Planning a multi-phased LRT solution in Ottawa.

Introduction

Ottawa's LRT solution was planned as a 3-phased project, spread over several years. Recently, Phase 1 went live, with mixed reviews.

This solution does put Ottawa on the map as a "grown up" city, with the makings of a world-class transportation system. Phase 1 however, has left some issues with not only the trains themselves, but some serious lingering issues with dealing with commuters getting to and from the new LRT system using buses.

The LRT solution is claimed to handle 21,400 passengers per hour, or 10,700 each way. Each train is claimed to hold up to 600 passengers at a time. Most of these 21,400 hourly commuters need to get on or off a bus at one end or the other to successfully complete their daily commute. The current design is in some ways not ideal for these numbers — at least not until all phases of the solution are complete.

Below, some of these issues will be reviewed, along with looking at what appear to be simple causes, as well to offer a potential all-encompassing solution.

System Planning

The best approach to putting in a system like the LRT, is to imagine the completed solution early in the plan. The "big picture" must be considered — and to not plan each phase in isolation from the others. While the City can successfully perform the implementation in a multi-phased approach, the implementation process should address the most important supporting changes that need to be done *up front*. This should be implemented in as proactive a fashion as possible, so as to minimize the impact to the many commuters in the City. Unfortunately this was not done, leading to the mixed reviews.

Putting in place a system in three phases really means that we are intentionally installing an *incomplete system* in the first of two phases. We must recognize and account for this while designing and building the system. When these first two phases are rolled out, we *must not* introduce serious gaps caused by it *being* an incomplete solution. Ideally, this incomplete solution should emulate the complete solution as closely as possible, with the potential gaps proactively covered.

Problems Today

One of the biggest issues seen with Ottawa's new LRT solution, is that in many ways, only Phase 1 has been fully planned. A perfect example is that bus route changes were implemented as part of the "go live" that served *only to accommodate Phase 1*. Again, it is an incomplete system made worse by not looking at the big picture. This

implementation method introduced major gaps, affecting most commuters in the City, and what will ultimately be a world-class system is seen now by many as *not a good system*.

Since everyone needs to somehow *get to and from* the LRT system, then they must transfer onto, or off of the LRT trains. We have an issue where almost all of the users of the system must arrive at either one of the two end points. This is not how the completed Phase 3 solution will be. The onboarding and offloading are not spread out over the multiple locations as the completed solution ultimately would accomplish. Due to this, all of the neighbourhood buses (encompassing many routes) that are used for transporting commuters to and from the LRT are forced to converge at one of these two stations, at each end of the system. Again, this is not how the completed solution will work, and it is not working well now.

Every LRT user living west of Tunney's Pasture for example, must use a possibly lengthy neighbourhood bus to arrive at, or leave from, Tunney's Pasture Station. Likewise, every user of their neighbourhood bus living east of Blair Station must arrive at, or leave from, Blair Station. Again, having every possible bus route arrive at, or leave from these two stations is not ideal, and contributes to the problem. This now incomplete solution is of course behaving like an incomplete system.

Let's focus on one of these two stations, Tunney's Pasture in the west-end, and how the system design affects commuters. During peak afternoon rush-hour usage, thousands of people are arriving at this one station. A train holding approximately 600 people arrives every few minutes. Almost every person disembarking walks to the bus platform — each looking for their particular bus route, so as to complete their specific journey to their neighbourhood. Each of these buses are all crowding the bus stops at Tunney's Pasture, with each going to a different part of the city. In addition, each has different capacity requirements and capabilities, and its own schedule. Some are large buses, some are small. This results in capacity issues and confusion for a large crowd of people each looking for their individual route. The confusion is even worse for infrequent users, not as accustomed to the system.

After 9pm at night, people need to know that they might need to look for their bus at a different platform. This invites even more confusion.

Likewise, when commuters arrive in the morning rush hour, thousands of people are arriving at the one station on a multitude of bus routes, resulting in a single station needing to move huge numbers of people through it, each wanting to get to the trains.

It should also be noted that there are also thousands of people who actually work at Tunney's Pasture who must compete with these in-transit commuters at the Tunney's Pasture LRT station — likely half of them needing a bus rather than a train at during Phase 1.

If we look down the road to the end of Phase 3, and the usage patterns that will be expected, we will see people getting on and off at many points all along the way, thus spreading the onboarding and offloading very well, rather than having all buses with their loads of passengers arriving at a single station.

We need to put in place something that can emulate the final solution *immediately*. Just because the Phase 1 rollout had a very focused plan that is not ideal, does not mean we cannot go back put in place something that works well.

Recall that the ideal scenario is that all three phases are complete, and that people will take a short bus ride from their neighbourhood, to their nearest LRT station, then board a train there. After Phase 3 is complete, this will of course be in place, and should be working well. Until all three phases are complete however, with no real solution in place, things will never run smoothly for Ottawa commuters.

Recommendation

The best way to completely solve the existing issues is to retroactively emulate the entire completed LRT system. Where the train does not yet exist, we must put in place temporary dedicated buses. These buses' sole existence would be only to go back and forth along (or close to) the "final" LRT routes, and carry people to their local, short bus route that they would be boarding at their nearest (future) LRT station. These buses would not have route numbering. They would simply be labeled for example, "LRT East", "LRT West" and "LRT South" - just as we do not number the train routes. Let's call these buses "shuttles". These shuttles would simply go back and forth on the entire, future LRT line, every few minutes, *and match the frequency of the Phase 1 LRT trains*. These shuttles would effectively be emulating the future Phase 3 trains, or the complete LRT solution.

When someone leaves downtown, headed to Kanata for instance, they would transfer at Tunney's Pasture to any westbound shuttle ("LRT West"). These shuttles would pull up in clusters every few minutes at the shuttle platform, lined up similar to how the train cars are lined up, and people could board any one of them quickly without confusion.

In this scenario, commuters would never wait more than a few minutes, as the frequency would match the train frequency, and they would not need to look for a bus route. They would stand on the westbound shuttle platform and board any bus that has space, anywhere on that platform — just as they would if they were boarding a train. The natural tendency would be for commuters to spread themselves out along the platform, just as they do on the train platforms. They would simply be continuing on their westbound LRT journey, but transferring from a train car to a generic, train-like shuttle bus. These shuttles would stop at each (future) LRT station to pick up and drop off their passengers, just as the future trains will. Our Kanata-bound passenger would simply get off his shuttle at one of these Kanata stations, and wait for the same local bus he would take if he had been riding the completed Phase 3 LRT.

In summary, this simple solution will put in place LRT shuttle buses that emulate the full LRT experience. It will use buses very efficiently, and will not be at all confusing for anyone using the system. No more fighting crowds at a single station to find a particular bus route. Phase 3's shorter neighbourhood bus routes would be put in place immediately, performing a one-time change to these routes — which of course would stay in place almost completely unchanged after Phases 2 and 3 actually are complete. All of these local buses would be short rides that get passengers to and from the LRT "solution", whether it is in fact the LRT train, or an LRT shuttle.

Bus traffic planning would be far simpler, as only the *final* shorter local routes would need to be planned out and adjusted (which must be done anyway at some point), and a single one-time change made to all routes. Again, these LRT shuttle buses, riding back and forth on the future LRT route would simply match the frequency of the LRT trains, and users would need only a change from an LRT train to a LRT shuttle bus, then transfer to their neighbourhood bus at their local LRT station closer to home.

As Phase 2 goes live, these shuttle bus trips need simply be shortened to reach the new, closer "end of the line". No other local bus route changes would be required, as they would be in place now.

This proposal considers the entire LRT system — the "big picture", including phases not yet complete, making the required changes that will make it work as closely to a completed solution as possible.

Following this recommended solution would mean that a partial Phase 3 would essentially be in place immediately, and passenger loads would be sufficiently spread out. As long as the frequency of the temporary shuttles matches the LRT trains, then only the local bus routes going from each station to local neighbourhoods would need fine tuning over time.

Benefits

There are a number of benefits of this "big picture" approach:

- A single immediate change to local bus routes that need not be changed again as Phases 2 and 3 go live. Commuters would not need to relearn routes as each phase of the LRT is completed.
- This solution could be implemented quickly and inexpensively, and would proactively avoid similar issues as Phase 2 is completed. The LRT shuttles would be routed closely to where the Phase 3 LRT trains will run, which in many cases would utilize existing OC Transpo Transitway corridors and bus lanes.
- Timetable planning would be simplified, as the shuttles need only have quantities of buses added or removed depending on capacity requirements, again always matching the train frequency.
- Passengers disembarking the LRT trains need not worry about overloaded buses on one route, and empty buses on others. They would simply board any of the

buses that line up at the platform — similar to LRT train cars. This also spreads out the loads at the bus platforms.

- At peak times, if for example 600 people arrive at Tunney's Pasture every 7 minutes, then all that is required to be in place is a sufficient quantity of buses to handle 600 passengers every 7 minutes.
- Frequency and quantity of shuttles would be reduced at non-peak times, again, matching the reduction of LRT train frequency and load. The shuttles would always be matched to the frequency of trains, to ensure proper flow, on and off of the system.
- In cases of train malfunctions, the temporary shuttles could simply continue on, using pre-determined contingency routes, in place of the failed trains, thus serving as a suitable backup plan to keep the flow of commuters consistent.
- Ottawa would have a pseudo-complete LRT solution prior to Phases 2 and 3 actually being completed.
- Commuters would have an elegant solution, that while not being perfect, would eliminate most of the capacity and flow issues that they are currently experiencing.

Note that this proposal does not address actual issues with the LRT trains, but rather the issues around having an incomplete solution in place. It is expected that technical issues with trains, computers, and the stations themselves are normal "growing pains", or issues that can be fixed by the manufacturer, and should gradually be resolved. There will always be the risk of train outages, but as pointed out, the above proposal does actually offer a potential contingency plan for these outages, that is smoother than what happens today in an outage.

Implementing the solution recommended here would ensure that commuters across Ottawa would be using essentially the same solution that will be in place with Phase 3 of the LRT. While it is certainly not perfect, the loads will be spread out, and bus route changes will be done once, and done correctly. This would make sense to commuters, and be a welcome relief. Many of the current issues would be resolved very quickly, and bring much needed stability and integrity to Ottawa's transportation network.

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Contact: Andre Hallam - andres.mail.box@gmail.com