Chapter

7 Connectivity and Mobility

Connectivity and Mobility

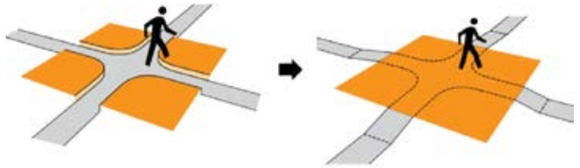
Improved Range and Connectivity

Improving connectivity and mobility is an essential goal of the Grand Connection. Envisioned primarily as a cyclists and pedestrian corridor, the team identified a number of opportunities to improve the range, safety, and overall experience of users. In addition to the improved experience and safety that raised intersections offer, a series of small scale, low cost improvements were proposed to achieve these goals.

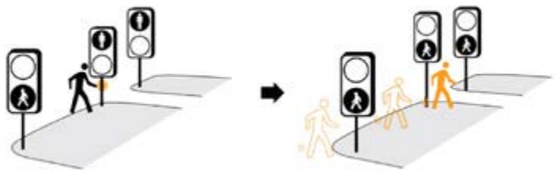
The design team produced recommendations that pursued innovative and creative solutions that embrace the latest in transportation technology, and also small scale adjustments that can offer significant improvements to range and experience. These changes are intended to work within the existing infrastructure as well as address challenges related to Bellevue's topography and superblock configuration.

Many of the recommended improvements are best practices to improve the safety and experience for pedestrians and cyclists including improved and priority signal timing at intersections along the Grand Connection, as well as physical improvements such as enhanced bicycle lanes. Embracing Bellevue's high-tech community, the design team also made recommendations that improves last mile connectivity through autonomous group rapid transit.

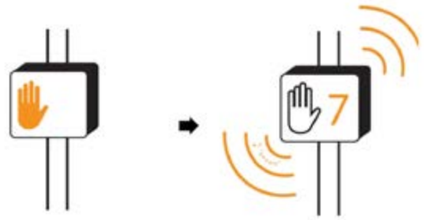
Low cost improvements can increase pedestrian speed and range by at least 20%.



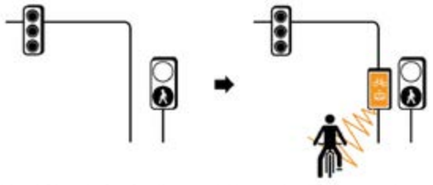
▲ **Raised Intersections** - *Image by* Mobility in Chain



▲ **Synchronized, No Push Button Pedestrian Signals**
- *Image by* Mobility in Chain



▲ **Audible and Improved Signal Length for Pedestrians**
- *Image by* Mobility in Chain



▲ **Prioritized Signals for Cyclists and Alternative Transportation**
- *Image by* Mobility in Chain

Improved Range and Connectivity

As a non-motorized corridor, the Grand Connection will prioritize the experience and safety of pedestrians and cyclists. Pursuing low cost and low risk solutions that provide a great impact on connectivity and range can represent a significant improvement.

As previously mentioned, raised intersections have an opportunity to improve the aesthetic and experiential quality of the urban environment for pedestrians, and can also improve safety and reduce exposure risk.

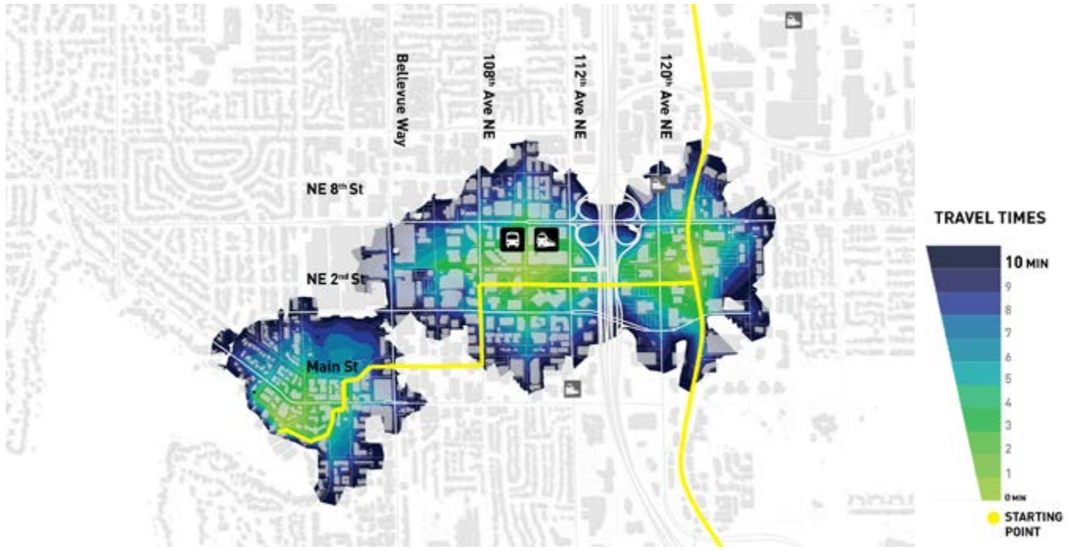
The design team also recommends to modify pedestrian signals to be synchronized and with additional crossing time for pedestrians. This presents the opportunity to improve range, and comfort for crossing compared to the existing configuration. With so few conflicting intersections, these minor improvements will greatly enhance the pedestrian experience while potentially having minimal impact on vehicular traffic flow.

Additionally, improved and priority signal timing for cyclists and other transportation alternatives could encourage non-motorized travel by improving speed, range, and connectivity. Each of these recommendations work with existing infrastructure and require only slight modifications that could be implemented early at little cost.

Next Steps:

- Evaluate potential to modify signal timing for pedestrians and cyclists to improve range and connectivity.

▲ **Existing 10 Minute Walking Range from Meydenbauer Bay Park, Bellevue Transit Center, & Wilburton Commercial Area**
- *Image by* Mobility in Chain



▲ **Improved 10 Minute Walking Range from Meydenbauer Bay Park, Bellevue Transit Center, & Wilburton Commercial Area Base on Signal Timing Improvements** - *Image by* Mobility in Chain

Group Rapid Transit (GRT's)

To create a route that is safe and accessible to all users the design team turned to the latest in transportation technology to address last-mile connectivity and Bellevue's challenging topography. The emergence of autonomous driving technologies has expanded to small autonomous shuttles that have been used in urban and campus settings around the globe. The design team has identified this as an opportunity to better link the route while improving range and connectivity for those with reduced mobility options.

Group Rapid Transit (GRT) are small shuttles capable of carrying six to twelve passengers at a speed similar to that of cyclists (12 to 18 mph). GRT's offer flexibility in operation mode and their integration into the urban environment. Intended to serve a role as a means of last mile connectivity, they can integrate into existing traffic and infrastructure as well as adapt to type and frequency of use.

The design team has considered a phased approach to integrating GRT's into the existing transportation network. Utilizing the proposed cyclist route, and other changes covered later in this document, GRT's can be introduced into the existing transportation infrastructure and ultimately phased into a dedicated route and infrastructure shared with bicycle lanes.

Flexibility in Operation and Phasing

- Similar to existing ride hailing services such as Uber and Lyft, GRT's can begin as an "on demand" service that can be performed using a smartphone app. This early phase of implementation can provide flexibility in pick up and drop off locations, as well as frequency in early stages of implementation as it integrates into the existing street network.
- As popularity for the system increases, the GRT's can begin operating in a "bus mode" using predefined stops and locations per request of the users. This mode operates similar to an "on demand" service with fixed stop locations. In "bus mode" it would operate as a horizontal lift, back and forth in a single traffic lane. With no predefined front or back, the GRT's can easily change direction without needing a turn.
- The final phase of implementation, when the service has reached optimal use and popularity, GRT's can operate in "metro mode." This allows for the shuttles to operate on a predefined schedule with fixed stops and locations. Operating in enhanced bike lanes, GRT's become bi-directional, traveling in both directions simultaneously.

Autonomous Group Rapid Transit (GRT) has already been deployed in cities such as Las Vegas and Washington, D.C.

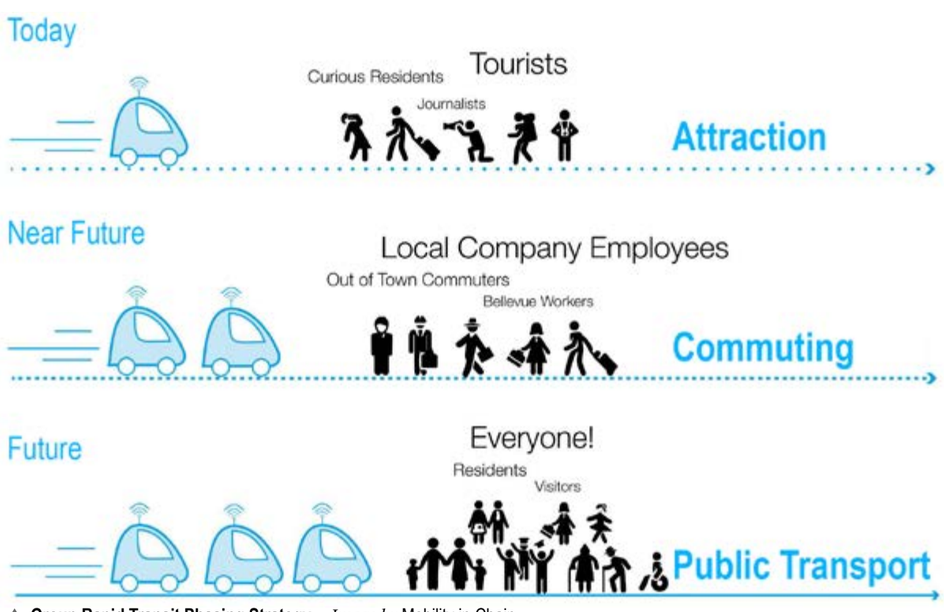
Phasing

As a new technology that would require a period of time to integrate into existing infrastructure, improve and enhance future infrastructure, and user comfortability the design team has recommended a phased approach as outlined in the modes outlined previously. This would allow for a measured integration, allowing both users and other modes of transportation to become comfortable and familiar with the new technology.

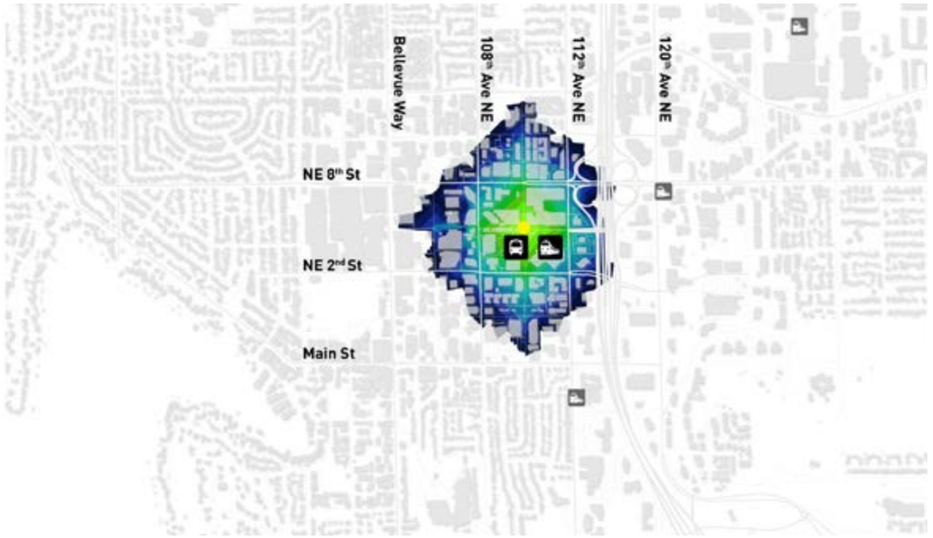
As popularity and use increases the City could identify opportunities to partner with other local and regional technology companies to improve and enhance the system, while also considering the expansion of additional routes in Downtown, and beyond.

Safety

The speed of GRT's matches that of the average cyclist with a cruising speed of approximately 12.5 mph. Sensors allow for the GRT's to adjust speed with cyclists in close proximity, and will even reduce speed as it passes a cyclist from an oncoming direction, prioritizing safety. Such features allow for a safe and successful mix of cyclists and GRT's users within the same environment.

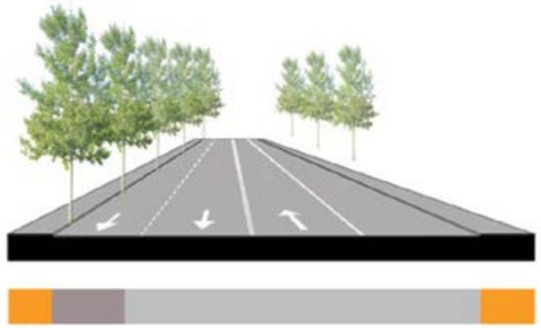


▲ **Group Rapid Transit Phasing Strategy** - *Image by* Mobility in Chain



▲ **Existing 10 Minute Walking Range from Bellevue Transit Center** - *Image by* Mobility in Chain

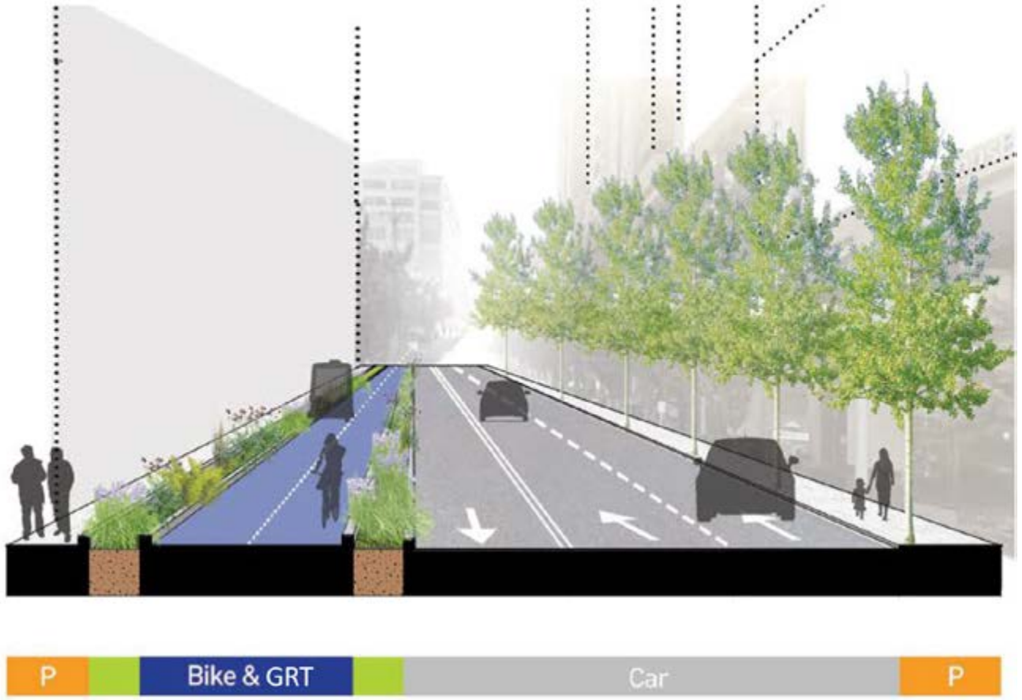
▲ **Potential 10 Minute Range via GRT's from Bellevue Transit Center** - *Image by* Mobility in Chain



▲ **Existing Example Street Section** - *Image by* Balmori Associates

Improved Streets

Group Rapid Transit (GRT) offers opportunities to reconfigure streets to accommodate new transportation options. The example configuration exhibits the improvements that could accompany enhanced bike lanes such as planting strips and buffers from the general purpose traffic lanes. In the example, lanes are not removed to make room for the vegetation, bike lanes, and group rapid transit. Instead the traffic lanes are reduced in width to create space.



▲ **Improved Example Street Section** - *Image by* Balmori Associates

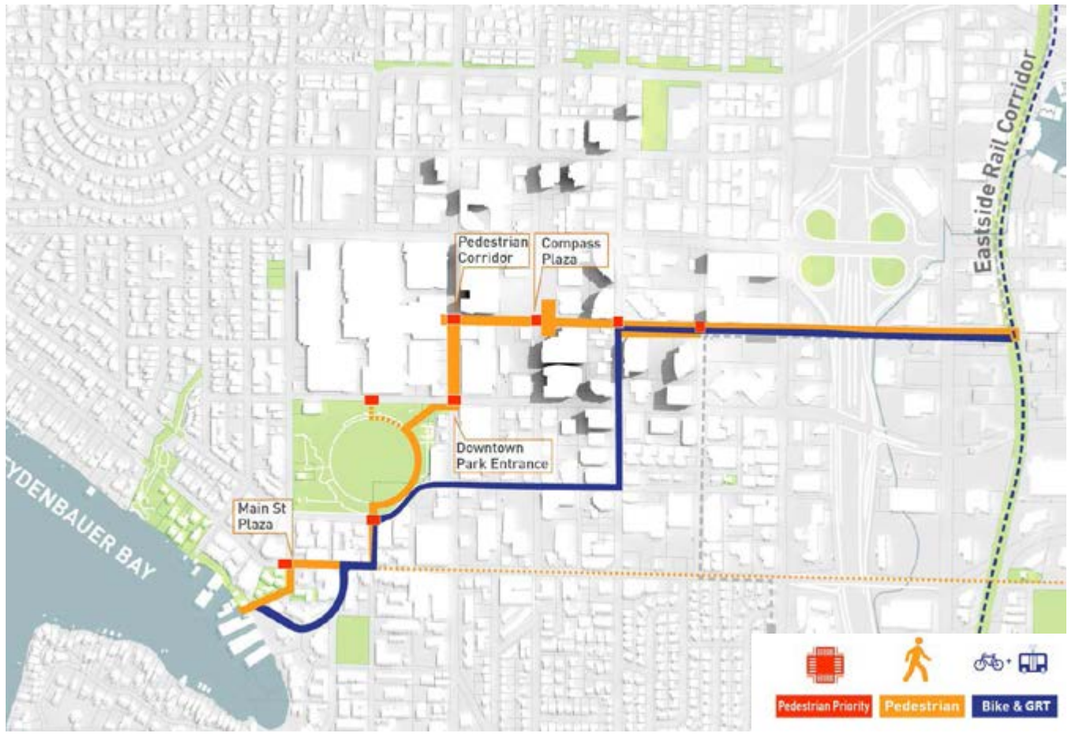
▲ **Group Rapid Transit Vehicles Sharing Proposed Bicycle Lanes** - *Image by* Balmori Associates

Group Rapid Transit

Group Rapid Transit (GRT) vehicles that can share bicycle lanes can increase mobility and connectivity. Traveling at approximately the same speed as a cyclist (12 - 18 mph) these autonomous transportation alternatives can increase the overall range of users as well as assist in navigating many of the steep hills that exist between Downtown Bellevue and the Wilburton Commercial Area.

▲ **Group Rapid Transit in a Pedestrian and Bicycle Mixing Zone**
- *Image by* Mobility in Chain

The design team recommends that west of 108th Avenue NE, the GRT route separates from the mainline of the Grand Connection. The route, pictured in blue in the graphic below, separates from the mainline of the Grand Connection, pictured in orange. This is in response to the tighter urban environment that exists between 108th Avenue NE and Bellevue, but also represents an opportunity to open a new mode of transportation on NE 2nd which presents challenges in topography for non-motorized transportation. The route reconnects south of the Downtown Park with the primary route, and then separates again in order to access Meydenbauer Bay Park.



▲ **Primary Grand Connection Route** - *Image by* Balmori Associates

Next Steps: Group Rapid Transit

- Explore the opportunity to implement a transportation alternative solution such as Group Rapid Transit.
- Study the proposed route and consider design and traffic implications as well as potential alternative routes.
- Determine if an Environmental Impact Statement would be needed to implement a Group Rapid Transit strategy.
- Research and explore opportunities for partnerships for implementation.