I. Summary of Innovation

Date(s)	Category	Innovation
1850-	TECH	Drafting the lines of the 1850s Boston clipper ships, McKay made possible high-speed connectivity to the West Coast of America and the rest of the world.

Short description

On December 7, 1850 Donald McKay launched his first Clipper ship from his East Boston shipyard. The novel design of the Clipper was built for speed; cutting a sleek line through the waves, soon after the Clipper's filled the sky with acres of sail. Their sailing feats fit America's fascination with speed at the time (and to this day) and they remain some of the fastest ocean-going sailing vessels in the world. Though their age was a short one, the Clippers were instrumental in opening new trade routes and connecting the world's people through port-of-calls. Boston was the home of the Clipper design and its greatest builder, Donald McKay.

Proposed factors

Rank	Factor	Explanation
5	Local Leadership (Entrepreneurial)	McKay's vision for a sleek cutting vessel capable of carrying cargo and passengers great distances in a short period of time revolutionized the shipbuilding trade and in turn changed the world's connectivity along the oceans. The impact on the Boston economy brought shipwrights, sailors, and captains from around the world.
4	Local Funding	Through a series of business mergers and partnerships McKay was able to grow and develop his burgeoning shipyard. Initial investments by Enoch Train allowed McKay to set up shop.
4	Inter-regional Competition/ Rivalry	The New York competition combined with the oceanic races of the competing shipyards caused a rapid and continual progress that innovated the maritime trade.
4	National Demand	California gold was calling and those that could deliver '49ers the fastest were able to command princely sums for passage and cargo. It was a trans-continental trade conducted around the Horn.
3	Transportation	Providing the captains, crews, and shipbuilders for the clipper age, Boston's place in the shipping trade led Boston's impetus and ability to innovate.

2	Immigration	McKay was an immigrant. His grandfather fled America after the revolution to settle in a Loyalist community in Nova Scotia. McKay returned to America in order to pursue his craft and his fortune- two things that, most likely, would not have happened in Nova Scotia. Additionally, the shipyards of East Boston brought an influx of captains, sailors, stevedores, and shipwrights from around the world.

II. Pertinent Background Info

Gold and the Need for Speed
Eureka! Gold had been found in the hills of California, the news had spread the world over, seemingly faster than the ships at the time could carry it; there was a fever. Gold Fever. People flocked for California by the thousands, seeking a new life and to strike it rich. Others saw an assured fortune in these fortune-seekers; these merchants understood that there was good money to be made in supplying the forty-niners. The once dreary port of San Francisco was now a bustling boomtown; consider that in the first four months of 1848 only four ships sailed from the East Coast for San Francisco, while in 1849, 774 cleared for the same destination (Evans 33). The problem was that the ships took on average 200 days to travel the 16,000 nautical mile journey around Cape Horn and up to San Francisco. An enterprising young shipwright established in East Boston was itching to make waves; Donald McKay changed the world of shipbuilding with the launch of the *Stag Hound* in 1850.

Dawn of the Clipper
The Boston clipper's design came from the brackish gliding vessels of the Chesapeake Bay. These Baltimore clippers brought knife-edged styling together with a skimming dish design that allowed them great speed but could not handle much cargo nor could they take rough seas. The Boston clipper solved the dilemmas that had riddled shipbuilders for centuries; they combined great speed with cargo carrying capacity and thrived in heavy seas that provided them the wind to travel remarkable- and still unrivaled- distances.

The father of the true clipper ship, the Boston clipper, was Donald McKay. Born in a rural Loyalist community in Nova Scotia McKay emigrated at the age of seventeen to the country his grandfather had abandoned after the Revolutionary war. Returning to America, McKay apprenticed as a ship-carpenter for Isaac Webb. After his indenture McKay found employment at the many shipbuilding houses of New York as a free-lance shipwright. Acing on ideals that he had developed and building upon the designs of the New York packet ships, McKay envisioned a new form of fast sailing vessel. In 1844 he opened a shipyard in East Boston at the behest of Enoch Train, owner of the Boston-Liverpool line.

McKay continued to hone his craft by slowly bettering the forms and lines of his ships. Smoothing their drafts and streamlining their cuts through the waves, McKay drew influence from the Baltimore clippers and the sleek *Rainbow* of New York. With the impetus of a booming trade in California, McKay produced his first Boston clipper in 1850. Dubbed the *Stag Hound*, it was but the progenitor of an age.

The year after the launch and success of the *Stag Hound,* McKay produced four clippers from his yard. The most famous of those four, and perhaps one of the most famous vessels of her time was the *Flying Cloud*. Christened on April 15, 1851 the *Flying Cloud* was a 1,783-ton clipper that was able to sail from New York City to San Francisco in less than ninety days. 16,000 miles in 90 days. The year before, ships were making the same run in more than twice that amount of time.

McKay's vessels would get larger and larger- some of the ships, such as the massive *Sovereign of the Seas* and the *Great Republic* would be funded by McKay himself because no company would order such large ships. The *Sovereign of the Seas* was captained by McKay's brother, Lauchlan, and gained Donald McKay international notoriety. The *Great Republic's* launch was witnessed by tens of thousands, making it a huge celebration for the Boston area. Unfortunately this 4,555 2/3-ton ship burned before she got to sea. The *Great Republic* was rebuilt and became the flagship of American merchant marine. Year after year during the 1850s McKay would outdo his previous years achievements. In 1854-55 McKay's shipyard produced six clipper ships built for the Liverpool-Australia trade that was opening up. New throngs of people were moving to Australia to find their fortune in gold. Once again, fast sailing ships were needed to bring provisions and capitalize on the boomtowns. Two of these clippers, the *James Baines* and the *Lightning* hold world records that still stand to this day for merchant vessels. The *Baines* was able to make the fastest transatlantic port-to-port crossing, traveling from Boston to Liverpool in twelve days, six hours. The *Baines* also set the round-the-world record of the day by making a round trip in 134 days. The *Lightning* holds the merchant vessel record for greatest day's run- 436 nautical miles.

In the Wake of the Clipper: Maritime Reorientation and New Horizons

These ships' great accomplishments accompanied the end of an era. They were the acme of the design but still fell short of their designer's vision. McKay said that, "I never yet built a vessel that came up to my own ideal; I saw something in each ship which I desired to improve," (Boston Daily Advertiser, Oct. 29, 1864). By 1855 the heyday of the 'extreme clipper' was over, their size and speed were not in the same demand. These California clippers were designed to attain great speed, but the forfeited cargo space in order to accomplish their speed. With the bottom dropping out and the trade to Australia picking up McKay turned his attention from the extreme clippers to the medium clippers. These medium clippers were able to carry a much greater amount of cargo a still high rate of speed. After 1855 there were too many of these vessels sailing the seas, competing for dropping cargo rates. In California the land produced what the merchants had supplied before and in 1857 a financial panic that served as a crippling shot to the American shipbuilders put the American merchant marine into a state of flux and a downward spiral.

A foreboding of the coming Civil War, the economic Panic of 1857 forced financial institutions to call in their debts and dropped the princely cargo rates of the merchants' dollars to pennies. This forced a redesign of the clipper ships, no longer built purely for speed the genius of McKay was thwarted in keeping his business afloat. At this time he traveled to England, where he helped their shipping industry and became convinced that the sailing ships time was fleeting, returning home advocating the advancement of steam power and iron cladding.

In the sunset of his career McKay worked to develop the Federal navy's iron clad boats, he worked to advance the designs and efficiency of steam powered boats and he continued to build medium clippers. His last great clipper was the *Glory of the Seas*, launched in 1869, well after the heyday of the clipper ship; the *Glory* served in the new California trade of wheat. The American shipping industry was paralyzed by high taxation, high cost of material, and rising labor rates. After the launching of the *Glory*, McKay's shipyard was closed in 1869. McKay remained employed in a limited capacity by working with the government to draft plans for the Navy's sloops of war. Here he enacted his new designs of iron cladding and worked to push the navy's technology forward.

The clipper age had set sail into the annals of history, but the profound impact that the ships, and Donald McKay, had on Boston and the country would remain. McKay's ships were built at a pivotal point in American and naval history. In America the west was rapidly opening up and the manifest destiny of a nation was looking towards the setting sun. The clippers provided rapid access to San Francisco, bringing provisions, news, and people westward. In naval history the clippers represent the pinnacle of sailing technology. After the heyday of the clipper ship and with the increasing technology of the steamship, the Clipper ships' days were clipped short, relegating their duties to that of refitted bark duty, pleasure boating, and coasting trade. For Boston, McKay and the Clipper Age brought great notoriety, an inflow of goods and money, and the development of a highly skilled set of sailors and craftsmen. Boston was home to the best in the nautical trade, but lost much of these workers with the spiral of the Civil War period. When you look across the harbor towards East Boston, if the sun is right and you squint your eyes just enough you can still see the bustling shipbuilding yards, the harbor full of the finest vessels, and the sky filled with the white sails of a bygone time.

III. List of Variables

5: Local Leadership (Entrepreneurial)
McKay was one of many in New York City, competing in for places in shipyards as a free-lance shipwright. His enterprising spirit took him north to Newburyport, Massachusetts to advance his position by heading a ship works. His association with William Currier and his reputation in building New York packets quickly brought him notoriety. This allowed for him to accept an invitation from Enoch Train to open a shipyard in Boston to build Train's line of ships for the Boston-Liverpool trade.

Soon through McKay's innovative designs and refinements he was producing world famous crafts that broke boundaries in speed and distance bringing the world closer with each passage. Each ship was an embodiment of McKay's search for the perfect seagoing vessel.

4: Local Funding: Capital/Finance From Bostonians/ Local Institutions
Without funding from such financiers as Enoch Train, McKay would not have been able to open his shipyard. At the age of 34 McKay became a master shipwright with the financial backing of Train. It was in Train's Boston-Liverpool line of ships that McKay first cut his teeth on revamping the packets. Train was looking for speed, strength, and stability at sea; all in addition to supreme comfort of passengers, just that is what McKay was able to produce.

4: Interregional Competition/ Rivalry (Inter-regional)
With rival shipbuilding houses found in Portland, Boston, New York, Philadelphia, Baltimore, Norfolk, Charleston, and New Orleans the race for the best built, fastest sailing, and most economical ship was highly contested. All cities produced ships for passenger service; brigs, schooners, and barks for the coasting trade; and packets for oceanic trade and travel.

It was McKay's clippers that changed the course of competition and forced the other cities to follow Boston's lead in designing and building the finest sailing ships of the day. It was the other cities following and changing designs that forced McKay to continuously refine his vessels.

4: National Demand: The innovation responds to a market/ Demand that is bigger then Boston
Gold fever was calling and Americans were rushing to California by the thousands. With so many seeking their fortunes there was a fortune to be made in transporting these people and the goods necessary to support them to California. A problem was that to sail around Cape Horn it took more than 200 days and even longer and more arduously to cross the American continent before rail travel. The California clipper design of the McKay house was the answer. Faster by half the time, the clipper ship sailed confidently into rough seas and high winds bringing a limited number of people and cargo to California at an astonishing rate.

This was coupled with American demand for certain raw goods that were found in Asia, allowing the clippers to engage in a robust China trade as well as commanding princely sums for consumer goods in California. A long distance- high-speed trade was enacted through American demand.

3: Transportation: Happened because Boston was a Hub of Transportation
Boston's place historically and contemporarily is important to understand in considering why McKay was so successful in Boston. Though it was not as populated and did not have as much to ship as New York and Philadelphia, the placement of Boston connected it with the coasting trade and the Atlantic trade. There was a host of sailors and captains

that were willing to crew and skipper the ships that McKay was producing. The area also brought the best shipbuilders away from the New York docks over time because of McKay's notoriety and success.

2: Immigration
A loyalist stronghold in Nova Scotia produced an American immigrant that brought honor and fame to the American merchant marine. The glory of the seas that was once Britain's moved to America during the clipper age.

IV. Economic or Social Impact

The clipper age was a transitional time in Boston and America's history. It was placed precariously during a time of rapid movement Westward and directly before the economic fallout of the Panic of 1857 and the opening shots of the Civil War. Too many ships, too many shippers, and a change of economy left the Boston shipping industry stalled.

After the clipper age Boston was not able to turn to steamship production nor was it able to produce ironclad sailing vessels that gained dominance over the seas. Without this industry the Boston shipping industry dwindled and dried up with time.

The heyday of the clipper was made possible because of enterprising individuals that built upon a legacy of shipbuilding in a nautical region. Availability of lumber and raw materials eventually compiled with an economic crunch making the heyday of the clipper a short lived albeit glorious age.

V. Timeline

1810:	Donald McKay born September 4th in Nova Scotia
1827:	McKay emigrates to New York to begin his shipwright apprenticeship to Isaac Webb.
1841:	McKay sets up a shipyard in Newburyport, MA in partnership with William Currier. McKay serves as master shipbuilder.
1844:	At the behest of financier and merchant Enoch Train, McKay moves his yard to East Boston.
1850:	McKay launches his first clipper ship, the *Stag Hound*.
1851:	McKay launches four clippers, notably he launches the *Flying Cloud*.
1852:	Launching the *Sovereign of the Seas,* McKay is forced to fund the ship on his own account, becoming the owner of the world's largest vessel.
1853:	Also on his own account, McKay boldly builds the *Great Republic*. The 4,555-ton behemoth sadly burnt while being outfitted. It was later rebuilt and was the pride of the American Merchant Marine.
1854-55:	Building the *James Baine,* the *Donald McKay*, and the *Lightning* clippers for use in the Liverpool-Australia trade McKay's ships

will set multiple speed records under sail that remain to this day for merchant vessels.

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VII. Next Questions to be Followed Up – when revisited

Each of these aspects could be emphasized to develop how we understand McKay's Clippers:

1) First Clipper ship?
2) Successful 'round the horn' passage in record time?
3) Tying the world together- making for a smaller 'time gap' in information and goods?
4) Starting the Clipper Age?
5) Breaking waves for new technological innovations in steel hulls and steam power?