Wide wet gap crossing

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Introduction

The Manoeuvre Support project has a requirement to assess bridging system capability against Wide Wet Gap Crossing (WWGC*) requirements to optimize vehicle design choices.

Method

A Multi Criteria Decision Analysis (MCDA) method was developed to assess the ability of bridging platforms to meet the challenges of WWGC.

This allowed the development of a framework to enable to rapid comparison of different characteristics of platforms and gaps (identified from the US Army Handbook), in a transparent, robust and quantitative way.

The MCDA used 8 real-world bridging systems and 20 gaps along 3 representative routes. The analysis aimed to identify those bridging platform characteristics deemed important, those that have little impact, and those where investment could potentially make a significant impact on performance.

Findings

- There was no ideal set of platform characteristics that would guarantee good gap crossing performance. Rather, it is better for a bridging platform to have good capability in all aspects of gap crossing than to specialise in a few.
- The ability to cover obstacles and terrain leading to and from the gap had a dependency with most of the other gap characteristics. This suggests that this characteristic may be an important design driver for future bridging platforms.
- It was also found that there was a trade off between high land speed and good gap crossing ability. The importance of this trade off will need to be carefully considered by any decision makers.

*A WWGC is a gap of greater than 40m that contains water (e.g. river, lake, etc.).

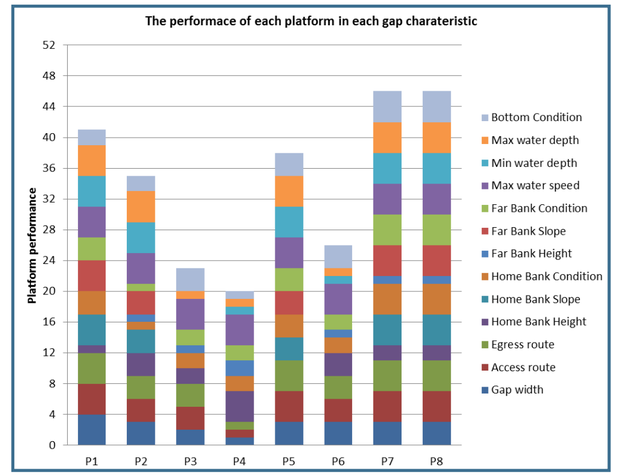

Figure 1: The capability of the 8 bridging platforms in each Gap Characteristic (GC). Performance in each GC was rated 0 – 4, giving a maximum possible score of 52.

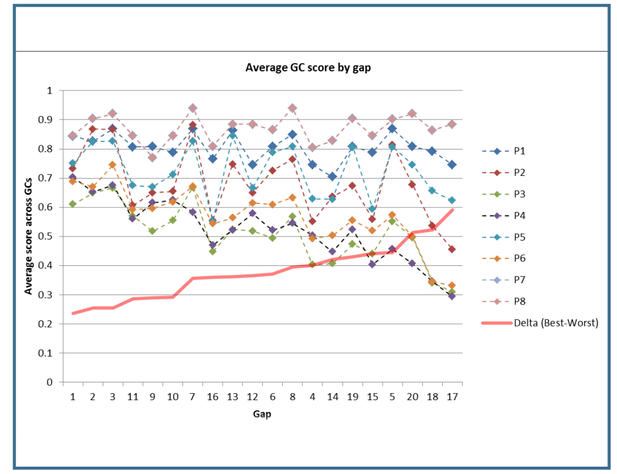

Figure 2: The average gap characteristic (GC) score for each bridging platform for the 20 gaps. The solid line indicates the difference between the highest and lowest scoring bridging systems for each gap. The gaps are ordered from smallest to largest difference between platforms.

Next Steps

Having identified what characteristics are key drivers of gap crossing performance, the next phase of this work is to look at how important these characteristics are in different situations (e.g. humanitarian relief Vs crossing under fire). We will also look at how the cost of each platform varies with performance characteristics.

This will add further context to our analysis, enabling decision makers to have a more complete picture of the trade-off between a platforms cost and performance.