

A Feasibility Study into the use of String Transport Systems for Passenger Rail in New South Wales

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String Transport Systems (STS) are an efficient rail technology currently under development in Russia by String Technologies Unitsky. This technology utilises high tension steel cables within concrete filler on an elevated structure, in place of conventional steel rails.

To determine the feasibility of STS application, a technical analysis and design has been carried out in this paper, particularly in relation to; application site selection, demand estimation, design, and costing. Based on this research, the best use for this novel technology was found to be a route from Sydney's Kingsford-Smith Airport to Bondi Beach which has been designed and developed. The structural and geotechnical elements of this route were designed using Australian Standards, and compared with data available from String Technologies Unitsky.

This design found that the route was capable of carrying 12,300 passengers per day between Sydney's Kingsford-Smith Airport and Bondi Beach, with provisions to increase this number to 80,000 in the future. The travel time was 25 minutes on this 20.42 km route, which is less than current public transport options, as well as personal transit. Structurally, the typical supports and foundations of a STS network were compliant with Australian Standards, ensuring a satisfactory design. The string-rail, the novel component within this technology, also sufficed design loading and when life cycle costing was considered, STS offered savings of 75% when considering its counterparts.

From the analysis of the transport elements, and structural and geotechnical design of the structure, STS has been proved feasible for small scale implementation in highly urbanised NSW areas. Based on this conclusion, further research towards implementation should now be possible.