Tbilisi – Georgia on my mind

David Parkin

Since 2015 Mott Macdonald has been involved in providing advice and assistance to the Municipal Authority of Tblisi, the capital city of Georgia. Georgia is a country in the Caucasus region of Eurasia. Located at the crossroads of Western Asia and Eastern Europe, it is bounded to the west by the Black Sea, to the north by Russia, to the south by Turkey and Armenia, and to the southeast by Azerbaijan. The capital and largest city is Tbilisi.

Map of Region

In the years before the country gained its independence car ownership was very low. As the population has become more affluent and more people have become able to own a car, it has become a status symbol to own and use a car. It is seen as a right, not only to drive your car wherever you like in the city, but also to park without restriction. This has led to an issue in recent years, not only to traffic congestion in the city, but also to parking regulation and enforcement.

Mott MacDonald have been providing advice to Tbilisi on public transport issues around the city. We have carried out studies of the public transport network and given advice on changes to the bus network to rationalise the routes and services, to provide advice on depot locations and designs, help purchase new buses to replace the old soviet buses and help design bus priority measures and bus lanes.

We had also been asked to identify a route that could be used to implement a Bus Rapid Transit, or even Tram Route. A route from the city centre to the north of the city was identified and a feasibility exercise and high-level design was produced. A study into parking enforcement in the City centre was also carried out as well as a guidance document on the regulation of Taxis.

In 2018 a team of five staff from Mott MacDonald spent a considerable amount of time in Tbilisi to directly help the staff of the City Hall Municipal Transport Department to design and implement various bus priority schemes and to provide training on CAD, traffic modelling, traffic engineering and traffic signals design.

The Transport Department had a VISSIM licence, they were using the programme to model proposed changes to the road network. The licence, however, was very limited and the staff were lacking in training and appreciation of how best to use it. Training was provided to the Department of Transport staff in the collection of data, model construction and validation, and the use of traffic models in the assessment of proposed schemes on the highway network. The staff were also introduced to LinSig and demonstration and training given on its capabilities.

Many of the traffic signals in Tbilisi are connected to an Urban Traffic Control (UTC) system. When Mott Macdonald first started working in Tbilisi many of the traffic signal controllers were of a Ukrainian manufacture and connected to a Ukrainian UTC system. The UTC system was an adaptive system and capable of providing a limited form of bus priority, although bus priority had never been used and the local operators would have needed assistance from Ukraine to do so. Over the last few years many of the traffic signal controllers have been replaced with Siemens controllers and connected to a new Siemens SCOOT system, which would be much easier to configure for bus priority.

The UTC control room is located in the 121 Control Centre overlooking the city, which is also the control centre for all of the emergency services throughout Georgia.

121 Control Centre

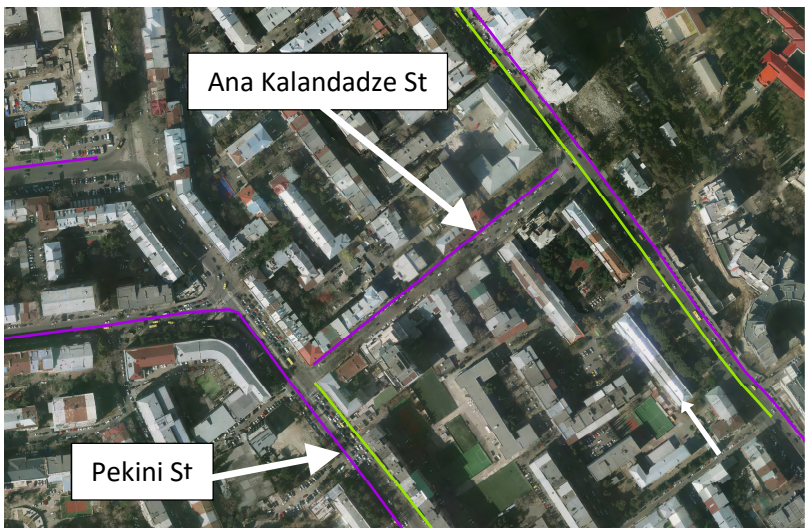
To provide priority for the buses, a trigger would need to be provided from each bus as it approaches the traffic signal junction at which the bus priority is needed. All of the buses in Tbilisi are equipped with a GPS location device. The buses send their location to a central computer system that plots the progress of each bus through the city. This information is then used to inform waiting passengers at the bus stop when the next buses will be arriving by displaying the information on

signs at the bus stops. The information can also be accessed on a web site or by mobile phone and can also be used by the bus operators.

Bus Stop Information Sign

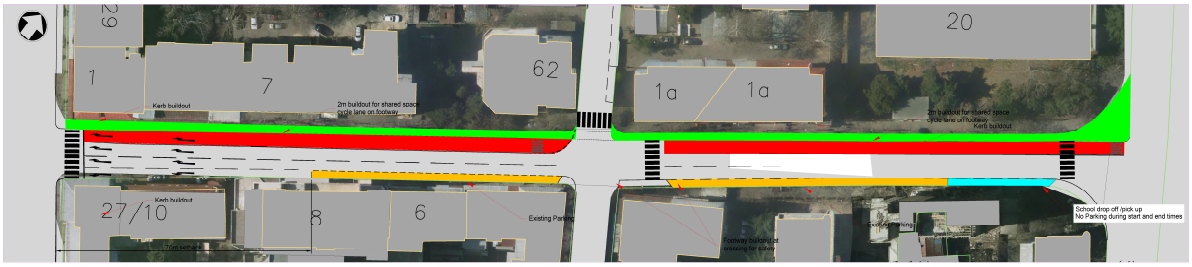
As the buses are constantly tracked and their location known, this information could then be used to provide a "trigger" when a bus approaches a signal controlled junction and requires priority. This would require a connection between the Bus GPS System and the UTC system in order for it to then provide priority to the bus at the traffic signals. Mott MacDonald helped the Department of Transport identify how the two systems could be linked and active bus priority provided, however the Bus AVL and ticketing system was due to be replaced and it was decided not to pursue this option until the new system was in place.

Several areas in Tbilisi were identified that would benefit from the introduction of bus priority. One of these areas was a short stretch of road known as Ana Kalandadze Street. Ana Kalandadze Street is one way with a set of traffic signals at the end of the street where it joins the very busy Pekini Avenue. During the morning peak period this street is completely filled with queuing traffic and buses are delayed in the general congestion.



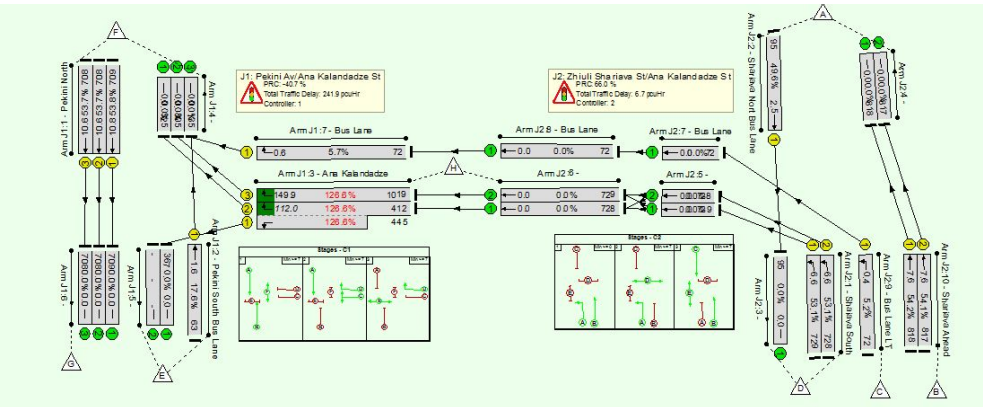
Ana Kalandadze St

We developed various schemes with Department of Transport for Ana Kalandadze St to provide bus priority and improved facilities for cyclists and pedestrians. This included a bus lane and cycle lane along the length of the street. The scheme finally chosen included a shared pedestrian/cycle lane on the north side of the road and a bus lane adjacent to it, with parking allowed on the south side of the road but stopped short of the junction with Pekini St to allow an additional short lane for left turning traffic.

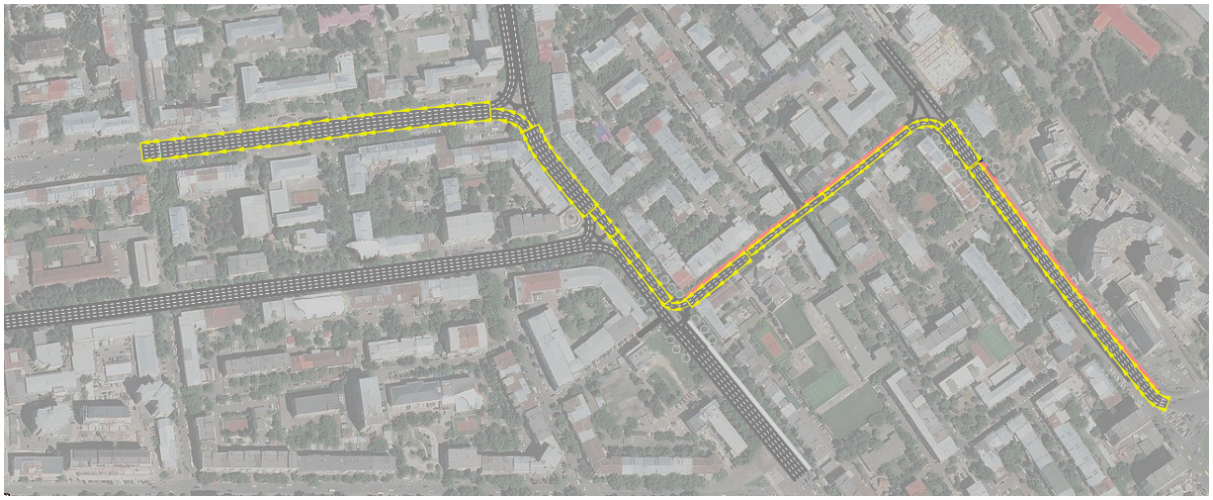


Ana Kalandadze St Proposal

As well as physical changes to the road layout changes to the traffic signals at the junction of Pekini St and the introduction of traffic signals at the junction of Shartava St were proposed. Buses travelling north on Shartava St stop on the right-hand side of the street. From the bus stop immediately south of Ana Kalandadze St buses turning left into Ana Kalandadze St have to force their way sometimes across several lanes of congested traffic. In order to provide priority for these buses a bus pre-signal on Shartava St was proposed. This was an entirely new concept for Tbilisi and the Department of Transport had to be convinced that this would work. A LinSig model of the proposal was developed to test it, and also a Vissim model was developed to provide a dynamic visual representation of the effect of the proposals that could be presented to the Department of Transport and senior politicians.



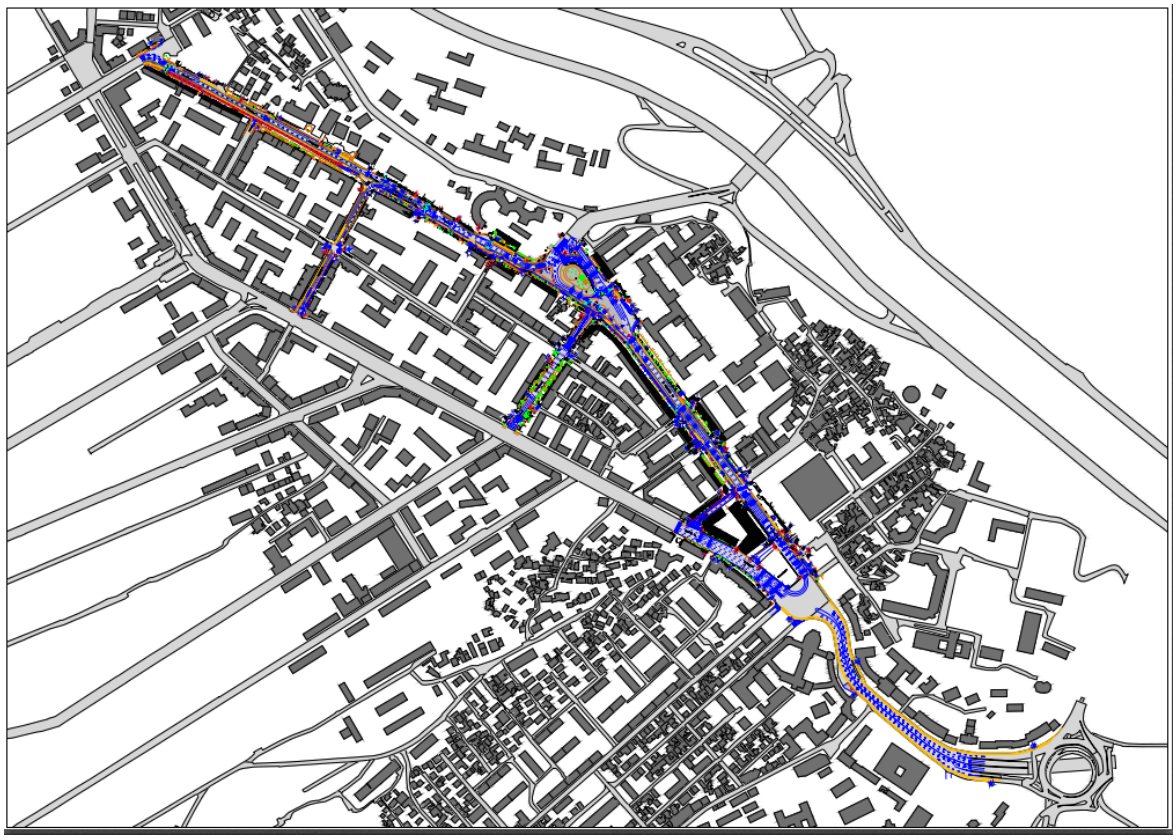
LinSig Model of Ana Kalandadze St



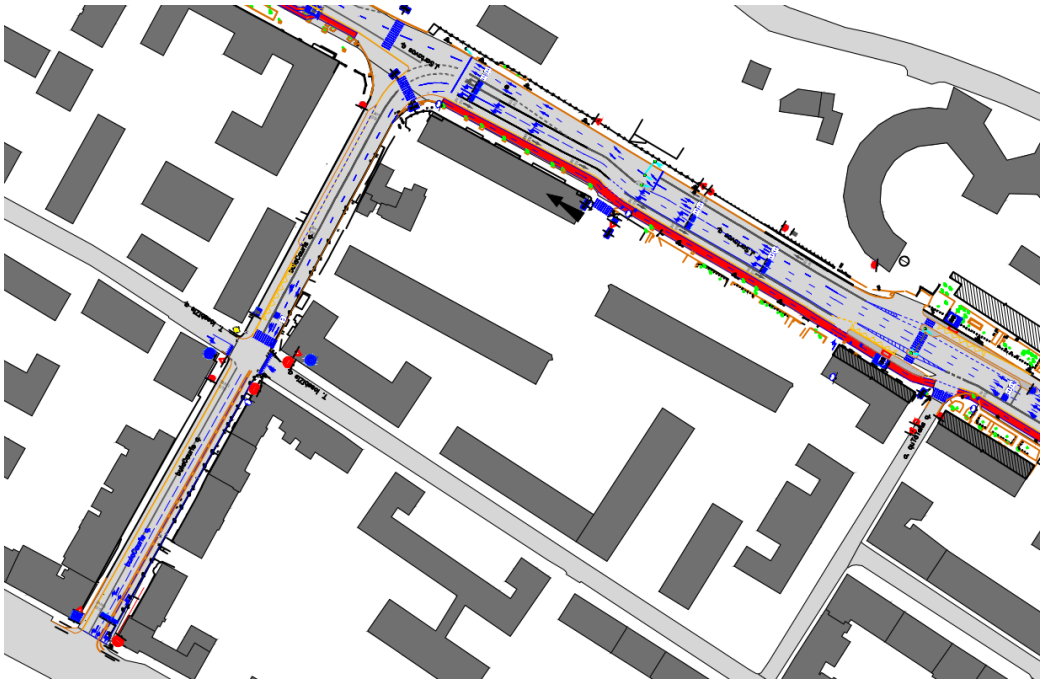
Vissim Model of Ana Kalandadze St

The proposals were accepted, and it was agreed to build the scheme on Ana Kalandadze St. The Department of Transport had already been developing a scheme for Shartava St and Kostava St, including the introduction of cycle lanes and improved pedestrian facilities. It was decided to combine the proposed scheme for Shartava St and Kostava St with the Mott MacDonald scheme for Ana Kalandadze St, and to also develop bus priority measures for Shartava St and Kostava St.

Bus lanes and cycle lanes were developed by Mott MacDonald along the entire length of the scheme and included some new traffic signal concepts to the city of Tbilisi such as the pre-signal.



Kostava/Shartava St Scheme



Ana Kalandadze St and Bus Pre-Signal on Satava St

The scheme was completed after our time in Tbilisi had come to an end. The feedback from the staff in Tbilisi has been very positive and the improvements appear to have had a definite improvement to traffic flow, and in particular bus journey times.

Part of the scheme as implemented – Viewed from Tbilisi City Hall

Part of the scheme as implemented – Viewed from Tbilisi City Hall