on engine size and the quality of fuel typically used by ships and cars shows that just 15 of the world's biggest ships may now emit as much pollution as all the world's 760m cars. Low-grade ship bunker fuel (or fuel oil) has up to 2,000 times the sulphur content of diesel fuel used in US and European automobiles.
>
> Pressure is mounting on the UN's International Maritime Organisation and the EU to tighten laws governing ship emissions following the decision by the US government last week to impose a strict 230-mile buffer zone along the entire US coast, a move that is expected to be followed by Canada.
>
> The setting up of a low emission shipping zone follows US academic research which showed that pollution from the world's 90,000 cargo ships leads to 60,000 deaths a year in the US alone and costs up to $330bn per year in health costs from lung and heart diseases. The US Environmental Protection Agency estimates the buffer zone, which could be in place by next year, will save more than 8,000 lives a year with new air quality standards cutting sulphur in fuel by 98%, particulate matter by 85% and nitrogen oxide emissions by 80%.
>
> The new study by the Danish government's environmental agency adds to this picture. It suggests that shipping emissions cost the Danish health service almost £5bn a year, mainly treating cancers and heart problems. A previous study estimated that 1,000 Danish people die prematurely each year because of shipping pollution. No comprehensive research has been carried out on the effects on UK coastal communities, but the number of deaths is expected to be much higher.
>
> Europe, which has some of the busiest shipping lanes in the world, has dramatically cleaned up sulphur and nitrogen emissions from land-based transport in the past 20 years but has resisted imposing tight laws on the shipping industry, even though the technology exists to remove emissions. Cars driving 15,000km a year emit approximately 101 grammes of sulphur oxide gases (or SOx) in that time. The world's largest ships' diesel engines which typically operate for about 280 days a year generate roughly 5,200 tonnes of SOx.

The EU plans only two low-emission marine zones which should come into force in the English channel and Baltic sea after 2015. However, both are less stringent than the proposed US zone, and neither seeks to limit deadly particulate emissions.

Shipping emissions have escalated in the past 15 years as China has emerged as the world's manufacturing capital. A new breed of intercontinental container ship has been developed which is extremely cost-efficient. However, it uses diesel engines as powerful as land-based power stations but with the lowest quality fuel.

"Ship pollution affects the health of communities in coastal and inland regions around the world, yet pollution from ships remains one of the least regulated parts of our global transportation system," said James Corbett, professor of marine policy at the University of Delaware, one of the authors of the report which helped persuade the US government to act.

Today a spokesman for the UK government's Maritime and Coastguard Agency accepted there were major gaps in the legislation. "Issues of particulate matter remain a concern. They need to be addressed and we look forward to working with the international community," said environment policy director Jonathan Simpson.

"Europe needs a low emission zone right around its coasts, similar to the US, if we are to meet health and environmental objectives," said Crister Agrena of the Air Pollution and Climate Secretariat in Gothenburg, one of Europe's leading air quality organisations.

"It is unacceptable that shipping remains one of the most polluting industries in the world. The UK must take a lead in cleaning up emissions," said Simon Birkett, spokesman for the Campaign for Clean Air in London. "Other countries are planning radical action to achieve massive health and other savings but the UK is strangely inactive."

The calculations of ship and car pollution are based on the world's largest 85,790KW ships' diesel engines which operate about 280 days a year generating roughly 5,200 tonnes of SOx a year, compared with diesel and petrol cars which drive 15,000km a year and emit approximately 101gm of SO2/SoX a year.

Containership travel is costly is every form of the word; it costs $100,000 a day in fuel consumption; it costs huge sums of money every days a ship must wait to offload goods at congested ports; it costs extra hundreds of thousands of dollars to travel all the way to the ports of L.A. and San Francisco as apposed to ports further north (because current northern ports cannot handle the traffic); and most importantly, it costs tens of thousands of people their lives.

There are many ideas in which serve to lessen the environmental costs of containership traffic including adding giant sails to the ships and removing containership traffic completely by connecting Russia to the U.S. via a tunnel that could handle massive train traffic. There is no quick fix solution for containership emission reduction, but the less time containerships spend traveling, the better for the worlds ecosystems. This is why North America and the U.S. need to find port solutions further north in order to greatly reduce the amount of time containerships spend traveling on our oceans.

On the other side of the coin lies the incredibly environmentally proficient counterpart of containerships, freight rail. Currently freight rail systems in the U.S. provide the most efficient and environmentally sound shipping infrastructure available. The U.S. Environmental Protection Agency estimates that for every ton-mile, a typical truck emits roughly three times more nitrogen oxides and particulates than a freight train; this is especially concerning when freight trains are capable of moving massive quantities of goods at one when trucks cannot. Related studies suggest that trucks emit six to 12 times more pollutants per ton-mile than do railroads, depending on the pollutant measured. According to the

American Society of Mechanical Engineers, 2.5 million fewer tons of carbon dioxide would be emitted into the air annually if 10 percent of intercity freight now moving by highway were shifted to rail.

In 2000, before trains were as efficient as they are today, railroads moved a ton of freight an average of 396 miles per gallon. If 10 percent of the freight moved by highway was diverted to rail, even then, the nation could have saved as much as 200 million gallons of fuel annually. Rail is also a preferred mode for hazardous materials shipments. The nation's railroads handled 1.7 million carloads of hazardous materials in 2000. Just 35 accidents took place that resulted in spills or leaks of the materials. Railroads have reduced their overall train accident rate 71 percent from 1980 to 2007 and 15 percent since 1990. Freight rail companies are consistently looking for ways to promote their environmentally friendly existence, in fact Newsweek Magazine has recently recognized this goal and labeled several freight rail entities as part of the "Greenest Companies" in transportation and aerospace:

> "Freight railroads are committed to preserving the beauty and natural resources of America and are being recognized for this dedication. In 2009, BNSF Railway Company, CSX Corporation, Norfolk Southern Corporation and Union Pacific Railroad were all named to *Newsweek's* "Greenest Companies" list for transportation and aerospace companies. *Newsweek* highlighted the railroads' initiatives to reduce greenhouse gas emissions, such as employing new locomotive technologies, electric cranes, and natural gas-powered locomotives and trucks and efforts to phase-out older locomotives. Plus all Class I railroads have joined the Environmental Protection Agency's Smart Way Transport Partnership, a voluntary partnership aimed at improving fuel efficiency and reducing greenhouse gas emissions."

As has been said earlier in this document, a combination of public and private entities is necessary for the successful future of rail, the same is true for a successful environmentally sound future. Having government programs to promote energy efficiency and environmental protection, whilst private entities enhance our nations transportation backbone with new environmentally friendly methodologies is an important partnership for global environmental stability. Many states are already on board with this idea and the following article segment is a good example:

> A multi-state freight rail project is promoting its ability to reduce carbon dioxide (CO2) emissions and fuel consumption as it seeks to build support for the hundreds of millions of dollars it needs to cover infrastructure investment costs.
>
> The National Gateway, a multi-state public-private partnership that aims to forge a new freight rail route between Mid-Atlantic ports and Midwestern markets, claims that clearing existing rail routes for double-stack freight trains would convert over 14 billion highway miles to rail-- and so reduce CO2 emissions by almost 20 million tons and fuel consumption by nearly 2 billion gallons.
>
> The group plans to invest over $840 million to increase tunnel clearances, raise bridges and develop new intermodal terminals along existing rail corridors to support the movement of double-stacked rail containers.
>
> To date, however, the project has received just $393 million in commitments from railroad CSX Corp. and its affiliates. State governments are currently expected to provide a further $191 million in funding and an additional $258 million will be requested from the federal government to fully cover the cost of the project.

As the entire rail industry begins spending billions of dollars worth of system improvements, it is increasingly seeking this public money to help pay for some of the expansion projects. Norfolk Southern, for example, is seeking public funding to help pay to upgrade the Crescent Corridor (mentioned earlier in the document), a network of routes between the New York City area and New Orleans. The industry is also asking Congress to pass a proposed bill that would give railroads tax credits for money spent on track expansion.

For the first time in decades, railroad stock prices have been going up instead of going down and it is because of all the major economic, efficiency, and environmental practices that freight rail has improved. The railroad industry has been assessed to have rapid and substantial growth over the next 30 years, and it has been postulated that it will need to expand its capacity by 88% in the next quarter-century, as highways get even more congested, fuel prices rise and more shippers decide to use trains to move their products.

Depth Conclusion:

Efficiency, Cost, International/Local Economic Impacts, and Environmental Impacts of freight rail are immense and benefit both the U.S. and the countries we trade with. Rail has the ability to transform our transportation infrastructure into a more cost effective marketplace by taking over more of the unnecessary and economically/environmentally toxic long distance truck traffic in North America. Rail is also a key player in expediently moving massive quantities of goods over medium to long distances from busy port locations much more efficiently than truck. Freight rails place in North America is part of the over all intermodal structure of goods disbursement and the more freight that can be feasibly moved to rail, the more this continent will feel the many benefits.

America is at a crossroads of significant importance when it comes to rail; there is the path of extending, creating, and repairing railways; or the path of no longer funding rail projects and letting one of the most efficient, cost effective, job creating, environmentally friendly methods of transportation disappear forever. The question of which path to take is not a moral one, it is a good idea, but the cost of which is needed to fully develop our rail system is a cost that must be bared by public and private entities all across this nation. The repercussions of this much needed investment in rail over the next 30 years will both cost and create billions of dollars, create millions of jobs, and raise the overall standard of living – from cleaner air to breathe to a more financially stable country.

In summation, the findings of this report clearly finds:

1. There is a great need for more investment in rail freight infrastructure and a national strategy that supports rail capacity expansion and investment without sacrificing efficiency, cost effectiveness, economic development, and environmentally sound methodologies.

2. That rail is the most efficient means of transporting goods in terms of speed, reliability, quality, energy efficiency and carbon emissions.

3. Intermodal transportation is critical to meet both current and future global shipping needs.

4. The prevailing economic/environmental trend among ocean shippers is to reduce the distance containerships need to travel in order to deliver goods and offload those goods as quickly as possible.

North America needs to search for existing ports and potential port sites further north that would assist Asian shippers in reducing ocean shipping distances, provide local, regional and national economic stimulus and relieve much of the current and forecasted pressure on existing and largely capacity-fixed ports.

Application

Description of Proposed Alaska Canada Rail Link

What is the Alaska Canada Rail Link?

The Alaska Canada Rail Link (ACRL) is the railroad link from Alaska to the rest of the North American rail system (from Alaska to Canada and down to lower 48 states) and has been under consideration since the Alaska Railroad was started in 1914.

There have been many attempts to determine where the real value is in the rail link, and there have been equally as many plans to support each theory. The vast majority of these studies tend to focus on regional prospects and direct benefits to relatively small groups of people. Single states in the U.S., groups of people in Canada, people in the mining industry, benefactors of the proposed natural gas pipeline, and so many others have lobbied and reported on every facet of the individual benefits of the rail link. Suffice it to say that many individuals would benefit and profit from the existence of the link, however, developing a complex global view that details the benefits a huge portion of the international market could share and the millions of people who are directly or indirectly tied to it will, most likely, provide a significantly more feasible plan.

This report will focus on international trade patterns between the U.S., Asia, Canada and Mexico in tandem with the overarching economic, efficiency, environmental, and cost elements associated with the ACRL's construction. The report will reconstruct and elaborate upon in-depth information acquired from local Alaskan studies, Canadian studies, and others from around the world to form the "best possible case" for the links creation.

Taking on containership traffic from Asia is the crux of the ACRL Project if it is to come to fruition. This inherently requires elements of international cooperation with, and political affirmation of the project, which will only come if all regions and entities can find value. Value for this project has often been solely measured in monetary amounts when there are many other factors that need equal consideration such as; security enhancements, speed & availability development, local/international job creation numbers, transportation infrastructure improvements, environmental/sociological impacts, capacity increases, intermodal transport improvement, and the ACRL's position in future projects.

Brief Narrative of the Evolution of Rail and the ACRL in Alaska

A brief history of rail in Alaska is an important starting point in order to discuss the over all plan for the proposed ACRL and how it can, strategically, be accomplished.

> The White Pass & Yukon Route Railroad, from the port of Skagway, Alaska to Whitehorse, Yukon was completed in 1900 by private investors. The Alaska Railroad was built by the US federal government in 1914-1923 and taken over by the State of Alaska in 1983. This railroad connects ports near Anchorage with the interior of Alaska around Fairbanks. Neither railway has a link to the North American Rail system, except by sea going barge.
>
> Interest in further railroad development has been maintained from the beginning, and there have been many public and private efforts and schemes to build a link to the south. None have produced any operating railways.
>
> A study was conducted by the US War Department in 1942. It estimated that a rail link could be built in two years with 17,000 men. The project was abandoned primarily because the time was considered too long, and the Alaska Highway was built instead.
>
> A second study was conducted in Canada in the late 1960's, at a time when national interest in development of the Northwest was very high. It was estimated that a rail route into Yukon could be built for $400 million, without a link to the Alaska Railroad. No construction was funded.
>
> More recently, in 2000 then US Senator Frank H. Murkowski of Alaska introduced the Rails to Resources bill in the US Senate. The bill proposed to fund an international commission to study the possibility of a rail link from B. C. to the existing Alaska Railroad. The bill was passed and authorized $6 million for the study.
>
> The US government then invited Canada to participate in the commission. Canada did not respond immediately, but the Yukon government recognized the importance of the project to its own economy. Yukon commissioned a review to confirm that is was an appropriate time to conduct such a study.
>
> In 2005, Premier Fentie and Governor Murkowski met with Prime Minister Paul Martin to discuss the project. The Prime Minister expressed support on behalf of the Canadian federal government, and the Minister of Transportation concurred.
>
> In March of 2005 Governor Murkowski and Premier Fentie signed a Memorandum of Understanding to initiate the Alaska Canada Rail Link Feasibility study. Past studies have made the case that resource deposits in Alaska, Yukon, and British Columbia were the primary benefits that the rail link would provide with very little emphasis on global trade and the necessity of having the rail link in Alaska. Although global trade dynamics have been mentioned in previous studies, it has always been briefed as a "long term" possibility that was not a heavily weighted portion.

The evolution of rail and the proposed ACRL in Alaska has currently ceased to make progress due to the lack of international focus. Current mining of minerals inside the state is insufficient to prompt an $11 billion dollar project; the export value is simply to low and would fail to pay back the cost of the rail system effectively. As was stated in the most recent 2006 report, the "Alaska Canada Rail Link Phase 1 Feasibility Study," there has been very little emphasis on global trade, which is the most important aspect of the project.

Project Overview

The proposed ACRL would be comprised of approximately 1,500 miles of new freight rail track that will connect Delta Junction, Alaska to Fort Nelson, Canada. This would be the first link-up of the Alaska rail system with the rail grid of the rest of continent. This would also be the first time that the many ports in Alaska would have a direct connection to the rest of North America. The project would be designed entirely around the concept of international trade; this being accomplished by leveraging the routes of containerships that move massive quantities of goods and providing them with the shortest distances from Pacific ports such as Japan, China, Korea, and Russia. This approach would likewise utilize the vast minerals and fossil-fuel wealth of the region, but this would be for development, not simply extraction.

The ACRL will have a continuing construction program to progressively expand the U.S. and Canadian railroad network to bolster local economies (where otherwise there would be no economic development) by allowing small cities like Whitehorse to build rail yards, resupply stations, mining exportation sites and other local infrastructure improvements that, without rail, would not be viable. Programs to consistently improve the rail line to increase capacity and electrification of the railroad lines is expected to be implemented in order to reduce unit energy and maintenance costs as well as to support regional economic development for the native reserves (such as First Nations) and other communities.

In addition, it is expected that passenger traffic is expected to add 5-10% to the railroad revenue base for tourist and cruise trains, plus online passenger services for business and pleasure.

The three commodities most likely to add to the freight traffic base for the Alaska-Canada rail connector are crude oil and petroleum products as one category, intermodal trailers and containers as a second category, and local products such as products from resource extraction and other locally made products. The ACRL will open a door for entrepreneurship in both Alaska and Canada by providing the ability to ship goods, cost effectively, where there may not have been the ability to ship goods before. The proposed ACRL will then have the ability to serve as the engine for the overall economic development of Alaska and Northwest Canada; the economic implications will be especially influential for the native reserves and communities along the route where new energy facilities, mines, forestry operations, and industrial facilities would be located.

The expected freight traffic volumes to be generated by utilizing the ACRL are very high as it will carry a significant percentage of goods from Asia and other Pacific shippers. The overarching plan for the rail system is to continuously provide improvements and eventually expand the Alaskan rail system to the west to prepare for the, seemingly inevitable, Bering Strait tunnel. The Bering Strait tunnel would exist between Russia and Alaska and would join all major economic hubs, from London to New York, and everywhere in between. The completion of the ACRL will put international pressure on the Bering Strait tunnel's creation, because without the ACRL the tunnel will not be created.

The ACRL would take advantage of the ports of Point Mackenzie, Anchorage, Seward, Whittier, and Skagway to distribute goods from Asian containerships to the rest of the United States. The ACRL will also connect all of Alaska's major ports to the manufacturing, surface transportation, and population center of the US and Canada. Port congestion on the West Coast of the US and Canada will continue as port sites are limited and as trade growth in the Pacific Rim is expected to continue for the foreseeable future. The Alaska port connection will help mitigate this congestion in the future. Speed and reliability are increasingly valuable in the just-in-time, global economy. This will also reduce costs and delays that result from land to sea, sea to land commodity transfers.

- The proposed ACRL would create over **1,045,000 working years of labor**.
- The proposed ACRL would create an estimated **150,000 new high paying jobs**, typically earnings around $50,000 – $75,000 a year.
- The proposed ACRL would create **$5,000,000,000 in new wages.**
- The proposed ACRL would make Alaska an international hub for the exchange of goods and could (based on acquiring 10% of west coast port traffic) save Asian shippers approximately:
    - **USD $759,110,400 in annual savings** from shipping to LA/LB or;
    - **USD $332,110,800 in annual savings** from shipping to Prince Rupert or;
    - **USD $1,636,831,800 in annual savings** from shipping to New York
- The proposed ACRL would allow Alaska and Canada to ship out an estimated **$170 billion in domestic products**.

- The proposed ACRL would save Alaska **$41 billion in transportation cost cuts** for mineral resource production.
- The proposed ACRL would create new entrepreneurship opportunities (in both rural and urban Alaska) otherwise unavailable without direct transport of goods to international markets.

The ACRL will provide new international direct and indirect value:

- During the construction of the ACRL
- During the operation of the ACRL
- By increasing wages and lowering the cost of living
- By expanding and enhancing the oil and gas industry to make money and create jobs
- By expanding and enhancing the resource extraction industry to make money and create jobs
- By expanding and enhancing the tourism industry to make money and create jobs
- By expanding and enhancing the global shipping industry to make money and create jobs
- By enhancing the environmental benefits of international/national trade through increased use of rail instead of containership, truck, and airplane.
- By expanding and enhancing the operating ability of Alaskan ports to make money and create jobs
- By creating a transportation infrastructure to help induce the creation of the Bering Strait Tunnel
- By providing opportunities to create new jobs and commerce in the global community over the next 40-50 years

Current Economics for Alaska and Canada

Overview

This section will focus on the current economic status of Alaska and Canada and then determine what economic impacts the ACRL could have on both their regional and local economies. This document will delve into what is already known about the regions and what potential elements exist for further economic diversification in relation to the ACRL.

Alaska's Current Economic Status

Alaska is a very large (covering nearly 572,000 square miles), relatively wealthy, but sparsely populated state. The state economy is dominated by the economic powers of oil & gas extraction and government. Those two powers are strongly interconnected as royalties and taxes from the oil & gas sector provide nearly 85% of the State of Alaska's revenues. Other important economic sectors in Alaska include tourism, construction, mining, and, to a smaller extent, fishing and seafood processing of salmon, crab, shrimp, halibut, herring, and cod. Alaska has very little agriculture, ranking last in the nation in number of farms and value of farm products. The state's best arable land is in its South central region, in the Matanuska Valley North of Anchorage and the Tanana Valley (around Fairbanks). The state's most valuable farm commodities are greenhouse, produce and dairy products and potatoes.

Government—federal, state, and local—is Alaska's major source of employment. The state's strategic location has generated considerable defense activity since World War II, including the establishment of highways, airfields, and permanent military bases. Alaska's tourism increased dramatically with the help of improvements in transportation; it now follows only oil among the state's industries.

Alaska is a resource extraction, tourism and government operated state with the potential to become an economic powerhouse if it can expand its economic activities. However diversification is very difficult because Alaska is at the end of an economic stream, the termination point for goods coming into the state, and the origin point for raw materials

leaving. Analysts have argued for in-state processing of raw materials - oil, timber, fish - but this has not been shown to be cost effective yet. Because transportation and infrastructure costs are high, value-added (processed) products would not be able to compete favorably when exported from the state. So while analysts and politicians have routinely urged diversification, proposals and initiatives have produced little.

Some have suggested that the greatest potential for expanding the economic base is education. A well-educated populace may generate new perspectives and ideas that might reduce the state's economic dependency. Such a solution is long-term. In the meantime, growth in the tourism industry, while highly visible, does little to displace oil production and federal spending. 80% of general fund revenue for the state comes from taxes on oil production, and investment of the royalty payments to the Alaska Permanent Fund. And while industry spokespeople assure that production will remain stable in Alaska for the next several decades, fluctuations in the price of oil and continuing exploration in other parts of the world suggest that there is less predictability to production stability than can be relied on. The development of North Slope gas deposits and construction of a natural gas pipeline would add value to the Alaska economy. And while a wide majority of Alaskans support opening the coastal plain of the Arctic National Wildlife Refuge to oil drilling, until exploration drilling should confirm predictions, no one knows how much, or what kind, of oil may lie there. And as ANWR is federal ground, the revenue it would generate for the state would be far less than that generated by North Slope production. Thus it is likely that the Alaska economy will be as narrow and vulnerable as it is now for some time to come.

There is no question that Alaska (with its vast natural resources, tourism, and public jobs) has the opportunity to become economically powerful, the question is, how can this be accomplished.

> We did not have a housing bubble like Nevada. We do not have a large heavy manufacturing sector like Michigan. And unlike California with a $16 billion hole in its state budget, we have a large state fiscal surplus. (Goldsmith, 2009)

Alaska has the money but has seemingly no marketplace to stimulate, this is because almost all of the businesses in the state serve as support entities to people who work for oil, resource extraction, or tourism. An explanation of this current state of affairs has been described as a 3-legged stool in which Alaska's entire economy relies upon 3 different "legs" where natural resource extraction is one leg, federal government is another leg, and the last leg is strictly oil dependency. Scott Goldsmith of the University of Alaska Anchorage, Institute of Social and Economic Research (ISER), describes this state of affairs by reconstructing the 3-legged stool model with the 1/3 model:

> About 1/3 of jobs and income can be traced back to the production of our traditional natural resource industries, those depicted on the state seal,-- fishing, mining, timber, as well as tourism, air cargo, and retirees. 1/3 can be traced to the dollars flowing into Alaska from the federal government. And 1/3 of jobs and income depend on the petroleum industry.
>
> What about the construction industry, the banking sector, health care, the university, or the many other industries that employ most of us in this room? It's not that these sectors are unimportant for the economy, but rather that if you work in one of these industries, your job would not exist without an inflow of dollars from one of these drivers.
>
> To take one example, if you work for a bank, roughly 1/3 of your coworkers have jobs because of our traditional resources, 1/3 because of the federal government, and 1/3 because of petroleum. The health of the banking industry ultimately depends on the health of those economic drivers.
>
> So lets look at each leg.

Traditional industries—particularly mining and tourism--have posted some impressive gains in recent years. Unfortunately among other challenges they have a size disadvantage. In spite of healthy growth, they still make a very modest contribution the overall size of the economy—about 14% of income comes from tourism and mining.

Looking back over the last 22 years, only a fraction of the growth can be traced to these sectors. It is a mistake to think, as many have done, that the economy was diversifying and "moving beyond" dependence on oil. In reality their growth only allowed them to hold their share.

Looking forward, with implementation of the right policies, these traditional sectors will continue to grow. But their contribute, at best, will be modest. For example a doubling of the contribution of mining to the economy would increase total employment only 2.5%.

At this point I need to mention the two terms most often heard in conversations about economic development in Alaska -- value added processing and economic diversification. 50 years of effort in these areas has produced minimal results. I don't think its because we were stupid.
Rather there are some hard economic facts that make these goals nearly impossible.

Turning to federal spending, everyone is aware of the "Ted Stevens" effect, but many people don't realize that the increase in those dollars has accounted for a large part of the job growth we have enjoyed over the last decade. That boom ran out of steam in 2006, and falling federal spending since then has been a brake, acting against growth.

That brings us to petroleum.

Everyone agrees that petroleum is an important driver, but like federal dollars, Alaskans tend to underestimate just how much petroleum means to the economy.

First, unlike tourism or commercial fishing, most of the action occurs remote from where most Alaskans live, so we just do not see it. If the Liberty oil rig, almost as tall as the Statue of Liberty, were off shore down at Ship Creek, we would have a much better sense of what drives our economy.

Second, 9 out of 10 of us were not here before petroleum. So we have little collective memory of the difference petroleum has made. Also, our attention has been diverted by good fortune--the run-up in the price of oil and other commodities, a decade long boom in federal spending, and a booming US economy. These made us complacent about petroleum's role.

So how important is petroleum?

The easiest way to understand this is to think of what would happen if a terrorist set off an atom bomb under Prudhoe Bay while we sit here over lunch, rendering all the oil and gas radioactive and un-saleable.

Over 40 thousand jobs directly and indirectly related to exploration, production, and transportation would disappear. The large share of government jobs funded by petroleum revenues plus many private sector jobs dependent on public spending would disappear, leaving an additional 50 thousand Alaskans without employment. The boost from the PFD would soon disappear as well. Altogether 1/3 of all jobs would be gone.

> But this is only part of the story of petroleum's importance. If we look at how the state has developed, we can see that the petroleum industry has generated spinoff benefits for our other economic drivers, helping them grow, and for the rest of the economy as well—transforming it from infancy to adolescence.

This perfectly outlines the state and its current economic climate with the importance of oil, natural resources, and tourism.

This 3-legged economy is however, a recipe for disaster. If one of the legs should fail this means a loss of as many as 50,000 jobs throughout the state, a loss that the state cannot afford. If (and when) Alaska suffers a tremendous earthquake that puts travelers in fear of coming to Alaska, or if (and when) oil reserves are reduced to the point of a non-financially feasible position, or if (and when) Alaskan fishers, miners, foresters are for any reason prohibited to fish in certain areas of unable to extract resources due to lack of transport availability what will Alaska do?

The truth of the matter is that all three legs are constantly in jeopardy, even today.

Oil - There are growing sanctions on the oil industry across the United States telling them where they can and cannot drill or making them pay incredible fees to do so. A tax hike created by ACES (Alaska's Clear & Equitable Share), which was adopted by the legislature in 1997, is the third and largest production tax increase in a 3-year period. It increased production taxes by 50% from 2007 and 350% from 2006 based on an $80/barrel market price, and includes an aggressive "progressivity" formula that boosts the tax rate as oil prices increase. As Andrew Halcro, an Alaskan economic development expert points out:

> "…With current prices of about $80/barrel, the production tax alone is 40% of net revenues, and the total government take is 70% (including state royalties, production tax, state income tax, state property tax, local property taxes and federal income tax)…
>
> …If Democratic state lawmakers oppose tax incentives to stimulate investment in Alaska that's their right. But it's Alaskan's right to know what the Democrats plans are to grow the economy, absent adopting incentives for the state's largest taxpayer…
>
> …So far, their ideas seem to have nothing to do with growing jobs and more to do with growing government obligations… "

Aside from taxes on oil in the state and sanctions creating costly waiting periods for new development (such as potential drilling in ANWAR), oil has, as a whole in Alaska, begun to slow its oil exploration. From declining investment, to increasing costs, to the shift towards more environmentally conscious fuel sources, oil in Alaska is starting to slow down; ConocoPhillips, the most active company in the state, is not drilling exploration wells for the first time since 1965; BP, the second largest oil producer in Alaska and the operator of Prudhoe Bay, plans to spend 15 percent less this year on Alaska capital projects than it did in 2009; Oil exploration may be slow at first, but they will continue to produce oil for decades to come, the problem is for the 50,000 people employed in Alaska because of oil.

A new influx of jobs, just like oil exploration and infrastructure expansion, will continue to slow. 1,300 jobs were lost world wide at ConocoPhillips in 2009 and they cut their budget from $20 billion in 2008 to $12.5 billion in 2009. Oil companies are simply making due with their current infrastructure in the U.S. and cutting costs where ever they can. This slowing of development may affect relatively few people within the industry at first, but this also means that new employment opportunities will fade away as oil giants like ConocoPhillips continue to downsize.

So if oil companies are ceasing to exhibit growth in the state what about the next leg, tourism/natural resource extraction?

Tourism & Natural Resource Extraction- Tourism in Alaska has generally relied on South Central locations to provide glacier cruises, train tours, fishing trips, canoeing, snow machining, mountain climbing and etcetera. These activities all revolve around our current limited transpiration routes, cost, and capacity to serve tourists. Alaska's tourism often struggles to serve the nearly 1.7 million-plus visitors it receives on a yearly basis (with its own internal population of only 640,000); that's almost 3 tourists for every 1 Alaskan. Although, Alaska wields a tremendous landscape with the opportunity to serve even more visitors, the states workforce and infrastructure simply does not exist to serve them.

The lack of entrepreneurship, capital, capacity, employment opportunities, the current recession and the overall lack of transportation infrastructure are driving tourism down. For example, the cruise industry, one of Alaska biggest economic contributors, was analyzed by The Alaska Travel Industry Association and they discovered that 140,000 fewer cruise passengers would visit Alaska in 2010 as a result of capacity cuts by big-ship lines like Princess, Holland America, Royal Caribbean, and Norwegian Cruise Lines. Fewer tourists jamming the streets might be a boon for Alaskans who dislike the influx of strangers, but if Alaska can no longer pull in usual $1.5 billion annually from tourism, it will reduce the spending power of many communities in the coming years. In fact some local governments, such as the Denali Borough, derive most of their operating revenue from room taxes levied on local hotels and motels, of which without they would suffer intensely.

> In regards to the money that tourism provides Alaska: "It really does trickle throughout the entire economy," said Julie Saupe, president of the visitors bureau.

Yet, the loss of tourists isn't just noticeable to local governments, it results in less sales to a multitude of other businesses in Alaska.

- Roughly 11 percent fewer people got off a plane at the Stevens International Airport, according to state officials.
- Car rentals at the airport were down 25 percent.
- Anchorage hotel revenue was down roughly 22 percent, according to the city's visitors bureau.
- About 25 percent fewer people visited Anchorage's five visitor information centers, which are run by the bureau.
- Bookings on the Alaska Railroad are down 10 to 15 percent, year to date, according to the railroad.

This list of financial damage continues through most all businesses in Alaska and the problem is only worsened by the declining employment rate in the state.

Contributing to economic deficiencies is the fact that over 75 percent of Alaska is inaccessible by roads, and therefore, many tourists. Even with only 25 percent of Alaska readily available for tourism and with the current economic decline the state still managed to pull in the aforementioned $1.5 billion. Investment in the states transportation infrastructure could generate billions of dollars and is vital to its success, but tourism alone is not a cost effective or financially powerful enough driver to spark the change.

***Resource Extraction (other than oil)* -** Resource extraction (other than oil) generates the remaining state revenue for this leg of the stool, and is currently running out of room. For example:

Alaska's minerals industry has grown in gross value from $290 million in 1981 to $4 billion in 2007. The state forecasts industry value to grow to nearly $11 billion by 2024, but only if major mining projects are undertaken to expand mining options with accompanying transportation infrastructures. The problem with mining is similar to the problem with tourism, lack of infrastructure, it is easy to think that it is a good idea to mine in an area rich with coal (of which Alaska has a base estimate of 5 trillion tons of undeveloped coal reserves), but does Alaska have the ability to move that coal in

a cost efficient manner? The answer is of coarse, not yet. In as short as 14 years the mining industry could provide at least 15,000 direct jobs to the state and greatly enhance the economy.

The forestry industry shares a similar problem but has the potential to become sustainable with proper management and the right transportation infrastructure. Still, there has been very little progress in the forestry industry due to lawsuits, poor management, lack of market reach and continued investment.

There is the uncertainty over how to best manage and distribute the now viable timber supply in Southeast Alaska (of the nation's largest national forest, the Tongass National Forest).

On the Kenai Peninsula, the wood-chip operations are struggling, in part because the beetle-killed timber has deteriorated significantly. Two operations are now closing.

The Ketchikan Wood Technology Center is now very close to having Alaska Standards approved so that the higher strength characteristics of the old-growth timber can be better marketed, but has not accomplished this to date.

The State and the Ketchikan Borough, who can no longer run the veneer mill, are working diligently to find a company to purchase and operate this Ketchikan mill.

In contrast however, with mineral extraction activities continuing to suffer, the fishing industry seems to become increasingly more prominent in Alaska's economic environment.

Commercial fishing forecasts can be difficult to predict, but the overall outlook is that Alaska's commercial fisheries will continue to provide the public with well more than half of U.S. domestic seafood production, and benefit from a market premium based on the value of the State's investment in the "Alaskan brand". Alaska's historical focus on sustainability ensured that it would have seafood to harvest and is now paying off in the marketplace, with large retailers such as Wal-Mart and Costco now considering this criteria - with the result of more Alaska seafood on their shelves.

Building the "Alaskan brand" is a difficult feat to accomplish as it requires the promotion and retention of quality products, quality image/marketing methods, and cooperation amongst the different facets of the fishing industry. In building this brand Alaska has helped secure its market share, but the industry must now make the marketplace understand Alaska's seafood superiority by intelligently expanding and selling more products, with higher quality, faster.

For the fishing industry the question has not been, do people like the product, it is how many people can access it, with what level of quality, and for what cost. Alaska is strategically located close to Asian markets, more so than any other place in North America, and Alaskan minerals, wood products, sea foods, etc. have the potential to enter these markets with great speed and at low cost if Alaska businesses can enhance branding power and gain access to new efficient transportation infrastructure.

This brings us to the last "leg" which is the money coming in from the federal government that our local government controls.

Federal Money – Government spending in Alaska has become increasingly more precarious with the declining activity in oil production, resource extraction, and tourism. Alaska invests its federal dollars in primarily

- Health Care – Most of which goes to pay welfare. **$1,470 Million**
- Education – Most of which goes to K-12 and college institutional development. **$3,250 Million**

- Transportation – Most of which goes to road maintenance and expansion projects. **$2,105 Million**
- Pensions – All of which are for Old Age Pensions. **$909 Million**
- Protection – Which pays for courts, prisons, and police. **$1,045 Million**
- Other Spending – Most of which goes to general public services, electric utilities, and economic affairs. **$3,829 Million**
- Total Spending of Federal Dollars in Alaska – **$16,047 Million**

This money provides jobs to many Alaskans and will continue to increase Alaska's economic stability. As a state, Alaska has relied on this federal funding and has been able to match or exceed many federal dollars with funding from its own internal activities. In fact taxes from oil production alone had produced $6,092 million in 2009 with other industries contributing another $948 million. The fact remains that even within government, oil still plays the biggest role in Alaska.

With Alaska's dependence on oil the question shifts to, what does the future hold for oil? The State of Alaska Department of Revenue believes that:

> Fiscal year 2009 was a tumultuous year for the price of Alaska North Slope (ANS) oil. It began the year at about $130 per barrel, then five months later dipped down to $38 per barrel, and finally ended the year at about $70 per barrel. Total general fund unrestricted revenue in FY 2009 was $5.8 billion. In FY 2010 and 2011, the department forecasts oil prices to be $66.93 and $76.35 with unrestricted revenues totaling $4.8 billion and $5.2 billion, respectively. The oil price and revenue forecast for FY2010 represents a significant increase from the forecast provided last Spring, which estimated an average FY2010 oil price of $58.29 and unrestricted revenues of $3.2 billion. Revenue from oil and gas production is expected to provide over 87% of the state's unrestricted revenue through FY 2019.
>
> Oil production on the North Slope declined 3.3% from FY 2008 to FY 2009, and declines are expected to continue into the near future. In FY 2010, we forecast daily output of approximately 659,000 barrels of oil, a 4.8% decline, and in FY 2011, we forecast a 5.4% decline, down to approximately 623,000 barrels per day. We anticipate new production coming from the Nikaitchuq field before the end of CY 2010, and continued development in the new Oooguruk field and in Point Thomson. Exploration in the National Petroleum Reserve- Alaska, the Foothills, and parts of the Colville River Unit are ongoing. Production is expected to increase in fiscal years 2013 and 2014, rising above FY2011 levels, and then begin to decline again in FY 2015.
>
> House majority leaders want to limit government spending this year, worried about what the expected, continual decline in oil production will mean for Alaska's energy-dependent economy.
>
> They were noncommittal Tuesday on key pieces of Gov. Sean Parnell's agenda, including his proposed crackdown on domestic violence and a $400 million merit scholarship plan, saying they had questions about the cost of the first and the scope and fairness of the second.
>
> They also pledged to keep working on an energy policy and looking at whether Alaska's oil and gas production tax was stifling production and needed more drastic changes than the expanded incentives fellow Republican Parnell has sought.
>
> House Speaker Mike Chenault said he believed lawmakers could accomplish at least a portion of the work before them within 90 days, but that they should not be "hemmed in" to that time constraint.

> Much of what they'll take up isn't new, particularly on the energy front. But this session comes against the backdrop of an election year, with 50 of 60 legislative seats and the governor's office up for grabs.
>
> It also comes amid still-unanswered questions about companies' commitment to — and, ultimately, the fate of — a major gas pipeline in the state. Whether lawmakers take steps aimed at prodding pledges and production remains to be seen.
>
> While lawmakers expect to have a budget surplus, they seemed, at least initially, to have little interest in significantly increasing spending.
>
> Parnell, who gives his first State of the State address on Wednesday night, has said his budget would hold growth of state agency operating budgets to about 2 percent, far less than they'd sought. House Majority Leader Kyle Johansen, R-Ketchikan, said agencies would need to justify their funding requests. State finance officials are slated to give revised budget estimates later this week.
>
> House Minority leader Beth Kerttula, who's been receiving treatment for a compressed nerve and missed the start of the session Tuesday, said Democrats agree on the need for responsible spending, given the state's heavy reliance on oil revenue to run and forecasts of slumping production.
>
> But she said the state also must "think big" when it comes to energy, and ensuring competition. She said she was not convinced oil companies need more incentives to do business here, and that she'd view a push for any major cuts under the current oil tax system as "holding the state back."

Alaska needs its revenue from oil because Alaska's economic viability is hinged on its continued success. This is a reality, but with 85% of all revenue for the state coming from oil, there is a dire need for economic diversification. Alaska's government has money to invest and vast geographical vantage points yet to be utilized. It is understood that, with the power of oil already fueling the state, it can prove to be very difficult when assessing new ventures to determine if they are worth while to attempt.

Yukon's Current Economic Status

The Yukon is a large territory with a small population and the heavy reliance on government that is typical of relatively remote northern jurisdictions. Although the Yukon has a variety of economic and industrial sectors, government (largely financed through federal transfers) is by far the largest. The Yukon's strong public sector and its continued growth through increased federal government transfers has proved to be a double-edged sword; it has provided economic stability but has done little to generate new growth and exports. In a sense, the Yukon can be viewed as a single industry economy. And, although that industry is unlikely to abruptly close, the Yukon would benefit greatly from better economic diversification. Having said this, the further development of the Territory's extensive resources could contribute significantly towards it becoming a more sustainable economy.

Outside of the public sector the Yukon's leading industries revolve around the mining of; lead, zinc, silver, gold, and copper. Tourism is the second most important industry; the area's colorful history and beautiful scenery draw visitors. Manufacturing has increased in importance, with such products as furniture, clothing, and handicrafts but is of little economic significance. Finally there are hydroelectric facilities at Whitehorse, Aishihik, Dawson and Mayo.

Transportation facilities are limited but there is an international airport at Whitehorse.

With a population last recorded at around 34,000 people the Yukon is vast and relatively under populated. According to the Yukon Bureau of Statistics the Yukon Territory has the following economic elements:

Mining

Work to bring both the Wolverine and Bellekeno mine projects into production in 2010 is currently ongoing. At Wolverine, the 205 person camp was completed in 2009 with project related employment currently in excess of 200 people. Production is now expected to begin mid-2010. Alexco Resource Corporation announced its plans to proceed to production at the Bellekeno project on November 11, 2009. Alexco will initiate construction activity at Bellekeno and anticipates that production at the project will commence in the third quarter of 2010.

Mineral exploration expenditures for 2009 are now estimated to total around $90 million, surpassing the estimate of $25 to $40 million made in the May 2009 Outlook publication. The upward revision to the estimate for 2009 is due in part to increased interest in properties near Underworld Resources' White Gold property following excellent drill results by Underworld Resources in the spring of 2009. Recent positive results along with strong gold prices throughout 2009 have helped contribute to over 7,000 new claims staked in the area around the Underworld Resources property. Changes to the Claims and Administration section of the Quartz Mining Act to simplify staking have also helped contribute to the recent staking rush. As well, numerous exploration projects including White Gold, Keno Hill, Wolverine, Rau, Casino, Brewery Creek and Selwyn Resources Selwyn zinc-lead project had higher than expected exploration spending in 2009.

Other projects such as Northern Freegold, Victoria Mining's Eagle Gold, and Western Copper's Casino are expected to contribute to future growth in Yukon's mining sector. It is anticipated that 2010 will see three operating hard rock mines in Yukon, with production from the currently producing Minto mine joined by production from the Wolverine mine in mid-year and from the Bellekeno mine in the third quarter.

Capstone Mining Corporation's results from its 2008-09 exploration programs at the Minto mine proved very positive. Even taking into account reductions due to two years of production, the estimated measured and indicated mineral resource saw an increase of over 32% in contained copper, over 38% in contained gold and over 28% in contained silver over the last consolidated estimate reported in 2007.

Prices for a number of minerals of interest to Yukon saw recovery from the lows recorded in the early days of the economic downturn in late 2008. Copper prices have increased throughout 2009 with the price at the time of writing of this publication of U.S.$2.99 per pound (November 11, 2009), more than double the price of U.S.$1.39 per pound recorded at the beginning of 2009. Current copper prices, while down significantly from the record high of U.S.$4.08 per pound recorded on July 3, 2008, are up substantially from the low of U.S.$1.26 per pound recorded on December 24, 2008 during the worst of the global economic downturn.

Gold prices continued to be strong throughout the economic downturn and into 2009. Gold prices for the month of October 2009 averaged over U.S.$1,044 per ounce, a record high. Year-to-date (to November 11, 2009) gold prices averaged a record U.S.$948.84 per ounce, up 7.6% from the previous record of U.S.$881.68 per ounce recorded in the same period in 2008.

At the time of publication of the Outlook in May 2009, a relatively low Canadian dollar versus the U.S. dollar was providing benefits to Yukon producers in terms of value of production. In recent months, the value of the U.S. dollar has weakened significantly versus the Canadian dollar. This has been a positive for Canadian operators who need to purchase machinery and equipment for exploration or development activities, as many of these items are priced in U.S. dollars. The higher Canadian dollar does have some negative impacts for Canadian mineral and metal producers as they receive less for their product due to the lower exchange rate differential. For Yukon placer gold producers, the high price of gold in U.S. dollars has helped soften some of the negative impacts coming from the high and strengthening Canadian dollar.

Oil and Gas

Current estimates of Yukon oil and gas potential indicate onshore estimates of 17 trillion cubic feet of conventional natural gas potential and 790 million barrels of oil. Current estimates of potential for the Beaufort Sea offshore include 40 trillion cubic feet of conventional natural gas and 4.5 billion barrels of oil.

Production at Kotaneelee, Yukon's only producing gas field, declined in 2009, dropping to 57 million cubic meters from 76 million cubic meters in 2008.

Yukon's oil and gas rights disposition process occurs twice each year. The Spring 2009 Call for Work Bids closed on June 10, 2009 with Permit #0019 being issued to Northern Cross (Yukon) Ltd. for work in Eagle Plain. The Government of Yukon's Oil and Gas Rights Disposition Fall 2009 Request for Posting closed on July 15, 2009 and yielded no Request for Postings. The next opportunity for industry to express interest in Yukon oil and gas rights is January 20, 2010.

The Government of Yukon continues to focus on northern pipeline development, with the Alaska Highway Pipeline Project and the Mackenzie Gas Project on the radar. Two proposals, TransCanada Pipelines and Denali, are helping to make the development of a gas pipeline from Alaska through Yukon into southern markets a possibility.

On June 11, 2009 TransCanada Pipelines Limited announced that they had reached an agreement with ExxonMobil, the world's largest publicly owned oil company, to pursue the development of an Alaska Gas Pipeline. TransCanada continues to move forward with project development, which includes engineering, environmental reviews, Alaska Native and Canadian Aboriginal engagement, and commercial work to conclude an initial binding open season by July 2010.

The Denali Project partners, ConocoPhillips and BP, are also continuing with efforts to ensure they are ready for a 2010 open season. To date there has been more than U.S.$100 million spent on the Denali Project with much of the work associated with field data gathering and analysis, engineering work, project cost estimates, and commercial preparations for the open season.

Both proponents are planning for an open season in 2010. An open season allows a pipeline company to identify gas producers and shippers interested in seeking carrier capacity on the line if built and willing to commit their product at an economically feasible carrier price. The U.S.$30 to U.S.$40 billion project could see a functional pipeline system in 2018.

Looking to advance pipeline development, TransCanada and Denali continue to meet with the Yukon government and Yukon First Nations along the proposed pipeline right of way. While planning and consultations continue, neither proponent had substantial spending in Yukon in 2009.

On the Mackenzie Gas Project, the Joint Review Panel is expected to deliver their report to the National Energy Board in December 2009 on their hearings for the project. Yukon will take part in one final hearing, scheduled for April 2010.

Tourism

Data published by the Department of Tourism and Culture reports visitation to Yukon down by 7% through the end of September 2009 compared to the same period in 2008. Border crossings show total of 265,719 visitors from January through September 2009 which is 20,873 fewer than the 286,592 visitors reported in the same period in 2008. As was noted in the May release of the Yukon Economic Outlook 2009, the economic downturn,

especially in the United States, was expected to negatively impact visitation to Yukon in 2009. The data in the first nine months of the year supports the May forecast with visitation from the United States down 19,562, or 10%. Visitation from other countries was also down significantly in the first nine months, by 3,503 visitors or 11%. On a bright note, the first nine months of 2009 saw increasing visitation from other areas of Canada, up 3,171 or 13%.

The strength of the Canadian dollar versus the U.S. dollar throughout 2009 has likely contributed to some of the recent weakness in visitation from the U.S.. Higher relative costs of travel related activities in Yukon are a consideration for would-be visitors to the territory. Going forward, a strong Canadian dollar may have some negative impacts on visitation from the U.S., as U.S. residents turn to travel activities in destinations which are now relatively less costly than travel to Yukon.

While the strength of the Canadian dollar versus the U.S. dollar remains a concern, many economic indicators are suggesting that Canada and most other countries are in the midst of a recovery from the global economic downturn. It is expected that the global economic recovery will contribute to a rebound in tourism visitation to the Yukon.

Construction

The *Yukon Economic Outlook 2009* called for a substantial increase in the value of permitted building construction for Yukon with the value forecast to increase to $220 million from $71.5 million. Spending associated with the development of the Wolverine mine along with substantial public spending on various construction projects were expected to constitute the bulk of the forecast increase in building permit value.

The first ten months of 2009 have seen a significant increase in the value of building permits with the total of $137.3 million to October up 125.7% from the value of $60.7 million posted in the same period in 2008. As expected, the majority of the increase in building permit value has been associated with projects being funded in part by federal stimulus spending, with the value of institutional building permits increasing by 968.0% in the first ten months of the year to $75.4 million. Among the current construction projects driving institutional spending in 2009 are the construction of the Whitehorse corrections centre, the Yukon Hospital Corporation's residence and medical services building and the City of Whitehorse public safety building. As expected, a decline in the value of residential building permits has countered some of the increase in the value of building permits. The value of residential building permits is down 16.8% to $32.8 million in the first ten months of the year.

The recent announcement of construction of the new Bellekeno mine near Keno will further boost construction activity into 2010.

While posting a strong increase in the first ten months of 2009, the forecast for the value of building permits will likely fall short of initial expectations but remain at twice the value of the previous year.

Population

Yukon population growth in the first half of 2009 was higher than the annual rate of 2.0% forecast in May 2009. Year-to-date population to June 2009 averaged 30,057, 3% higher than the average in the same period in 2008.

The population of Yukon reached a level of 34,157 in June 2009, an increase of 863 from June 2008. By community, Whitehorse saw the largest increase in population increasing by 746 people. Twelve other communities also posted growth with increases amongst these communities, totaling 168 people. The total

population decline among the four communities that reported a population loss was 51 people, with Watson Lake accounting for 35 of these people.

Overall, in is expected that population in the territory should still average 34,200, unchanged from the May 2009 Forecast.

Labor Force

It was noted in the *Yukon Economic Outlook 2009* publication that the unemployment rate was expected to average around 7% in 2009. Yukon's seasonally adjusted unemployment rate in the first ten months of 2009 has averaged 6.9%, 2.1 percentage points above the 4.8% averaged during the first ten months of 2008.

As evidenced by the year-to-date increase in the average unemployment rate, there appears to have been some negative impacts related to the recent economic downturn. Lower visitation to Yukon in 2009 has resulted in negative employment impacts in some businesses that rely on tourist dollars, whether directly or indirectly. Mineral exploration expenditures, while not down as much as forecast in the May Outlook publication, are down from expenditures in 2008. Lower mineral exploration activity could account for some of the employment weakness in the first ten months of 2009. As well, it has been speculated that some of the higher unemployment rate could be explained by the loss of employment for residents of Yukon who were employed outside of the territory. This might be the case for Yukoners who work in the mining and oil and gas sector in other parts of Canada or around the world.

While higher in 2009, the unemployment rate in Yukon remains below the national average which averaged 8.2% in the first ten months of 2009.

The Yukon's overall future will rely on the ability to enhance mining and resource extraction opportunities. There are mines at various stages of development in the Yukon, but all are waiting for higher prices. Exploration activity has plummeted in the past few years, although the territory is starting to see an increase in exploration for gold and base metals. Some exploration work is being done at three gold-silver deposits in the Mount Skookum area, south of Whitehorse. The Yukon is generally considered under-explored for most minerals. Yukon mines developed to date have tended to be high cost and, therefore, vulnerable when mineral prices decline.

Tourism is one area that has shown considerable growth in the Yukon over the long term. Although the number of tourists declined from 2002-2003, tourism is still an important part of the Yukon's economy. The longer-term growth of tourism in the Yukon is reflected not only in the numbers of tourists coming for traditional summer tourism but also in the types of activities available. Many tourism activities emphasize the adventure and wilderness potential of the Yukon and the tourism season is extended by winter tourism activities. Although the number of tourists coming from the United States was down a little in the past two years, tourism from the U.S. remains the largest single source for larger cities like Whitehorse and the Yukon as a whole.

Yukon First Nations have been increasing their economic development activities. Dana Naye Ventures is a lending agent for First Nations businesses in tourism and other fields. In addition to the many individual First Nations people who own and operate small businesses, First Nations consortiums have invested in businesses as diverse as major hotels, office buildings, and a window-manufacturing company. Members of the Yukon First Nations Tourism Association emphasize tourism as a source of economic and job growth. These include retail, arts and crafts, outfitting, adventure, and air or helicopter services.

Though there has been economic growth, the Yukon is suffering from the lack of economic diversification and the ability to enhance mining activities in a cost efficient manner.

Summary of the Current Economic Status of Alaska and the Yukon

Alaska

- **Poor Economic Diversification**
- **Economy Reliant on:**
    - **Oil (85% of all revenue for the state)**
    - **Tourism/Resource Extraction**
    - **Federal Money**
- **Transportation and Infrastructure Creation/Maintenance Costs are High**
- **Geographically Opportune Position for Global Trade (Asia as a focus)**
- **Accounts for over 50% of all U.S. Seafood Production**
- **Government has Surplus of Funds**
- **Lack of Entrepreneurship**
- **Limited Job Opportunities for Rural Alaskans**
- **Vast Untapped Natural Resources**
- **Current Major Economic Drivers (including oil) are Sustaining but Not Expanding**

Yukon Territory Canada

- **Extremely Poor Economic Diversification**
- **Very Small Population (around 34,000)**
- **Public Sector is Largest Employer**
- **Mining Activities are the Only Substantial Economic Driver Outside of Government**
- **Huge Potential for Oil & Gas Exploration/Production**
- **Vast Untapped Natural Resources Especially in Areas Directly North of Mayo**
- **New Mining Activity has been Stifled Due to High Costs Created by Geographic Isolation**
- **Tourism Primarily Consists of U.S. Travelers (a large number of which are served by First Nations tribal members)**
- **First Nations Land Disputes have Significantly Slowed Economic Development in the Yukon Region but are Finally Being Resolved**

Economic Impacts of the Proposed Alaska Canada Rail Link to Alaska & Yukon

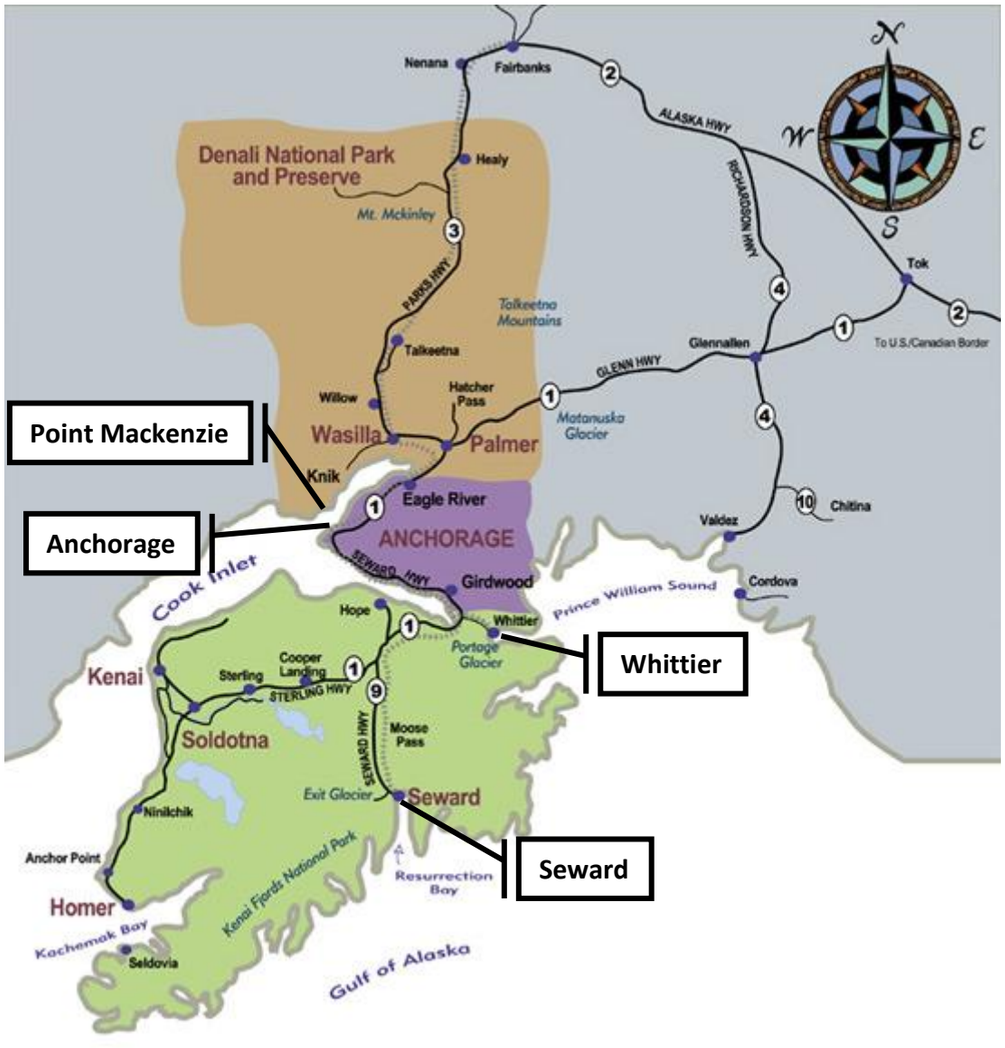
Alaska's Strategic Global Position

The economic climate in Alaska is currently reliant on the "three legged stool" with oil, tourism/resource extraction, and federal money. Each leg suffers from unsustainable or stagnant operation, thus leading to an inevitable, all be it slow, collapse of the stool. Of coarse this situation can be rectified by enhanced participation by any of the three legs but economic diversity is severely needed to have an economically progressive state with a more strategic global position.

This is why the proposed Alaska Canada Rail Link (ACRL) is so important to Alaska, it gives it a strategic global position. In past studies the creation of the ACRL has been looked at from a regional focus try to elaborate upon how particular areas of the state would benefit; as they exist now, none of the "three legs" could gain enough value from the ACRL to spark its plans to come to fruition. This is not to say that particular areas in Alaska would not reap incredible benefits from the link, but a global focus on the project will help produce more key stakeholders, in more countries, with more influence, all pushing for the project to happen, thereby benefiting more members of the global marketplace, not just certain Alaskans.

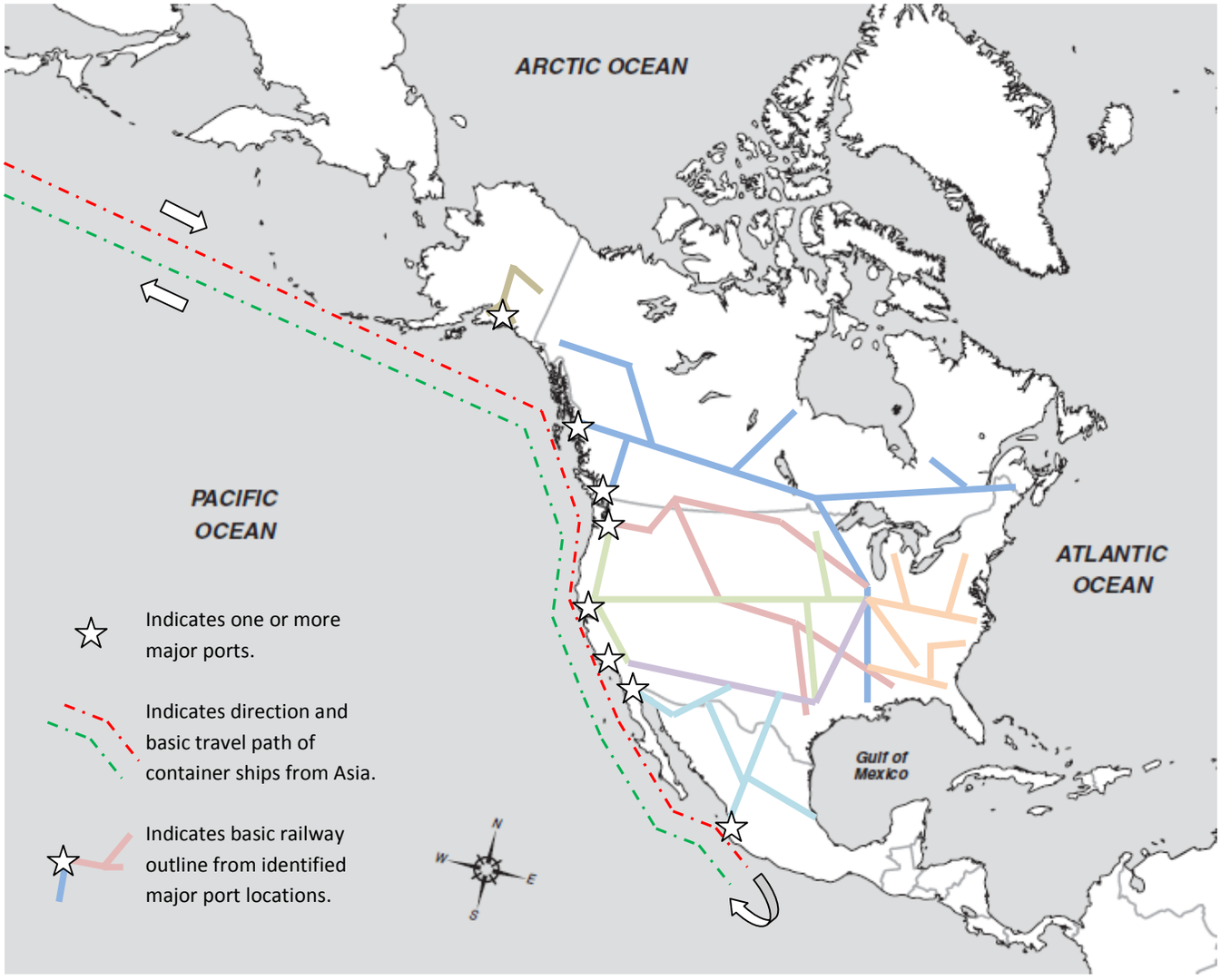
In order to understand the importance of Alaska's potential strategic position in the global community it is important to start by looking at its 4 deep water capable South Central ports (illustrated on the right).

Each of these ports is significant because they are capable of being converted to fully functional deep water ports. A deep water port is a port capable of fully accommodating Panamax sized containerships (currently the largest on the planet). Each of these ports is capable of handling the Panamax ships with infrastructure modifications, in fact the Ports of Seward and Whittier already handle traffic from some of the worlds largest cruise ships. In addition the Port of Anchorage already handles smaller containership traffic and the newly established Port at Point Mackenzie has tremendous area in which to construct port facilities as well as the ability to handle Panamax and Cape sized vessels.



The importance of these ports in the global community stems from the fact that containership traffic from Asia passes only 300 miles away from Alaska's coast towards the larger ports in Canada, Seattle, San Francisco, and Los Angeles. It is this traffic that places Alaska in such an opportunistic geographical situation; Alaska is capable of handling a large portion of these containerships (10%), and with 40% of all consumer goods being transported from Asia to Californian ports, it is feasible to say that Alaska could acquire a large enough percentage to fuel a new economic sector in Alaska.

Basic Railway Distribution Model with Container Ship Travel Outline



Utilizing Anchorage as a model we can see the actual distance advantages and time advantages associated with utilizing Alaska's strategic geographic location (courtesy of GHK and Norbridge : Shipping Cost Analysis - The North Pacific Rim Trade Corridor Study):

ASSESSING COMPETITIVENESS: POA'S ADVANTAGES

The sea distances between North American West Coast ports, including Anchorage, and the main Far East ports are shown in Table 3. Anchorage's distance advantages relative to other North American ports are

shown in Table 4. As shown, Anchorage's advantage over the dominant ports of LA/LB is about 1500 nautical miles. The sea voyage times between North America west coast ports and the main Far East ports are given in Table 5. They assume a vessel speed of 24.5 knots. Anchorage's sea voyage time advantages relative to other North American ports are given in Table 6.

Anchorage's advantage over the dominant ports of LA/LB is about 2.6 days.

Table 3 Sea Distances **(N miles)**

From:	Yokoham	Kobe		HK
To:				
Anchorage	3,320	3,596	4,173	4,830
LA/LB	*4,842*	*5,137*	*5,708*	*6.363*
Prince Rupert	3,825	4,101	4,678	5,355
Vancouver	4,284	4,554	5,114	5,760
New York	10,587	10,867	11,471	11,587

Table 4 Anchorage's Distance Advantages (N Miles)

From:	Yokoham	Kobe	Shanghai	HK
To:				
Anchorage				
LA/LB	*1,522*	*1,541*	*1,535*	*1,533*
Prince Rupert	505	505	505	525
Vancouver	964	958	941	930
New York	7,267	7,271	7,298	6,757

Table 5 Sea Voyage Times (days, one direction)

From:	Yokohama	Kobe		**HK**
To:				
Anchorage	5.6	6.1	7.1	8.2
LA/LB	*8.2*	*8.7*	*9.7*	*10.8*
Prince Rupert	6.5	7.0	8.0	9.1
Vancouver	7.3	7.7	8.7	9.8
New York	18.0	185	19.5	197

Table 6 Anchorage's Sea Voyage Time Advantages (days, one direction)

From:	**Yokoham**	**Kobe**	**Shanghai**	HK
To:				
Anchorage				
LA/LB	2.59	2.62	*2.61*	*2.61*

Prince Rupert	0.86	0.86	0.86	0.89
Vancouver	1.64	1.63	1.60	1.58
New York	12.36	12.37	12.41	11.49

SHIPPING COSTS

The costs of serving Far-East/US West Coast routes via Anchorage and competing ports are calculated in detail in Appendix I and summarized in Table 7.[1]

Table 7 **Shipping Costs, $/TEU, in One Direction** **($ per TEU)**

		2000 TEU	4000 TEU	6000 TEU	8000 TEU
Anchorage					
	Kobe	*622*	550	584	579
	Yokohama	***617****	*546*	532	497
	Hong Kong	*605*	*592*	563	547
	Shanghai	***563***	*490*	523	499
Prince Rupert					
	Kobe	649	576	609	585
	Yokohama	644	571	605	582
	Hong Kong	821	808	764	740
	Shanghai	572	572	530	506
Vancouver					
	Kobe	736	736	694	670
	Yokohama	731	657	690	666
	Hong Kong	903	814	850	819
	Shanghai	659	657	614	590
LA/LB					
	Kobe	747	745	702	*678*
	Yokohama	742	740	698	*674*
	Hong Kong	915	814	835	*804*
	Shanghai	765	667	688	*659*
New York					
	Kobe	851	779	731	725
	Yokahama	846	775	745	704
	Hong Kong	1.068	934	877	847
	Shanghai	1,183	1,007	927	882

** This could be reduced to $520 if ship speed were raised to 25 5 knots instead of the 24 5 knots assumed for ail other routes The costs in the table above include*

(a)ship operating costs at sea and in port.
(b)the cost of the containers,
(c)terminal handling charges, and
(d)port charges

It is important to note that the advantages of utilizing the port of Anchorage alone do not completely justify port expansion in Alaska. There must be a way to transport massive quantities of these goods to the lower 48 states and vise versa, this will require more than just the port of Anchorage and more than the current infrastructure that exists in Alaska today.

Therefore the ACRL must exist to create the infrastructure in which for goods to travel, and all four deep water ports must be utilized and expanded appropriately to accommodate more ships and ships of greater TEU capacity. The Savings of 5.2 days in average travel time (not including lengthy/costly waiting periods) to busy southern ports for one round trip of a containership **can be up to $520,000, per ship, in operating costs**. Even if only a small percentage of containership traffic is rerouted to Alaska's four potential deep water ports the savings to Asian shippers would be huge.

The Port of Anchorage simply cannot handle containership traffic demands to create a profitable global trade network, it will take all four deep water ports working together to grow the "Alaskan Port Option" and make international trade truly advantageous.

Even with the amount of traffic that the Port of Anchorage does receive, however, there has been a tremendous economic impact.

> *…As Alaska's regional port it serves 80% of the state's maritime trade and 90% of its population. The strategic locale of the port has been put to use through several military deployments and, most recently, the Stryker Brigade Combat Team. It is also homeport for the U.S. Coast Guard Marine Safety and Security Team.*
>
> *Previous research in 1999 estimated the total annual economic impact of the port to be about $750 million per year…*
>
> *…Starting with labor income, the multipliers for Anchorage are consistently higher than those for the southwest and the state as a whole. The water transport multiplier of 3.71 means that for every $1 of labor income generated to the ocean vessel employees in Anchorage a further $3.71 is created in the market area. In 2006 the Port of Anchorage paid $1.8 million in labor income (inclusive of wages and benefits) which implies a further $6.7 million in labor income in Anchorage as a result…*
>
> *…For every 1 job created as a result of increased ocean vessel activity in Anchorage a further 5.21 jobs are created in the market area. Another way to look at this is: the typical job in the ocean vessel sector creates enough economic activity in the market area to warrant the hiring of more than five other people in other sectors of the economy…*

The expansion of these four ports will create direct and indirect jobs for tens of thousands of Alaskans for the next 50 years (and continue to do so) and will provide a multi billion dollar a year industry for Alaska, that will, effectively add a fourth "leg" to Alaska's economic portfolio.

Economic Impacts of the ACRL for Alaska & the Yukon

Understanding the importance of Alaska's deep water ports is key to the ACRL's economic success, but before the ports expansion become a truly viable option, the plans for implementing the ACRL must come to fruition.

The mammoth task of creating the ACRL is very similar to the construction of the Trans-Alaska Pipeline. It had the promise to create jobs across the state for both highly skilled laborers from around the state to small rural communities.

The project was tremendous, employed many people, and after two years was completely finished. This project created many jobs, and then disappeared, leaving many people involved with its construction out of work and financially ruined. The strategy of creating the ACRL will be to, not just create the rail way, but to do it in such a manner that clearly enables communities all alone the rail to benefit and develop real stake in its use.

The construction will enable communities and entrepreneurs alike to gain access to new resources and reduce the cost of imported resources (coming in from Asian markets and the lower 48 sates) allowing for growth in places otherwise inhospitable. The cost of the construction of the ACRL ($11.5 billion) needs to be an investment that will not only provide immediate value and pay off its own costs, but it must also improve the lives of all stakeholders involved and continue to grow new business and economic development in urban and rural areas.

Another concern about the creation of the ACRL, due to the small population of the Yukon (34,000 people) and its primarily public sector employment, is that internal Canadian laborers will not be able to meet the demands of the ACRLs construction. If they cannot meet its demands it is expected that readily available foreign laborers will step in and take potential Canadian jobs. This is why the project must be conducted in a way that encourages continued use of the railway and more importantly, provides strategic integration of local communities located near the railway. In this fashion you have major benefactors of the commercial use of the ACRL with local businesses and entrepreneurs benefiting from being able to move their products cost efficiently where they could not before; thus stakeholder benefits can be assessed during the creation and continued use of the ACRL and the positive effects that will trickle down through whole economies and in select regional communities.

Information Insights Inc., a professional economics consulting entity in Alaska, was able to provide expert information about the tangible and intangible economic benefits of the ACRL in Alaska and Canada:

> The study of the impact of a large construction project like the ACRL can be likened to dropping a rock into a pond. If one looks at the pond in its entirety, the impacts are modest. However, near the entry point of the rock, there are sizeable waves that ripple outward. The task of economic impact analysis is to measure the magnitude, reach, and persistence of those ripples. Estimating the impacts of the ACRL is complicated by the size and shape of the pond, which spans one state (Alaska), one territory (Yukon), one province (British Columbia), and two countries.
>
> Each of these jurisdictions operates in its own economic and fiscal environment, with a unique mix of human and natural resources. These differences will determine how impacts of the project will be felt in different regions. For example, while the relatively modest construction labour demand may be readily absorbed in Alaska during a period of projected decline in construction activity, the much larger demand in Canada will be substantially in excess of available resources in Yukon and northern British Columbia.
>
> Without careful planning to mitigate the impacts created by the arrival of large numbers of temporary workers, communities in the region will be subject to the negative impacts of a sharp boom-bust cycle, such as that experienced in Interior Alaska during construction of the Trans-Alaska Pipeline.

With the costs, routes, environmental and almost every technical detail for the ACRL already calculated the issue of its existence is one of socioeconomics. The link must provide huge cost benefits for both Alaska and Canada, but the ACRL must also create and enhance jobs and job environments. This document will briefly assess the economic impacts of the ACRL in regards to;

- The Economic Impact of the Construction of the ACRL
- The Economic Impact of the Operation of the ACRL
- The Economic Impact on Wages and Cost of Living
- The Economic Impact on the Oil and Gas Industry
- The Economic Impact on the Resource Extraction Industry
- The Economic Impact on Tourism
- The Economic Impact in Regards to Global Shipping
- The Environmental Impacts of the ACRL
- The Economic Impacts on Alaskan Ports
- The Future Implications of Building the ACRL

The Economic Impact of the Construction of the ACRL

The construction of the ACRL will require a very large workforce in both Alaska and Canada. In Alaska, there will be less than 200 miles of rail to be built from Delta Junction in Alaska to the Yukon border so there are no major route alternatives to be examined. In Yukon, there are two major options both converging at Watson Lake: the Alaska Highway route and a more northerly route generally paralleling the Robert Campbell Highway along the Tintina Trench. In B.C. options include connecting to the existing BC Rail link at Fort Nelson or to the partially completed Dease Lake extension. This will require that a work force for both the smaller section in Alaska is assembled and the larger section in Canada that is not completely reliant on either Canadian or American laborers.

Due to business relocation and start-ups entities, such as new resource extraction, trans-continental shipping, and port development businesses, moving to Alaska and Canada, facilitated by the ACRL, it is estimated that for every 1 job directly created by the existence of the ACRL that 50 more will be created. There is an estimated 200 jobs that will be created on the Alaskan side of the rail link, thereby effectively creating 10,000 jobs and for everyone 1 of these jobs an estimated 10 more can be produced in supporting service industries such as restaurants, hospitals, car dealerships, and etcetera; this would, in effect, produce 100,000 new jobs within the state.

Similar metrics apply to Canadian job growth and with the direct employment of 1,000 rail employees every one job will create 10 jobs due to business relocation and start-up, thereby creating 10,000 new jobs; and with every 1 of those jobs creating 5 new support industry positions, an estimated 50,000 jobs can created on the Canadian side of the ACRL.

(All external job creation figures are based upon project maturity -5 to 10 years after ACRL completion-)

The breakdown for the cost and economic impact of the construction of the rail, without external job creation figures, is as follows (Information provided courtesy of Information Insights Inc.):

The Alaska-Canada Rail Link (ACRL) is a standard-gauge rail line over 1,500 miles in length, with a capital cost of approximately US$11.8 billion in current dollars. Most of the mileage and the construction costs are in Canada (1,323 miles and approximately US$10.6 billion). The remaining construction will take place in Alaska (213 miles, US$1.2 billion).

The route for the ACRL determines both the total expenditure and the annual capital outlay. The route chosen for the impact study is the Delta Junction to Ladue (Alaska Segment) to Carmacks to Watson Lake (Yukon Segment) to Hazelton (B.C. Segment) with a spur from Carmacks to Whitehorse to Skagway.

Construction costs average about US$7.7 million per mile (CD$9.1 million). In Alaska, construction costs are lower (about US$5.6 million per mile) while in Canada they average about US$8.0 per mile (Yukon - US$8.3 million per mile and BC US$7.5 million per mile).

	Total Project	Rest of U.S.	Alaska	Yukon	B.C.	Rest of Canada	Canada
Miles of Track	**1,536**	0	**213**	791	532	0	**1,323**
Investment [1] (Millions, US$)	**$11,800**	-	**$1,200**	$6,600	$4,000	-	**$10,580**
Investment [1] (Millions, CD$)	**$13,900**	-	**$1,500**	$7,700	$4,700	-	**$12,400**
Total Economic Output/GDP (Millions, US$)	**$24,930**	N/A	**$1,980**	$5,400	$5,700	$11,850	**$22,950**
Direct Employment	**68,500**	-	**10,500**	33,000	25,000	-	**58,000**
Indirect + Induced Employment	**140,200**	N/A	**6,600**	21,800	35,700	76,100	**133,600**
Total Employment	**208,700**	N/A	**17,100**	54,800	60,700	76,100	**191,600**
Total Labour Income (Millions, US$)	**$12,610**	N/A	**$880**	$2,200	$3,100	$6,430	**$11,730**

The construction phase of the project will generate about 209,000 person-years of employment, about 17,000 in Alaska and over 190,000 in Canada. Direct construction employment will be 68,500 person-years, with over 10,500 in Alaska and about 58,000 in Canada (33,000 in Yukon and 25,000 in B.C.). The balance of jobs results from *indirect* employment generated by suppliers to the project and the employment *induced* by workers spending their paychecks from construction and supplier firms on goods and services in the broader economy. Many of the indirect and induced jobs will be in other parts of Canada and the U.S.

The estimate of 209,000 person years of labor stands for direct employment on the railway itself, however, it is much more likely that, including indirect jobs that are almost certain to be created, there will be closer to 1,045,000 person-years of work created by the construction of the ACRL.

The Economic Impact of the Operation of the ACRL

The operation of the rail system must directly benefit Canadians including their government, stakeholders, and native communities such as First Nations. Although its operation will employ new rail personnel in Alaska, it will directly employ only around 1/6 of the personnel required in Canada. This also inherently causes the need for a major rail yard on the Canadian side, with the most operable location residing within Whitehorse as it is the most developed and populated area in the Yukon that also can serve as a major resource extraction (and perhaps processing hub (more detailed information of the Whitehorse rail yard later in this document).

The operation of the rail-link will also require maintenance and continued operation of the current railway, rail yards, new track, train cars, and all related rail support elements (Information provided courtesy of Information Insights Inc.).

The operations phase of the rail link requires resources for maintenance of the right-of-way, equipment maintenance, the transport of goods, and the administration of the operating activities (billing, payroll, etc.). Annual ACRL employment for operations would be about 530 full-time equivalents (FTEs) with about 90 in Alaska, 260 in Yukon, and 180 in B.C.

The real action arises from the induced activity in mining along with the induced employment to supply the indirect needs of the rail and mining sectors in Alaska and Canada and the induced needs arising from the increase in labor income. The Gross Domestic Product (GDP) for the rail link operations should cover the wage bill, net interest paid, capital consumption allowances, and a regulated rate of return for invested capital. There is an implicit assumption that any revenue shortfalls are covered by the U.S. and Alaska governments, with minor contributions from Canada.

	Total Project	Rest of U.S.	Alaska	Yukon	B.C.	Rest of Canada	Canada
Operation Costs [1] (Millions, US$)	**$127**	-	**$20**	$64	$43	-	**$107**
Operation Costs [1] (Millions, CD$)	**$149**	-	**$23**	$75	$51	-	**$126**
Direct Employment [2]	**530**	-	**90**	260	180	-	**440**
Indirect + Induced Employment [2, 3]	**8,774**	N/A	**74**	3,200	3,400	2,100	**8,700**
Total Employment [2, 3]	**9,304**	N/A	**164**	3,460	3,580	2,100	**9,140**
Labour Income [2, 3] (Millions, US$)	**$635**	N/A	**$11**	$230	$238	$156	**$624**
Labour Income [2, 3] (Millions, CD$)	**$748**	N/A	**$13**	$271	$280	$184	**$735**
Economic Output/ GDP (Millions, US$)	**$1,370**	N/A	**$52**	$342	$415	$561	**$1,318**
Economic Output/ GDP (Millions, CD$)	**$1,611**	N/A	**$61**	$402	$488	$660	**$1,550**

Alternatively, the governments could operate the roadbed/right-of-way with an annual charge tied to the use of the line by railroad companies. Any losses would show up as losses by a Crown corporation. Depending on the method of covering these costs, GDP should be significantly, positively, impacted.

The Economic Impact on Wages and Cost of Living

With the huge influx of new jobs being created over the coarse of the ACRL's construction and operation it is difficult to ascertain exact numbers on cost of living impacts and wage increases, however there are certain basic economic trends that can be established. With the base salary of railroad employees (from laborers to conductors) resting at around $50,000 a year and the average yearly household income of $63,191 (for the most common single-detached households) in the Yukon there stands the ability to greatly improve the number of high paying jobs, especially for households with multiple "rail employed" individuals. In addition, it is known that many places in the Yukon and in North East Alaska are home to a very poor native population that could greatly benefit from these same high paying jobs.

The ARCL will result in a number of direct and indirect workers migrating into the relatively small regions of Eastern Alaska and the Yukon Territory of Canada, this mean more demand for products and services to facilitate more people.

Of coarse this also will result in lower living costs for all people in the area due to goods being in higher demand and more easily transported via the rail link.

> Wages and the pricing of services also reflect the cost-of-living. Reductions in the prices of consumer goods will induce reductions in the price of services as well, leading to further increases in consumers' real incomes. The CPI is expected to be reduced permanently by between 0.3 and 0.4 percent in both Yukon and Alaska.
>
> In Alaska, the average savings resulting from the diversion of up to two million tones of highway and marine freight could total over $100 million per year or about 25 percent of annual resupply transportation costs. We expect that some of this savings would be passed on to Alaska households, businesses and government purchasers. Annual savings on general merchandise entering Alaska would average $52 per ton or $162 per capita. (Information provided courtesy of Information Insights Inc.)

The Economic Impact on the Oil and Gas Industry

The cost savings for the oil industry involved with the completion of the ACRL are immense:

> The oil and gas industry uses a variety of current inputs of goods for producing oil and gas. Many of these inputs originate in the Lower 48 States or in Canada. A rail line will reduce the transportation costs of these inputs, although trucking from the railhead to Prudhoe Bay will still be required. Movements of line pipe, cement, fuel, and drilling mud could benefit from the existence of a rail line. Similar benefits could accrue in Yukon if oil and gas exploration activities lead to subsequent developments.
>
> Rail cars on a track are a substitute for trucks on a road. Highway maintenance will be reduced on those highways currently used to move goods to B.C., Yukon and Alaska. Loaded trucks are the principal source of highway wear, with damage proportional to the square of axle weight. Savings in Alaska may be on the order of US$2 million per year; in Yukon and northern B.C., combined savings of US$4 million per year are likely.
>
> At some point in the near future, a large-diameter natural gas pipeline will be built, linking the natural gas deposits in Prudhoe Bay, Alaska, with the Alberta node for the North American natural gas transportation network. Transportation costs for materials to the construction sites are a major expense, equivalent to three to four percent of the total project cost, which has been estimated at US$21 billion (2005). If the ACRL becomes operational before pipeline construction begins, there would be significant savings to the pipeline project from reduced transportation costs for steel pipe, diesel fuel, and other supplies. Trucks will still be necessary for hauling materials to construction spreads from offload points on the rail line. However, this should be a shorter distance by truck when compared to the project operating without rail available.
>
> The ACRL could save the project over US$37 million on the transportation of pipe and fuel. Heavy equipment (bulldozers, pipe-laying equipment, etc.) can also be moved more efficiently by rail, which on average use one quarter of the diesel fuel trucks consume to move a ton of freight one mile. A rail line would also be beneficial for removal of equipment.
>
> In addition, the ACRL could save the state and North Slope producers US$250 to US$300 million in avoided highway maintenance costs. This is around one-third of the US$800 million that Alaska's Department of Transportation and Public Facilities expects to spend after construction to repair the wear and tear on Alaska highways and bridges due to the extremely heavy loads and high levels of project-related traffic.

Reductions in the logistics costs for the pipeline construction reduce the capital cost of the pipeline, resulting in larger economic rents for the North Slope producers and the State of Alaska. These gains occur regardless of where along the route the savings occur, because the pipeline itself will be a regulated utility, with a tariff representing its total costs. Savings in transportation costs will result in a lower tariff, higher wellhead price, and increased revenues and royalties. The ACRL could increase the net present value of producer revenues by US$13 million and increase payments to the State of Alaska by US$17 million over the life of the project. (Information provided courtesy of Information Insights Inc.)

It is also important to consider the Yukon's eight sedimentary basins rich in untapped natural gas and oil that will be able to be cost effectively accessed because of the ACRL's existence. Current natural gas potential is estimated at 17 trillion cubic feet and oil potential is estimated to be nearly 700 million barrels, with the influx of new laborers and transportation infrastructure provided by the ACRL, these tremendous natural assets will be within reach for the first time. The Yukon contains, within these eight structural sedimentary basins, suitable land for the formation and preservation of hydrocarbons. Seven of these basins occur within the sedimentary rocks of ancestral North America, and one occurs within the suspect terranes southwest of the Tintina Fault. Five of the basins occur in the northern Yukon, and two are located in the southern portion of the territory. Geology within the basins northeast of the Tintina Fault is essentially the same as that in the Western Canada Sedimentary Basin.

The Economic Impact on the Resource Extraction Industry

Mineral Extraction – Mineral and solid fuel products are low unit value products that must be transported by bulk carriers such a rail, barge, or marine vessels. There are at least 588 known mineral occurrences within a 120 mile wide corridor from Fairbanks to the Canadian border. The Rail Link will reduce the transportation cost for these occurrences to one third the cost of transport by truck. It is estimated that at least six mineral occurrences in this corridor will become major mines over the next 30 years as a consequence of the reduced transportation costs if the ACRL plan becomes reality. The expected economic impact on interior Alaska ranges from at least $4.2 billon to $41 billion.

Iron ore exports from the Yukon, could with the advent of the ACRL, account for an estimated 63 percent of the 50 million tons per year that would be transported on the railroad. The two next-largest types of freight, each accounting for 13 percent of potential traffic, would be coal exports from British Columbia and Asian intermodal container imports. Yukon coal and concentrate exports would account for 7 percent (starting) of the traffic and the remaining 4 percent (starting) would be Alaska and Yukon inbound resupply/mineral exports.

Currently the only hard rock mine operating in the Yukon is Sherwood Copper's newly opened Minto mine. There are many more Yukon projects in the exploration and development stage, but there are no immediate plans to develop the Crest iron ore deposit. A private company called Promithian hired Hatch Associates in 2002 to evaluate the company's plan for a mining and steel manufacturing operation which would involve developing the Crest iron ore deposit and the Wind River coal field.

Crest is one of the largest iron ore deposits in North America, containing an estimated total resource of over 18 billion tons of 43-46 percent iron ore, according to Hatch's study. The steel produced by Promithian's project could be used for construction of an Alaska gas pipeline from the North Slope or the proposed Mackenzie Valley gas pipeline. Without such mega projects in the vicinity, the plan wouldn't be viable, Hatch said, because there is already enough steel production in less remote locations.

Due to high costs of transportation and energy, only the largest and highest grade mineral deposits (those in the upper 90th percentile of their type worldwide) have been developed in Alaska. With the synergistic effects of the Rail Link and multiple sources of energy (coal, petroleum, and natural gas), medium size deposits (those in the 50th percentile and

higher of their type worldwide) will be developed. With lower transport costs, marginal production is increased, so less valuable sections can be profitably developed. This will extend the life of many mines, increase job opportunities, and further diversify the economy of the state.

Commuter rail service to new major resource development projects within the corridor will allow the workforce to come from existing communities thus reducing the capital costs of the projects related to employee housing and support services. Rail service from existing communities to mine or mill sites will also enhance the quality of life in existing communities by ensuring job opportunities, but at the same time not disrupting community relationships and life styles.

> 100 miles on either side of the route, transportation costs are significantly lowered, both for inputs and outputs of a project. Projects with large transportation costs are natural economic development opportunities. Metal mining and coal mining are two such industries. Fortunately, Alaska, Yukon, and British Columbia are known for their mineral riches. However, transportation and energy costs have been a barrier in the past for many sites. There are three levels or tiers of development expected.
>
> First, existing mine sites currently being planned or already in production will move to rail for transportation if it is cost-effective. This move could be achieved quickly, as soon as loading facilities can be put in place.
>
> Second, mid-term developments will include known mineral sites that would likely become economic with the rail line. Their development will be spread out over a number of years, as developers reassess prospects, raise capital, and begin the process of mine development. Estimates of Tier 1 and Tier 2 mineral development in Yukon and British Columbia have been included in the impact study.
>
> Third, longer-term developments will involve new sites, not yet discovered, that result from increased exploration activity in the transportation corridor. In Alaska, statistical analysis has provided estimates of the tonnage of refined metal and mineral concentrates likely to be produced in the rail corridor over a thirty-year period. Not all of these mineral occurrences will be developed right away. However, it is reasonable to assume that exploration activity will increase and eventually many of sites will come on stream. It is also possible that some sites that are more than 100 miles from the rail line could also become economic with a rail link. For example, the sheer size of the Crest Mine in Yukon, with its very large iron ore deposits, may warrant the construction of a rail spur to transport iron pellets for international markets. The economic feasibility of such projects will require additional study. (Information provided courtesy of Information Insights Inc.)

Forestry - Inventories of forest resources on State and Native Corporate lands from Fairbanks to the border indicate at least 1.6 billion board feet that can be produced on a sustainable yield at a rate of 30 million board feet per year. The gross value of this potential annual production at current market prices is $10 million and would provide for long term employment in rural communities east of Fairbanks. As in the case of minerals and coal, forest products are low unit value materials that require bulk transportation systems.

Fishing – International port development would allow the thriving Alaska fishing industry to expediently and cost effectively ship fresh “Alaska branded” seafood to feed the high demand for Alaska’s fish in Asian countries and the lower 48 states.

The Economic Impact on Tourism

Rail Tourism Spending Impact - Research into potential tourism passenger traffic and revenues on the Alaska Canada Rail Link was conducted for the project by Klughertz & Associates of Seattle, Washington, under contract to the University of Alaska Fairbanks. Based on that research, typical spending profiles for Yukon tourists and income multipliers for tourist industry suppliers are represented on the facing page.

> *A Total Spending Impact Of Approximately $115 million Each Year Is Anticipated From A Mid-Range Case For Rail Based Tourism Development.*

Research results indicate gross revenue potential in a mid-range case for inland rail cruise development of $35 million per year in tourist spending on the tram. In addition to covering train operating costs, approximately $2 million of these revenues would be paid to the railway owner as track access fees for private rail car operations.

It is likely that an even greater amount of *off-train* spending would be stimulated by the introduction of inland rail cruises. Based on the mid-range case for tourism and tram development, an additional $37 million per year of tourist spending is anticipated.

The subsequent income effect that results from the combination of on and off tram tourist spending that spins through to local suppliers is estimated at over $43 million. With a total spending impact potentially exceeding $100 million per year, the significance of inland rail cruise infrastructure to stimulate and develop northern tourism is compelling.

Inland Rail Cruise Conclusion - The prospect of an Alaska Canada Rail Link offers the opportunity to develop remote tourism to a level previously considered unreasonable for northern communities:

- Rail Cruise Tracks can control larger-scale tourist access to remote regions;
- Rail Cruise Trains can accommodate more tourists with sleeping and dining cars;
- Rail Cruise Tourists can benefit northern communities without overwhelming them.

The benefits from, and investment in, rail based tourism development should attract a combination of cruise line, tour operator and First Nations participation. The infrastructure platform for northern tourism growth with inland cruise trains will be increasingly available at each stage of the Alaska Canada Rail Link Project.

(More tourism information can be found in the full tourism report for the ACRL “Tourism and Trains – A Prospectus and Proposal” Drafted by the Alaska Canada Rail Link Feasibility Study team)

The Economic Impact in Regards to Global Shipping

The Alaska Canada Rail Link (ACRL) Phase 1 Feasibility Study considers that the rail connection through Alaska, Yukon and Northern B.C. linking North Pacific Rim markets in the shortest trade corridor between North Asia and North America, via a U.S. port. Utilizing all four of the major potential deep water ports in south central Alaska will allow for a significant number of goods to be transported to-and-from the U.S., Canada, and Asia at cheaper costs, faster.

For Asian shippers the price difference from the distance of shipping to LA/LB ports vs. Alaskan ports alone can be more than half of a million dollars (round trip). The ramifications of building out the ports of Point Mackenzie, Seward, Anchorage, and Whittier are incredibly beneficial to both Canada and Alaska, allowing for a means to export mineral resources to a demanding international market:

> Mutually dependent economics of large-scale northern resource and railway development are compelling. Drastic changes in global demand, driven by Asian markets, have sharply raised the value of mineral resources in northwestern Canada and Alaska. Rail infrastructure investment would dramatically increase economic productivity, development and sustainability in this region:
>
> - Larger projects (e.g. iron ore and coal mines) can only be developed with heavy haul rail capacity;
> - Smaller projects (e.g. mid-size base metal mines) may not survive severe price cycles with high cost trucking;
> - Remote resource exploration and development will become more affordable with low cost rail access.
>
> A new North Pacific Rim Trade Corridor may be well positioned to complement bulk mineral resource traffic for export to Asia with container import traffic from Asia. A rail connection through Canada would improve the economic security of Alaska and the lower 48 United States by providing both essential supply route redundancies as well as West Coast container congestion relief - with a new Alaska sea/rail port gateway on U.S. soil.
>
> A preliminary working route scenario for a Canadian rail connection to an Alaska port gateway is based on the following key findings:
>
> - Market-driven route selection, in conjunction with engineering constructability criteria, favours a Tintina Trench route between Delta Junction, Alaska and New Hazelton, B.C. connecting the most mineral shipping points to Alaska and Northern B.C. ports;
>
> - A Tintina Trench route through Carmacks, Yukon supports the shortest Alaska Railroad connection to the Canadian National Railway (CNR) and Northern B.C. ports and can support Alaska Highway Gas Pipeline logistics from strategic distribution points in Yukon*1*;
>
> - While connection to an Alaska Inside Passage port would provide the shortest route to tidewater for much mineral export traffic, combined port and rail considerations suggest Anchorage-area ports might require less capital investment;
>
> - Commercial analysis of all potential revenues supports the Business Case for public-private partnerships to invest in a full ACRL rail connection; and initial investment in a phased resource railway to Haines appears economically viable in the private sector.
>
> As markets firm up traffic timing and demand for some or all track segments of the working route scenario, long-term commercial feasibility for a preliminary Business Case can be better tested for near-term bankability.

Global trade positioning would also allow Alaska to expand their already tremendously successful seafood production industry and provide new market access to newly developing Yukon resource extraction activities. The thousands of jobs generated in the U.S. and Canada from this trade would be easily sustainable as port communities and supporting businesses continued to grow and maintain the infrastructure of the ACRL and the major ports, rail yards, tourist destinations, resource extraction sites, fisheries, resupply stations and etcetera generated by the existence of the ACRL.

It is a key issue to understand that current resource extraction activities (outside of oil an gas) in Alaska and the Yukon do not have, currently, enough internal resources to fund any sizeable portion of the ACRL; true value of the rail link will come in incredible value added scenarios attributed to the actual completion and utilization of the ACRL. Scenarios such as:

- Port creation, operation, maintenance, & support.
- New Entrepreneurial activity.
- High profile international business relocation.
- New resource extraction opportunities.
- International tourism.
- Enhanced transportation availability in more areas of Alaska and the Yukon.
- Economic expansion of current enterprise.

It is these kind of activities that will provide real value to both Alaska and Canada, not merely taking advantage of pre-existing infrastructure; though it may be the first and most easily quantitative element to consider, pre-existing activities will not provide as much value as new enterprise that will, with little doubt, provide completely new industries and economic diversity based on observed current international demands as they are today.

The Environmental Impacts of the ACRL

When considering the environmental implications of the ACRL it is, as it has been with the rest of this document, important to consider what the effect of - not just what the initial implementation of the ACRL might be - but the external implications as well. It is known that rail operation is more environmentally friendly during operation that truck, containership, or air transport this document must look very closely at the construction of the ACRL and what factors must be taken into account to better prepare for the existence of a sustainable environmentally friendly rail system.

The ACRL has been studied in depth by HDR and IRIS Environmental Systems to better determine what will be required to better protect the environment, and to better understand the extent to which the ACRL will effect the environment**:**

> Infrastructure such as rail will provide opportunities for resource development that would otherwise not take place in Yukon, the key consideration being access to markets from remote northern sites. A major infrastructure project such as the ACRL therefore has the potential to influence an extended landscape beyond the immediate vicinity of its route. Analysis of the overall corridor within which the ACRL would lie is therefore relevant to the SEA.
>
> In Yukon and northern British Columbia, sub-corridor options exist for the ACRL to be introduced to a number of areas devoid of infrastructure and essentially all sustained human activity. Even where such infrastructure exists, many will hold that such areas would be considered “wilderness”. At the time writing, it is unknown whether the state of the environment in the overall corridor has been subject to any landscape monitoring to determine whether “wilderness values” are being maintained. Evidence is accumulating of the trend in northern Canada towards a changing landscape as the effects of climate change are felt. The rate of change is unknown, but is generally projected to be appreciable over the next four or five decades, within the life of an operating ACRL. It is beyond the resources of the current review to analyze the potential implications; however, a reasonable scenario for Yukon and northern British Columbia involves increased risk of forest fire, a reduction in permafrost layer, and alterations in precipitation and vegetation patterns, all with significant implications for a railway line.

A key consideration for the Project will be whether it selects a corridor with an existing road, thus mitigating the effects of creating access into an otherwise “wilderness” area. Even though such a choice is consistent with established environmental management practice for minimizing the biophysical impacts of linear developments, science-based risk analysis may reveal that the impacts of using a corridor without existing access are less than those with existing access. An example may be an ACRL option paralleling the Alaska Highway through Kluane National Park where, despite the presence of the Highway, the railway may place at risk a number of ecologically sensitive areas, thus suggesting a “wilderness” alternative as being preferable. This potential situation underscores the need for detailed biophysical information collection and analysis during the planning and design stage such that the comparative trade-offs can be appreciated in decision-making.

In terms of landscape permanence, common to all parts of the ACRL overall corridor is the risk of forest fire due to climate change. Presence of the operating ACRL will, due to increased access, exacerbate this risk. Permafrost will be commonly encountered by the ACRL, particularly in Yukon. Owing to the possibility of thawing and terrain movement, permafrost presents a potential railway integrity issue underscored by biophysical risk due to derailment. Therefore, special attention to rail bed structure design to maintain insulation of the permafrost layer will be necessary, coupled with assiduous inspection and maintenance during the operations phase. Further, alterations to precipitation patterns and vegetation patterns over the life of the rail line due to climate change, and consequent potential effects on fisheries, wildlife corridors and ranges, strongly suggest that final design parameters need to be sensitive to these effects, with the establishment of strong baseline data and information as management and mitigation measures during the construction and operation of the rail line should include significant resources to monitor and adjust to such changes.

The relative reduction in emissions inherent in rail line transport goes to the cause of climate change. However, climate change is occurring at an accelerated rate in the project area; it is issues of climate change adaptation that the rail line will need to manage during its duration. Further, the rail line offers a focus for ongoing research and applied research activities on climate change adaptation.

Sustainability assessment requires that the life of the Project be considered along with the prospect of decommissioning and abandonment. Given the volumes of earth moving and positioning involved in its construction, the grade for a railway through mountainous areas such as those in Yukon and northern British Columbia will become a permanent, prominent feature of the landscape. Restoration of the landscape prior to the ACRL, if this were to be a desired objective of reclamation for abandonment, would be likely to cause as much disturbance as its original construction, and may negate any ecological adaptation that may have taken place. The grade is therefore likely to remain into the foreseeable future. However, the integrity of the grade in relation to maintenance and protection of biophysical environmental quality will be a continuing impact management task.

The ACRL as a Sustainable Railway

To be sustainable in biophysical environmental terms, the ACRL will need to consider a variety of issues, design criteria and actions that seek to attain the goal. Since it will be introduced to a landscape largely devoid of equivalent infrastructure, and, by virtue of its presence, may induce significant other activity, the full extent of the development potential and its impacts must be envisaged. As the Project moves from concept to realization it will involve a series of decision stages, corresponding to standard Project development. It is important to note that resolution of issues relating to biophysical impacts is critically dependent on acceptance of preferred alternatives, reasonably presented, through public consultation and negotiation.

At the Project Concept stage, sustainability features are best considered as part of the pre-feasibility and feasibility study. Typically, these might be concerned with the fundamental operating concept, in the same way that economic and social considerations affect the method of taking the concept to a blueprint. Much remains to be developed in terms of an ACRL design and operational strategy. For this SEA, in the text below we list examples that are most relevant during analysis of the Project Concept, and best considered at the Pre-Feasibility and Feasibility Stages:

- Selection of single or double track options in relation to minimizing the overall land use footprint of the Project.

- Width of the right-of-way in relation to minimization of clearing and grading and related effects on habitat.

- Length of trains in relation to stopping capability in mountainous terrain, and potential for derailment and spillage.

- Evaluation of alternative scenarios for train frequency, length and weight in relation to the need for deeper ballast and borrow pits, thus causing greater terrain disturbance.

- Size of locomotives and cars and their weight in relation to the need for different bridge and culvert structures affecting hydrology and fisheries.

- Design grade, wherein the lower the grade, the greater the need for cut and fill to achieve it, thus increasing the terrain footprint of the railway, and potentially lengthening culverts with attendant impacts on fish passage.

- Operating (design) speed, wherein faster speed requires less curvature, in turn requiring greater potential topographical conflict and surface disturbance in areas of high relief, and raising the potential for wildlife collisions.

- Maximum curvature (radius), wherein the lower the maximum radius, the more likely the terrain impact, but the lower the risk of derailment and risk of spillage.

- Deciding whether access for construction will be along the right-of-way, or whether subsidiary access will be necessary, proceeding on the principle that minimizing access requirements will reduce impacts, particularly on fish and wildlife populations and their habitat.

- Readiness to implement a “no net loss” policy with regard to fish and wildlife habitat, and compensate in kind for residual impacts, particularly at watercourse crossings for fish habitat, and for wildlife habitat in valley bottom situations where rail grade is achieved most easily, and where habitats may be fragmented and habitat effectiveness may be compromised.

- Readiness to incorporate climate change adaptation considerations in final design, construction and operation phases of the project.

(More environmental information can be found in the HDR & IRIS Environmental Systems: STRATEGIC ENVIRONMENTAL ASSESSMENT for the ACRL)

The Economic Impacts on Alaskan Ports

Alaska's ports are potentially able to handle a great deal of containership, cruise ship, and large/medium/small sea vessel traffic, and the structure for which information can be based, is easily related to ports further North in Canada (Prince Rupert).

> *The .1 square mile Prince Rupert Container Terminal is the first dedicated intermodal (ship to rail) container terminal in North America, with the design capacity to move 500,000 TEUs (Twenty Foot Equivalent Units) per year.*

The port situation is so similar to each of the 4 potential deep water ports in south central Alaska because each of them have a terminal size of .01 square miles or larger. Even the Port of Anchorage, unmodified, has handled over 600,000 TEU's of international goods (2004). This being the case it is feasible to predict that each of the Alaskan ports (with modification and development) could handle a similar capacity to that of the Port of Prince Rupert.

Looking at the current state of Price Rupert we see that:

> **Prince Rupert, B.C.; January 21, 2009** - Led by a surge in container traffic through the Fairview Terminal, the Port of Prince Rupert handled 10,596,863 tonnes in 2008, a moderate increase over 2007, despite a global economic downturn that has resulted in declining traffic through most other North American West Coast ports.
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> Fairview Terminal handled 181,890 TEUs (20-foot equivalent units) from 78 vessels in its first full year of operations, following the facility's opening in late October, 2007. The terminal's throughput for the first six months was 42,555 TEUs, before jumping more than 300 per cent in the second half of 2008 with 139,335 TEUs as a result of the addition of the second COSCO/CKYH Alliance service in July. In the fourth quarter, the terminal operated at greater than 60 per cent of its 500,000 TEU capacity with a throughput of 79,106 TEUs.

In addition to its strategic global position and capacity the Port of Prince Rupert also employees approximately 100 full time port employees, that create on average 1,000 indirect jobs per year. These numbers could translate to **over 400 new fulltime jobs**, with around **1,200 generated during construction projects**, **and 4,000 new jobs every year** trickling into Alaska as a result of the creation of the ports. These, again, are very modest estimates and would most likely be much higher as the potential capacity and opportune location of ports like the Port of Point Mackenzie and the expanded Port of Anchorage with their already large workforce population, international airport, and construction entities could be utilized to more quickly develop and expand port operations.

It has recently come to pass that any new construction project in Cook Inlet must properly assess their impact on the Beluga Whale population, therefore any new port construction project must properly evaluate the following elements as is currently being done by the City of Anchorage for their new port expansion:

> Actions to properly account for Beluga Whales during port expansion include but are not limited to:

- Construction and operationally generated underwater noise is being evaluated to develop a baseline sound index. A study will be conducted and a final report will be generated that identifies structural and operational noise reduction measures to minimize increased noise at the expanded Port to the maximum extent practicable.
- Sound levels and distance attenuation isopleths will be mapped.

- This baseline sound index will be collaborated with concurrent marine mammal monitoring efforts to statistically correlate construction and operational generated noise exposures with presence of beluga whales with documentation of any altered behaviors observed (e.g. a dose-response analysis).
- A passive acoustic monitoring plan will be conducted to correlate unseen mammals detected by underwater hyrdrophone with visual observations.
- In collaboration with NMFS, a marine mammal monitoring program has been established to estimate the frequency at which beluga whales are present in the project footprint, to characterize habitat use and behavior of belugas near the port during ice free months, and to assess the impacts of noise on beluga whale behavior and movements â€“ pre-construction, construction, post-construction. “
- Enforcement of construction management practices to minimize impacts:
    - Front line observers on the construction team with authorization to shut down construction activities during presence of whales within an established safety radii
    - Direct radio communication with the Alaska Pacific University marine mammal observation team
    - Slow start of daily construction activities to allow whales to move out of the safety radii before construction fully ramps up
    - In water impact pile driving will not be allowed within two hours of either side of low tide low tide
    - Monthly evaluation of these management practices to determine methods to improve construction techniques.

The Future Implications of Building the ACRL

Aside from local, international, job creation, revenue, industrial, environmental and infrastructure benefits from the proposed ACRL it is a reality that the construction and existence of the ACRL will prompt the continuation of the proposed Bering Strait Tunnel (BST) Project. The BST would effectively connect London to New York, and everywhere in between by rail. This project would go far beyond any tunnel project ever before conceived and would require international transportation infrastructure changes, including the creation of the ACRL.

The construction of the BST has been deemed financially and technically feasible to complete utilizing plans derived from engineering experts from around the world, but it will not happen unless transportation infrastructure in both Alaska and Russia is completed, in specific, the freight rail infrastructure must be expanded. If Alaska shows determination to complete the require ACRL section of the overall intercontinental rail line it will greatly increase the chances of the international community responding and completing work on the Russian side of the rail line. If the beginning construction of the ACRL does in fact spark the creation of the Russian rail line extension, it is highly likely that construction teams who were working on the ACRL, after the ACRL is completed, will then shift to extending rail to western Alaska; thus providing jobs for, not just the personnel involved in the 7-10 years it will take to finish the ACRL, but for the next 20-30 years during the overall construction of the BST intercontinental rail link.

A description of the BST follows:

> The $65 billion (£33 billion) mega-project aims to transform trade links between Russia and its former Cold War enemies across some of the world’s most desolate terrain. It would create a high-speed railway line, energy links and a fibreoptic cable network.
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> Proposals for a tunnel under the Bering Strait were first advanced a century ago under Tsar Nicholas II but foundered with the outbreak of the First World War and the Russian Revolution. The idea was revived after the collapse of the Soviet Union but was shelved once again in Russia’s financial meltdown of 1998.

Russian officials insist that the tunnel is an economic idea whose time has now come and that it could be ready within ten years. They argue that it would repay construction costs by stimulating up to 100 million tons of freight traffic each year, as well as supplying oil, gas and electricity from Siberia to the US and Canada.

Maxim Bystrov, deputy head of Russia's agency for special economic zones, said: "This will be a business project, not a political one." The tunnel across the international date-line would be built in three sections through two islands in the Bering Strait and would link 6,000km (3,728 miles) of new railway lines. The tunnel alone would cost an estimated $10-12 billion to construct.

The scheme is being championed by Viktor Razbegin, deputy head of industrial research at Russia's Economic and Trade Development Ministry. He has long advocated a tunnel under the Bering Strait to provide a land route between Russia and the US, and published a feasibility study in the 1990s.

He told journalists that state and commercial companies would form a public-private partnership to fund and run the project. A conference in Moscow next week will propose an inter-governmental agreement with the US to underwrite construction of the transport link in return for a stake in the business.

Russian Railways is said to be examining the construction of a 3,500km route from Pravaya Lena, south of Yakutsk, to Uelen on the Bering Strait. The tunnel would connect this to a 2,000km line from Cape Prince of Wales, in West Alaska, to Fort Nelson, in Canada.

Summation of Potential Economic Impacts Provided by the ACRL

The Alaska-Canada Rail Link has the ability to create hundreds of thousands of jobs in both Canada and Alaska during the ACRL's construction and on going operation. Freight rail is cheaper and more efficient than other forms of transportation and will fulfill an important position in both America's and Canada's intermodal transportation infrastructure. The ACRL will lower the cost of living, create high paying jobs, economically bolster existing communities and create new opportunities for entrepreneurs through Alaska and Canada. The ACRL will lower development costs and provide infrastructure on which to build new foundations for resource extraction and international trade.

The ACRL will also provide a "4th leg" to the Alaska "3 legged stool" financial model and provide a new transportation infrastructure that will help support the other three legs and make them stronger. Governments in Alaska and Canada both will benefit from lower resupply costs and reduced highway maintenance because rail will take over a great deal of traffic.

- The proposed ACRL would create over **1,045,000 working years of labor**.
- The proposed ACRL would create an estimated **150,000 new high paying jobs**, typically earnings around $50,000 – $75,000 a year.
- The proposed ACRL would create **$5,000,000,000 in new wages.**
- The proposed ACRL would make Alaska an international hub for the exchange of goods and could (based on acquiring 10% of west coast port traffic) save Asian shippers approximately:
    - **USD $759,110,400 in annual savings** from shipping to LA/LB or;
    - **USD $332,110,800 in annual savings** from shipping to Prince Rupert or;
    - **USD $1,636,831,800 in annual savings** from shipping to New York
- The proposed ACRL would allow Alaska and Canada to ship out an estimated **$170 billion in domestic products**.

- The proposed ACRL would save Alaska **$41 billion in transportation cost cuts** for mineral resource production.
- The proposed ACRL would create new entrepreneurship opportunities (in both rural and urban Alaska) otherwise unavailable without direct transport of goods to international markets.

The ACRL will provide new international direct and indirect value:

- During the construction of the ACRL
- During the operation of the ACRL
- By increasing wages and lowering the cost of living
- By expanding and enhancing the oil and gas industry to make money and create jobs
- By expanding and enhancing the resource extraction industry to make money and create jobs
- By expanding and enhancing the tourism industry to make money and create jobs
- By expanding and enhancing the global shipping industry to make money and create jobs
- By enhancing the environmental benefits of international/national trade through increased use of rail instead of containership, truck, and airplane.
- By expanding and enhancing the operating ability of Alaskan ports to make money and create jobs
- By creating a transportation infrastructure to help induce the creation of the Bering Strait Tunnel
- By providing opportunities to create new jobs and commerce in the global community over the next 40-50 years

This project will require the cooperation of state and local governments, private entities, urban/rural/native communities, manufacturers and key stakeholders in two different countries to work together to provide value for themselves and the global community at large. Over the last four years there has been increasingly less drive to pursue the development of this project due to the financial stress on the global economy, but now is the time to build. Business as a whole is suffering and opportunities that previously would be overlooked due to being to grandiose must again be considered.

Local economies must have a complex network of economic drivers to fuel continued growth, especially when times are rough; “three legs” in Alaska may be enough to stand on today, but when one leg finally disappears because of the over-extraction of natural resources or under-development of tourism and port infrastructures, the “stool” will collapse. Alaska and Canada both must realize the direct and indirect benefits of the ACRL and how it will create untold levels of new economic development, not just to fill immediate needs, but to create new jobs for the next 50 years and reinforce jobs that currently exist; and Alaska and Canada must also realize that without projects like the ACRL, hundreds of thousands of potential job opportunities along with tens of thousands of current industry positions, may disappear, forever.

Total Project Cost for Alaska and Canada: **- $11.5 Billion**

Potential Economic Impact to Alaska and Canada: **+ $218.5 Billion**