We sincerely thank Reviewer #2 for his/her careful review and constructive feedback and suggestions. We truly believe that the changes suggested by Referee #2 will enhance the quality of the manuscript. A point-by-point response is presented below.

1. ***Page 1 line 14: I suggest replacing "add valuable minutes to travel times" to "may significantly increase the total travel time".**

   Thanks for your suggestion, the sentence has been changed as
   "However, disasters increase the difficulty of rescue and may significantly increase the total travel time between dispatch and arrival."

2. ***Page 1 line 22: Since EMS is defined as "Emergency medical services" in the abstract, I suggest using "Emergency medical services" in the keywords as well instead of just "Emergency medical service".**

   Thanks for noting this. The key words has been replaced.

3. ***Pages 1: The authors start the introduction section with a discussion regarding the importance of emergency services. I suggest including a broader discussion, highlighting potential consequences of disasters, importance of emergency evacuation and disaster preparedness, and the need for developing the methodologies that can improve both emergency services and emergency evacuation. In the discussion, I recommend acknowledging some relevant studies, including the following:**

   Thanks for your comments, we have read the relevant papers and one of the included references were also added to the reference list as below:

   "The demands being placed upon emergency services often exceed the resources made available by governments(Liu et al., 2017) . Furthermore, disasters always take more time to respond to the EMS demands due to a very dense traffic flow along the rescue routes. A crash at the rescue route may block one or several lanes, which will further result in congestion, significantly delay the emergencies efficiency, and may ultimately result in casualties (Dulebenets et al., 2019). Therefore, the maintenance of efficiency and quality of emergency services during disasters is the key to emergency management."

4. ***Page 3: Towards the end of the introduction section, please briefly discuss the structure of the manuscript (what would be described in the next sections of the manuscript).**

   Thanks for noting this. We have added discussion about the structure of the manuscript of introduction section as follows:

   "In the following sections, we describe the problems that the model needs to solve and the design of the Optimal Location Model. We also take a case study of urban fluvial floods in the

Minhang District of Shanghai, China to validate this model."

5. ***Page 3: It would be good to have a Figure in section 2.1, illustrating the problem of interest. This will help the readers visualizing the problem at hand.**

Thanks for your comments, we added one qualitative expression of problems and one logi-gram to make it clearer as follows:

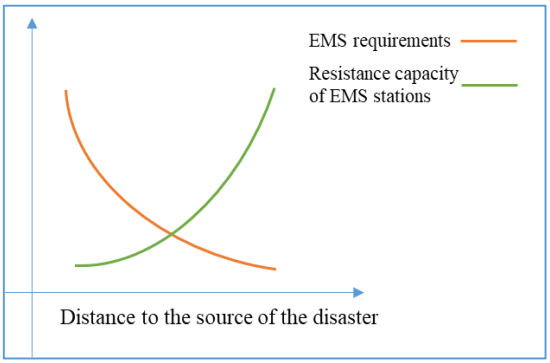

Fig.1 Description of Model problems

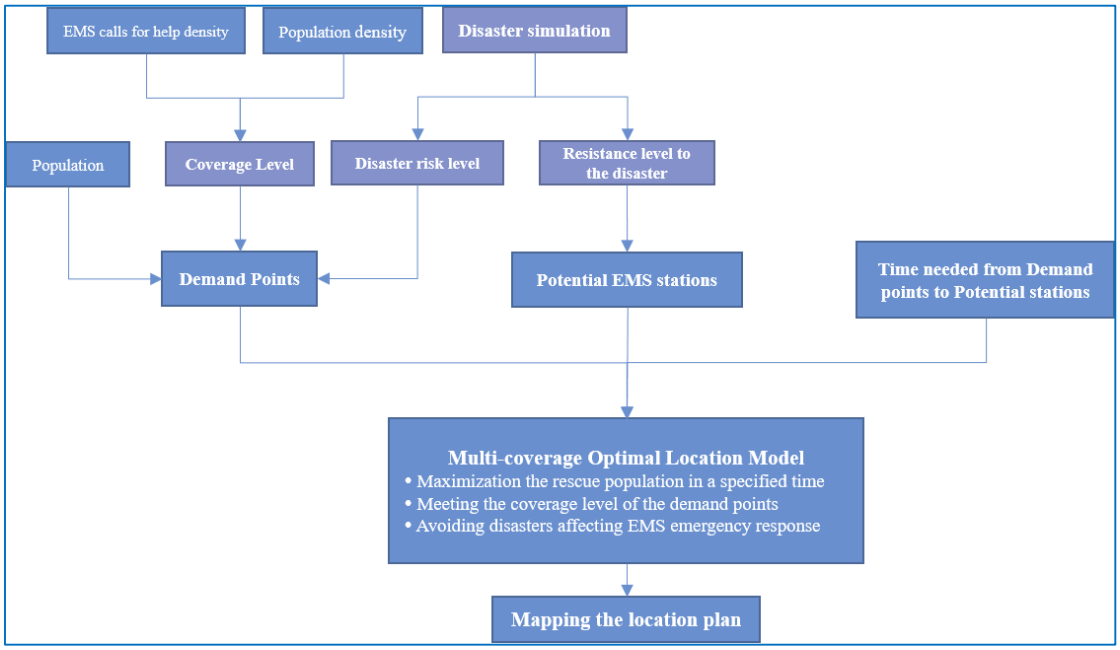

Fig.2 Multi-coverage Optimal Location selection logi-gram

6. **Pages 4-5: There are some issues with the control of indexes in the mathematical model. For example, in constraint set (2) you have y_j but you are summing over i, which is incorrect. The summation should be over index j. In constraint set (4) indexes "i,j" are not controlled. I assume you are trying to enforce the following condition: $t_{ij} \leq T \; \forall i \in I, j \in J$. Again, please check the entire model and make sure that all the issues associated with the control of indexes are fixed.**

Thanks for noting this. The formulas has been corrected

7. ***Pages 7-8: Did you develop Figures 1 and 2 yourself? If not, please provide a relevant reference.**

Yes, Figures 1 and 2 in manuscript were developed by ourselves, Figure 1 was illustrated by ArcGIS 10.2 software and Figure 2 was simulated by Floodmap model and illustrated by ArcGIS 10.2.

8. ***Page 15: The conclusion section should be strengthened. The authors should clearly highlight limitations of this study and how they will be addressed in future research.**

Thanks for your suggestion, we have added the limitations of this study and the future research in conclusion:

The model also has some aspects that could to be improved in order to arrive at more robust solutions. Firstly, in our case study, we did not have a quantitative assessment of the disasters risk level on emergency response, we evaluated the disaster risk level only by the buffer distance to disaster source area, which is subjective. Secondly, as we only analyzed in theory, our model did not consider whether the terrain or other basic conditions were suitable for the EMS facilities. The future studies will consider disaster risk factors such as the vulnerability of buildings comprehensively, evaluate the level of disaster risk quantitatively, and take the real terrain and construction cost of each potential point into full account.

Lastly, the location of urban emergency service facilities has always been the focus of urban planning. Location selection should consider a variety of factors and the ability to respond to disasters is also a key factor to consider, while in this paper, we divided the area into grids with a cell size of 2 km * 2 km and assumed that every grid center point was a potential emergency station, The division of grid will affect the efficiency of model running efficiency and the accuracy of results. The smaller the scale, the higher the accuracy, but the greater the running pressure. Therefore, in the future research, we will consider multi-scale division with variable squared meshes taking into account the distribution density of the population.

Reference

Dulebenets, M. A., Abioye, O. F., Ozguven, E. E., Moses, R., Boot, W. R., and Sando, T.: Development of statistical models for improving efficiency of emergency evacuation in areas with vulnerable population, Reliability Engineering & System Safety, 182, 233-249, https://doi.org/10.1016/j.ress.2018.09.021, 2019.