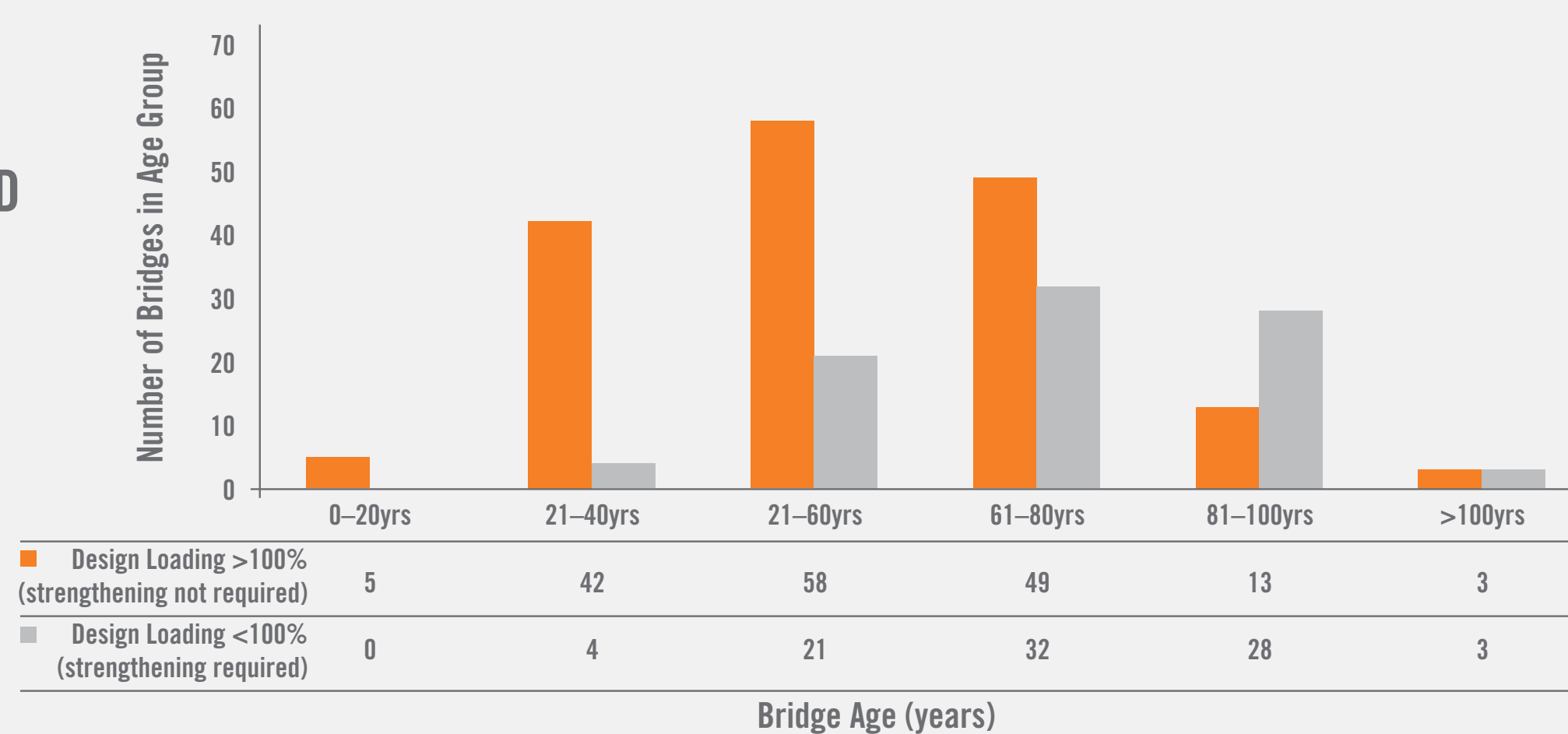


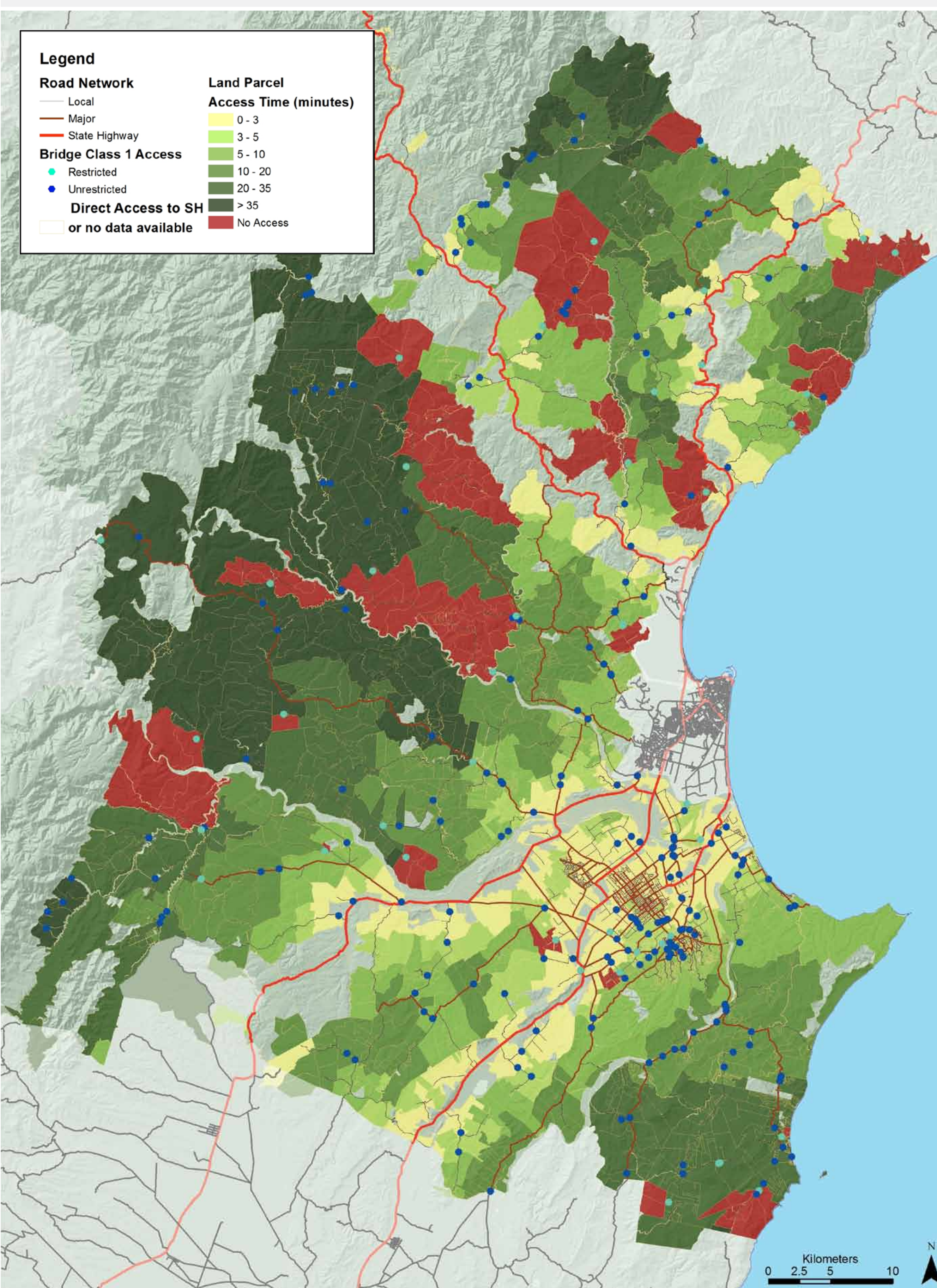
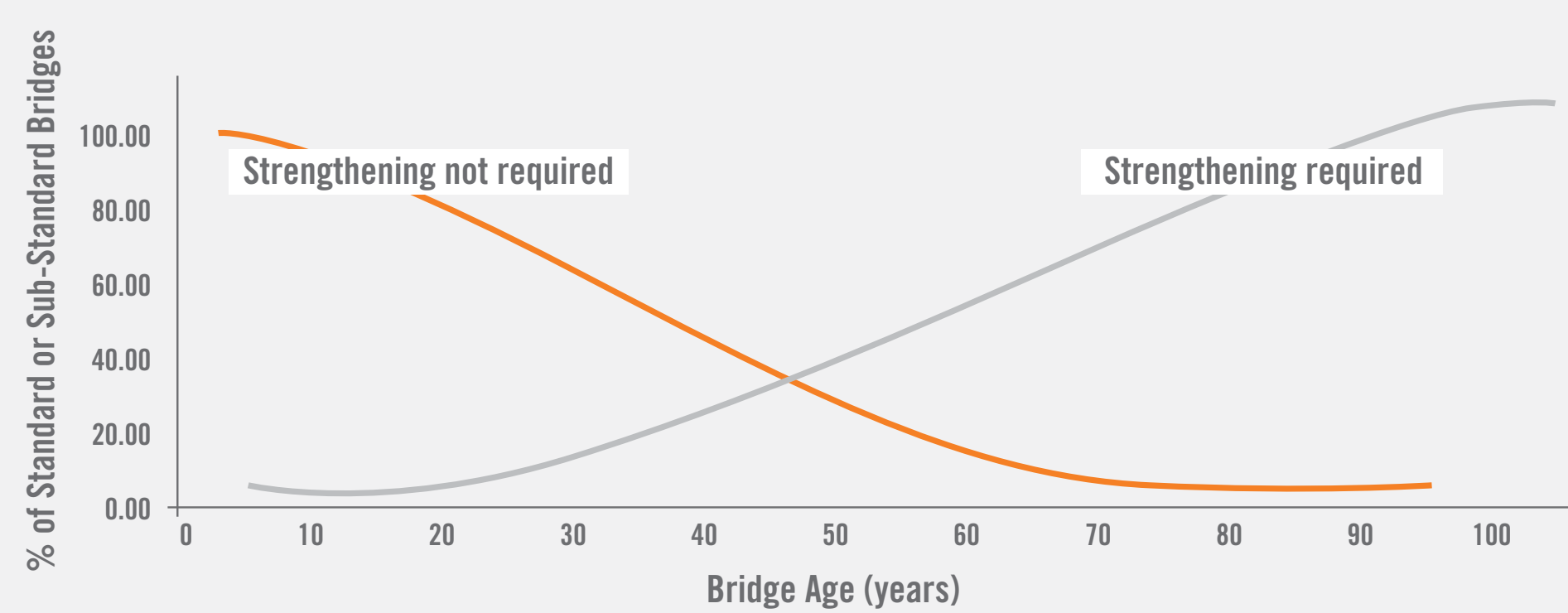
OPTIMISING BRIDGE ASSET MANAGEMENT



SUMMARY OF BRIDGES IN HASTINGS ASSESSED AS REQUIRING STRENGTHENING



CUMULATIVE DISTRIBUTION OF BRIDGES REQUIRING & NOT REQUIRING STRENGTHENING



THIS STUDY FOCUSED ON UNDERTAKING AN ACCESSIBILITY ANALYSIS TO MEASURE THE IMPORTANCE OF THE 260 BRIDGE ASSETS IN THE HASTINGS DISTRICT IN TERMS OF THEIR CRITICALITY WITHIN THE STRATEGIC NETWORK. THE OUTCOMES FROM THE STUDY ARE BEING USED TO PRIORITISE BRIDGE ASSET INVESTMENT WITHIN HASTINGS DISTRICT.

WHAT IS BRIDGE ASSET MANAGEMENT?

Many of New Zealand's local road bridges were built in the 1950s and 1960s and are now reaching the end of their useful life, and therefore needing upgrading or replacement (New Zealand National Infrastructure Unit, 2009). Bridges are maintained to a specified level of service, this can lead to weight limits being imposed on bridges to reduce maintenance costs and maintain user safety.

Bridges function as both individual structures and at a network level to allow access to entire areas. Bridge asset management involves agreeing on performance goals for an inventory of bridges at both an individual bridge and a network level and optimising investment to achieve the agreed service level.

The fundamental goal of a structured approach to bridge asset management is therefore to establish a strategy for bridge stock that achieves an optimised balance between life-cycle cost, risk and level of service.

HOW CAN IT BE OPTIMISED?

A multi-criteria analysis can be carried out and results compared against performance measures. This project involved the development and implementation of a network assessment model to evaluate and rank the criticality of approximately 260 bridge structures within Hastings District.

The assessment included the development of an iterative accessibility model in GIS. In this instance accessibility modelling has been used to calculate the journey time (impedance) on the transport network between origins (land parcels) and destinations (the State Highway Network) with the results focused around the access performance of bridges. This is a novel application of an accessibility analysis. The model produces two performance outputs including the relative importance of lifeline bridges and the relative importance of weight restricted bridges from a heavy commercial vehicle transport perspective.

PROJECT OUTCOMES

The outputs from the analysis have proved valuable and enable decision makers to make better decisions about prioritising maintenance schedules and developing balanced signposting and strengthening strategies for bridges as well as assisting with lifelines and emergency response decision making, including prioritisation of seismic retrofitting. The analysis process has also been for the most part automated, so it can be repeated periodically as changes to the road network, land parcel and bridge locations occur or to allow benefit and cost tests of potential improvements to be undertaken.

The outcomes from the study are being used to target investment and optimise the asset management process within Hastings District. This will result in better investment decisions and therefore more efficient outcomes. This should also ease the processing of funding applications due to the transparent investment methodology.



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