How Baltimore's Natural Advantages and Infrastructure Can Lead to Economic Growth

By Niall H. O'Malley, MBA
Portfolio Manager, Blue Point Investment Management

In recent history, Baltimore has been challenged by a lack of economic opportunity, but that need not be the case moving forward. One of the most effective ways to enhance economic opportunity is to understand the region's natural resources and then invest in these natural advantages to deliver economic growth to both the city of Baltimore and the state of Maryland. This article looks at the historic natural advantages that have shaped Baltimore, and the infrastructure investment opportunities that can enhance economic growth in the region.

The Development of Baltimore Town

Following the American Revolution, Baltimore Town had fewer then 6,000 inhabitants, but it had a bevy of natural advantages: a protected deep water port that offered the best inland access and natural resources that extended beyond farmland and timber to include iron, copper and coal. In addition, Baltimore had ample freshwater from the Jones Falls River and Harris Creek. Interestingly, the fresh water content in Baltimore's harbor was a significant advantage for Baltimore over Annapolis in the age of wooden tall ships. The bane of ship owners was the shipworm, a relative of the salt water clam, often called the "termite of the sea." These mollusks bore into wood leaving a network of channels. The combination of the Jones Falls River and Harris Creek introduced enough freshwater into Baltimore's harbor to make it unappealing to shipworms thereby preserving the structural strength of tall ships. So the combination of a deep water port that offered the closest land access to the Ohio River Valley and a lower salinity helped contribute to Baltimore overtaking Annapolis as a preferred commercial port.

With Ships Come Trade and Ship Building

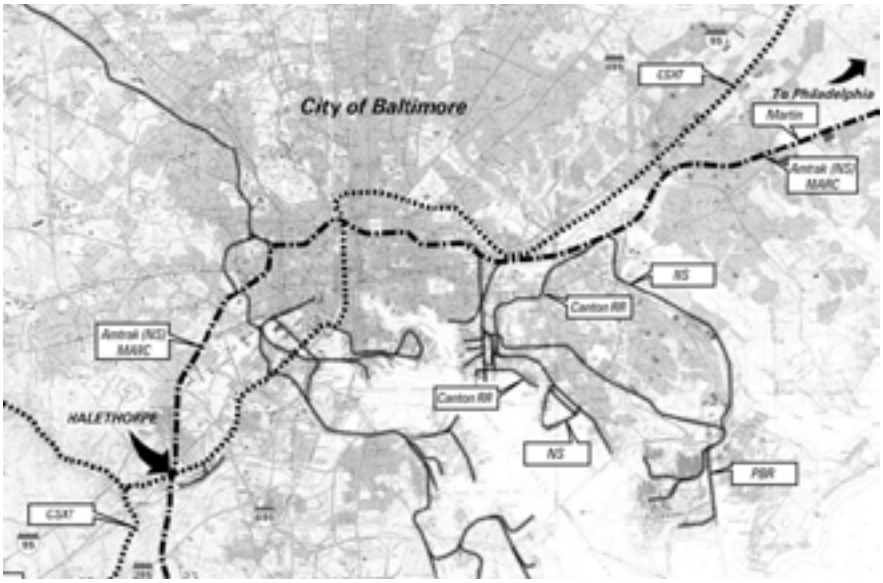
In 1785, the ship *Pallas* was recorded as the first ship to arrive in Baltimore from China as noted in George Washington's archives. The arrival of the *Pallas* with a cargo from Canton, China was a seminal moment in a spice trade that continues to this day with McCormick & Company. The *Pallas* brought cinnamon, cinnamon flowers, teas, opium, fine china, and silks. Baltimore Town thrived by exporting tobacco, pig iron, grains and refined flour. Baltimore was a primary port for sugar from the Caribbean, as well as immigrants, indentured servants, and slaves. In 1797, commercial growth drove geographic growth when Baltimore Town merged with Fells Point and incorporated as the City of Baltimore.

Tall ships Baltimore Harbor circa 1870, uncredited photo, Center Club

With international trade came the need for credit to finance trade and ship building. In the early 1800s Alex. Brown & Sons and Peabody, Riggs & Company provided credit and bills of exchange which fueled trade and ship building. During this period, Federal Hill was called Signal Hill, and the daily arrivals and departures of tall ships were noted with the raising and lowering of flags. During the 1800s there were 72 shipyards in Baltimore, and a number specialized in building a class of ship called the Baltimore Clipper, which offered unparalleled speed and maneuverability.

Baltimore Clippers had distinctive design innovations that allowed them to out sail British ships. First, Baltimore Clippers had distinctive masts that were sloped back. This mast design, known as raked masts, originated in the Chesapeake. Next, the Baltimore Clippers had sharp, V-shaped hulls, which led to them being called sharp built. To increase the sail area, Baltimore Clippers secured a long pole to the bow, which is called a bowsprit. The enormous sail area of a Baltimore Clipper and the sharp built hull design gave it speed and maneuverability. Baltimore Clippers were renowned for their ability to sail close to the wind, which helped them outmaneuver and capture British ships.

A Baltimore Clipper still sailing today is the *Pride of Baltimore II*. The ship's design is based on the design elements unique to the Baltimore Clipper's. The *Pride of Baltimore II* shares the speed and maneuverability of the *Chasseur.* In 1815 when the *Chasseur* returned to Baltimore, it was celebrated as being the *Pride of Baltimore* – a name that has stuck over 200 years later. Privateers like the *Chasseur* helped exact an extraordinary cost on the British Empire, capturing or sinking 1,200 ships between 1812 and 1815. In 1815, insurance rates for British ships skyrocketed to approximately one third the value of their cargo due to extensive losses exacted by privateers like the *Chasseur*. So, the reason the British came to Baltimore in 1814 was not



for the view from Fort McHenry, but a sincere desire to take control of the "hornets' nest" of ships and ship building in Baltimore.

Following the end of hostilities in 1815, Baltimore's trade and industrial base grew. A new economic threat emerged for the Port of Baltimore in 1825 with the opening of the Erie Canal. The Erie Canal connected the Hudson River with the Great Lakes, and transformed the relevance of New York as a port. Realizing the significance of the threat, Baltimore invested—privately and publically—in what would become America's first commercial railroad. In 1827, Alexander Brown and his son George lead the organization of the Baltimore & Ohio Railroad Company, and took leading roles in taking the company public. The stock offering raised $4 million dollars from over 23,000 investors. The Baltimore & Ohio Railroad sought to compete directly with the Erie Canal by offering more direct access to the Ohio Valley. The age of tall ships flourished as the Baltimore Clipper hull design inspired larger and faster clipper ships that were square riggers with deep keels for cargo but had pointed bows and sterns. The 'tea clippers' dominated trade with the East as demand for teas, spices, silk and porcelain grew. The Baltimore & Ohio Railroad transported the grain harvests of the Ohio Valley to the Port of Baltimore for export, while inbound ships carried both cargo and an increasing number of immigrants.

Between 1840 and 1860 the population of the city doubled. There was an influx of German and Irish immigrants to Baltimore dislocated by conflict in continental Europe and the Great Potato Famine in Ireland. Also during this time Baltimore became home to the largest free black population in the country. In the ten years prior to the Civil War, free blacks outnumbered slaves by more than eight to one. The 1861 Pratt Street Riot marked one of the initial conflicts associated with the beginning of the Civil War. Federal troops turned the guns at Fort McHenry and Federal Hill on the City, and Baltimore spent four years under military supervision. During this period, trade with the South was cut off. After the Civil War, ship building began anew in Baltimore, and Isaac Myers started Baltimore's first African American-owned shipyard, which is celebrated today by the Fredrick Douglass – Isaac Myers Maritime Park in Fells Point.

The success of the Port of Baltimore is tied to the transit options offered by commercial railroads. The vertical north-south leg of the CSX Track in downtown Baltimore along Howard Street is widely considered one of the biggest bottle necks in the East Coast of the U.S.

Creative Destructive Forces of Innovation Reshape Transportation

Standing today as an Inner Harbor landmark is the Power Plant, an example of the creative destructive forces at work in Baltimore. The Power Plant was built in 1899 to supply power to the United Railways and Electric Company for its electric streetcar system. However, after World War II, the popularity of motor cars led to the demise of Baltimore's electric streetcar in 1963. In 1965, transportation planning migrated to a six line Metro Subway system. Phase 1 was approved in 1972, and in 1983 Baltimore's Northwest line – the Green Line – opened. The Red Line extension was estimated to cost $2.9 billion.

The creative destruction associated with innovation, like the electric streetcar and the plant built to power it, has changed the importance of subways relative to their cost. The long sought Red Line subway extension was canceled due to its estimated $2.9 billion cost. The Red Line would have required extensive excavation between Lombard Street and Baltimore Street, critical bottlenecks in the city's already constrained infrastructure. New technologies are changing commuting patterns and ride sharing options. Telecommuting has grown into a commonly accepted practice, and an even newer

Under this plan the Inner Harbor, Pratt Street, Boston Street and Federal Hill would struggle to be more and elevated highway transit points.

technology has gained wider acceptance: ride sharing applications like Uber and Lyft. These ride sharing applications have fundamentally changed point-to-point transit, and are rewriting the rules about the number of parking spaces needed for urban developments as owning a car becomes more optional. In an era of scarce resources and changing commuter options, there is an option to do more with less.

BaltimoreLink

Constraints breed resourcefulness and invention. Using demographic data, decades old bus routes are being redrawn. A unified approach to urban transit, BaltimoreLink, is having a staged rollout, and is expected to be fully operational in July, 2017. BaltimoreLink includes 30 bikeshare locations that will be co-located with Zipcars to make point-to-point transit more seamless. There will be 12 new CityLink bus routes that use color coding to clearly indicate the bus route. An already observable change is the dedicated bus lanes being established throughout the city to facilitate more timely service. Timetables will be replaced with monitored scheduling every 10 to 15 minutes. The same changes will be made to Baltimore's LightRail which will become known as RailLink with 10 more hours of service on Sundays.

Highway versus Inner Harbor

A byproduct of the Eisenhower Interstate Highway System was Baltimore's proposed East/West expressway in 1960. The plan called for the integration of Route 70, Interstate 95 and Interstate 83, but sacrificed the Inner Harbor, parts of Little Italy, Fells Point, Canton and Federal Hill. Downtown Baltimore would have been cut off as an elevated highway ran down Pratt Street, Boston Street, and across Federal Hill. From a planning perspective, Interstate 83 was never intended to end in Baltimore's downtown core. But in 1980, Inner Harbor development took hold, and the area began the transition into a tourist destination. At the same time, the nation's 1776 bicentennial played a leading role in highlighting the historical significance of Fells Point. The planned highway's circular access ramps would have fundamentally changed many historical elements of Baltimore. Community opposition and over a dozen redesigns over two decades resulted in the hybrid solution that filled in and expanded Light Street, expanded Martin Luther King Jr. Boulevard, and added the elevated roadway that connects to Interstate 95.

Port of Baltimore Magazine

First new-Panamax container ship at Baltimore's Seagirt Marine Terminal July, 2016.

Smart City Challenge

Due to past choices, Baltimore suffers with limited East/West infrastructure, so the city needs further investment in infrastructure to lessen transit bottlenecks. One item sorely needed is traffic light synchronization on East/West thoroughfares. Synchronizing traffic lights with an assumed velocity would enormously help optimize traffic through key bottlenecks on Light Street and Boston Street. Linking the traffic lights to a dynamic smart grid would allow for fine tuning of the traffic patterns on a real-time basis and alleviating a rush hour that has evolved into a 3 to 4 hour rush period. Investing in traffic light infrastructure, maintaining city roads, and BaltimoreLink are key steps that would allow Baltimore to compete for funding under the Department of Transportation's Smart City Challenge, a federally-funded grant initiative to support technology transportation projects.

Sparrows Point and Middle River

As a country the U.S. was literally made stronger by the steel produced at Sparrows Point. The lasting legacy of Bethlehem Steel is in the Empire State Building, the Golden Gate Bridge, the George Washington Bridge, the Chesapeake Bay Bridge and the nation's rail system. From a ship building perspective, Sparrows Point Shipyard has also had a dramatic impact on the nation's maritime history. It built over 670 tugs, barges, passenger ships, destroyers, cargo ships, dredges, tankers, tunnel tubes and oil rigs. During both World Wars, the Sparrows Point Shipyard, supported by Bethlehem Steel, produced more ships than any other American shipyard. A total of 384 Liberty ships were built by Sparrows Point Shipyard. At its peak in 1943, Sparrows Point Shipyard employed 46,700 workers. Just down the road in Middle River was Glenn L. Martin, which built aircraft and flying boats. Glenn L. Martin built the China Clipper, Philippine Clipper and Hawaii Clipper for Pan American Airways. During World War II, the Glen L. Martin Company built 1,585 B-26 Marauders, and its Middle River plant employed over 52,000 workers in 1943.

A New Lease on Life

In January 2016, Sparrows Point was renamed Tradepoint Atlantic. The infrastructure that supported Bethlehem Steel and Sparrows Point Shipyard includes two highways systems, an extensive rail system, deep water piers, and its own power plant that can now support development of one of the most centrally located distribution hubs on the east coast. The former industrial site has 3,100 acres of land that now offers low-cost land for voluminous distribution facilities supported by the infrastructure of the Port of Baltimore. As the waterfront of Baltimore continues to gentrify with housing developments and developments like Port Covington, some of the salt piles and roll-on roll-off cargo will migrate to Tradepoint Atlantic. One key difference is that Baltimore will also be building distribution center jobs that leverage existing infrastructure and the Seagirt container terminal. In July 2016, the Seagirt Marine Terminal received its first new-Panamax container ship which carries nearly three times the cargo of a traditional Panama Canal class cargo ship. A new-Panamax container ship can carry 15,000 20-foot containers.

The Biggest Rail Bottleneck on the East Coast

In 1986, the Chessie System Railroads and Seaboard System Railroads were merged to form CSX. The Chessie System Railroad included the previously merged Chesapeake & Ohio Railway and the Baltimore & Ohio Railroad. CSX, as an integrated rail transportation railroad covering the Northeast, has been working on a National Gateway project to upgrade bridges and tunnels to allow double-stack intermodal containers. The last tunnel project is the Howard Street Tunnel in Baltimore. Due to rail capacity constraints, this area is widely cited as the biggest rail bottleneck on the East Coast. Adding double-stack capacity to the Howard Street Tunnel would offer a critical missing piece of rail infrastructure that would make the Port of Baltimore a

more desirable destination for logistics companies and ships. More importantly, it would allow a doubling of container shipping volume while lowering container traffic congestion on Interstates 95 and 695, and Route 70. Rail capacity of the Seagirt Marine Terminal would double with additional capacity to spare for future growth. In the past, this was fanciful infrastructure investment. The cost of a totally new rail tunnel replacing the Howard Street Tunnel was estimated to cost in the billions, however, with lessons learned from other CSX National Gateway projects and new technology, the estimated cost is now $425 million. A public-private partnership of the State of Maryland which operates the Maryland Port Administration, the Federal Government's FastLane grants, and CSX Corp which operates the tunnel would each provide one third of the funding. The State's application for Federal FastLane funding was turned down last year, but the State of Maryland is already preparing to apply again in 2017.

Need for a Blue Water Harbor

As Baltimore gentrifies, the salt piles and roll-on-roll off cargo will move to Tradepoint Atlantic, as Sparrow's Point is repurposed as a distribution hub, an age-old question arises regarding water quality in the harbor. How can Baltimore attract tourism, sporting events and families to a city with an unaddressed raw sewage overflow issue? While Baltimore has been blessed with a wonderful water supply and reservoir system, it was the last large city the U.S. city to install sewage treatment plants in 1912. Baltimore needs to complete the investment in water treatment infrastructure by separating and upgrading old storm water and sewage lines. The current lack of water treatment infrastructure takes away from the city's core asset. Heavy rains regularly overwhelm the city's sewage treatment facilities resulting in a direct discharge of untreated raw sewage and undesirable health risks.

Conclusion

Today, even with limited financial resources, Baltimore and Maryland have the opportunity to invest in infrastructure that will power economic growth. After a comprehensive review, there are four key projects that will strengthen the region's natural advantages and relieve infrastructure disconnects: the BaltimoreLink mass transit integration project, a smart traffic light management system, double-stack rail capacity in the Howard Street tunnel, and completion of the storm water and sewer line upgrades. It is important that Baltimore and Maryland make these critical investments. There is a lot of pride in Maryland, and investing in Baltimore's natural strengths will help foster economic growth and regional competitiveness. The infrastructure investments would also leverage the mission of Maryland's Ambassador, the *Pride of Baltimore*, as she reminds the world of the Port that built a City and a State.

Appendix

Industries of Maryland Historical Publishing Company, 1882 Baltimore, MD https://books.google.com/books?id=qjFEAQAAMAAJ&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false

Baltimore's Railroad Network, Department of Transportation, Federal Rail Administration, January 2011 file:///C:/Users/Owner/Downloads/BaltimoreRailroadNetworkReport.pdf

Baltimore's Rail Network Challenges and Opportunities, Federal Rail Administration file:///C:/Users/Owner/Downloads/brn1%20(4).pdf

Building the Great Road, The Building of the Baltimore & Ohio https://books.google.com/books?id=JjrCWPwvHzIC&pg=PA203&dq=The+great+road+building+the+B%26O&hl=en&sa=X&ved=0ahUKEwiTjPKsn5XQAhVl0YMKHXRfCaAQ6AEIJjAA#v=onepage&q=The%20great%20road%20building%20the%20B%26O&f=false

https://en.wikipedia.org/wiki/History_of_Baltimore

https://en.wikipedia.org/wiki/Henry_Fite_House

http://msa.maryland.gov/msa/intromsa/pdf/slavery_pamphlet.pdf

https://en.wikipedia.org/wiki/Baltimore_riot_of_1861

https://en.wikipedia.org/wiki/Isaac_Myers

http://monumentcity.net/2012/02/15/a-brief-history-of-baltimores-electric-streetcars/

http://www.baltimoresun.com/news/opinion/editorial/bs-md-hogan-transportation-20150624-story.html

https://en.wikipedia.org/wiki/Red_Line_(Baltimore)

http://baltimore.org/article/baltimore-civil-war

http://articles.baltimoresun.com/1994-08-23/news/1994235147_1_slavery-free-blacks-slaves-and-free

http://www.baltimoremd.com/charm/pointofentry.html

http://www.shipbuildinghistory.com/history/shipyards/2large/inactive/bethsparrowspoint.htm

https://baltimorelink.com/images/public_engagement/press_releases/2016-06-20%20-%20Express%20BusLink%20Debut.pdf

https://www.tradepointatlantic.com/

http://www.mpa.maryland.gov/