

Unconventional Intersection Design for El-Majmaa Urban Network Intersections

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Abstract

The use of unconventional arterial intersection designs (UAIDs) has been advocated as a novel solution that can efficiently enhance the operational and safety performance of at-grade signalised intersections. Several studies suggest that UAIDs can lead to higher capacity, lower delays and fewer crashes. As well, these 'non-traditional' designs are cost-effective as only minor geometric modifications are usually required. Therefore, we intended to apply one of UAIDs policies on a major intersection in Al-Majmaa city to enhance its operation.

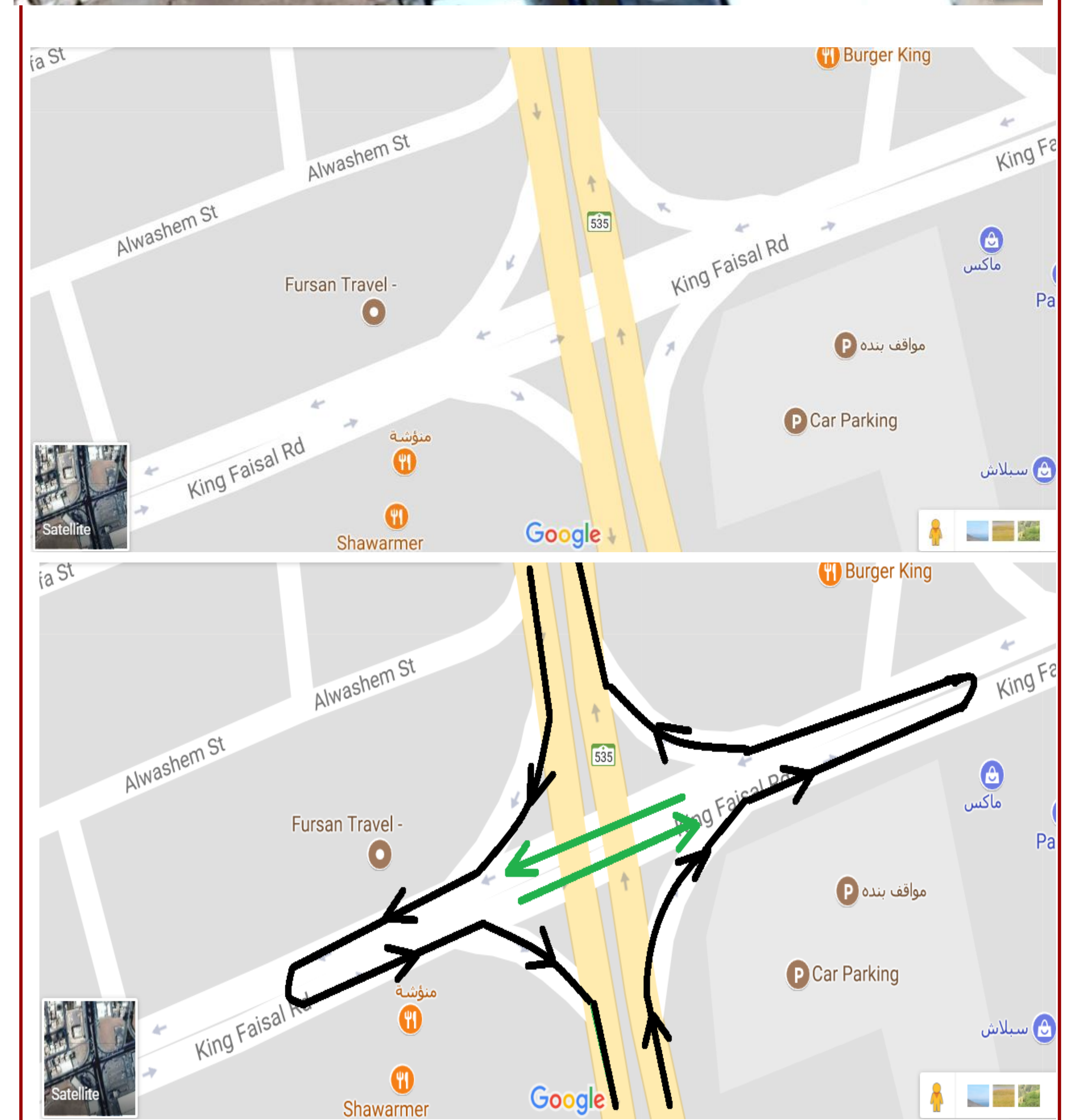
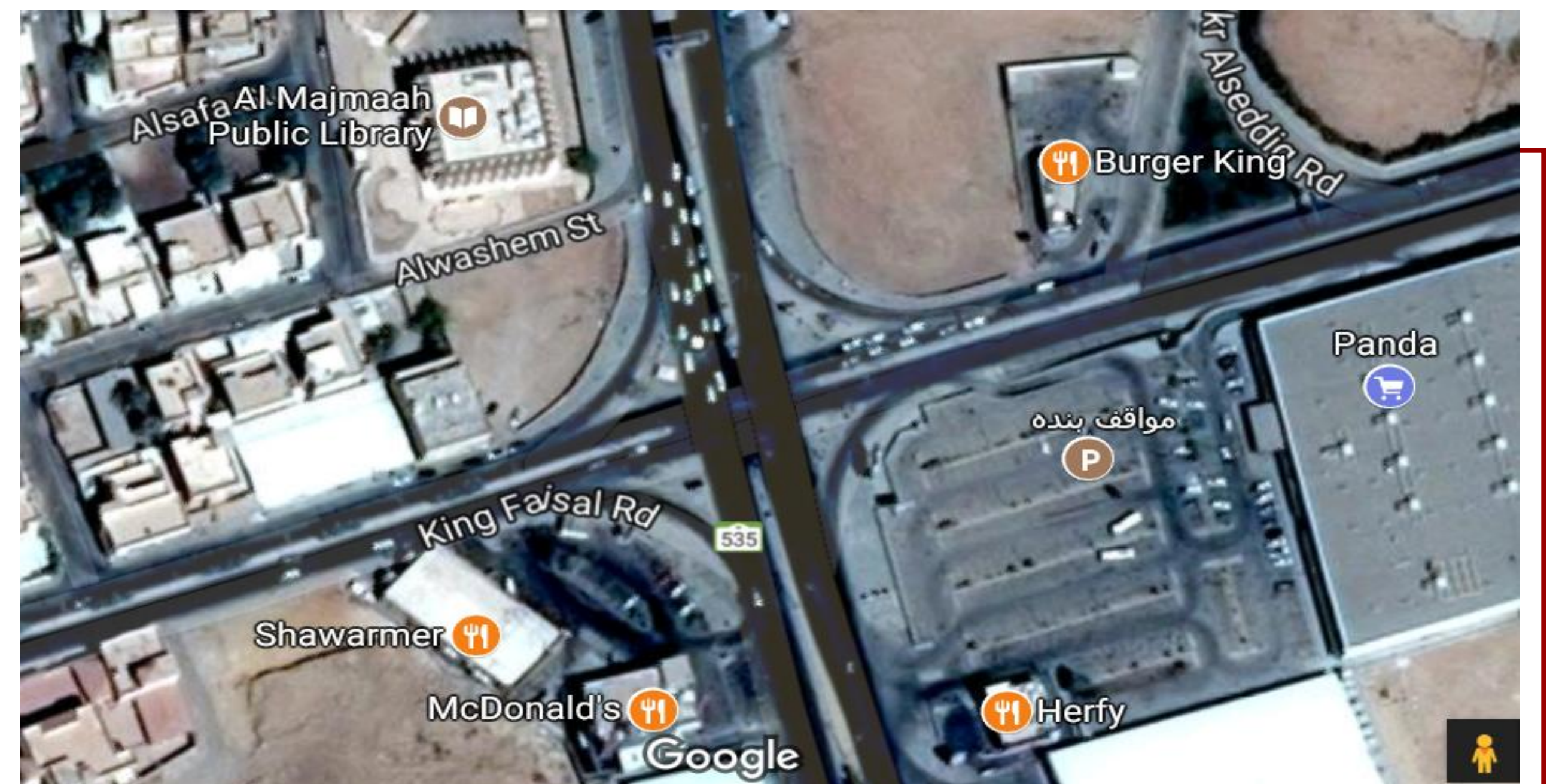
Description

The left-turn movements are partially or fully prohibited at the intersection and moved to median crossovers downstream the primary intersection. Partial prohibition of left-turns is meant to allow only left-turns from the minor street to the major street at the primary intersection. Full prohibition, on the other hand, does not allow any left-turn movement at the primary intersection whether from the minor or the major street. The U-turn crossovers can be located either on the major street, the minor street, or both, depending on the available median width. Furthermore, these crossovers can be signalised or unsignalised.

Objective

- UAIDs can lead to higher capacity, lower delays and fewer crashes.
- As well, these non-traditional designs are cost effective as only minor geometric modifications are usually required.
- We can facilitate through traffic movements, and reduce the conflicts between left turn movements and the opposing through traffic by re-routing one or more of these movements major conflicts between left-turning and opposing through movements are removed
- Fewer number of signal phases are required to operate the intersection.
- We can obtain shorter cycle lengths can be utilised which leads to lower delays, higher capacity and better through progression.

The Case Study



Tools & Data

- Chosen intersection location which is suffering from acute delays and congestion.
- Traffic counting on all approaches.
- Simulation program.
- Traffic Speed measures.
- Authorization to apply the decided traffic control.