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### 3. Planning the Report 🐱

Link to Google Document:

[https://docs.google.com/document/d/1e\\_tWkpBdvx4i\\_-bYC5Xs6yoCO2TgK3ba8F5DA-Y4RPU/edit?usp=sharing](https://docs.google.com/document/d/1e_tWkpBdvx4i_-bYC5Xs6yoCO2TgK3ba8F5DA-Y4RPU/edit?usp=sharing)

NOTE\*\*: We will be doing queuing, thus simulation is most important for our group's project

#### A. Allocate team

- **Group 1: Simulation Model for Analysis**

Priya

Jennifer

- Work: The basis of the project. Conduct a model that can accurately simulate the queuing at Pardee Way. This includes the base model and critiques.

- **Group 2: Extended Model with New Diagrams**

Francesca

Sumin

- Work: The extended part of the project. Conduct a model that may include a hypothetical solution to the queuing problems seen during data collection.

#### B. Timeline

- Models (technical work, charts, and explanation with comments, jupyter notebook) ---> DUE Saturday May 3rd
- Meeting to WRITE & COMPLETE Paper ---> Saturday May 3rd @ 1PM-5PM
- Rough draft of paper, outlines, finalized appendix with engineering explanations and jupyter notebook ---> Sunday May 4th @ 1PM-5PM
- SUBMISSION RAHHHHHH ---> May 7th @ 11:59pm

#### C. Organization of paper

##### Introduction:

- Why

- Approach to our analysis (we split it up into two main models to analyze the structure of Pardee Way, and then a new optimized approach and compared the difference)

### **Data Collection Approach**

- Analysis
- Why we collected the data we did
- Potentially have charts

### **Assumptions**

- Overview CLEARLY all assumptions (VERY BROAD because you will go more in depth later)
- General assumptions
- Time periods chosen are peak times

### **Approach for Enriching the Model + Creating an accurate simulation:**

- Assumptions for the model
- What is simulation, high level
- What are we aiming to achieve? What are we aiming to solve?
- How will our model solve it?
- What metric are we solving for? Which is our objective?

### **Enriched Model Explanation**

- Diagrams, charts, etc.
- How does this model accurately represent the Pardee Way checkpoint.
- Why did you choose this objective function?
  - MINIMIZE THE EXPECTED WAIT TIME OF THE SUM OF DISRUPTORS DIVIDED BY 3 (groups, bike/scooter, visitor)

### **Optimized Model + With new Diagrams**

- Assumptions
- Why did you choose this objective function?
  - MINIMIZE THE EXPECTED WAIT TIME OF THE SUM OF DISRUPTORS DIVIDED BY 3
- Visitor lane, troubleshooting scanner, worker utilization re-assignment etc.
- How would this improve the efficiency of our system?
- How many employees are used? Key metrics on worker utilization, expected waittime.

### **Comparison with previous Model**

- Compare key metrics with enriched model and optimized simulation model.
- Why / how this incorporates a realistic solution.
- How can they realistically incorporate this

### **Limitations**

- Security team contract information
- Hiring a minimum number of works due to legal issues
- We didn't compute costs / cost optimization because we didnt have assumptions behind the outsourcing of security team → security team contract information

**Trade Offs (within limitations)**

- Focusing on wait time v probability of misuse of scanners at the expense of focusing on another metric like costs
- Changing the approach of number of scanners/efficiency of scanners may mean hiring less employees —> ethical concerns?

**Future Recommendations**

- What we recommend them to do and why
- How would our solution be realistic
- Probability of disruptor using scanner 1 rather than 3

**Conclusion**

- How this would help in interviews
- Connect this to Adam's research paper, and how we drew on his topics to understand splitting up the models of free-for-all versus the queue-splitting method. Created a visual that showed them side by side and how it improved queue waiting times. Make the comparison to our new diagrams and include charts on how it will improve waiting times.

**D. Extra Considerations for Cost**

1. Do they have a contract with the university? If our goal is to maximize utilization, then we have to assume that we aren't using cost. We should assume the contact between security team and USC is unknown. This may be the minimum amount of workers necessary, but we aren't sure so we can talk about future consideration.
  2. Figure out the cost of scanners such as if we open a scanner then it would cost us a certain amount
- Have a good reason for why we're not doing cost:
    - Security off sourced team contract is unknown and might be set
    - Scanner cost is minimal and may be built into contract cost with outsourced