



# Toronto Transit Commission - Flat Wheels Study

<p><b>Project</b> Flat Wheels Study</p>
<p><b>Client</b> Toronto Transit Commission (TTC)</p>
<p><b>Location</b> Toronto, Canada</p>
<p><b>Dates &amp; Duration</b> 2019 - 2019 (6 months)</p>
<p><b>Services Provided</b></p> <ul style="list-style-type: none"> <li>▶ Diagnostic study of the increase in wheel flats on the T1 Subway Fleet;</li> <li>▶ Develop joint recommendations with TTC operational departments; and</li> <li>▶ Support the implementation of those solutions to minimize and mitigate the occurrence of wheel flats.</li> </ul>

## Background

Toronto Transit Commission (TTC) operates four subway lines throughout the City of Toronto, including Line 2 Bloor – Danforth. Line 2 is operated exclusively by Bombardier T1 subway cars that are trains run in a 6-car joined by 3 married units and were introduced between 1995 and 2001.

Historically, during normal operations, TTC experienced three to four new wheel flats per day on Line 2. However, in 2018 the number of wheel flats significantly increased and to date, the cause of the issue has not been found.

## Scope of Works

Network Rail Consulting (NRC) was engaged to help understand the root cause(s) and identify potential solutions. This was carried out in two phases:

### Phase 1 – Diagnostic Study:

- ▶ Initial diagnostic study and opportunity to understand and gather all relevant technical information and data to allow the production of a comprehensive work plan to help mitigate the TTC wheel flat issue. Subject matter experts from mechanical, engineering and transportation disciplines to work both on and off site to get all base information to develop a longer-term work plan for this project.

### Phase 2 – Workplan and Solution Implementation:

- ▶ Workshops with front line staff, supervisors and managers;
- ▶ Formation of dedicated train sets with pre-determined wheels, brake shoes and brake settings;
- ▶ Joint investigations with manufacturers;

- ▶ Departmental meetings with Transportation, Engineering, Mechanical teams to focus on each area of the investigation;
- ▶ Track walks and cab rides to understand the condition of the infrastructure; and
- ▶ Development of a Control Room to track all the activities in a single location.

#### Phase 3 – Review of Recommendations:

- ▶ Follow up task to review progress made by TTC in the areas that NRC has made recommendations.

#### Key Project Outputs

- ▶ Reports from each phase of work, including presentations highlighting findings and recommendations;
- ▶ Technical Notes highlighting areas of improvement in Lubrication, Brake Rate Testing, Defensive Driving Techniques and Spin Slide Testing; and
- ▶ Control Room outline and facilitation of the first 6 weekly meetings.