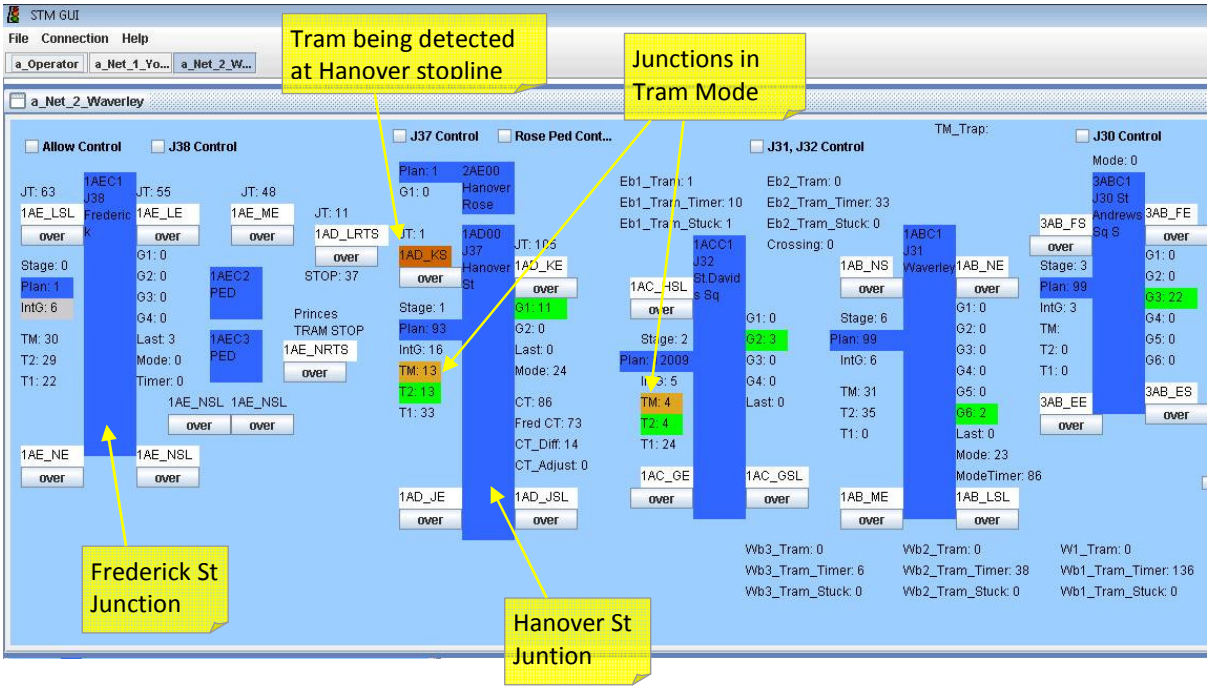
EDINBURGH TRAMS - CENTRAL PRINCES STREET NETWORK

Comprising of junctions:

- **Princes Street / Hanover Street**
- **Hanover Street / Rose Street Ped**
- **Princes Street / Princes St Stop Peds**
- **Princes Street / Frederick Street**

The 90s cycletime is retained but is allowed to float up and down during the strategies. The junctions are coordinated on the base plans for bus progression but because of the Tram stop between junctions the Tram priority allows the junctions to operate individually for optimal tram priority. Frederick Street is the more complex junction and is treated as the master junction; any plan offset here is reflected at Hanover once it has finished its priority by making incremental changes to bring it back into sync. Because of the simplicity of Hanover's 2 stages this can be done quickly - typically well within a cycle.

Princes Street STM SPRUCE GUI snapshoot

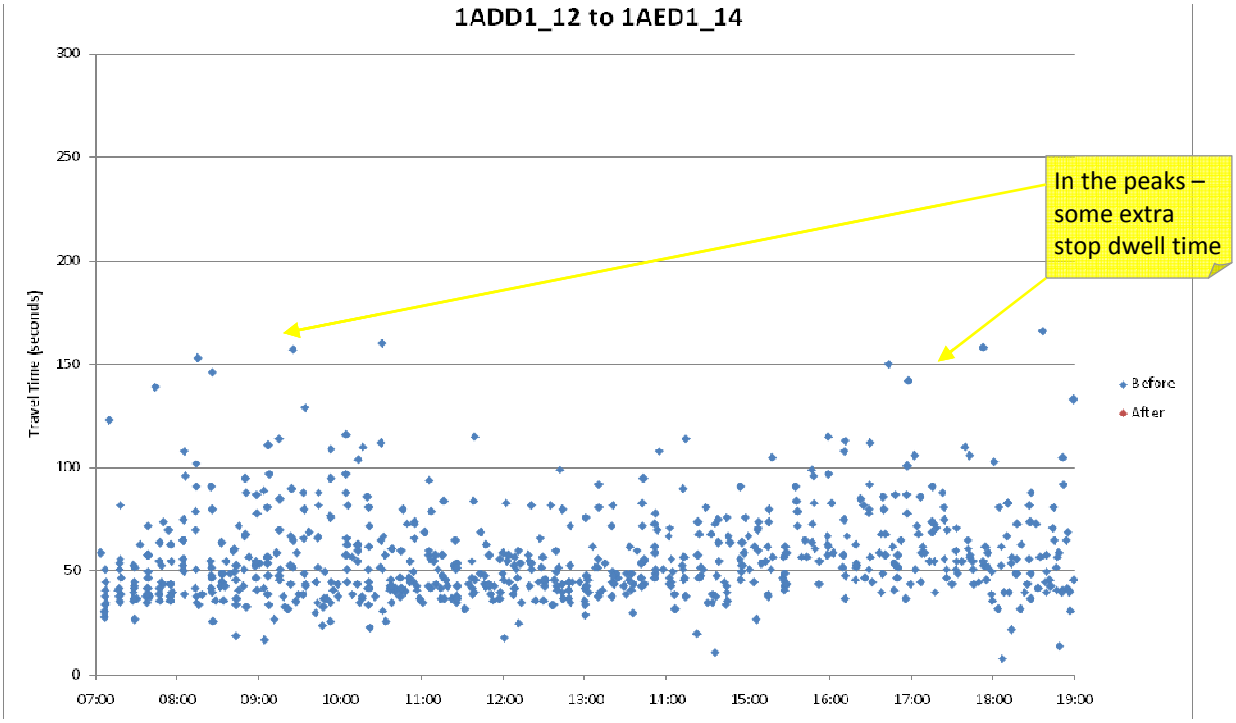


Princes Street / Hanover Street

The WB direction has potential to block as the Tram and traffic lanes merge to a single lane. The WB tram strategy is initiated at the exit of St Andrews Square by calling a Stage 2 (Hanover Street) window allowing the demand to be satisfied early. A longer Frederick Street stage 2 EB green (currently +6s) is also run to help reduce any blocking of the Tram by vehicles merging across the Hanover junction.

In the EB direction as the Tram enters Frederick St junction a stage 2 (Hanover Street) window is presented at Hanover to allow any demand to be served early. This stage 2 will be held for a period until it is time to move back to stage 1 (as determined by a timer). This timer is dependent on the typical Tram stop duration taken from the Journey Time Tool chart seen below:

Princes Street STOP Dwell time scatter chart



For crossing trams, as the WB direction is prone to blocking this movement takes precedence over EB, in particular an EB Tram will not call an early stage 2 if a WB Tram is already in the Tram stop.

After Tram priority has been served, the junction will drop back in sync with Frederick Street. If there has been a long stage 1 (initially set to higher than 60s) then stage 2 will immediately be served before dropping back into sync.

Hanover Street / Rose Street Ped

This ped is kept in sync with Hanover. To avoid ped windows being skipped it uses predetermined points in the cycle at Hanover to offer a ped window, eg *4s after Stage 2 has terminated at Hanover*.

Princes Street / Princes St Stop Peds

These peds have 2 windows per cycle, and to avoid ped windows being skipped it uses predetermined points in the cycle at Frederick to offer a ped window.

Princes Street / Frederick Street

WB Trams, on entering the Princes Street stop, initiate a strategy that aims to bring the junction around to stage 1 (the preceding WB priority stage) whilst the Tram is still in the stop;

- If the junction is already in stage 2 then it will quickly do a full cycle back round to stage 1.
- If the junction is already in 1 it will hold it and move it into stage 2 when a reasonably long stage 1 has run (initially 50s) and then holds stage 2.

The strategy again uses the Journey Time Tool typical dwell time to judge when to initiate a move to Stage 2 before the TRTS (it is observed that Tram driver's often wait until stage 2 has appeared before pressing TRTS). On clearing the stopline the junction will move into stage 3 and sync back to running the background plan.

EB Trams have a simpler strategy with a long pre-emption period. The priority is initiated after the Shandwick Puffin. If at this point the junction is already in priority stage 1, the junction is cycled through the other stages and back again rather than relying on a very long stage 1.

Crossing Trams are prioritized with EB handled first because of the cyclic priority stage order.

CENTRAL PRINCES STREET NETWORK PERFORMANCE

The scatter chart below very clearly shows an improvement in WB journey times with the outlying higher blue 'before' band of data being lowered to the red 'after' data. This is due mainly to the better handling of trams that have suffered some delay coming through the Waverley network.

Hanover Street WB Journey time scatter chart – BEFORE & AFTER