Tacoma Narrows Bridge

Executive Summary

Tacoma Narrows Bridge was constructed in the late 1930's and was opened for public use in July 1940. Within months of its use, the bridge collapsed in Nov 1940. Even though there were not many human casualties, it raised a lot of concerns about the lack of knowledge and understanding of various stresses that should be taken into account when designing and building suspension bridges.

The bridge was designed and constructed with all the correct regulations and practices established during that time. The collapse of the bridge during a 40 miles/hr wind was unexpected, especially when it was designed to withstand 110 miles/hr wind. After the incident, a detailed analysis was conducted to find the root cause and come up with recommendations to avoid such incidents in future. The investigating officers concluded that science of aerodynamics, deflection theory and self-excited motion were not well known by the engineers and designers during that era; as a result they were not incorporated in the bridge design.

Recommendations for future suspension bridge design are to include wind tunnel testing prior to any construction, incorporate effects of wind uplift during bring design and to include aerodynamic truss and stability through mass approach. In order to prevent such incidents in existing suspension bridges, wind tunnel testing of existing bridges must be conducted and should be structurally stabilized if deemed necessary. Another action plan is to revise the bridge design policies and regulations based on the recommendations and knowledge gained from this incident.