Proposing “Transit Availability”

- Transit Availability is a measure of the amount of transit service that is available within a certain radius.
- It is a function of the headways of bus routes which have stops within the radius.
- Uses GIS density calculations to “sum” headways.
- Resulting values represent relative availability of transit.
- Does not factor in directionality.

The need for a new measure

- Simply mapping routes gives no indication of where the stops are.
- Stop density is high, such that showing individual stops results in unreadable maps.
- Overlapping stops and routes are difficult to portray on traditional maps.

Transit Availability Calculation

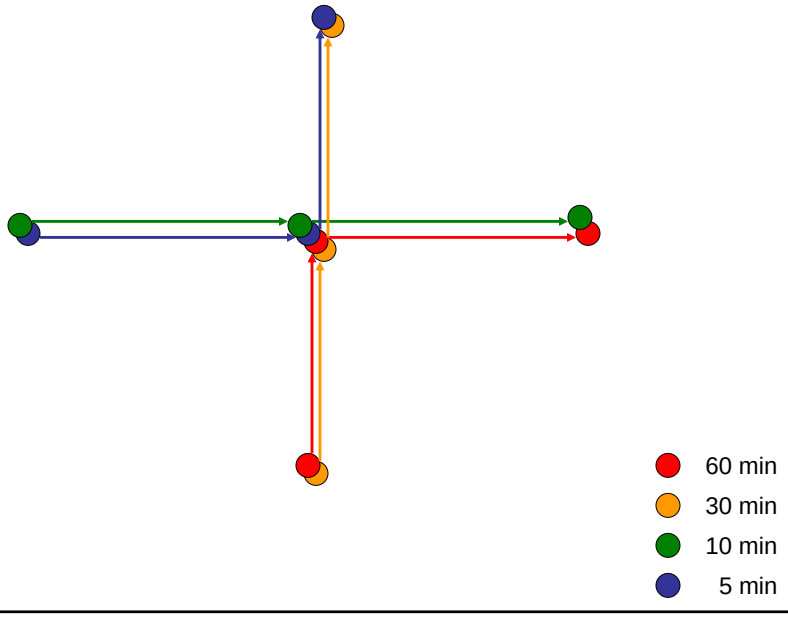
- An effective headway is calculated by summing the inverse of the headways:

$$H_E = \frac{1}{\sum \frac{1}{H_i}}$$

- Transit Availability is calculated in a similar fashion:

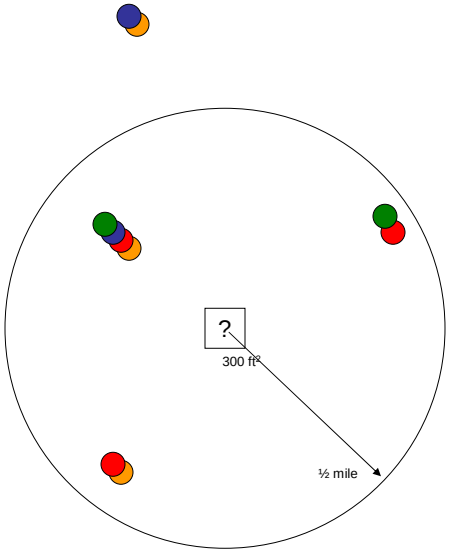
$$A_H = \frac{\sum \frac{1}{H_i}}{area}$$

Example: Bus transit routes



Search radius

For any given location, find the bus stops within the search radius.



60 min
30 min
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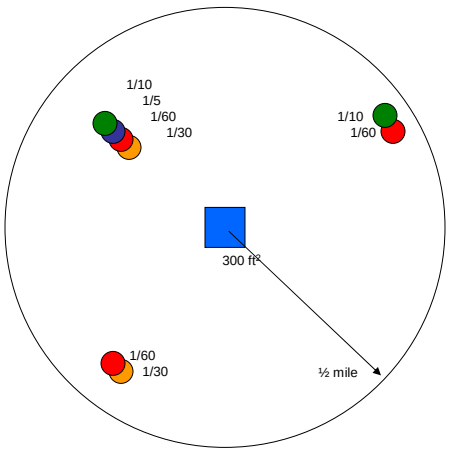
Calculate the "density" of the headways

$$A_H = \frac{\sum \frac{1}{H_i}}{area}$$



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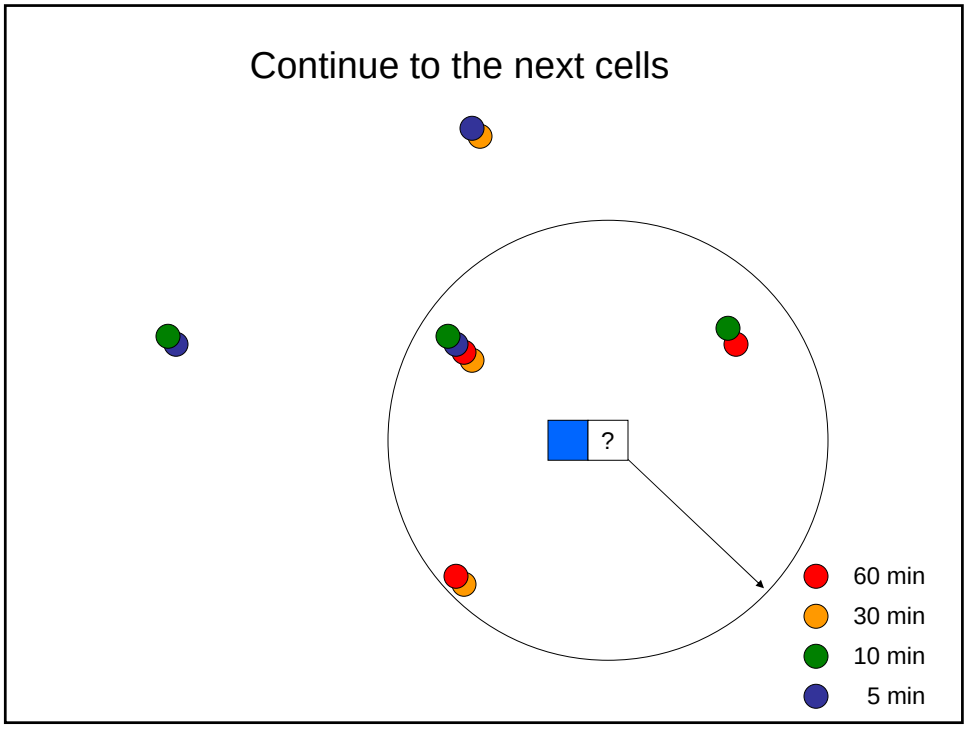
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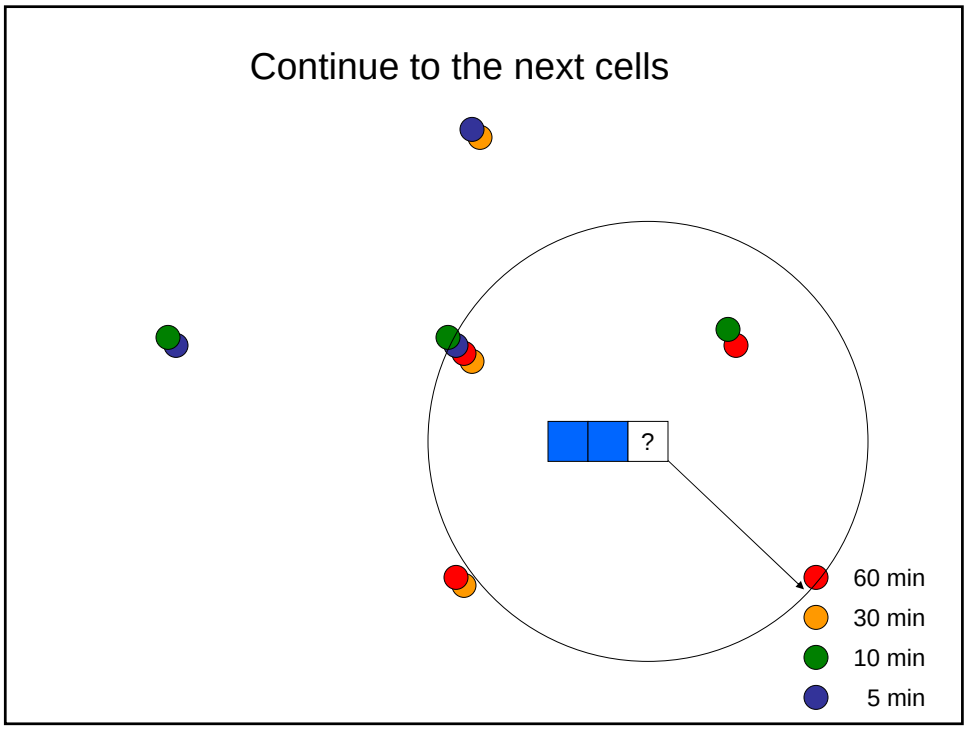
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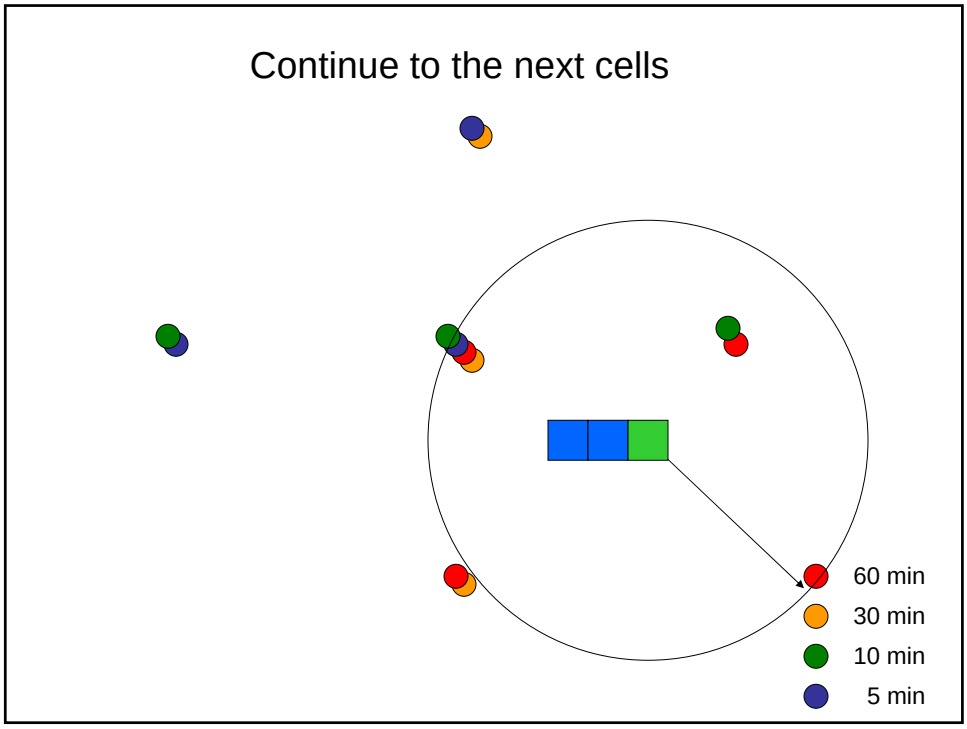
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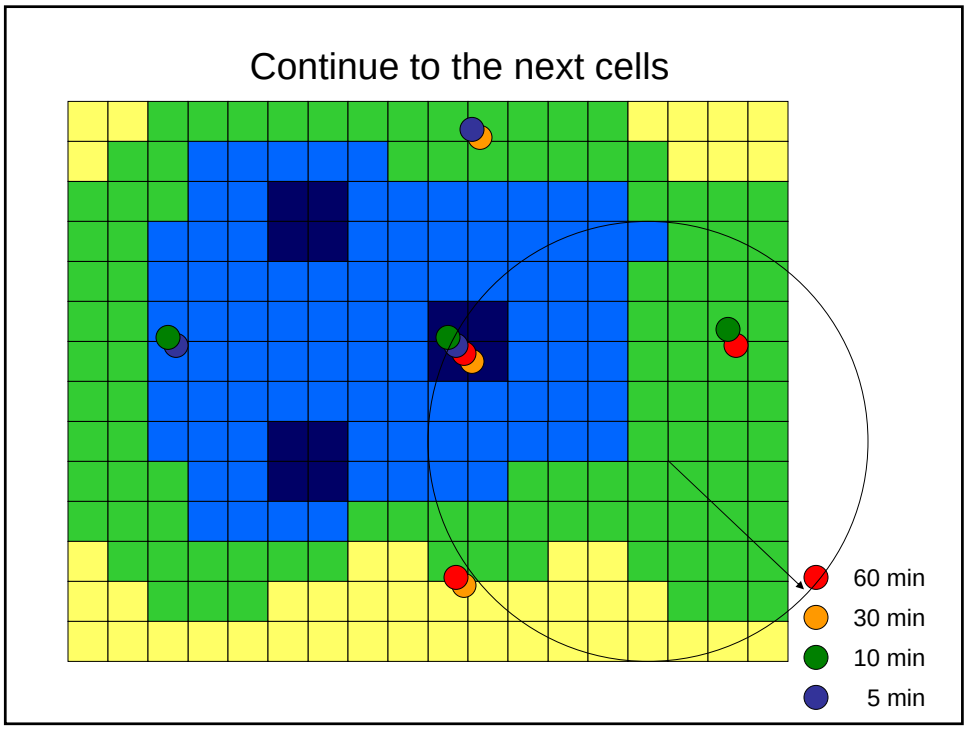
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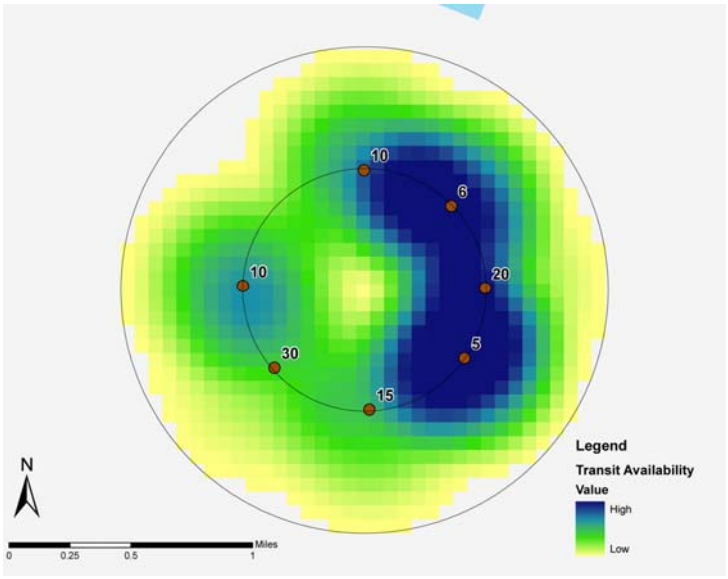
Actual density calculation uses a smarter algorithm

--Factors in distance from bus stop as well as headway.



Questions for further study

- Should a different radius be used for express bus versus local bus?
- Are there more appropriate thresholds for residential density and change in households?
- Should local and express availability be combined?
- Is there other data which should be presented on these maps?