Chapter 12: Connections or Complexity

Introduction

Chapter 12 is all about examining the differences between systems designed to provide direct connections from every major point of interest to every other major point of interest and those designed around providing fewer routes with higher frequency but requiring connecting to a different route to complete the trip.

Though Walker acknowledges that most people want a direct trip, he also lays out the logistical issues of providing that for every possible connection.

The Rare Many-To-One Network

Connection-free networks work well when everyone’s final destination is the same place. Direct service routes do not cause complexity when everyone is traveling to one location. Since many people do not live in a way where simple radial networks can easily serve them connections, while not being ideal for rider experience, reduce the complexity and expand the locations you can access via transit.

Connections Buy Frequency

Walker uses a simplified model to demonstrate how an example city could have either a complex or connection based network. With a fixed number of buses available, the complex system allows direct connections from any location to any other location, but at low frequencies. By contrast, the connection network offers higher frequencies, but only has direct connections to a few pairs of places, requiring a transfer be made to complete other trips.

He also points out that the relative resource advantage of connections increases with the number of destinations.

He then outlines how, on average, the connection based network can actually be faster thanks to its higher frequency. The shorter wait times between buses mean shorter average trip times.

A counter example is provided of when frequency isn’t necessarily useful in the routine commuter example, where people schedule their trips very specifically, and so don’t care if there’s another bus coming very soon.
Connections Free Us From Complexity

In addition to the travel time and general utility of frequency, Walker points out that less complex systems are more useful for riders for the simple reason that they are more simple. Fewer routes to know, less worry over missed connections or service disruptions, easier route shapes, etc. all make it easier for riders to use the system.

The Full Price of Connection Avoidance

Many american cities desire a system where transit lines run parallel to arterial streets. While more connections make a transit system less desirable, a system of mostly direct routes becomes too complex to easily use. There are several benefits of multiple connections in transit systems:

- More connections yield a wider coverage with less routes
- Higher frequency and route distance adds cost, several overlapping routes may lead to low frequency or a shorter span on all routes
- This leads to more waiting, more planning of your life around a transit schedule and a higher risk that traffic will interrupt your trip
- Overlapping lines yield to more complicated transit maps and much more knowledge is needed to use the transit system making it much more difficult to spontaneously use transit to move around a city

Questions from Connections or Complexity

1. What are some examples of Many-To-One networks within Metro Atlanta, either on their own, or as a part of a larger system? How well do these work?

   (Potential answers if needed to spur discussion: The eXpress bus network; the university bus systems)

2. How does MARTA’s current bus system behave? Is it a complex system, or one based on connections? Or both?

3. When looking at the MARTA bus map, how do you feel about the clarity of the network? How easy is it to figure out how to get from one part of town to another?

4. Do you prefer direct connections at lower service levels, or higher service levels with required connections?

5. Have you ever missed a connection due to reliability issues or other causes? How did it impact your trip?