PROGRESS REPORT2

Agent behaviour:

Agents start from left side of the world, which is outside of the station, move through the entrance and get on the train. The entrance is represent by a white blank. The black area is the wall and agents can not move through the wall.

System behaviour:

Number of turtles start from outside the entrance and move to the train. If there are too many turtles trying to get through the entrance, they might stop and wait. They should never run into other turtles.

I made the patches the same size as agents and allow only one turtle on each patch. This is how turtles avoid bumping to other turtles.

Agents are always trying to move towards the train, so if there is other turtle on the patch ahead an agent, it will move to neighbours to find new path. If it can't move anywhere, it stop and wait.

```
facexy dest-x dest-y                          ; dest-x dest-y is the coordinate of the train
if not can-move? 1 or patch-ahead 1 is wall   ; avoid run into walls
   [ find-nearest-patch ]                     ; find the neighbour which is nearest to destination
ifelse not any? other turtles-on patch-ahead 1  ; avoid bumping to others
 [ fd 1 ]
 [ set wait-time wait-time + 1
   move-to-neighbour ]
```

Rationale for agent rules

Agents find the shortest path to get on the train and avoid collide. I give the agents these rules to make them behave like a real person.

Turtles rule is as shown in the code above.

Turtles get on the train at random cars. The distribution is similar to reality since random numbers are dense at the middle and rare at both ends. In reality, people are more likely to boarding at middle of the train.

Model output

I didn't come up with new measures. I think number of people getting on trains in a certain period and mean waiting time can reflect the performance of a station structure. Because a good design of the station structure is to make more people move through this area in the same time. Longer waiting time shows the flow didn't move smoothly, which might lead to less people getting on the train in the same time.

Questions:

The structure of station is too simple to simulate the movement of real crowd. I need to read some resources on station design as you mentioned in the comment of my last report.

Next steps:

1. Design more complex station structures. Such as adding exits.
2. Adding turtles that get off from the train.
3. Make train moving.

Model Analysis:

Increase width of entrances reduce the waiting time.

Advanced feature:

Inspired by the sheep model Bryan showed last week, now I plan to use LevelSpace to give each agent a “brain” that they can “think” and make decisions to wait or finding other ways and so on. For example, suppose there are two entrance to the platform, and an agent has moved forward only 2 patches in 10 ticks, it may think to use another entrance. But changing queues is a time-cost action, so it may evaluate the waiting time for these two queues. Sometime after making a wrong decision, the feedback of the neural network could help it make better future decisions.