Minutes of Monthly Webinar No. 4:
INFORMS RAS · 2020 Problem-Solving Competition
June 17, 2020 · 9:00 AM EDT

RAS Attendance:
Krishna Jha (Host / Problem Owner) · Jay Baillargeon (Problem-Solving Competition Chair)

Agenda:
- Welcome & Important Updates
- Open Forum for Participants' Q&A
- Adjourn (Next Monthly Webinar: **Wednesday, June 24, 2020**)

Conference Call / Zoom Webinar:
- Jay Baillargeon and Krishna Jha welcomed those who attended the fourth monthly webinar for the 2020 INFORMS RAS Problem-Solving Competition and re-iterated that the goal of the webinar is to provide an open forum to gather feedback for the problem at hand from the RAS community as well as address questions from participants.
- Mr. Baillargeon then proceeded to discuss some important updates related to the 2020 INFORMS RAS Problem-Solving Competition:
    - The Committee ran into some unforeseen issues receiving the final dataset from the railroad partner, which has ultimately affected the schedule for getting the final validation dataset to participants. Although, it was announced that Mr. Baillargeon and Mr. Jha had come up with an alternate dataset to be used for validation purposes based on a previous Problem-Solving Competition's dataset. As such, there will be slight variations to the formatting than what was previously presented and/or discussed.
    - Given the affect this unfortunate circumstance has had on the schedule, the Committee agreed to change the date that the Quiet Period will begin from Friday, June 26, to Friday, July 3, starting at 11:59 PM CDT.
    - In addition, additional webinars will be hosted before the Quiet Period on Friday, July 3, to ensure all participants are comfortable with the validation dataset and have has a chance to have their questions addressed.
- In addition, Mr. Baillargeon and Mr. Jha also provided a detailed overview of the validation dataset, which had been modified from a previous year's Problem-Solving Competition, going sheet to sheet in the Microsoft Excel file to be provided to participants.
    - Mr. Jha also added that, though it was the committee's best attempt at adapting the dataset for this year's problem, there are likely errors within that may have gone unnoticed. As such, he encouraged participants to let the committee know if they come across such errors so they can be addressed and corrected in a timely manner.
- Following his update on recent news and an overview of the validation dataset, Mr. Baillargeon opened the forum for questions, comments, and any discussion related to the problem statement and datasets. This brought about the following questions:

- **Is there a speed limit for the sections within the network provided in the validation dataset?**
    - Mr. Jha responded that the maximum speed of the trains (in kilometers per hour, or KPH) is provided in the "Train Mvmt Data" sheet in the Microsoft Excel file, and the allowed speed between each station is provided in the "Num Track Chart" sheet as well.
    - A follow-up question asked, **"Has the headway distance changed with the new network provided in the validation dataset?"** In response, Mr. Jha noted that nothing has changed regarding the headway between trains; only one train is allowed to occupy any given section of track, which is denoted as the section of track between stations in the case of the validation dataset.
- **Where are the sidings locations within the network provided for the validation dataset?**
    - Mr. Baillargeon noted that the sidings will only be located at certain stations and will be denoted in the "Stn Order & Details" sheet, rather than on the diagram itself due to the sheer size of the network.
    - The visual diagram provided in the validation dataset only depicts an abbreviated version of the mainline tracks and does not feature any sidings or spurs, the details of which are provided in the other sheets within the Microsoft Excel file.
- **What is the penalty for using a crossover?**
    - Mr. Baillargeon clarified that there is no penalty to utilize a crossover and allow trains moving in either direction to move to any of the adjacent tracks.
    - Although, there is a penalty (i.e., **5 minutes**) for using a siding, which is denoted within the "Errata & Update" file posted to the website.

UPDATE: Originally, the penalty was 15 minutes, which was discussed during this call. Although, this is incorrect with the new dataset due to the shorter travel times associated with the trains involved. As such, the penalty will be **5 minutes**, not 15 minutes, as previously reported. This has been updated here in the minutes as well as the other files provided to participants.

    - A follow-up question asked, **"How will the penalty be assessed for using a siding, and where does the 5-minute penalty stem from exactly?"** In response, Mr. Baillargeon noted that sidings, which will be located at specific stations, will be available to use (as long as they are not occupied) to allow higher-priority trains to pass.
        - Although, a penalty of **5 minutes** will be assessed to account for the movement into the siding, clearance of the passing train, and authorization to proceed from the dispatcher, which are representative of real-world freight operations.
        - Mr. Jha described this more as an average approximation of time associated with the movement, rather than a "penalty" per se.
        - A follow-up question asked, **"Are sidings located between stations in the network provided?"** In response, Mr. Baillargeon noted that, given that the

network is based on an actual operating passenger service line in Europe, no information was provided regarding the presence and location associated with sidings between the stations. As such, to simplify things, it was decided that sidings will only be located at stations.

- To clarify, if a station containing a siding is designated as a stop for a specific train, the train will occupy a separate "station siding/spur," for which no penalty is assessed. Furthermore, the siding listed for that station is open for other trains to use while the train is "parked" at the station.

- **Is there a distinction between spurs and sidings for this particular problem dataset?**
  - Mr. Baillargeon noted that only sidings will be specifically designated for the network provided; no spurs will be given for trains to use to allow other trains to pass. This is due to the fact that no information was provided from the railroad regarding the presence and location of spurs on the network.
  - A follow-up question asked, **"Are yards included in this network as well?"** In response, Mr. Baillargeon noted that the "yards" (for which the random variable will be used) will be the points where cars are picked up or dropped off. There are also other points in the network (i.e., specific stations) designated as yards which act as locations with multiple sidings and storage tracks that can be used while a train is en route.
  - Mr. Jha noted that, if the yard currently occupied, a following train must wait at the previous station until the train picking up or dropping off cars departs. Unless the station contains a siding, then this will delay other successive trains behind it as well.
- **Can participants run a train at speed lower than the permissible speed?**
  - Mr. Jha mentioned this was brought up previously and the decision was to avoid running trains at less than the permissible speeds (i.e., for the train type and for the track section) for this competition.