

MEMO

Date: January 18, 2013

To: StarTran Advisory Board

From: Brian Praeuner

Re: Request for information on Grid Network bus systems

Per the Advisory Board's request for information and costs of a grid bus network provided is background information on bus route networks and further information on grid type bus networks.

Background Information: Types of Bus Networks

Radial/Hub-and-Spoke System:

Routes radiate in and out of a single, centrally located transit center. When more than one transit center is provided, the system can be referred to as a hub-and-spoke system. This is the most popular service type in low to moderate density areas as a greater amount of regional coverage can be provided with one transfer at a central location.

Trunk Route System:

System with routes located along major road corridors/arterials and link major generators. Connecting routes are a mixture of limited and high density stops.

Circulator Service System:

Provides transportation service within a limited area such as a downtown, a suburban community, etc. Generally, all service is higher density stops (very little/if any limited stop service).

Grid System:

Made up of a series of networks of mostly parallel routes laid perpendicular to each other to form a grid based on the street network. Included in the types of service integrated into the grid are limited stop/express service and circulator service. Mostly used in communities with multiple activity centers of a similar intensity. Assumes no one area gets preferential service treatment over another. The only two cities found with grid "like" systems are Chicago and Los Angeles. Both these cities have several grid type routes and routes that serve the downtown areas.

Crosstown System:

Service set up to connect two areas without going through the CBD (the typical hub location). The connecting service may be limited stop if the two connected areas are complementary in uses (i.e. one being residential and the other employment).

Grid Bus Network: Advantages and Disadvantages

Advantages:

- The relative simplicity of the system. Such a system is easy for public to understand and navigate

Disadvantages:

- Nearly all patrons would have to transfer at least once, and many times twice, before reaching destination
- Not afforded direct service to downtown, which continues to be largest concentration of employment and student trip purposes

Costs:

For a grid system to work well, frequent service should be furnished on every route: headways should be every 15 or 20 minutes or less. A grid system will not work well with half-hour headways because it is mathematically impossible to schedule more than a few key locations for convenient transfer connections. The remaining locations will involve long waits for transfers. A successful grid system depends on random connections and frequent headways. If population density or ridership is low and will not support frequent headways, it is doubtful that a grid system will be very successful.

At a minimum to obtain 15 minute peak and 30 minute non-peak service need to double our current operating costs and increase fleet size:

- Operating – An additional \$6,000,000/year
- Increase fleet size – estimate need an additional 33 buses at \$400,000 each = \$13,200,000

This assumes the same number of routes just reconfiguring the route network and increasing the hours of service and vehicles. These costs do not include additional vehicle storage facility.

If the preferred network was the grid and the goal was to keep costs at current levels a grid system may be feasible if the grid network covered only part of the city today. That is, providing 15 minute headways could be attainable if many activity centers near the fringe were eliminated such as SECC, SouthPointe, LPS schools, Arnold Heights, etc.