

Scheduling 101

Running Time Development

John E Pappas

Transit Operations Consultant

Brooklyn, New York

Key Presentation Take-Aways

- Quick Overview of Scheduling
- Scheduling's Place in Improving On-Time Performance
- Importance of Correct Running time
- How to Measure and Adjust Running time
- Class Exercise
- Wrap-Up

Scheduling 101

Running Time Development

Inspiration:

Past Ops Planning session where someone new to the business asked:

“What can schedulers do to improve On-time Performance?”

A quick view of the Overall Scheduling Process

Gather and analyze inputs

- Passenger data
- Running time data
- Plans for any route, service or pattern change

A quick view of the Overall Scheduling Process

Definition:

Service patterns are different ways trips can operate on a route, which include turnbacks, alternate routes, express and limited stop trips

A quick view of the Overall Scheduling Process

- Perform roundtrip cycle analysis to determine vehicle requirements
- Decide on headways during different times of the day, partly based on above analysis
- Policy or demand service levels

A quick view of the Overall Scheduling Process

- Build trips
- Hook trips with recovery time together to form “Blocks”
- Assign Pull-out/in times to and from the garage
- Perform runcut

A quick view of the Overall Scheduling Process

- On some transit properties, Roster the work into weekly assignments with designated days off (five day, four day, part-time schemes)
- Prepare output (paper and electronic) to affected staff

Roundtrip Cycle Calculation

- Running time must be accurate to have any hope that individual trips will be running on time.
- If operators do not have proper layover or recovery, next trips will not start on time
- Running times vary over time and need to be looked at and adjusted periodically

Roundtrip Cycle Calculation

Example: Route 99 – Midday cycle

Eastbound RT: 47 minutes

Westbound RT: 53 minutes

Total time roundtrip: 100 minutes

Roundtrip Cycle Calculation

Total time roundtrip: 100 minutes

Minimum recovery time: 10 percent of running time

Roundtrip cycle time: 110 minutes (minimum)

Proposed midday headway: 12 minutes

How many vehicles?

Does this headway work?

Running Time Analysis

Obtain data from

- APCs
- Old Fashioned (but effective) Ride Checks
- Vehicle Location information (AVL)

Running Time Analysis

Things to Keep in Mind

- Check in the Spring or the Fall, avoid atypical operating days
- Check toward the middle of the week (NO Monday or Friday checks)

Running Time Analysis

Things to Keep in Mind

- Ideally, average a minimum of three or more checks (the more the better, safety in numbers)
- Throw away “bad” checks

Running Time Analysis

Things to Keep in Mind

- You're looking for the average day. There is no "average" day!
- Get out and actually ride a roundtrip on the line and do your own ride check
- Mean? Median? Chose **Mode!**

Running Time Analysis

Things to Keep in Mind – For a new or revised route

- NEVER, EVER establish running time for a new route by driving a car over the route!
- Better to lay out times using the Running Time Data sheet and drive it in a bus, simulating stops

Running Time Analysis

Things to Keep in Mind

You will establish two adjustments

- Running time breaks (classes, levels, intervals)
- Running time between timepoints within each break

Running Time Analysis



Running Time Analysis

Spreadsheet – Line 99 Analysis

Running Time Analysis

Rules to Ponder

- Look for most frequently occurring times
- Note when times tend to escalate or grow smaller
- Ignore outliers

Running Time Analysis

Spreadsheet – Line 99 Analysis

Running Time Analysis

Running Time Data Sheet

- Highly useful tool to evaluate speed in MPH between timepoints
- Allows you to do what-if scenarios

Running Time Analysis

Running Time Data Sheet – Route 99



Running Time Analysis

Class Exercise

- Review the actual trip data shown
- Establish running time breaks, if necessary
- Establish new running times within the breaks as demonstrated earlier

Running Time Analysis

Class Exercise – Route 100

Running Time Analysis

Back to this question:

“What can schedulers do to improve On-time Performance?”

- Schedulers can build the most realistic schedule possible but....

Running Time Analysis

Back to this question:

“What can schedulers do to improve On-time Performance?”

- Supervision must manage the service effectively
- And that’s a discussion worthy of another session on another day

Running Time Analysis

Thank you so very much for your participation

